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HIGH-LOADING LOW-SPEED FAN STUDY
III. DATA AND PERFORMANCE
SLOTTED BLADES AND VANES AND
ROTOR TIP TREATMENT

by
K. G. Harley
J. Harris
E. A. Burdsall (Acoustics)

Pratt & Whitney Aircraft Division
United Aircraft Corporation

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T. F. Gelder, Program Manager
Fluid System Components Division

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Pratt & Whitney Aircraft DIVISION OF UNITED AIRCRAFT CORPORATION

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Subject: Errata Sheet for Report No. CR 72895

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Enclosed herewith is an errata sheet for report number CR -72895 entitled:

High-Loading Low Speed Fan Study
III Data and Performance Slotted
Blades and Vanes and Rotor Tip
Treatment

UNITED AIRCRAFT CORPORATION
Pratt & Whitney Aircraft Division

K. G. Harley
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ERRATA

NASA Contractor Report CR-72895

HIGH-LOADING LOW-SPEED FAN STUDY

III DATA AND PERFORMANCE

SLOTTED BLADES AND VANES AND ROTOR TIP TREATMENT

By K. G. Harley, J. Harris, and E. A. Burdsall

Page 10, last paragraph, line 4: Insert the words "area at the screen axial location", after the words, "inlet annulus".

Page 59, Figure 24: The ordinate scale for the top curve should read "p_{10}/P_0" instead of "p_{13}/P_{10}", and for the lower curve, "p_{13}/P_{10}", instead of p_{13}/P_0"

Page 143, Appendix 1: Delete parenthetical references to "Table 25-33" after definition of symbol "MR".

Page 152: Replace with attached table. Values followed by a dot have been changed to provide better agreement and accuracy.

Aerodynamic Design - Blade Element and Over-all Performance

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	614	995	605.4	• 560	0	• 823	0	• 56.1	35.5	• -28.6	751	• 638	-412	305	424	518
10	14.100	16.790	620	• 989	621.5	• 612	0	775.8	0	• 51.7	37.0	• -20.8	778	• 655	-445	• 232	455	544
15	15.170	17.580	627	971	627.4	• 637	0	734.8	0	49.2	38.6	• -14.7	804	656	-488	170	489	568
30	18.280	19.910	650	916	652.1	640.4	0	655.1	0	45.6	42.7	- 0.6	877	641	-602	7	586	643
50	22.190	23.090	671	836	671.1	606.1	0	576.4	0	43.8	47.2	15.5	981	629	-716	-173	714	742
70	25.880	26.260	680	782	680.4	583.9	0	525.0	0	41.7	51.1	29.4	1077	668	-836	-328	838	848
85	28.450	28.610	682	755	682.6	569.9	0	492.3	0	40.8	53.3	37.5	1145	715	-918	-432	918	923
90	29.320	29.410	683	747	682.8	564.1	0	488.0	0	40.8	54.1	39.6	1167	729	-946	-461	944	949
95	30.150	30.180	683	737	682.6	556.9	0	487.9	0	41.3	54.8	41.8	1189	738	-974	-488	969	973

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.1	0.81	10.3	61.7	71.1	0	.390	.0673	.0124	.0124	1.540	.9601	.9576		.5654	.902	.698	.514
10	-5.0	1.65	11.5	58.0	66.1	0	.385	.0377	.0077	.0077	1.540	.9750	.9735		.5718	.891	.717	.586
15	-4.3	1.99	12.2	54.0	63.0	0	.400	.0264	.0057	.0057	1.540	.9807	.9795		.5797	.878	.738	.594
30	-3.0	2.69	13.0	43.3	53.2	0	.473	.0334	.0085	.0085	1.540	.9719	.9702		.6045	.820	.813	.574
50	-1.6	3.41	11.2	31.7	39.0	0	.535	.0481	.0136	.0136	1.540	.9535	.9506		.6245	.740	.909	.551
70	-0.5	3.73	9.0	21.7	26.9	.0087	.537	.0673	.0190	.0165	1.540	.9274	.9229		.6328	.686	1.001	.586
85	0.0	3.71	7.1	15.8	19.5	.0142	.525	.0867	.0238	.0199	1.540	.9022	.8961		.6342	.658	1.066	.624
90	0.0	3.53	6.8	14.5	18.3	.0162	.523	.0979	.0269	.0225	1.540	.8871	.8800		.6360	.649	1.089	.635
95	-0.2	3.20	7.0	13.0	17.4	.0186	.533	.1197	.0313	.0263	1.540	.8672	.8589		.6358	.642	1.110	.642

TO2/ TO1	PO2/ PO1	EFF-AD %	EFF-P %	STA-1	STA-2
1.1410	1.5400	93.3	93.8	5.0	6.0

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	978	575	622.7	575	747	0	49.7	0	-16.9	46.30	652	818	179	-601	571	598
10	18.350	19.110	962	600	641.6	600	710	0	47.8	0	-11.4	46.05	657	850	119	-618	592	616
15	19.070	19.740	947	617	659.3	617	678	0	45.8	0	- 5.9	46.00	662	882	64	-637	614	637
30	21.140	21.600	914	636	673.8	636	614	0	42.4	0	6.1	47.55	676	943	-68	-698	682	697
50	23.970	24.200	875	630	674.3	630	555	0	39.5	0	17.8	51.00	708	1005	-216	-782	777	782
70	26.790	26.880	840	624	665.0	624	511	0	37.6	0	28.0	54.23	752	1070	-354	-867	868	871
85	28.860	28.900	818	619	655.4	619	488	0	36.7	0	33.9	56.52	889	1120	-442	-933	939	935
90	29.570	29.600	811	616	649.8	616	484	0	36.8	0	35.8	57.30	802	1135	-469	-954	956	957
95	30.240	30.270	805	612	642.4	612	485	0	37.0	0	37.3	58.08	809	1152	-492	-978	977	978

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	0	3.95	16.2	49.7	61.8	0	.593	.210	.0485	.0435	.9184	0	0	.7682	.885	.4923	.5890	.706
10	0	4.25	15.9	47.8	59.2	0	.558	.165	.0399	.0399	.9365	0	0	.7989	.870	.5142	.5928	.734
15	0	4.32	15.5	45.8	56.8	0	.528	.129	.0307	.0307	.9526	0	0	.8338	.854	.5335	.5965	.763
30	0	4.79	13.9	42.4	51.7	0	.495	.069	.0171	.0171	.9751	0	0	.8926	.817	.5510	.6053	.823
50	0	5.48	10.3	39.5	44.7	0	.483	.046	.0154	.0154	.9831	0	0	.9114	.777	.5458	.6305	.867
70	0	6.09	12.5	37.6	44.4	0	.473	.043	.0192	.0192	.9830	0	0	.8940	.743	.5389	.6654	.920
85	0	6.50	15.2	36.7	45.2	0	.473	.061	.0273	.0273	.9789	0	0	.8571	.719	.5322	.6955	.960
90	0	6.59	15.8	36.8	45.9	0	.477	.073	.0312	.0312	.9765	0	0	.8397	.712	.5281	.7037	.975
95	0	6.75	16.3	37.0	46.8	0	.484	.096	.0369	.0369	.9729	0	0	.8163	.705	.5234	.7070	.988

NCOR-1 RPM	WCOR-1 LBM/SEC	WC/A-1 LBM/SEC SQFT	TO2/ TO1	PO2/ PO1	EFF-AD %	EFF-P %	STA-1	STA-2
7400.0	185.0	42.0	1.1410	1.5000	87.3	88.1	11.0	12.0

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NASA Lewis Research Center
Contract NAS3-10483
T. F. Gelder, Program Manager
Fluid System Components Division

FOREWORD

This report was prepared by the Pratt & Whitney Aircraft Division of United Aircraft Corporation, East Hartford, Connecticut, to present data and performance of slotted airfoils, with and without rotor tip treatment, under Contract NAS3-10483, High-Loading Low-Speed Fan Study. Performance tests were conducted between December 1969 and January 1970.

ABSTRACT

High-Loading, Low-Speed Fan Study
III. Data and Performance, Slotted
Blades and Vanes and Rotor Tip Treatment

A single-stage fan with a tip speed of 1000 ft/sec (304.8 m/sec), a pressure ratio of 1.5 and a hub to tip ratio of 0.392 was tested from 65 to 110 percent of design speed to determine the effect of various design features on performance, stall characteristics, and noise. The tests were conducted with both uniform and radially distorted inlet flow. Stator-hub slit suction was used to improve the stator performance although with uniform inlet flow, the stator hub section still induces stage stall at design speed. The rotor and stator slots improved both the pressure rise and the efficiency at part speed. Without slots the stall flow at design speed was not repeatable. With stator hub (and tip) slots, the stall flow was repeatable and agreed with the minimum value obtained without slots. Rotor tip treatments were applied mainly during tip radially distorted inlet flow tests where the rotor tip rather than the stator hub caused the stage to stall. Use of a honeycomb structure in the case over the rotor tips in combination with vortex generators improved the stall margin by as much as ten percentage points but caused about a seven-point reduction in overall efficiency. Airfoil slots had little effect on noise levels previously measured for the unslotted stage. However, the addition of the honeycomb over the rotor blade tips increased the blade passing frequency noise levels 5 to 10dB.

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I. SUMMARY

Tests were conducted to determine the detailed aerodynamic characteristics of a highly loaded, single-stage fan with slotted airfoils. The stage consisted of a low-tip-speed rotor and a stator separated by two rotor-chord lengths to provide low noise levels. Stator-hub-slit suction which reduced losses during previous tests with unslotted airfoils was used for most of the present tests. The rotor blade and stator vane slots were part of the program to improve stall range and reduce endwall loss. Other devices for improving stall range were designed and tested: vortex generators on the outer case ahead of the rotor, and a honeycomb structure over the rotor blade tips. Both uniform inlet flow and tip radially distorted inlet flow were used. Acoustic measurements were made in the inlet plenum and downstream of the stator vanes.

At design speed and uniform inlet flow, the stator hub induced stage stall with or without stator-hub-slit suction. With suction (about 0.2 percent of the total inlet flow) the stall flow range was extended about 8 and 4 percent at speeds of 80 and 100 percent of design speed, respectively. The stator stall range was sufficiently improved at 80 percent of design speed to permit the rotor to induce stall.

Airfoil slots were in the stator end regions and in and near the rotor tip. Without slots the stall flow at design speed was not repeatable. With stator hub (and tip) slots, the stall flow was repeatable and agreed with the minimum value obtained without slots. Rotor and stator slots improved the overall stage efficiency by as much as 2.5 percentage points at 80 percent of design speed with essentially no change in efficiency at design speed.

The effects of tip radial distortion on stall margin were similar to those obtained previously with the unslotted stage. Slots did not help to attenuate the deterioration in stall margin.

Rotor tip treatments were applied mainly during tip radially distorted inlet flow tests where the rotor tip rather than the stator hub induced stage stall. Best results were obtained with a honeycomb structure in the case over the rotor blade tips combined with vortex generators upstream of the rotor. They lowered the weight flow at stall and 95 percent of design speed from 164.6 lb/sec to 149.7 lb/sec, or about a 10 percentage point increase in stall margin. With honeycomb alone the improvement was about 7 percentage points in stall margin. Vortex generators alone had no effect on stall margin. All configurations using honeycomb (open back) resulted in an overall stage efficiency penalty of about 7 percentage points. This severe penalty was traced to air recirculation through the honeycomb resulting in an increase in rotor exit temperature from which no useful work was derived. Rotor blade element losses and deviation angles were about the same with or without honeycomb tip treatment if calculated from measured air angles rather than from measured temperatures.

The acoustic data showed no significant changes in broadband or supersonic fan noise (combination tones) when the blades and vanes were slotted nor were there significant changes in these noise components when honeycomb tip treatment was added to the slotted blade configuration. An unexplained increase of 5 to 10 dB in blade passing frequency noise was noted when the honeycomb tip treatment was added over the rotor tips. No effect on blade passing frequency noise was measured by the addition of slots in the airfoils.

II. INTRODUCTION

The objective of this program was to determine the aerodynamic performance characteristics of a highly loaded, low-speed fan stage that would be applicable to a low-noise engine. Since fan noise is related to the physical characteristics of the stage and its operating conditions, an attempt was made in the design of this stage to reduce fan noise by (1) eliminating inlet guide vanes, (2) designing for low rotor-tip Mach numbers, (3) spacing the rotor and stator apart by two rotor chord lengths, and (4) selecting the number of stator vanes equal to sixteen more than twice the number of rotor blades. Design details are reported in Reference 1.

Creating a useful pressure ratio with low tip speeds requires large rotor turning angles (relative air angles past the axial direction at the hub), high stator inlet Mach numbers, and high aerodynamic blade loadings. The high loadings limit the potential for stall margin and for tolerance to inlet distortion.

Previous tests of this fan with solid airfoils showed an encouragingly high overall efficiency, but the stall range was poor. Consequently, the program discussed in this report was devoted primarily to the evaluation of various methods for improving the stall range. These included slotted blading, vortex generators on the outer case forward of the rotor, and a honeycomb structure in the outer case opposite the rotor blade tips.

Some flow range advantages have been observed with slotted subsonic compressor blading but little improvement in overall efficiency (Reference 2). Also, potential flow studies indicate that slots would be useful in improving stall range while keeping losses to a minimum, provided that they are properly designed for an airfoil operating in the critical region. The airfoil slots studied in this program were designed primarily for range improvement, particularly in the blade end regions, with losses of secondary concern. The slots were formed by electrodischarge machining the originally tested solid airfoils (Reference 3). They are located in the stator end regions, and in and near the rotor tip.

Increased flow range due to vortex generators located upstream of the rotor and stators has been observed in a single stage compressor (Reference 4). Therefore votex generators for use ahead of the rotor tips were designed and tested.

Flow range improvement has also been reported for a porous outer-case insert of honeycomb over the rotor tips of a single stage compressor (Reference 5). A similar honeycomb structure was designed and tested in the present program.

Tolerance to inlet distortion can be the most significant single factor in determining engine operating stability. Inlet distortion may change the performance of a compressor in several ways. Efficiency and the speed-flow relationship may be altered, but the most significant possibility is that the stall limit may move closer to the engine operating line. Because some inlet flow distortion is likely in a practical application of a fan stage, tests were conducted with tip radially distorted flow in addition to those with uniform inlet flow.

Essentially all testing was performed with stator-hub-slit suction, which has been demonstrated during previous testing to reduce stator losses (Reference 3). During the shakedown testing with slotted blades, a limited amount of testing was performed without slit suction to determine the effect of this suction on stage stall characteristics. These shakedown tests revealed that with or without suction the stator hub limited the stall flow range of the fan stage at design speed and with uniform inlet flow. Therefore the rotor tip treatments of vortex generators and porous case were used mainly with tip radially distorted flow which made the rotor tip critical rather than the stator hub.

With the exception of the new hardware required for the rotor tip treatments all hardware, including distortion screens, used in this program was the same as that used for the unslotted fan tests (Reference 3).

This report presents the test results for a highly loaded, low-tip speed fan stage with slotted rotor and stator blades with and without tip radial distortion. Also the results from rotor tip treatments of vortex generators and porous casing are given. Test results include detailed aerodynamic performance for all configurations and noise data for some. Highlights of the various configurations are discussed.

III. APPARATUS AND PROCEDURES

A. Test Compressor

1. Overall Design Description

A schematic drawing of the fan stage mounted in the test rig is shown in Figure 1. This single-stage fan was designed with a flow per unit annulus area at the rotor leading edge of 42 lb/sec ft^2 and with an overall pressure ratio of 1.50. The design rotor tip speed is 1000 ft/sec, and the design stator inlet Mach number range is from 0.90 at the hub to 0.70 at the tip. There are 24 rotor blades and 64 stator vanes.

The overall flowpath convergence was determined by setting the inlet-to-exit axial velocity ratio approximately equal to unity. A constant outer diameter was chosen to permit maximum flow convergence at the rotor hub, thereby providing a maximum rotor-exit wheel speed and a smaller amount of rotor hub turning. Air turning at the rotor hub is 72.6 degrees, which results in a rotor exit relative air angle of -39.6 degrees.

The running tip clearance was 0.028 inch at design speed, and the static tip clearance was 0.053 inch.

2. Basic Unslotted Airfoil Design

The design is briefly reviewed here for convenience, details are reported in Reference 1.

a. Rotor

The rotor was designed to produce a constant pressure ratio from root to tip of 1.54. The rotor aspect ratio is 1.92 (based on average blade length, 8.6 inches, and the aerodynamic root chord), and the rotor inlet hub-to-tip ratio is 0.392.

The airfoil sections are developed as multiple-circular-arc sections. Rotor-blade metal angles and solidities for the nine streamlines at which blade element data were obtained are shown in Table 1. Other aerodynamic design data are presented in Appendix 2. Symbols and performance parameters are defined in Appendix 1.

In reviewing the design data shown in Appendix 2, it is important to note that the total rotor losses shown are the estimated total losses used in the blade design but that the profile losses do not agree with the loss correlation in the design report (Figure 35 of Reference 1). Total losses are composed of profile and shock losses. In the initial loss estimate, the shock losses were high as a result of overestimated supersonic turning. The estimated profile losses, however, were low because they were derived by subtracting normal shock model losses (based on Prandtl-Meyer turning, see Reference 6) from high-speed rotor loss data. These normal shock model losses were too high in this application, resulting in the low estimate for the profile losses. Use of too high an estimate for the shock losses and too low an estimate for the profile losses resulted, however, in a realistic estimate for the total losses. Consequently,

the shock losses and profile losses were never re-estimated for the final design. Recent data indicate that the profile losses indicated by the correlation in Figure 35 of Reference 1 should be increased by 0.005 for the low-speed range if the normal shock model of Reference 6 is to be used in estimating total losses.

TABLE 1

ROTOR BLADE DESIGN DATA
(STATIONS 5 AND 6 OF FIG. 12)

Percent Span From Hub†	Diameter at Leading Edge (in) (Station 5)	Diameter at Trailing Edge (in) (Station 6)	Mean Leading Edge Metal Angle, β'^*_5 (Degrees)	Mean Trailing Edge Metal Angle, β'^*_6 (Degrees)	Suction Surface Leading Edge Metal Angle, β'^*_{s5} (Degrees)	Shock Angle, β'^*_{sh} (Degrees)	Solidity σ
5	13.12	16.03	34.17	-36.78	41.08	27.18	2.43
10	14.10	16.79	35.01	-31.13	41.66	28.44	2.29
15	15.17	17.58	36.17	-26.88	42.46	29.31	2.16
30	18.28	19.91	39.54	-13.70	45.23	32.64	1.90
50	22.19	23.09	43.57	4.53	48.58	38.14	1.69
70	25.88	26.26	46.96	20.02	51.19	43.54	1.53
85	28.45	28.61	49.58	30.03	53.28	46.56	1.44
90	29.32	29.41	50.56	32.29	54.09	47.69	1.41
95	30.15	30.18	51.58	34.15	54.97	48.69	1.39

† Data are for points along design streamlines which pass the rotor trailing edges at the specified span locations.

b. Stator

The stator vanes are multiple-circular-arc airfoils designed on conical surfaces approximating streamlines of revolution. The number of stator vanes was set by acoustical considerations at twice the number of rotor blades plus sixteen, which equals 64. A constant radially projected chord of 1.83 inches is used, resulting in an aspect ratio of 3.67 (based on average vane length, 6.8 inches, and the aerodynamic root chord). The stator-vane metal angles and solidities for nine streamlines are listed in Table 2, and aerodynamic design data are presented in Appendix 2.

TABLE 2

STATOR VANE DESIGN DATA
(STATIONS 11 AND 12 OF FIG. 12)

Percent Span From Hub†	Diameter at Leading Edge (in) (Station 11)	Diameter at Trailing Edge (in) (Station 12)	Mean Leading Edge Metal Angle, β^*_{11} (Degrees)	Mean Trailing Edge Metal Angle, β^*_{12} (Degrees)	Suction Surface Leading Edge Metal Angle, β^*_{s11} (Degrees)	Shock Angle, β^*_{sh} (Degrees)	Solidity σ
5	17.72	18.58	45.34	-16.48	49.29	39.06	2.11
10	18.35	19.11	43.27	-15.92	47.52	37.19	2.03
15	19.07	19.74	41.41	-15.42	45.74	35.31	1.95
30	21.14	21.60	37.70	-13.97	42.49	32.50	1.75
50	23.97	24.20	34.03	-10.74	39.51	30.05	1.55
70	26.79	26.88	31.46	-12.79	37.56	27.83	1.39
85	28.86	28.90	30.22	-15.02	36.72	26.56	1.29
90	29.57	29.60	30.22	-15.73	36.82	26.37	1.26
95	30.24	30.27	30.42	-16.33	37.17	26.34	1.23

†Data are for points along design streamlines which pass the rotor trailing edges at the specified span locations.

3. Slot Design

a. Rotor

Two slots were designed for the rotor blades to reduce losses in the endwall region and to improve the flow range of the blades by energizing the suction-surface boundary layer and delaying separation. The slot designs are shown in Figure 2 and are based on performance data obtained with unslotted rotor blades presented and discussed in Reference 3.

The larger slot extends from the 70 percent span from hub to the 94 percent span location. The slot discharge is located at a distance behind the leading edge equal to approximately 70 percent of the chord. This location was selected to place the discharge behind the minimum blade passage area to prevent premature choking of the rotor and forward of the position where the discharge angle relative to the suction surface would not exceed about 20 degrees, an angle shown by experience to provide nonseparated flow. The selected discharge location lies halfway between the calculated point of maximum suction-surface velocity and the estimated point of separation. The slot width was selected using data from Pratt & Whitney Aircraft cascade tests of a slotted 65/CA(40)07 airfoil in which the ratio of slot width to wake momentum thickness was investigated. The selected slot width provides an adequate covered area for flow guidance and results in an estimated slot flow equal to 3 percent of the flow in the channel between the slotted airfoils. No slot wall convergence was used for convenience and because the slot entrance Mach numbers were sufficiently high to energize the suction surface boundary layer. Also, previous testing under Contract NAS3-7614 (Reference 7) showed that airfoil slots are susceptible to choking because of the boundary-layer growth in the slot.

The rotor tip slot was designed to improve the generally poor tip flows due to outer case boundary layer. It extends from the 95 percent span location outward through the rotor tip and discharges at a distance from the leading edge equal to 20 percent of the blade chord. Because of its location in the boundary layer, the discharge from this slot does not need to be positioned behind the minimum passage area. The slot discharges at an angle of 11 degrees to the suction surface. The slot width was selected at the maximum value that still provides a covered slot area for flow guidance. The flow through the slot is estimated to be approximately 2 percent of the channel flow in the outer 5 percent of blade span. Slot edge radii were selected mainly by fabrication rather than aerodynamic considerations.

b. Stator

Slots were provided at both ends of the stators to energize case boundary layers and thereby increase the stator stall range and reduce losses. No slots were provided in the midspan region because previous tests with unslotted airfoils (discussed in Reference 3) showed good performance in this region.

The designs of the stator slots are shown in Figure 3. At each end, the slots extend radially from the endwall to a distance equal to 5 percent of the stator span. The slots discharge at a distance from the leading edge equal to 20 percent of the stator chord and at an angle of

15 degrees to the suction surface. In this position, the slots are as far forward as permitted by the vane geometry while discharging at a maximum angle of 15 degrees. The slots were made as wide as possible while still retaining a covered slot area for flow guidance. No convergence was provided in the slot passage for the same reasons as given above for the rotor.

4. Stator Hub Slit Modification

As discussed in Reference 3, stator-hub-slit suction reduced stator-hub-endwall losses during testing of the unslotted fan stage. For the tests with the unslotted fan stage, the slits were 0.017 inch wide and extended from the 15-percent chord position to the 85-percent chord position in the suction-surface corner between the stator vane and the inner case. Detailed design criteria are included in Reference 1. For the present tests, the slit width was increased to 0.030 inch in an attempt to determine the effect of increased slit flow. Typical suction slits are shown in Figure 4.

5. Honeycomb Tip Treatment Design

For some of the rotor tip treatment tests, a honeycomb structure produced by brazing alternate layers of corrugated stainless steel and flat plates was used in the outer casing over the rotor blade tips to improve the rotor stall range. As shown in Figure 5, the honeycomb structure extended from 0.2 inch upstream of the rotor leading edge to 0.6 inch downstream of the rotor trailing edge. The cells of the honeycomb were inclined in the direction of rotation at an angle of 70 degrees to the radial direction (see Reference 5). For initial tests, the cells were open at both ends, and an enclosed plenum was provided over the outer ends. However, provisions were included to reduce the volume of the plenum and also to close off, or band, the outer ends or backside of the cells. The length of the cells was selected to be in resonance with blade passing frequency at 95 percent of design speed, assuming that the cells operated as open-ended organ pipes.

6. Vortex Generator Tip Treatment Design

Vortex generators were provided on the outer case upstream of the rotor blades to induce high-momentum air from the free stream into the wall boundary layer by turbulent mixing. The design criteria are presented in Reference 8. The geometric configuration was based on the rotor blade leading-edge boundary layer thickness, which was calculated to be 0.4 inch on the basis of flat-plate theory with corrections for wall convergence. The design criteria and actual design dimensions are listed in Table 3.

The vortex generators were fabricated from available NACA Series 65 bar stock with a chord of 0.98 inch, a thickness-to-chord ratio of 0.09, and a camber of 25 degrees. Eighty generators were positioned symmetrically in pairs to produce counter-rotating vortices, and a stagger angle of 14 degrees was used to produce the maximum lift-to-drag ratio. Figure 6 is a photograph of these vortex generators.

TABLE 3

VORTEX GENERATOR DESIGN DATA

	Design Criteria	Design Value (Inches)
Height	Approximately 1.1 x Boundary Layer Thickness	0.45
Chord	Approximately 2 x Height	0.98
Tangential Spacing	Approximately 2.7 x Height	1.21
Distance Upstream of Rotor Blade	Approximately 20.0 x Boundary Layer Thickness	8.0

B. Test Facility

The test program was carried out in the sea-level test stand (X-202) shown schematically in Figure 7. The stand is equipped with a gas-turbine drive engine using a 2.1:1 gearbox to provide the optimum speed-range capability.

The entering airflow is measured through a calibrated nozzle. From the nozzle, the air flows through a 72-foot-long straight section of 42-inch-diameter pipe to a 90-inch-diameter inlet plenum. A wire-mesh screen is supported midway through the plenum to provide a uniform pressure distribution to the test compressor.

The compressor discharge flow is exhausted into a toroidal collector, after which it flows into a six-foot-diameter discharge stack. A six-foot-diameter valve in the exhaust stack and two smaller valves in the bypass line provide accurate control of the back pressure to the compressor.

Bleed suction for the stator-hub suction slits was provided by the test facility exhausters. Eight bleed lines provided the air passage from the stator hub cavity to the exhaust header in the stand.

Inlet distortion patterns were created by overlaying screens with various mesh sizes to produce the maximum pressure drop. The screens were mounted on a supporting base screen which had a one-inch mesh size. For these tests, the flow was distorted radially by covering the outer two-fifths of the inlet annulus with screens that had the same porosity as that which produced the maximum distortion during previous testing with unslotted airfoils. This level of distortion ($P_{max} - P_{min}/P_{max}$) was equal to approximately 0.12 at 95 percent of speed.

Several different inlet configurations were required for the various types of testing performed during this program. As shown in Figure 1, performance testing with inlet flow distortion was done with distortion inducing screens positioned 32 inches upstream of the rotor blade leading edge. A photograph of the distortion support screen is shown in Figure 8. For performance testing with uniform inlet flow, the distortion screen and its support struts (Figure 1) were removed and the tip of the stationary nose cone was 30 inches upstream of the rotor leading edge. A photograph of the uniform inlet flow configuration is shown in Figure 9. For noise measurements, all the inlet support struts were removed and the stationary nose fairing was replaced with a short rotating nose cone, as shown in Figure 10.

The same discharge section was used for all tests and included eight discharge support struts located 7 inches downstream of the stator.

C. Instrumentation and Calibration

1. Aerodynamic Instrumentation

Airflow was measured with a flow nozzle designed to ISA flow-nozzle specifications (Reference 9). Flow measurements made with this system are accurate to within one percent.

The compressor speed was measured with an impulse-type pick-up, which is an electromagnetic device that counts the number of gear teeth passing within an interval of time and converts the counts to revolutions per minute. The accuracy of the speed measurements was within 0.2 percent of the indicated speed between 3600 and 8900 rpm.

The instrumentation used for measuring the overall and the blade-element performance data are listed in Table 4. Typical probes are shown in Figure 11. The axial and circumferential positions of the instrumentation are shown in Figures 12 and 13, respectively.

All traversing probe measurements were made at nine radial locations defined by streamlines which passed the rotor trailing edge at the 5, 10, 15, 30, 50, 70, 85, 90, and 95 percent span locations. In addition, boundary-layer surveys were conducted during uniform inlet flow tests without tip treatments, with the combination probe located behind the rotor at the 2.5, 3.75, 7.5, 92.5, 96.25, and 97.5 percent span locations; with the wake-rake probe behind the stator at the 2.5, 3.75, 7.5, and 92.5 percent span locations, and with the disk probe behind the stator at the 3.75, 7.5, 92.5, 96.25, and 97.5 percent span locations. These data improved the distributions of pressure used in the flow field calculations. The fixed radial rakes for measuring total pressure near the rotor leading edge (Stator 4, Figure 12) were in place only during the testing with inlet flow distortion.

Transducers were used to measure pressures on all probes, fixed rakes, and static pressure taps, and the results were recorded in millivolts by an automatic data-acquisition system. The pressures measured with this system were accurate to within 0.12 in Hg. All traversing probes were calibrated for Mach number as a function of the indicated static-to-total pressure ratio and pitch angle. In addition, for the disk probes, the total pressure recovery and yaw angle deviation were calibrated as functions of Mach number and pitch angle. For the

combination probes, total pressure and total temperature recovery were calibrated as a function of Mach number and pitch angle, but there is no yaw angle deviation. The angular position of all the air-angle measurement instrumentation was accurate to within one degree.

All temperatures were measured with Chromel-Alumel Type K thermocouples, and the data were recorded in millivolts by the automatic data-acquisition system. All temperature sensing elements and the leadwires were calibrated over their full operating temperature range. All temperature instrumentation was calibrated for temperature recovery as a function of Mach number. The overall RMS temperature accuracy was estimated to be within 0.7°F

Strain gages were installed on critical stationary and rotating parts to determine the levels of steady and vibratory stress over the operating range of the compressor. The locations of the rotor and stator strain gages are shown in Figure 14.

TABLE 4

PERFORMANCE AND BLADE-ELEMENT INSTRUMENTATION

	Instrument Plane Location	Parameter	Type and Quantity
Station 0	plenum chamber	P	6 pressure taps on plenum wall, 4 on automatic data-acquisition system transducers, 2 on manometers
		T	6 bare wire thermocouples, 4 on automatic data-acquisition system, 2 on self-balancing precision potentiometers
		inlet noise	8 condenser-type microphones
Station 0.1 Station 0.2 Station 1.1 Station 2.1		p	2 O. D. and 2 I. D. wall static taps located top and bottom dead center
Station 4	rotor inlet	P, p, β	2 disk traverse probes 180 degrees apart, 9 radial positions*
		p	4 O. D. and 4 I. D. wall static taps
		P	2 fixed radial rakes spaced 180 degrees apart, 9 radii*

TABLE 4 (Cont'd)

PERFORMANCE AND BLADE-ELEMENT INSTRUMENTATION

	Instrument Plane Location	Parameter	Type and Quantity
Station 6.1	rotor exit	p	4 O. D. and 4 I. D. wall static taps
Station 10	stator inlet	P, p, β, T	2 combination traverse probes, 9 radial positions*
		p	4 O. D. and 4 I. D. wall static taps located on extension of mid-channel line
		p	4 O. D. and 4 I. D. wall static taps spaced across vane gap
Station 13	stator exit	P	2 equally spaced, 14-element circumferential wake rakes traversable to each of nine radial locations.*
		T	6 fixed radial temperature rakes at each of 9 radii*, spaced circumferentially to obtain readings across a vane gap. A 7th probe located 180 degrees from a probe spaced in the center of a channel was installed for checking purposes and subsequent distortion testing.
		P, p, β	2 disk traverse probes, 9 radial positions*
		p	4 O. D. and 4 I. D. wall static taps located on extension of mid-channel line
		p	4 O. D. and 4 I. D. wall static taps spaced across vane gap
		downstream noise	1 crystal microphone
Station 15.1	rig exit	P	1 fixed five-element radial rake

*Radial position of each axial station defined as the intersection of the axial station and the design streamline which passes through 5, 10, 15, 30, 50, 70, 85, 90 and 95 percent of passage-height locations at rotor trailing edge.

The parameters listed in Table 5 could be recorded continuously to provide detailed data during transients and stalls. Rotor discharge pressures (using high-response-rate quartz-crystal probes), rotor and stator strain gages (Figure 14), and a rotor-speed timing signal were recorded on oscillograph tape. The other parameters listed in Table 5 were recorded continually on printed tape at the rate of ten readings per second. The oscillograph data primarily provided relative time data, while the data recorded on printed tape provided calibrated pressure data.

TABLE 5

CONTINUOUSLY RECORDED PERFORMANCE INSTRUMENTATION

	Instrument Plane Location	Parameter	Type and Quantity	Recorded*
	flow nozzle	p	upstream static	PT
Station 0.0	inlet plenum	p	inlet pressure	PT, OT
Station 0.1	instrumentation ring	p	1 O.D. wall static tap	PT
Station 4	rotor inlet	p	1 O.D. wall static tap	PT
	rotor blade	e.m.f.	4 strain gages at hub section max thickness, 2 gages at hub leading edge (Figure 14)	OT
Station 6.1	rotor exit	P, frequency	3 quartz-crystal dynamic-pressure probes, at unequal circumferential spacing. Sensors located at 25, 50 and 85 percent of blade height from hub (for detection of rotating stall)	OT
		p	1 O.D. wall static tap	PT
Station 10	stator inlet	p	1 O.D. wall static tap	PT
	stator vane	e.m.f.	1 strain gage at O.D. trailing edge, 1 gage at I.D. trailing edge (Figure 14)	OT
Station 13	stator exit	p	1 O.D. wall static tap	PT

TABLE 5 (Cont'd)

	Instrument Plane Location	Parameter	Type and Quantity	Recorded*
Station 15.1	rig exit	P	1 element of fixed 5-element radial rake	PT
	gearbox	N	impulse pickup in gearbox	PT, OT

*PT refers to printed tape
OT refers to oscillograph tape

With the oscillograph data, rotating stall could be detected, and the part of the fan stage inducing stall could be identified. Rotating stall was detected using the high frequency response pressure probes at the rotor exit (Station 6.1). Stall was detected and the stalling airfoil row was determined by observing the response of the strain gages on the blades and vanes as recorded on the oscillograph trace during the stall. The airfoil row first to show an increase in stress is believed to be the row inducing stall. The signals from the high frequency response pressure probes and the strain gages were also monitored on oscilloscope screens, but the sequence of events was too rapid to permit visual determination of which gage responded first. Stall was also identified during testing by the abrupt increase in the downstream nozzle static pressure.

2. Acoustic Instrumentation

The compressor inlet noise was measured using microphones at the locations shown in Figure 15. These locations were the same as those used during unslotted stage testing (Reference 3). They were selected on the basis of tests that determined both the reverberation time and the sound-pressure-level distribution within the inlet. These tests are discussed in detail in Reference 3.

In addition to the microphones installed in the inlet, a one-quarter-inch diameter dynamic pressure transducer (crystal microphone) was installed in a probe located one inch downstream of the stator trailing edge to obtain blade-passing-frequency data downstream of the fan stage. Three different radial locations of the probe were investigated of which one was selected for subsequent noise measurements (Figure 15).

A block diagram of the acoustic recording system used during the compressor tests is shown in Figure 16. The outputs from each condenser microphone and from the one-quarter-inch diameter crystal microphone passed through a monitor and signal attenuator which amplified or attenuated the signals to the level providing the optimum input voltage range for the tape recorder. All data were recorded in the FM mode on magnetic tape at a speed of 30 inches per second.

D. Test Procedure

Initial testing consisted of stress surveys along operating lines with wide-open and near-stall throttle settings. These tests showed high rig vibrations and large rotor-blade tip movements (0.017 inch) at 80 percent of design speed. Consequently, the rotor and shaft were rebalanced using a strumming technique which minimized random seating of the pin-rooted blades at the 900 rpm balancing speed. After rebalancing, acceptable rig vibration levels were obtained.

Shakedown tests with the slotted airfoils, solid outer case, and uniform inlet flow included an evaluation of the effect of stator-hub-slit suction on the stage stall margin as well as an overall evaluation of the stall characteristics of the fan stage. Since these tests showed that slit suction improved the stall margin and since previous tests had shown that slit suction improved the stage efficiency, all subsequent testing was performed with slit suction.

The slotted fan stage was tested with uniform-, and with tip radially distorted-inlet flow to evaluate slot effectiveness. Then various rotor tip treatments were tested. Because the shakedown tests with uniform inlet flow revealed that stage stall was induced by the stator hub (at speeds above 80 percent of design speed), the rotor tip treatment tests with uniform inlet flow were mainly to determine possible efficiency decrements if such treatment were subsequently found desirable from the distorted inlet flow tests. Most of the testing with rotor tip treatments was performed with tip radially distorted-inlet flow. Here the rotor tip stalls before the stator - - thereby permitting evaluation of the effectiveness of the tip treatments in extending the stall range of the stage, and also their effectiveness in improving tolerance to distorted inlet flow.

The basic fan stage with slotted airfoils was tested with uniform inlet flow at 80 and 100 percent of design speed. Performance data were obtained at five throttle settings at 80 percent of design speed and at six throttle settings at design speed. Tests were performed with radial inlet distortion at 80, 90, and 95 percent of design speed, with data being obtained at four throttle settings at each speed. Excessive blade vibration prevented distortion testing at speeds above 95 percent of design speed. These data provided a baseline for evaluating the effects of the tip treatments.

The rotor tip treatments tested with radial inlet distortion were (1) vortex generators, (2) vortex generators and honeycomb, (3) honeycomb without vortex generators, (4) partially backed honeycomb, and (5) fully backed honeycomb.

The honeycomb was partially backed by covering the forward 20 percent of the outer honeycomb openings with 1/8-inch-thick rubber. This provided backed honeycomb rearward to the approximate location of the minimum pressure on the suction surface and placed the rotor tip slot forward of the honeycomb with open cells.

Each tip treatment configuration was tested with radial inlet distortion at 80, 90, and 95 percent of design speed with three to five operating points being obtained at each speed.

Following the tests with radial inlet distortion, performance testing was conducted with uniform inlet flow and open honeycomb without vortex generators. Data were obtained at 80, 90, 95, and 100 percent of design speed with three throttle settings at each speed. Stall operation above design speed was avoided throughout all tests because of the high stator stresses experienced with the unslotted stage (Reference 3).

No circumferential inlet distortion tests were performed with the slotted stage.

To prevent data inaccuracies caused by probe blockage effects, the four stator-discharge probes were immersed at one time, and the four remaining traversing probes were immersed following retraction of the stator discharge probes. This technique eliminated interaction effects. Each traverse sequence was preceded by a reading of the fixed instrumentation to verify the compressor operating condition.

For noise measurements, all radially mounted instrumentation was removed except the five-element pressure rake at the rig exit. Noise measurements were then made at 80, 90, 95, 100, 105, and 110 percent of design speed.

The final test consisted of running a checkpoint at design speed with uniform inlet flow and no tip treatment. This test verified that no degradation or change in performance occurred. At the end of the test program, the blades and vanes had completed 367 hours of testing.

E. Data Reduction Techniques

1. Aerodynamic Data

All performance data were automatically recorded in millivolts on computer cards. These data were then converted to engineering units and corrected and averaged as described in the following sections.

a. Pressure Data From Fixed-Element Probes

Data obtained from total-pressure probes located in supersonic flow were corrected for shock losses.

The circumferential total pressure distributions indicated by the two wake rakes were mass-flow-averaged at each radial position, using a constant circumferential static pressure determined by linearly interpolating the wall static pressure data. Peak values from the circumferential pressure distribution indicated by each wake rake were chosen to represent the stator exit free stream and rotor exit pressures.

A stator wake blockage factor (defined in Appendix 1) was calculated at each radial position for use in the flow-field calculation program to improve the accuracy of the static-pressure and velocity calculations.

Free stream pressures, circumferentially mass-flow-averaged pressures, and wake-blockage factors from both rakes were each arithmetically averaged at each radial location. The resulting radial distributions were then radially mass-flow averaged by the flowfield analysis program to calculate the overall performance. The radial distributions of static pressure required for radial mass-flow averaging were calculated by the flowfield analysis program.

b. Data From Traversing Combination and Disk Probes

The combination and disk probes provided measured total pressure, measured air angle, calibrated Mach number, and calculated static pressure at the selected radial locations. In addition, the combination probes provided measured total temperatures. These data served as a check on that from fixed-element pressure and temperature probes.

The measured total pressure, total temperature, and flow angle from these probes are corrected using Mach number recovery calibration curves for individual probes. Mach number is determined from calibration of measured total and measured static pressure. The resulting calibrated Mach number and corrected total pressure are then used in conjunction with standard air property tables to calculate the static pressure. Of this measured traverse data, only air angles are used in the flow field calculation, other data are used for checking and for substantiating flow field calculations.

c. Stationary Temperature Probe Data

The stationary temperature probes consisting of six radial rakes approximately equally spaced about the annulus behind the stator with each rake located at a different circumferential position relative to a stator gap were calibrated for Mach number and pressure level. The variations in recovery correction factor with pressure were applied as noted in Reference 10. A circumferential mass-flow average was calculated at each radial position and used in the flowfield calculation. The circumferential total-pressure distribution required for this calculation was obtained from the wake rakes.

d. Overall Performance Calculations

Overall performance parameters of corrected speed ($N/\sqrt{\theta}$), corrected weight flow ($W\sqrt{\theta}/\delta$), total temperature ratio across rotor or stage (T6/T5 or T12/T5), total pressure ratio across rotor or stage (P6/P5 or P12/P5), and adiabatic, also polytropic efficiencies across rotor or stage (η ad, ηp) are tabulated in Appendices 2 through 8. Overall performance for the rotor is tabulated along the bottom of the rotor data and for the stage along the bottom of the stator data. This performance is calculated from the flow field analysis program which translates pressure measurements along streamlines to the blade edges. Overall performance parameters were based on conditions of the rotor leading edge (Station 5). With radially distorted inlet flow, performance was based on the measured, mass-flow-averaged pressure at the rotor inlet instrument plane (Station 4). Discharge total pressures and temperatures for overall performance calculations were measured with fixed element probes and mass-averaged as previously described.

The overall stall performance data consisted of airflow and rotor speed. Stall flow was calculated from the flow nozzle pressure recorded on printed tape using the continuous recording mode. Rotor speed at stall was calculated from the frequency-modulated signal recorded on the oscillograph trace. Pressure ratio at stall was estimated from extrapolation of overall performance data at constant speed. Stall data appears on the overall performance figures.

e. Flowfield Analysis Computer Program

The blade-element performance data tabulated in Appendices 2 through 8 was calculated using a flowfield analysis computer program. Calculations were made at 19 streamlines using flowpath geometry and measurements at 9 fixed radial locations defined by design point streamlines passing through the rotor trailing edge at 5, 10, 15, 30, 50, 70, 85, 90, and 95 percent of the passage height. All parameters were corrected to standard-day conditions. The measurements and blockage estimates used for the solution of the flowfield program were:

1. Compressor Inlet (Station 0, Figure 12): Corrected weight flow and corrected rotor speed.

2. Rotor Inlet Instrument Plane (Station 4): Constant radial distribution of standard-day temperature, axial inlet absolute air angle, constant radial distribution of standard-day pressure for tests with uniform inlet flow, and radial distributions of total pressure from the two rotor-inlet rakes for tests with radial inlet distortion. (The radial mass-averaged pressure was adjusted to standard-day conditions.) Estimated blockage factor to account for wall boundary layer.

3. Stator Inlet (Station 11): Radial distribution of total-pressure free-stream values from the wake rakes behind the stator divided by the rotor inlet total pressure. Estimated blockage factor to account for wall boundary layer.

4. Stator Exit Instrument Plane (Station 13): Radial distribution of total temperature from the circumferentially mass-averaged temperature rake data divided by the rotor inlet total temperature, radial distribution of the total pressure data from both wake rakes divided by the rotor inlet, total pressure, radial distribution of the wake rake blockage factors from both wake rakes, and the radial distribution of the absolute air angle from the two disk probes.

All static-pressure distributions and air angles behind the rotor were calculated by the computer program on the basis of mass-flow continuity, radial equilibrium, and energy equations assuming axisymmetric flow. Curvature, enthalpy, and entropy gradient terms were used in the equlibrium calculations. Blade-element performance at the blade edges were calculated by translating the measured data from the instrument planes along streamlines. The blade element performance parameters are presented at the nine radial locations defined by streamlines passing through the rotor trailing edge at 5, 10, 15, 30, 50, 70, 85, 90 and 95 percent of the passage height.

2. Acoustic Data

The acoustic data were reduced using the system shown in Figure 17. The tape-recorded data were processed through a wave analyzer having a 50-Hz bandwidth filter. The output of the analyzer was then recorded on a graphic-level recorder so that a trace of sound pressure level as a function of frequency could be obtained. From these traces, broadband noise and supersonic-tip-speed combination tone (multiple pure tones or "buzz saw") noise were evaluated. Blade-passing frequency data were time averaged for 30 seconds at each compressor operating point. This was accomplished by tuning the wave analyzer to the blade-passing frequency and obtaining a trace on the recorder of the sound pressure level at this frequency as a function of time.

The supersonic fan noise (combination-tone noise) was computed by summing the sound pressure levels of the discrete frequency tones below the blade-passage frequency but at integral multiples of the rotor speed. The discrete frequency levels were obtained directly from the 50-Hz bandwidth spectrum traces from each of the microphones and were logarithmetically averaged.

The average acoustic power level for each one-third-octave band was calculated for the broadband noise from the following equation, which is derived in Reference 3.

$$PWA = SPL + 10 \log v - 10 \log H - 19.4 \text{ dB}$$

In order to determine the average value of the broadband sound pressure level to use in this equation, each spectrum trace was marked in preferred one-third-octave bands. The average pressure reading within each band was then determined after deleting all discrete frequency tones. A correction was then applied to the averaged sound pressure level to account for the fact that a 50-Hz bandwidth filter was used rather than a one-third-octave filter. The correction involved addition of the factor 10 log (fz/50) where fz is the bandwidth of each one-third-octave expressed in Hertz.

The values of the corrected broadband sound pressure levels from each microphone were then averaged logarithmically within each one-third-octave band for each operating point. These average broadband sound pressure levels and the reverberation time determined experimentally (Reference 3) were used to calculate the radiated sound power level from the acoustic power level equation.

The equivalent volume of the plenum chamber, v, in the acoustic power-level equation is particularly difficult to determine for an open-ended plenum such as used for these tests. The calculated power level, however, is relatively insensitive to chamber volume, since doubling the volume raises the calculated power level by only 3 dB. In any event, the data trends are not affected by the volume used in the calculations because the volume is a constant. A good approximation of the volume was considered to be 442 ft^3.

IV. RESULTS AND DISCUSSION

A. Introduction

The effects of stator-hub-slit-suction on fan stage stall are presented first. Because the benefits of stator-hub-slit-suction were significant it was used for all subsequent tests. The effects of slotted blades and vanes and then the effects of rotor tip treatments are discussed in separate sections. Within each of these two sections, topics in the order presented are: overall performance and stall investigation, blade element aerodynamic data, stress survey, and noise measurements.

B. Stator-Hub-Slit Suction

Investigation of the effects of stator-hub-slit suction during this program was restricted to determining the effects of the slit suction on fan stage stall characteristics. The effects on steady state performance were determined previously using unslotted blades and vanes, and the results were documented in Reference 3.

To determine the effects of slit suction on the stall characteristics of the fan, tests were performed with and without suction slit airflow. The results are shown in Figure 18 and indicate that slit suction extends the stall flow range at speeds from 80 to 100 percent of the design speed. The improvement with suction ranges from about 8- to about 4-percent from 80- to 100-percent speed, respectively. (Although stall flows at speeds less than 80 percent of design speed were not measured, stator slit suction should have little effect on stall flows there because the rotor tip appears to induce stage stall at the lower speeds as discussed below.) The stall flow rate obtained during these tests at design speed with suction-slit flow agrees reasonably well with the flow rate of 172.5 lb/sec obtained during shakedown testing of the uslotted fan (Reference 3), which was also run with slit suction.

Strain-gage and high-response-rate pressure data were obtained during stalls without slit suction at design speed and at 80 percent of design speed with uniform inlet flow, and the results are shown in Figures 19, 20, and 21. The later two figures, both for 80 percent of design speed, differ in that Figure 20 does not contain high-response rate pressure traces that were available from a similar test the results of which are shown in Figure 21. At both speeds, the strain-gage data indicate that vibrations occurred in the stator vanes before they occurred in the rotor blades, indicating that the stator induced stall. Comparison of the high-response-rate pressure data in Figures 19 and 21 shows that the period of the rotating stall is about 0.018 seconds for the stall at 100 percent of design speed compared with about 0.011 seconds for the stall at 80 percent of design speed.

Comparable strain-gage and high-response-rate pressure data were obtained during stalls with slit suction at design speed and at 80 percent of design speed with uniform inlet flow and the results are shown in Figures 22 and 23. At design speed (Figure 22), stage stall produced vibrations in the stator vanes slightly before those in the rotor blades. (The rotor blade vibration frequency shown in Figure 22 is 180 Hertz, which is the natural first-mode bending frequency for the blades.) Further evidence that the stator induced stall at design speed is

the static pressure data shown in Figure 24. All data shown on Figure 24 except for that at stall represent averages of the static pressure measured by pressure taps on the inner and outer cases. The points shown at stall were obtained from transient data records. The sharp drop in the static pressure ratio across the stator at stall without a similar drop in the pressure ratio across the rotor is a clear indication that the stator stalled first. Comparable static pressure data at 80 percent of design speed is not available. However, the strain-gage data at 80 percent of design speed in Figure 23 clearly shows that rotor vibrations start before stator vibrations, indicative of rotor induced stall. Thus the benefits of stator hub slit suction were sufficient at 80 percent of design speed to delay stator hub stall until the rotor stalled first. Other strain-gage data, not shown, indicates that at 50 and 65 percent of design speed the rotor causes stall even without stator-hub-slit suction.

The width of the stator-hub slits in this build of the fan was 0.030 inch, compared with a width of 0.017 inch in the build discussed in Reference 3. However, the effects of slit suction flow rate could not be determined because the flow rate for both series of tests was limited to 0.2 percent of the total flow by the eight suction lines used to evacuate the stator-hub plenum.

C. Slotted Blades and Vanes

1. Overall Performance and Stall Investigation

The effect of the blade and vane slots on the overall stage performance with uniform inlet flow is shown in Figure 25. At design speed, the peak stage overall efficiency was essentially the same with and without slots. The maximum efficiency obtained with slots was 88.3 percent. It was achieved at a corrected flow of 176.45 lb/sec and a pressure ratio of 1.497. At 80 percent of design speed, the slots increased the peak stage efficiency by about 2.3 percentage points to 90.8 percent with little change in overall stage pressure ratio. The increase in efficiency can be traced mainly to improved rotor performance between the midspan region and the tip.

The overall rotor performance showing the effect of rotor blade slots is presented on Figure 26. At 80 percent of design speed, rotor slots are effective only in the mid flow range, where they provide about 1.6 percentage points improvement.

At design speed with slots, the stall flow of 171.5 lb/sec agrees within 1.0 lb/sec with that obtained with the unslotted fan as noted earlier. However with slots this stall flow was obtained repeatedly, whereas without slots it was attained once at the start of shakedown testing and was not repeatable. Usually the unslotted fan stage stalled near 182 lb/sec (Reference 3). At 80 percent speed the stall flow was 120.5 lb/sec without slotted blades and vanes and 123.5 lb/sec with slots.

The traces produced by the high-response-rate pressure instrumentation shown earlier in Figures 22 and 23 show the strength and period of the rotating stall at the rotor exit. The period of the rotating stall is essentially the same as that recorded previously during tests without slots. However, with the slotted rotor, the rotating stall appears to be strongest at

the hub, mid section, and tip at 80 percent of design speed. Data obtained for the unslotted rotor indicated that the rotating stall was strongest at the midspan and tip at both 80 and 100 percent of design speed.

The stage performance with radially distorted inlet flow is shown in Figure 27. At these conditions, the combined rotor and stator slots improved overall efficiency about 2.5 percentage points with higher total pressure ratios at all speeds tested. Very little change in stall line was observed. Also, there was no change in the rotating stall period with speed as there was with uniform inlet flow (Figures 19 and 21). The overall rotor performance showing the effect of slots with radial distortion is presented in Figure 28. Here, the efficiency benefits of rotor blade slots increase as speed increases from 80 to 95 percent of design speed.

The deterioration in stall margin with inlet distortion is not attenuated with slots. At 80 percent of design speed, stall margin (defined in Appendix 1) was reduced about 10 percentage points with tip radial distortion. However, a similar reduction occurred with the unslotted stage (Reference 3).

The effects of stage, then rotor, and thus stator slots on the peak efficiency at each condition tested are summarized in Table 6.

TABLE 6

EFFECTS OF SLOTS ON MEASURED PEAK OVERALL EFFICIENCY

Percent Corrected Design Speed	Improvement (Percentage Points) Stage	Rotor	Stator
Uniform Inlet Flow			
80	+2.3	+1.6	+0.7
100	+0.1	+0.5	- 0.4
Tip Radially Distorted Inlet Flow			
80	+2.4	+0.7	+1.7
90	+2.3	+1.1	+1.2
95	+2.5	+1.4	+1.1

2. Blade Element Aerodynamic Data

The complete tabulations of blade-element data at nine different radial positions obtained during testing of the slotted fan stage with uniform and radially distorted inlet flow are presented in Appendices 2 and 3, respectively. Rotor blade losses, deviations, and loadings are plotted as functions of incidence angle in Figure 29 for uniform inlet flow. Similar data for the stator are shown in Figure 30. The data obtained with radially distorted flow are shown in Figure 31 for the rotors and in Figure 32 for the stators.

A significant improvement in overall rotor efficiency was demonstrated by slotted rotor blades at 80 percent of design speed, uniform inlet flow (Table 6). The effect of the rotor slots can be seen from the spanwise distribution of blade loss (Figure 33a). Improvements in stator loss at the hub due to slotting are shown for the same operating point as the rotor (Figure 33b).

Rotor slots have an effect upon maximum stage flow at design speed as shown in Figure 25. (The maximum flow at design speed is probably limited by the rotor blading.) With slots, the maximum obtained corrected flow at design speed was 184.37 lb/sec compared with 186.47 lb/sec for the unslotted stage. At wide open discharge throttle, a comparison of slotted with unslotted rotor data shows a change in the rotor total pressure ratio distribution, Figure 34a, and also the specific flow (flow/area) at the rotor exit, Figure 34b. As shown, the rotor slots slightly improved the total pressure and specific flow in the tip region (region of slots) but elsewhere, particularly in the midspan region, there were degrading effects. Also shown (Figure 34) are slotted rotor data at a corrected flow of 183.73 lb/sec, about 0.6 lb/sec less than the maximum. At this flow and at 50-percent span, the total pressure ratio improved to only slightly less than that for the unslotted rotor at 186.74 lb/sec and yet the specific flows there differ as before. Thus the effects of slots on maximum flow are not confined to the spanwise region of the slots and it appears that more than total pressure changes are involved.

Rotor exit specific flows over the outer 30-percent span remain essentially constant with back pressure at design speed, as shown by Figure 35. These tip region specific flow values are all less than design. Similar performance is found in the unslotted rotor data at both 95- and 100-percent of design speed (Reference 3). Although this unchanging specific flow with throttle position suggests choked flow, other evidence, like increasing losses as the throttle is opened, is lacking. Also, the large turning past axial at the rotor hub results in an energy addition at the rotor hub that decreases while that at the tip increases as the throttle is closed. Such a design may be a factor in the specific flow trends of Figure 35. Another reason for not attaining design specific flow near the rotor tip is due to the higher than design rotor deviation angles over the outer 30-percent span (Figure 29). These large deviation angles preclude the attainment of design total pressures and thus design axial velocities at the rotor exit. The specific flows are directly reduced when axial velocities are reduced. Similar higher than design deviation angles were also evident in the tip region of the unslotted rotor. Thus the addition of rotor tip slots had little effect on deviation angles near design speed. The need for additional camber in the tip region of this rotor seems indicated. However it should only be considered with caution. Present design diffusion factors are near 0.5 in the rotor tip region and losses increase rapidly with diffusion factor in this range.

3. Stress Survey

The vibratory stresses in the rotor and stator were not perceptibly different from those of the unslotted stage. Similar to the unslotted rotor, the slotted rotor experienced first-bending mode blade flutter that prevented testing above 95 percent of design speed with tip radial inlet distortion. The slotted stator stresses exceeded the maximum allowable stress of 10,000 psi at 115 percent of design speed during testing with uniform inlet flow.

4. Noise Measurements

Inlet noise measurements were made of the slotted fan stage, and comparisons were made with the unslotted fan stage, Reference 3. Comparisons of broadband noise versus blade tip relative Mach number are shown on Figure 36 for the same 1/3 octave bands used in Reference 3, which represent typical low, middle, and high frequency bands. The broadband noise levels produced by the two sets of airfoils differ by less than 3dB and generally show similar trends with relative Mach number. (The lack of variation with Mach number is discussed but not resolved in Reference 3). Figure 37 shows a comparison of the fundamental blade passing frequency noise levels of the two configurations at both the wide open and part throttle discharge valve setting. The curves represent sound pressure levels averaged from all microphones plotted as a function of relative tip Mach number. The curves show very similar trends and no significant difference in levels were noted.

Measured supersonic fan inlet noise levels are presented in Figure 38 for both the slotted and unslotted blade. The average broadband sound pressure levels have been included for blade tip relative Mach numbers below 1.1 for reference only. The supersonic fan noise trends for both blades are similar and levels agree within 4 dB, which is considered reasonable agreement for low frequency discrete tone measurements in a reverberant chamber.

D. Rotor-Tip Treatments

1. Overall Performance and Stall Investigation

Fan rotor tip treatments consisting of vortex generators, honeycomb (open back), combined vortex generators and honeycomb, and banded-back honeycombs were tested to determine their effects on the performance and stall characteristics of the fan. (No efficiency data were obtained with the full chord banded honeycomb). Most of the tests were performed with radially distorted inlet flow because tip treatments are effective primarily when the rotor tip controls the stage stall characteristics.

The performance data obtained with each of the tip treatments are shown in Figure 39 through 46 together with baseline data obtained without tip treatment but with rotor blade and stator vane slots and with stator-hub-slit suction. Composite plots for all treatments are shown in Figures 47 and 48. Figure 39 and 40 show that the vortex generators alone provided no improvement in stall characteristics and caused a loss in the peak stage efficiency of 1.5 percentage points. The honeycomb treatments, Figures 41 through 46, all provided some improvement in stall margin while also reducing the peak stage efficiency by about 7 percentage points. The largest improvement in stall margin was obtained with the combined honeycomb structure and vortex generators (Figures 41 and 42) which reduced the weight flow at stall for 95 percent of design speed from 164.6 lb/sec to 149.7 lb/sec. This represents about a 10 percentage point increase in stall margin (defined in Appendix 1). A stall flow reduction of about 19 lb/sec was also obtained at 80 percent of design speed. The effects of the various tip treatments showing the improvement in stall margin and the decrement peak stage efficiency at 95 percent of design speed are summarized in Table 7.

TABLE 7

EFFECTS OF ROTOR TIP TREATMENTS ON STALL MARGIN AND PEAK STAGE EFFICIENCY AT 95 PERCENT OF DESIGN SPEED WITH RADIAL INLET FLOW DISTORTION

	Improvement in Stall Margin (Percentage Points)	Decrement in Peak Stage Efficiency (Percentage Points)
Vortex Generators	0	1.5
Vortex Generators with Honeycomb	10	7
Honeycomb Alone (Open Back)	7	7
20-Percent of Forward Chord Banded Honeycomb	6	7
Full Chord Banded Honeycomb	2	(no data)

In reviewing the performance maps obtained with the honeycomb tip treatments, it is significant to note that nearly equal stall margin improvements were obtained at all speeds. This result had not been expected because it has been believed that best results would be obtained at the rotor speed which produced a blade-passing frequency equal to the resonant frequency of the honeycomb cells. The cells had been tuned to the blade-passing frequency produced at 95 percent of design speed. In view of the test data, it appears that the resonant frequency of the honeycomb cells is not a significant design parameter. A similar conclusion was reached in Reference 11 for several other treatment configurations.

The honeycomb treatment (without vortex generators) was tested with uniform inlet flow at 80- and 100-percent of design speed to determine its effect on performance in case the treatment were used to recover some flow range with tip radial inlet distortion. Performance improvements from rotor tip treatments and uniform inlet flow were not expected because the rotor tip is not critical at the speeds tested. Stage performance with honeycomb and uniform inlet flow is shown on Figure 47. The honeycomb treatment reduces the peak efficiency by about 7 percentage points and also reduces the stall margin by about 4 percentage points. Because of the large loss in efficiency, none of the tip treatments tested in this program would be acceptable for most compressor fan applications. Other configurations (Reference 12) have shown efficiency decrements of less than two points.

In analyzing the data obtained with the various tip treatments, two different techniques were used to calculate efficiencies. The quoted efficiencies were calculated using the measured temperature as an indication of the energy rise. The second technique used Euler's work equation and the measured rotor exit angles. Both methods used a flow-field-analysis program, so they differed only in the method of calculating the energy addition. Comparisons of measured

and calculated temperature rise, efficiency, and velocity are shown in Figures 49 and 50 without tip treatment and for uniform and radially distorted inlet flow. Similar data with honeycomb tip treatment and radially distorted inlet flow is shown in Figure 51.

As shown, good agreement was obtained without tip treatment, with uniform inlet flow, and fair agreement was obtained without tip treatment, with radial inlet flow distortion, but the agreement is poor for the data obtained with open-backed honeycomb tip treatment and radial inlet distortion. For the latter condition, the measured air angles show less turning across the entire span than indicated by the temperature data. As a result, the efficiencies calculated on the basis of the measured air angles are about 7 percentage points higher than those calculated on the basis of temperature data and are equal to the efficiencies obtained without honeycomb. The additional temperature rise measured when open-backed honeycomb is used must be caused by recirculation through the honeycomb structure from which no useful work is derived. Confirming this assumption is the fact that the temperature in the rotor-tip plenum outboard of the honeycomb is approximately 10°F higher than that at the rotor-tip trailing edge. Consequently, the efficiencies based on measured temperatures are believed to be more indicative of the overall performance of the fan than those based on measured air angles.

Transient data obtained during stalls with various tip treatments show several interesting characteristics. Although the performance data showed that vortex generators produced no improvement in stall margin, the transient data presented in Figures 52 and 53 show that they did reduce the period of the rotating stall from about 0.014 seconds to about 0.007 seconds. The addition of honeycomb with or without vortex generators (Figures 54 and 55) resulted in a longer rotating stall period, about 0.023 seconds compared with 0.014 seconds without any tip treatment. Transient traces for stalls with honeycomb at lower speeds are presented in Figures 56 and 57.

A study of the rotor and stator strain gage data during stall indicates that, without tip treatments and with radial inlet flow distortion, the rotor caused the stall. The addition of vortex generators did not alter this situation. With honeycomb, however, the stability of the rotor tip was improved sufficiently that all stalls were induced by the stator. These results are summarized in Figure 58 together with the results obtained with uniform inlet flow. Stall weight flows for all configurations tested are presented in Table 8.

TABLE 8

SUMMARY OF STALL WEIGHT FLOWS
SLOTTED BLADES AND VANES

Percent Design Speed	65	70	80	90	95	100
Uniform Inlet Flow						
no slit suction	101.0		133.5	155.0	166.0	177.0
with slit suction			123.5			171.5
honeycomb			128.5	150.0	161.0	171.5
Distorted Inlet Flow						
no tip treatment			141.0	156.0	164.6	
honeycomb			123.3	143.0	152.6	
vortex generators			141.5	157.4	164.0	
honeycomb and vortex generators			122.0	140.0	149.7	
honeycomb 20 percent banded			123.3		153.5	

2. Blade Element Aerodynamic Data

The blade-element data obtained during the tip treatment tests are presented in Appendices 4 through 8. These data were calculated using the measured temperature rise, however, and should be used with reservation.

To assess the effect of the calculation procedure on the results, the rotor deviations and losses with and without honeycomb were calculated by both techniques described above for similar operating points. The results, shown in Figure 59, show that the losses and deviations are similar with and without honeycomb when calculated using rotor exit angles and Euler's equation. This suggests that blade element performance parameters like deviation angles and loss coefficients should be based on the measured air angles when an extraneous-to the blade element-temperature effect is involved. Therefore measured air angles at the stator inlet instrument plane have been included at the ends of Appendices 4 through 8. Except at stator exit, all other tabulated air angles are calculated from measured temperatures. Blade element values of $\overline{\omega}$, D, and $\delta°$ with honeycomb tip treatments are not plotted because they were not generally recalculated using the measured air angles as just recommended.

3. Stress Survey

Vibratory stresses of the rotor and stator were generally unaffected by the application of the honeycomb and vortex generator tip treatments tested. However, the honeycomb structure did eliminate blade flutter above 95 percent of design speed with tip radial distortion.

4. Noise Measurements

Detailed noise data were obtained for the fan configuration with the honeycomb tip treatment and uniform inlet flow. The results were analyzed to provide overall spectra near stall and at wide-open throttle position for speeds ranging from 80 to 110 percent of design speed. The analysis also provided the relations between sound pressure or power level and relative Mach number, the variations in blade-passing-frequency noise with relative Mach number, and the levels of supersonic fan noise. In addition, the broadband sound pressure levels in three typical one-third octave bands produced with the honeycomb tip treatment were compared with the levels produced in the same one-third octave bands without tip treatment.

Sound pressure level spectrum characteristics were obtained along the operating line of constant wide open throttle from 80 percent to 110 percent of design speed and along the near-stall operating line from 80 percent to 100 percent of design speed. The results obtained with microphone number 5 are shown in Figures 60 and 61. These traces are similar to those obtained with other microphones installed in the inlet plenum, as can be seen by comparing the traces from each microphone for design speed near stall presented in Figure 62. All of the traces show similar shapes but differing levels for the broadband noise and for the fundamental and first harmonic of the blade-passing frequency noise. In evaluating these results, it should be noted that the high indicated noise levels below 500 Hertz are caused by the electronic characteristics of the filtering system and are not representative of the compressor-generated noise. For this reason calculations of fan broadband noise levels did not include data below 500 Hertz.

The broadband noise data obtained from each microphone were reduced to sound pressure levels in one-third-octave bandwidths. These data were then averaged and the results are presented in Appendix 9. The averaged sound pressure levels were then used to calculate the one-third-octave band power levels tabulated in Appendix 10. The average power levels for three one-third-octave bands along three constant throttle operating lines are plotted in Figure 63 as a function of the blade-tip relative Mach number. The frequency bands shown are the same as those presented in Reference 3, representing typical low, middle, and high frequency bands.

The total broadband sound power level was calculated as the logarithmic sum of all of the one-third-octave-band power levels for each operating line. The results are plotted in Figure 64 and indicate that the broadband noise remained essentially constant with increasing blade-tip relative Mach number and throttle setting. The broadband sound power level produced by the unslotted fan stage was also found to be essentially independent of these parameters (Reference 3).

In contrast to the broadband noise levels, time-averaged blade-passing frequency noise at wide open and part throttle was found to increase with blade-tip relative Mach number and with throttle closure, as shown in Figures 65 and 66. These results can be seen for the data from each individual microphone and from the logarithmic average of all of the data. The relatively large difference in the sound pressure levels measured by the different microphones results from the standing-wave patterns produced by discrete tones within the inlet plenum

chamber. Comparing the blade passing frequency noise level of the honeycomb tip treatment tests (Figures 65 and 66) with those without tip treatment (Figure 37) shows the addition of honeycomb increased the noise level 5 to 10 dB. No explanation is made for this effect except to note that the same trend occurs at both wide open and part throttle conditions.

The noise level of the first blade passing frequency harmonic is equal to the fundamental at low speeds, but becomes insignificant as speed is increased (Figure 67). As shown, the relative level of the first harmonic decreases as speed is increased along any constant throttle operating line to a level 10 dB below the level of the blade passing frequency noise. Similar results were obtained without tip treatment and with unslotted blades (Reference 3).

The fundamental blade-passing-frequency signals were also measured by a one-quarter inch diameter dynamic pressure transducer located one inch downstream of the fan stator. An attempt was made early in the program to determine the highest ratio of blade passing frequency noise to background noise along the span. A probe was traversed radially at 80, 90, and 100 percent of design speed at part throttle; the results are shown on Figure 68. The radial position at 53 percent span represents an average level at the three speeds. This probe location was used for subsequent tests.

Typical spectra obtained with this probe are shown in Figure 69 for the part-throttle operating line. As shown, the blade-passing frequency noise is clearly identifiable. The large discrete tone appearing below that of the blade-passing frequency in all spectra (Figure 69) appears to be caused by flow over the cylindrical probe shank to which the ¼ inch diameter crystal microphone is mounted. This discrete tone is typical of vortex shedding noise. The frequency of such tones are calculated by $f = 0.2\ v/d$ where v is the flow velocity downstream of the stator and d is the outer diameter of the probe, in this case ½ inch.

These discharge noise data were reduced to time-averaged discrete-frequency noise levels, and the results are plotted in Figure 70 as a function of blade-tip relative Mach number for each operating line. The curves show an increase in the blade-passing frequency noise level with increasing Mach number. Trends and levels are similar to the data from the unslotted blade tests (Reference 3). Broadband noise levels obtained by the downstream microphone are not evaluated herein because there was no attempt to account for wind noise effects of the high velocity stream.

The supersonic-fan noise (combination-tone noise) at the fan inlet was calculated by summing the sound-pressure levels of the discrete-frequency tones that were below the blade passing frequency but that were at integral multiples of the shaft rotor speed. This type of noise was noted at the wide open throttle operating point at 105 and 110 percent of design speed. The sound pressure levels produced as supersonic-fan noise are shown in Figure 71 together with the integrated broadband noise. The supersonic-fan noise obtained with the unslotted fan is also shown. The trends shown in the figure are typical of all fans and full-scale engines operating in this transonic Mach number range and indicate the large contribution of supersonic fan noise to the total radiated noise levels. Observed trends of supersonic fan noise data from other rigs indicate no change in noise level as throttle position is varied.

The broadband sound pressure levels obtained with this fan with honeycomb tip treatment were compared for three typical one-third-octave bands with similar data obtained without honeycomb tip treatment. The results, presented in Figure 72, show that the noise characteristics of the two fan configurations exhibit similar trends with blade-tip relative Mach number variations, and that the absolute noise levels are within 2 dB of each other at each operating condition.

V. SUMMARY OF RESULTS

A. Slit Suction

At design speed and uniform inlet flow the stator hub induced stage stall with or without stator-hub-slit suction. With suction (about 0.2 percent of the total inlet flow) the stall flow range was extended about 8 and 4 percent at 80 and 100 percent of design speed, respectively. The stator stall range was sufficiently improved at 80 percent of design speed to permit the rotor to induce stall.

B. Airfoil Slots

Without slots the stall flow at design speed was not repeatable. With stator hub (and tip) slots, the stall flow was repeatable and agreed with the minimum value obtained without slots. At lower speeds there was little effect of slots on stall flows. Slots improved the overall stage efficiency by as much as 2.5 percentage points at 80 percent of design speed with no change at design speed.

Deterioration in stall margin caused by inlet radial tip distortion was not attenuated by airfoil slots.

C. Tip Treatments

Rotor tip treatments were applied mainly during tip radially distorted inlet flow tests where the rotor tip rather than the stator hub caused stage stall. Best results were obtained with a honeycomb structure in the case over the rotor blade tips combined with vortex generators upstream of the rotor. They lowered the stall weight flow at 95 percent of design speed from 164.6 lb/sec to 149.7 lb/sec, or about a 10 percentage point increase in stall margin. However, all configurations using honeycomb (open back) resulted in an overall stage efficiency penalty of about 7 percentage points. This severe penalty was traced to air recirculation through the honeycomb, resulting in an increase in rotor exit temperatures from which no useful work was derived. Blade element losses and deviation angles were about the same with or without honeycomb tip treatment if calculated from measured air angles rather than from measured temperatures. Vortex generators alone had no effect on the stall flow and penalized the overall stage efficiency about 1.5 percentage points.

For tests with uniform inlet flow where stall was caused by the stator, the honeycomb structure decreased the stall margin about 4 percentage points and decreased the overall stage efficiency about 7 percentage points.

D. Noise Measurements

No significant changes in broadband or supersonic fan noise (combination tones) resulted from the addition of slots nor from the addition of honeycomb tip treatment to the slotted fan stage.

An unexplained increase of 5 to 10 dB in blade passing frequency resulted when honeycomb treatment was added over the rotor tips. Blade passing frequency was not effected by the airfoil slots.

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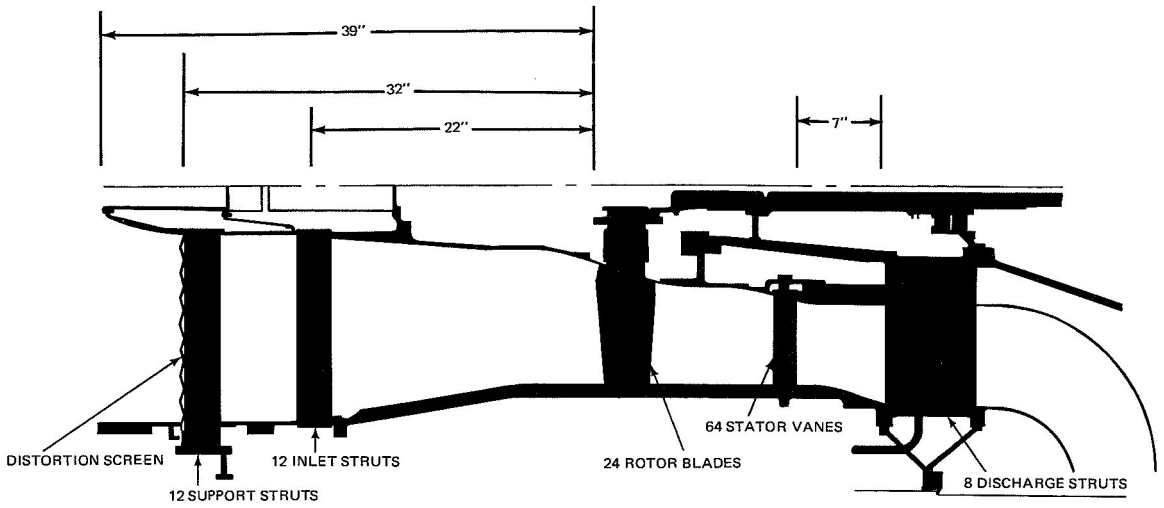
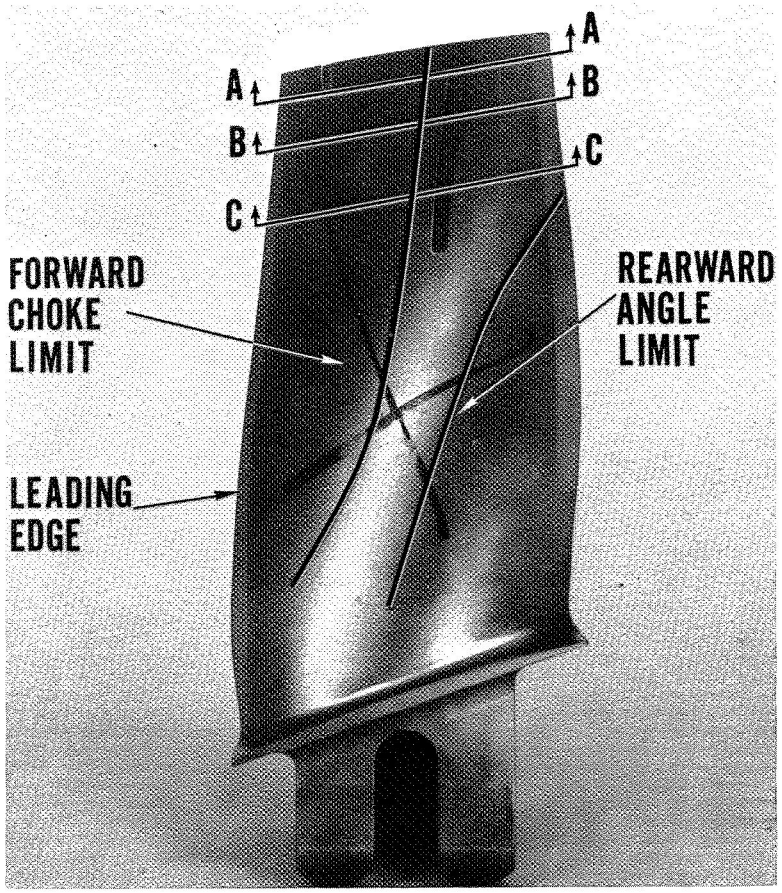


Figure 1 Schematic Drawing of Fan Stage Mounted in Test Rig for Testing With Radial Inlet Distortion



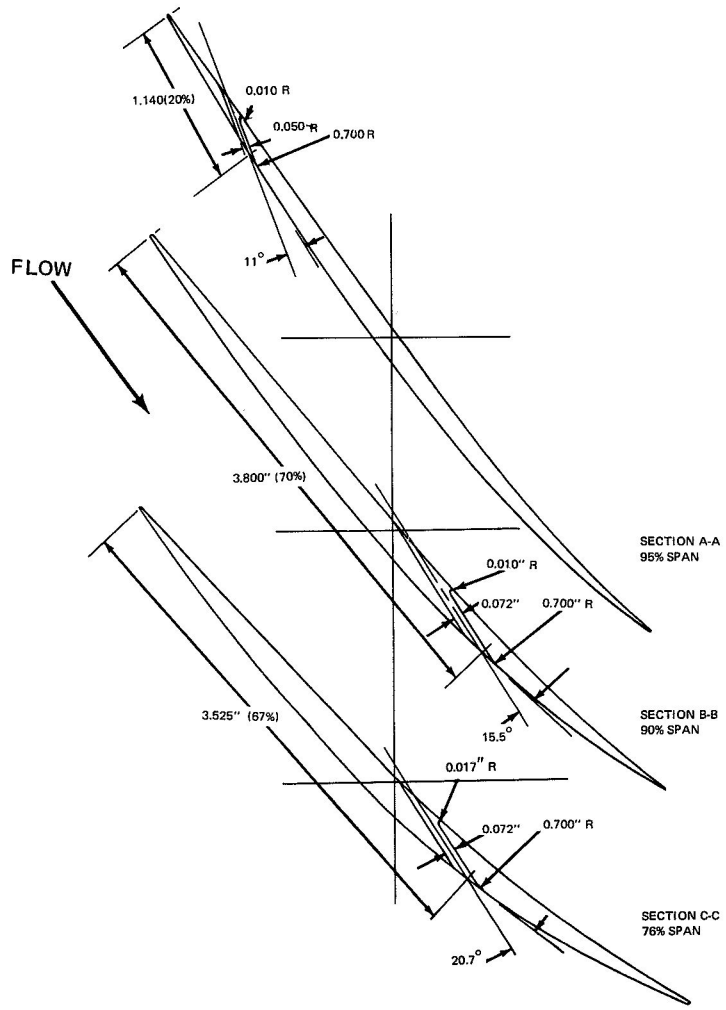
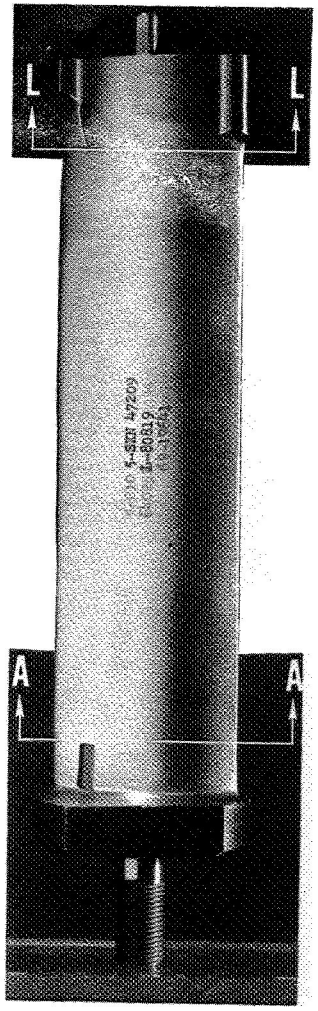


Figure 2 Slotted Rotor Blade XPN-136



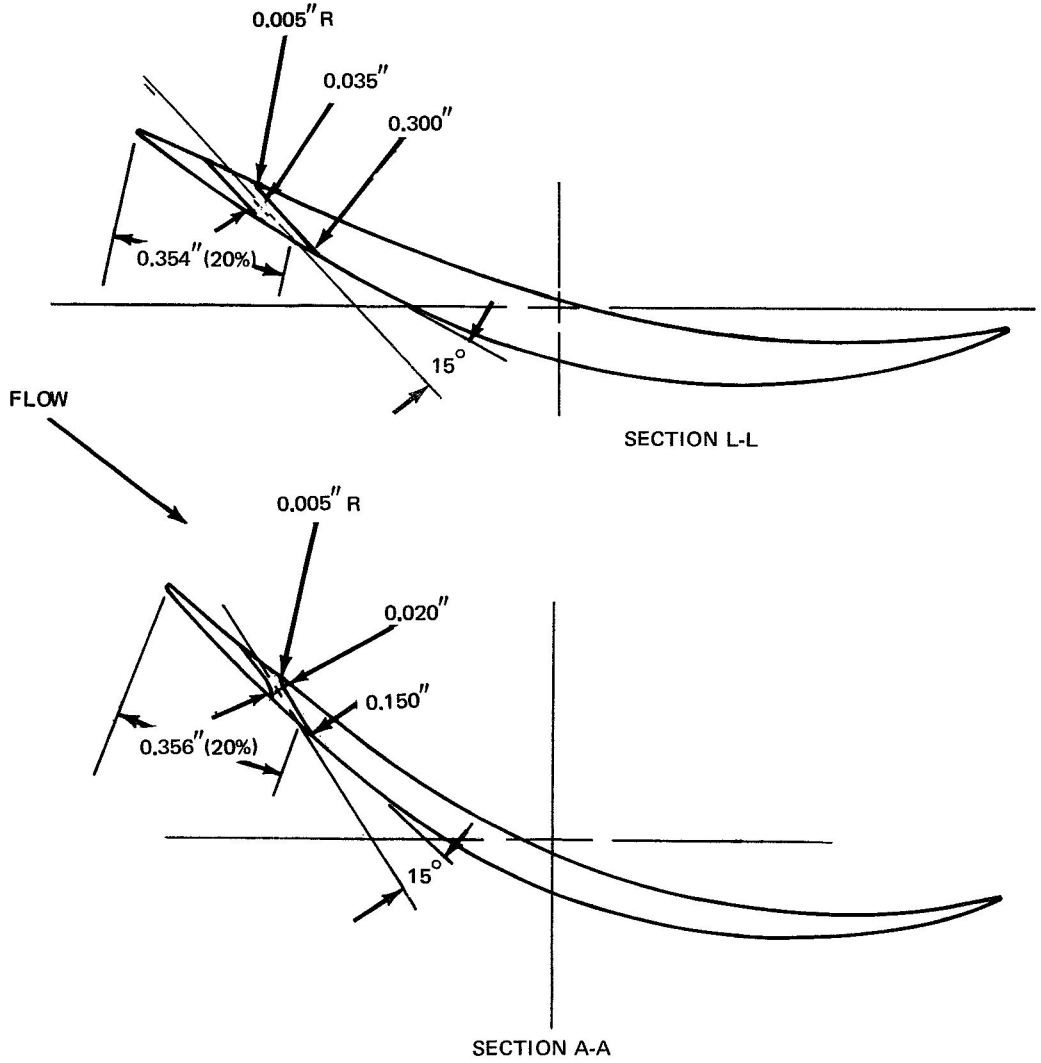


Figure 3 Slotted Stator Vane XPN-9817

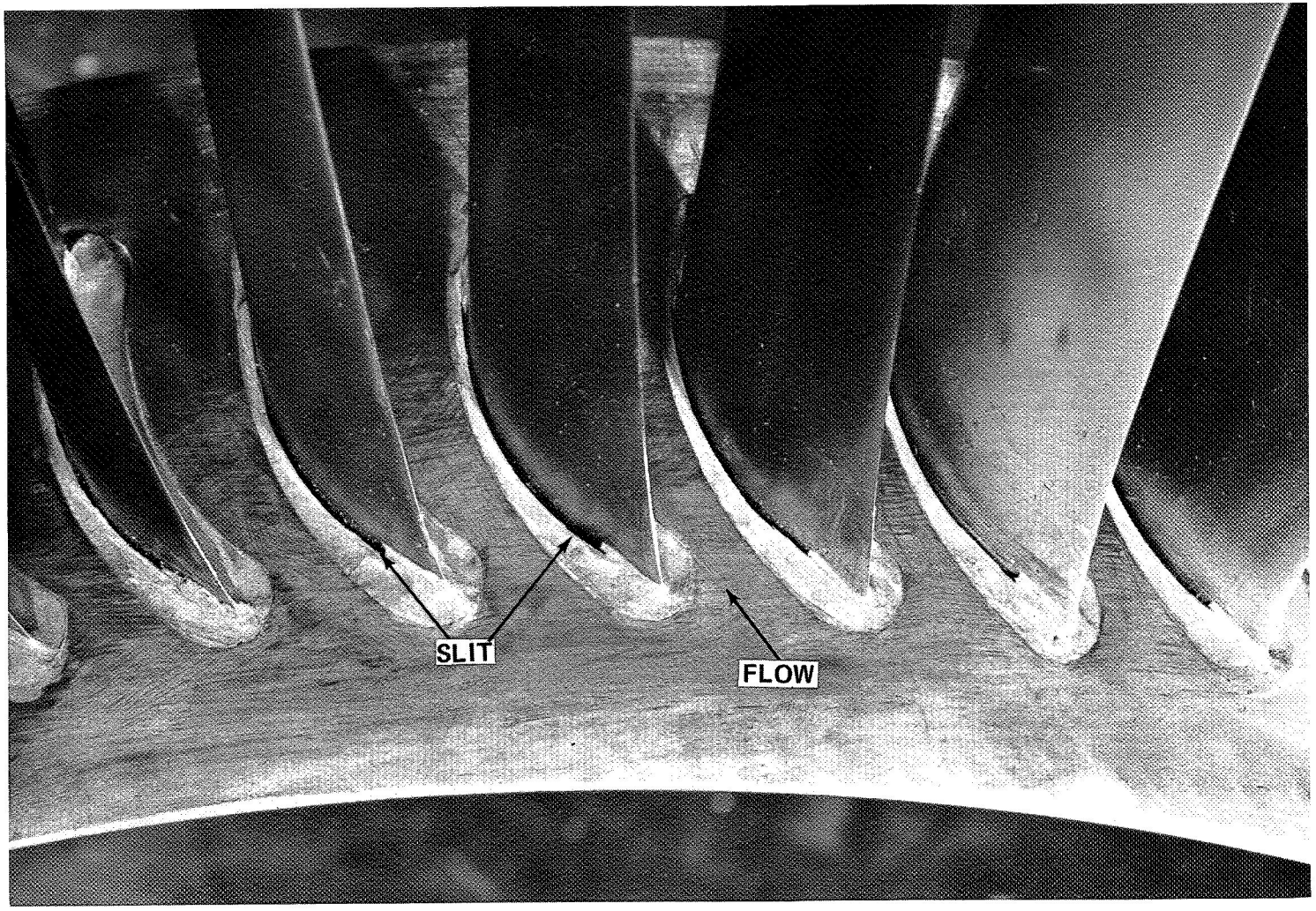


Figure 4 Stator Hub Suction Slits (fillet radius is zero) XP-90788

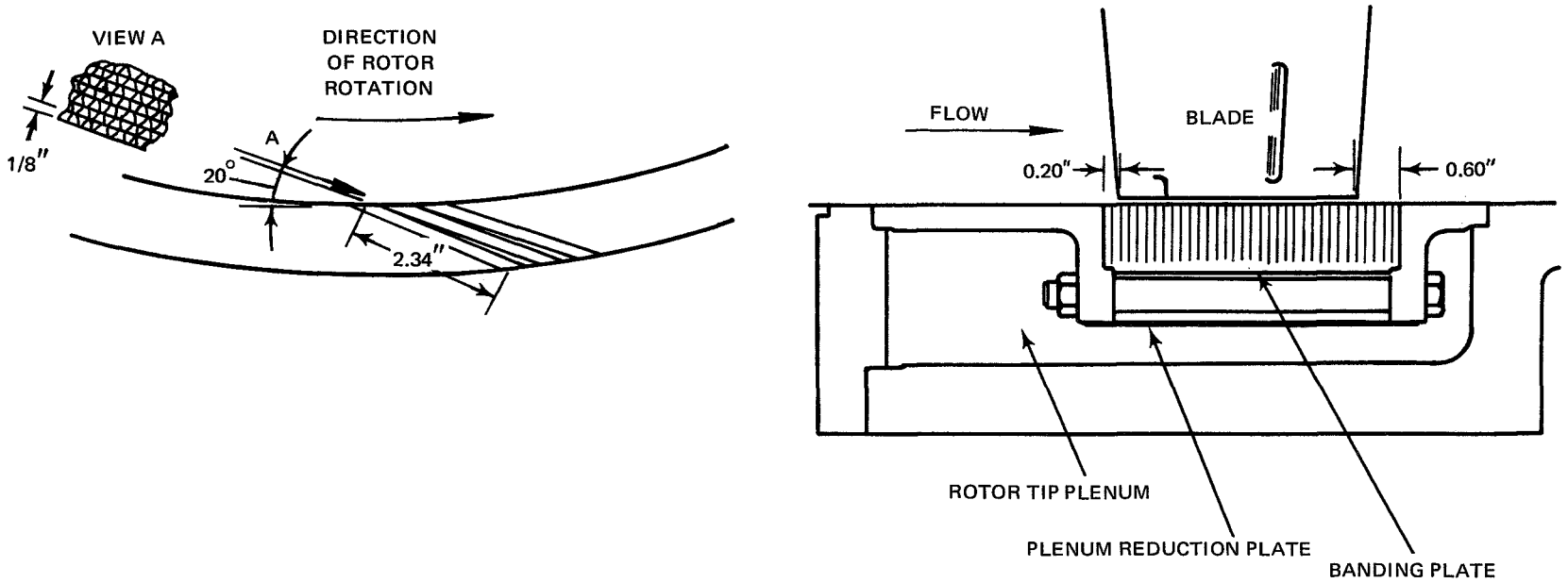


Figure 5 Sketch of Honeycomb Tip Treatment

Figure 6 Photograph of Vortex Generator Installed in Outer Case Wall

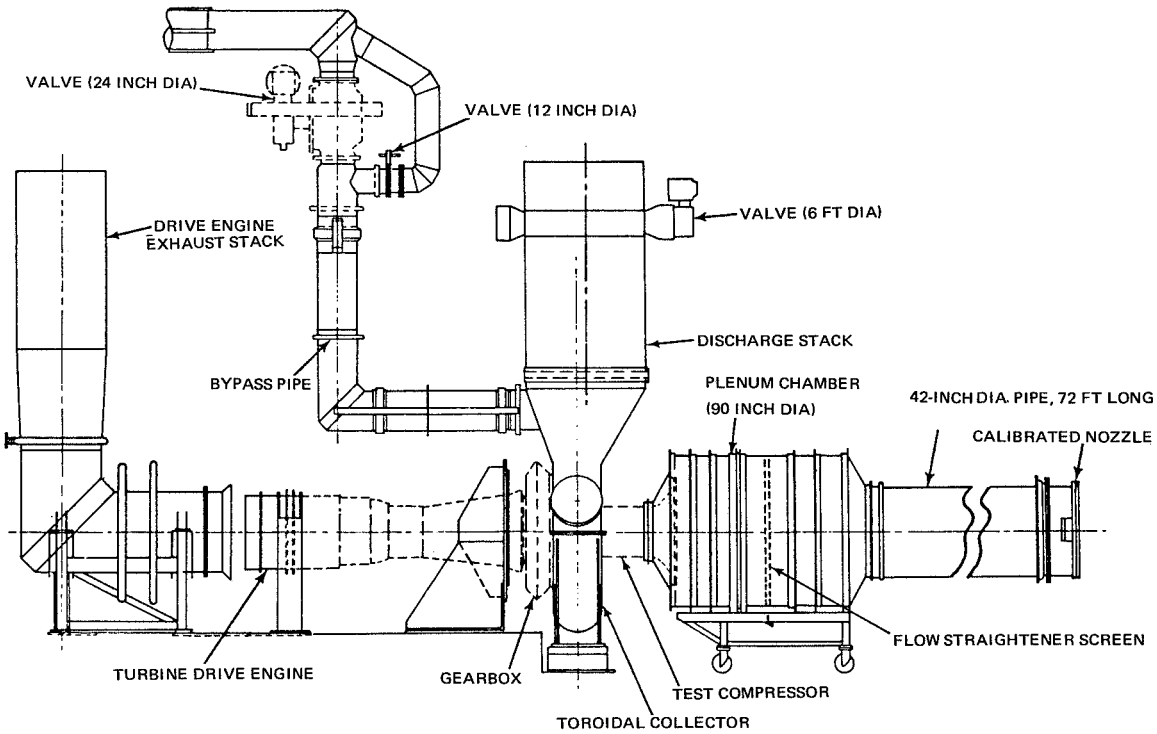


Figure 7 Schematic Drawing of Compressor Test Facility

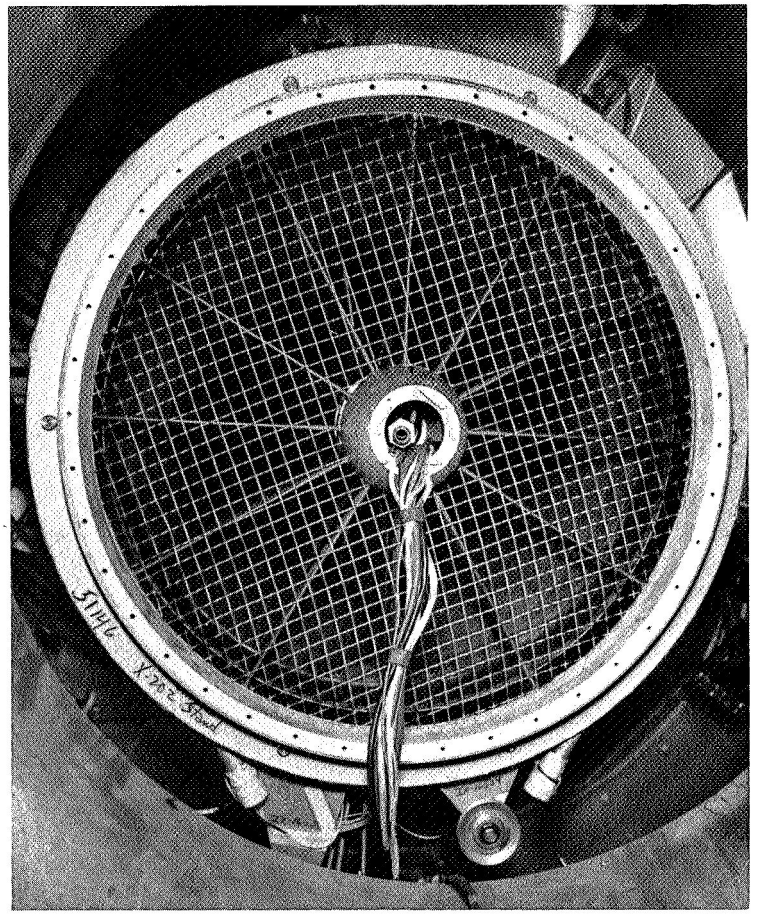


Figure 8 Test Compressor Inlet With Distortion Support Screen Installed X-30574

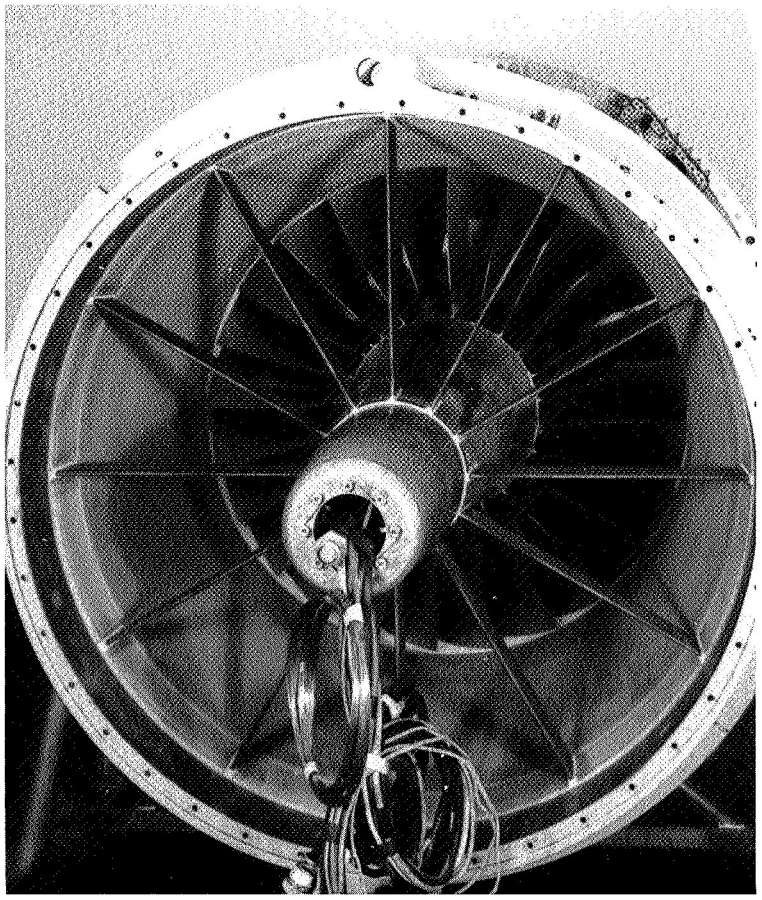


Figure 9 Test Compressor Inlet Configuration for Performance Testing With Uniform Inlet Flow

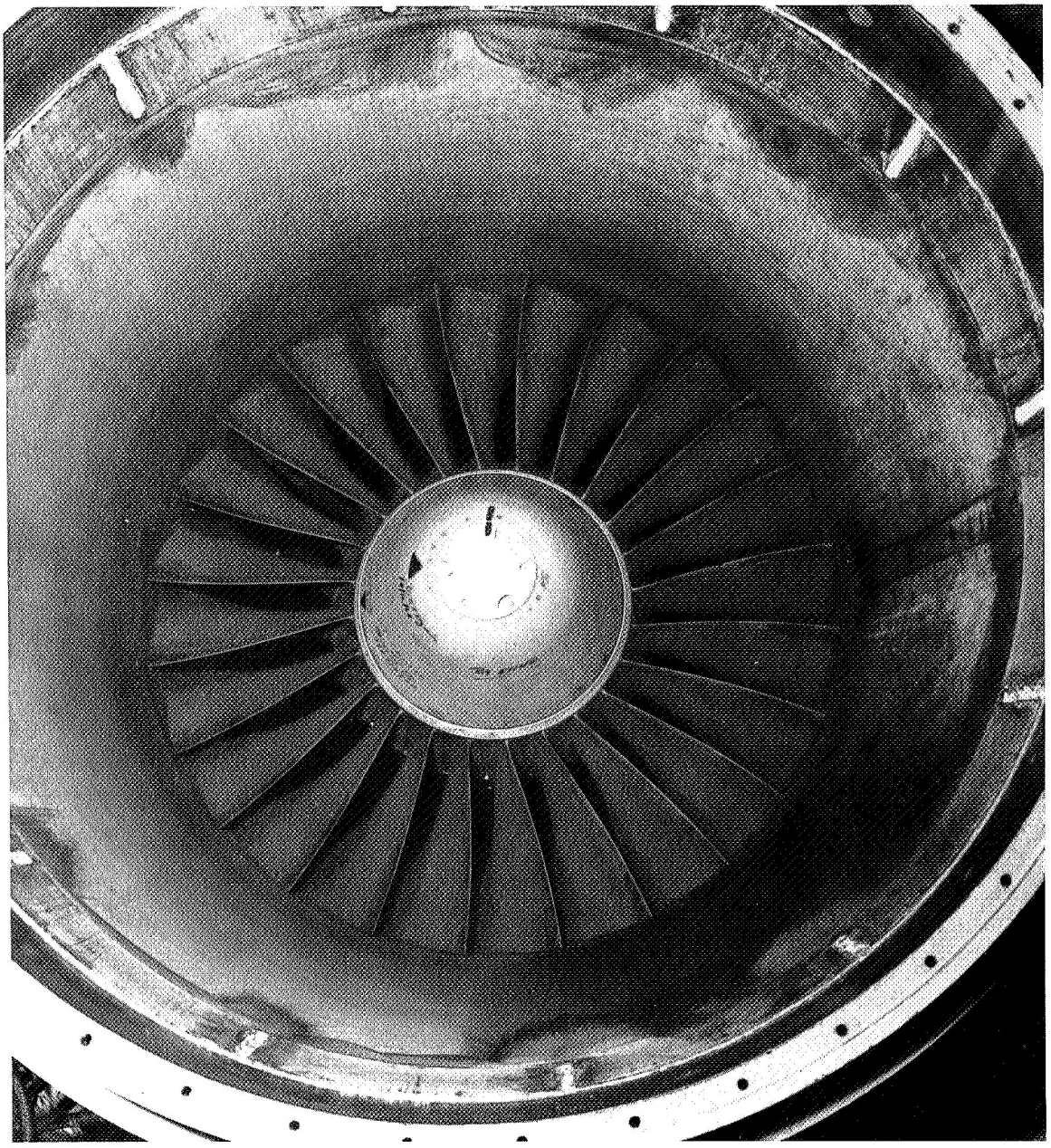
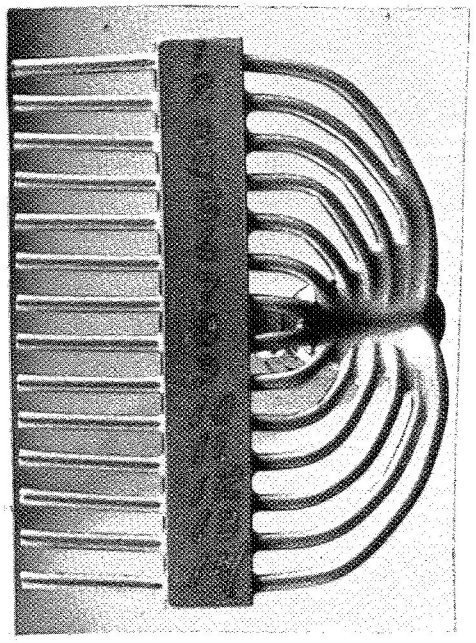
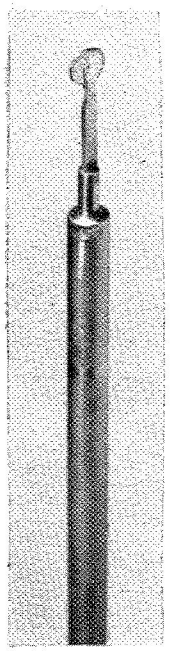


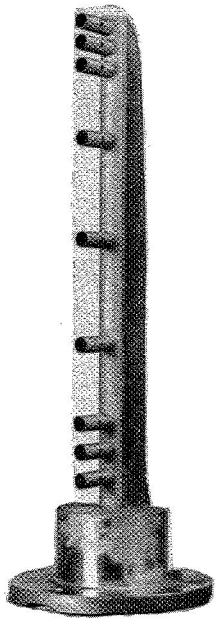
Figure 10 Test Compressor Inlet Configuration for Noise Measurements X-30726



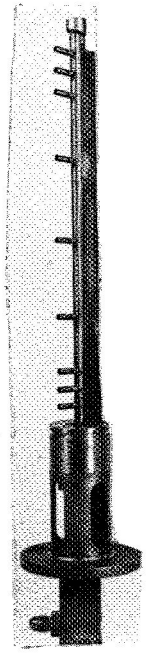
TRAVERSABLE TOTAL PRESSURE WAKE RAKE XP-90924



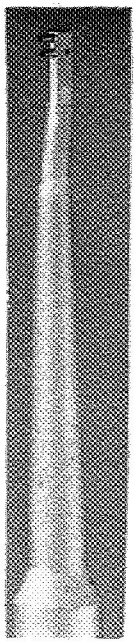
TRAVERSABLE DISK PROBE XP-79802



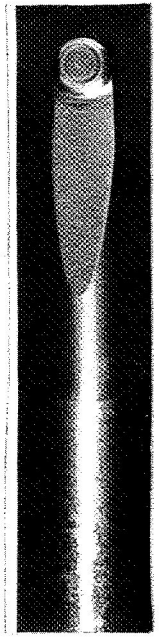
TEMPERATURE RAKE XPN-659



SHIELDED TOTAL PRESSURE RAKE XPN-657



TRAVERSABLE COMBINATION PROBE XPN-663



HIGH FREQUENCY RESPONSE PRESSURE PROBE XP-52934

Figure 11 Compressor Instrumentation

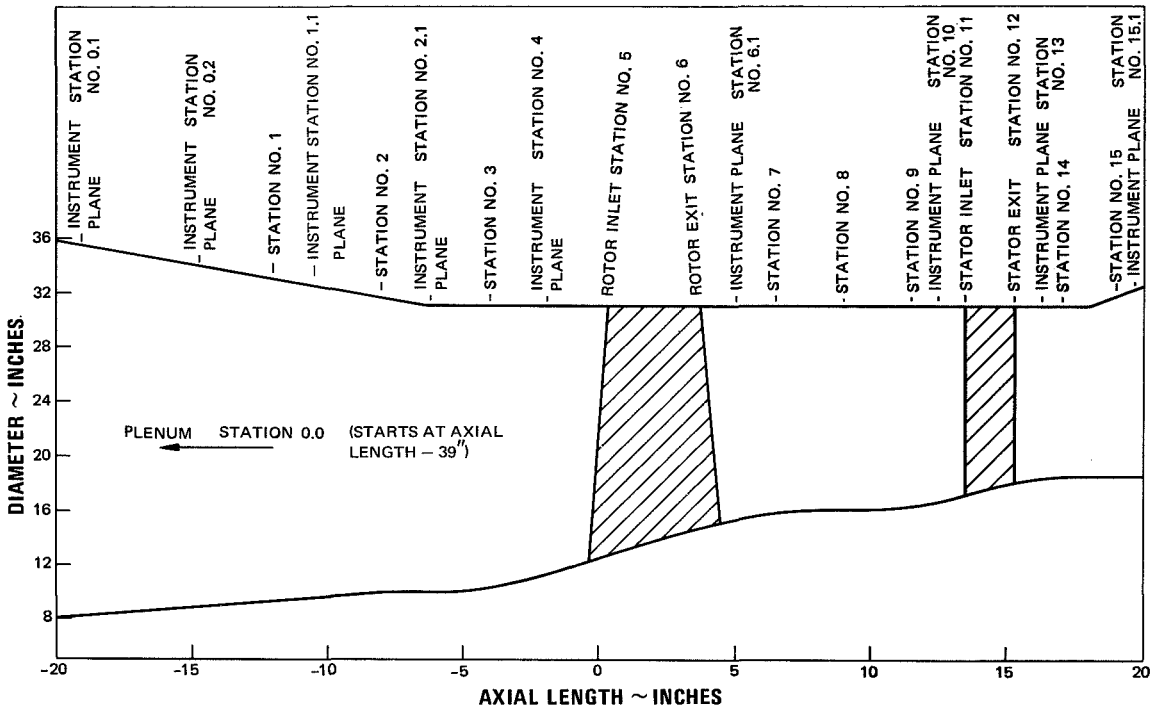


Figure 12 Axial Location of Flowpath Instrumentation

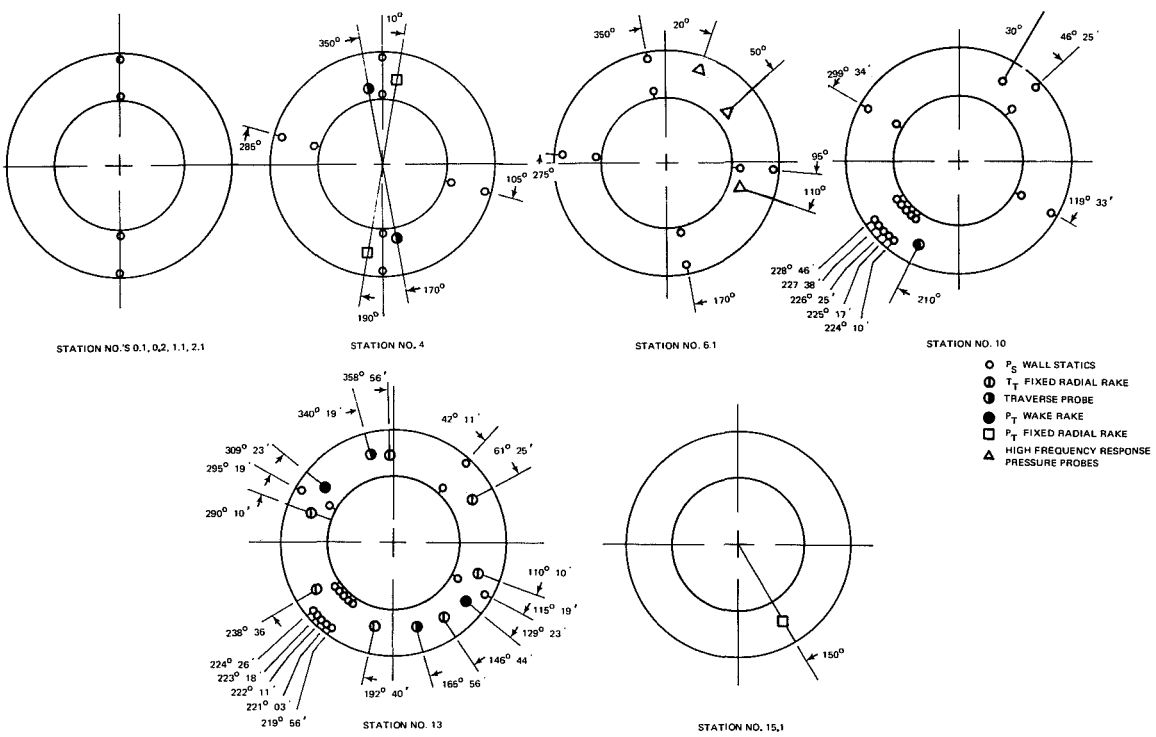


Figure 13 Downstream View of Instrumentation Planes Showing Circumferential Locations of Instrumentation

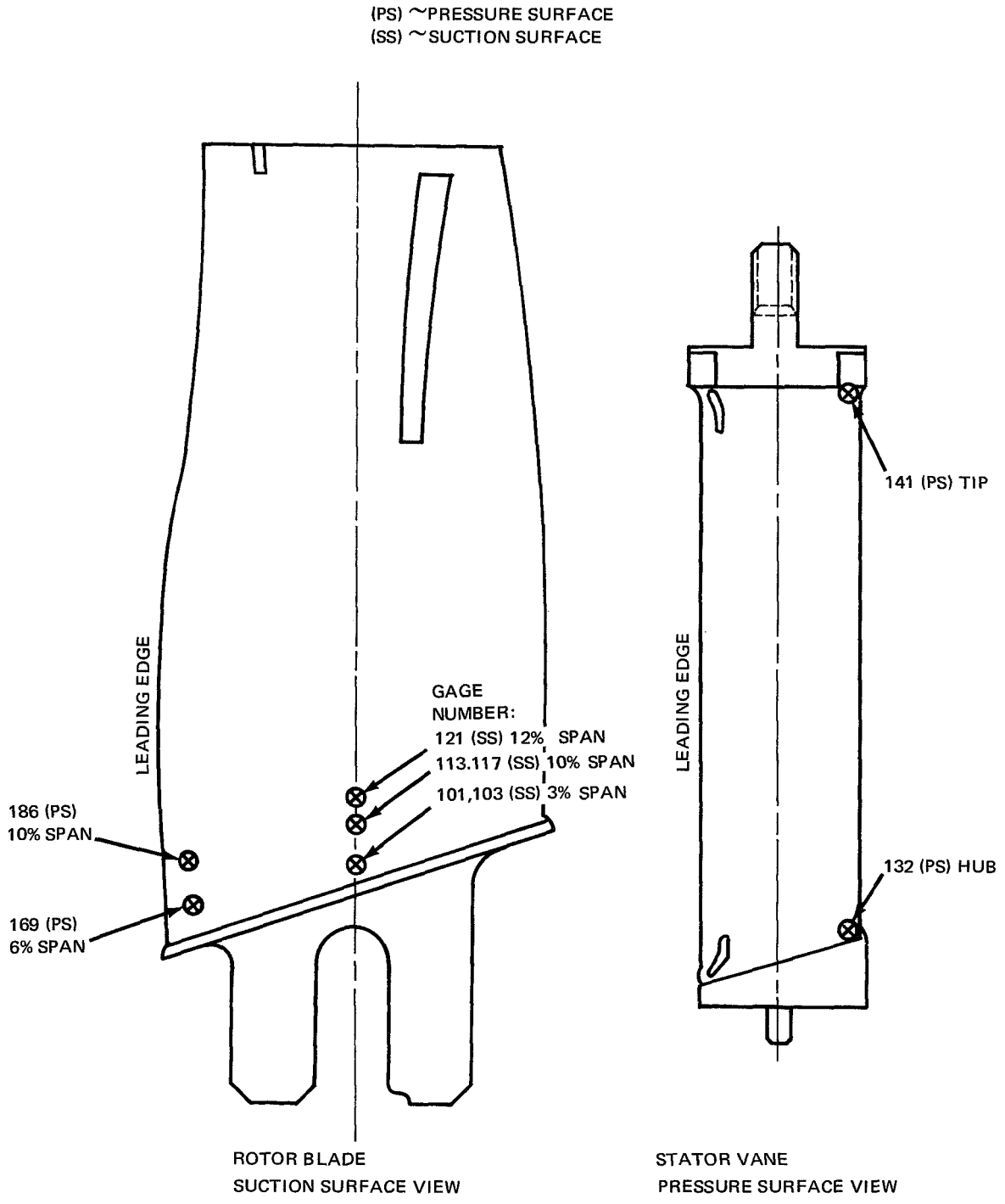


Figure 14 Strain Gage Locations on Rotor Blades and Stator Vanes

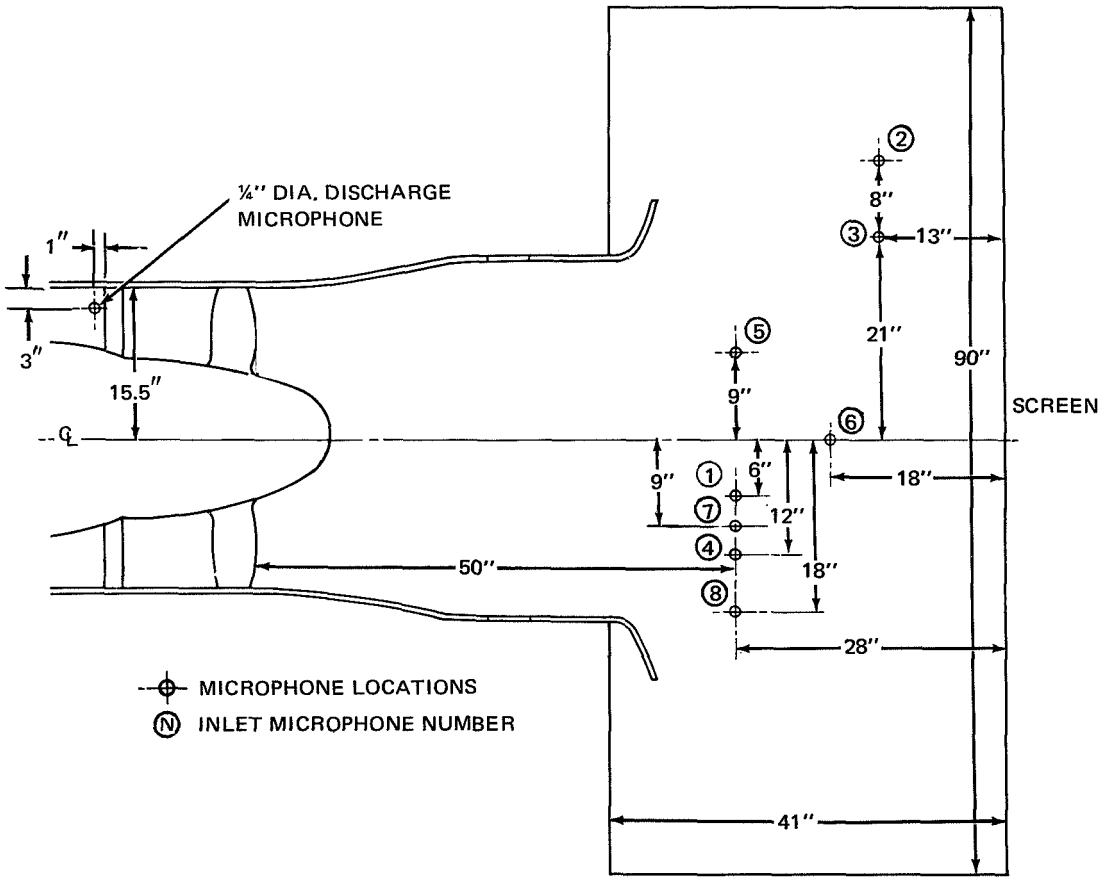


Figure 15 Acoustic Microphone Locations for Fan Noise Tests

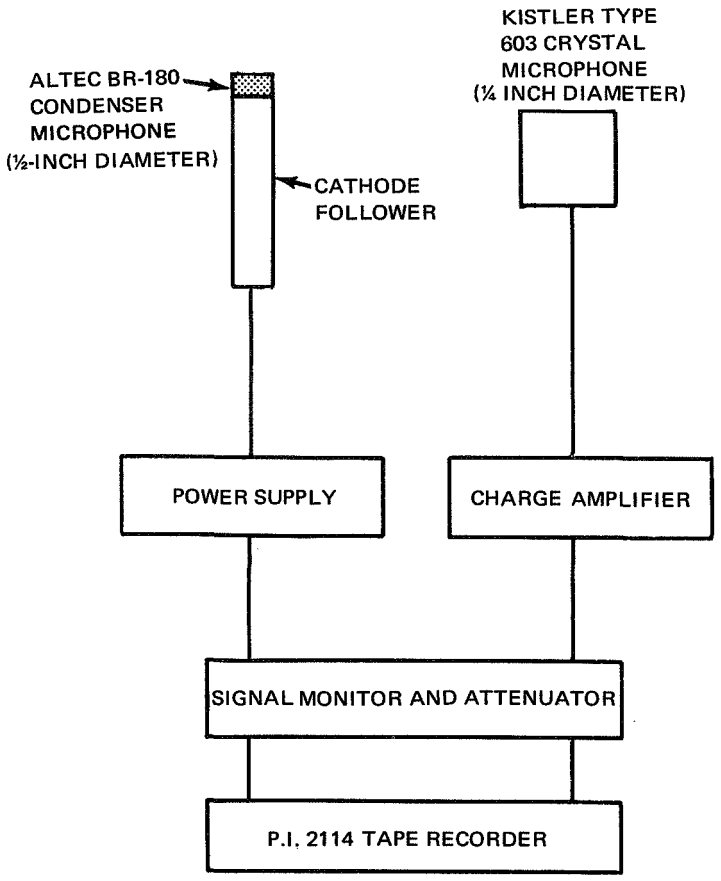


Figure 16 Acoustic Recording System Used for Fan Noise Tests

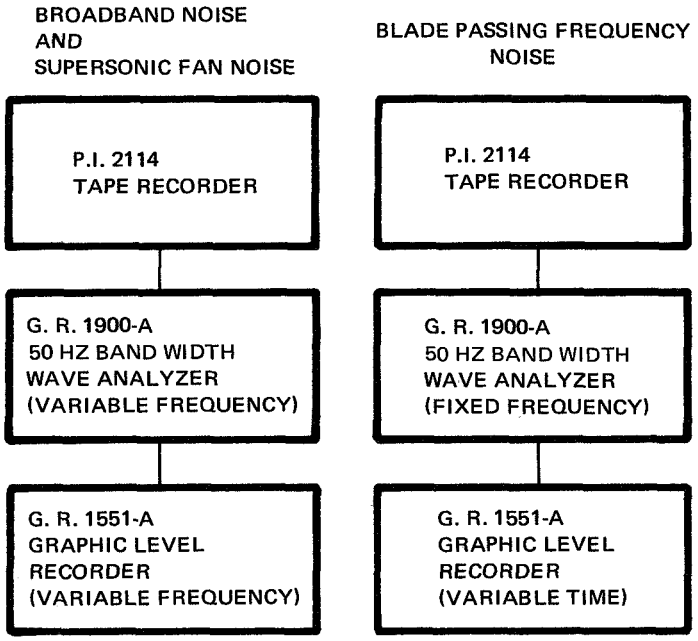


Figure 17 Acoustic Data-Reduction System

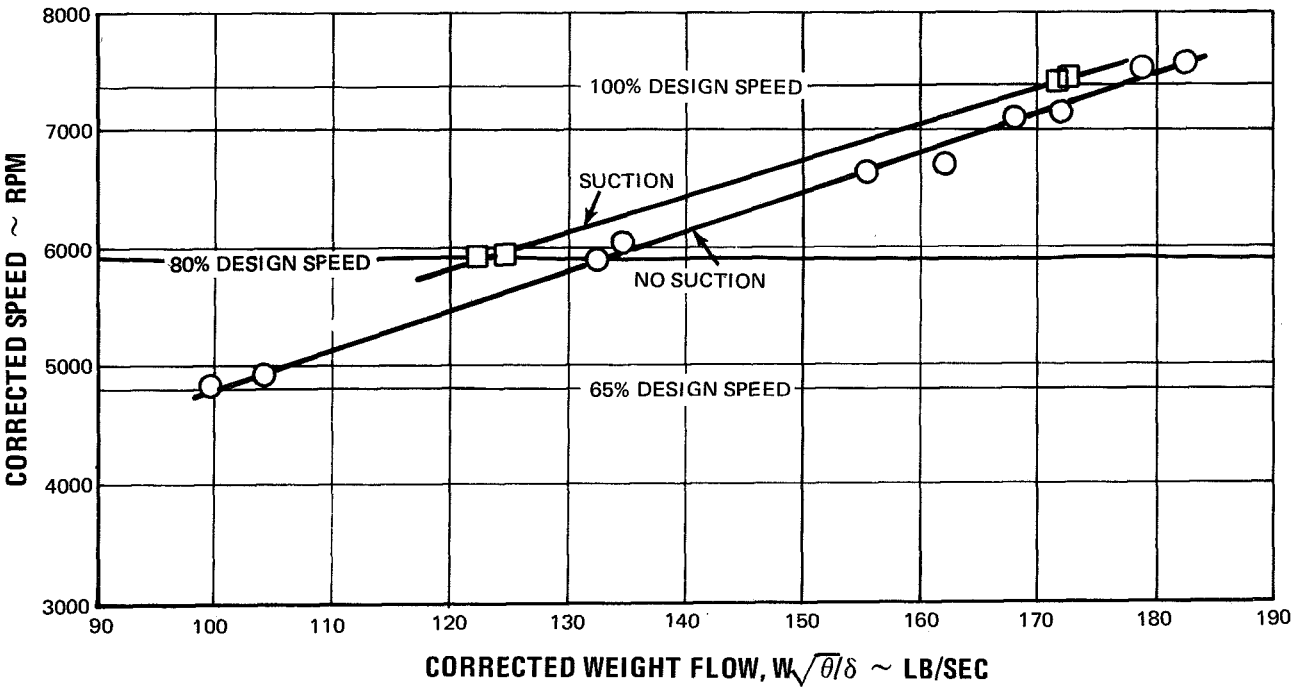


Figure 18 Effect of Stator-Hub-Slit Suction on Stall Flow

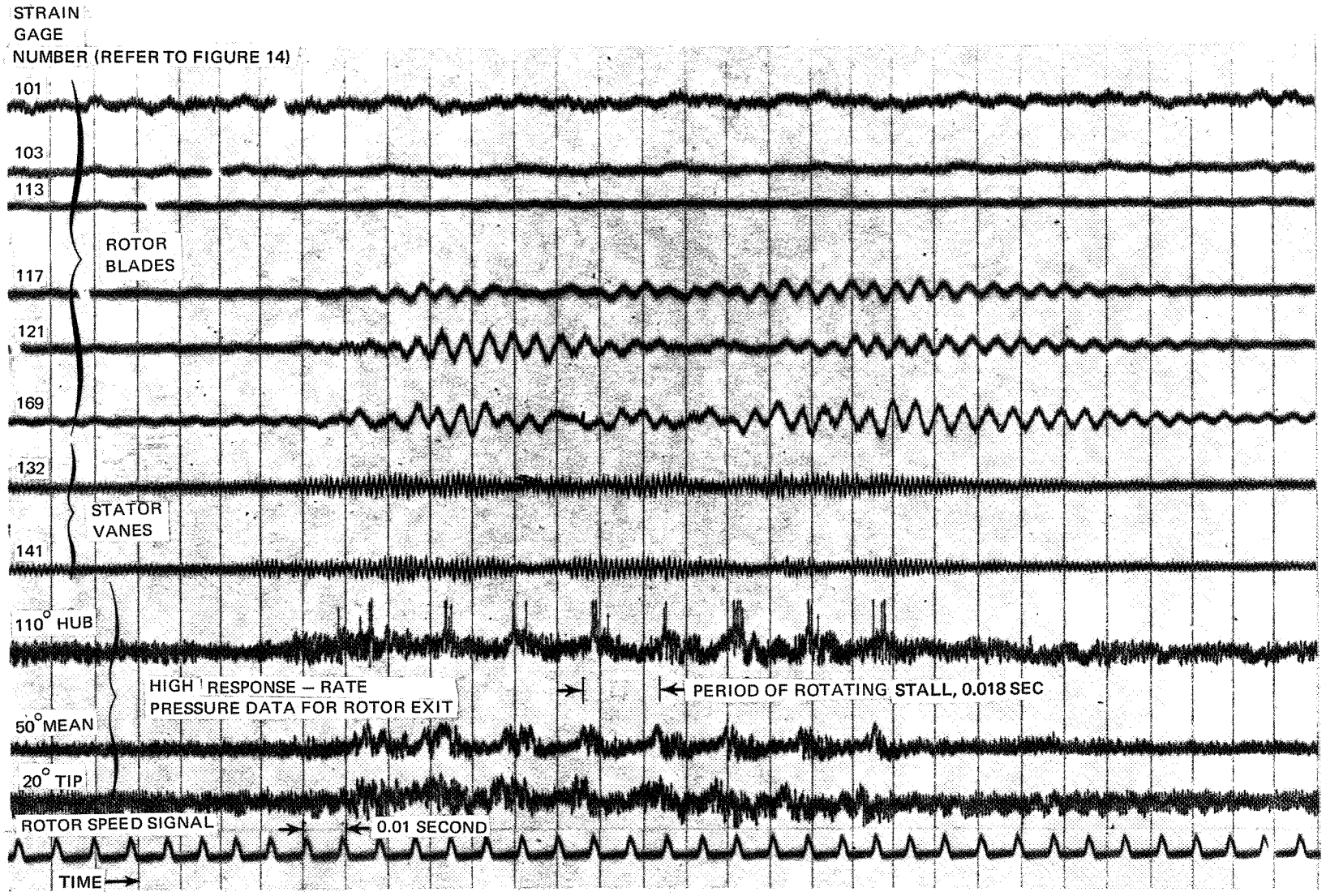


Figure 19 Oscillograph Trace of Stall Without Slit Suction and With Uniform Inlet Flow at 100 Percent of Design Speed

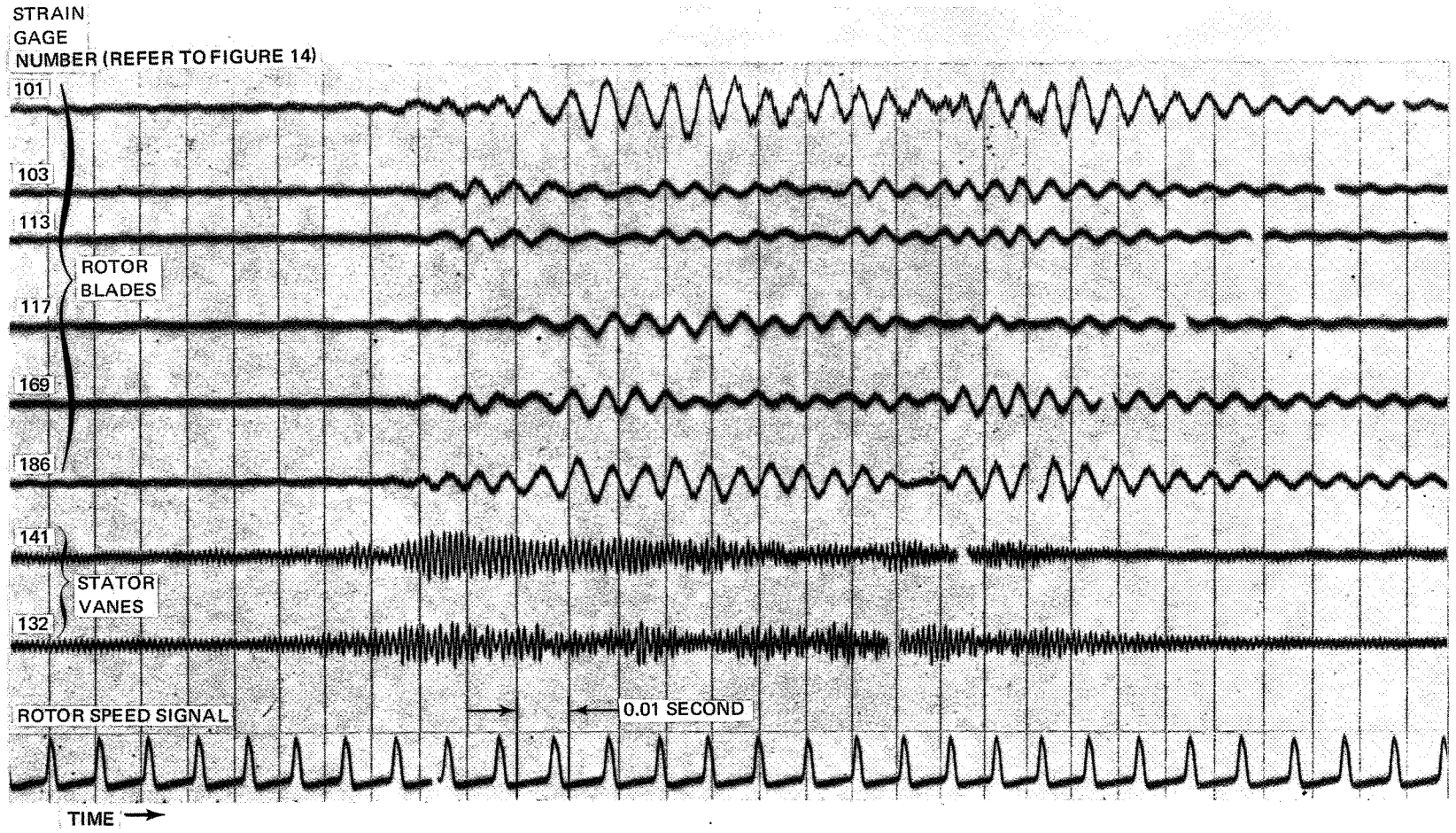


Figure 20 Oscillograph Trace of Stall Without Slit Suction and With Uniform Inlet Flow at 80 Percent of Design Speed

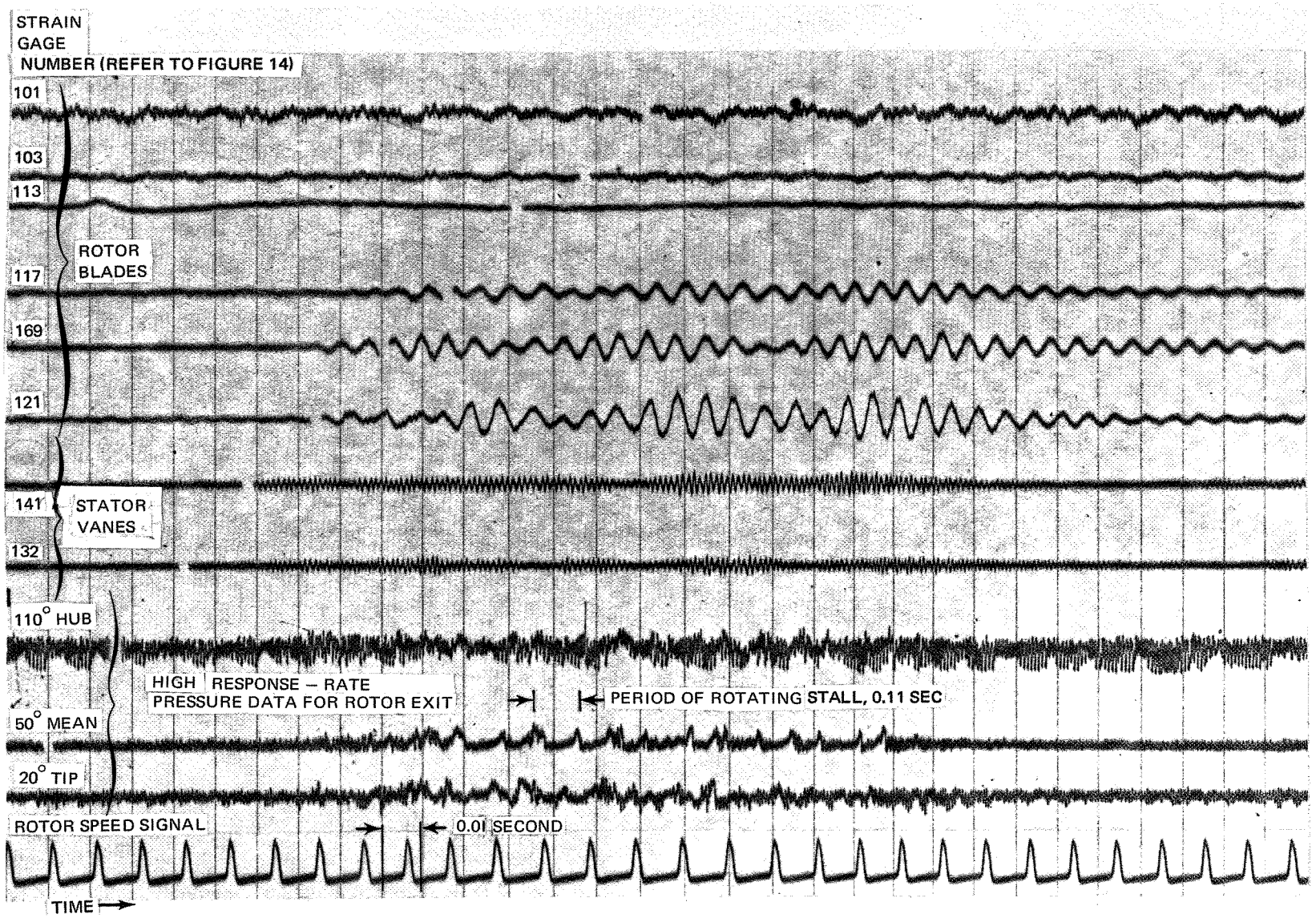


Figure 21 Oscillograph Trace of Stall Without Slit Suction and With Uniform Inlet Flow at 80 Percent of Design Speed Showing High Response Rate Pressure Data

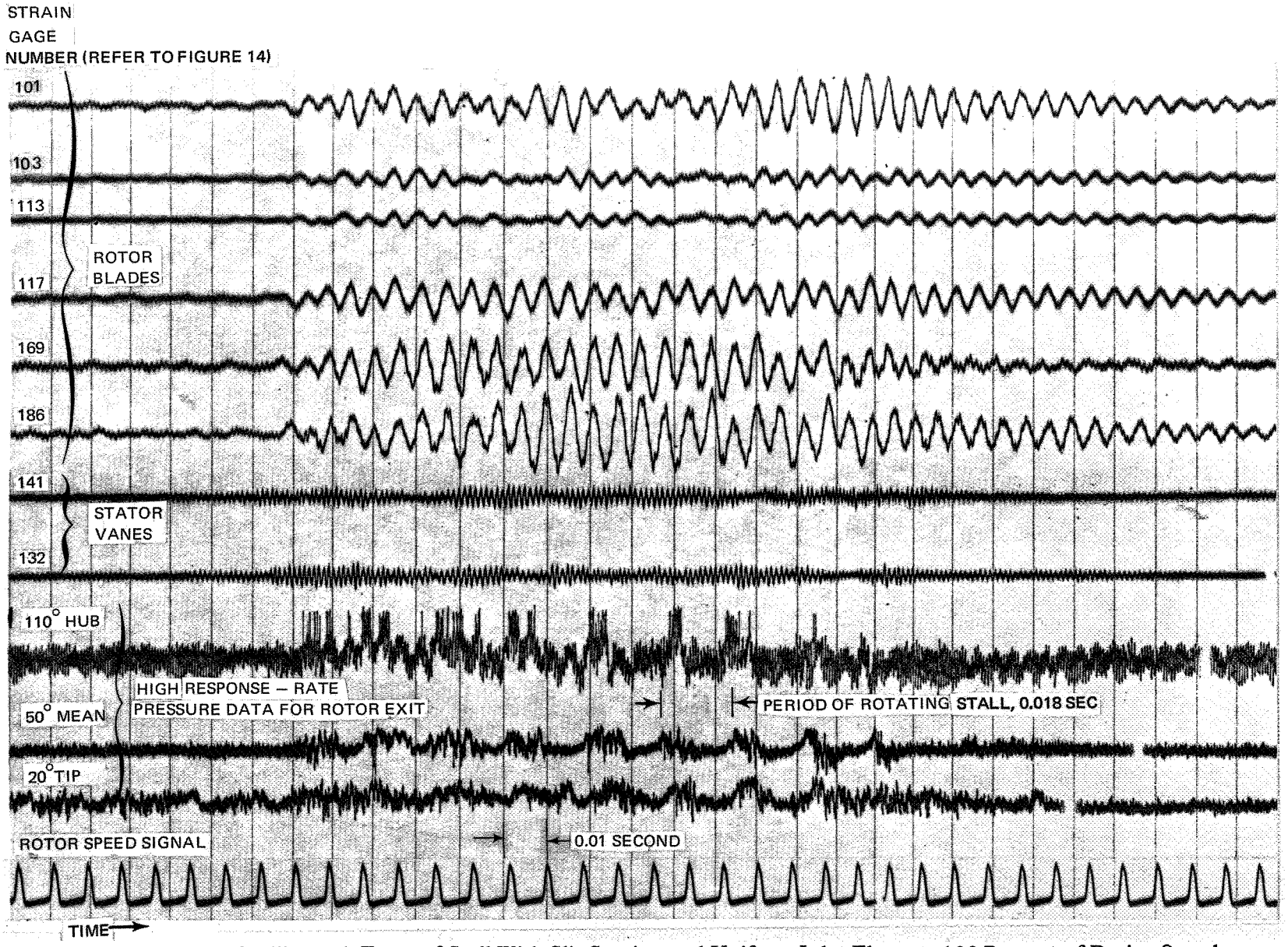


Figure 22 Oscillograph Trace of Stall With Slit Suction and Uniform Inlet Flow at 100 Percent of Design Speed

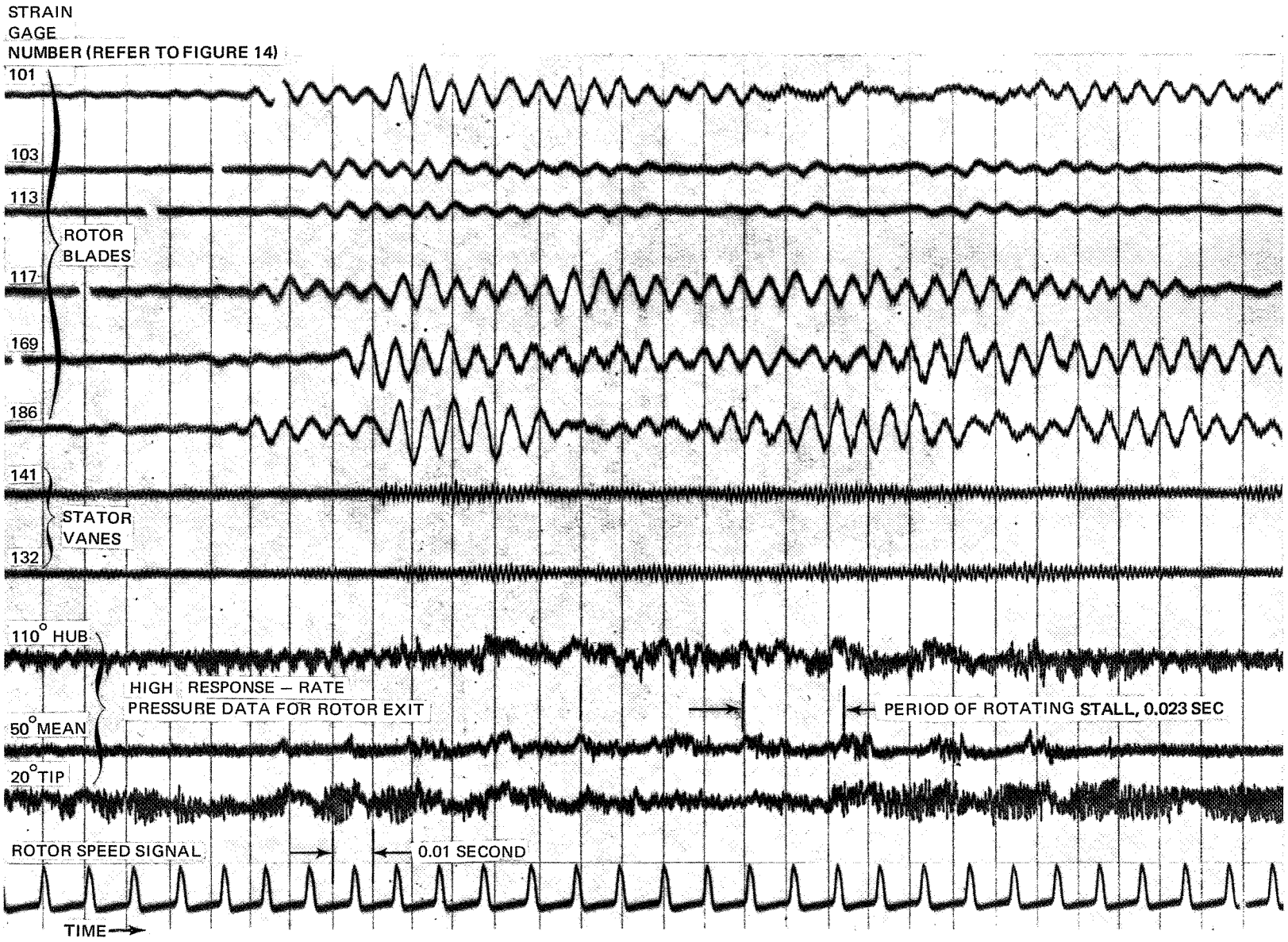


Figure 23 Oscillograph Trace of Stall With Slit Suction and Uniform Inlet Flow at 80 Percent of Design Speed

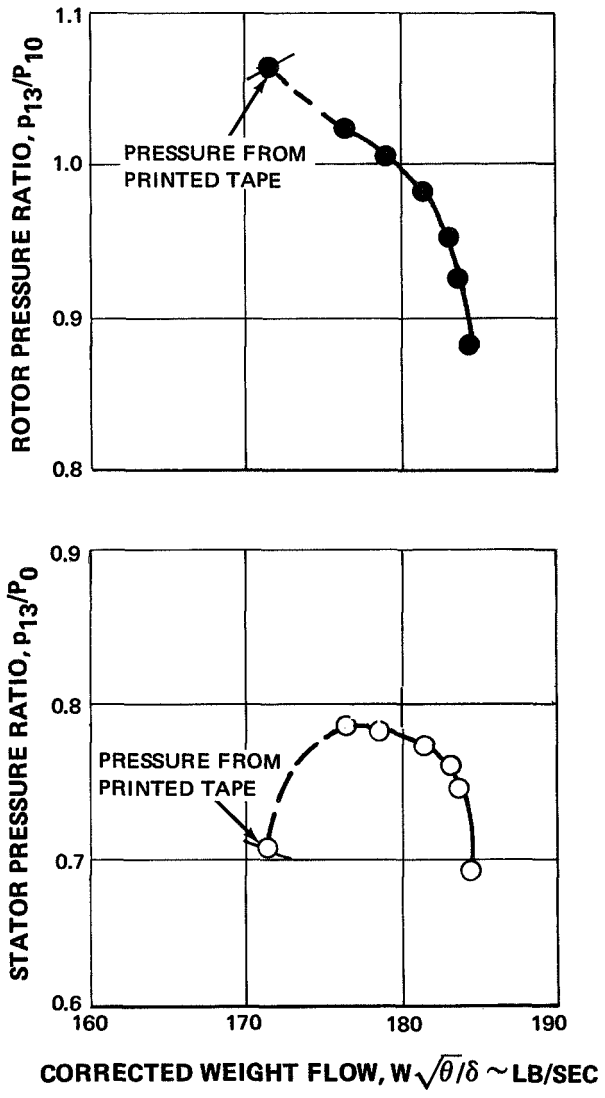


Figure 24 Rotor and Stator Static Pressure Ratio Data for Uniform Inlet Flow and Stator-Hub Slit-Suction, 100% of Design Speed

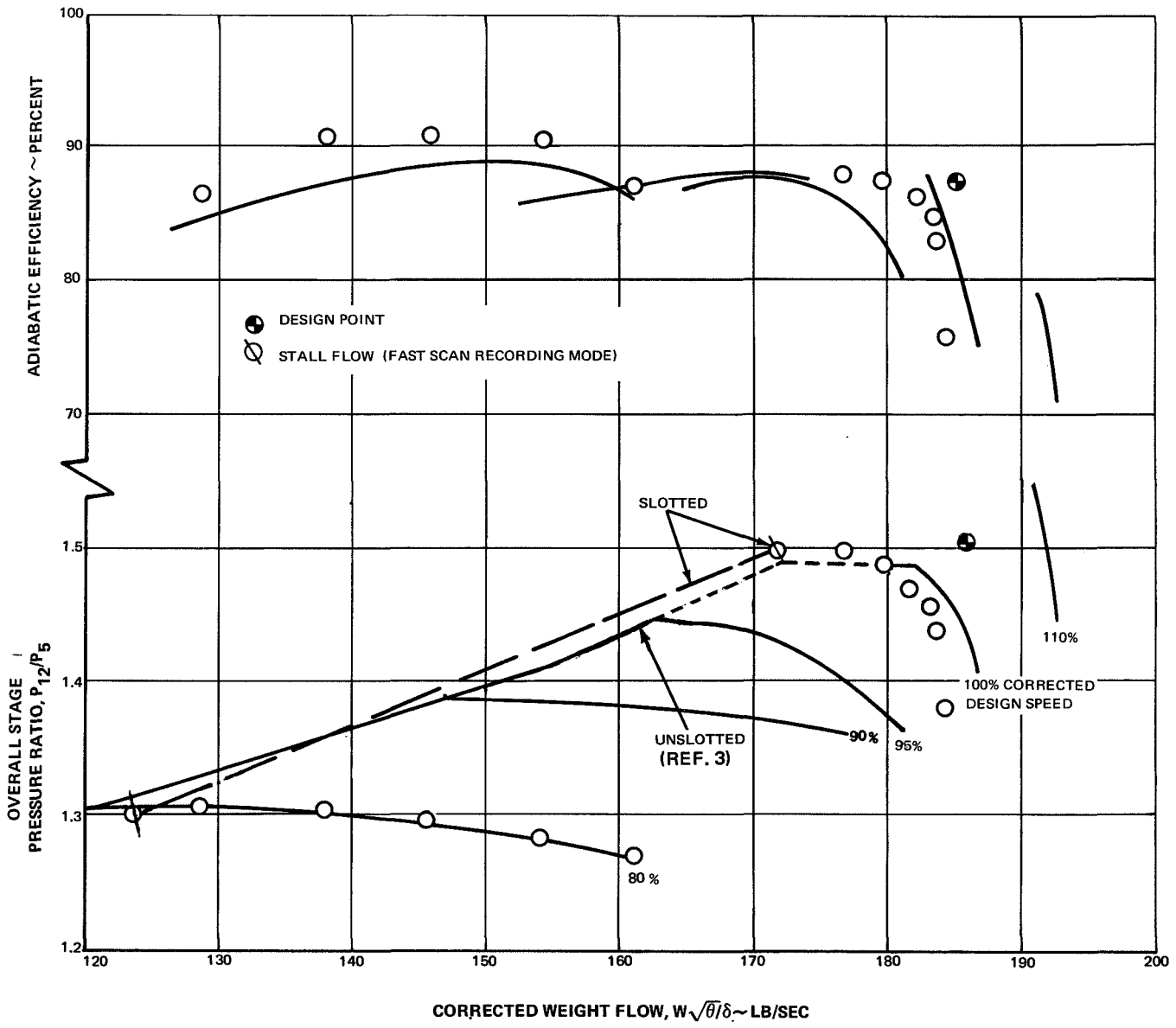


Figure 25 Overall Fan Stage Performance With Uniform Inlet Flow Showing Effect of Rotor and Stator Slots

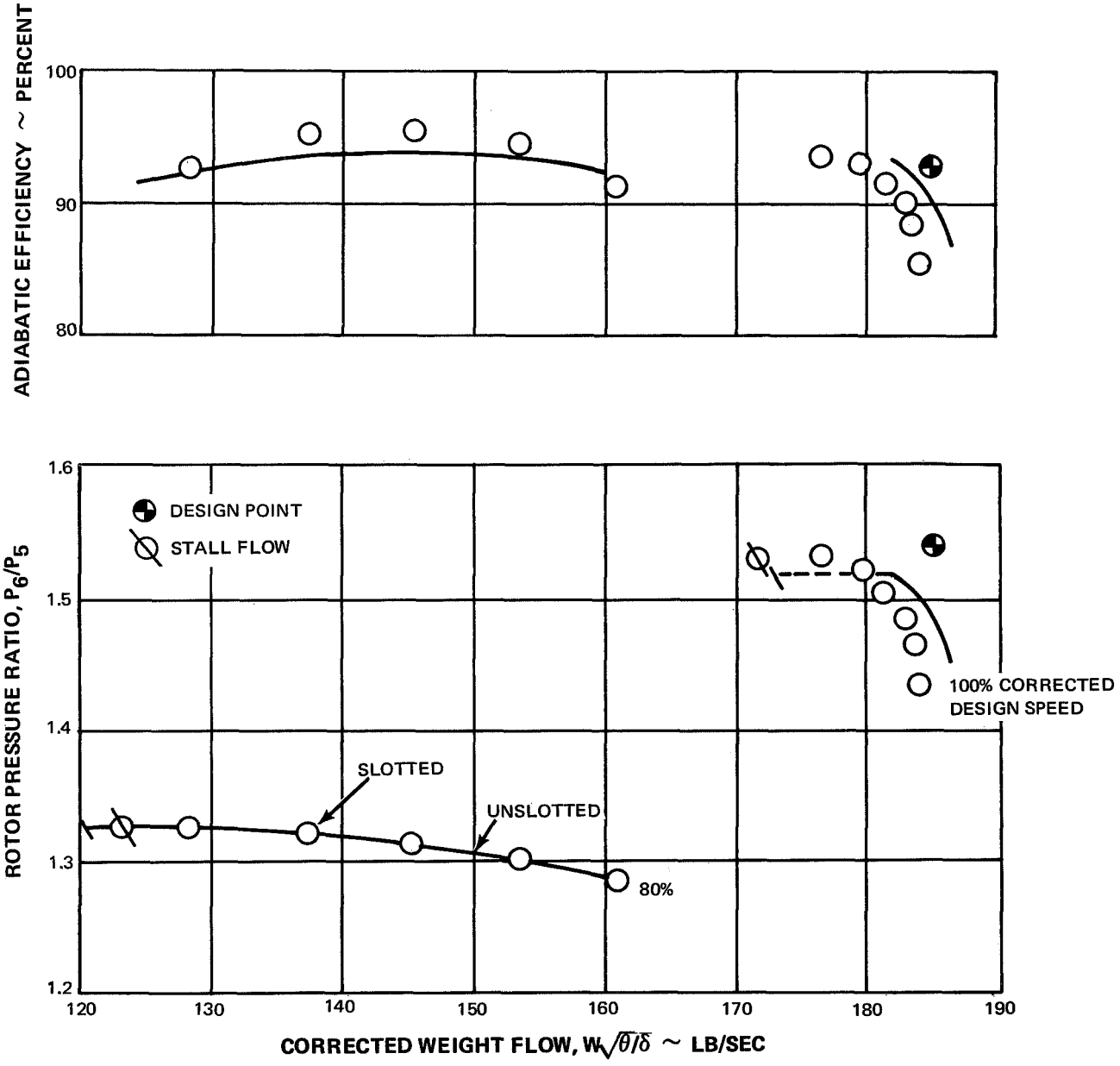


Figure 26 Overall Performance of Rotor With Uniform Inlet Flow Showing Effect of Rotor Slots

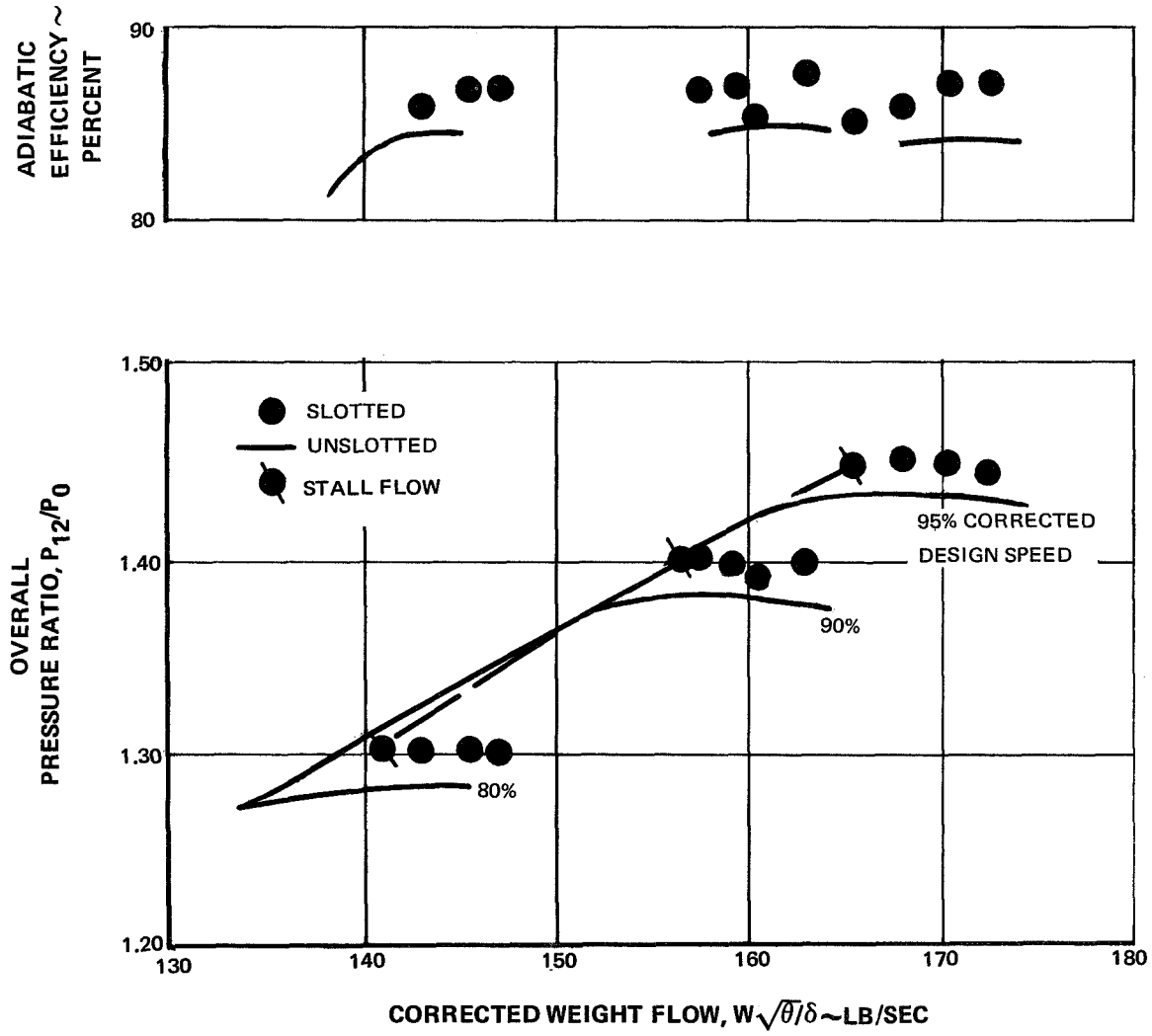


Figure 27 Overall Fan Stage Performance With Radially Distorted Inlet Flow Showing Effect of Rotor and Stator Slots

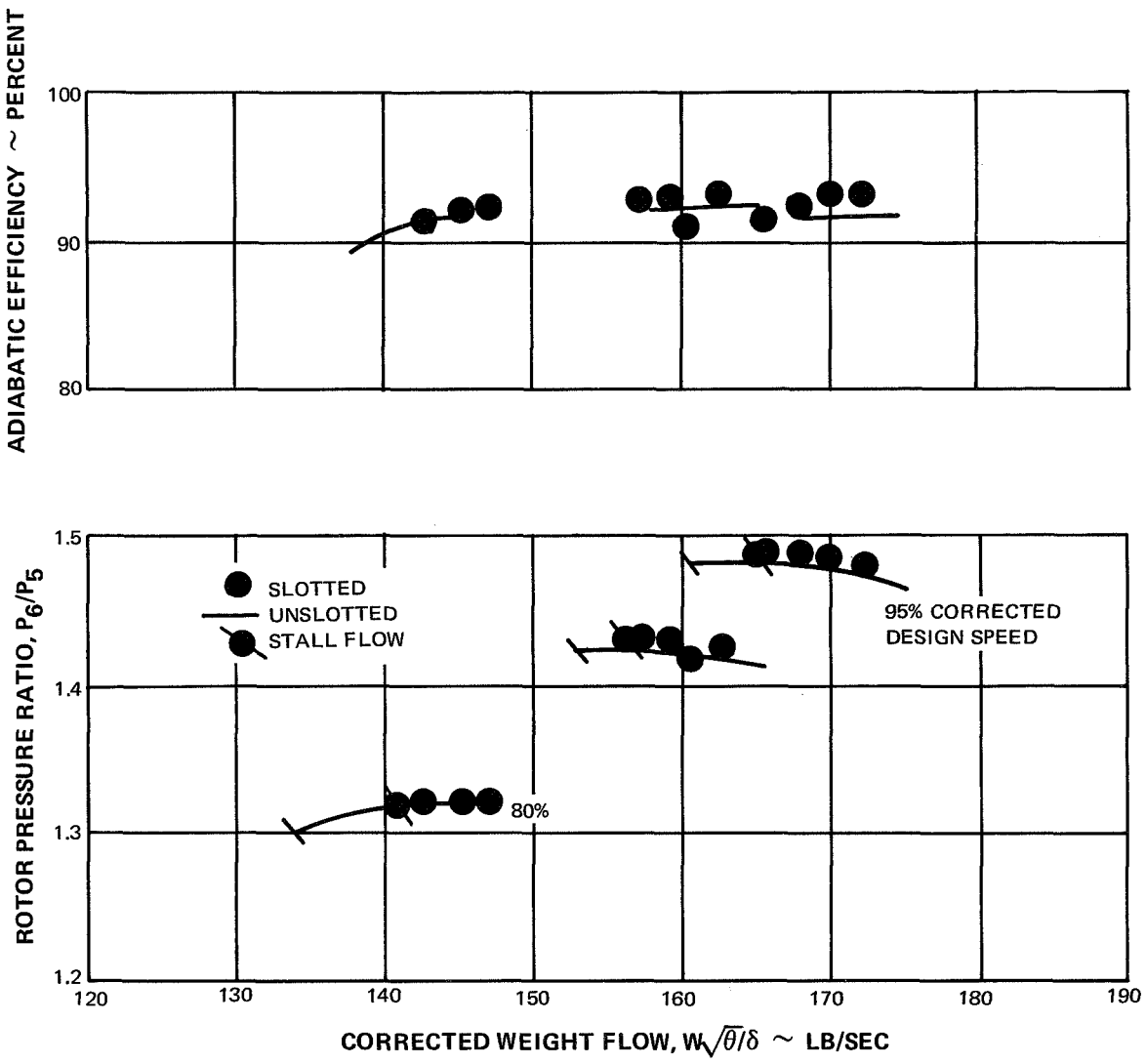


Figure 28 Overall Performance of Rotor With Tip Radially Distorted Flow Showing Effects of Rotor Slots

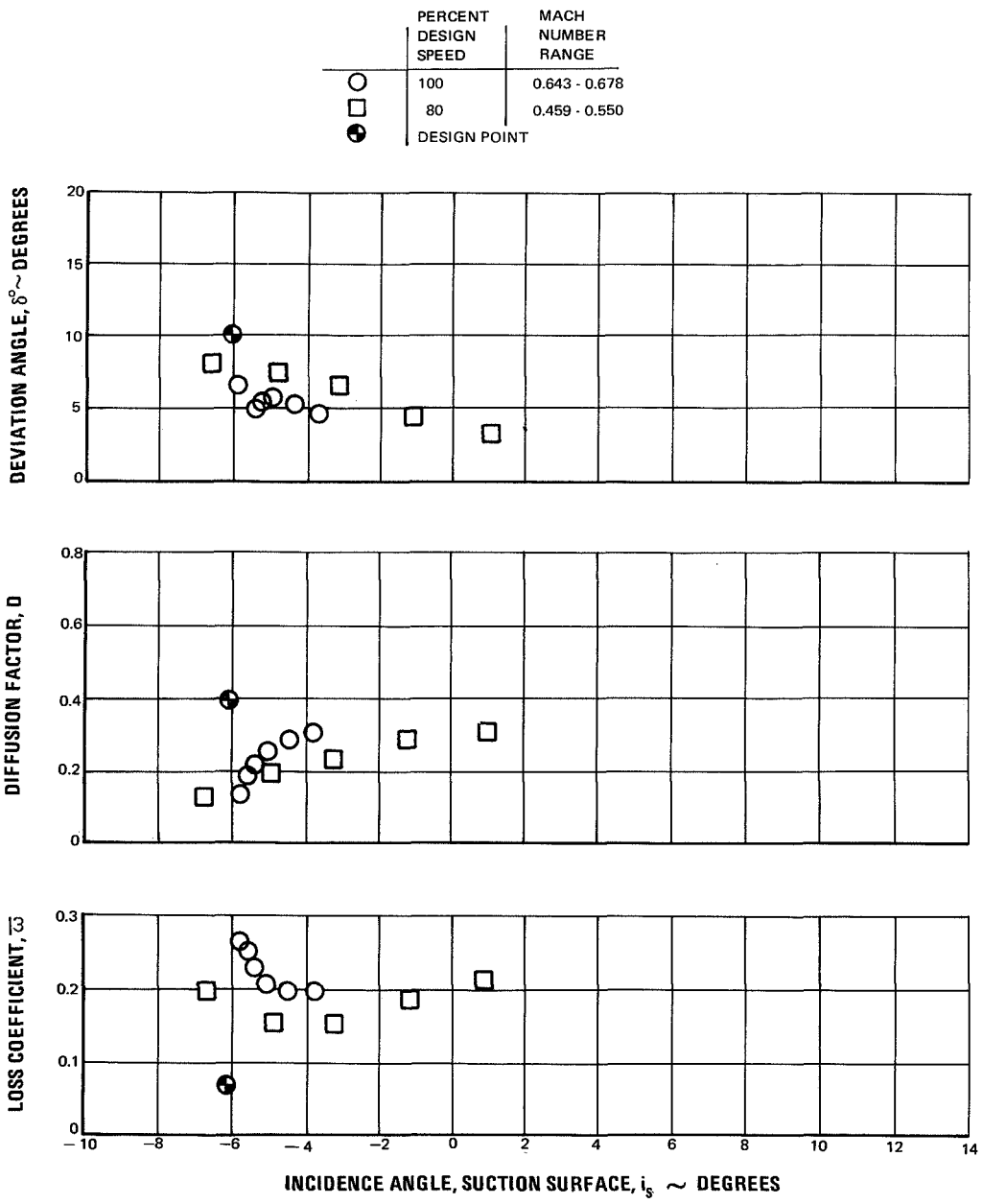


Figure 29a Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 5 Percent Span From Hub

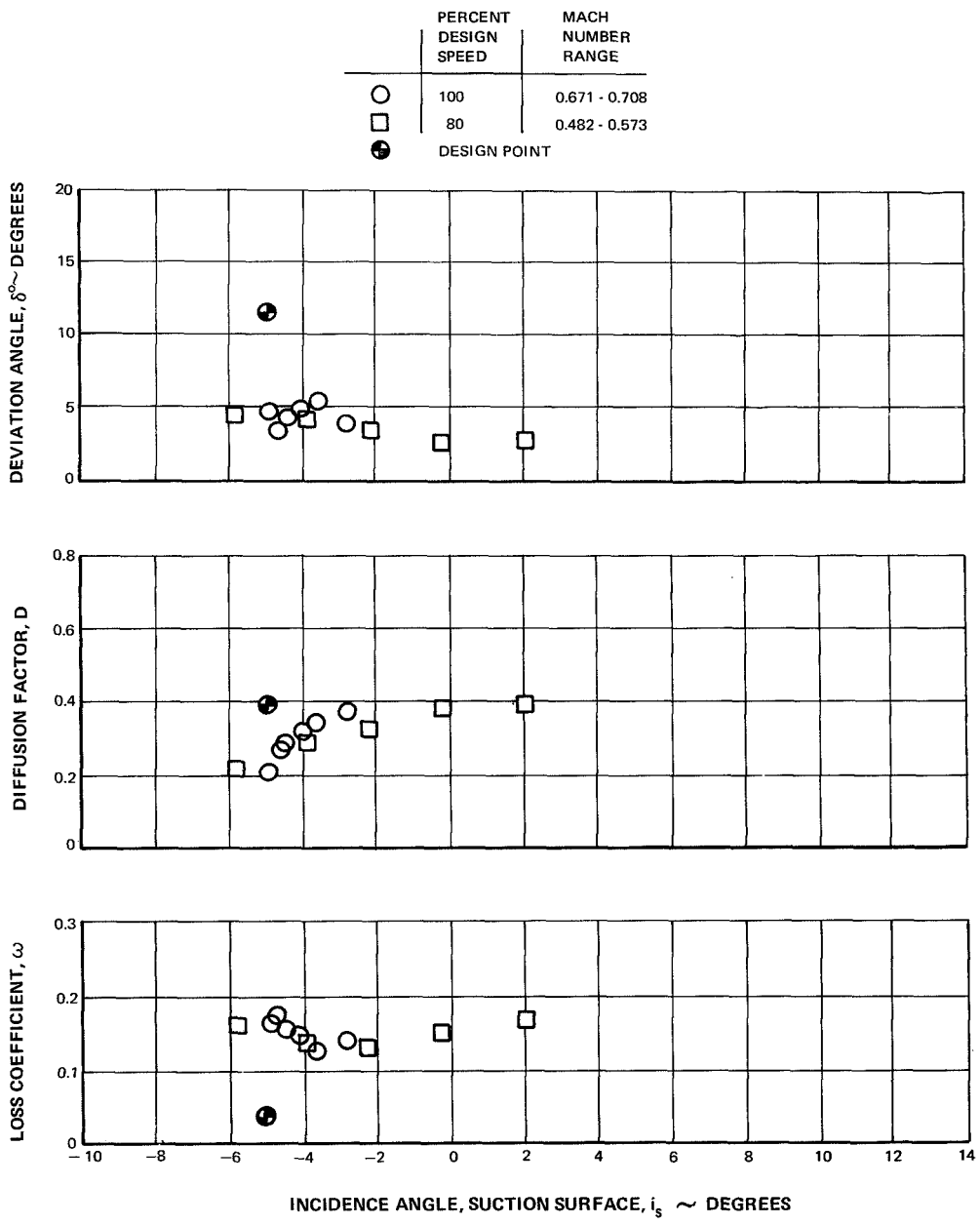


Figure 29b Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 10 Percent Span From Hub.

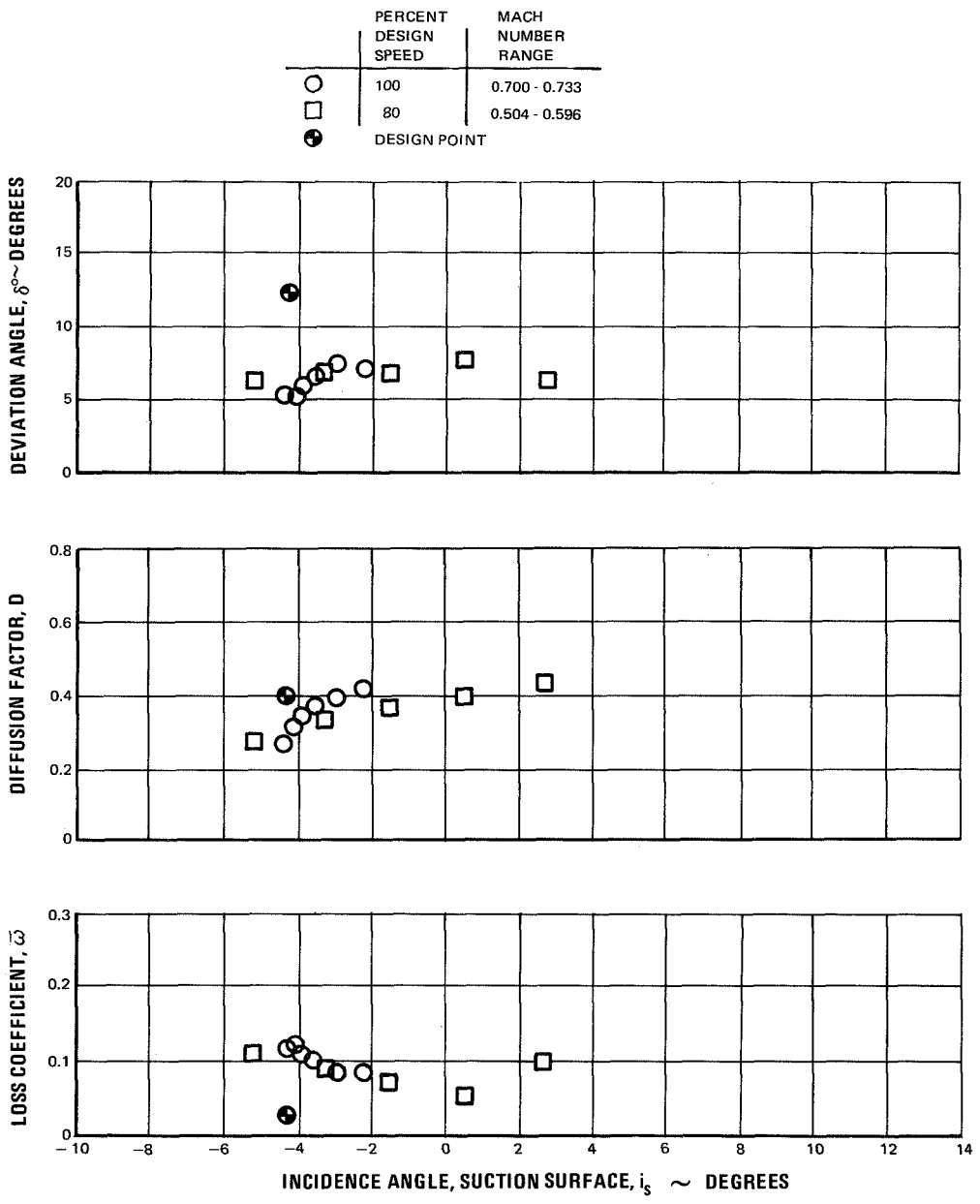


Figure 29c Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 15 Percent Span From Hub

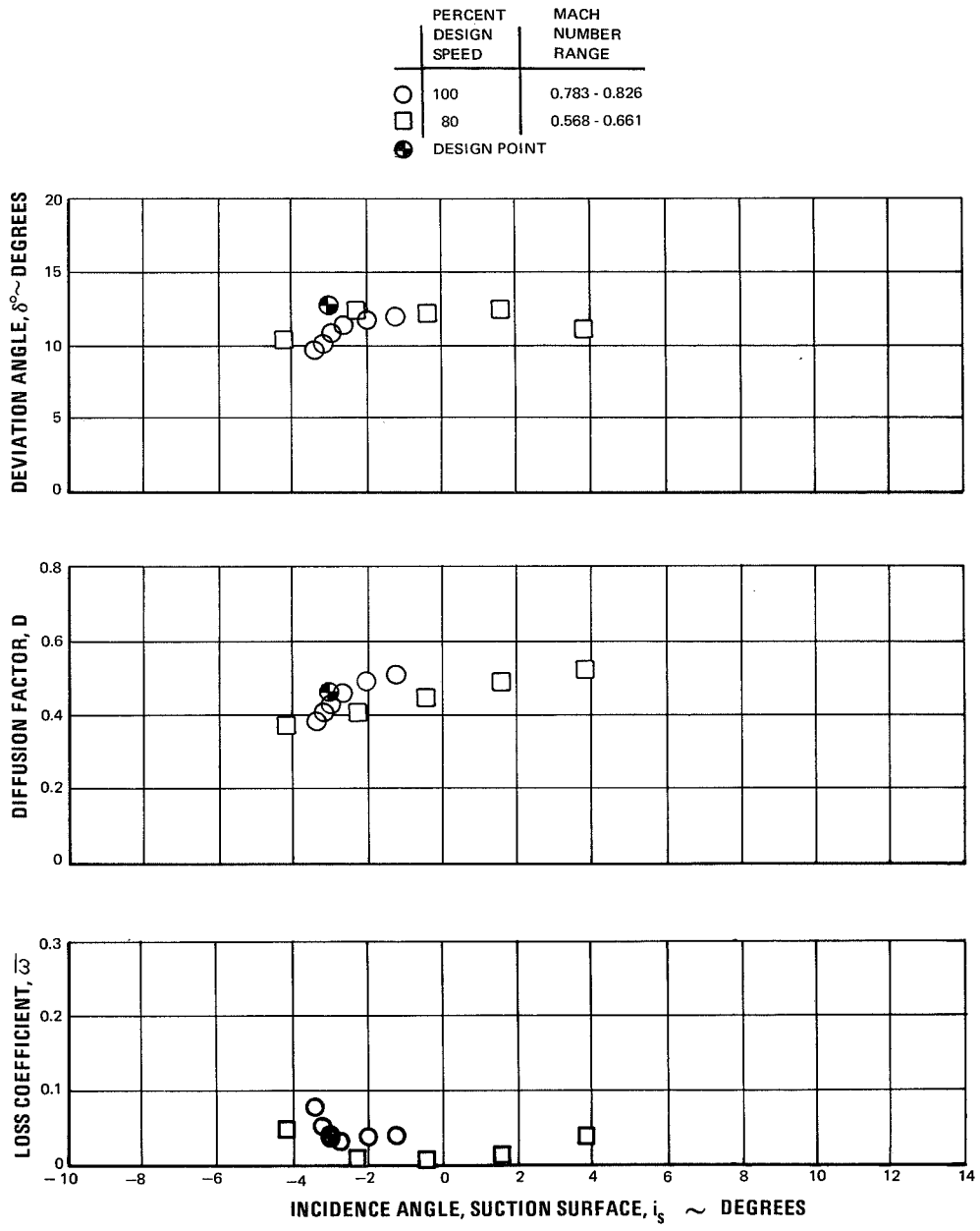


Figure 29d Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 30 Percent Span From Hub

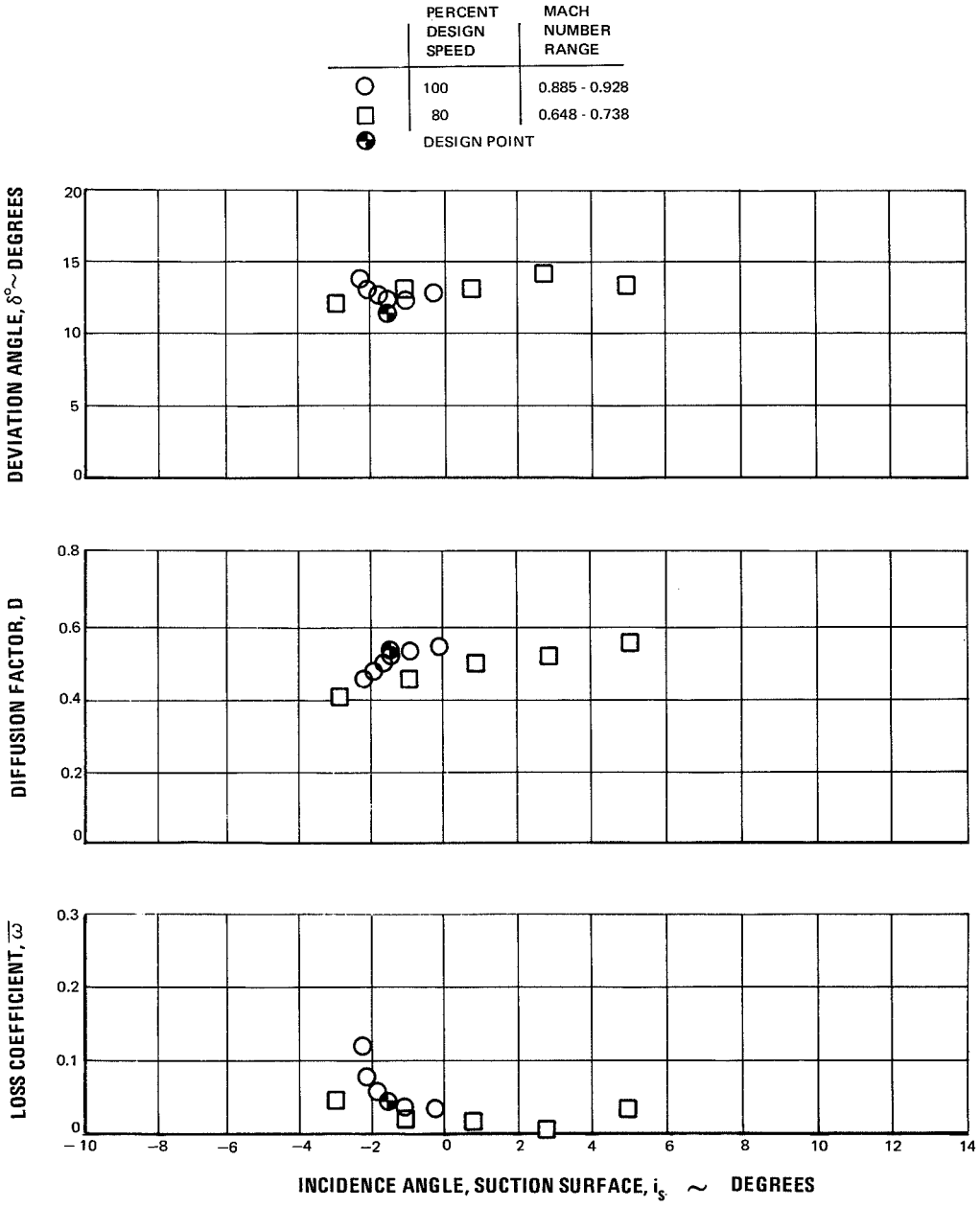


Figure 29e Slotted Rotor Blade Element Performance Wtih Uniform Inlet Flow at 50 Percent Span From Hub

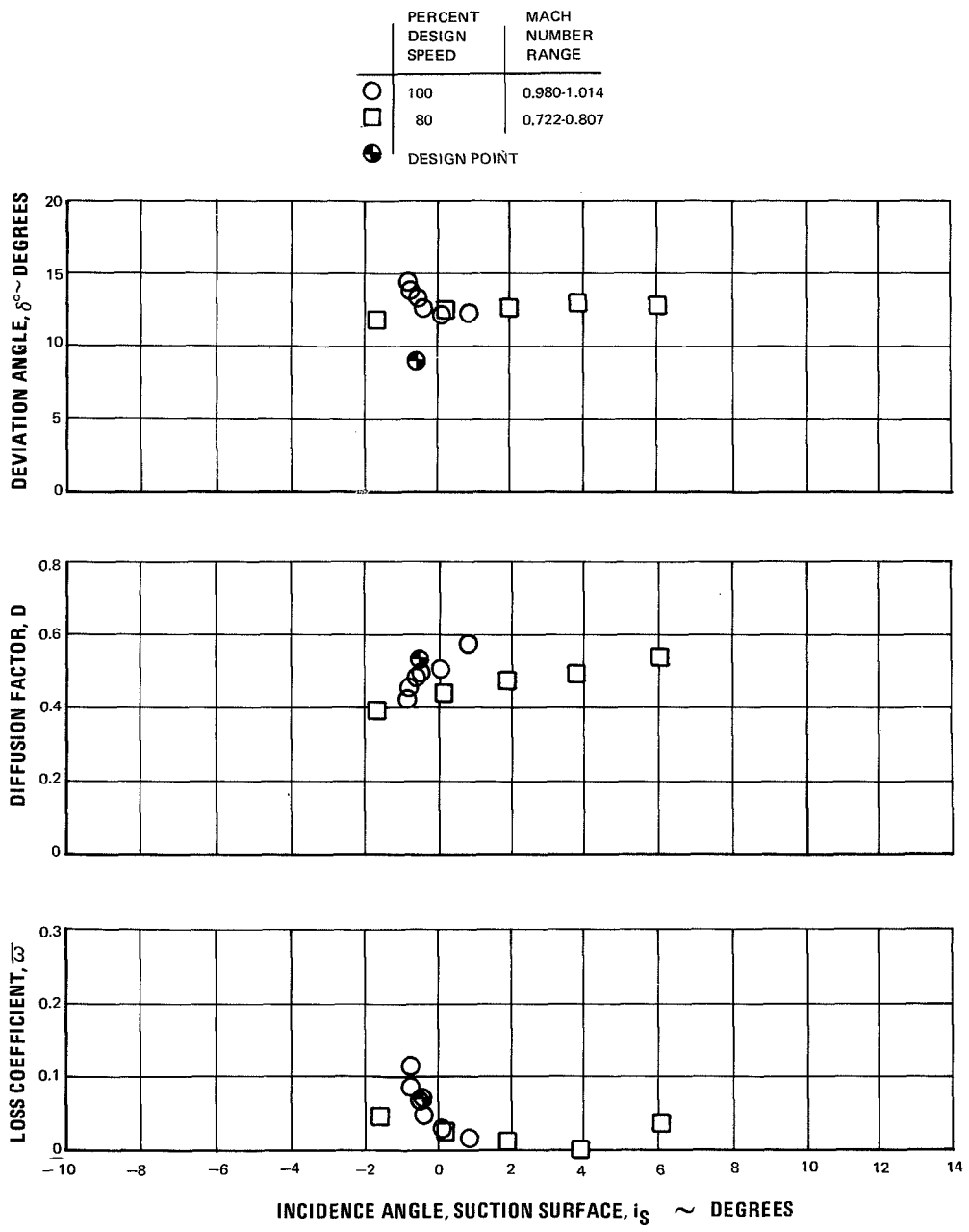


Figure 29f Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 70 Percent Span From Hub

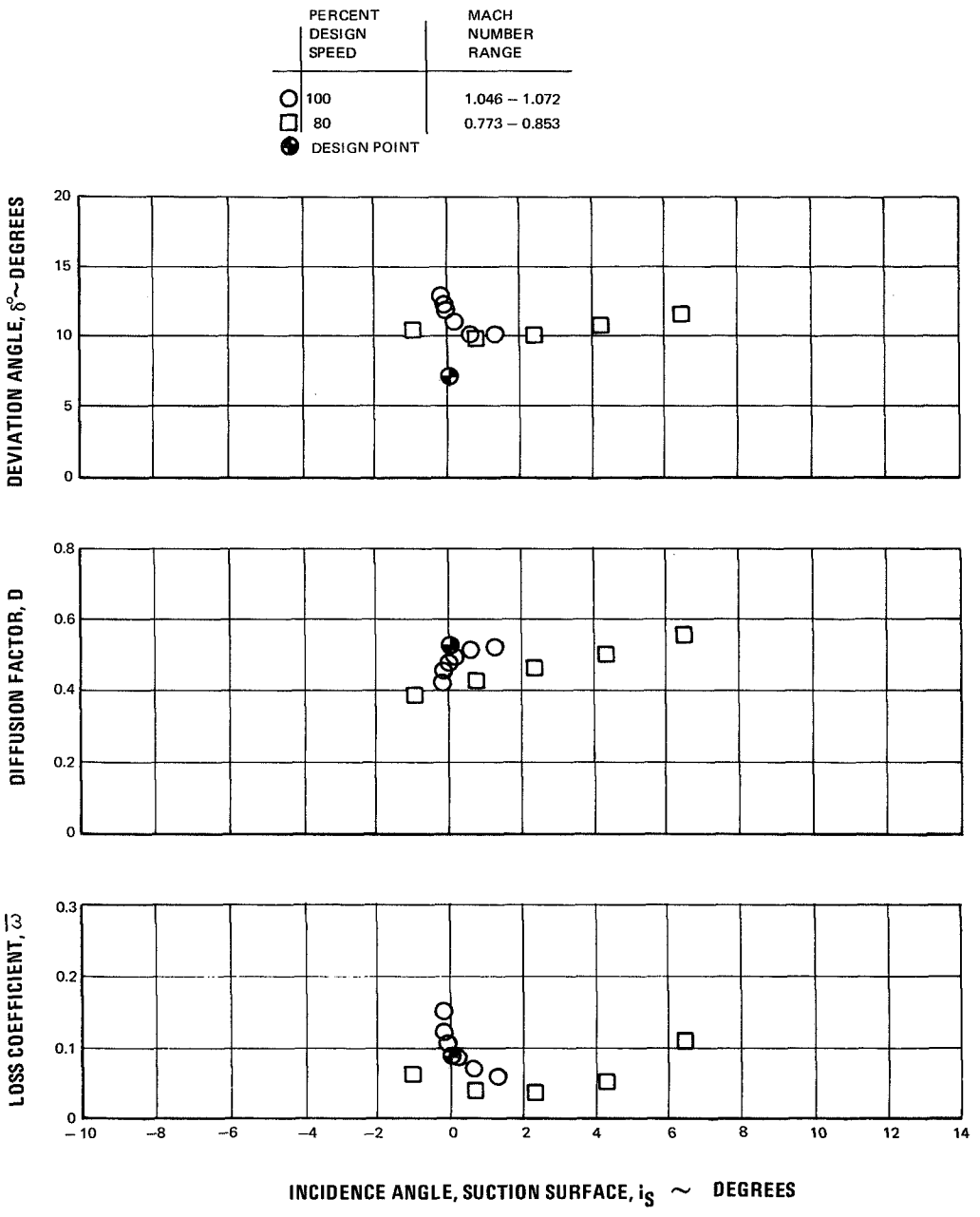


Figure 29g Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 85 Percent Span From Hub

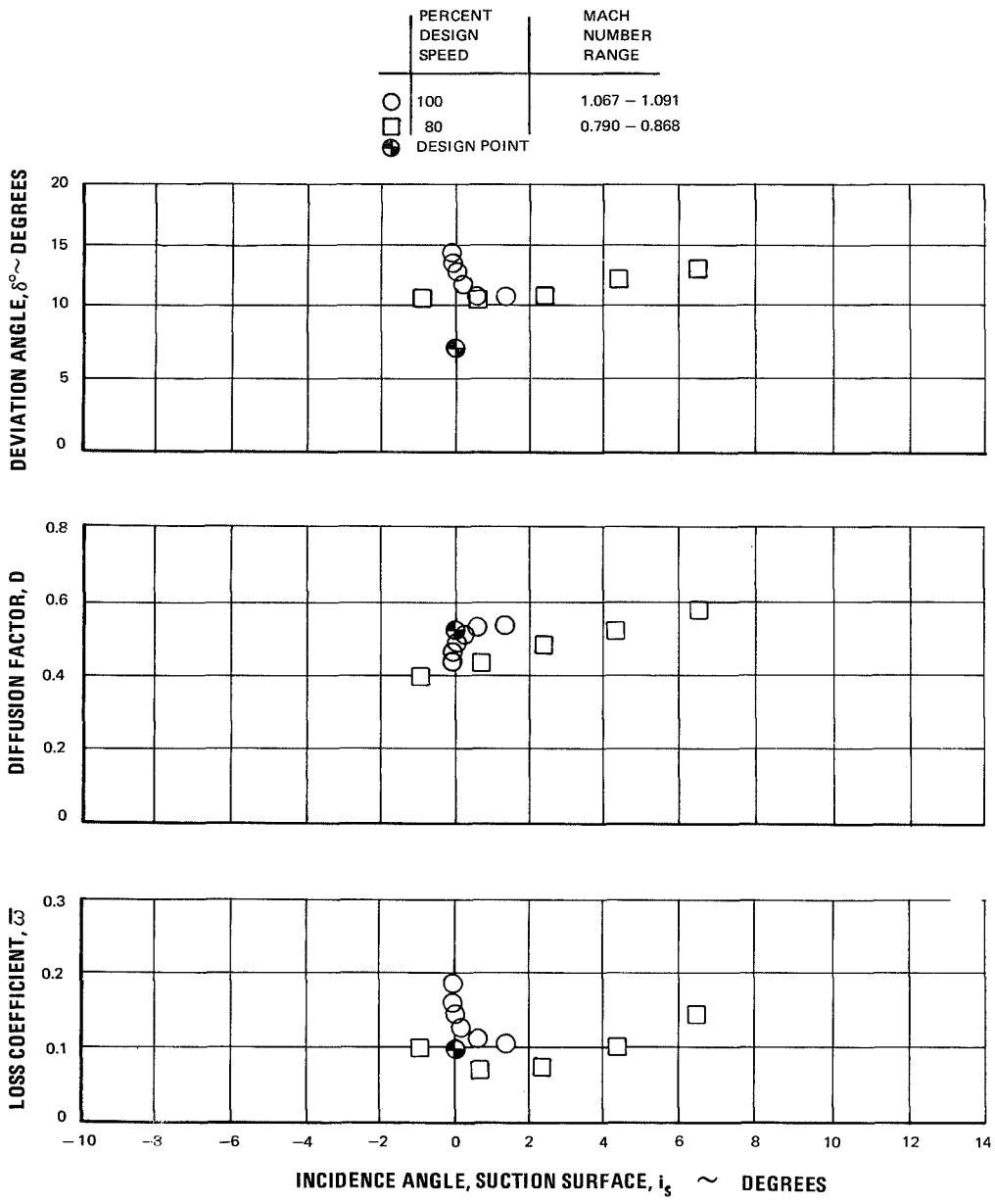


Figure 29h Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 90 Percent Span From Hub

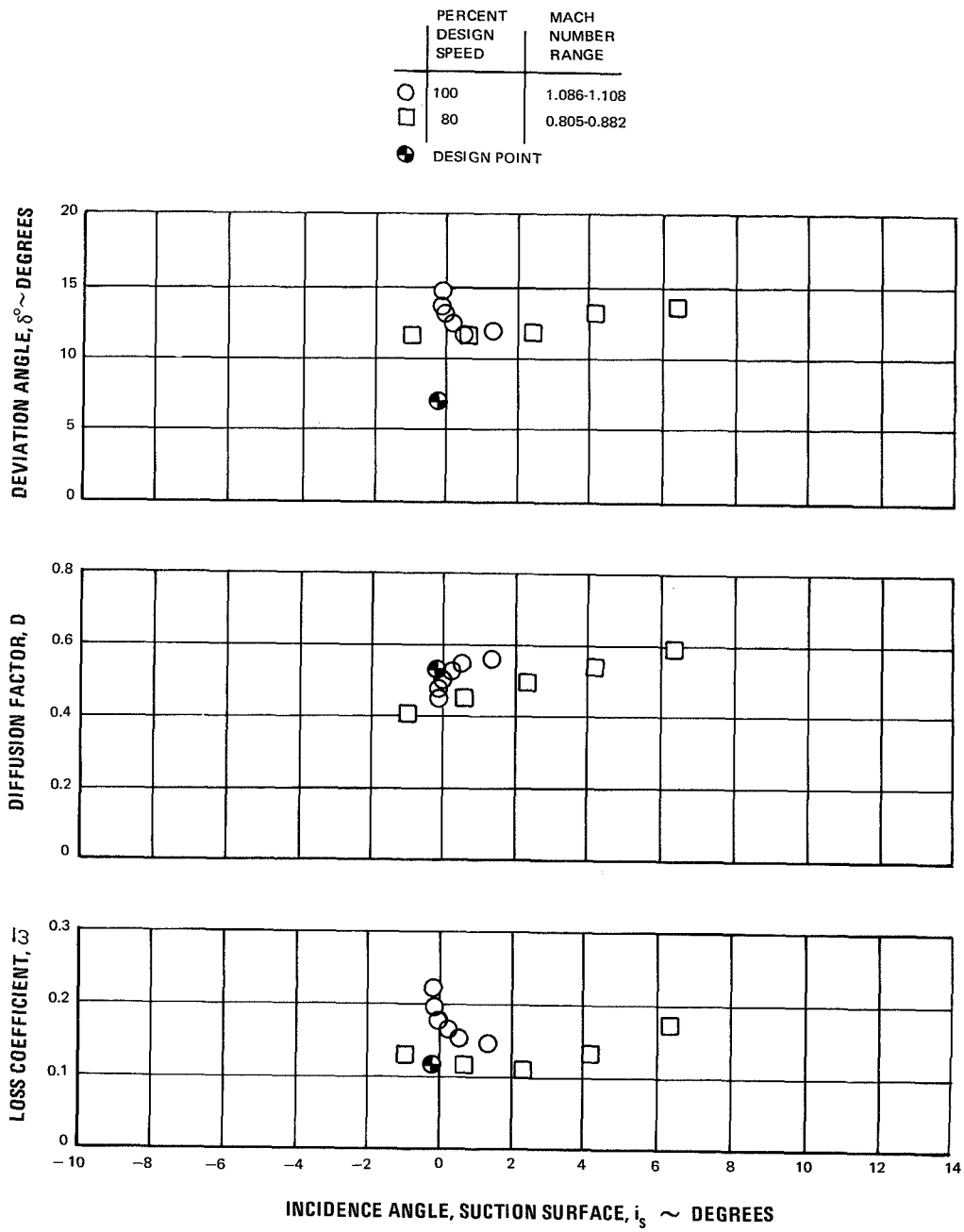


Figure 29i Slotted Rotor Blade Element Performance With Uniform Inlet Flow at 95 Percent Span From Hub

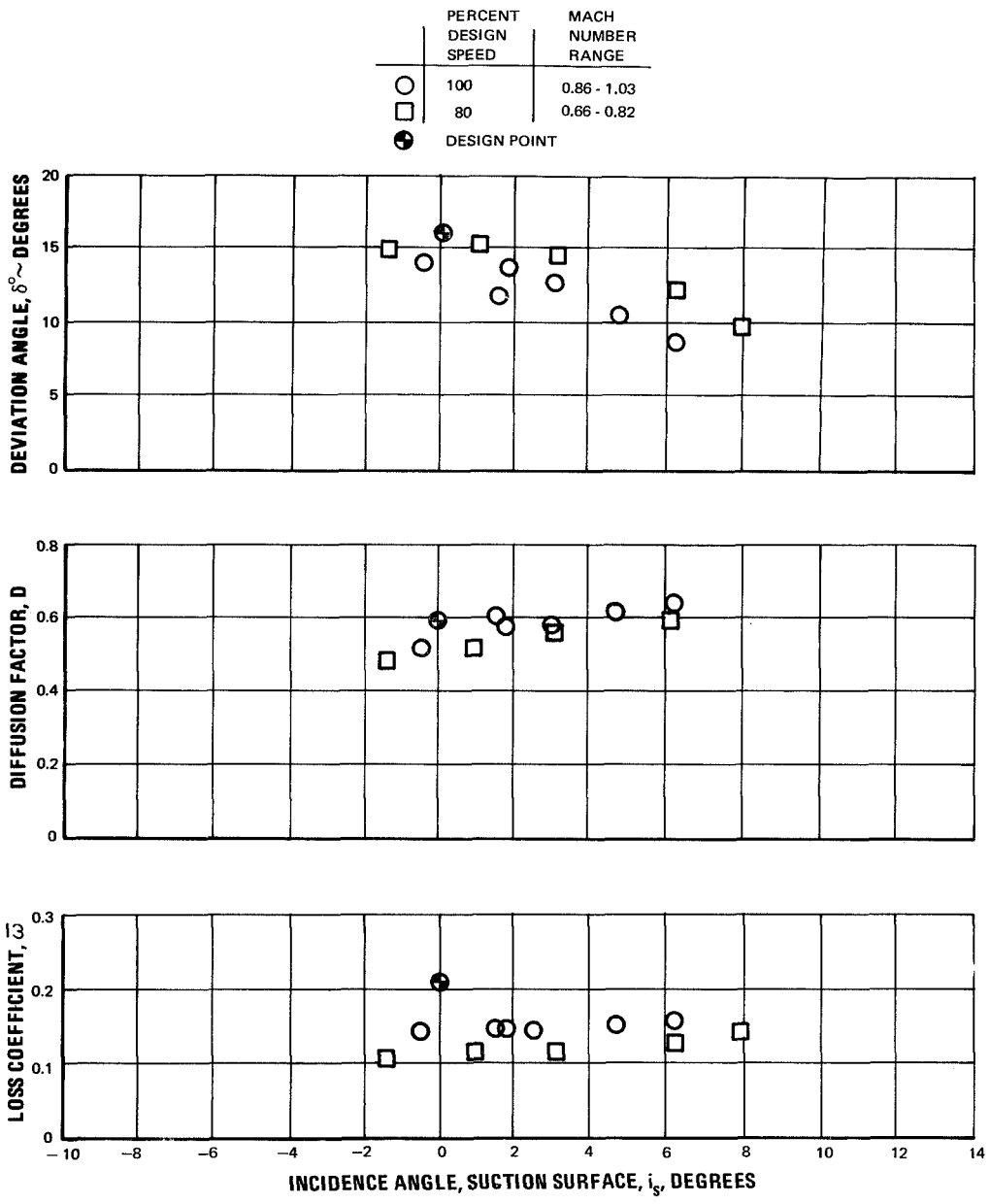


Figure 30a Slotted Stator Blade Element Performance With Uniform Inlet Flow at 5 Percent Span From Hub

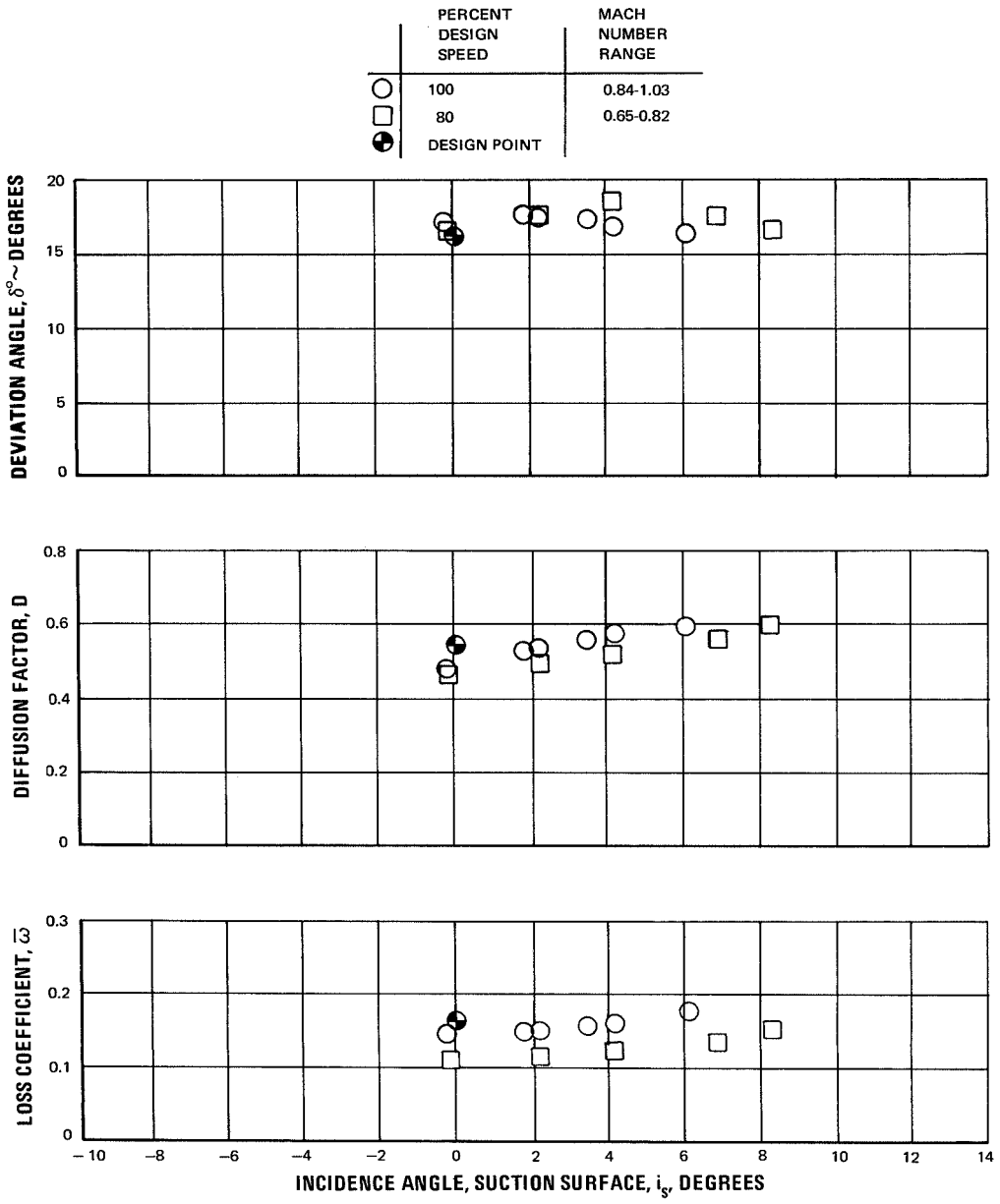


Figure 30b Slotted Stator Blade Element Performance With Uniform Inlet Flow at 10 Percent Span From Hub

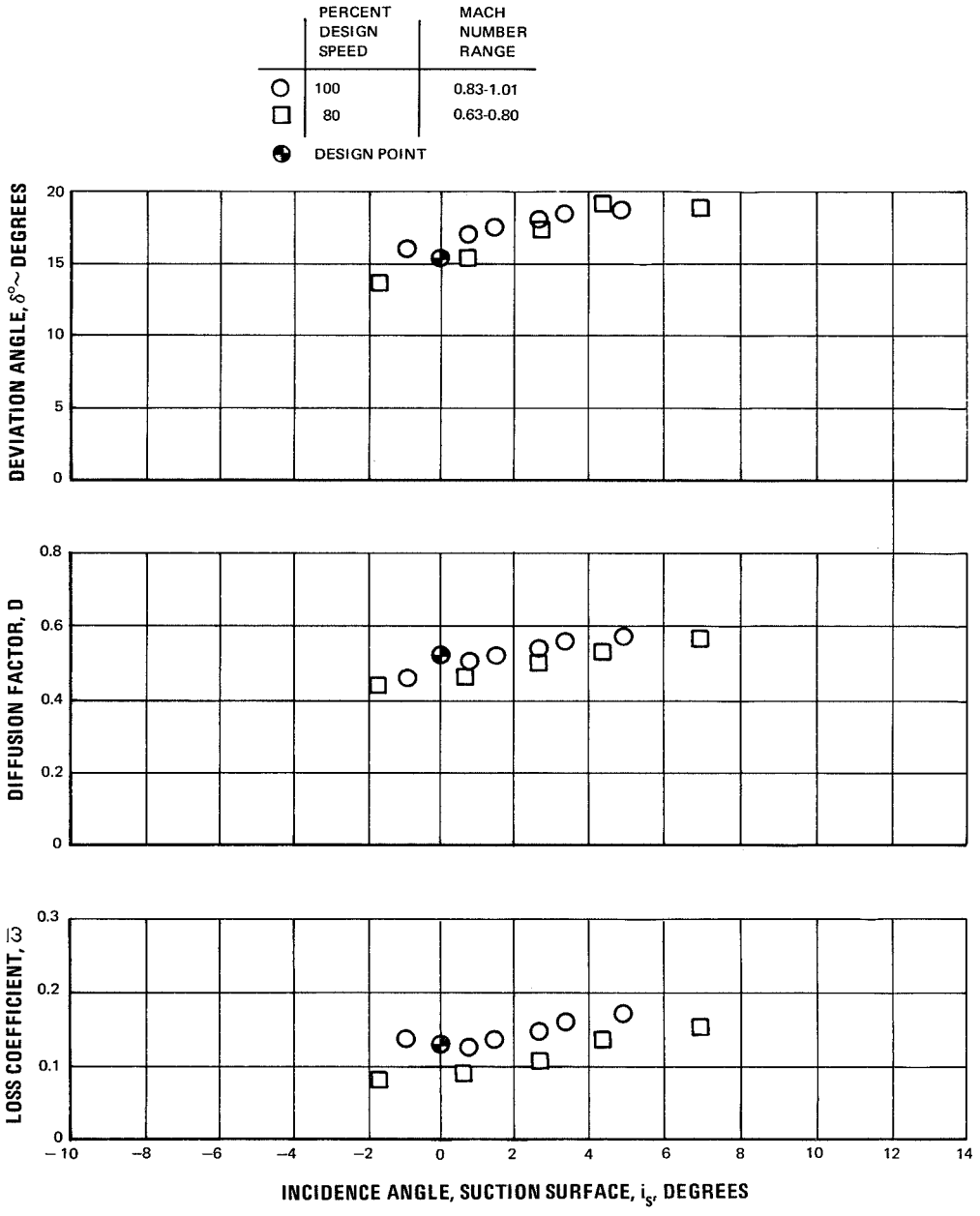


Figure 30c Slotted Stator Blade Element Performance With Uniform Inlet Flow at 15 Percent Span From Hub

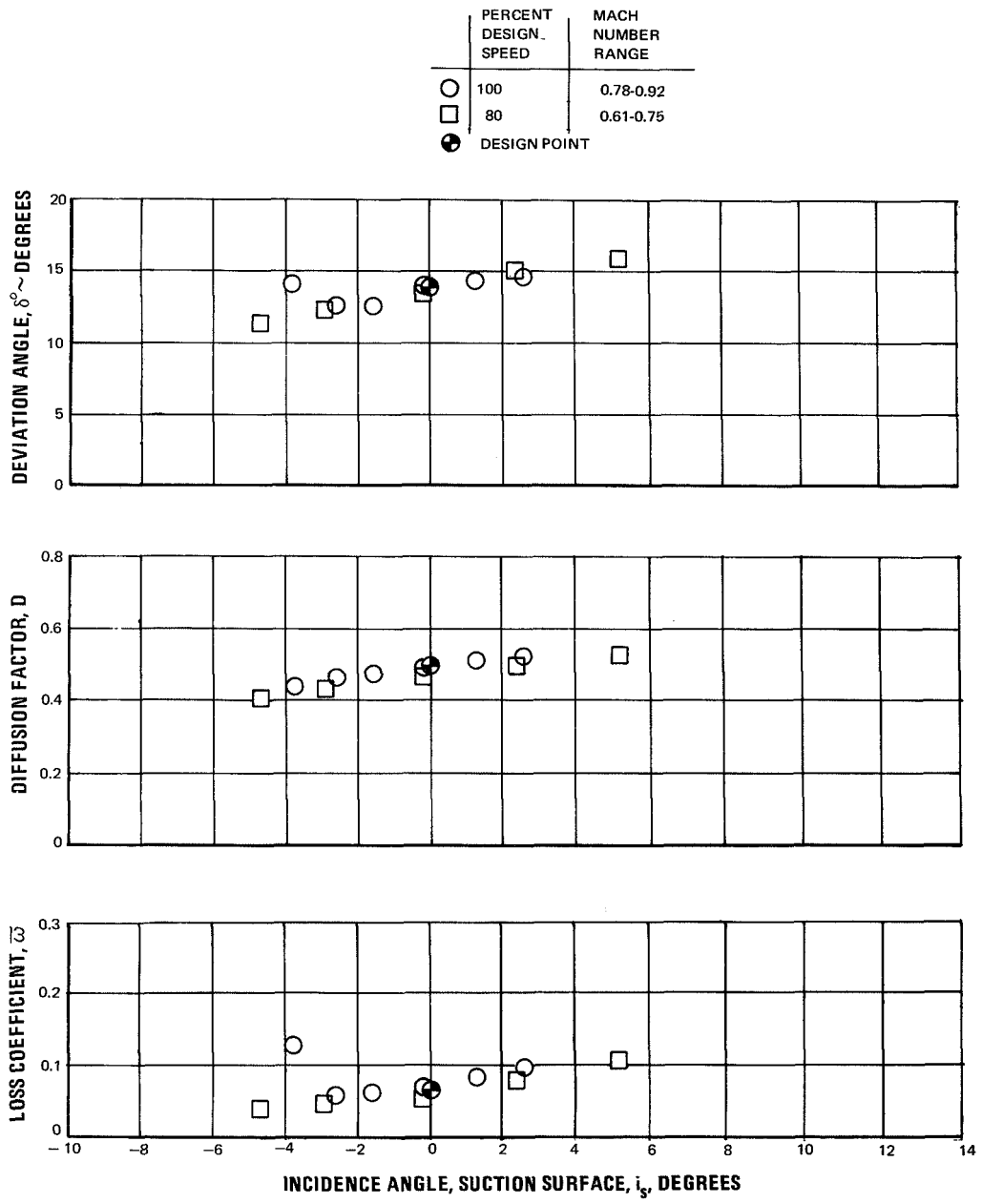


Figure 30d Slotted Stator Blade Element Performance With Uniform Inlet Flow at 30 Percent Span From Hub

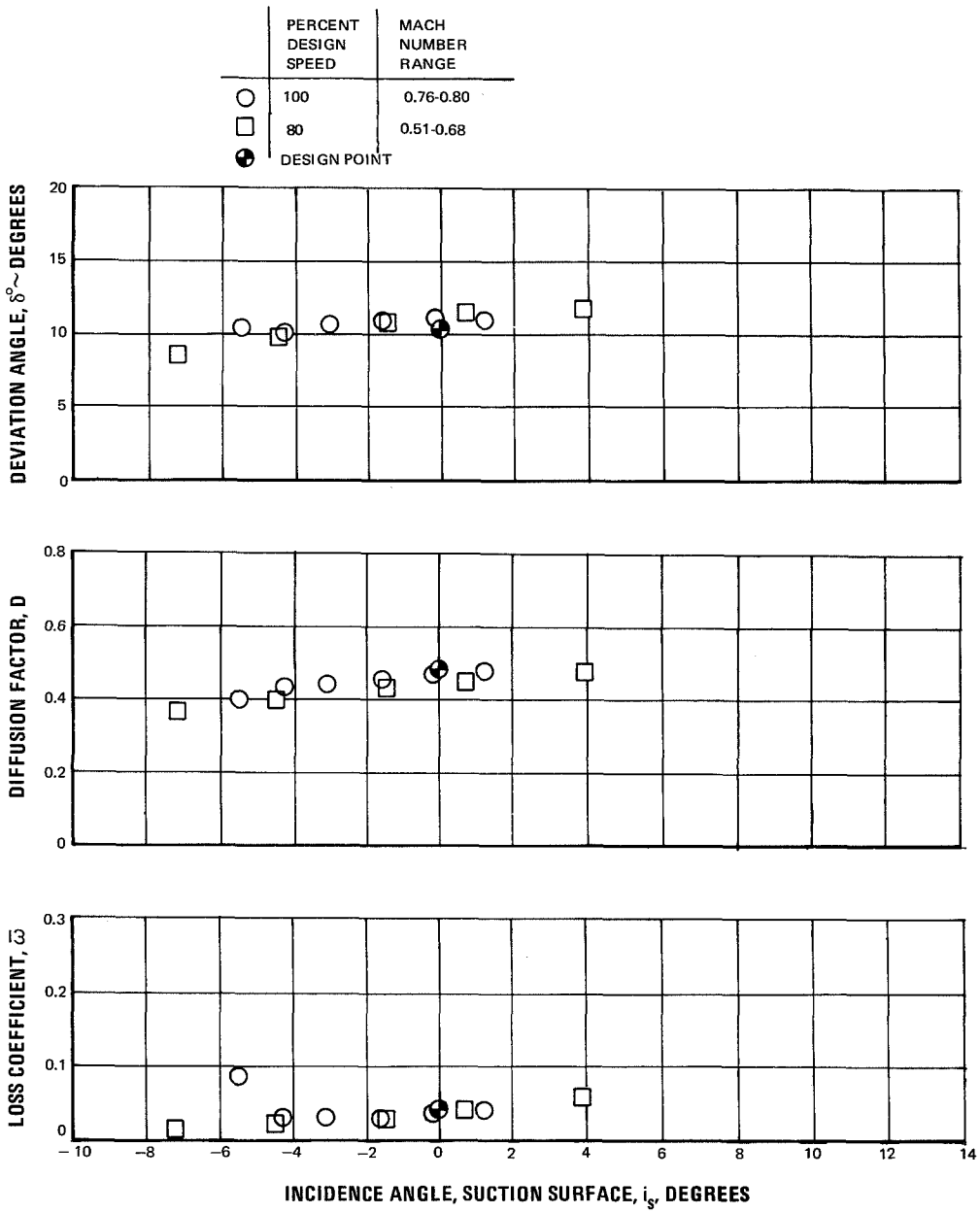


Figure 30e Slotted Stator Blade Element Performance With Uniform Inlet Flow at 50 Percent Span From Hub

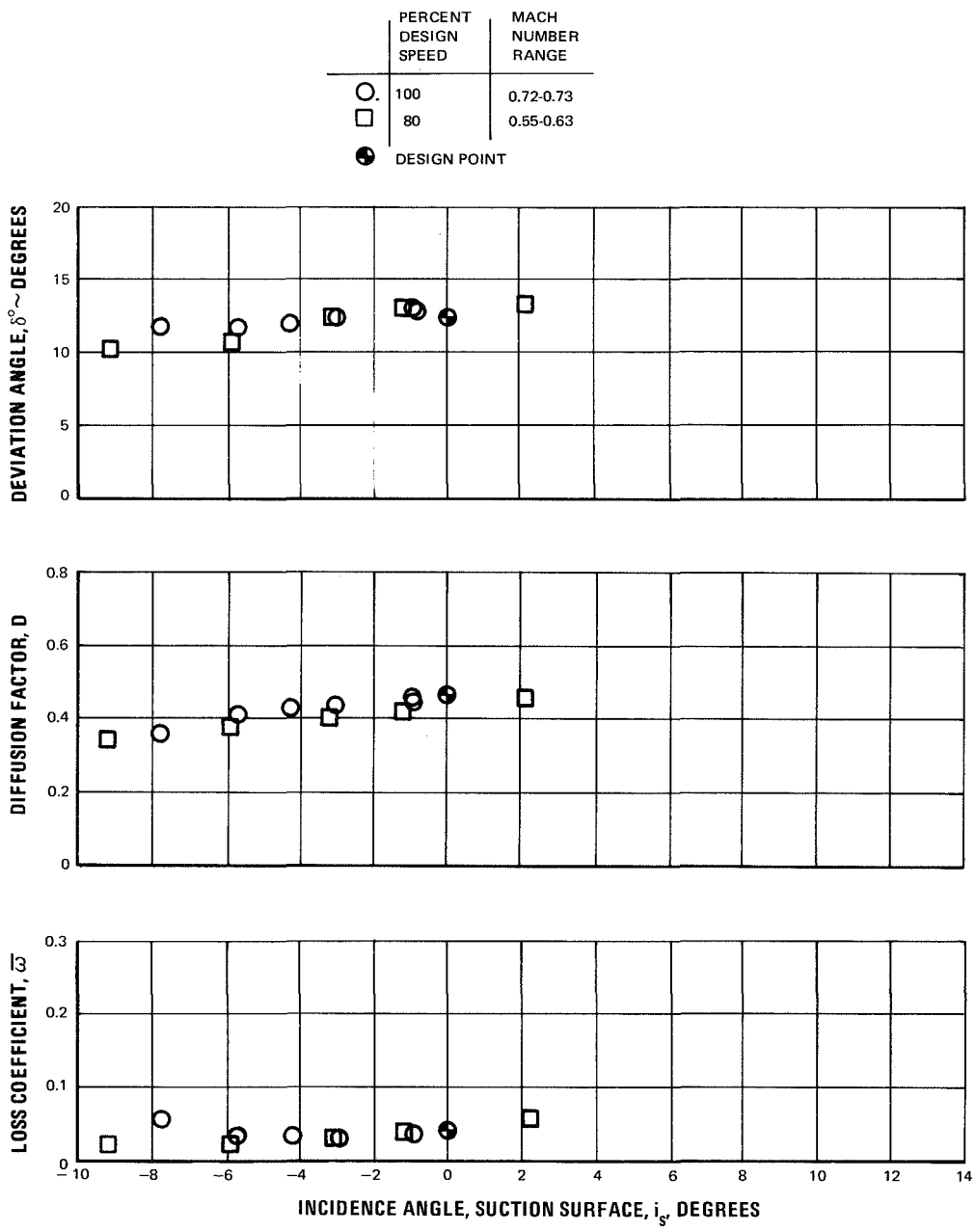


Figure 30f Slotted Stator Blade Element Performance With Uniform Inlet Flow at 70 Percent Span From Hub

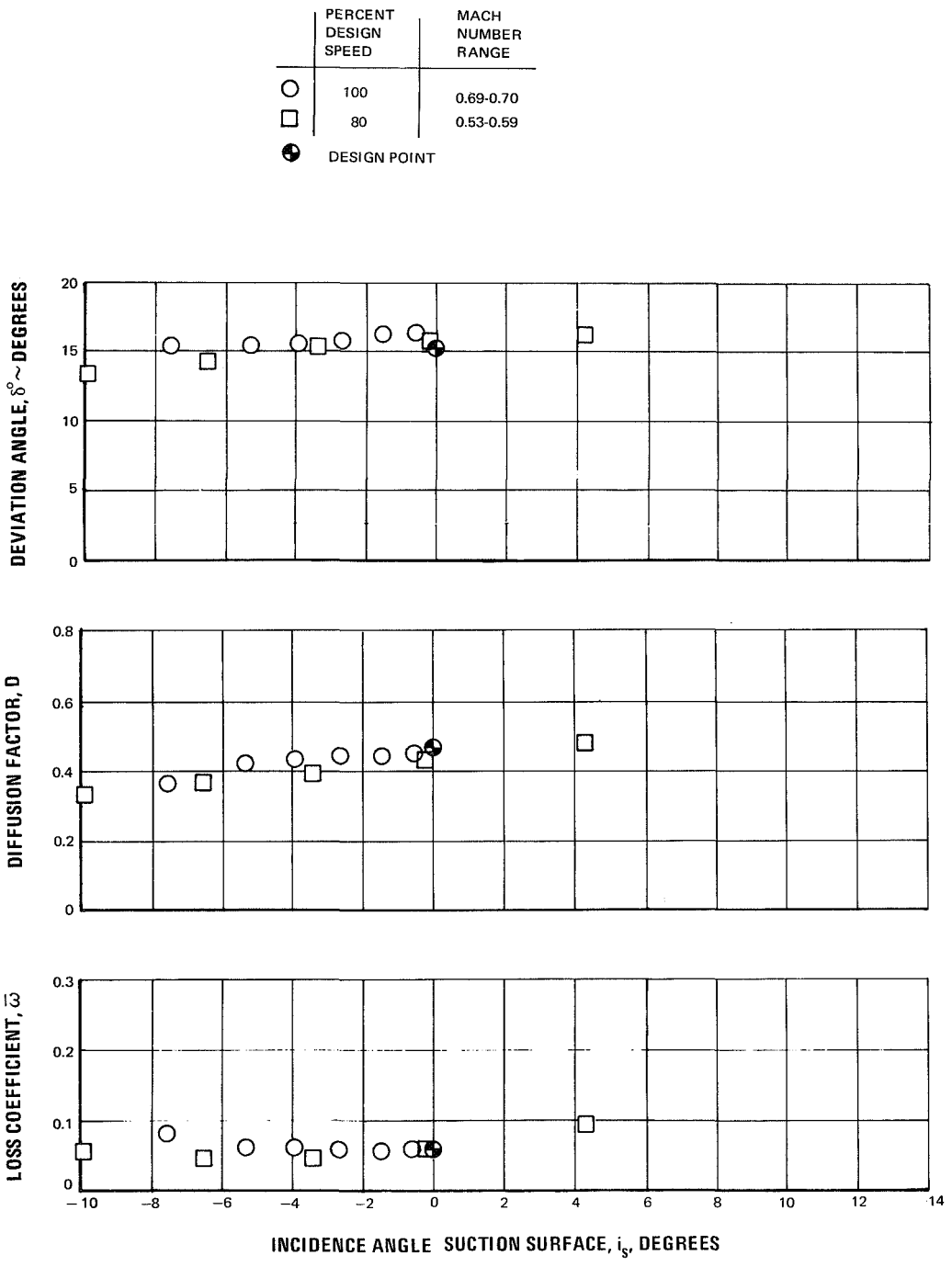


Figure 30g Slotted Stator Blade Element Performance With Uniform Inlet Flow at 85 Percent Span From Hub

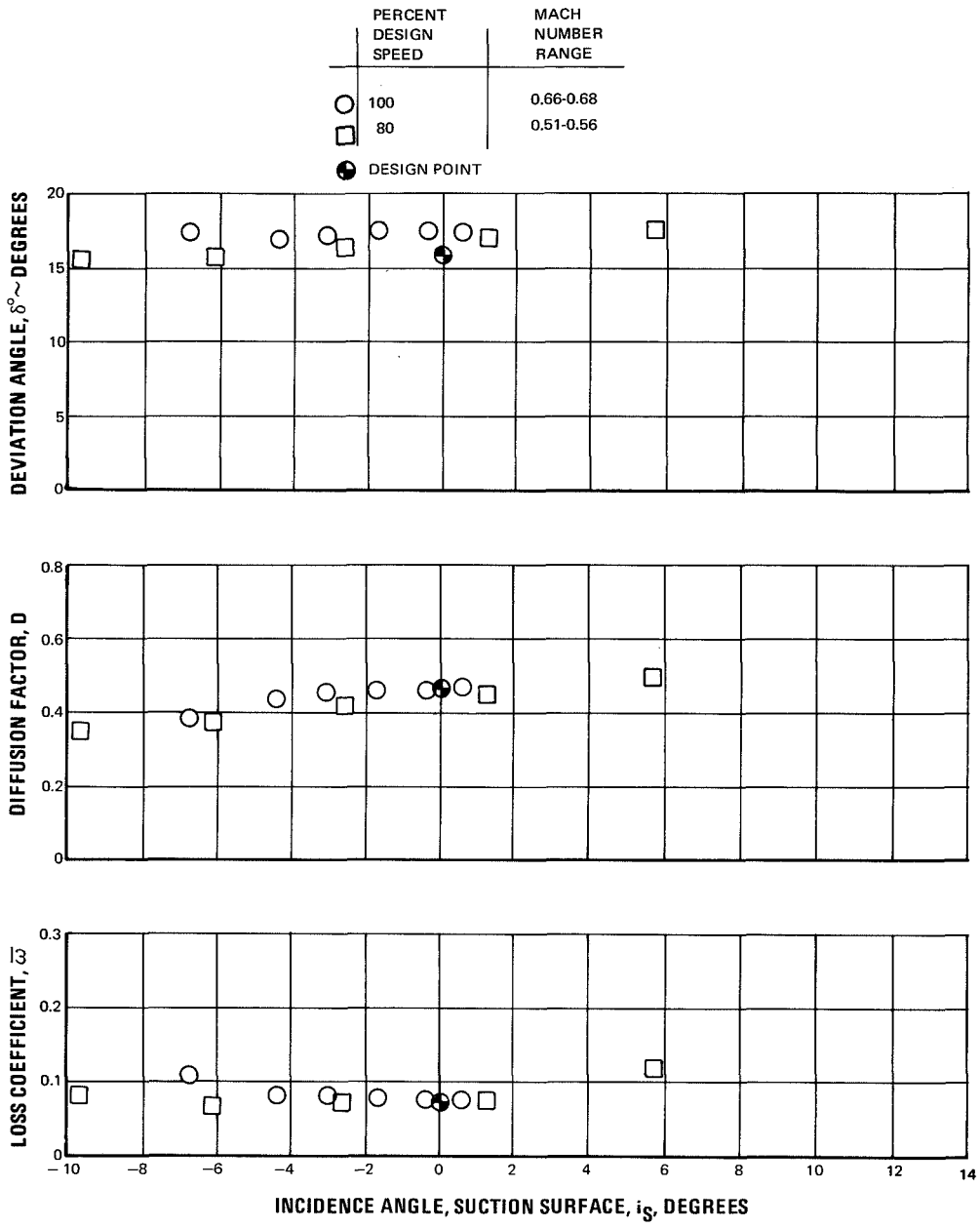


Figure 30h Slotted Stator Blade Element Performance With Uniform Inlet Flow at 90 Percent Span From Hub

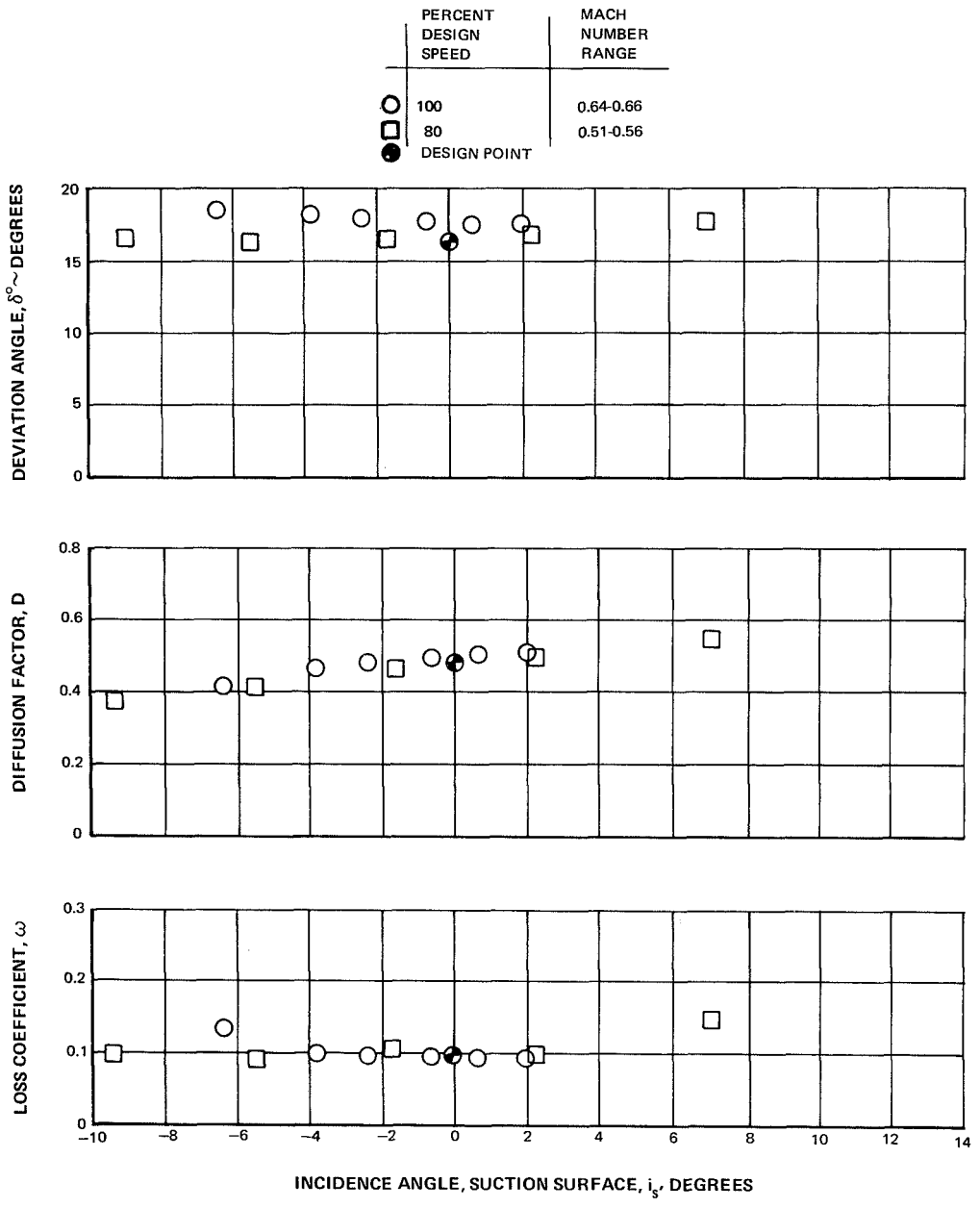


Figure 30i Slotted Stator Blade Element Performance With Uniform Inlet Flow at 95 Percent Span From Hub

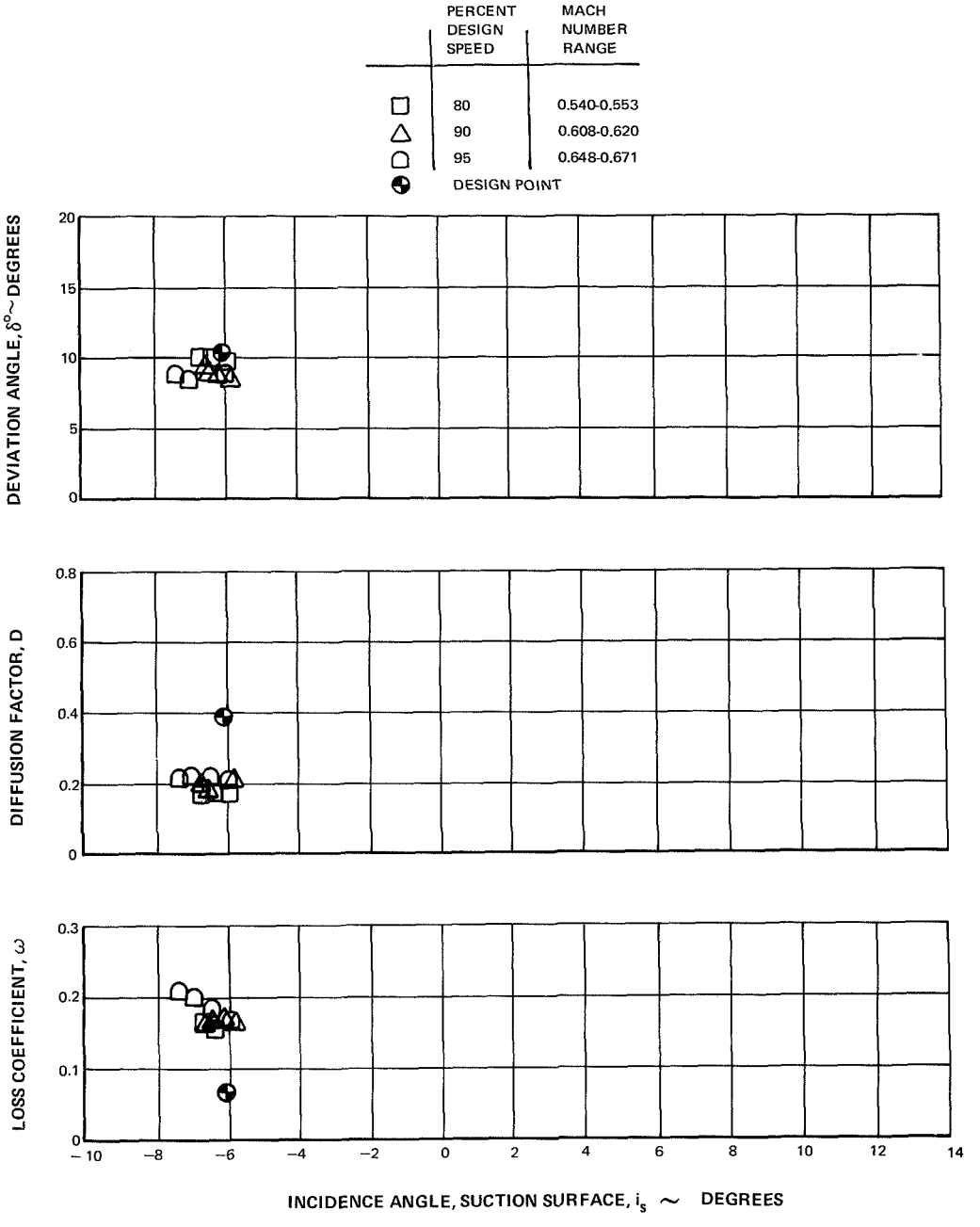


Figure 31a Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 5 Percent Span From Hub

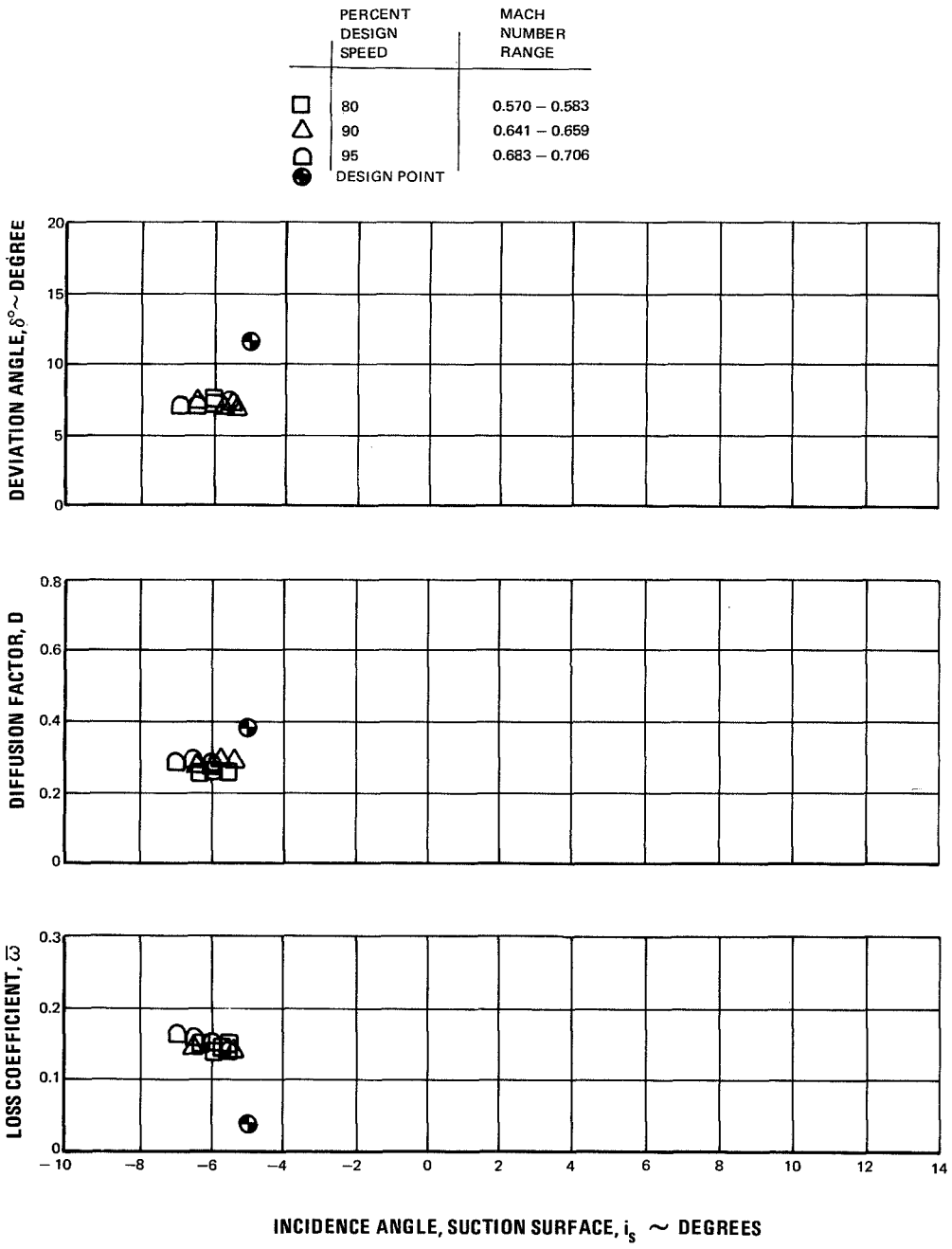


Figure 31b Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 10 Percent Span From Hub

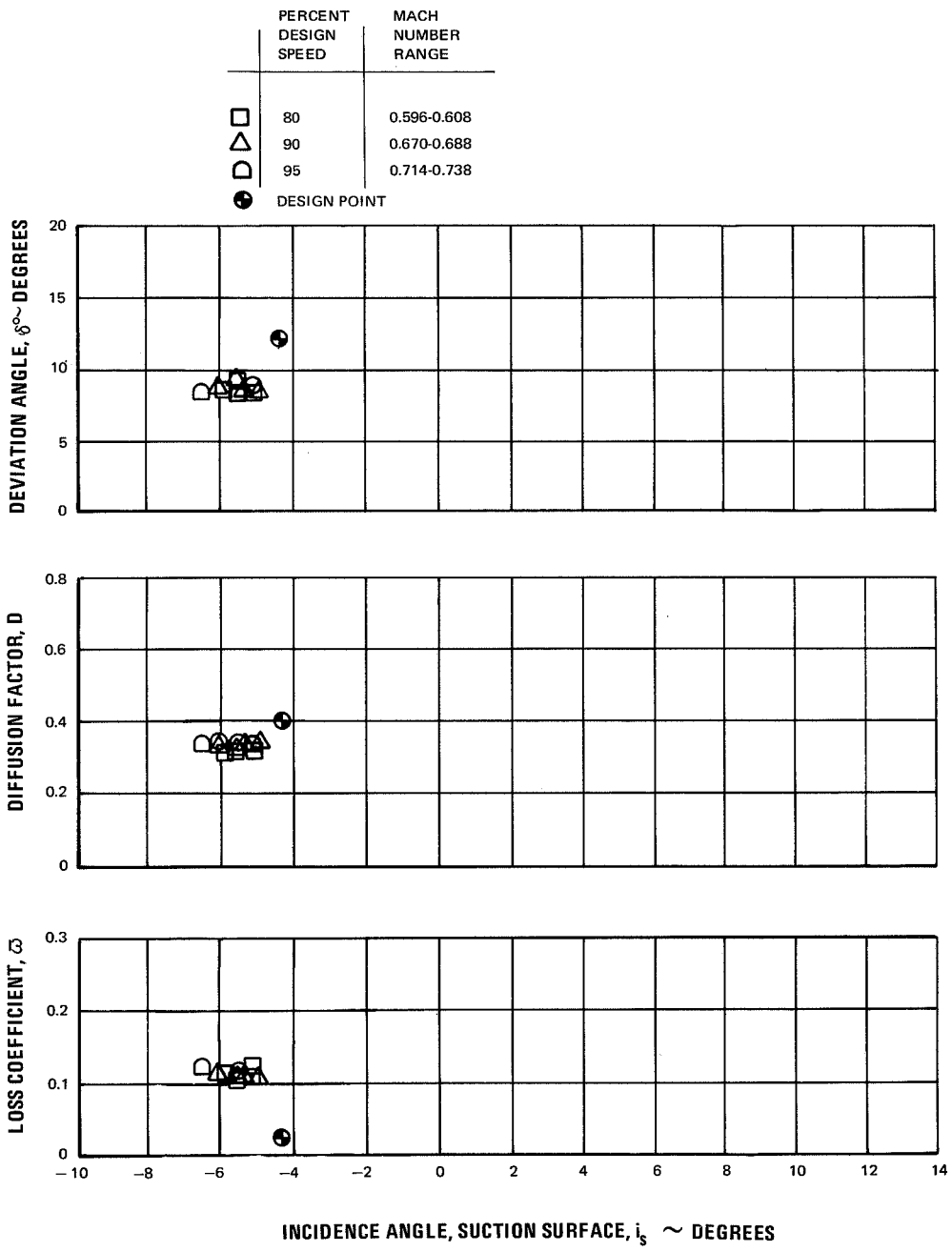


Figure 31c Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 15 Percent Span From Hub

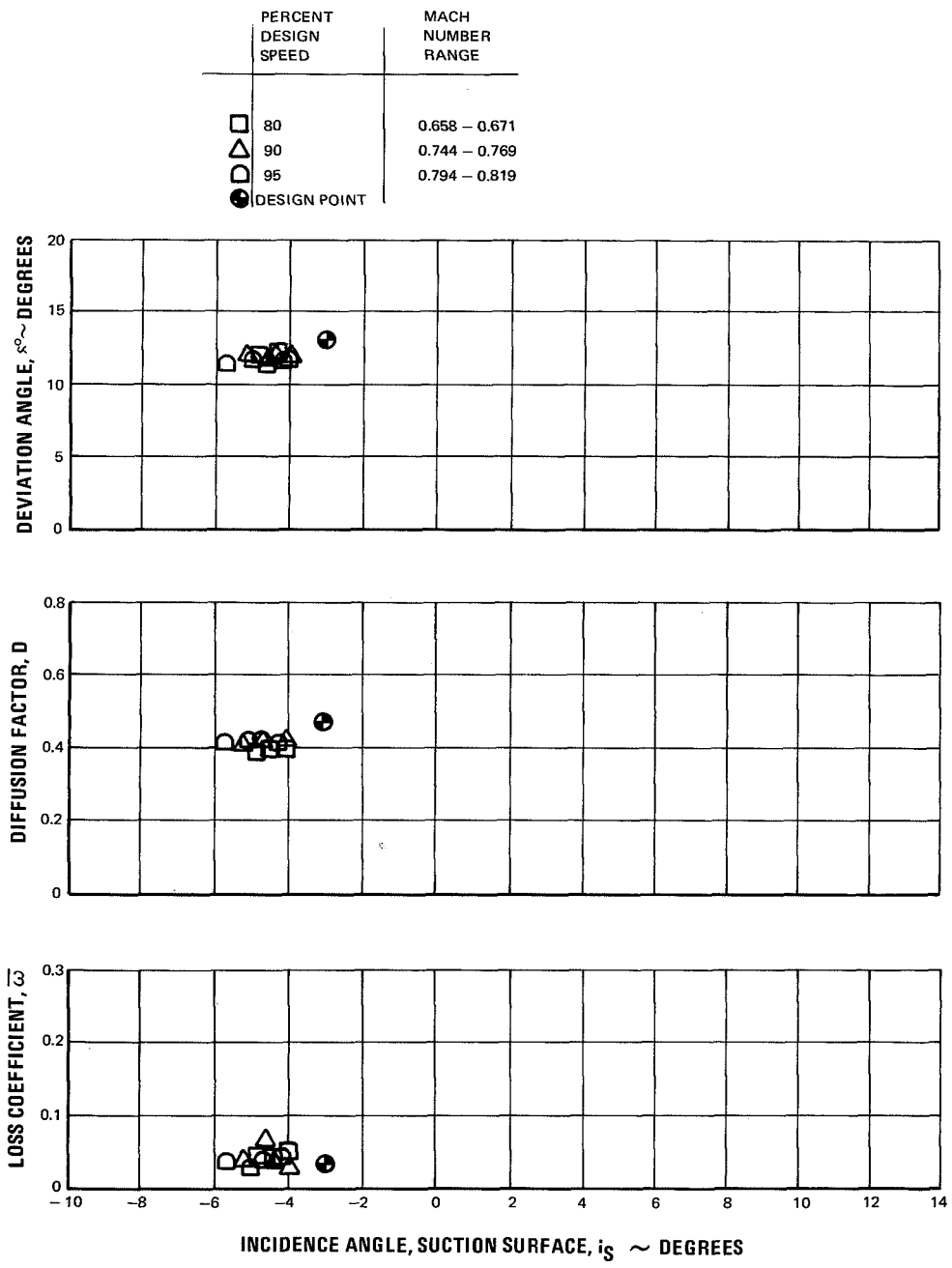


Figure 31d Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 30 Percent Span From Hub

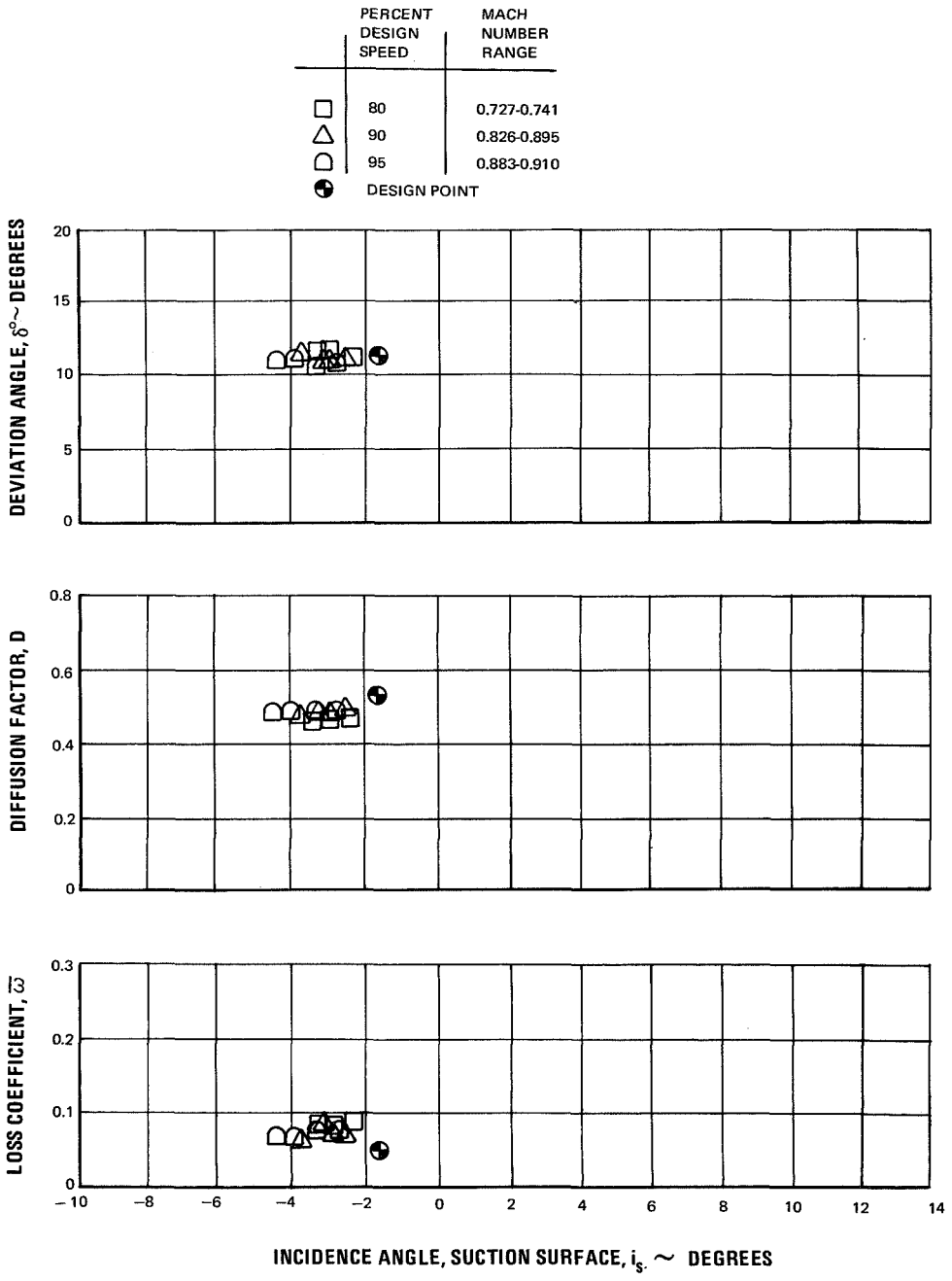


Figure 31e Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 50 Percent Span From Hub

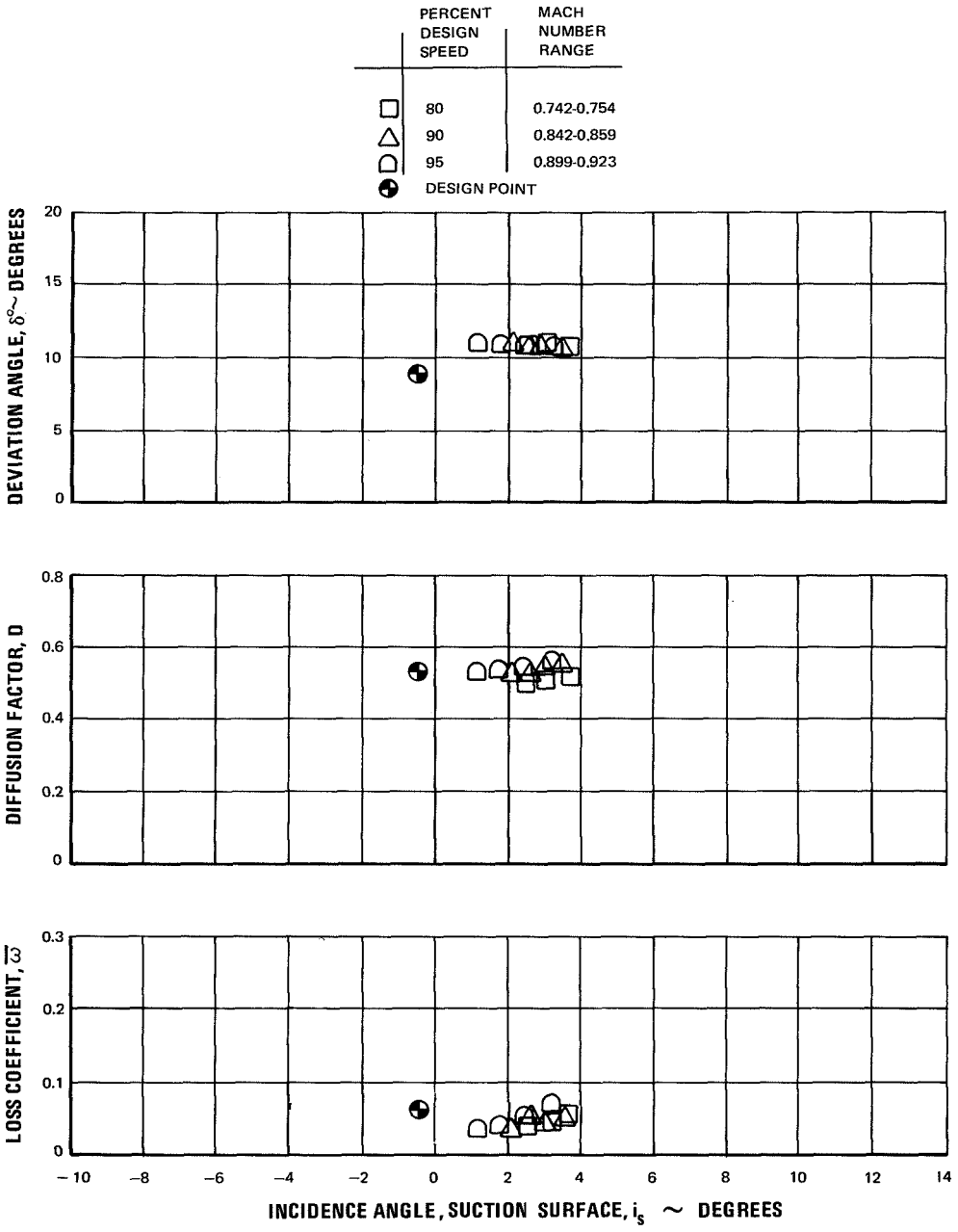


Figure 31f Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 70 Percent Span From Hub

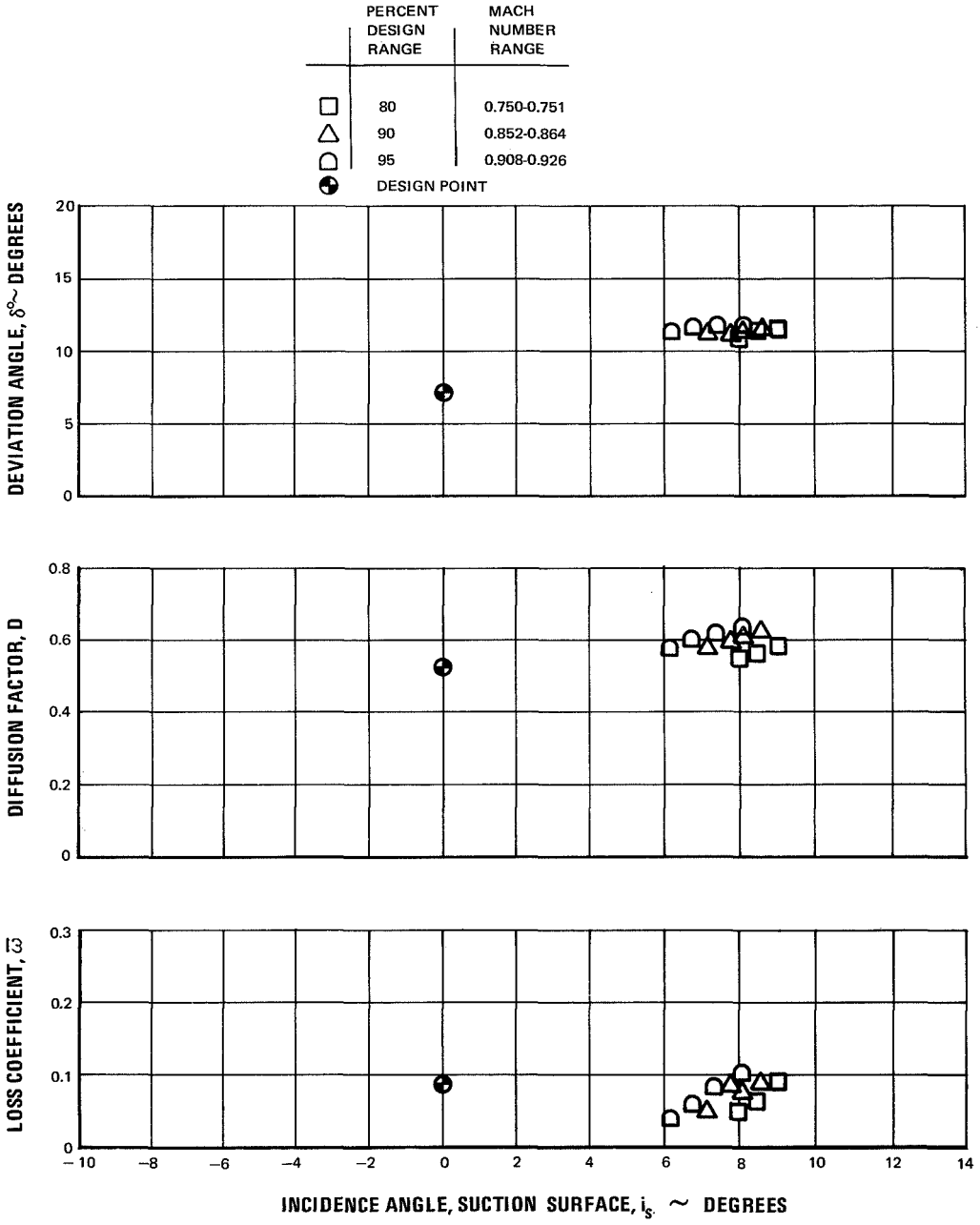


Figure 31g Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 85 Percent Span From Hub

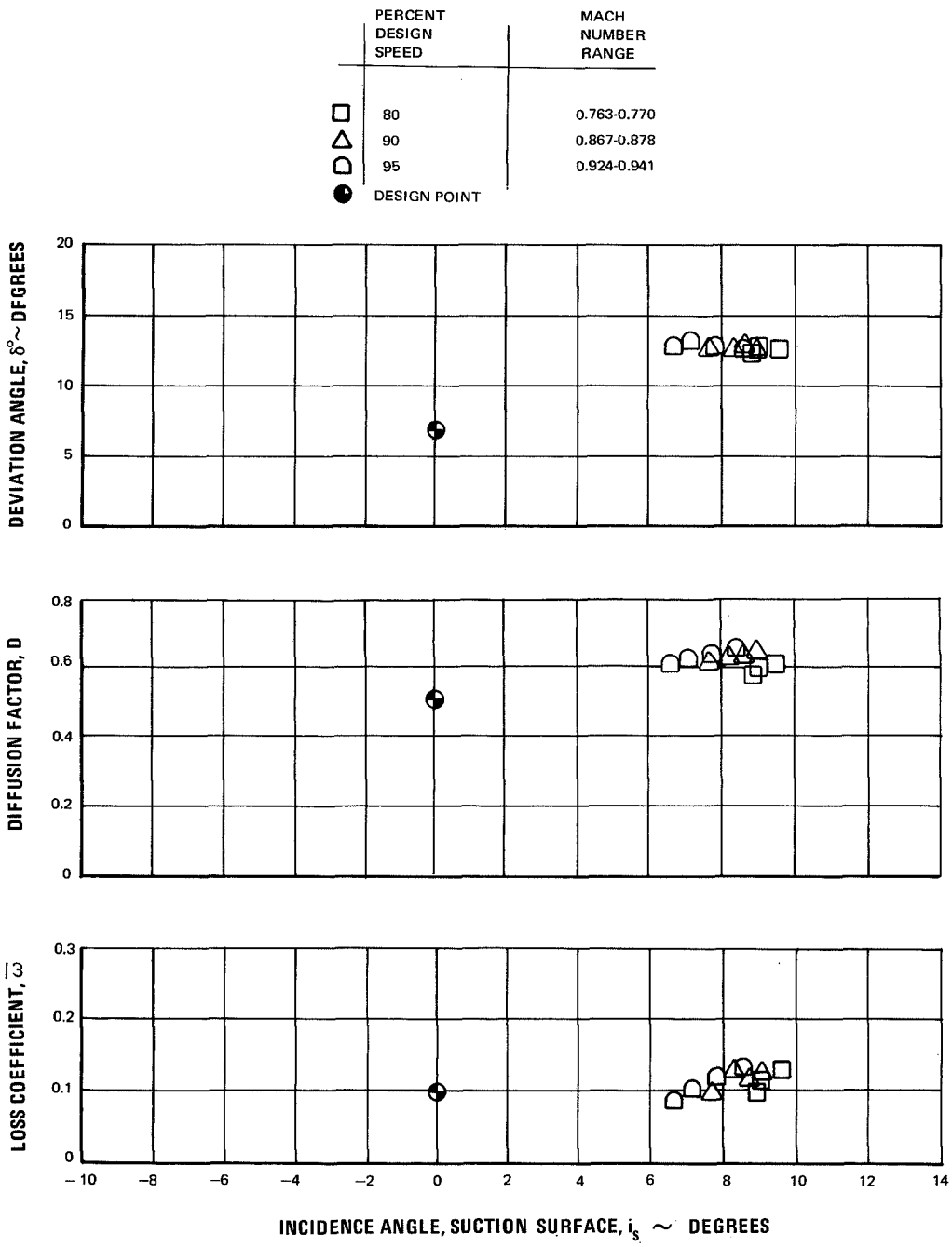


Figure 31h Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 90 Percent Span From Hub

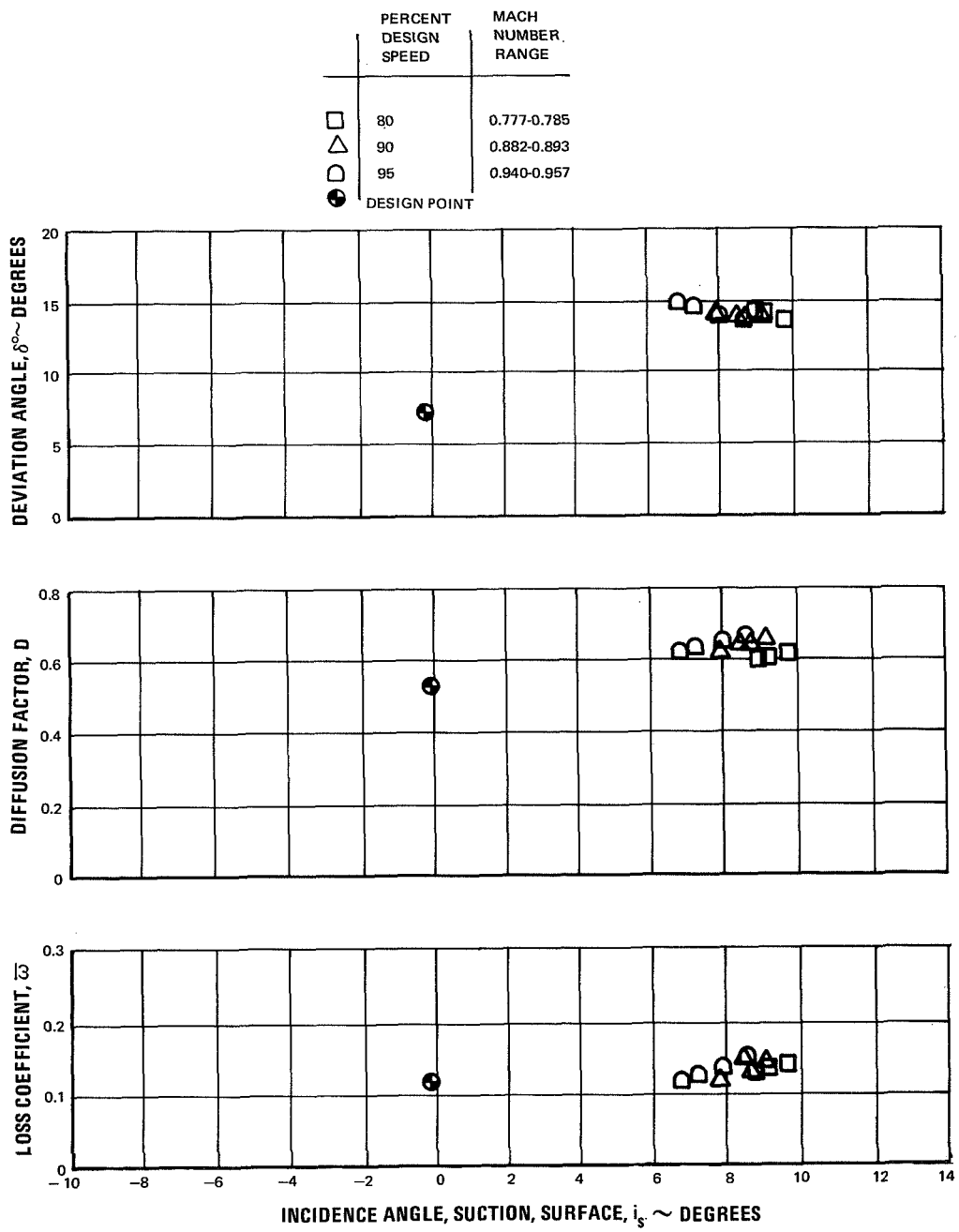


Figure 31i Slotted Rotor Blade Element Performance With Radial Inlet Distortion at 95 Percent Span From Hub

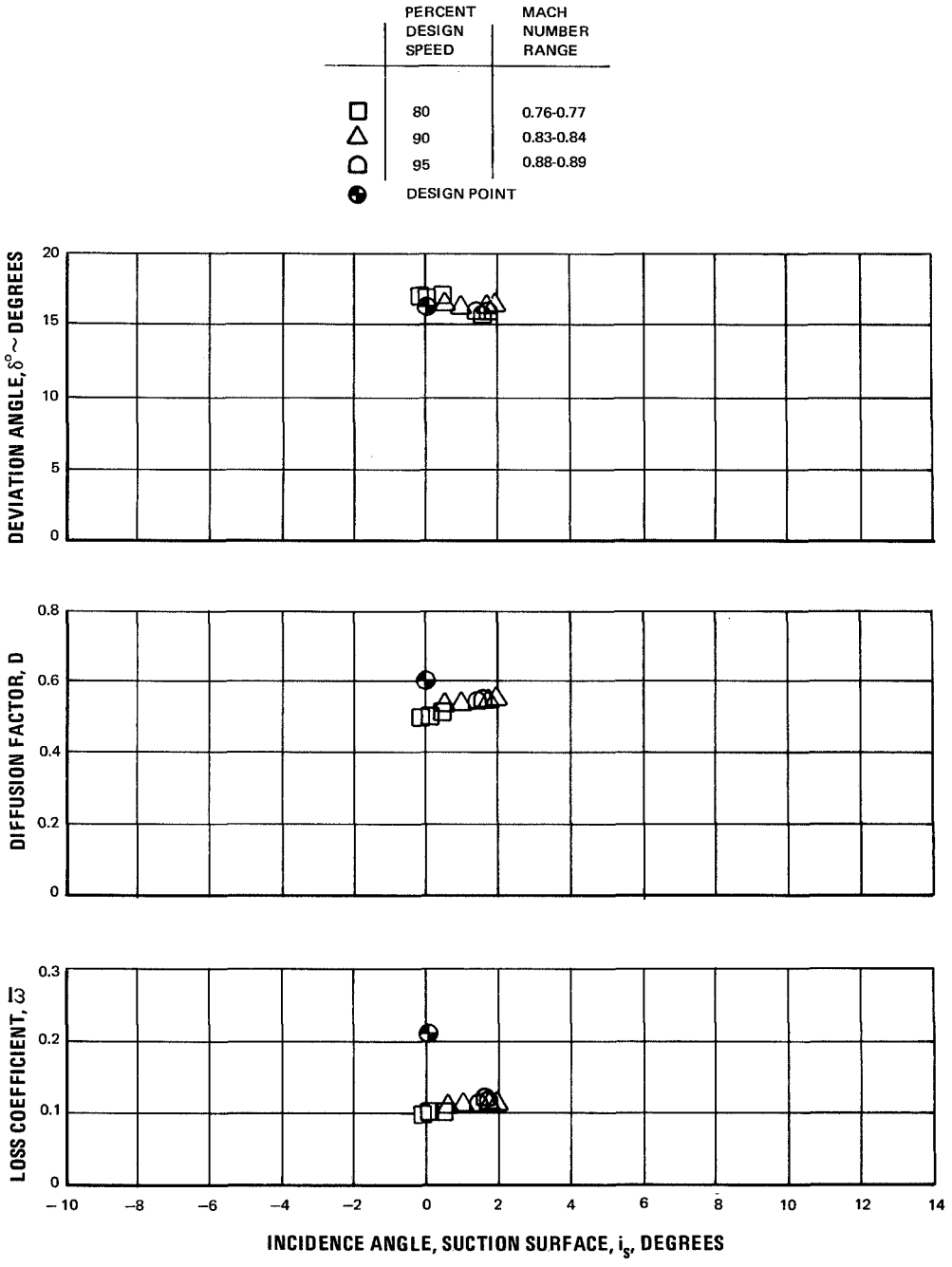


Figure 32a Slotted Stator Blade Element Performance With Radial Inlet Distortion at 5 Percent Span From Hub

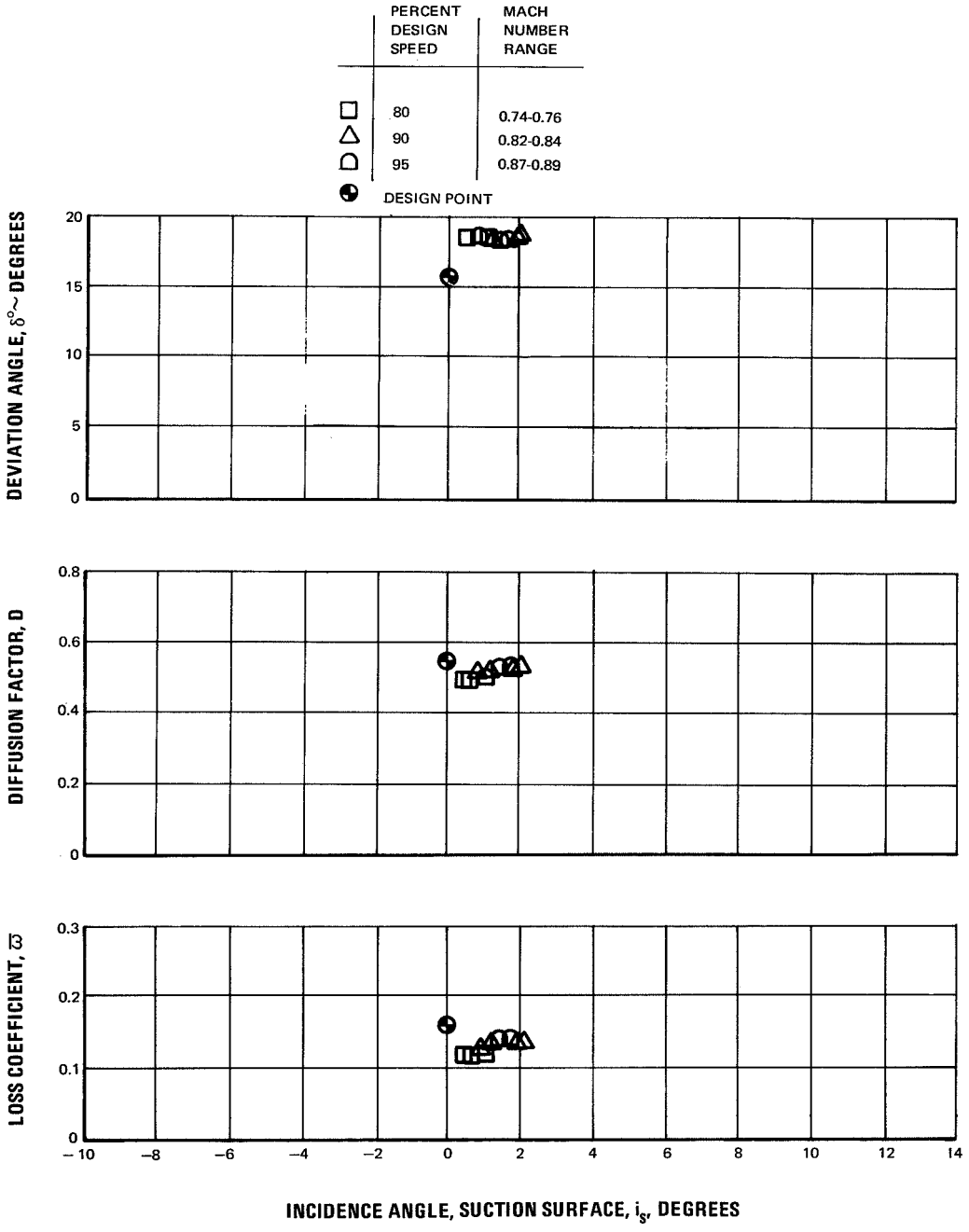


Figure 32b Slotted Stator Blade Element Performance With Radial Inlet Distortion at 10 Percent Span From Hub

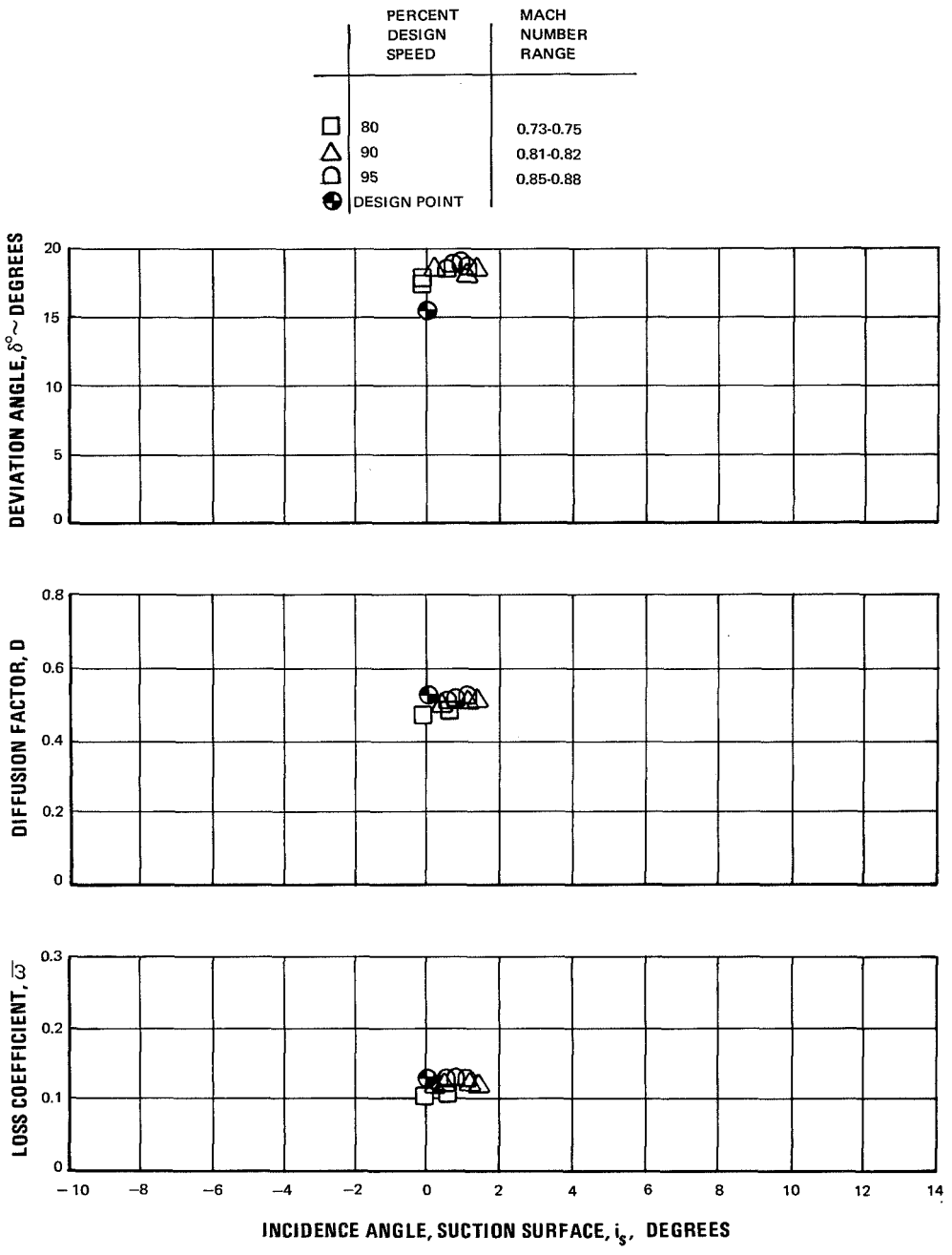


Figure 32c Slotted Stator Blade Element Performance With Radial Inlet Distortion at 15 Percent Span From Hub

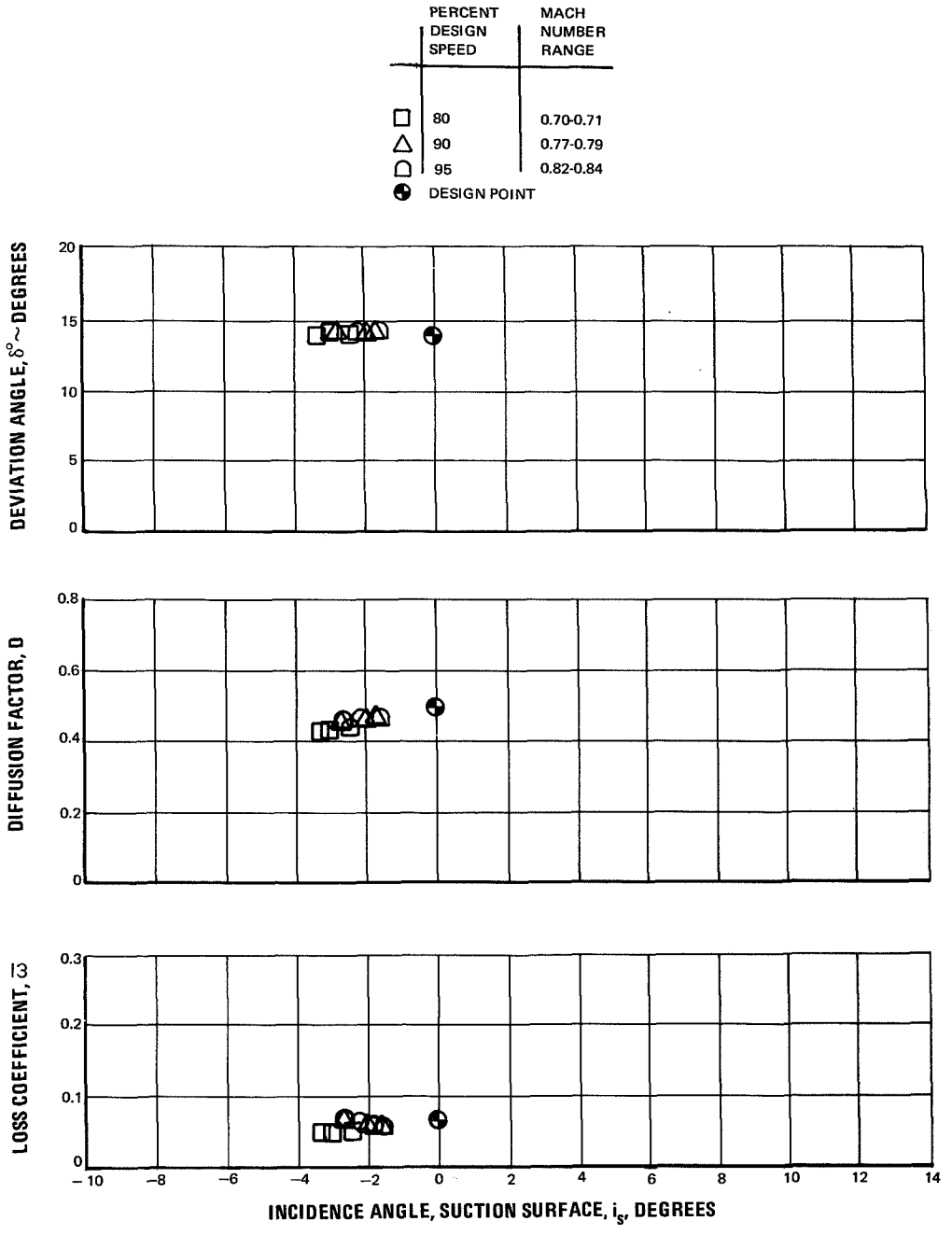


Figure 32d Slotted Stator Blade Element Performance With Radial Inlet Distortion at 30 Percent Span From Hub

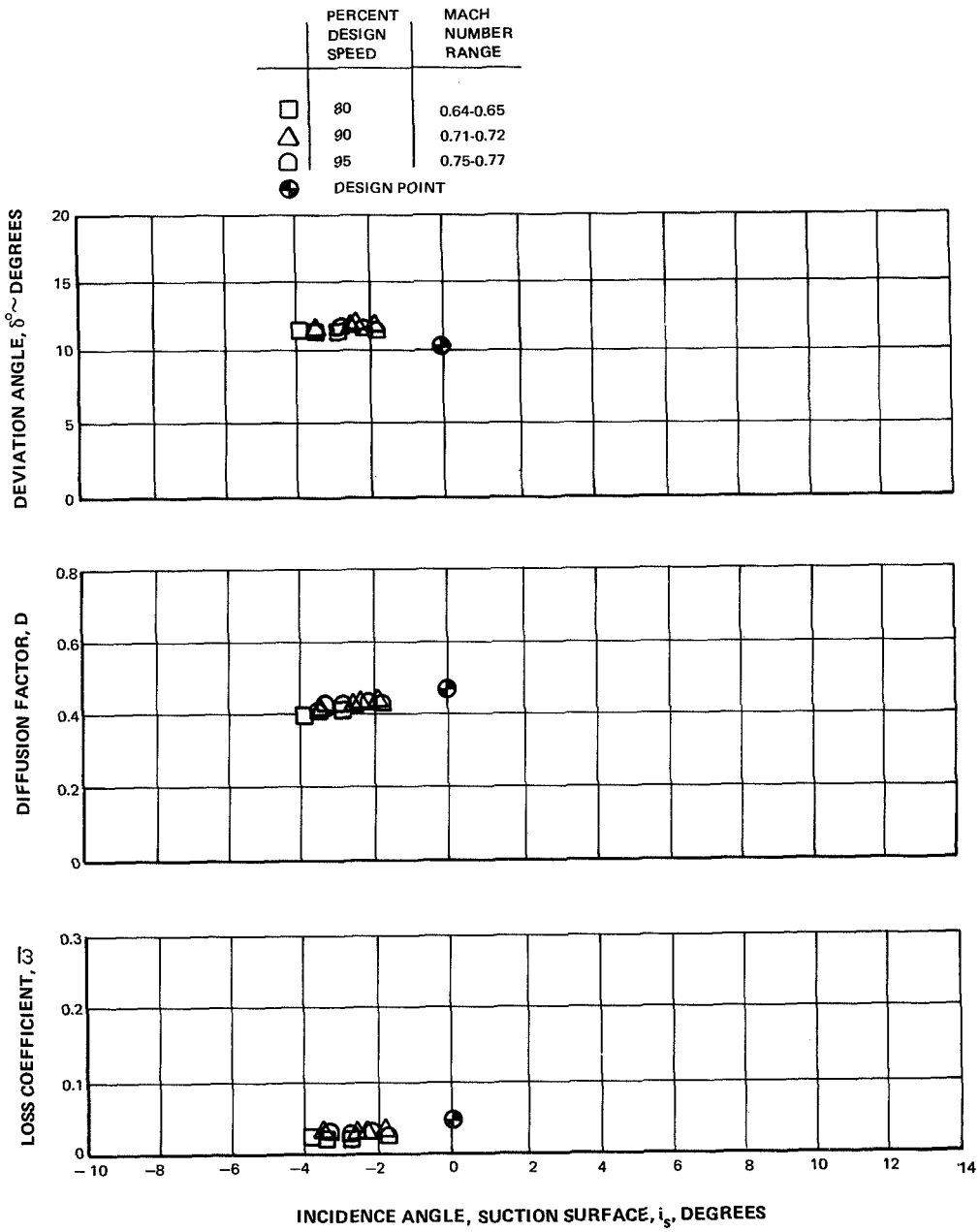


Figure 32e Slotted Stator Blade Element Performance With Radial Inlet Distortion at 50 Percent Span From Hub

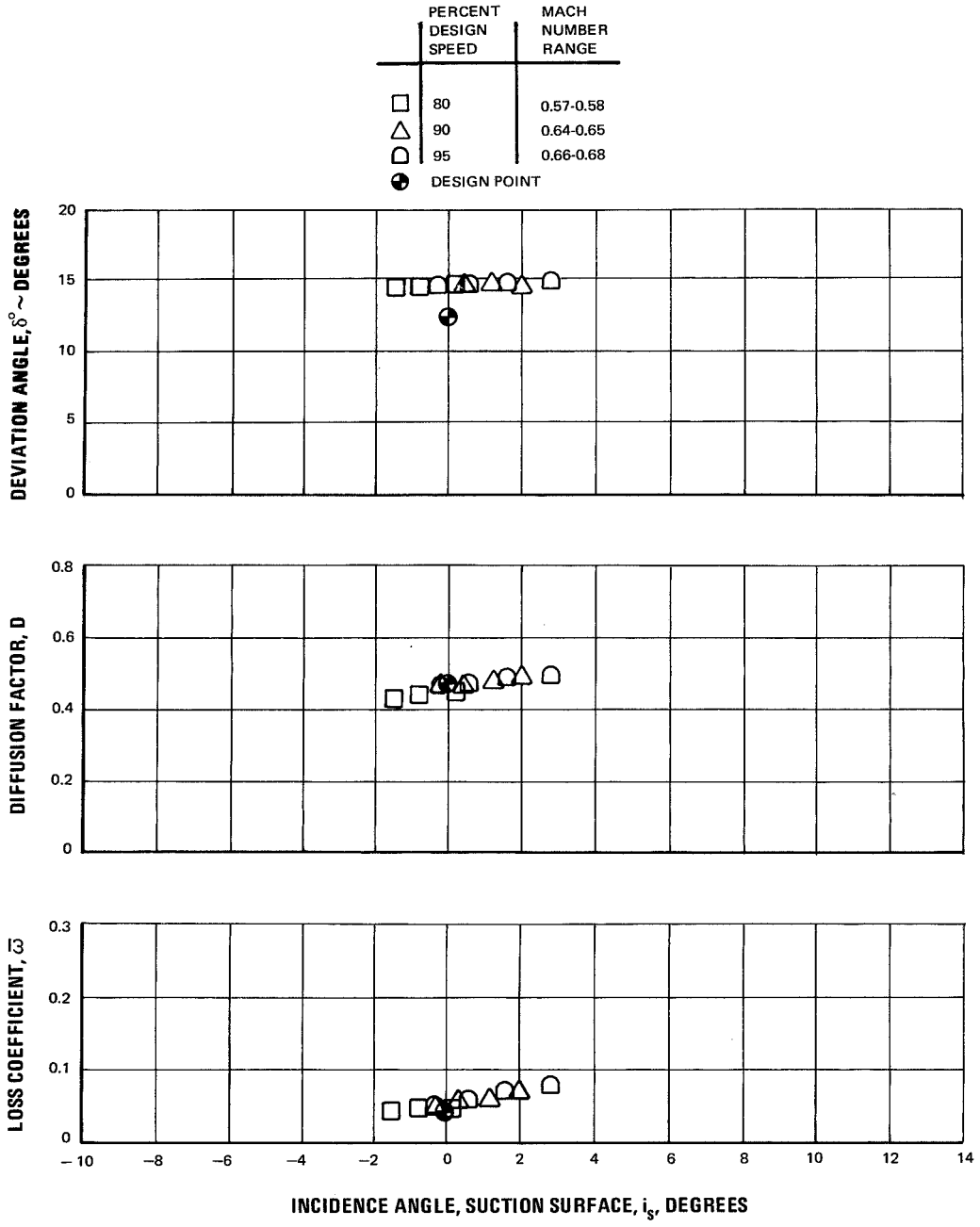


Figure 32f Slotted Stator Blade Element Performance With Radial Inlet Distortion at 70 Percent Span From Hub

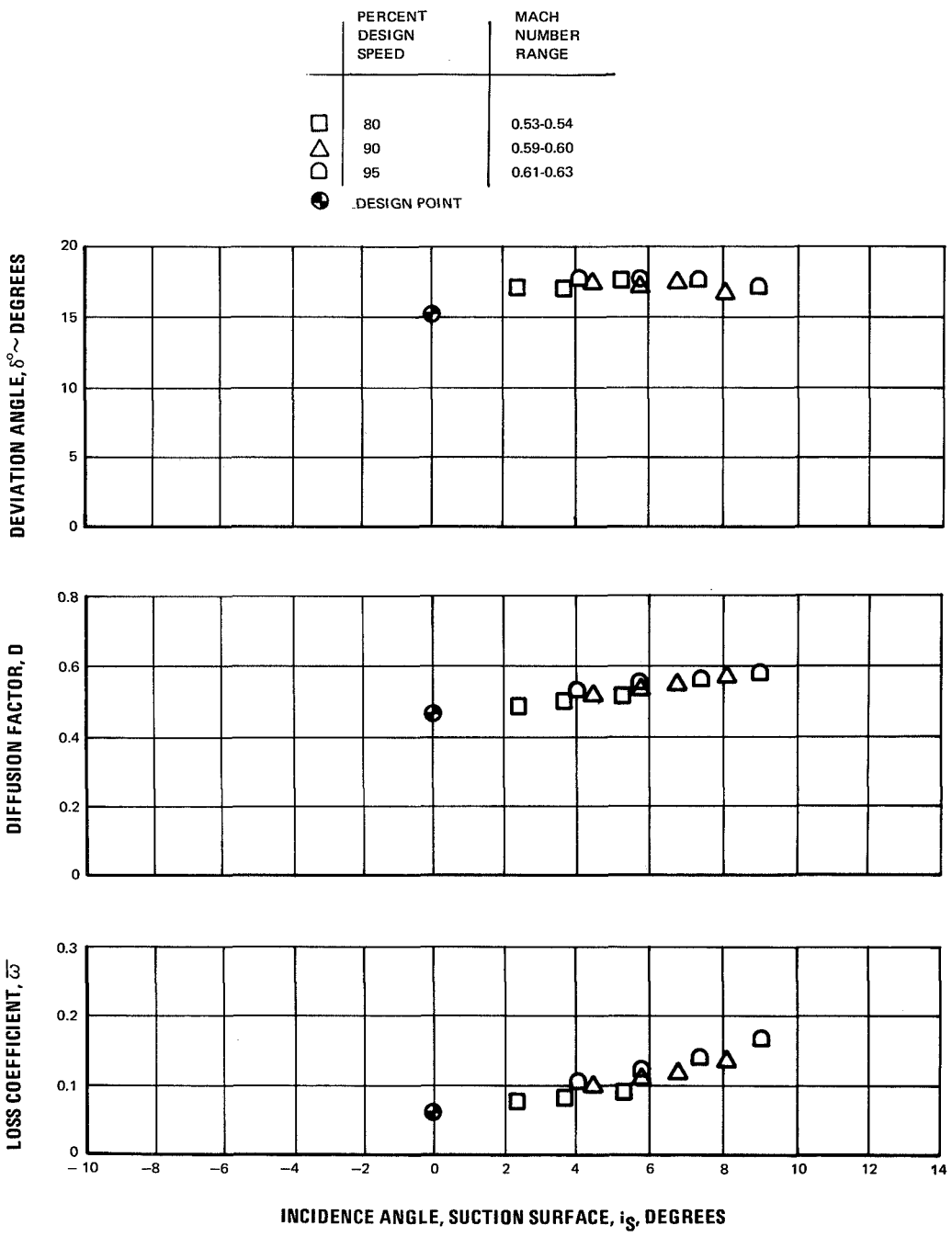


Figure 32g Slotted Stator Blade Element Performance With Radial Inlet Distortion at 85 Percent Span From Hub

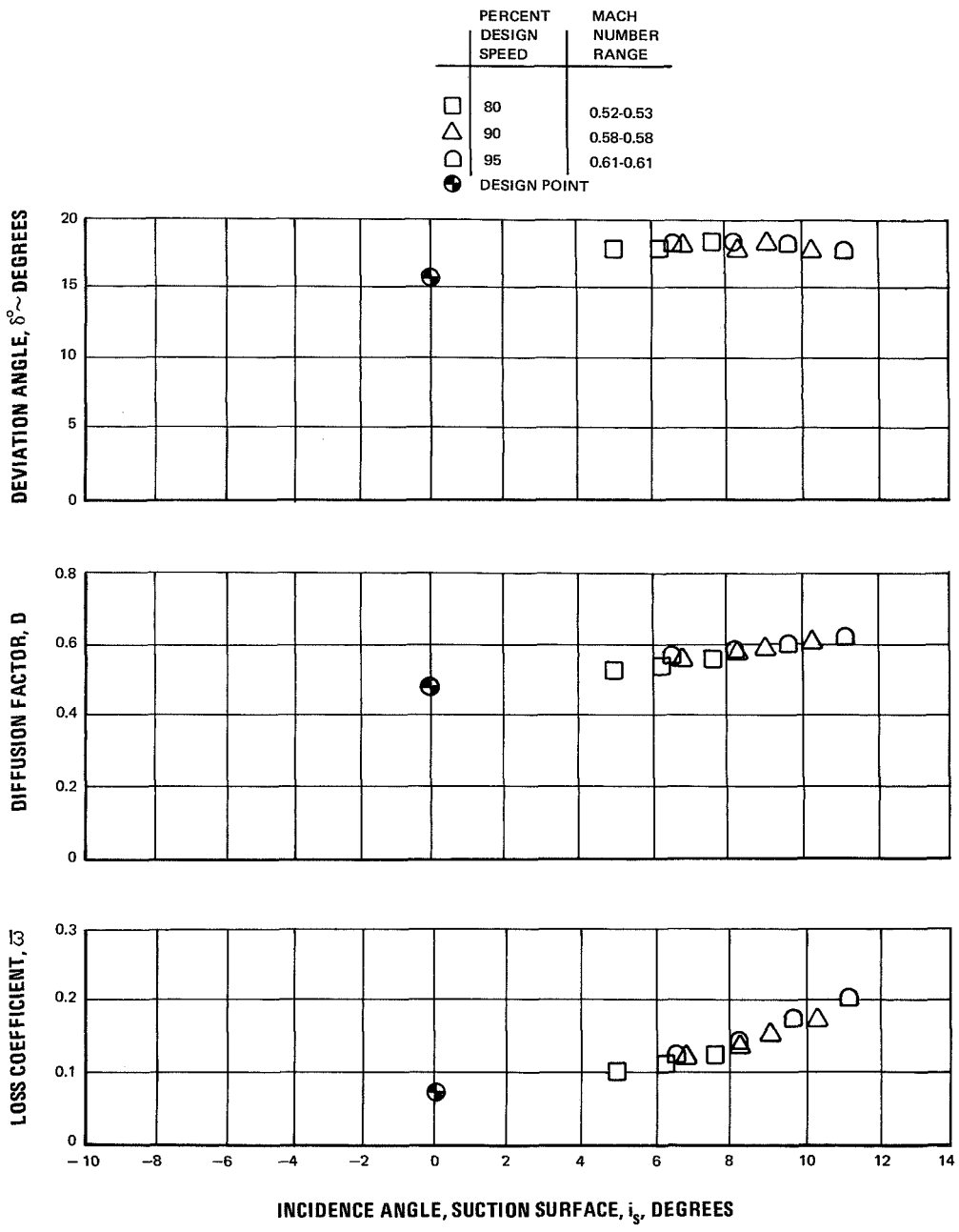


Figure 32h Slotted Stator Blade Element Performance With Radial Inlet Distortion at 90 Percent Span From Hub

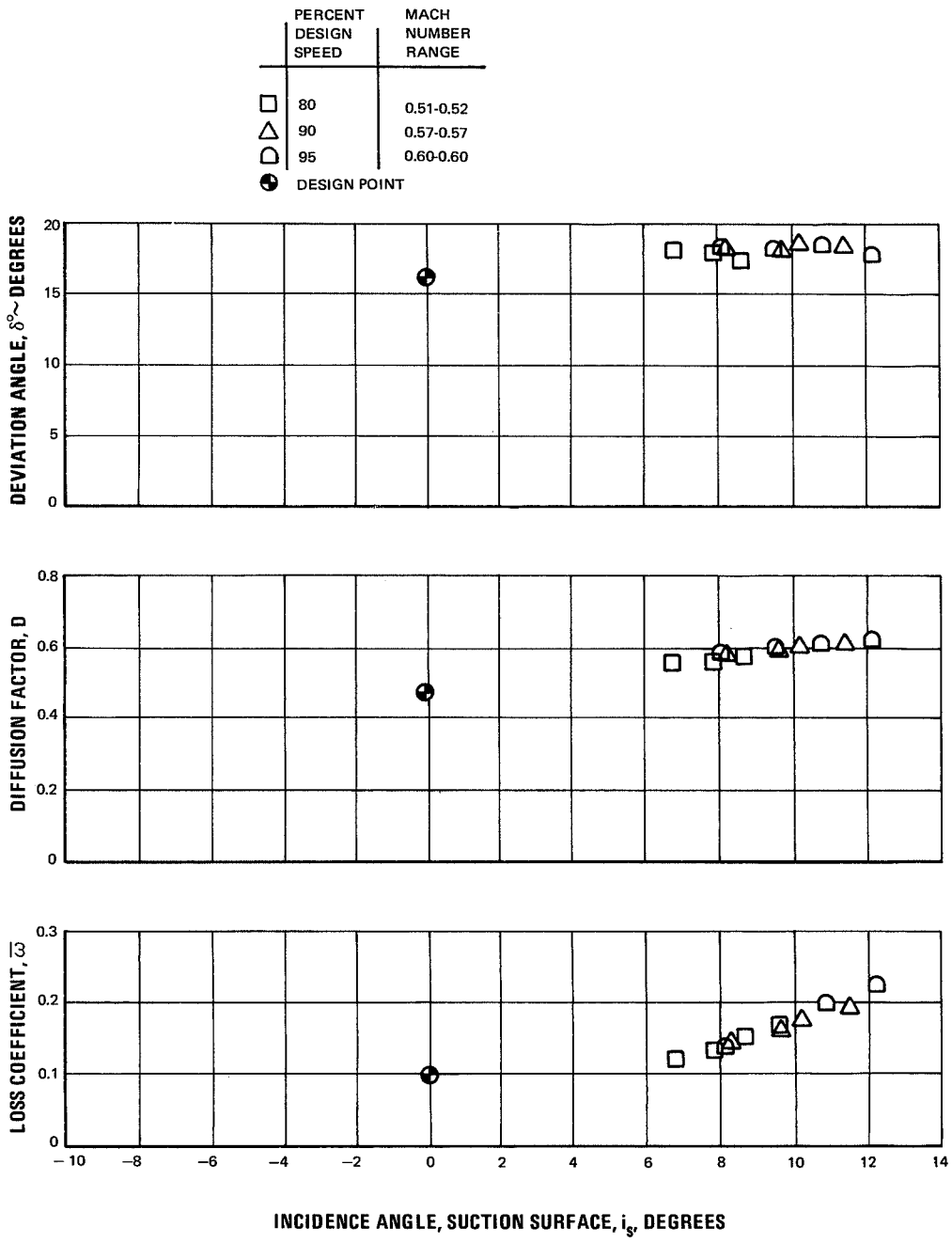


Figure 32i Slotted Stator Blade Element Performance With Radial Inlet Distortion at 95 Percent Span From Hub

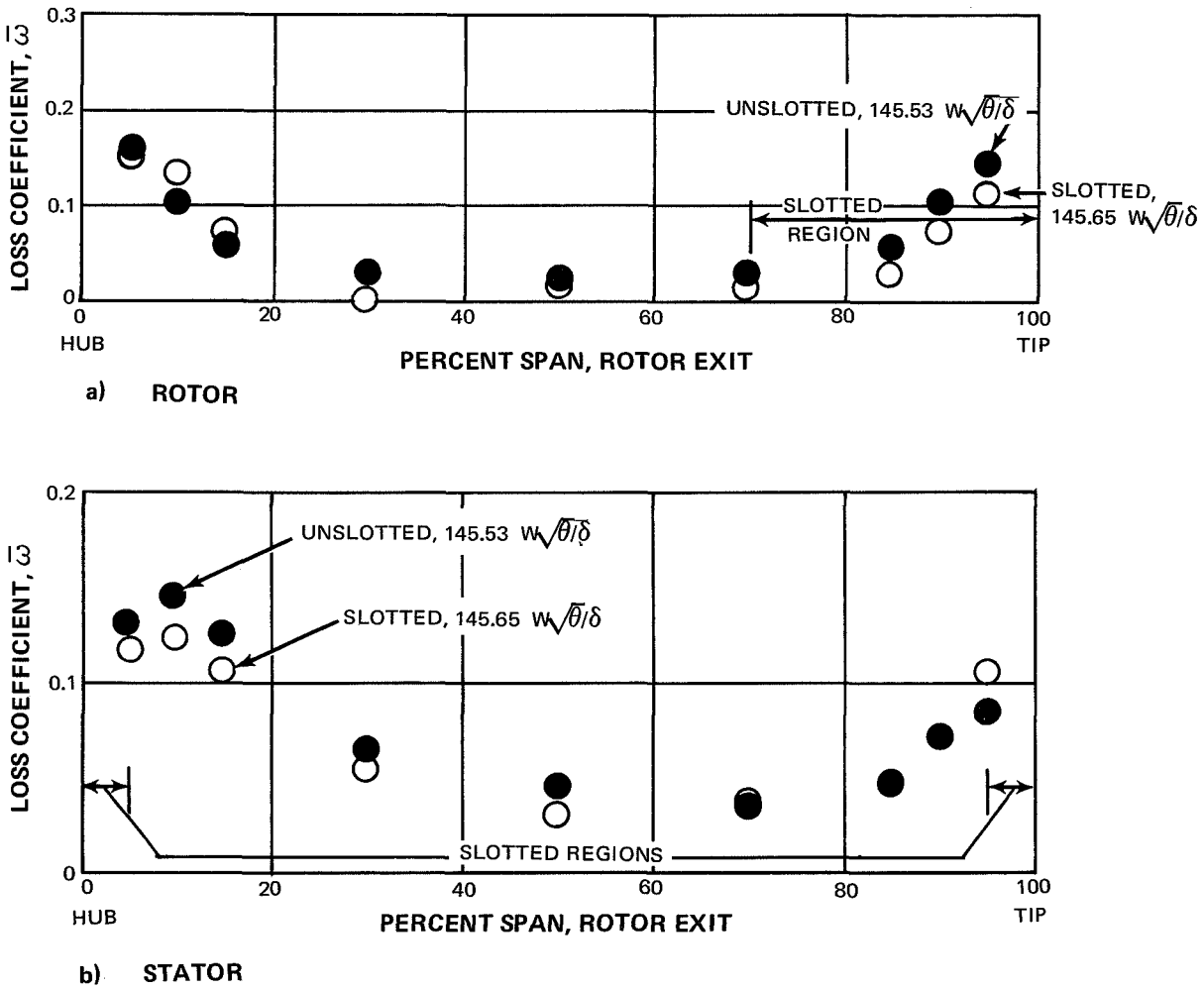
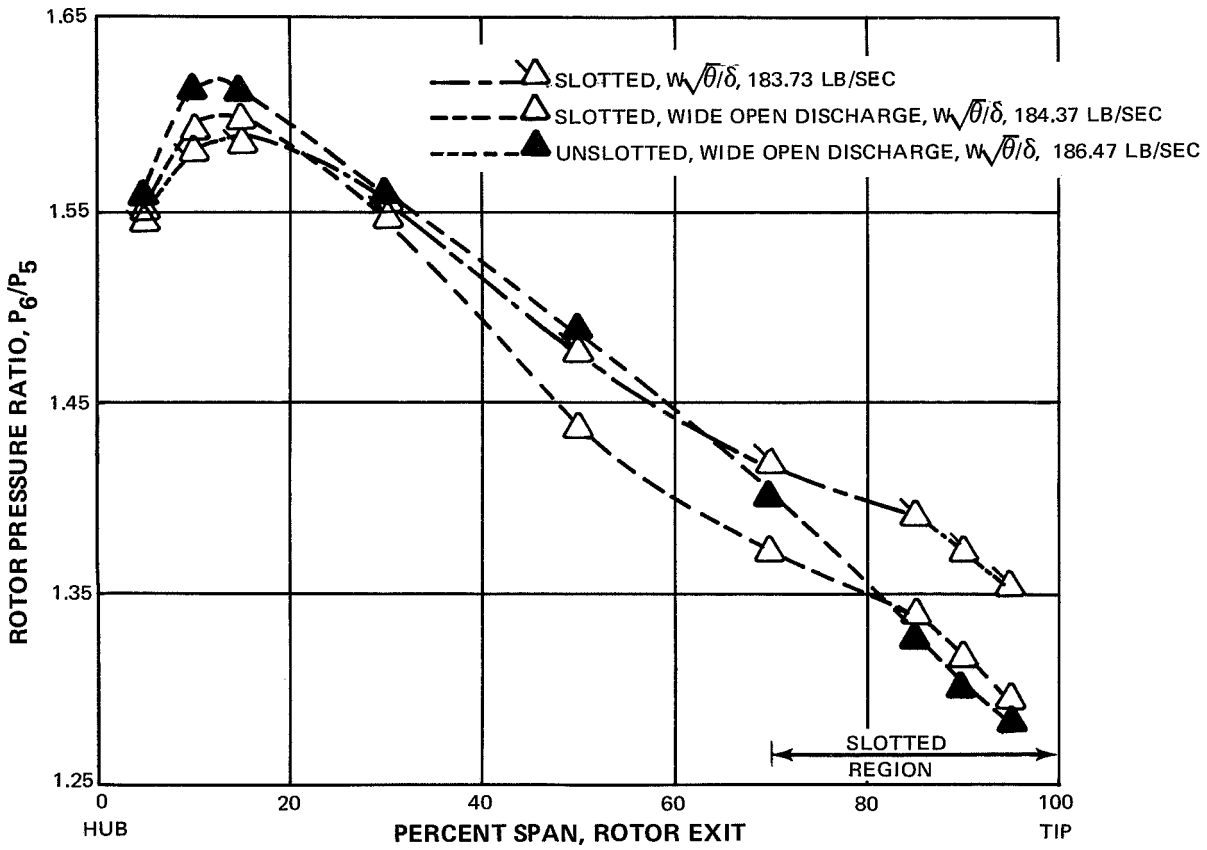
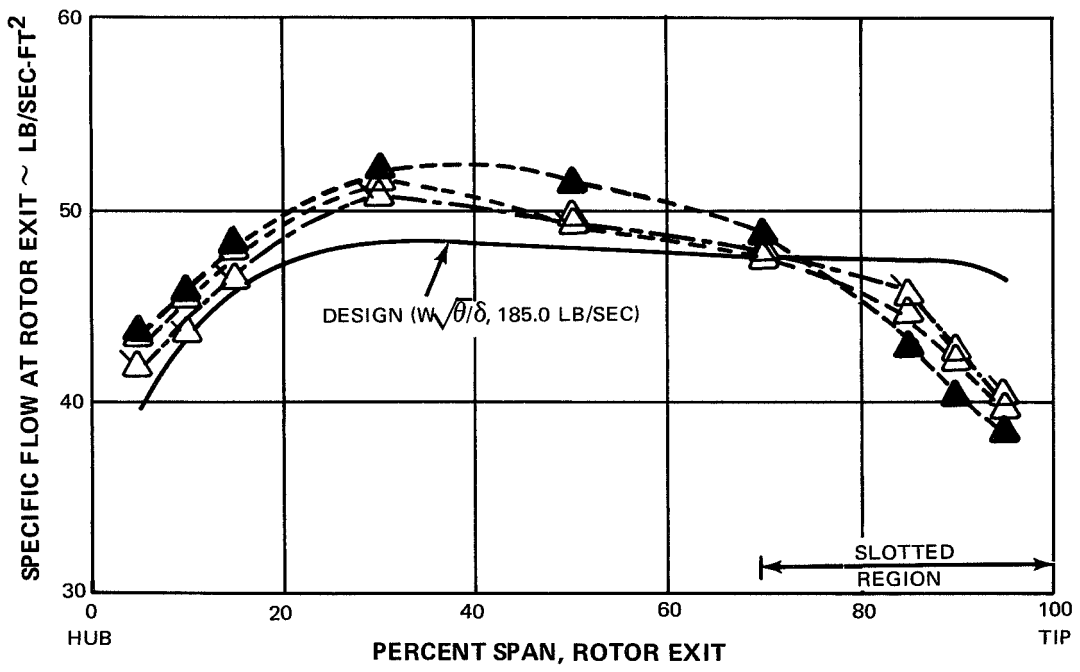


Figure 33 Spanwise Loss Comparison of Slotted and Unslotted Blades



a) PRESSURE RATIO



b) SPECIFIC FLOW

Figure 34 Effects of Slots on Rotor Exit Specific Flow and Total Pressure Ratio

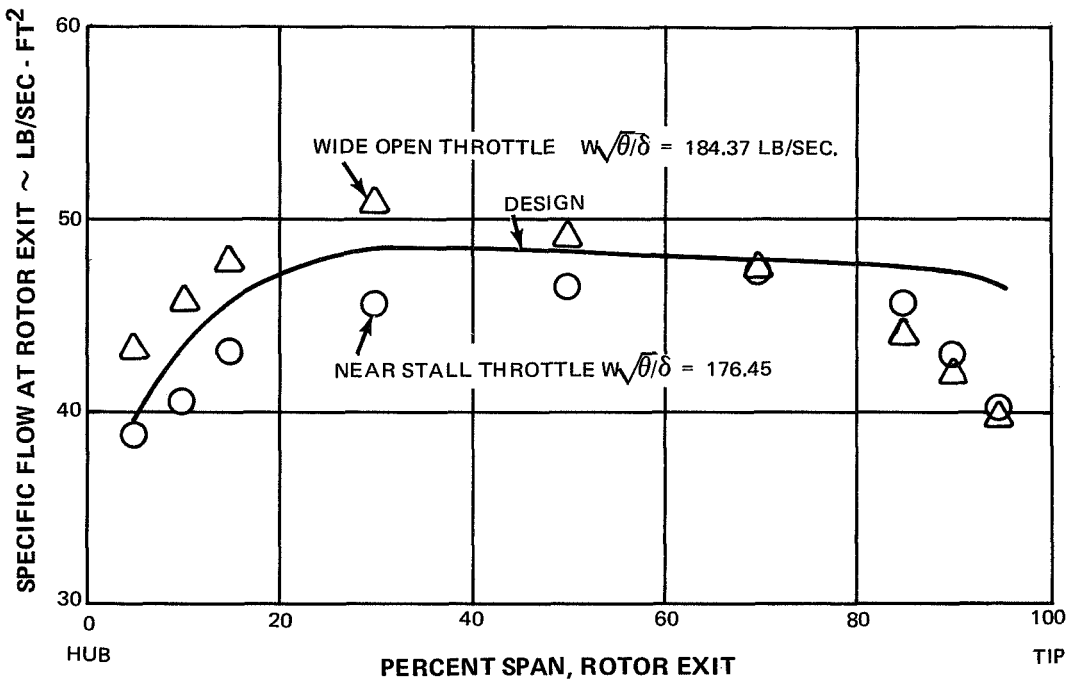


Figure 35 Exit Specific Flow of Slotted Rotor at Design Speed

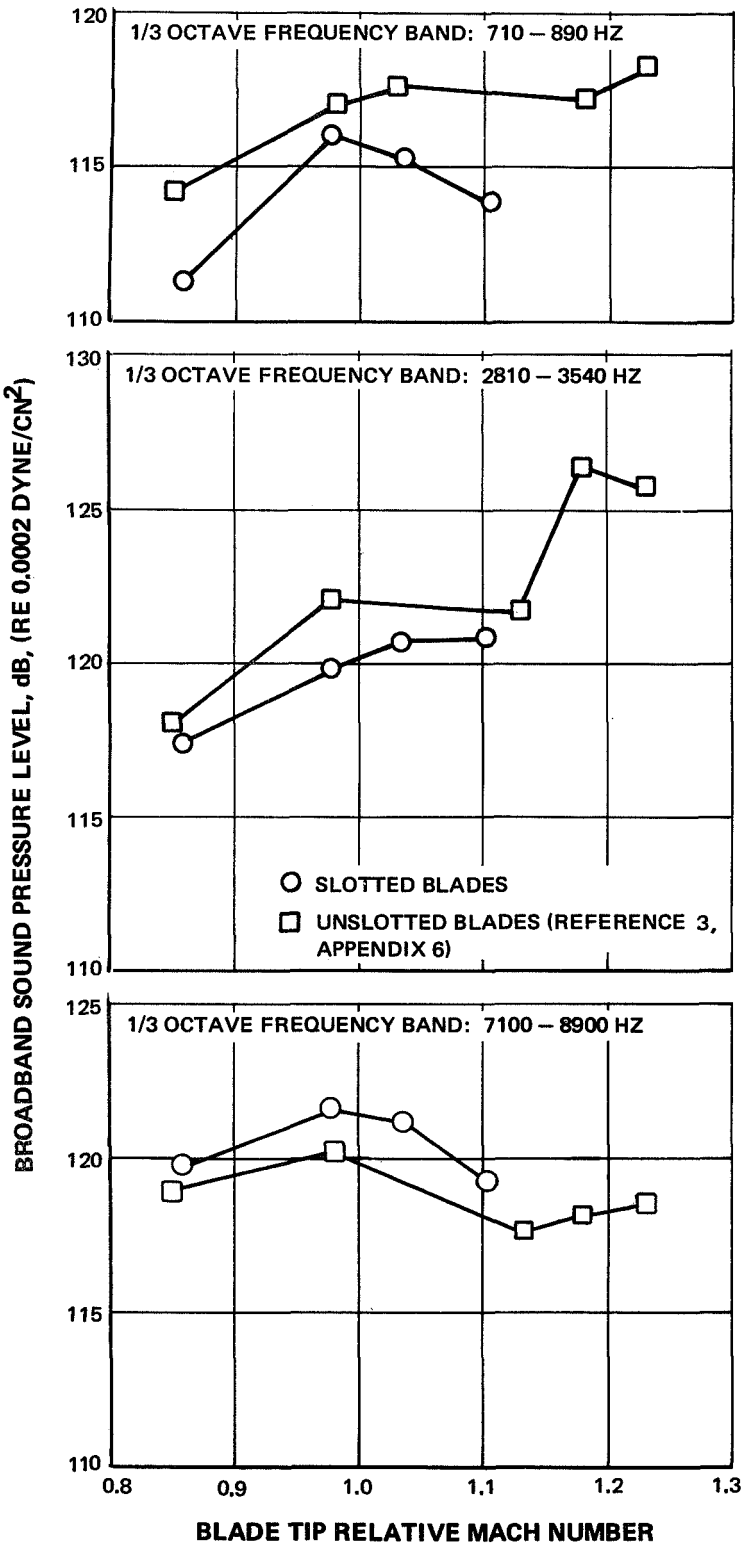
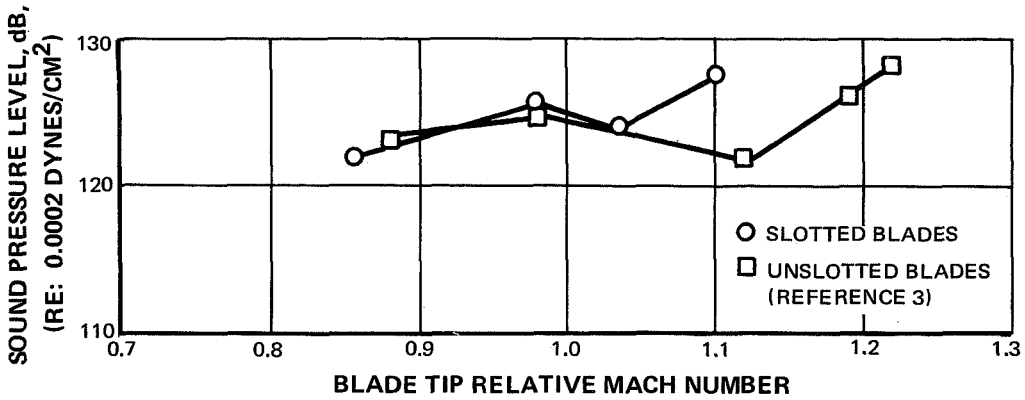
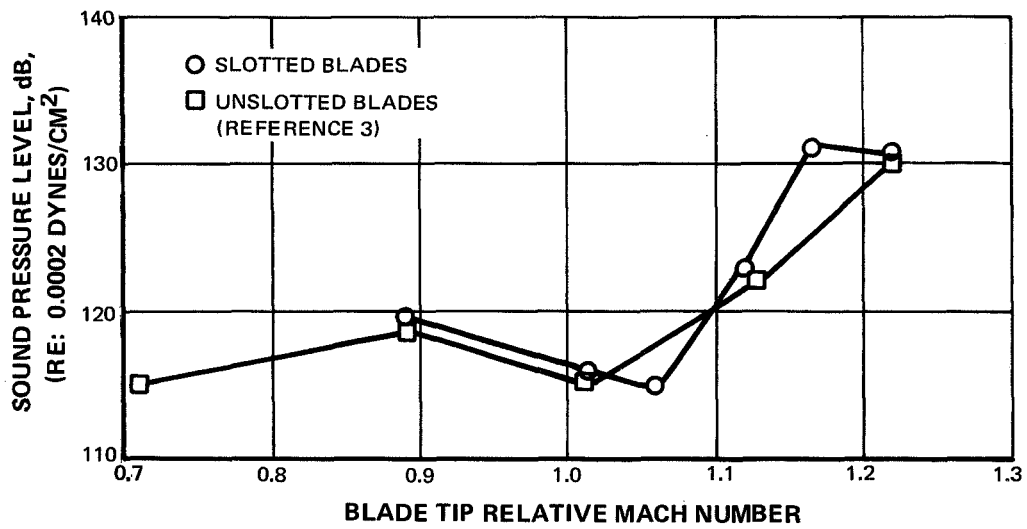


Figure 36 Effect of Slots on Broadband Sound Pressure Levels at Fan Inlet Along Part-Throttle Operating Line



a) PART THROTTLE



b) WIDE OPEN THROTTLE

Figure 37 Effect of Slots on Fundamental Blade Passing Frequency Inlet Noise

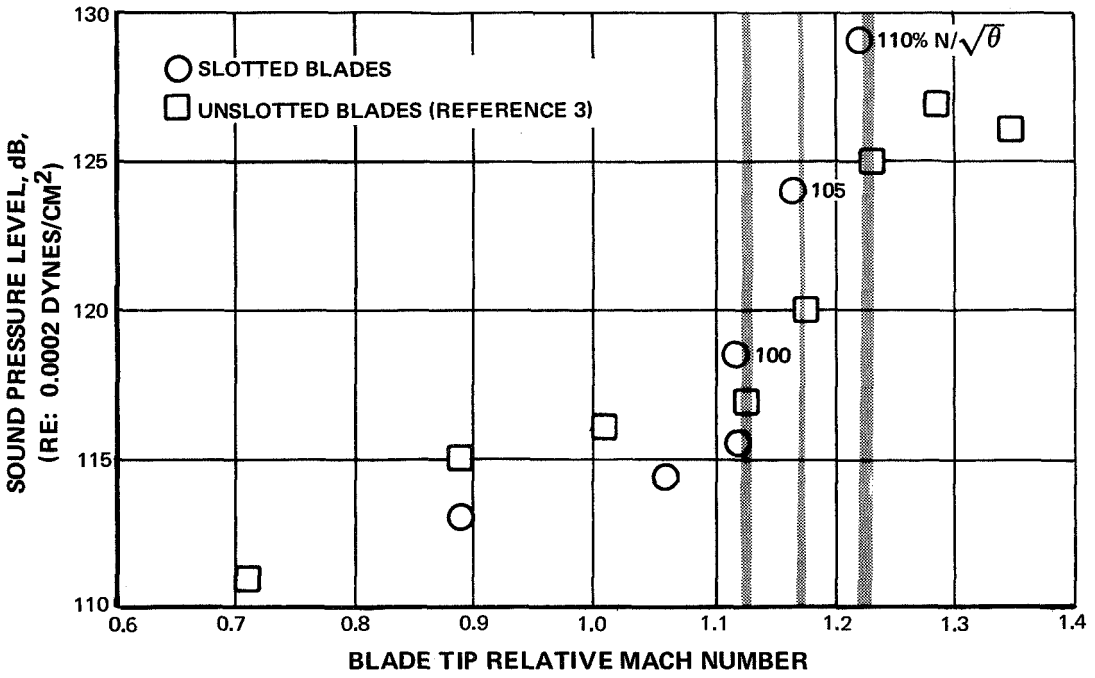


Figure 38 Effect of Slots on Supersonic Fan Inlet Noise (Combination Tones)

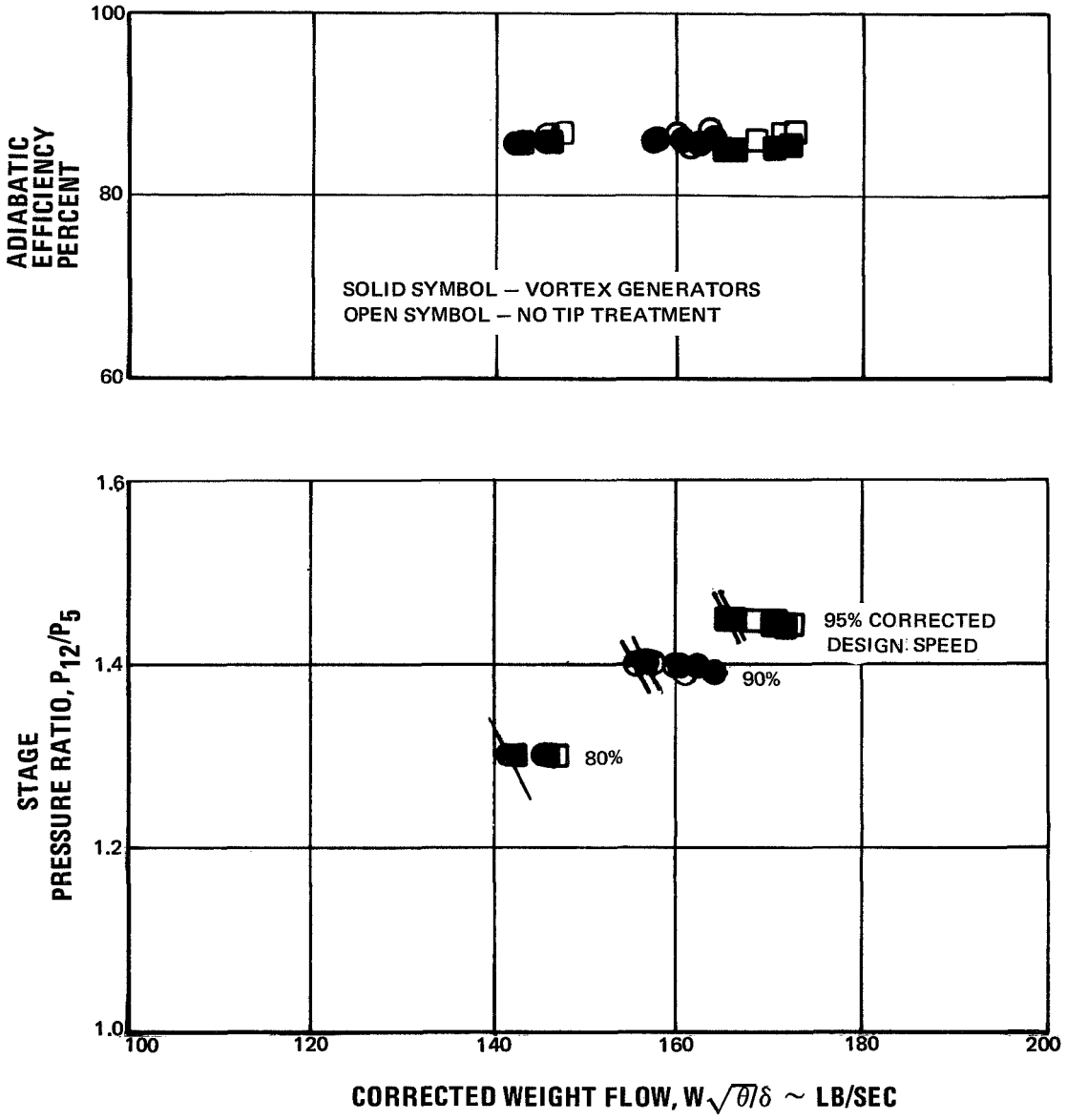


Figure 39 Effect of Vortex Generators on Overall Fan Stage Performance With Radial Inlet Distortion.

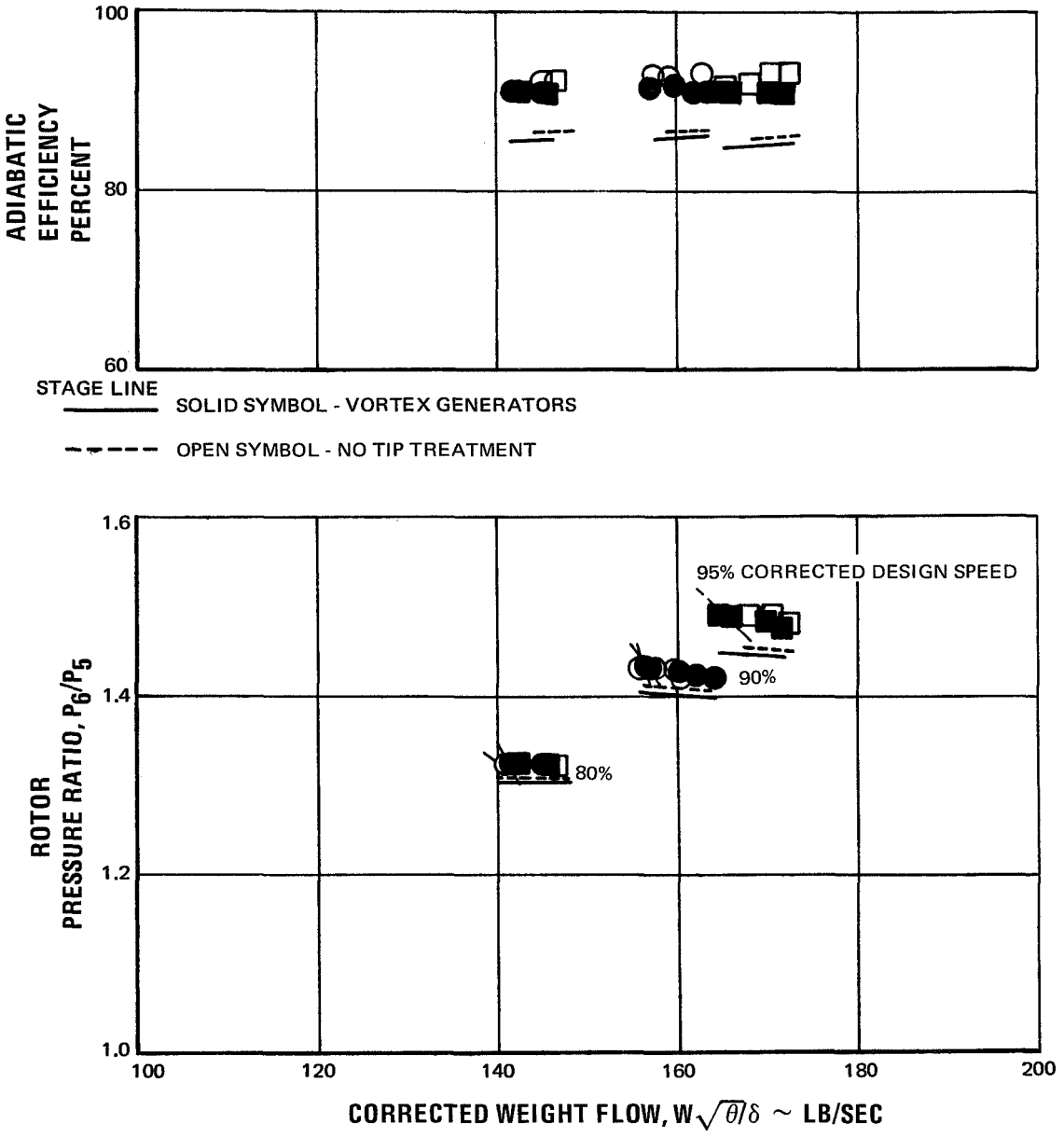


Figure 40 Effect of Vortex Generators on Rotor Performance With Radial Inlet Distortion

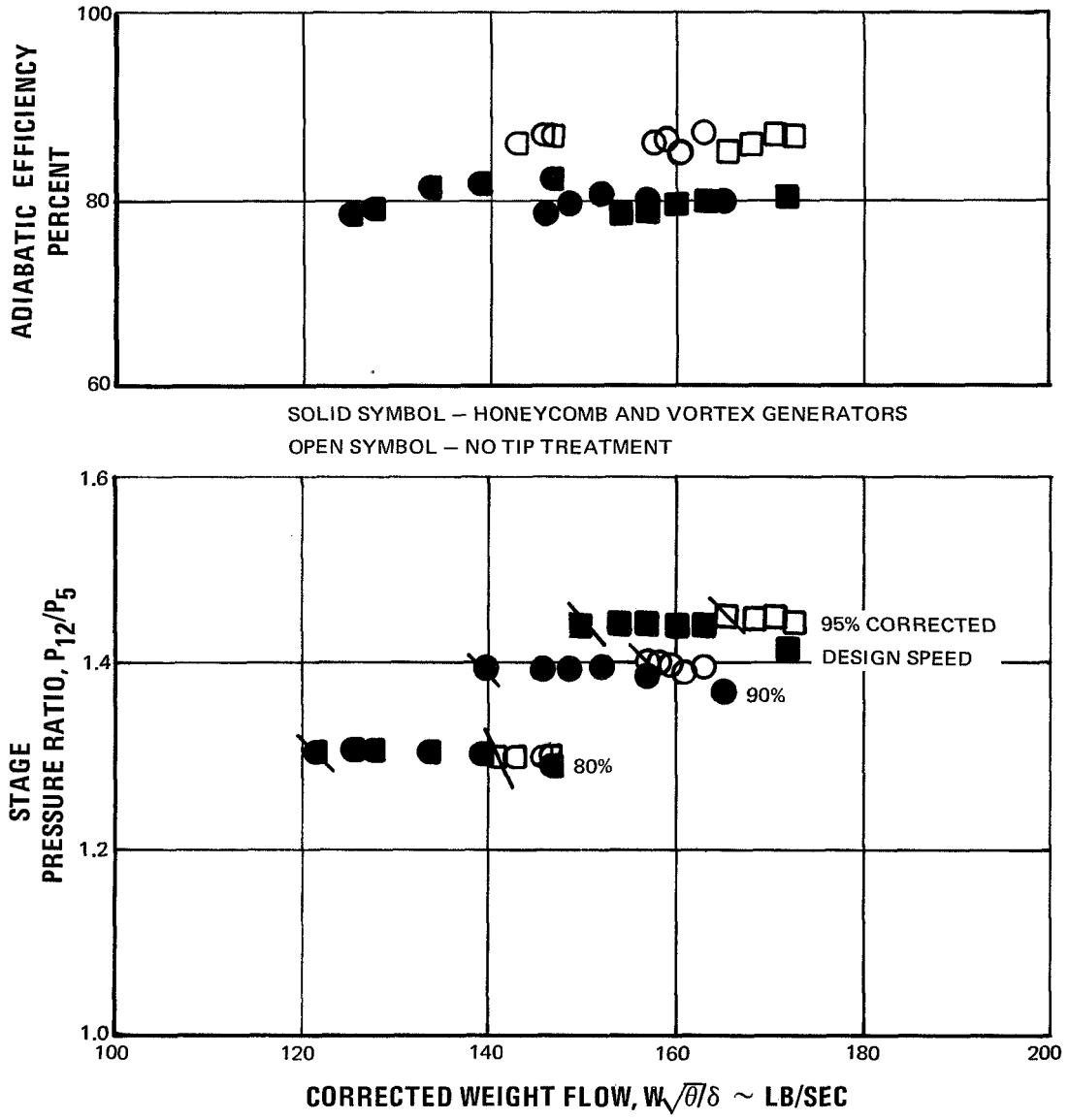


Figure 41 Effect of Honeycomb and Vortex Generators on Overall Fan Stage Performance With Radial Inlet Distortion

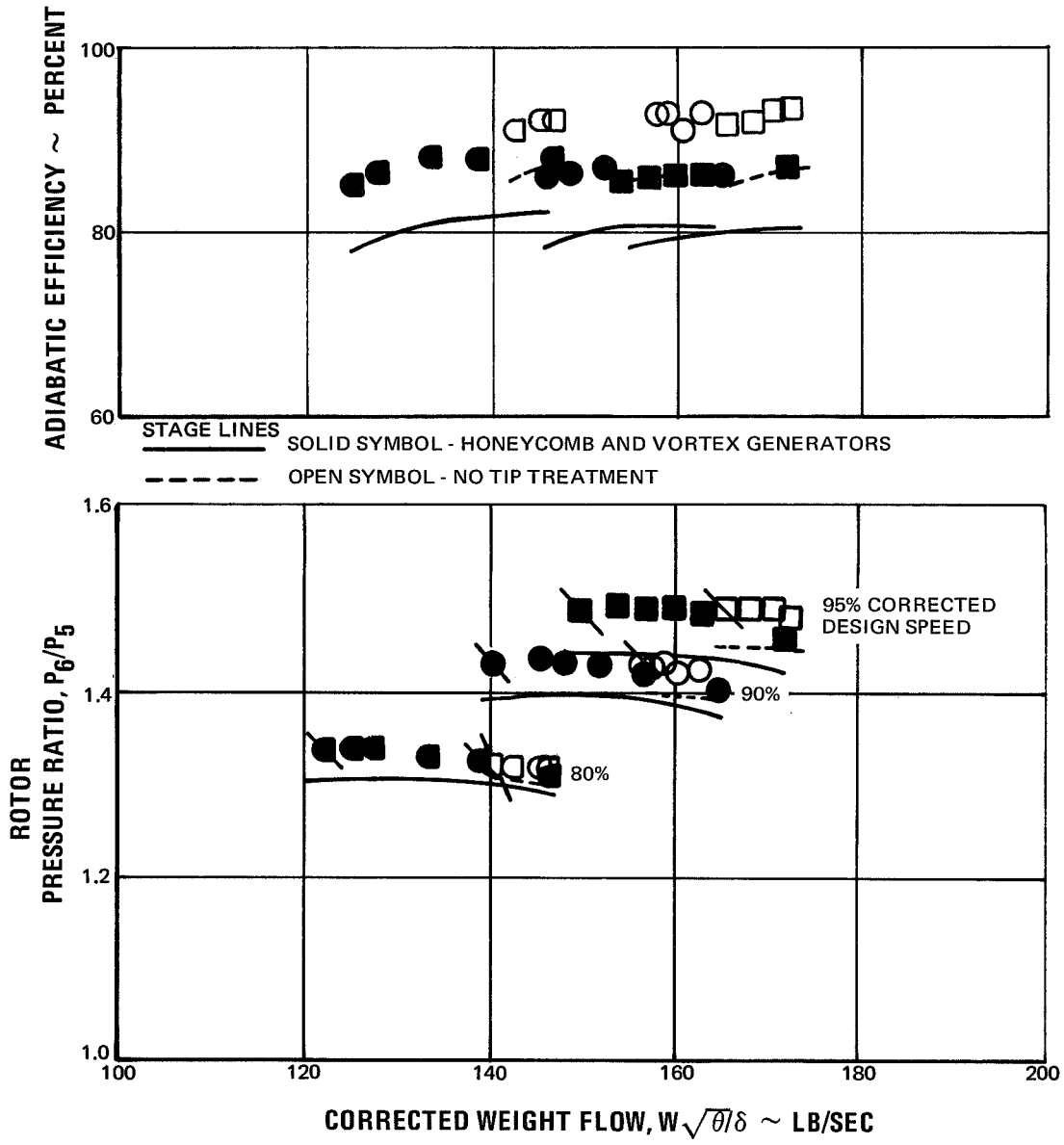


Figure 42 Effect of Honeycomb and Vortex Generators on Rotor Performance With Radial Inlet Distortion

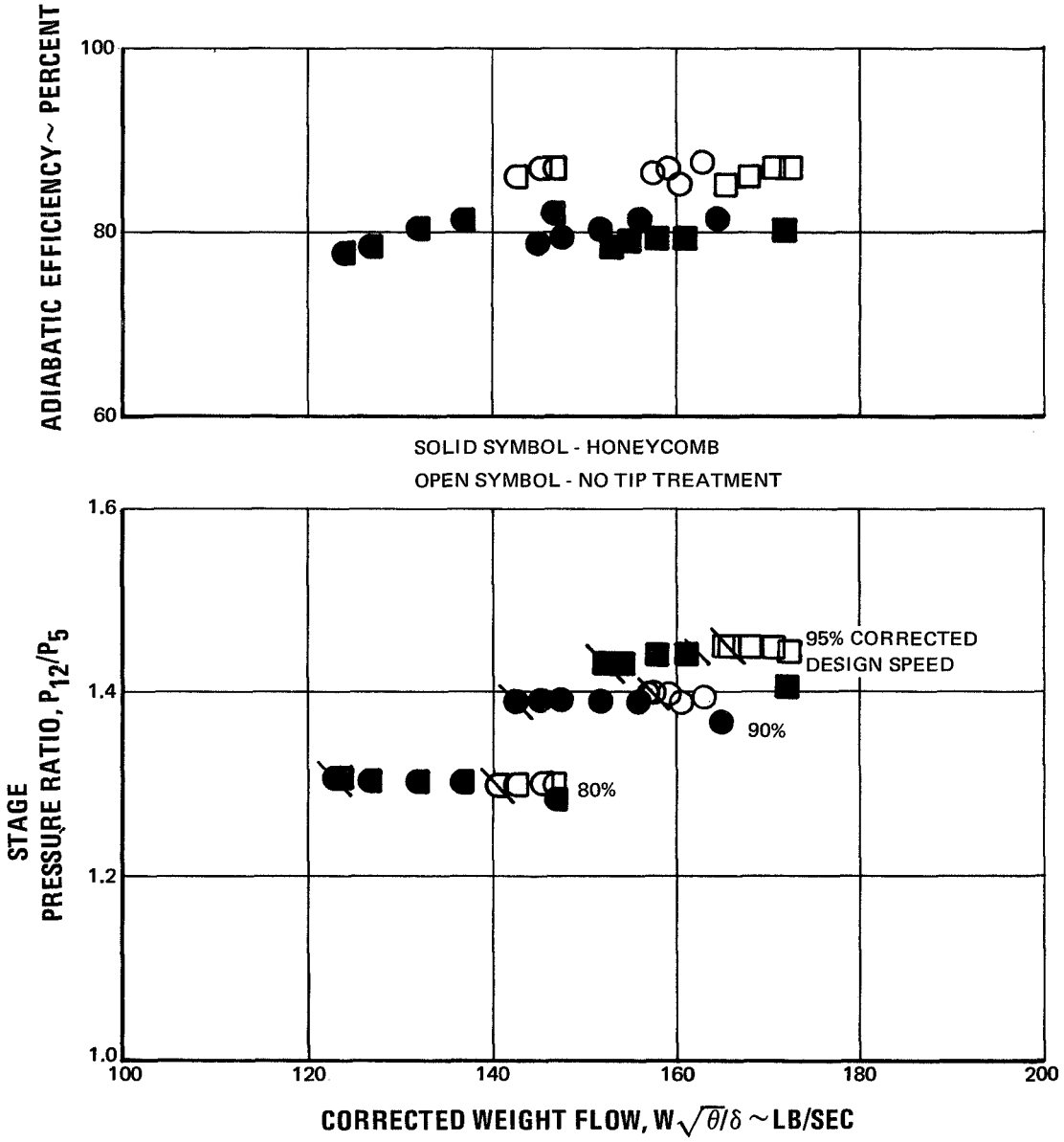


Figure 43 Effect of Honeycomb on Overall Fan Stage Performance With Radial Inlet Distortion

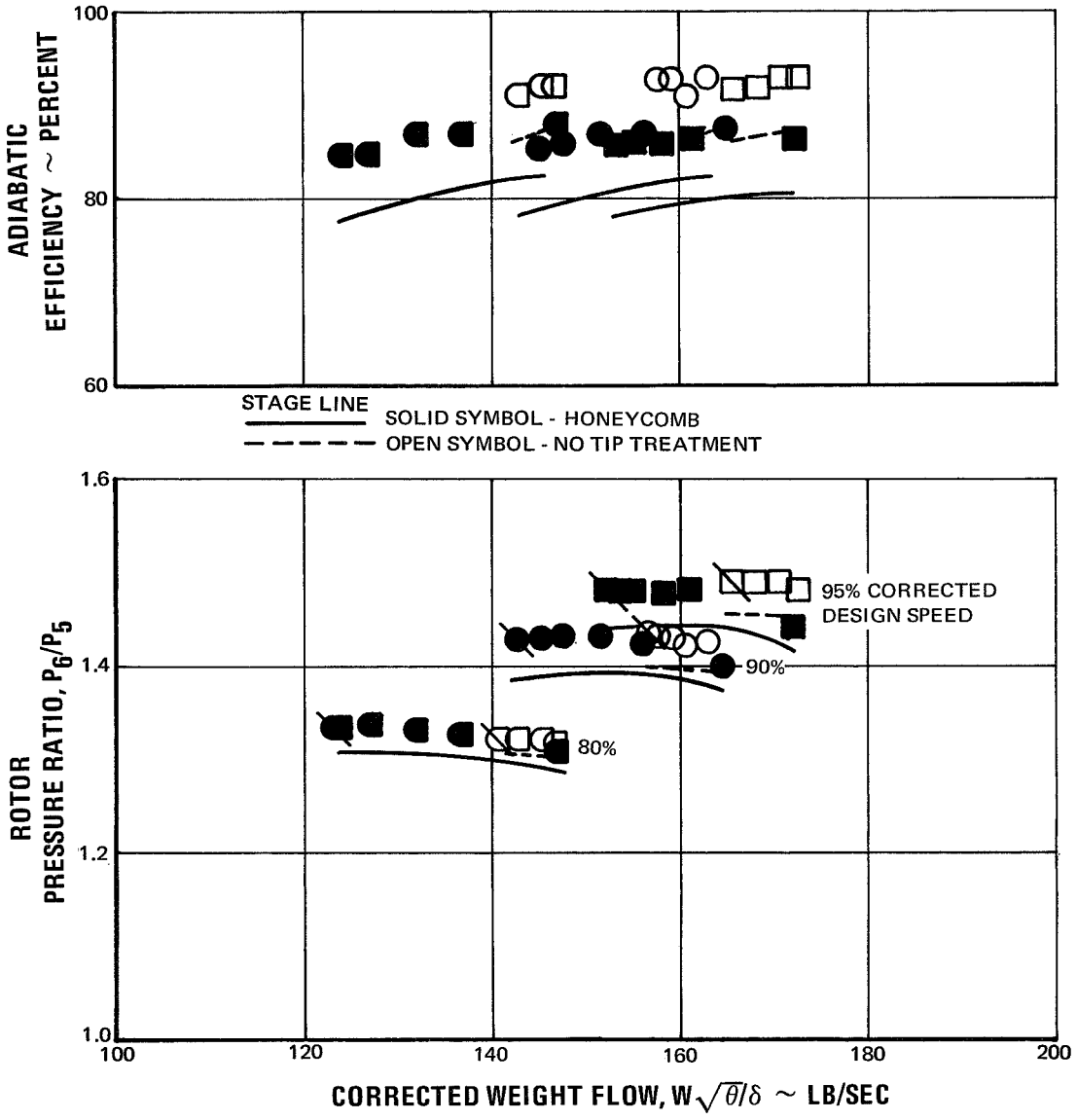


Figure 44 Effect of Honeycomb on Rotor Performance With Radial Inlet Distortion

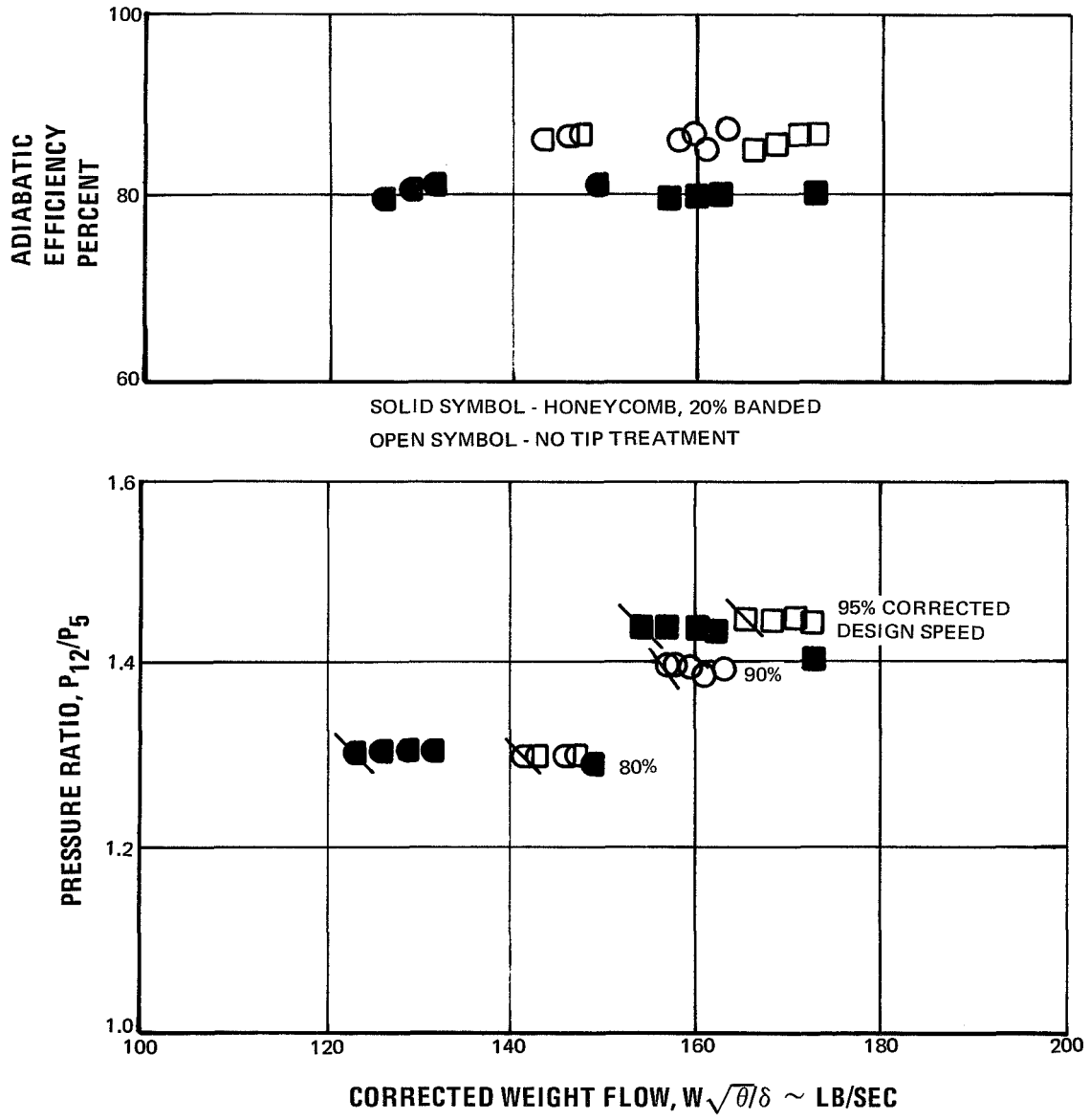


Figure 45 Effect of 20-Percent of Forward Chord Banded Honeycomb on Overall Fan Stage Performance With Radial Inlet Distortion

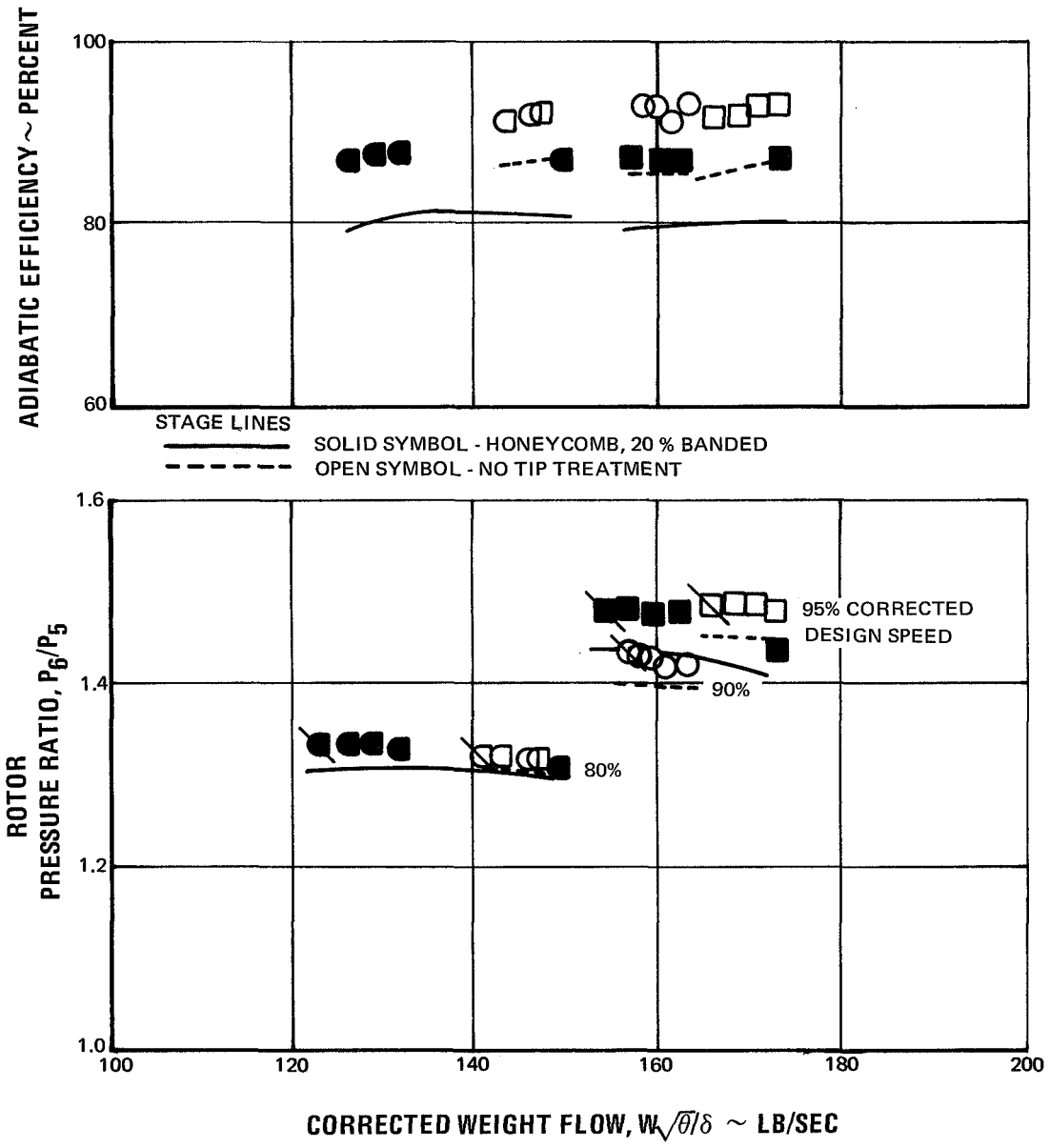


Figure 46 Effect of 20-Percent of Forward Chord Banded Honeycomb on Rotor Performance With Radial Inlet Distortion

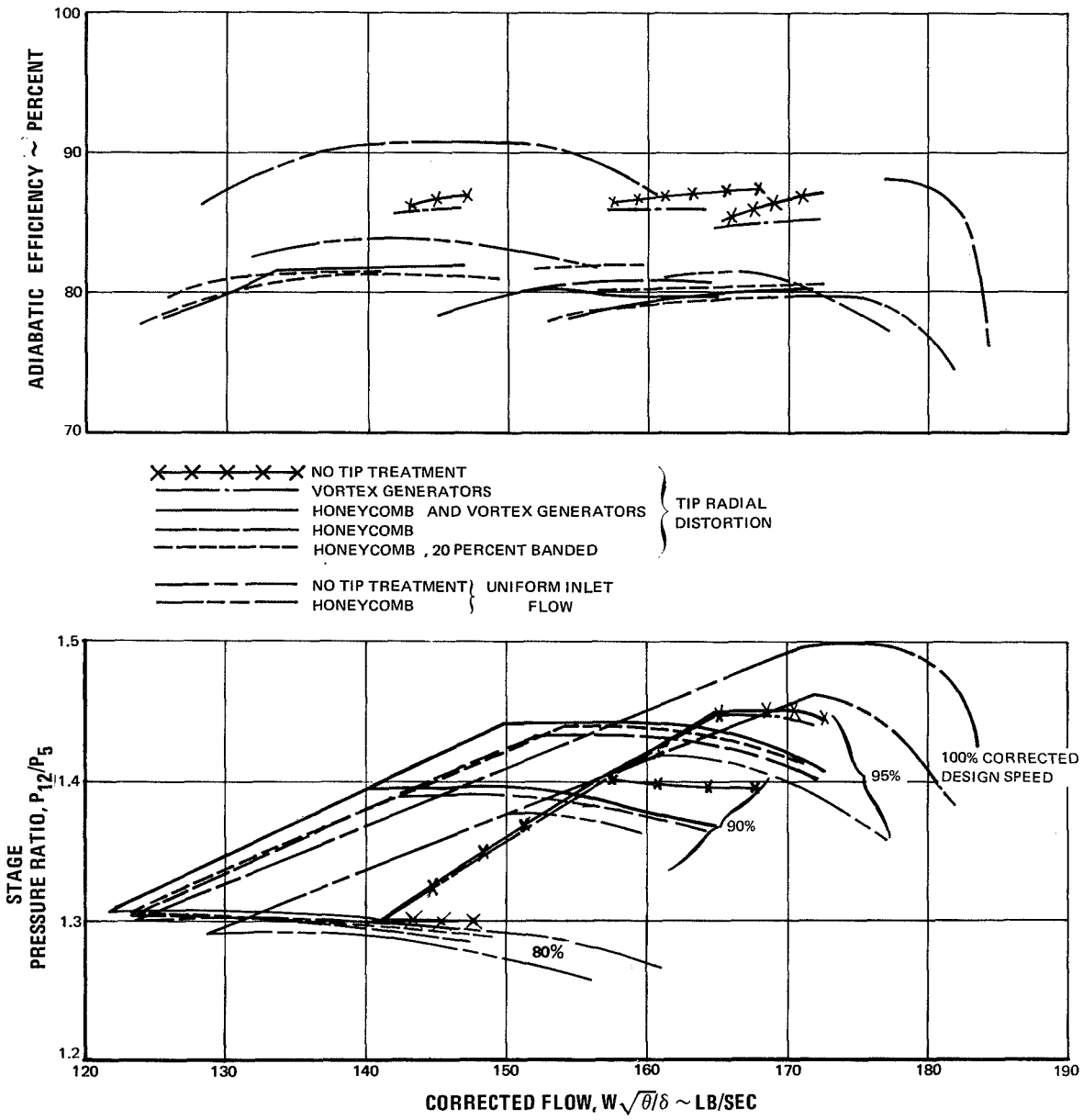


Figure 47 Summary of Overall Fan Stage Performance With Various Rotor Tip Treatments

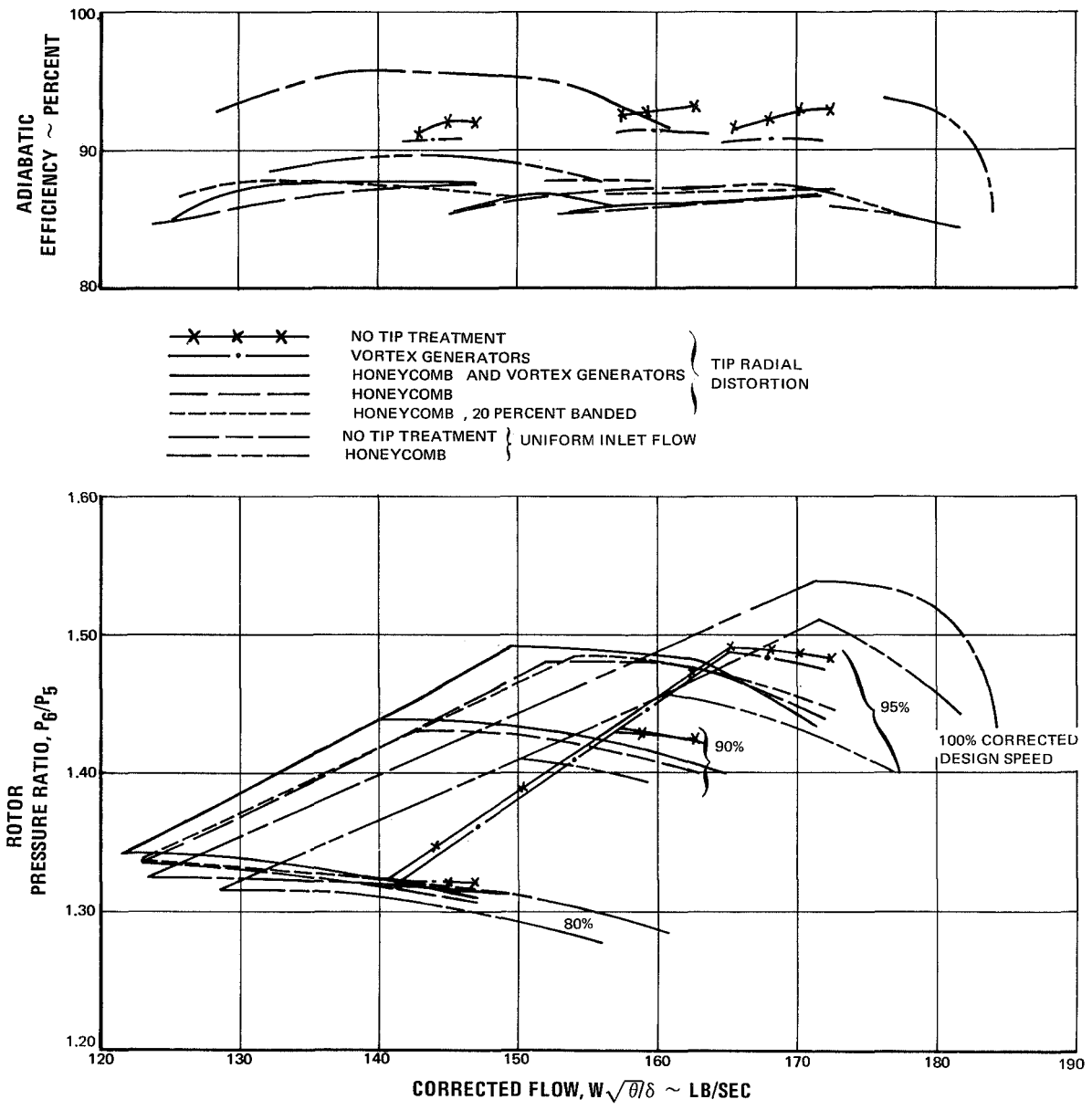


Figure 48 Summary of Rotor Performance With Various Rotor Tip Treatments

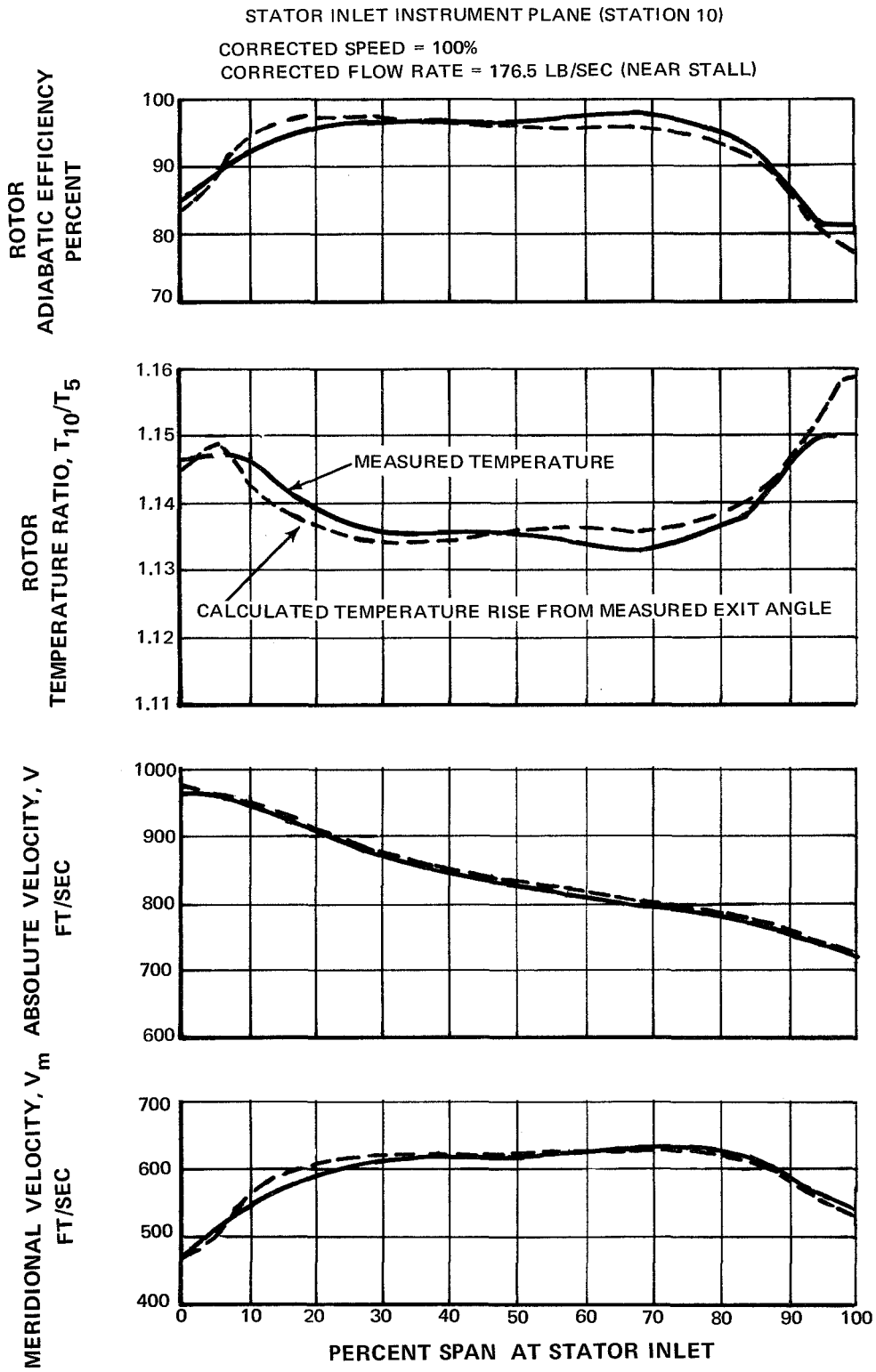


Figure 49 Effect of Data Calculation Technique on Performance Parameters at Stator Inlet Instrument Plane Without Honeycomb and With Uniform Inlet Flow

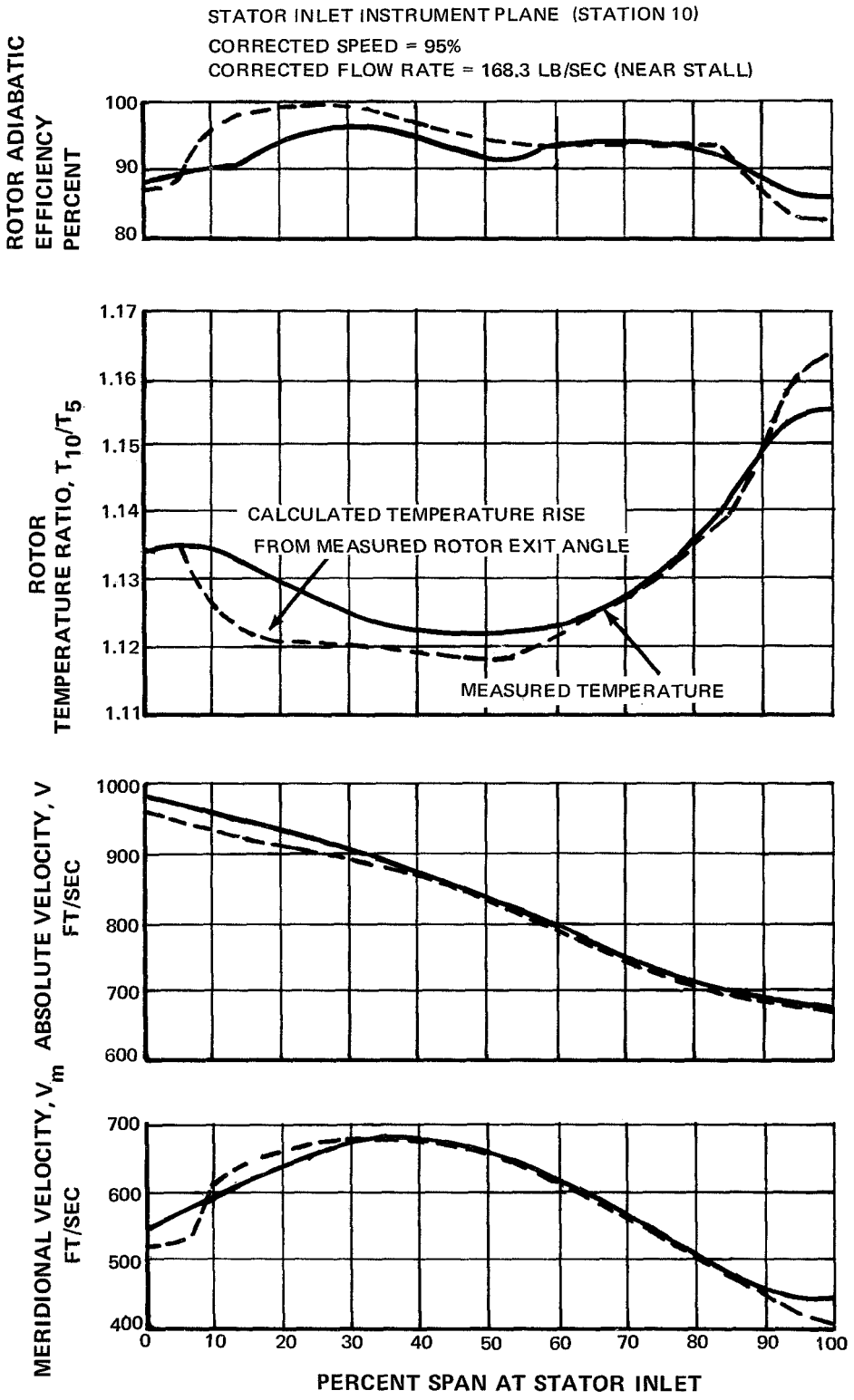


Figure 50 Effect of Data Calculation Technique on Performance Parameters at Stator Inlet Instrument Plane Without Honeycomb and With Radial Inlet Distortion

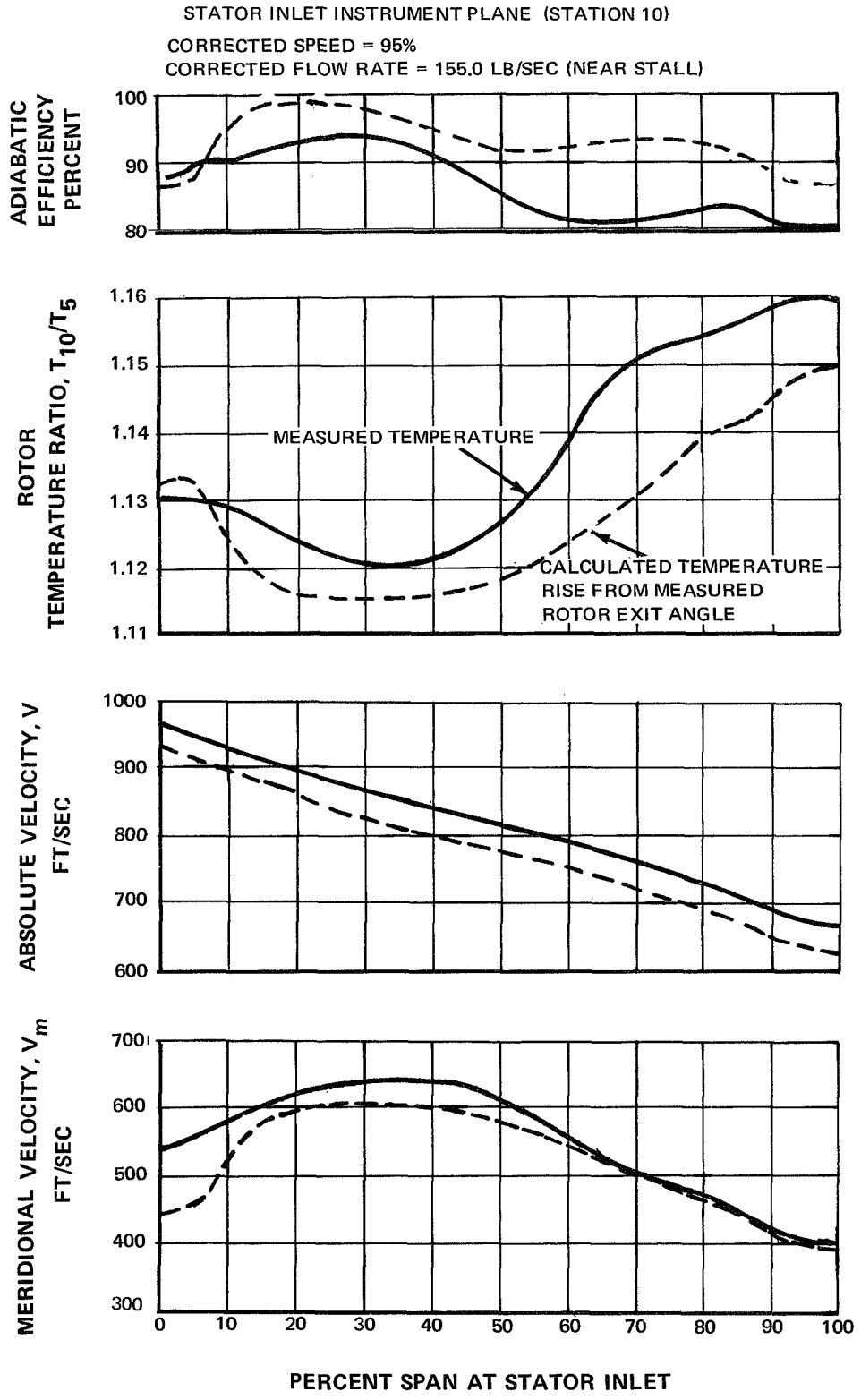


Figure 51 Effect of Data Calculation Technique on Performance Parameters at Stator Inlet Instrument Plane With Honeycomb (Open Back) and Radial Inlet Distortion

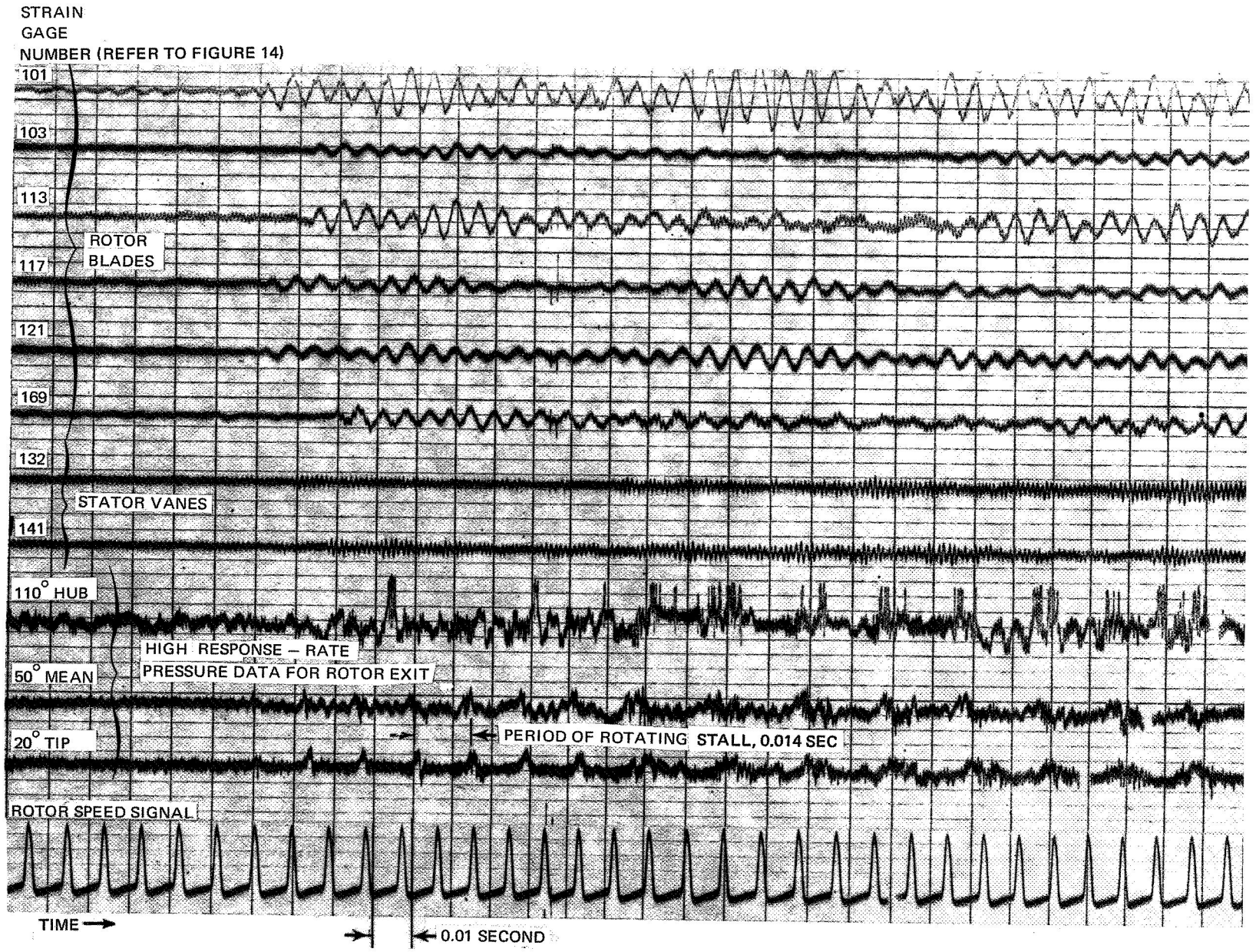


Figure 52 Oscillograph Trace of Stall Without Tip Treatment and With Radial Inlet Distortion at 95 Percent of Design Speed

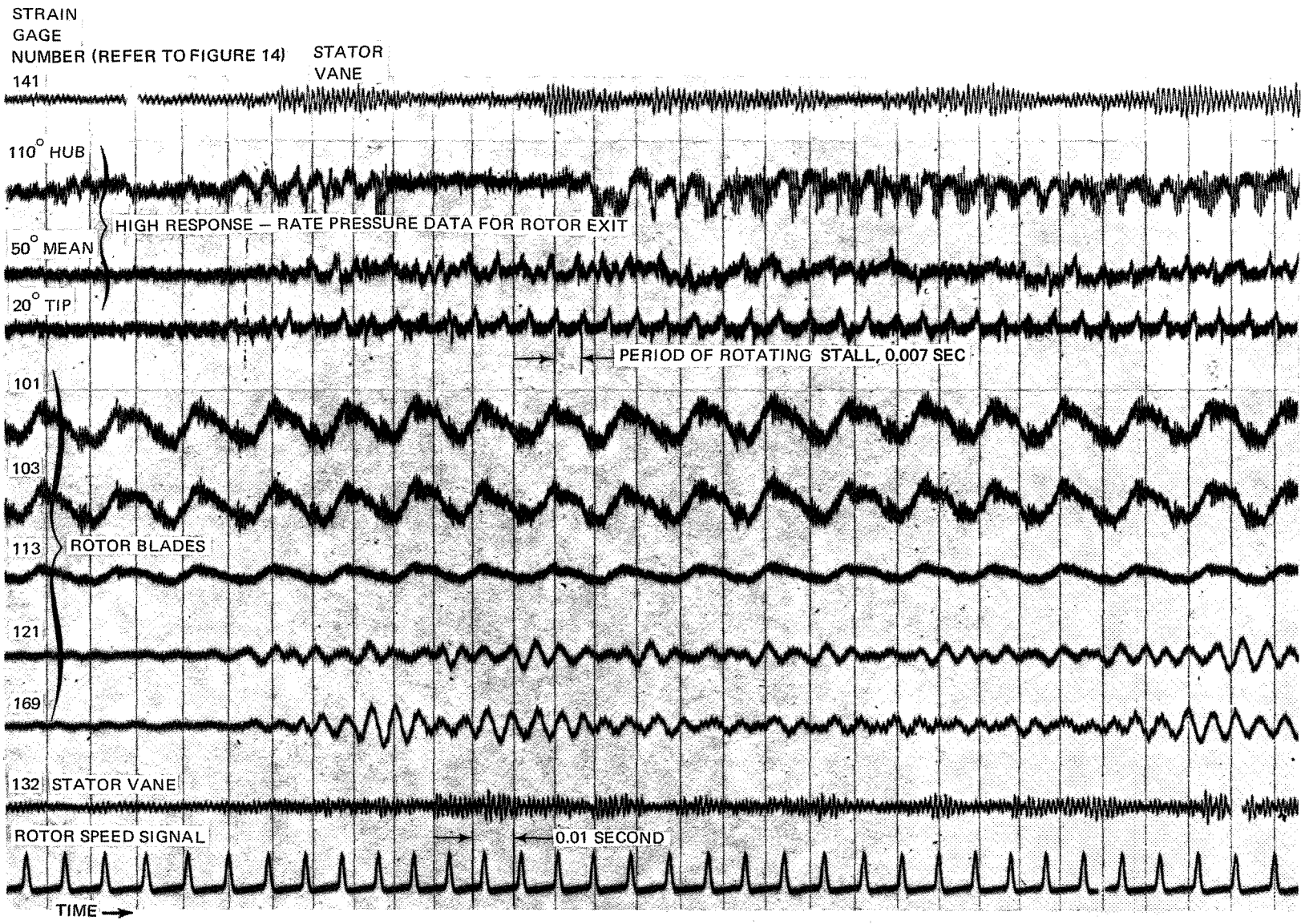


Figure 53 Oscillograph Trace of Stall With Vortex Generators and Radial Inlet Distortion at 95 Percent of Design Speed

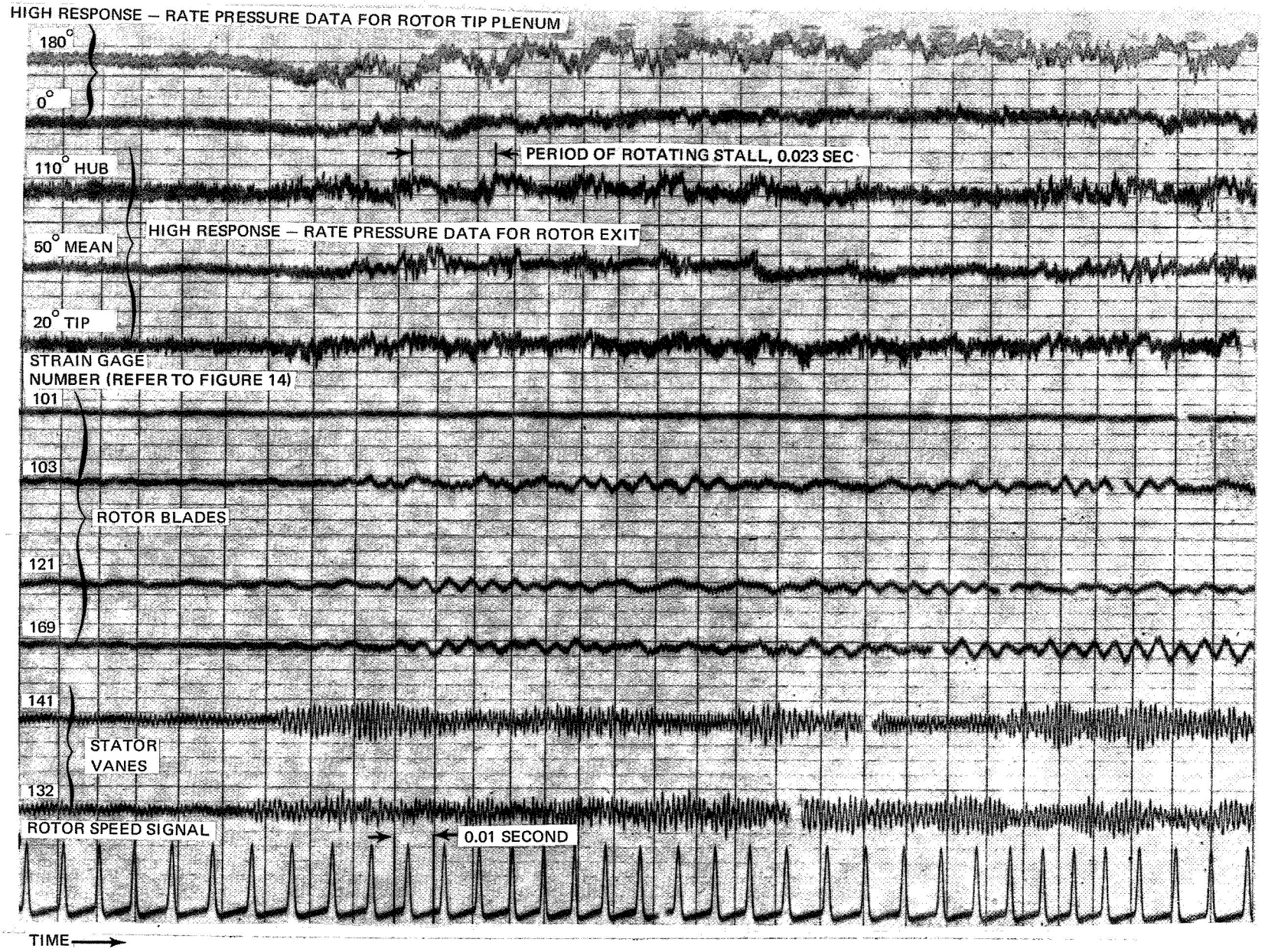


Figure 54 Oscillograph Trace of Stall With Vortex Generators and Honeycomb and With Radial Inlet Distortion at 95 Percent of Design Speed

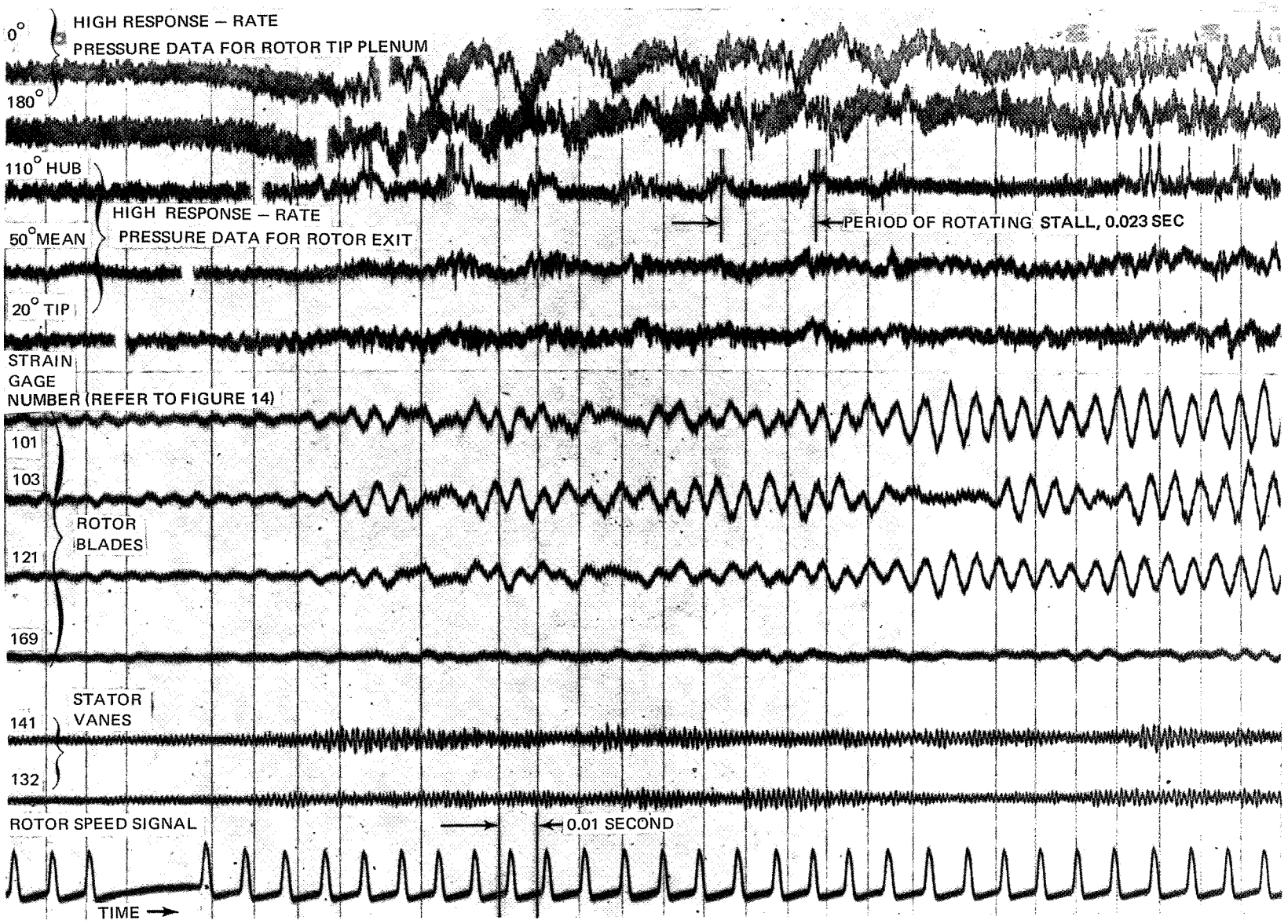


Figure 55 Oscillograph Trace of Stall With Honeycomb and Radial Inlet Distortion at 95 Percent of Design Speed

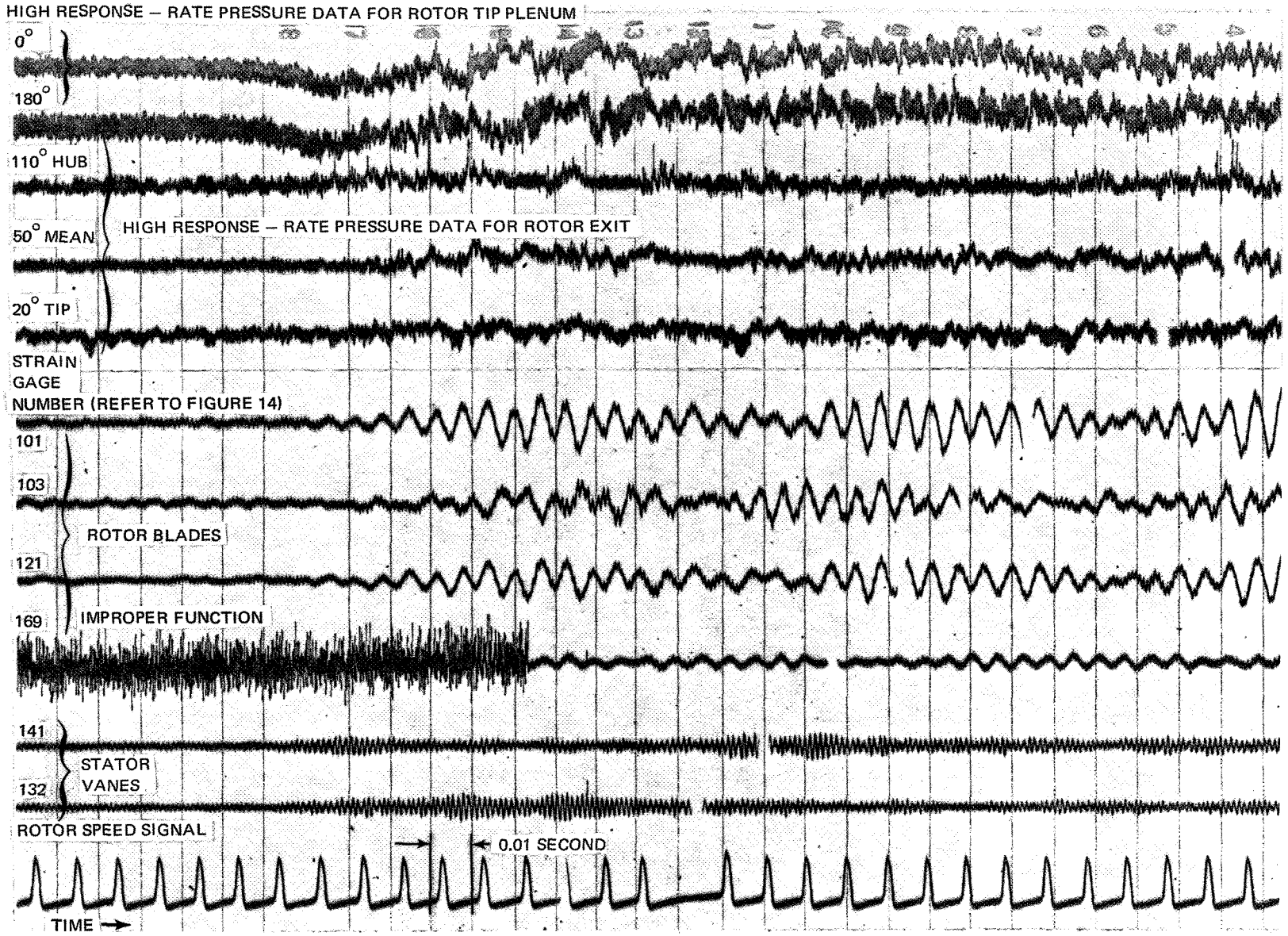


Figure 56 Oscillograph Trace of Stall With Honeycomb and Radial Inlet Distortion at 90 Percent of Design Speed

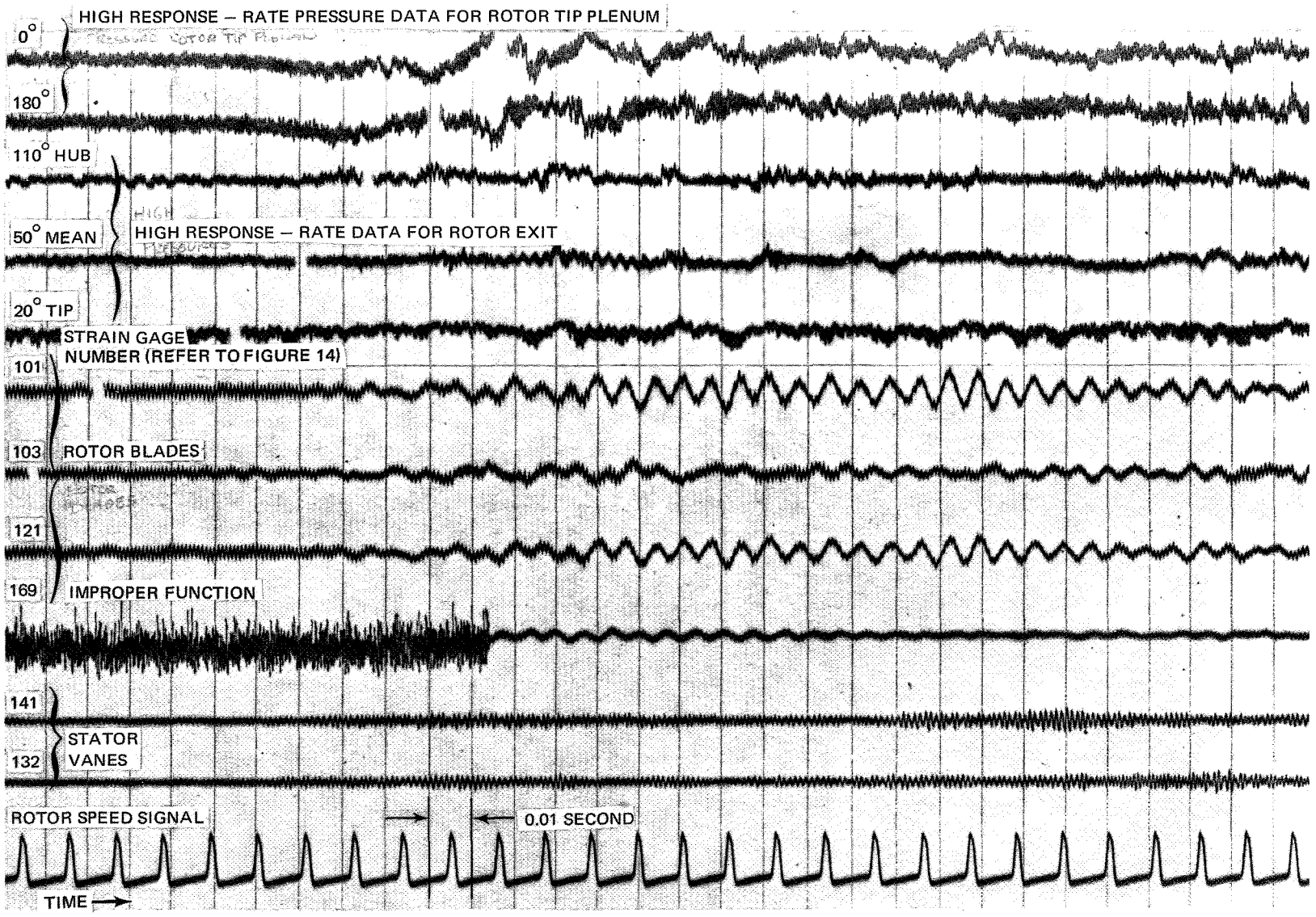


Figure 57 Oscillograph Trace of Stall With Honeycomb and Radial Inlet Distortion at 80 Percent of Design Speed

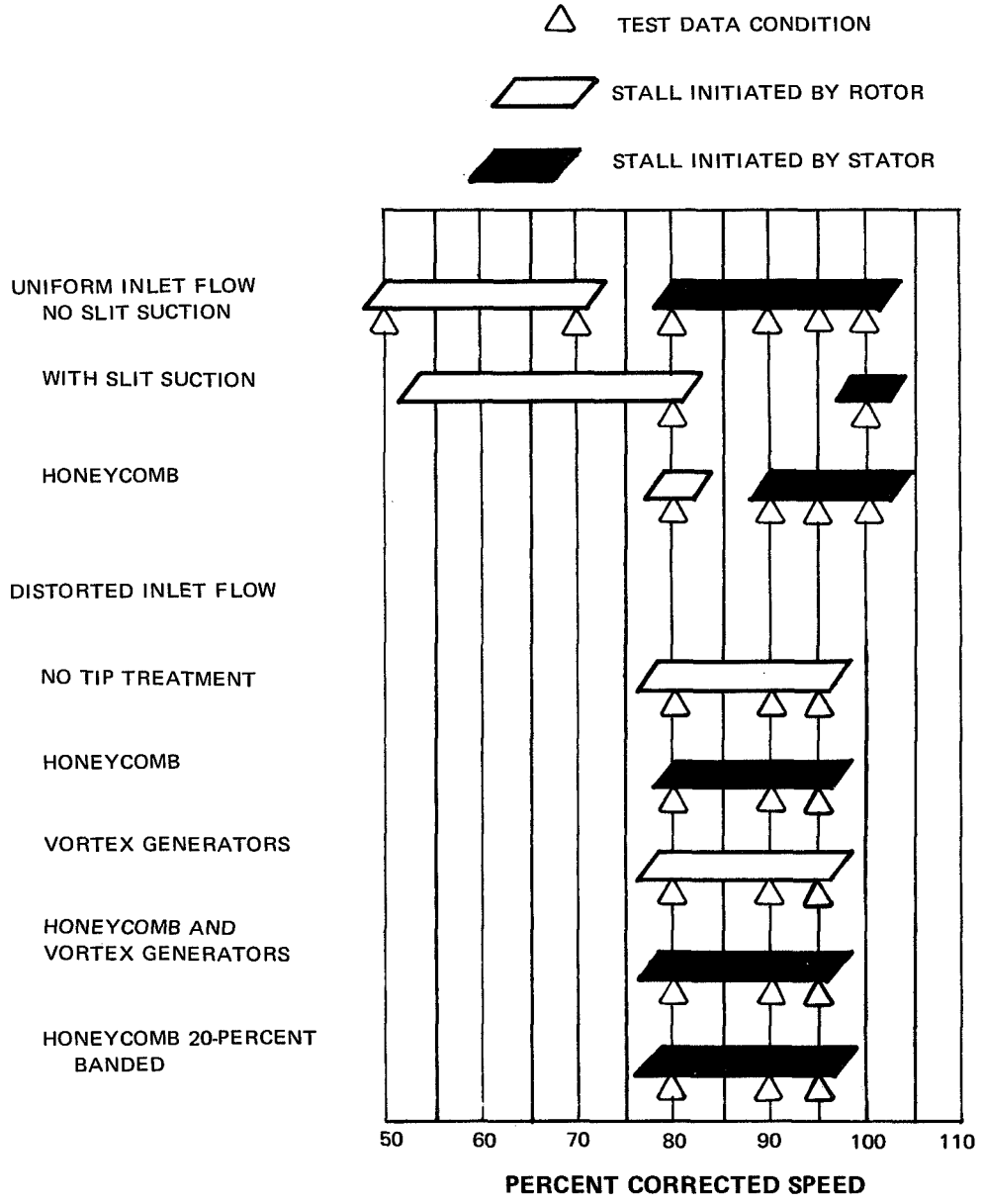


Figure 58 Effect of Stator-Hub-Slit Suction and Various Rotor Tip Treatments on Relative Stability of Rotor and Stator

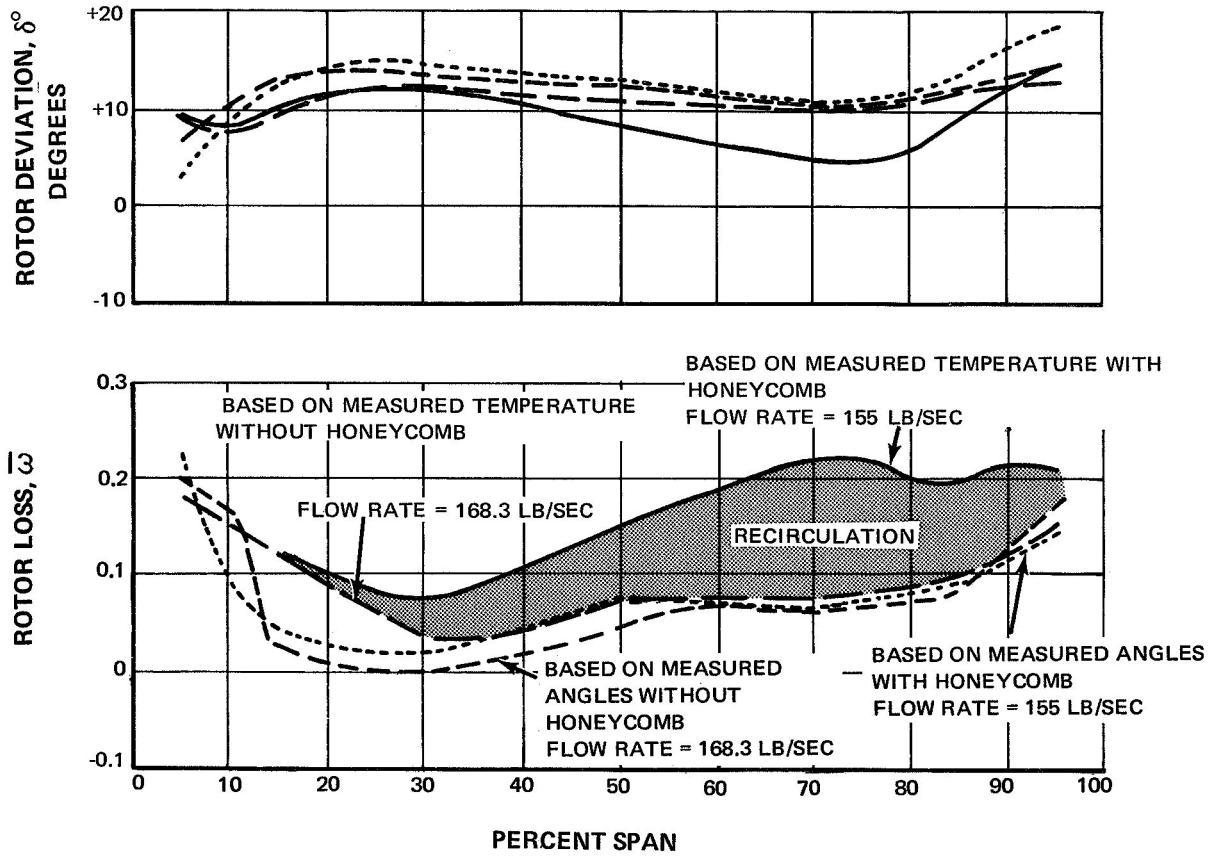


Figure 59 Effect of Honeycomb on Rotor Losses and Deviations Near Stall at 95 Percent of Design Speed With Radial Inlet Distortion

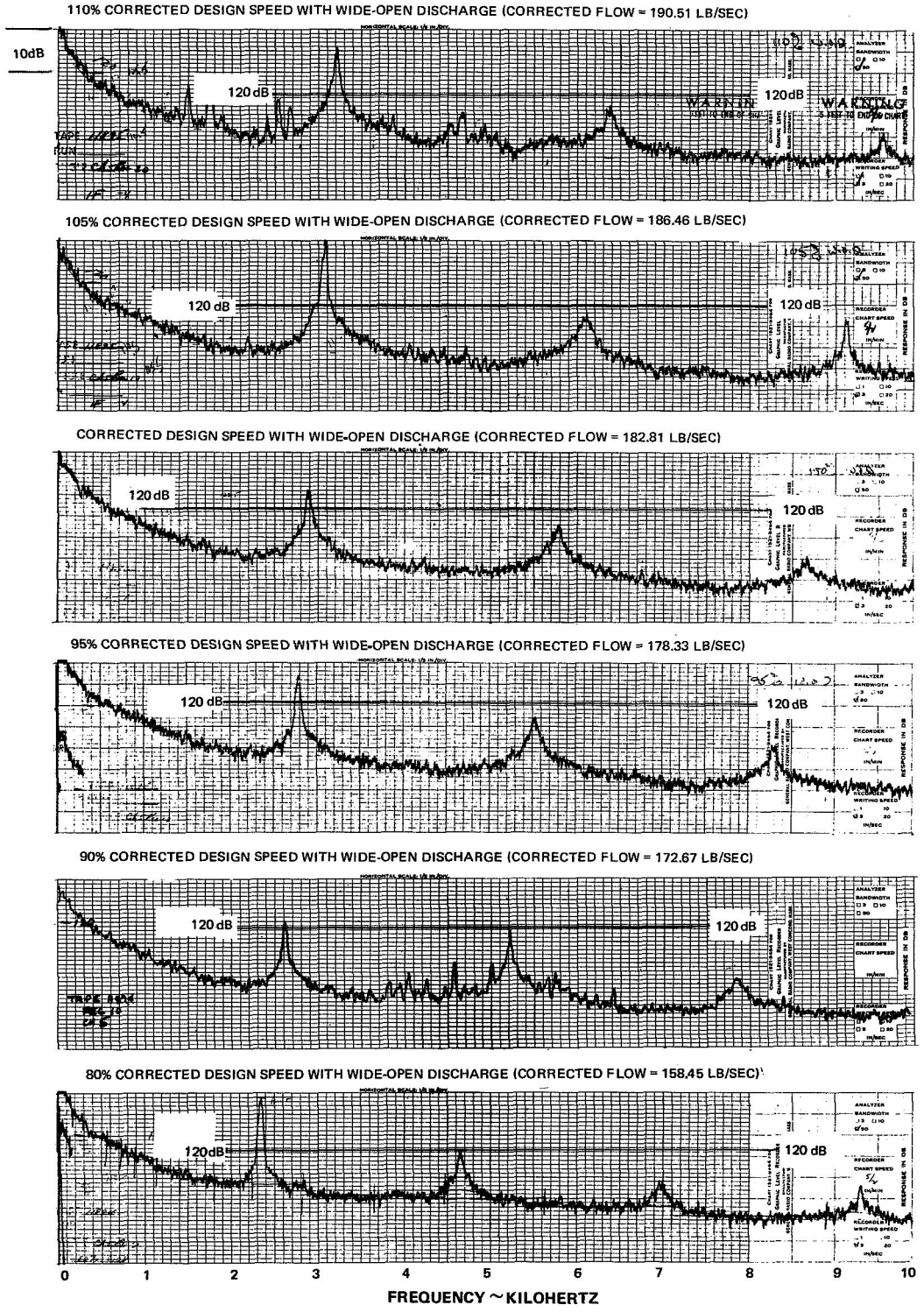


Figure 60 Sound-Pressure-Level Spectra From Plenum Microphone Number 5 for Fan Stage With Honeycomb Tip Treatment Operating With Wide-Open Discharge

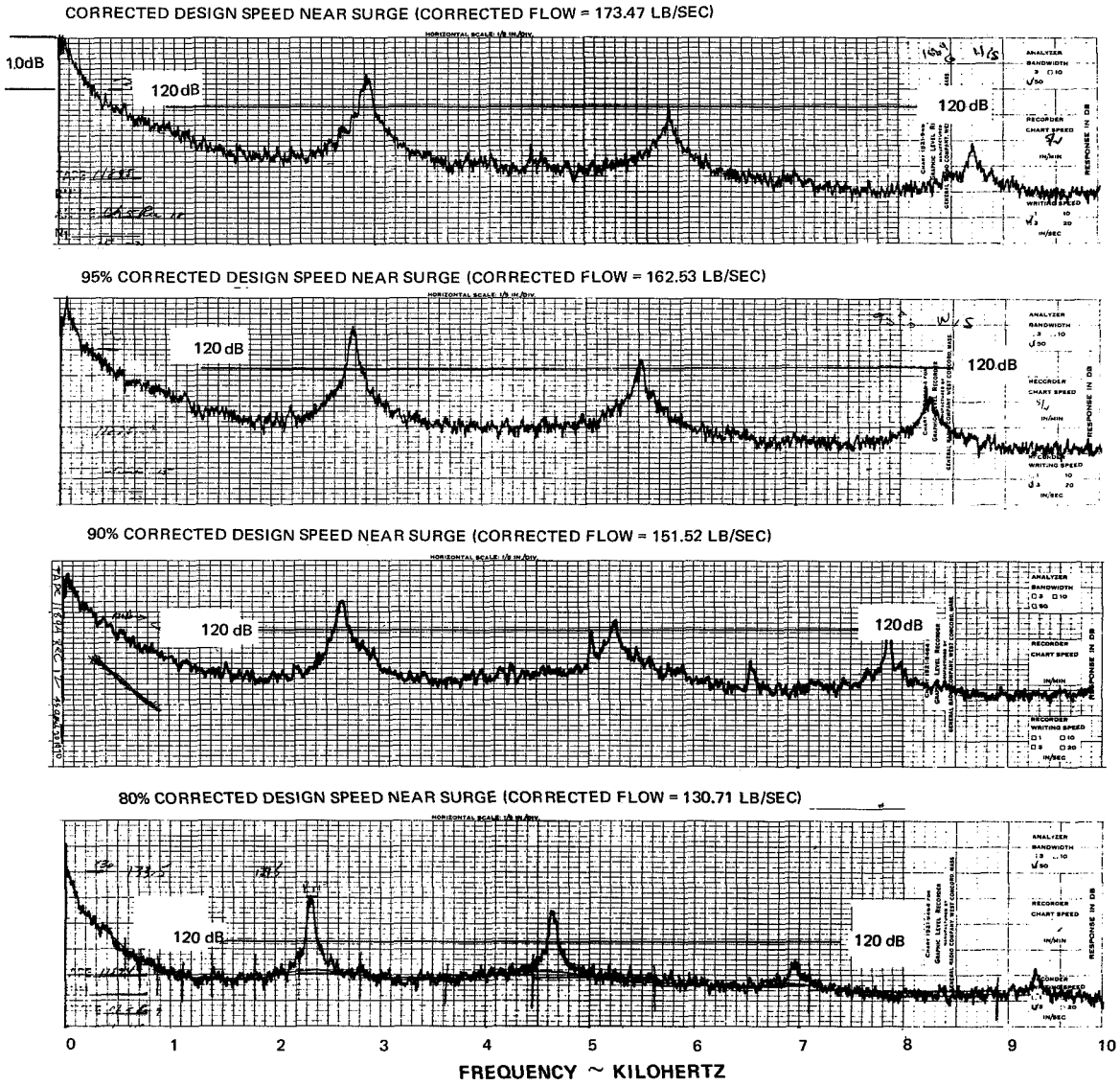


Figure 61 Sound-Pressure-Level Spectra From Plenum Microphone Number 5 for Fan Stage With Honeycomb Tip Treatment Operating Near Stall

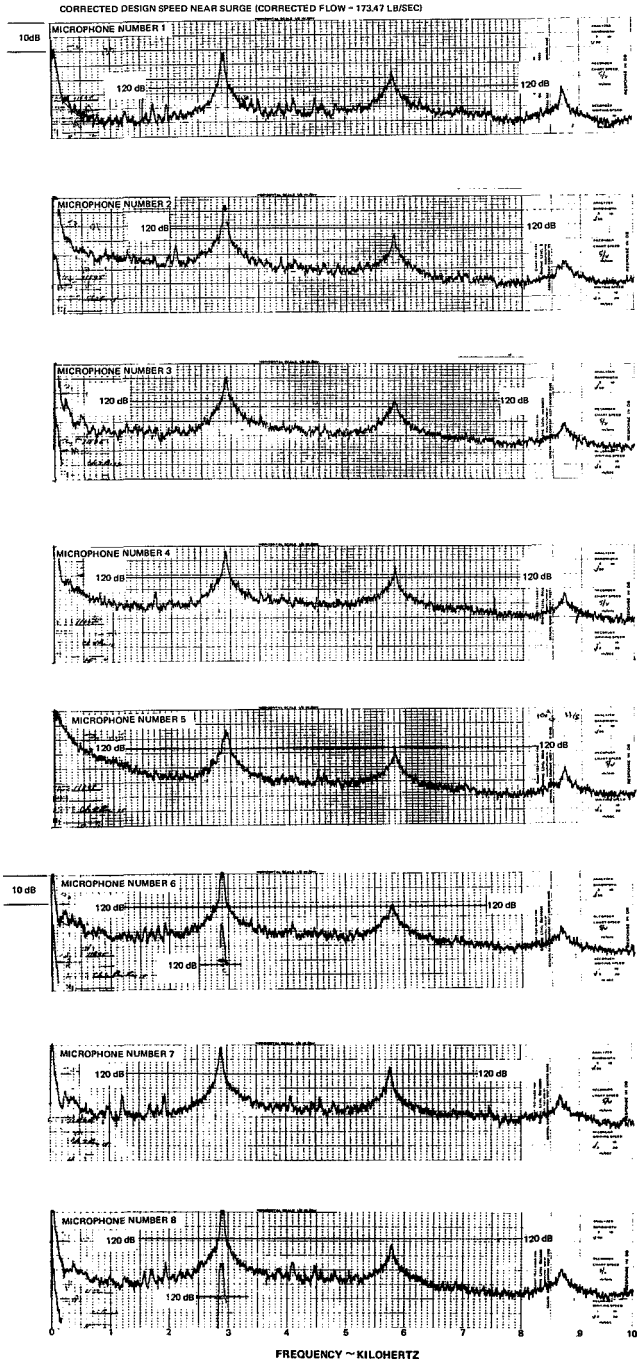


Figure 62 Sound-Pressure-Level Spectra Obtained With Each Inlet Plenum Microphone During Operation of Fan Stage With Honeycomb Tip Treatment at Design Speed Near Stall

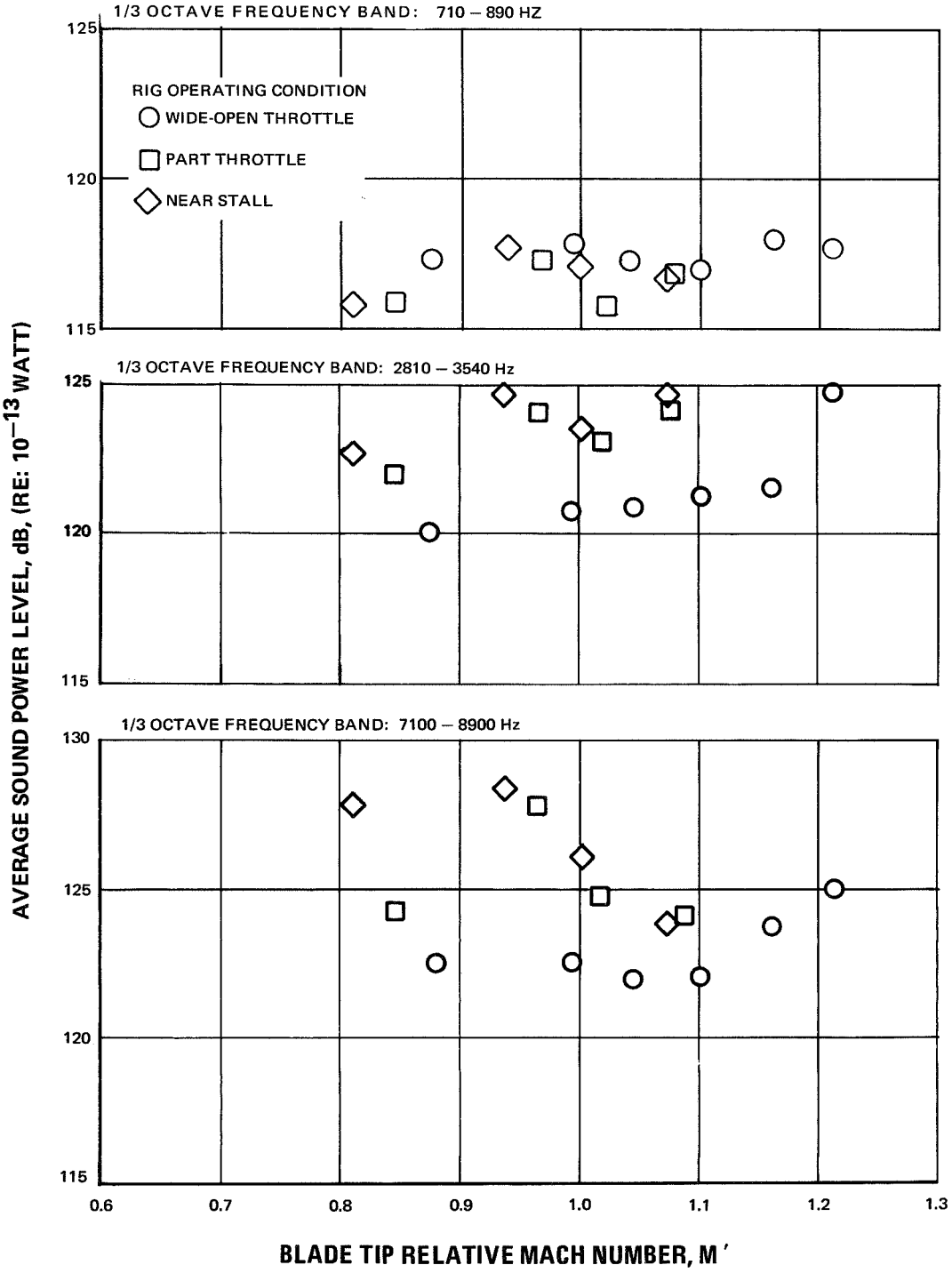


Figure 63 Average Sound Power Levels Produced in Three Typical One-Third Octave Bands by Fan Stage With Honeycomb Tip Treatment

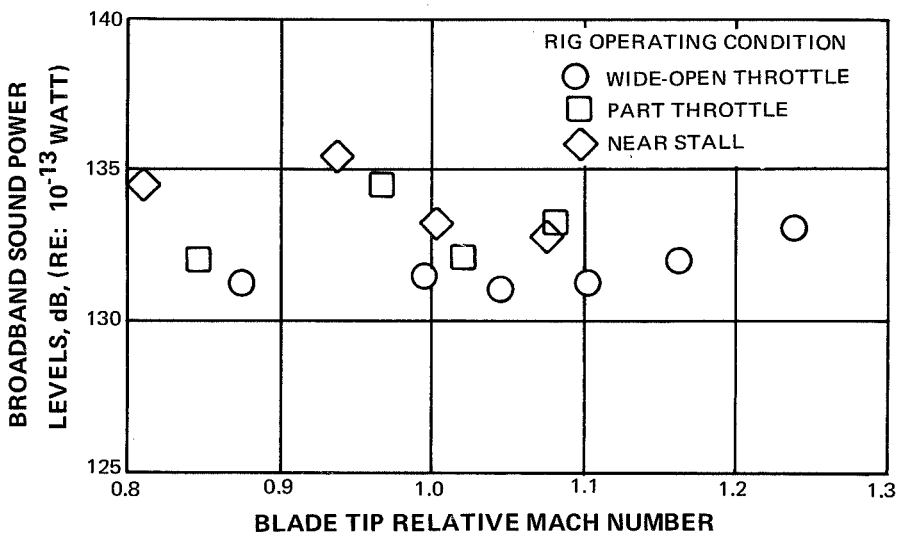


Figure 64 Total Broadband Sound Power Level Produced by Fan Stage With Honeycomb Tip Treatment

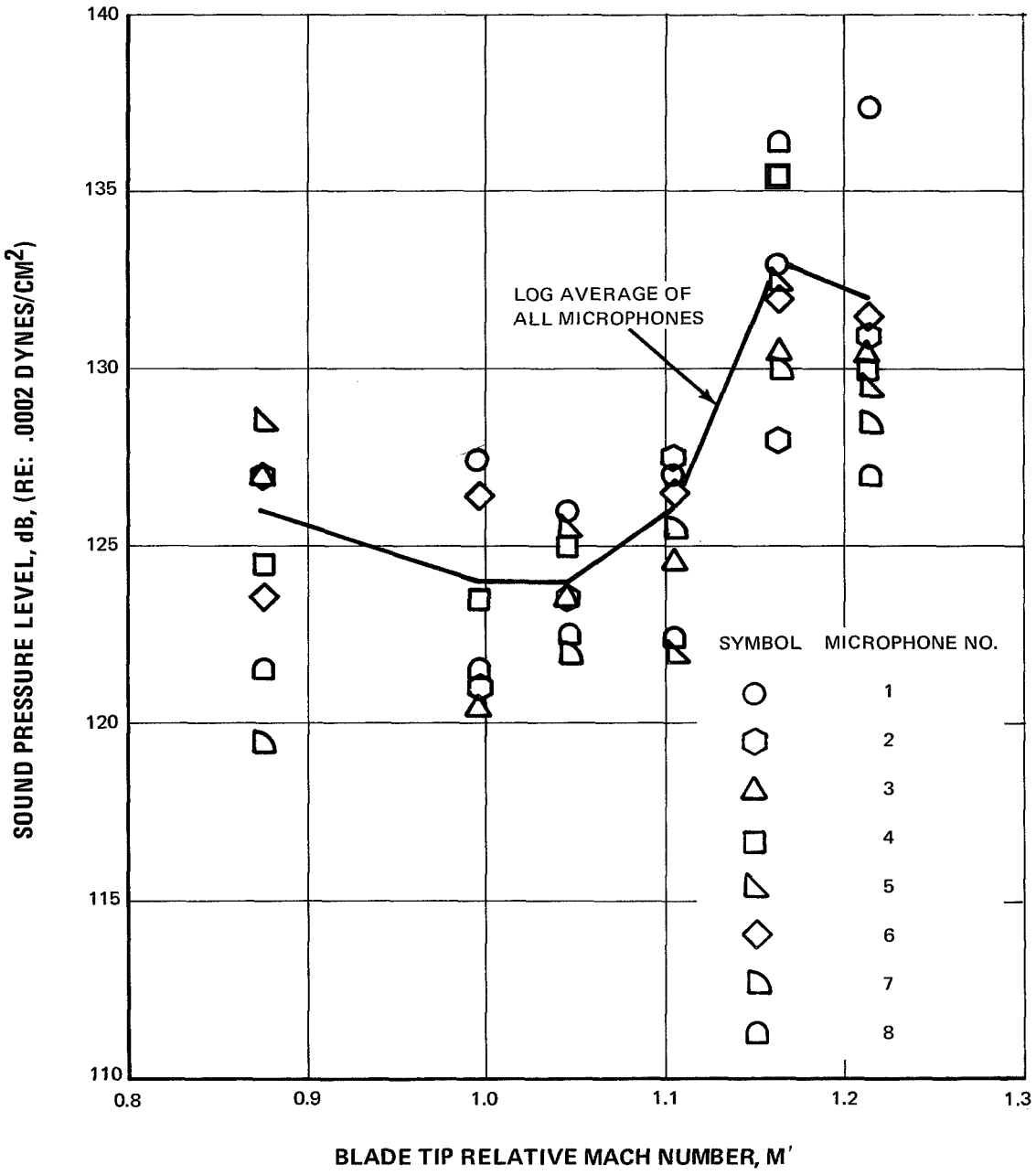


Figure 65 Time-Averaged Blade-Passing Frequency Noise Produced by Fan Stage With Honeycomb Tip Treatment at Wide-Open Throttle

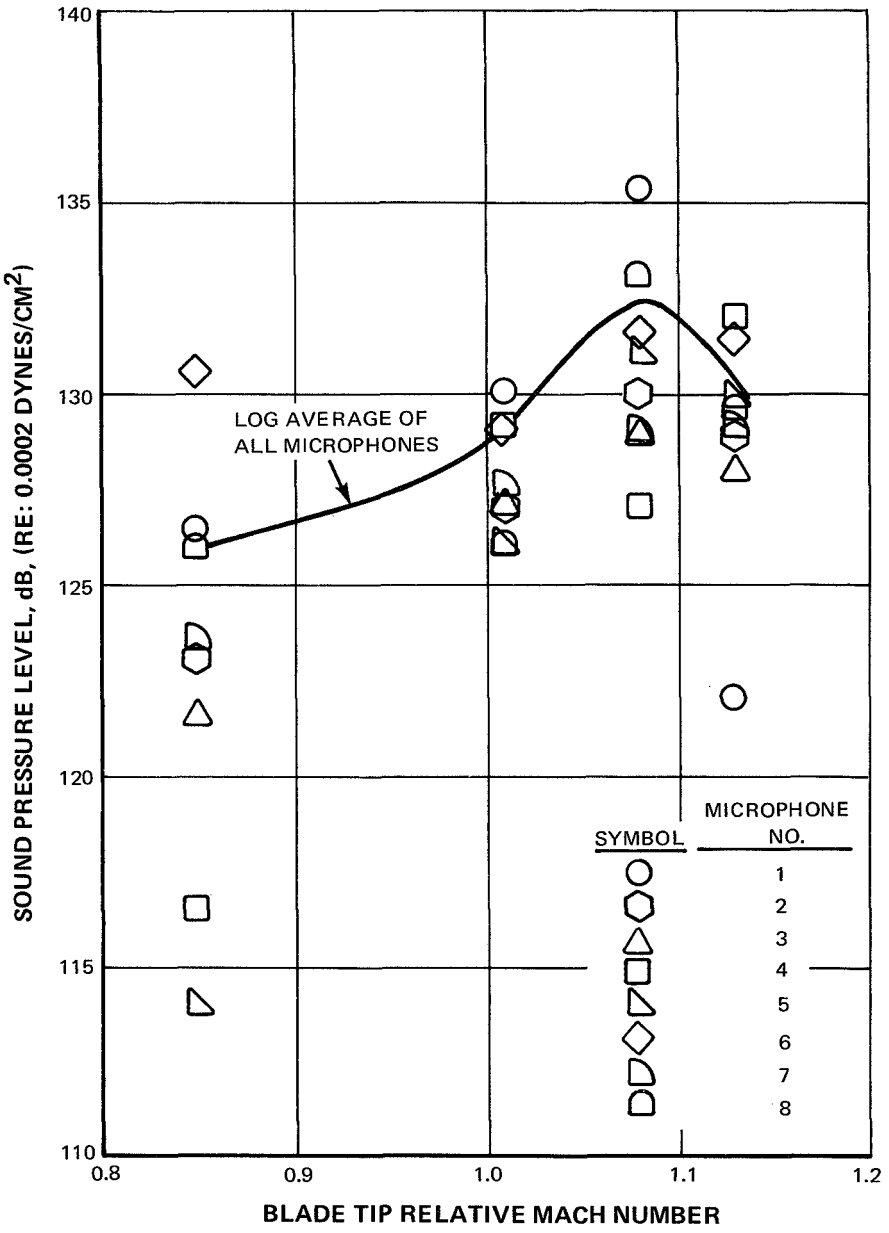


Figure 66 Time-Averaged Blade-Passing-Frequency Noise Produced by Fan Stage With Honeycomb Tip Treatment at Part Throttle

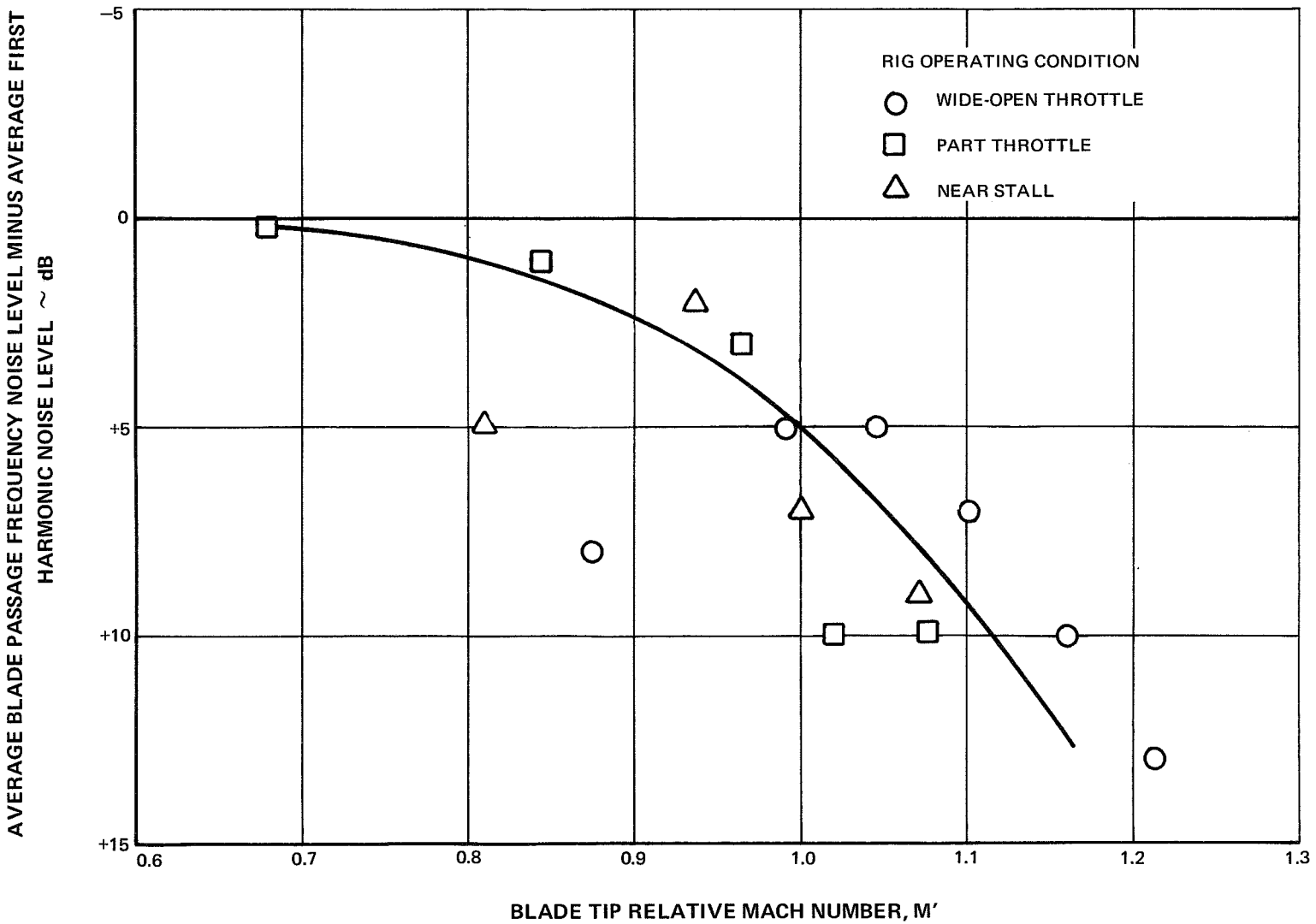


Figure 67 Difference Between Noise Level at Blade-Passing-Frequency and Noise Level at First Harmonic to Blade-Passing-Frequency for Fan With Honeycomb Tip Treatment Showing Relative Decrease in Harmonic Noise Level

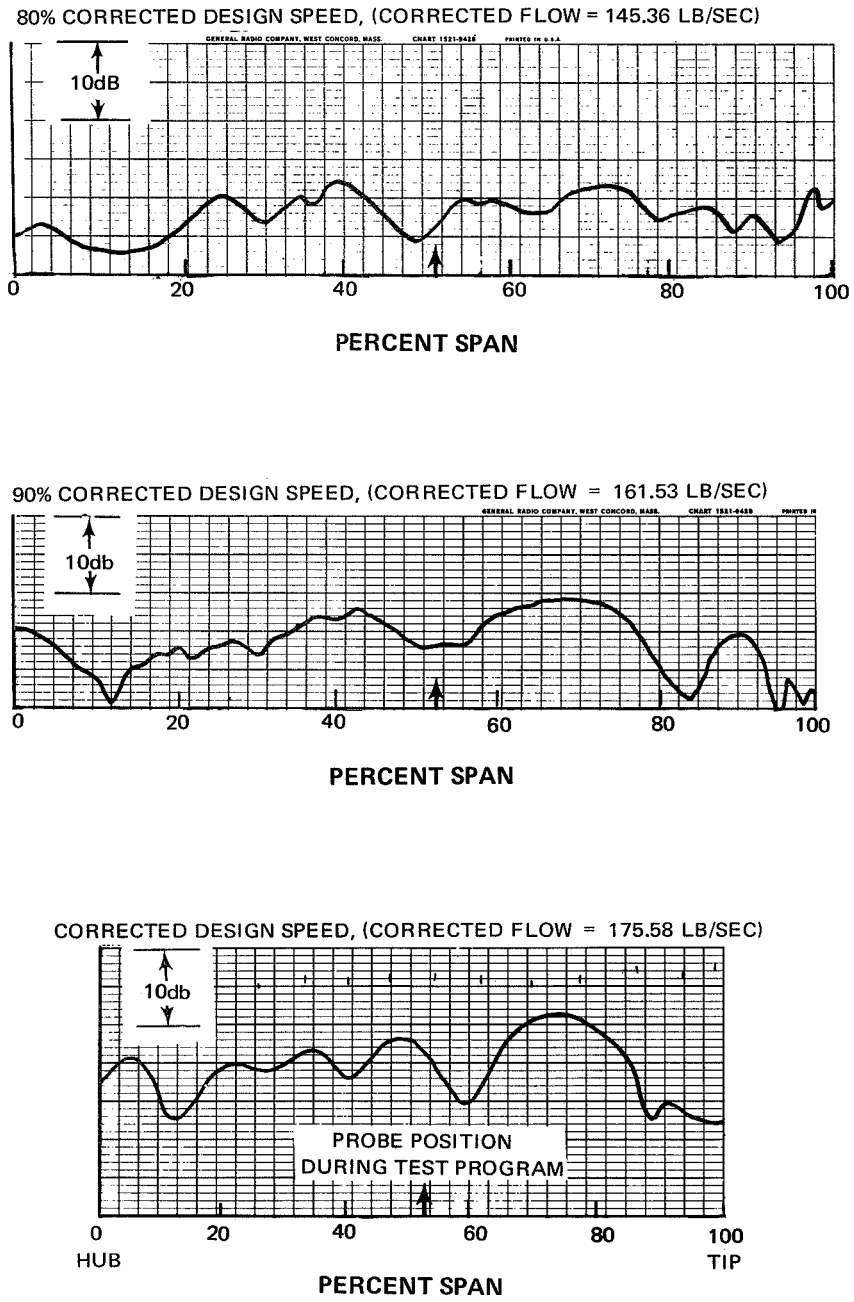


Figure 68 Radial Profiles of Blade-Passing-Frequency Noise Levels Downstream of Stator in Fan With Honeycomb Tip Treatment, Part Throttle

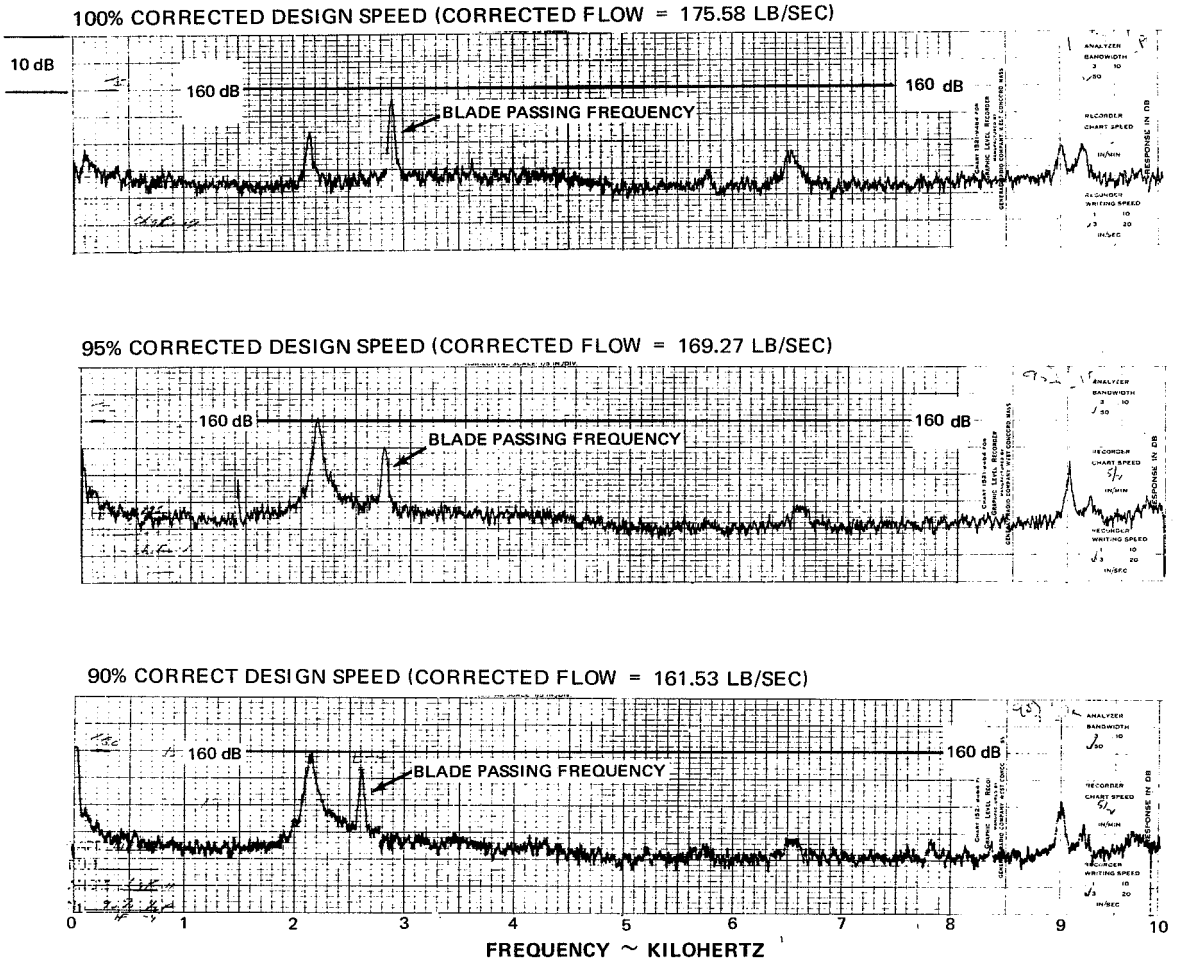


Figure 69 Sound-Pressure-Level Spectra Downstream of Stator In Fan With Honeycomb Tip Treatment, Part Throttle

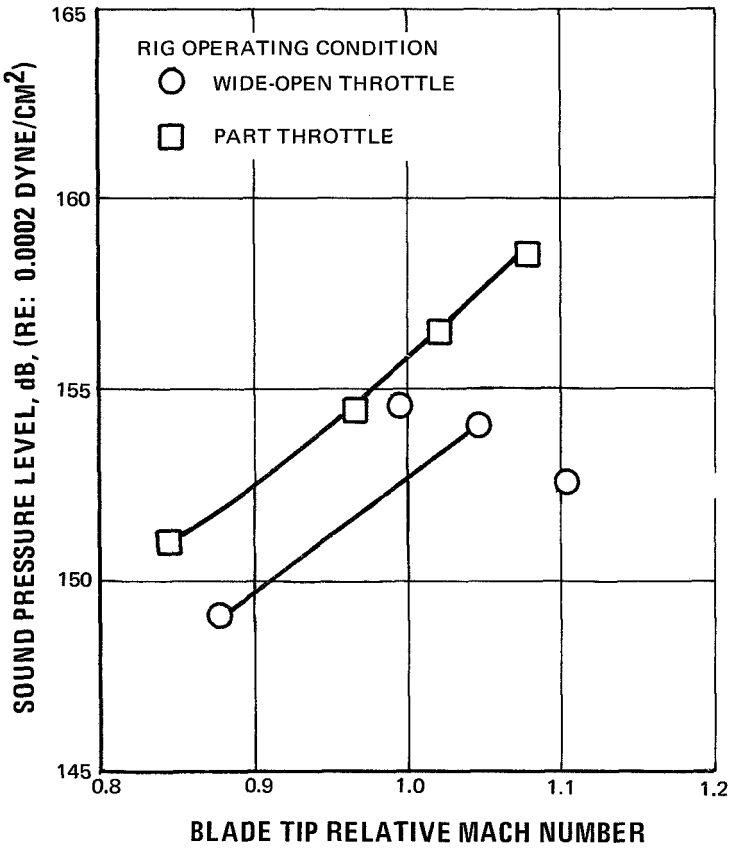


Figure 70 Time-Averaged Blade-Passing-Frequency Sound Pressure Level Downstream of Stator in Fan With Honeycomb Tip Treatment

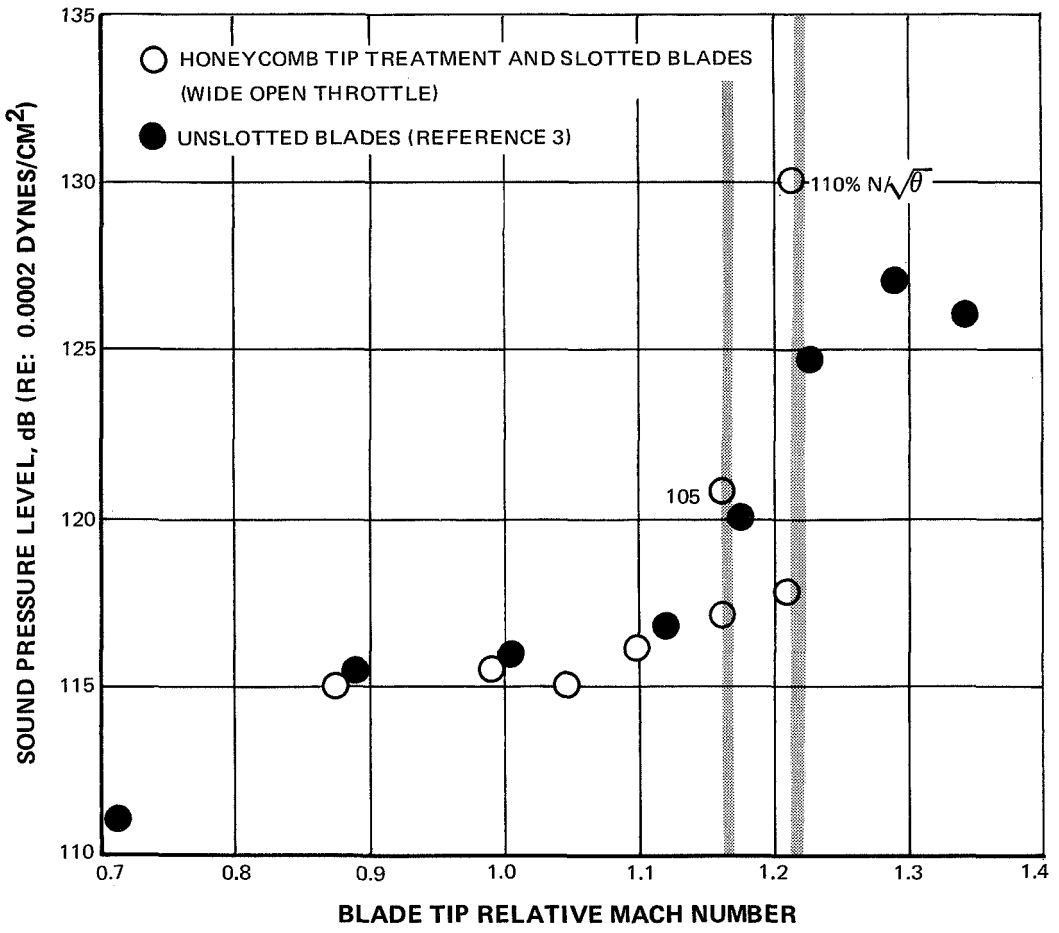


Figure 71 Supersonic Fan Inlet Noise and Integrated Broadband Sound Pressure Levels in Fan With Honeycomb Tip Treatment

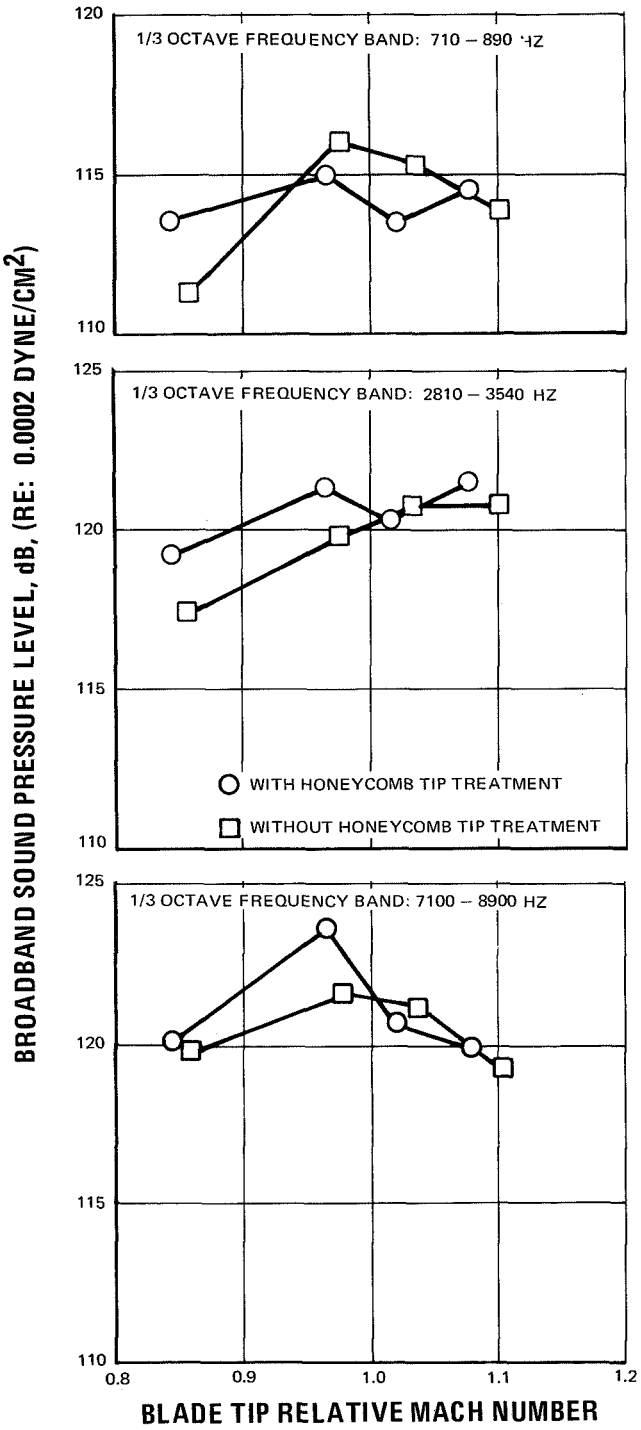


Figure 72 Effect of Honeycomb on Broadband Sound Pressure Levels In Three Typical One-Third Octave Bands at Fan Inlet Along Part-Throttle Operating Line

APPENDIX 1

Symbol and Performance Parameter Definitions

APPENDIX 1

A. Symbols

A_{an}	-	annulus area, ft^2 (station 5, fig 12)
D	-	diffusion factor
dB	-	decibel
f	-	frequency
fz	-	bandwidth of each 1/3 octave, Hz
g_c	-	conversion factor, 32.17 lb_m ft/lb sec^2
H	-	reverberation time, sec
i_m	-	incidence angle, angle between inlet air direction and line tangent to blade mean camber line at leading edge, degrees
i_s	-	incidence angle, angle between inlet air direction and line tangent to blade suction surface at leading edge, degrees
M	-	Mach number
MR	-	mass average in radial direction (tables 25-33)
N	-	rotor speed, rpm
P	-	total pressure, psfa
PWL	-	sound power level based on a reference power of 10^{-13} watt
p	-	static pressure, psfa
R	-	gas constant for air, ft lb/lb_m °R
r	-	radius, ft
SPL	-	sound pressure level (dB, 0.0002 dyne/cm^2)
T	-	total temperature, °R
t	-	static temperature, °R
U	-	rotor speed, ft/sec
V	-	air velocity, ft/sec
V_z	-	axial air velocity, ft/sec
Vm	-	meridional air velocity, $(V_r^2 + V_z^2)^{1/2}$, ft/sec
V_θ	-	tangential component of air velocity $(V^2 - Vm^2)^{1/2}$, ft/sec
v	-	volume of a chamber, ft^3
W	-	weight flow, lbs/sec

β	-	absolute air angle $\left[\cot^{-1} (V_m/V_\theta)\right]$ degrees
β'^*	-	metal angle on conical surface between tangent to mean camber line and axial direction at leading and trailing edge, degrees
$\Delta\beta$	-	air turning angle $\beta'_5 - \beta'_6$ for rotors and $\beta_{11} - \beta_{12}$ for stators, degrees
$\Delta\beta^*$	-	camber angle, degrees
λ	-	ratio of specific heats for air, 1.4
δ	-	ratio of inlet total pressure to standard pressure of 2116.22 lbs/ft^2
δ^c	-	deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, degrees
ϵ	-	angle between tangent to streamline projected on meridional plane and axial direction, degrees
η	-	efficiency, %
θ	-	ratio of inlet total temperature to standard temperature of 518.6°R
ρ	-	mass density, lbs-sec^2/ft^4
σ	-	solidity, ratio of chord to spacing
$\overline{\omega}$	-	total pressure loss coefficient
ω	-	angular velocity of rotor, radians/sec

Superscripts:

'	-	relative to moving blades
*	-	designates blade metal angle

Subscripts:

ad	-	adiabatic
p	-	polytropic or profile
r	-	radial direction
sh	-	shock
s	-	suction surface
z	-	axial direction
0	-	plenum chamber
4	-	instrument plane upsteam of rotor
5	-	station at rotor inlet
6	-	station at rotor exit
10	-	instrument plane upstream of stator
11	-	station at stator leading edge
12	-	station at stator trailing edge
13	-	instrument plane downstream of stator
COR	-	corrected to standard day conditions

B. Performance Parameter Definitions

a) Relative total temperature

$$T'_5 = t_5 \left[1 + \frac{\gamma - 1}{2} (M'_5)^2 \right] \qquad \text{(rotor in)}$$

$$T'_6 = T'_5 + \left[\frac{(\omega r_5)^2 - (\omega r_6)^2}{\frac{2\gamma}{\gamma - 1} Rg_c} \right] \qquad \text{(rotor out)}$$

b) Incidence angle based on mean camber line

$$i_m = \beta'_5 - \beta'^*_5 \qquad \text{(rotor)}$$

$$i_m = \beta_{11} - \beta^*_{11} \qquad \text{(stator)}$$

c) Deviation (DEV, $\delta°$)

$$\delta° = \beta'_6 - \beta'^*_6 \qquad \text{(rotor)}$$

$$\delta° = \beta_{12} - \beta^*_{12} \qquad \text{(stator)}$$

d) Diffusion factor (D-FAC)

$$D = 1 - \frac{V'_6}{V'_5} + \frac{r_6 V_{\theta 6} - r_5 V_{\theta 5}}{(r_5 + r_6)\sigma V'_5} \qquad \text{(rotor)}$$

$$D = 1 - \frac{V_{12}}{V_{11}} + \frac{r_{11} V_{\theta 11} - r_{12} V_{\theta 12}}{(r_{11} + r_{12})\sigma V_{11}} \qquad \text{(stator)}$$

e) Loss coefficient (OMEGA-B)

$$\bar{\omega} = \frac{P'_5 \left[\frac{T'_6}{T'_5} \right]^{\frac{\gamma}{\gamma - 1}} - P'_6}{P'_5 - p_5} \qquad \text{(rotor)}$$

$$\bar{\omega} = \frac{P_{11} - P_{12}}{P_{11} - p_{11}} \qquad \text{(stator)}$$

f) Loss parameter (LOSS-P)

$$\frac{\bar{\omega} \cos \beta'_6}{2\sigma} \qquad \text{(rotor)}$$

$$\frac{\bar{\omega} \cos \beta_{12}}{2\sigma} \qquad \text{(stator)}$$

g) Polytropic efficiency (EFF-P, TOTAL)

1) $$\eta_p = \frac{\frac{\gamma-1}{\gamma} \ln\left[\frac{P_6}{P_5}\right]}{\ln\left[\frac{T_6}{T_5}\right]} \qquad \text{(rotor)}$$

2) $$\eta p = \frac{\frac{\gamma-1}{\gamma} \ln\left[\frac{p_{12}}{p_{11}}\right]}{\ln\left[\frac{t_{12}}{t_{11}}\right]} \qquad \text{(stator)}$$

h) Adiabatic efficiency (EFF-AD, TOTAL)

$$\eta ad = \frac{\left[\frac{P_6}{P_5}\right]^{\frac{\gamma-1}{\gamma}} - 1}{\left[\frac{T_6}{T_5}\right] - 1} \qquad \text{(rotor)}$$

$$\eta_{ad} = \frac{\left[\frac{P_{12}}{P_5}\right]^{\frac{\gamma-1}{\gamma}} - 1}{\left[\frac{T_{12}}{T_5}\right] - 1} \qquad \text{(stage)}$$

i) Wake blockage factor

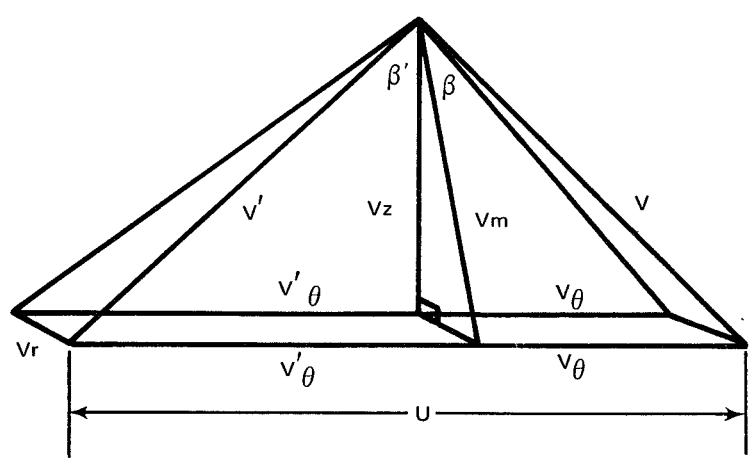
$$\bar{K} = \frac{\sum_1^n \rho AV}{n} \Big/ \rho AV_{avg}$$

where n is number of tangential traverse points equally spaced across a stator gap and ρAV_{avg} is calculated from mass flow averaged values of P, p, and T at that radius.

j) Stall margin

$$SM = \left[\left(\frac{\frac{P_{12}}{P_5}}{\frac{W\sqrt{\theta}}{\delta}} \right)_{\text{at stall}} \times \left(\frac{\frac{W\sqrt{\theta}}{\delta}}{\frac{P_{12}}{P_5}} \right)_{\text{at reference point}} - 1 \right] \times 100\%$$

Where the reference herein is the corresponding stall point without tip treatment. (Note: For absolute values of stall margin, the reference is generally an operating point near peak efficiency.)



APPENDIX 2

Blade Element and Overall Performance
with
Uniform Inlet Flow
and
No Tip Treatment

ROTOR

Identification of Blade-Element and Overall Performance Table Headings

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5																		
10																		
15																		
30																		
50	$2r_5$	$2r_6$	V_5	V_6	V_{m5}	V_{m6}	$V_{\theta 5}$	$V_{\theta 6}$	β_5	β_6	β'_5	β'_6	V'_5	V'_6	$V'_{\theta 5}$	$V'_{\theta 6}$	U_5	U_6
70																		
85																		
90																		
95																		

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5																		
10																		
15																		
30																		
50	i_{s5}	i_{m5}	δ°_6	$\Delta\beta$	$\Delta\beta^*$	$\bar{\omega}_{sh}$	D	$\bar{\omega}$	$\frac{\bar{\omega}\cos\beta'_6}{2\sigma}$	$\frac{(\bar{\omega}-\bar{\omega}_{sh})\cos\beta'_6}{2\sigma}$	$\frac{P_6}{P_5}$	η_p	η_{ad}	η_p	M_5	M_6	M'_5	M'_6
70																		
85																		
90																		
95																		

T02/ T01	P02/ P01	EFF-AD %	EFF-P %
$\frac{T_6}{T_5}$	$\frac{P_6}{P_5}$	η_{ad}	η_p

STA-1	STA-2	SLANT-1 DEGREE	SLANT-2 DEGREE
5	6		

See Figure 12

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5																		
10																		
15																		
30																		
50	$2r_{11}$	$2r_{12}$	V_{11}	V_{12}	V_{m11}	V_{m12}	$V_{\theta 11}$	$V_{\theta 12}$	β_{11}	β_{12}	β'_{11}	β'_{12}	V'_{11}	V'_{12}	$V'_{\theta 11}$	$V'_{\theta 12}$	U_5	U_6
70																		
85																		
90																		
95																		

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5																		
10																		
15																		
30																		
50	i_{s11}	i_{m11}	δ°_{12}	$\Delta\beta$	$\Delta\beta^*$	$\bar{\omega}_{sh}$	D	$\bar{\omega}$	$\frac{\bar{\omega}\cos\beta'_{12}}{2\sigma}$	$\frac{(\bar{\omega}-\bar{\omega}_{sh})\cos\beta'_{12}}{2\sigma}$	$\frac{P_{12}}{P_{11}}$	η_p	η_{ad}	η_p	M_{11}	M_{12}	M'_{11}	M'_{12}
70																		
85																		
90																		
95																		

NCOR-1 RPM	WCOR-1 LBM/SEC	WC/A-1 LBM/SEC SQFT	T02/ T01	P02/ P01	EFF-AD %	EFF-P %
$\frac{N}{\sqrt{\theta}}$	$\frac{W\sqrt{\theta}}{\delta}$	$\frac{W\sqrt{\theta}}{\delta A_{an}}$	$\frac{T_{12}}{T_5}$	$\frac{P_{12}}{P_5}$	η_{ad}	η_p

STA-1	STA-2
11	12

See Figure 12

Aerodynamic Design - Blade Element and Over-all Performance

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	614	995	605.4	538.5	0	807.8	0	55.9	35.5	-26.2	751	632	-412	305	424	518
10	14.100	16.790	620	983	621.5	566.1	0	775.8	0	52.0	37.0	-21.0	778	645	-445	241	455	544
15	15.170	17.580	627	971	627.4	630.0	0	734.8	0	49.2	38.6	-15.4	804	656	-488	170	489	568
30	18.280	19.910	650	916	652.1	640.4	0	655.1	0	45.6	42.7	- 0.6	877	641	-602	7	586	643
50	22.190	23.090	671	836	671.1	606.1	0	576.4	0	43.8	47.2	15.5	981	629	-716	-173	714	742
70	25.880	26.260	680	782	680.4	583.9	0	525.0	0	41.7	51.1	29.4	1077	668	-836	-328	838	848
85	28.450	28.610	682	755	682.6	569.9	0	492.3	0	40.8	53.3	37.5	1145	715	-918	-432	918	923
90	29.320	29.410	683	747	682.8	564.1	0	488.0	0	40.8	54.1	39.6	1167	729	-946	-461	944	949
95	30.150	30.180	683	737	682.6	556.9	0	487.9	0	41.3	54.8	41.8	1189	738	-974	-488	969	973

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.1	0.81	10.3	61.7	71.1	0	.390	.0673	.0124	.0124	1.540	.9601	.9576		.5654	.902	.698	.514
10	-5.0	1.65	11.5	58.0	66.1	0	.385	.0377	.0077	.0077	1.540	.9750	.9735		.5718	.891	.717	.586
15	-4.3	1.99	12.2	54.0	63.0	0	.400	.0264	.0057	.0057	1.540	.9807	.9795		.5797	.878	.738	.594
30	-3.0	2.69	13.0	43.3	53.2	0	.473	.0334	.0085	.0085	1.540	.9719	.9702		.6045	.820	.813	.574
50	-1.6	3.41	11.2	31.7	39.0	0	.535	.0481	.0136	.0136	1.540	.9535	.9506		.6245	.740	.909	.551
70	-0.5	3.73	9.0	21.7	26.9	.0087	.537	.0673	.0190	.0165	1.540	.9274	.9229		.6328	.686	1.001	.586
85	0.0	3.71	7.1	15.8	19.5	.0142	.525	.0867	.0238	.0199	1.540	.9022	.8961		.6342	.658	1.066	.624
90	0.0	3.53	6.8	14.5	18.3	.0162	.523	.0979	.0269	.0225	1.540	.8871	.8800		.6360	.649	1.089	.635
95	-0.2	3.20	7.0	13.0	17.4	.0186	.533	.1197	.0313	.0263	1.540	.8672	.8589		.6358	.642	1.110	.642

TO2/ TO1	P02/ P01	EFF-AD %	EFF-P %	STA-1	STA-2
1.1410	1.5400	93.3	93.8	5.0	6.0

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	978	575	622.7	575	747	0	49.7	0	-16.9	46.30	652	818	179	-601	571	598
10	18.350	19.110	962	600	641.6	600	710	0	47.8	0	-11.4	46.05	657	850	119	-618	592	616
15	19.070	19.740	947	617	659.3	617	678	0	45.8	0	- 5.9	46.00	662	882	64	-637	614	637
30	21.140	21.600	914	636	673.8	636	614	0	42.4	0	6.1	47.55	676	943	-68	-698	682	697
50	23.970	24.200	875	630	674.3	630	555	0	39.5	0	17.8	51.00	708	1005	-216	-782	777	782
70	26.790	26.880	840	624	665.0	624	511	0	37.6	0	28.0	54.23	752	1070	-354	-867	868	871
85	28.860	28.900	818	619	655.4	619	488	0	36.7	0	33.9	56.52	889	1120	-442	-933	939	935
90	29.570	29.600	811	616	649.8	616	484	0	36.8	0	35.8	57.30	802	1135	-469	-954	956	957
95	30.240	30.270	805	612	642.4	612	485	0	37.0	0	37.3	58.08	809	1152	-492	-978	977	978

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	0	3.95	16.2	49.7	61.8	0	.593	.210	.0485	.0485	.9184	0	0	.7682	.885	.4923	.5890	.706
10	0	4.25	15.9	47.8	59.2	0	.558	.165	.0399	.0399	.9365	0	0	.7989	.870	.5142	.5928	.734
15	0	4.32	15.5	45.8	56.8	0	.528	.129	.0307	.0307	.9526	0	0	.8338	.854	.5335	.5965	.763
30	0	4.79	13.9	42.4	51.7	0	.495	.069	.0171	.0171	.9751	0	0	.8926	.817	.5510	.6053	.823
50	0	5.48	10.3	39.5	44.7	0	.483	.046	.0154	.0154	.9831	0	0	.9114	.777	.5458	.6305	.867
70	0	6.09	12.5	37.6	44.4	0	.473	.043	.0192	.0192	.9830	0	0	.8940	.743	.5389	.6654	.920
85	0	6.50	15.2	36.7	45.2	0	.473	.061	.0273	.0273	.9789	0	0	.8571	.719	.5322	.6955	.960
90	0	6.59	15.8	36.8	45.9	0	.477	.073	.0312	.0312	.9765	0	0	.8397	.712	.5281	.7037	.975
95	0	6.75	16.3	37.0	46.8	0	.484	.096	.0369	.0369	.9729	0	0	.8163	.705	.5234	.7070	.988

NCOR-1 RPM	WCOR-1 LBM/SEC	WC/A-1 LBM/SEC SQFT	TO2/ TO1	P02/ P01	EFF-AD %	EFF-P %	STA-1	STA-2
7400.0	185.0	42.0	1.1410	1.5000	87.3	88.1	11.0	12.0

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	495.2	957.2	495.2	605.0	.0	741.7	.00	50.80	34.28	-28.56	599.3	688.8	-337.5	329.3	337.5	412.4
10	14.100	16.790	505.2	934.2	505.2	587.0	.0	726.7	.00	51.06	35.68	-26.64	621.9	657.2	-362.7	294.8	362.7	431.9
15	15.170	17.580	515.2	900.1	515.2	594.5	.0	675.3	.00	48.61	37.13	-20.53	646.4	636.3	-390.2	223.0	390.2	452.2
30	18.260	19.910	539.5	807.6	539.5	596.2	.0	544.6	.00	42.36	41.05	-3.06	715.8	599.3	-470.2	32.4	470.2	512.2
50	22.190	23.090	558.9	709.0	558.9	568.7	.0	423.0	.00	36.60	45.58	16.68	799.0	595.7	-570.8	-171.0	570.8	594.0
70	25.860	26.260	566.0	639.5	566.0	541.0	.0	340.9	.00	32.19	49.61	31.68	874.0	637.1	-665.8	-334.7	665.8	675.5
85	28.450	28.610	565.7	598.5	565.7	515.8	.0	303.1	.00	30.44	52.30	40.00	925.0	673.6	-731.9	-432.9	731.9	736.0
90	29.320	29.410	564.7	577.6	564.7	494.7	.0	297.0	.00	31.00	53.18	42.90	942.2	675.5	-754.3	-459.6	754.3	756.6
95	30.150	30.180	563.5	553.8	563.5	469.9	.0	293.2	.00	31.97	54.00	45.80	958.7	674.0	-775.6	-483.2	775.6	776.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.70	.21	8.34	62.84	71.06	.0000	.1304	.1968	.0355	.0355	1.3384	.8890	.8844	2.0147	.4536	.8788	.5502	.6325
10	-5.60	.83	4.49	62.31	66.04	.0000	.2213	.1633	.0320	.0320	1.3548	.9039	.8996	-4.8736	.4639	.8535	.5733	.6004
25	-5.16	1.11	6.35	57.67	62.95	.0000	.2755	.1125	.0245	.0245	1.3541	.9269	.9237	.3801	.4735	.8193	.5965	.5792
30	-4.16	1.49	10.66	44.10	53.28	.0000	.3707	.0487	.0128	.0128	1.3324	.9582	.9564	.8916	.4962	.7291	.6611	.5409
50	-3.02	1.93	12.16	28.90	39.15	.0002	.4139	.0426	.0121	.0120	1.2942	.9516	.9498	.9270	.5142	.6350	.7388	.5335
70	-1.62	2.55	11.56	17.93	26.96	.0003	.3989	.0458	.0127	.0126	1.2624	.9347	.9326	.9233	.5204	.5704	.8069	.5682
85	-1.03	2.64	10.08	12.30	19.73	.0008	.3857	.0679	.0180	.0178	1.2408	.8913	.8880	.8871	.5198	.5320	.8533	.5990
90	-.96	2.55	10.63	10.28	18.34	.0009	.3946	.0983	.0255	.0252	1.2271	.8393	.8347	.8419	.5189	.5120	.8683	.5994
95	-1.03	2.33	11.64	8.20	17.48	.0011	.4071	.1328	.0333	.0330	1.2120	.7787	.7726	.7941	.5178	.4902	.8822	.5966

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0611	1.2852	91.63	91.92	36.89

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	900.3	622.4	602.6	622.0	668.9	-14.8	47.99	-1.39	-19.47	38.39	639.2	793.7	213.0	-492.8	455.8	478.0
10	18.350	19.110	900.7	641.6	606.7	641.6	665.7	4.0	47.65	.36	-17.70	37.23	637.0	805.9	193.6	-487.6	472.1	491.6
15	19.070	19.740	885.0	651.6	625.5	651.2	625.5	-20.3	44.98	-1.78	-12.20	39.03	640.9	838.5	134.9	-528.1	490.6	507.8
30	21.140	21.600	831.3	647.0	653.5	646.3	513.3	-30.8	38.12	-2.73	2.65	42.21	655.6	872.8	-30.5	-586.5	543.8	555.7
50	23.970	24.200	759.7	619.5	641.0	619.0	407.5	-25.4	32.42	-2.35	18.03	46.30	675.5	896.2	-209.1	-647.9	616.6	622.5
70	26.790	26.880	701.2	592.7	616.4	592.0	334.0	-29.4	28.44	-2.85	29.91	50.60	712.1	933.0	-355.1	-720.9	689.2	691.5
85	28.860	28.900	665.2	562.5	593.5	562.3	300.4	-11.9	26.85	-1.20	36.67	53.33	740.1	941.7	-442.0	-755.3	742.4	743.4
90	29.570	29.600	647.4	537.7	576.2	537.7	295.2	-.0	27.14	.02	38.94	54.78	740.9	932.3	-465.4	-761.5	760.7	761.5
95	30.240	30.270	628.5	510.2	556.2	510.1	292.6	3.1	27.74	.34	41.11	56.66	738.3	928.4	-485.4	-775.6	777.9	778.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.58	2.59	15.11	49.38	62.55	.0029	.4848	.1092	.0259	.0252	.9610	.0000	.0000	.8208	.8196	.5474	.5811	.6981
10	-.24	4.02	16.33	47.29	59.62	.0060	.4651	.1067	.0263	.0248	.9620	.0000	.0000	.8284	.8151	.5649	.5785	.7096
15	-1.66	2.69	13.68	46.76	57.14	.0038	.4484	.0818	.0210	.0201	.9717	.0000	.0000	.8754	.7988	.5753	.5853	.7404
30	-4.72	.13	11.29	40.83	51.83	.0000	.4067	.0373	.0106	.0106	.9883	.0000	.0000	.9351	.7477	.5733	.5944	.7733
50	-7.23	-1.70	8.47	34.76	44.85	.0000	.3677	.0172	.0056	.0056	.9954	.0000	.0000	.9674	.6813	.5497	.6098	.7953
70	-9.15	-3.02	10.03	31.29	44.32	.0000	.3412	.0230	.0083	.0083	.9946	.0000	.0000	.9342	.6283	.5262	.6402	.8283
85	-9.92	-3.41	13.86	28.05	45.32	.0000	.3367	.0569	.0221	.0221	.9879	.0000	.0000	.8249	.5949	.4986	.6627	.8347
90	-9.70	-3.10	15.74	27.12	45.96	.0000	.3510	.0790	.0315	.0315	.9840	.0000	.0000	.7740	.5782	.4755	.6618	.8244
95	-9.43	-2.68	16.67	27.40	46.75	.0000	.3758	.0963	.0392	.0392	.9815	.0000	.0000	.7485	.5603	.4499	.6578	.8187

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5896.	161.22	1.0811	1.2694	86.97	87.40

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	465.0	903.1	465.0	547.3	.0	718.4	.00	52.70	36.05	-29.11	575.2	626.4	-338.6	304.7	338.6	413.7
10	14.100	16.790	474.3	878.3	474.3	526.9	.0	702.5	.00	53.12	37.49	-27.03	597.8	592.2	-363.9	269.3	363.9	433.3
15	15.170	17.580	483.6	844.1	483.6	538.3	.0	649.6	.00	50.32	38.98	-19.98	622.2	574.3	-391.5	195.9	391.5	453.7
30	18.280	19.910	506.3	759.9	506.3	549.1	.0	525.0	.00	43.67	42.95	-1.13	692.1	551.3	-471.7	11.2	471.7	513.8
50	22.190	23.090	524.5	671.0	524.5	519.4	.0	424.6	.00	39.24	47.49	18.19	776.7	548.5	-572.6	-171.2	572.6	595.8
70	25.860	26.260	532.1	614.8	532.1	499.8	.0	358.0	.00	35.61	51.44	32.54	854.0	593.9	-667.8	-319.6	667.8	677.7
85	28.450	28.810	532.9	589.3	532.9	487.7	.0	330.9	.00	34.16	54.02	39.87	907.2	635.6	-734.2	-407.4	734.2	738.3
90	29.320	29.410	532.3	571.6	532.3	468.5	.0	327.4	.00	34.97	54.87	42.66	925.1	637.2	-756.6	-431.5	756.6	758.9
95	30.150	30.180	531.4	548.4	531.4	441.3	.0	325.6	.00	36.42	55.66	45.76	942.2	632.7	-778.0	-453.3	778.0	778.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.92	1.99	7.77	65.16	71.03	.0000	.1934	.1560	.0280	.0280	1.3395	.9164	.9129	8.9772	.4248	.8235	.5267	.5712
10	-3.98	2.65	4.09	64.52	66.03	.0000	.2889	.1408	.0275	.0275	1.3504	.9208	.9174	.2887	.4342	.7969	.5494	.5373
15	-3.32	2.96	6.90	58.96	62.94	.0000	.3368	.0884	.0193	.0193	1.3480	.9445	.9421	.7302	.4430	.7635	.5722	.5194
30	-2.27	3.39	12.58	44.08	53.28	.0003	.4108	.0072	.0019	.0018	1.3338	.9928	.9925	.9850	.4640	.6827	.6365	.4953
50	-1.13	3.83	13.67	29.29	39.14	.0008	.4586	.0202	.0057	.0054	1.3059	.9777	.9769	.9679	.4809	.5983	.7148	.4890
70	.18	4.37	12.46	18.90	26.99	.0011	.4420	.0246	.0067	.0064	1.2889	.9674	.9662	.9614	.4877	.5459	.7846	.5273
85	.69	4.36	9.92	14.15	19.70	.0020	.4262	.0403	.0107	.0102	1.2828	.9424	.9404	.9370	.4883	.5219	.8334	.5629
90	.73	4.24	10.39	12.21	18.34	.0022	.4365	.0717	.0186	.0181	1.2725	.8969	.8934	.8921	.4877	.5051	.8494	.5630
95	.64	4.01	11.61	9.90	17.48	.0024	.4530	.1118	.0281	.0275	1.2578	.8373	.8320	.8387	.4870	.4832	.8642	.5574

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0830	1.3038	94.89	95.08	35.20

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	842.3	559.3	538.1	558.9	648.0	-10.7	50.29	-1.13	-19.52	41.25	571.0	743.5	190.7	-490.2	457.3	479.5
10	18.350	19.110	838.7	574.6	536.4	574.3	644.6	19.3	50.23	1.92	-17.69	39.53	563.2	744.5	171.1	-473.8	473.5	493.1
15	19.070	19.740	820.5	582.1	556.7	581.9	602.2	1.1	47.23	.12	-11.22	41.11	568.5	772.8	110.1	-508.3	492.1	509.4
30	21.140	21.600	772.0	582.2	592.1	582.0	495.0	-16.6	39.87	-1.64	4.84	44.59	595.5	817.6	-50.5	-574.0	545.5	557.4
50	23.970	24.200	711.5	561.8	581.9	561.7	409.2	-11.7	35.09	-1.19	19.75	48.55	619.5	848.8	-209.4	-636.2	618.6	624.5
70	26.790	26.880	669.5	550.4	570.2	550.0	350.9	-19.9	31.60	-2.07	30.81	52.37	664.5	901.0	-340.5	-713.6	691.3	693.7
85	28.860	28.900	651.1	541.8	562.5	541.7	327.8	-6.9	30.24	-.72	36.54	54.26	700.2	927.4	-416.9	-752.7	744.7	745.8
90	29.570	29.600	637.3	521.6	547.9	521.6	325.3	.8	30.71	.10	38.63	55.65	701.4	924.5	-437.7	-763.0	763.1	763.8
95	30.240	30.270	618.3	492.8	526.1	492.7	324.8	-.5	31.69	-.07	40.88	57.77	696.0	924.1	-455.5	-781.7	780.4	781.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.99	4.95	15.37	51.42	62.54	.0043	.5173	.1151	.0273	.0263	.9633	.0000	.0000	.8186	.7604	.4898	.5141	.6512
10	2.22	6.48	17.89	48.31	59.61	.0088	.4947	.1129	.0278	.0257	.9643	.0000	.0000	.8289	.7527	.5035	.5081	.6524
15	.66	5.01	15.58	47.11	57.13	.0051	.4756	.0888	.0228	.0215	.9729	.0000	.0000	.8682	.7354	.5113	.5157	.6788
30	-2.85	1.98	12.35	41.51	51.77	.0000	.4329	.0453	.0129	.0129	.9875	.0000	.0000	.9183	.6917	.5133	.5369	.7208
50	-4.46	1.06	9.61	36.29	44.83	.0000	.4004	.0229	.0074	.0074	.9945	.0000	.0000	.9503	.6360	.4957	.5554	.7489
70	-5.95	.17	10.75	33.68	44.26	.0000	.3772	.0239	.0086	.0086	.9949	.0000	.0000	.9354	.5977	.4858	.5935	.7954
85	-6.52	-.02	14.32	30.96	45.29	.0000	.3675	.0468	.0182	.0182	.9904	.0000	.0000	.8661	.5801	.4778	.6238	.8178
90	-6.16	.44	15.81	30.61	45.96	.0000	.3841	.0683	.0272	.0272	.9866	.0000	.0000	.8175	.5671	.4590	.6239	.8134
95	-5.48	1.27	16.25	31.76	46.75	.0000	.4173	.0901	.0367	.0367	.9833	.0000	.0000	.7789	.5486	.4323	.6169	.8106

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5914.	153.72	1.0830	1.2880	90.36	90.70

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	434.7	863.6	434.7	501.8	.0	702.9	.00	54.48	37.82	-30.07	550.3	579.9	-337.4	290.6	337.4	412.3
10	14.100	16.790	443.3	639.3	443.3	485.7	.0	684.3	.00	54.62	39.28	-27.44	572.7	548.0	-362.6	252.5	362.6	431.8
15	15.170	17.580	451.9	607.4	451.9	500.2	.0	633.5	.00	51.67	40.80	-19.89	597.0	533.2	-390.2	181.3	390.2	452.1
30	18.280	19.910	472.6	728.4	472.6	505.3	.0	524.4	.00	46.03	44.82	-1.35	666.7	507.4	-470.1	12.3	470.1	512.1
50	22.190	23.090	489.4	647.8	489.4	479.9	.0	435.0	.00	42.17	49.36	18.24	751.9	507.0	-570.7	-158.8	570.7	593.9
70	25.880	26.260	497.1	599.2	497.1	469.0	.0	372.9	.00	38.48	53.23	32.76	830.8	558.7	-665.6	-302.5	665.6	675.4
85	28.450	28.610	498.2	576.3	498.2	456.4	.0	351.8	.00	37.63	55.74	40.08	885.3	596.7	-731.7	-384.0	731.7	735.8
90	29.320	29.410	497.8	560.4	497.8	435.7	.0	352.2	.00	38.97	56.57	42.86	903.6	594.6	-754.1	-404.2	754.1	756.4
95	30.150	30.180	497.0	543.1	497.0	413.0	.0	352.6	.00	40.49	57.34	45.72	921.1	591.7	-775.4	-423.6	775.4	776.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.16	3.75	6.80	67.88	71.02	.0000	.2351	.1504	.0268	.0268	1.3334	.9241	.9209	-.8091	.3962	.7839	.5028	.5264
10	-2.19	4.45	3.68	66.72	66.02	.0000	.3274	.1300	.0252	.0252	1.3433	.9306	.9277	.5447	.4048	.7585	.5252	.4952
15	-1.49	4.78	6.99	60.69	62.95	.0000	.3709	.0710	.0155	.0155	1.3426	.9575	.9557	.8214	.4129	.7277	.5478	.4806
30	-.39	5.27	12.36	46.17	53.28	.0010	.4541	.0075	.0020	.0017	1.3323	.9930	.9927	.9859	.4318	.6520	.6114	.4542
50	.74	5.71	13.71	31.12	39.14	.0020	.5001	.0182	.0051	.0045	1.3143	.9813	.9805	.9730	.4473	.5757	.6894	.4506
70	1.96	6.16	12.69	20.47	27.01	.0024	.4748	.0134	.0037	.0030	1.3065	.9830	.9823	.9792	.4543	.5305	.7605	.4946
85	2.41	6.09	10.12	15.67	19.69	.0036	.4642	.0383	.0102	.0092	1.3041	.9502	.9483	.9433	.4552	.5086	.8107	.5265
90	2.43	5.94	10.59	13.71	18.34	.0038	.4800	.0758	.0196	.0187	1.2958	.9019	.8983	.8927	.4548	.4933	.8270	.5234
95	2.32	5.69	11.56	11.62	17.48	.0042	.4955	.1120	.0282	.0271	1.2863	.8542	.8489	.8468	.4541	.4768	.8421	.5195

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0850	1.3146	95.66	95.82	33.36

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	799.7	508.0	487.1	507.3	634.3	-15.3	52.48	-1.76	-20.13	44.18	518.9	707.7	178.5	-493.2	455.7	477.9
10	18.350	19.110	794.7	519.8	486.0	519.3	628.7	23.4	52.29	2.58	-17.88	42.03	510.8	699.1	156.8	-468.1	471.9	491.5
15	19.070	19.740	777.8	525.7	509.9	525.3	587.1	19.8	49.01	2.16	-10.76	42.88	519.7	717.0	96.6	-487.9	490.5	507.7
30	21.140	21.800	732.7	532.5	540.6	532.6	494.3	-3.7	42.42	-.40	5.18	46.38	544.0	772.4	-49.4	-559.3	543.7	555.5
50	23.970	24.200	680.8	520.3	536.3	520.6	419.2	.1	37.99	.01	20.14	50.07	572.4	811.4	-197.3	-622.3	616.5	622.4
70	26.790	26.880	647.5	517.8	534.5	517.7	365.3	-5.5	34.35	-.61	31.16	53.38	625.3	868.2	-323.7	-696.8	689.0	691.3
85	28.860	28.900	632.7	515.3	528.2	515.3	348.3	1.3	33.40	.15	36.72	55.22	659.1	903.4	-394.0	-742.0	742.3	743.3
90	29.570	29.600	620.6	496.5	512.5	496.4	349.8	6.0	34.32	.70	38.72	56.68	656.9	903.9	-410.7	-755.2	760.5	761.3
95	30.240	30.270	606.5	469.9	494.1	469.8	351.8	.3	35.45	.02	40.76	58.87	652.4	909.1	-425.9	-778.3	777.7	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.10	7.05	14.74	54.24	62.54	.0070	.5530	.1180	.0280	.0263	.9656	.0000	.0000	.8239	.7182	.4436	.4650	.6180
10	4.18	8.43	18.53	49.71	59.59	.0125	.5295	.1219	.0300	.0269	.9649	.0000	.0000	.8258	.7107	.4540	.4601	.6106
15	2.67	7.01	17.62	46.85	57.11	.0071	.5080	.1060	.0272	.0254	.9705	.0000	.0000	.8443	.6951	.4601	.4687	.6275
30	-.19	4.62	13.60	42.82	51.75	.0004	.4648	.0540	.0154	.0153	.9864	.0000	.0000	.9042	.6546	.4676	.4878	.6781
50	-1.52	3.99	10.79	37.98	44.78	.0000	.4329	.0301	.0097	.0097	.9934	.0000	.0000	.9370	.6067	.4573	.5107	.7128
70	-3.19	2.92	12.20	34.95	44.23	.0000	.4063	.0322	.0116	.0116	.9935	.0000	.0000	.9214	.5761	.4552	.5559	.7632
85	-3.37	3.13	15.18	33.25	45.28	.0000	.3985	.0489	.0190	.0190	.9906	.0000	.0000	.8733	.5617	.4524	.5848	.7932
90	-2.57	4.03	16.41	33.63	45.96	.0000	.4205	.0727	.0290	.0290	.9865	.0000	.0000	.8220	.5499	.4348	.5818	.7917
95	-1.70	5.05	16.35	35.43	46.75	.0000	.4613	.1062	.0433	.0433	.9812	.0000	.0000	.7603	.5356	.4103	.5756	.7937

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5894.	145.65	1.0850	1.2972	90.83	91.16

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	405.9	827.2	405.9	449.0	.0	694.7	.00	57.13	39.79	-32.10	528.3	530.1	-338.1	281.7	338.1	413.1
10	14.100	16.790	413.9	802.9	413.9	439.1	.0	671.7	.00	56.81	41.28	-28.56	550.7	501.0	-363.3	239.1	363.3	432.7
15	15.170	17.580	421.9	775.0	421.9	470.3	.0	615.7	.00	52.60	42.80	-19.06	575.2	498.7	-390.9	162.7	390.9	453.0
30	18.280	19.910	441.3	701.4	441.3	467.3	.0	522.9	.00	48.18	46.84	-1.15	645.6	469.2	-471.0	9.8	471.0	513.0
50	22.190	23.090	457.0	630.9	457.0	452.5	.0	439.5	.00	44.14	51.34	18.86	732.1	479.9	-571.8	-155.5	571.8	595.0
70	25.880	26.260	463.9	589.4	463.9	448.5	.0	382.4	.00	40.46	55.16	33.22	812.4	536.9	-666.9	-204.2	666.9	676.7
85	28.450	28.610	463.8	563.4	463.8	422.8	.0	372.3	.00	41.38	57.68	40.81	867.5	558.7	-733.1	-364.9	733.1	737.2
90	29.320	29.410	462.8	545.7	462.8	395.9	.0	375.3	.00	43.50	58.51	44.04	886.0	550.9	-755.5	-382.6	755.5	757.8
95	30.150	30.180	461.7	526.2	461.7	371.0	.0	373.2	.00	45.17	59.27	47.47	903.8	549.0	-776.9	-404.5	776.9	777.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.20	5.71	4.68	71.88	70.93	.0000	.2940	.1848	.0322	.0322	1.3253	.9131	.9095	.1479	.3691	.7474	.4814	.4789
10	-.22	6.43	2.50	69.84	65.96	.0000	.3804	.1515	.0291	.0291	1.3342	.9239	.9207	.6184	.3769	.7227	.5034	.4509
15	.50	6.78	7.81	61.87	62.94	.0004	.3994	.0527	.0115	.0115	1.3376	.9696	.9683	.8849	.3845	.6964	.5262	.4481
30	1.62	7.28	12.56	47.99	53.28	.0029	.4947	.0110	.0029	.0021	1.3313	.9910	.9906	.9818	.4022	.6259	.5904	.4188
50	2.71	7.68	14.32	32.48	39.13	.0045	.5254	.0047	.0013	.0001	1.3235	.9946	.9944	.9923	.4166	.5595	.6694	.4256
70	3.90	8.09	13.13	21.94	26.99	.0049	.4936	-.0013	-.0004	-.0017	1.3222	1.0001	1.0001	1.0003	.4228	.5208	.7425	.4744
85	4.35	8.01	10.88	16.87	19.72	.0066	.5053	.0576	.0151	.0134	1.3173	.9322	.9295	.9201	.4225	.4955	.7935	.4913
90	4.36	7.87	11.76	14.47	18.34	.0069	.5282	.1039	.0264	.0246	1.3080	.8779	.8731	.8624	.4216	.4784	.8097	.4830
95	4.24	7.60	13.31	11.81	17.48	.0073	.5412	.1373	.0334	.0316	1.2978	.8361	.8300	.8229	.4206	.4602	.8246	.4801

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0867	1.3221	95.79	95.95	31.51

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	760.0	463.3	428.5	461.7	627.6	-32.1	55.68	-4.01	-21.76	47.88	461.5	688.8	171.0	-510.9	456.6	478.8
10	18.350	19.110	752.5	472.1	426.7	471.8	619.8	16.6	55.46	2.01	-19.01	45.25	451.3	670.1	147.0	-475.9	472.9	492.4
15	19.070	19.740	738.5	476.5	468.5	475.4	570.6	31.5	50.60	3.79	-9.64	45.10	475.7	673.6	79.2	-477.2	491.4	508.7
30	21.140	21.600	697.8	489.9	493.9	489.8	492.7	8.7	44.91	1.02	5.97	48.19	497.7	735.0	-52.0	-547.9	544.7	556.6
50	23.970	24.200	656.8	492.2	501.9	492.1	423.5	7.8	40.15	.91	21.07	51.36	538.9	788.3	-194.2	-615.8	617.7	623.6
70	26.790	26.680	631.8	497.0	509.1	497.0	374.2	2.6	36.32	.30	31.81	54.23	599.5	850.4	-316.1	-690.1	690.3	692.7
85	28.860	28.900	615.4	489.5	493.4	489.4	367.7	8.2	36.70	.96	37.32	56.39	620.4	884.4	-376.0	-736.5	743.7	744.7
90	29.570	29.600	601.9	471.8	472.7	471.7	372.4	10.6	38.25	1.29	39.50	57.91	612.7	887.9	-389.6	-752.2	762.0	762.7
95	30.240	30.270	585.7	446.3	452.2	446.2	372.3	5.1	39.47	.65	41.98	60.06	608.4	894.2	-406.9	-774.9	779.2	780.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	6.21	10.17	12.49	59.68	62.54	.0152	.5918	.1275	.0302	.0266	.9660	.0000	.0000	.8186	.6785	.4035	.4114	.5997
10	6.94	11.19	17.95	53.45	59.58	.0233	.5659	.1356	.0334	.0276	.9645	.0000	.0000	.8187	.6703	.4112	.4084	.5836
15	4.38	8.72	19.24	46.81	57.07	.0093	.5386	.1353	.0347	.0323	.9656	.0000	.0000	.8050	.6586	.4158	.4276	.5879
30	2.42	7.22	15.07	43.90	51.75	.0016	.4932	.0793	.0226	.0221	.9818	.0000	.0000	.8631	.6225	.4287	.4439	.6431
50	.72	6.21	11.60	39.24	44.66	.0000	.4536	.0426	.0138	.0138	.9912	.0000	.0000	.9126	.5846	.4312	.4780	.6906
70	-1.23	4.86	13.09	36.02	44.20	.0000	.4249	.0408	.0147	.0147	.9922	.0000	.0000	.9099	.5612	.4358	.5309	.7457
85	-.20	6.30	15.98	35.74	45.27	.0000	.4313	.0592	.0230	.0230	.9892	.0000	.0000	.8687	.5449	.4280	.5491	.7733
90	1.27	7.86	17.00	36.96	45.96	.0000	.4554	.0746	.0297	.0297	.9870	.0000	.0000	.8332	.5320	.4114	.5408	.7742
95	2.34	9.08	16.98	38.82	46.75	.0002	.4933	.0986	.0402	.0401	.9837	.0000	.0000	.7862	.5154	.3881	.5341	.7775

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5906.	137.59	1.0867	1.3023	90.43	90.78

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	375.7	609.3	375.7	421.5	.0	690.8	.00	58.61	41.97	-33.38	505.4	504.9	-338.0	277.8	338.0	412.9
10	14.100	16.790	383.1	781.8	383.1	420.8	.0	658.7	.00	57.41	43.47	-28.23	527.9	478.4	-363.2	226.1	363.2	432.5
25	15.170	17.580	390.4	754.5	390.4	436.6	.0	615.2	.00	54.62	45.02	-20.35	552.4	466.5	-390.8	162.3	390.8	452.9
30	18.280	19.910	407.7	689.3	407.7	437.9	.0	532.3	.00	50.54	49.08	-2.48	623.0	440.0	-470.9	19.4	470.9	512.9
50	22.190	23.090	421.4	624.7	421.4	423.9	.0	458.8	.00	47.24	53.57	17.68	710.3	446.7	-571.6	-136.1	571.6	594.8
70	25.880	26.260	426.4	582.9	426.4	417.7	.0	406.7	.00	44.24	57.38	32.83	791.4	497.9	-666.7	-269.8	666.7	676.5
85	28.450	28.610	425.2	551.9	425.2	381.3	.0	398.9	.00	46.31	59.88	41.57	847.3	509.8	-732.9	-338.1	732.9	737.0
90	29.320	29.410	424.0	538.3	424.0	357.8	.0	402.3	.00	48.37	60.69	44.82	866.2	504.5	-755.3	-355.3	755.3	757.6
95	30.150	30.180	422.9	525.5	422.9	337.4	.0	402.9	.00	50.05	61.43	47.98	884.4	504.2	-776.7	-374.6	776.7	777.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.99	7.90	3.47	75.35	71.00	.0002	.3100	.2113	.0363	.0362	1.3212	.9081	.9044	.1373	.3411	.7296	.4601	.4552
10	2.00	8.63	2.89	71.70	66.03	.0006	.3906	.1671	.0322	.0321	1.3258	.9211	.9178	.6002	.3484	.7024	.4824	.4299
15	2.72	9.00	6.54	65.37	62.97	.0020	.4328	.0999	.0217	.0213	1.3283	.9474	.9452	.8047	.3552	.6763	.5053	.4182
30	3.86	9.52	11.23	51.57	53.30	.0070	.5276	.0399	.0105	.0086	1.3307	.9728	.9717	.9414	.3708	.6139	.5693	.3918
50	4.95	9.91	13.16	35.89	39.14	.0091	.5659	.0347	.0098	.0072	1.3296	.9703	.9691	.9539	.3832	.5527	.6489	.3952
70	6.14	10.31	12.71	24.55	26.96	.0093	.5395	.0369	.0101	.0075	1.3299	.9626	.9610	.9498	.3875	.5135	.7227	.4386
85	6.54	10.20	11.66	18.30	19.73	.0116	.5620	.1081	.0280	.0250	1.3227	.8858	.8812	.8608	.3861	.4834	.7737	.4465
90	6.53	10.04	12.55	15.86	18.34	.0119	.5820	.1468	.0368	.0338	1.3177	.8442	.8380	.8167	.3851	.4704	.7899	.4407
95	6.39	9.75	13.82	13.45	17.48	.0124	.5939	.1749	.0421	.0392	1.3131	.8122	.8048	.7854	.3842	.4579	.8049	.4394

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0905	1.3264	92.90	93.18	29.39

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	739.5	430.0	395.8	426.3	624.6	-50.1	57.64	-6.71	-23.02	51.10	430.2	679.3	168.2	-528.7	456.5	478.6
10	18.350	19.110	727.4	434.3	402.1	434.2	606.1	6.0	56.44	.80	-18.35	48.24	423.7	651.9	133.4	-486.3	472.7	492.3
15	19.070	19.740	712.3	436.7	428.7	436.0	568.7	24.9	52.99	3.27	-10.26	47.97	436.1	651.1	77.5	-483.6	491.3	508.5
30	21.140	21.600	678.7	456.9	457.7	456.6	501.1	14.7	47.58	1.84	5.38	49.86	460.6	708.6	-43.5	-541.8	544.6	556.4
50	23.970	24.200	644.7	469.2	469.3	469.1	441.9	9.6	43.26	1.17	20.43	52.60	501.8	772.6	-175.6	-613.8	617.5	623.4
70	26.790	26.880	620.2	475.8	476.1	475.8	397.4	5.9	39.85	.71	31.57	55.27	559.3	835.4	-292.7	-686.6	690.1	692.5
85	28.860	28.900	597.9	459.2	449.9	459.1	393.7	9.7	41.20	1.22	37.86	58.00	569.9	866.4	-349.7	-734.7	743.5	744.5
90	29.570	29.600	587.7	443.1	431.7	442.9	398.6	13.1	42.72	1.70	40.08	59.42	564.3	870.6	-363.2	-749.4	761.8	762.5
95	30.240	30.270	577.3	424.1	414.4	423.9	401.9	9.0	44.12	1.21	42.30	61.18	560.4	879.7	-377.1	-770.8	779.0	779.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	7.98	11.93	9.78	64.35	62.52	.0231	.6305	.1448	.0341	.0287	.9632	.0000	.0000	.8076	.6579	.3737	.3830	.5904
10	8.33	12.58	16.72	55.64	59.53	.0267	.6018	.1516	.0373	.0307	.9626	.0000	.0000	.7989	.6468	.3776	.3800	.5667
15	7.03	11.35	18.70	49.72	57.01	.0169	.5789	.1528	.0391	.0348	.9636	.0000	.0000	.7855	.6344	.3801	.3894	.5667
30	5.20	9.97	15.96	45.74	51.76	.0058	.5281	.1066	.0303	.0287	.9767	.0000	.0000	.8271	.6050	.3986	.4086	.6181
50	3.93	9.40	11.78	42.09	44.55	.0012	.4870	.0625	.0201	.0198	.9876	.0000	.0000	.8805	.5728	.4096	.4422	.6745
70	2.24	8.32	13.50	39.14	44.19	.0001	.4597	.0579	.0208	.0208	.9893	.0000	.0000	.8841	.5495	.4156	.4936	.7296
85	4.50	10.79	16.24	39.98	45.27	.0014	.4813	.0916	.0356	.0350	.9843	.0000	.0000	.8097	.5271	.3995	.5018	.7538
90	5.71	12.30	17.41	41.02	45.95	.0038	.5071	.1191	.0474	.0459	.9802	.0000	.0000	.7594	.5168	.3845	.4961	.7554
95	7.00	13.74	17.54	42.91	46.75	.0071	.5425	.1496	.0609	.0581	.9761	.0000	.0000	.7020	.5057	.3669	.4896	.7611

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5904.	128.38	1.0905	1.3013	86.38	86.88

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

100% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	599.3	1190.5	599.3	732.2	.0	938.5	.00	52.04	35.18	-29.97	733.2	845.3	-422.4	422.3	422.4	516.1
10	14.100	16.790	612.2	1167.6	612.2	735.4	.0	907.2	.00	50.97	36.55	-26.47	762.2	821.9	-454.0	366.6	454.0	540.6
15	15.170	17.580	625.6	1128.5	625.6	733.8	.0	857.1	.00	49.41	37.97	-21.59	793.7	790.3	-488.4	291.1	488.4	566.0
30	18.280	19.910	658.3	1001.6	658.3	724.1	.0	691.5	.00	43.62	41.77	-3.91	883.2	728.9	-588.6	50.4	588.6	641.1
50	22.190	23.090	682.9	844.6	682.9	659.5	.0	527.4	.00	38.60	46.27	18.12	988.5	696.9	-714.5	-216.1	714.5	743.5
70	25.880	26.260	689.8	746.2	689.8	620.2	.0	414.8	.00	33.75	50.37	34.71	1081.9	756.3	-833.3	-430.7	833.3	845.5
85	28.450	28.610	687.4	696.1	687.4	582.5	.0	381.1	.00	33.20	53.11	42.83	1145.3	794.6	-916.0	-540.0	916.0	921.2
90	29.320	29.410	685.5	668.2	685.5	551.2	.0	377.5	.00	34.44	54.01	45.94	1166.7	793.0	-944.0	-569.4	944.0	946.9
95	30.150	30.180	683.5	640.9	683.5	520.8	.0	373.5	.00	35.65	54.85	48.95	1187.3	793.3	-970.8	-598.2	970.8	971.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.82	1.09	6.73	65.15	70.85	.0000	.1365	.2644	.0471	.0471	1.5460	.8611	.8524	2.2564	.5537	1.1065	.6785	.7857
10	-4.93	1.71	4.58	63.05	65.94	.0002	.2047	.1619	.0317	.0317	1.5931	.9100	.9039	8.0221	.5675	1.0796	.7087	.7599
15	-4.52	1.96	5.29	59.56	62.93	.0009	.2729	.1197	.0258	.0256	1.5997	.9277	.9228	.3079	.5810	1.0363	.7398	.7258
30	-3.43	2.22	9.81	45.68	53.28	.0041	.3887	.0762	.0200	.0189	1.5481	.9403	.9365	.8533	.6133	.9058	.8270	.6592
50	-2.30	2.62	13.60	28.15	39.16	.0067	.4558	.1199	.0337	.0318	1.4371	.8757	.8693	.8340	.6370	.7523	.9289	.6207
70	-.83	3.32	14.54	15.66	26.92	.0087	.4266	.1135	.0304	.0281	1.3730	.8500	.8431	.8434	.6425	.6607	1.0144	.6696
85	-.19	3.45	12.92	10.28	19.74	.0144	.4219	.1514	.0385	.0348	1.3396	.7822	.7730	.7942	.6397	.6129	1.0721	.6995
90	-.12	3.38	13.66	8.07	18.33	.0164	.4348	.1886	.0464	.0423	1.3171	.7243	.7134	.7511	.6379	.5860	1.0903	.6954
95	-.18	3.17	14.80	5.90	17.48	.0188	.4452	.2204	.0521	.0476	1.2958	.6718	.6596	.7156	.6361	.5600	1.1072	.6931

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1273	1.4353	85.48	86.19	42.19

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1117.5	739.5	727.2	738.4	848.4	-29.7	49.40	-2.37	-20.92	40.39	778.6	969.7	277.9	-627.9	570.5	598.2
10	18.350	19.110	1125.4	777.7	760.1	777.4	829.8	16.7	47.51	1.23	-17.46	37.60	797.0	981.2	239.0	-598.6	590.8	615.3
25	19.070	19.740	1110.2	789.9	778.7	789.8	791.0	8.6	45.44	.63	-12.81	38.44	799.3	1008.5	177.0	-627.0	614.0	635.6
30	21.140	21.600	1029.8	761.9	797.6	761.9	650.8	.0	39.18	.00	2.14	42.39	800.3	1031.8	-29.8	-695.4	680.7	695.5
50	23.970	24.200	904.1	704.4	748.0	704.4	507.5	-4.6	34.12	-.38	19.44	48.05	795.3	1054.1	-264.2	-783.8	771.8	779.2
70	26.790	26.880	818.3	669.2	710.1	669.1	406.4	-12.4	29.77	-1.06	32.67	52.67	844.9	1104.0	-456.2	-877.9	862.6	865.5
85	28.860	28.900	774.2	636.7	675.8	636.7	377.6	3.6	29.20	.34	39.22	55.51	872.5	1124.6	-551.6	-926.9	929.2	930.5
90	29.570	29.600	750.6	602.0	650.1	601.7	375.2	17.1	30.01	1.67	41.59	57.28	869.4	1113.0	-576.9	-936.0	952.1	953.1
95	30.240	30.270	727.9	566.4	625.3	565.9	372.7	22.6	30.79	2.29	43.86	59.27	867.4	1107.5	-601.0	-952.0	973.7	974.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-.47	3.50	14.15	51.77	62.57	.0210	.5207	.1448	.0343	.0294	.9296	.0000	.0000	.8062	1.0273	.6409	.7200	.8404
10	-.32	3.94	17.22	46.28	59.66	.0227	.4836	.1449	.0358	.0302	.9288	.0000	.0000	.7978	1.0280	.6764	.7307	.8534
15	-.96	3.40	16.10	44.81	57.18	.0200	.4668	.1346	.0347	.0295	.9352	.0000	.0000	.8126	1.0074	.6891	.7320	.8798
30	-3.78	1.08	14.09	39.17	51.93	.0045	.4387	.1256	.0359	.0347	.9458	.0000	.0000	.8055	.9249	.6668	.7267	.9031
50	-5.53	.01	10.41	34.50	44.83	.0000	.4029	.0867	.0280	.0280	.9695	.0000	.0000	.8379	.8052	.6172	.7147	.9236
70	-7.81	-1.68	11.84	30.83	44.34	.0000	.3663	.0627	.0226	.0226	.9812	.0000	.0000	.8474	.7292	.5876	.7560	.9693
85	-7.55	-1.05	15.40	28.86	45.33	.0000	.3651	.0825	.0321	.0321	.9776	.0000	.0000	.7828	.6868	.5572	.7750	.9840
90	-6.83	-.22	17.39	28.33	45.96	.0000	.3879	.1098	.0437	.0437	.9718	.0000	.0000	.7336	.6639	.5247	.7692	.9699
95	-6.38	.37	18.61	28.51	46.76	.0000	.4178	.1359	.0553	.0553	.9671	.0000	.0000	.7008	.6421	.4915	.7648	.9612

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7379.	184.37	1.1273	1.3828	76.26	77.31

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	593.8	1160.9	593.8	683.5	.0	938.4	.00	53.93	35.43	-31.70	728.7	803.4	-422.5	422.2	422.5	516.2
10	14.100	16.790	606.5	1131.4	606.5	684.6	.0	900.7	.00	52.76	36.82	-27.72	757.6	773.9	-454.0	360.1	454.0	540.6
15	15.170	17.580	619.7	1091.2	619.7	691.4	.0	843.9	.00	50.65	38.24	-21.85	789.1	746.1	-488.5	277.8	488.5	566.1
30	18.260	19.910	652.8	976.0	652.8	694.9	.0	684.8	.00	44.53	42.01	-3.54	879.2	699.0	-588.6	43.7	588.6	641.1
50	22.190	23.090	679.4	839.2	679.4	643.7	.0	538.2	.00	39.86	46.42	17.66	986.1	678.2	-714.5	-205.4	714.5	743.5
70	25.880	26.260	688.1	745.8	688.1	603.1	.0	438.7	.00	36.02	50.44	33.94	1080.8	728.7	-833.4	-406.9	833.4	845.6
85	28.450	28.610	686.8	698.1	686.8	567.6	.0	406.3	.00	35.60	53.14	42.21	1145.0	766.6	-916.1	-514.9	916.1	921.3
90	29.320	29.410	685.2	674.7	685.2	539.4	.0	405.2	.00	36.94	54.03	45.14	1166.6	764.9	-944.1	-541.8	944.1	947.0
95	30.150	30.180	683.5	651.4	683.5	510.9	.0	404.0	.00	38.34	54.85	48.01	1187.3	763.9	-970.8	-567.8	970.8	971.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.58	1.33	5.00	67.13	70.84	.0001	.1885	.2526	.0442	.0441	1.5522	.8690	.8606	4.8240	.5480	1.0728	.6733	.7424
10	-4.69	1.97	3.27	64.54	65.87	.0003	.2611	.1758	.0340	.0340	1.5825	.9029	.8965	-.3595	.5612	1.0391	.7026	.7108
15	-4.07	2.23	5.01	60.09	62.90	.0010	.3204	.1241	.0267	.0265	1.5868	.9250	.9199	.5816	.5743	.9963	.7330	.6812
30	-3.20	2.47	10.16	45.55	53.25	.0044	.4178	.0508	.0133	.0122	1.5560	.9597	.9571	.9123	.6070	.8795	.8199	.6299
50	-2.18	2.77	13.14	28.76	39.14	.0070	.4767	.0760	.0214	.0195	1.4766	.9230	.9187	.8991	.6332	.7460	.9240	.6029
70	-.78	3.38	13.80	16.50	26.94	.0088	.4589	.0863	.0233	.0209	1.4205	.8922	.8867	.8879	.6410	.6583	1.0119	.6431
85	-.18	3.48	12.30	10.93	19.74	.0144	.4538	.1248	.0320	.0283	1.3916	.8318	.8238	.8405	.6392	.6125	1.0708	.6726
90	-.11	3.39	12.87	8.89	18.34	.0164	.4673	.1617	.0403	.0362	1.3734	.7802	.7702	.7989	.6377	.5897	1.0895	.6685
95	-.18	3.18	13.86	6.84	17.48	.0188	.4792	.1949	.0469	.0424	1.3556	.7322	.7205	.7630	.6361	.5672	1.1069	.6652

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1307	1.4672	88.57	89.16	42.07

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1082.4	666.6	671.6	665.2	848.8	-31.1	51.65	-2.73	-22.50	43.41	727.0	916.2	278.2	-629.4	570.6	598.3
10	18.350	19.110	1080.4	692.9	697.2	692.5	825.3	21.5	49.81	1.78	-18.58	40.61	735.7	912.3	234.4	-593.8	590.9	615.4
15	19.070	19.740	1062.8	707.7	722.3	707.4	779.3	18.9	47.16	1.54	-12.89	41.07	741.7	938.5	165.2	-616.7	614.1	635.6
30	21.140	21.600	997.2	719.4	760.1	719.2	644.9	-15.8	40.28	-1.26	2.67	44.67	762.8	1011.7	-35.8	-711.4	680.7	695.5
50	23.970	24.200	894.8	670.9	729.3	670.9	518.2	-9.2	35.37	-.78	19.15	49.60	773.9	1035.6	-253.7	-788.5	771.8	779.3
70	26.790	26.880	813.0	631.3	690.0	631.2	429.9	-11.8	31.92	-1.07	32.06	54.25	815.3	1081.0	-432.8	-877.4	862.7	865.6
85	28.860	28.900	770.8	599.9	657.3	599.9	402.5	2.9	31.48	.29	38.71	57.11	842.5	1104.8	-526.8	-927.7	929.3	930.6
90	29.570	29.600	751.3	572.2	634.2	571.9	402.6	15.7	32.42	1.61	40.92	58.62	839.4	1098.3	-549.6	-937.4	952.2	953.1
95	30.240	30.270	732.2	543.3	611.3	542.9	403.1	18.3	33.40	1.92	43.03	60.41	836.3	1099.9	-570.7	-956.4	973.7	974.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.62	5.79	13.78	54.38	62.56	.0266	.5728	.1464	.0347	.0284	.9322	.0000	.0000	.8198	.9846	.5734	.6642	.7881
10	1.78	6.04	17.75	48.03	59.63	.0271	.5383	.1480	.0365	.0298	.9317	.0000	.0000	.8143	.9786	.5975	.6701	.7867
15	.60	5.15	17.01	45.62	57.15	.0221	.5148	.1285	.0330	.0274	.9422	.0000	.0000	.8346	.9599	.6123	.6756	.8120
30	-2.56	2.28	12.78	41.54	51.84	.0051	.4658	.0593	.0169	.0155	.9757	.0000	.0000	.9155	.8955	.6269	.6910	.8816
50	-4.26	1.28	10.02	36.15	44.84	.0001	.4395	.0342	.0111	.0110	.9882	.0000	.0000	.9471	.7955	.5850	.6939	.9029
70	-5.65	.48	11.83	32.99	44.34	.0000	.4189	.0364	.0131	.0131	.9893	.0000	.0000	.9253	.7214	.5505	.7267	.9427
85	-5.25	1.25	15.35	31.20	45.33	.0000	.4230	.0629	.0245	.0245	.9832	.0000	.0000	.8614	.6810	.5213	.7453	.9600
90	-4.41	2.19	17.33	30.81	45.96	.0000	.4433	.0827	.0329	.0329	.9789	.0000	.0000	.8285	.6618	.4954	.7397	.9508
95	-3.78	2.97	18.25	31.48	46.76	.0000	.4721	.0994	.0405	.0405	.9759	.0000	.0000	.8077	.6432	.4686	.7344	.9486

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7380.	183.73	1.1307	1.4342	83.05	83.88

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	P-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	591.0	1130.9	591.0	658.5	.0	919.5	.00	54.39	35.60	-31.43	726.9	771.8	-423.1	402.5	423.1	517.0
10	14.100	16.790	603.6	1100.3	603.6	664.6	.0	876.8	.00	52.83	36.99	-26.75	755.7	744.8	-454.7	335.3	454.7	541.5
15	15.170	17.580	616.7	1061.7	616.7	670.0	.0	823.3	.00	50.84	38.42	-20.89	787.2	718.3	-489.2	256.3	489.2	567.0
30	18.280	19.910	649.2	953.6	649.2	672.7	.0	675.5	.00	45.08	42.21	-2.79	877.1	676.0	-589.5	33.4	589.5	642.1
50	22.190	23.090	675.8	834.1	675.8	629.3	.0	547.3	.00	40.98	46.62	17.37	984.4	661.8	-715.6	-197.4	715.6	744.7
70	25.880	26.260	685.4	746.5	685.4	592.2	.0	454.1	.00	37.47	50.59	33.49	1080.1	711.7	-834.6	-392.8	834.6	846.9
85	28.450	28.610	684.7	702.1	684.7	560.1	.0	423.3	.00	37.09	53.26	41.72	1144.9	750.6	-917.5	-499.4	917.5	922.7
90	29.320	29.410	683.3	681.2	683.3	533.6	.0	423.3	.00	38.45	54.14	44.56	1166.7	749.0	-945.6	-525.2	945.6	948.5
95	30.150	30.180	681.8	659.6	681.8	505.7	.0	423.4	.00	39.94	54.96	47.39	1187.6	747.2	-972.3	-549.9	972.3	973.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.42	1.50	5.27	67.03	70.84	.0001	.2241	.2313	.0406	.0405	1.5479	.8788	.8711	-4.1627	.5453	1.0406	.6714	.7101
10	-4.52	2.14	4.23	63.74	65.86	.0003	.2903	.1556	.0304	.0303	1.5733	.9126	.9069	.2963	.5584	1.0067	.7006	.6814
15	-3.69	2.40	5.97	59.31	62.90	.0012	.3476	.1087	.0235	.0233	1.5777	.9333	.9289	.7100	.5712	.9660	.7309	.6536
30	-3.00	2.67	10.91	45.01	53.25	.0047	.4398	.0386	.0101	.0089	1.5549	.9688	.9668	.9379	.6031	.8571	.8168	.6075
50	-1.99	2.97	12.85	29.24	39.13	.0073	.4952	.0570	.0161	.0140	1.4997	.9431	.9398	.9266	.6294	.7401	.9209	.5872
70	-.04	3.53	13.37	17.10	26.96	.0091	.4790	.0699	.0190	.0165	1.4517	.9155	.9110	.9120	.6382	.6573	1.0100	.6268
85	-.06	3.60	11.80	11.55	19.73	.0148	.4730	.1074	.0278	.0239	1.4278	.8612	.8541	.8670	.6373	.6147	1.0699	.6572
90	.00	3.51	12.28	9.58	18.34	.0168	.4864	.1439	.0362	.0320	1.4121	.8131	.8039	.8265	.6359	.5942	1.0890	.6533
95	-.07	3.29	13.24	7.57	17.48	.0192	.4992	.1781	.0434	.0387	1.3959	.7669	.7557	.7901	.6345	.5731	1.1067	.6493

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1328	1.4867	90.35	90.87	41.95

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1050.0	640.2	640.6	638.2	831.8	-39.7	52.40	-3.61	-22.12	45.02	691.7	903.4	260.3	-638.9	571.5	599.2
10	18.350	19.110	1045.3	660.6	668.6	660.3	803.6	19.6	50.24	1.70	-17.58	42.11	701.4	890.0	211.8	-596.7	591.8	616.3
15	19.070	19.740	1028.2	671.9	691.9	671.4	760.3	24.3	47.69	2.08	-11.87	42.36	707.6	908.7	145.3	-612.4	615.0	636.6
30	21.140	21.600	968.7	689.4	729.9	689.4	636.5	-4.1	41.07	-.34	3.52	45.45	732.8	983.1	-45.3	-700.7	681.8	696.6
50	23.970	24.200	885.7	660.3	711.6	660.3	527.2	-1.5	36.51	-.13	19.03	49.82	754.3	1023.7	-245.9	-782.0	773.0	780.5
70	26.790	26.880	811.9	624.6	679.1	624.5	445.0	-10.7	33.23	-.98	31.64	54.55	798.7	1077.3	-419.0	-877.6	864.0	866.9
85	28.800	28.900	774.3	596.9	651.0	596.9	419.3	3.8	32.78	.38	38.15	57.26	828.1	1103.6	-511.5	-928.2	930.7	932.0
90	29.570	29.600	757.5	573.4	630.0	573.1	420.4	15.5	33.73	1.57	40.25	58.61	825.5	1100.4	-533.2	-939.1	953.6	954.6
95	30.240	30.270	740.2	547.5	607.9	547.2	422.4	16.8	34.79	1.75	42.28	60.29	821.8	1104.6	-552.9	-959.4	975.2	976.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.49	6.46	12.90	56.00	62.55	.0267	.5829	.1451	.0344	.0281	.9359	.0000	.0000	.8223	.9503	.5501	.6294	.7762
10	2.24	6.49	17.66	48.54	59.62	.0254	.5490	.1500	.0370	.0307	.9342	.0000	.0000	.8116	.9432	.5688	.6363	.7663
15	1.48	5.82	17.54	45.61	57.13	.0211	.5272	.1363	.0350	.0296	.9417	.0000	.0000	.8223	.9258	.5799	.6412	.7844
30	-1.64	3.18	13.68	41.41	51.79	.0053	.4750	.0633	.0181	.0165	.9752	.0000	.0000	.9051	.8689	.5991	.6612	.8543
50	-3.06	2.46	10.68	36.64	44.83	.0004	.4463	.0321	.0104	.0102	.9891	.0000	.0000	.9461	.7880	.5743	.6748	.8904
70	-4.02	1.80	11.88	34.21	44.31	.0000	.4327	.0362	.0131	.0131	.9894	.0000	.0000	.9259	.7197	.5432	.7098	.9369
85	-3.97	2.53	15.43	32.41	45.32	.0000	.4374	.0639	.0248	.0248	.9828	.0000	.0000	.8644	.6833	.5173	.7310	.9564
90	-3.13	3.47	17.28	32.16	45.96	.0000	.4558	.0816	.0325	.0325	.9790	.0000	.0000	.8359	.6665	.4952	.7263	.9502
95	-2.37	4.37	18.08	33.04	46.75	.0000	.4835	.0958	.0390	.0390	.9764	.0000	.0000	.8168	.6490	.4710	.7199	.9502

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7391.	183.19	1.1328	1.4534	84.92	85.68

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	582.2	1097.5	582.2	633.0	.0	896.6	.00	54.77	35.98	-30.98	719.4	738.5	-422.6	380.2	422.6	516.4
10	14.100	16.790	594.4	1066.5	594.4	635.5	.0	856.4	.00	53.42	37.38	-26.38	748.1	710.0	-454.2	315.6	454.2	540.9
15	15.170	17.580	607.1	1027.5	607.1	642.0	.0	801.8	.00	51.30	38.82	-20.10	779.4	684.8	-488.7	235.5	488.7	566.3
30	18.280	19.910	638.6	927.0	638.6	643.7	.0	666.9	.00	45.98	42.65	-2.22	868.8	646.4	-588.9	25.5	588.9	641.4
50	22.190	23.090	665.5	824.0	665.5	609.1	.0	554.8	.00	42.31	47.02	17.18	976.8	639.7	-714.8	-189.0	714.8	743.8
70	25.880	26.260	676.9	748.4	676.9	581.7	.0	470.9	.00	38.99	50.91	32.75	1074.0	692.9	-833.7	-375.0	833.7	845.9
85	28.450	28.610	677.7	709.8	677.7	553.5	.0	444.4	.00	38.77	53.52	40.77	1139.8	731.0	-916.5	-477.2	916.5	921.6
90	29.320	29.410	676.6	690.5	676.6	525.7	.0	447.4	.00	40.42	54.38	43.58	1161.9	725.8	-944.5	-500.0	944.5	947.4
95	30.150	30.180	675.4	669.1	675.4	495.4	.0	449.7	.00	42.23	55.19	46.52	1183.0	720.1	-971.2	-522.5	971.2	972.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.03	1.68	5.72	66.96	70.84	.0001	.2552	.2092	.0369	.0368	1.5399	.8900	.8832	-.5038	.5367	1.0056	.6639	.6766
10	-4.13	2.54	4.62	63.76	65.88	.0004	.3231	.1464	.0287	.0286	1.5608	.9176	.9123	.5291	.5493	.9718	.6928	.6469
15	-3.49	2.81	6.76	58.92	62.90	.0013	.3772	.1024	.0223	.0220	1.5621	.9368	.9327	.7730	.5616	.9312	.7225	.6207
30	-2.56	3.11	11.48	44.87	53.24	.0051	.4658	.0351	.0092	.0079	1.5480	.9716	.9699	.9474	.5921	.8306	.8066	.5791
50	-1.60	3.37	12.65	29.84	39.11	.0079	.5163	.0418	.0118	.0096	1.5174	.9588	.9564	.9476	.6188	.7296	.9102	.5663
70	-.35	3.84	12.67	18.16	26.99	.0095	.4986	.0488	.0134	.0107	1.4874	.9430	.9398	.9397	.6298	.6579	1.0014	.6091
85	.19	3.86	10.83	12.75	19.71	.0149	.4943	.0871	.0229	.0189	1.4715	.8931	.8872	.8950	.6303	.6203	1.0633	.6387
90	.24	3.75	11.30	10.80	18.34	.0169	.5116	.1281	.0328	.0284	1.4574	.8432	.8348	.8506	.6292	.6009	1.0830	.6316
95	.16	3.52	12.36	8.67	17.48	.0193	.5282	.1667	.0413	.0365	1.4413	.7951	.7844	.8107	.6280	.5797	1.1013	.6240

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1350	1.5060	91.93	92.38	41.60

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1010.6	603.5	602.7	600.8	811.0	-47.5	53.38	-4.56	-21.74	47.06	649.0	882.5	240.2	-646.0	570.8	598.5
10	18.350	19.110	1004.3	619.3	625.7	619.1	785.6	16.0	51.46	1.48	-17.26	44.09	655.3	861.8	194.4	-599.6	591.1	615.6
15	19.070	19.740	984.9	624.9	648.7	624.3	740.9	28.3	48.79	2.60	-11.05	44.22	661.6	871.2	126.6	-607.6	614.3	635.9
30	21.140	21.600	932.0	648.5	688.1	648.6	628.3	.1	42.38	.02	4.34	46.99	691.5	951.2	-52.7	-695.7	681.0	695.8
50	23.970	24.200	870.0	640.7	686.2	640.7	534.6	2.6	37.90	.23	19.05	50.48	727.4	1007.2	-237.6	-777.0	772.2	779.6
70	26.790	26.880	814.0	622.7	670.6	622.7	461.4	-3.3	34.53	-.30	30.88	54.37	782.2	1069.3	-401.6	-869.2	863.0	865.9
85	28.860	28.900	784.9	605.0	650.1	604.9	439.8	8.4	34.08	.81	37.00	56.75	814.1	1103.2	-489.9	-922.5	929.7	931.0
90	29.570	29.600	770.2	583.2	629.2	582.9	444.1	18.0	35.23	1.77	38.95	58.07	809.1	1102.4	-508.5	-935.5	952.6	953.5
95	30.240	30.270	753.4	557.0	605.2	556.6	448.6	15.5	36.55	1.59	40.96	59.88	801.6	1109.4	-525.5	-959.6	974.1	975.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.53	7.50	11.94	57.94	62.54	.0274	.6001	.1470	.0348	.0283	.9388	.0000	.0000	.8200	.9100	.5177	.5873	.7571
10	3.46	7.71	17.43	49.98	59.58	.0271	.5681	.1557	.0383	.0317	.9358	.0000	.0000	.8066	.9015	.5321	.5915	.7405
15	2.68	7.01	18.06	46.19	57.09	.0217	.5478	.1466	.0376	.0320	.9414	.0000	.0000	.8102	.8832	.5379	.5963	.7499
30	-.18	4.62	14.05	42.36	51.76	.0063	.4941	.0720	.0205	.0187	.9736	.0000	.0000	.8895	.8345	.5617	.6204	.8238
50	-1.61	3.90	11.00	37.67	44.76	.0010	.4598	.0335	.0108	.0105	.9890	.0000	.0000	.9403	.7744	.5557	.6482	.8736
70	-3.01	3.10	12.52	34.83	44.25	.0000	.4404	.0332	.0120	.0119	.9903	.0000	.0000	.9326	.7214	.5403	.6930	.9278
85	-2.69	3.81	15.85	33.27	45.29	.0000	.4426	.0573	.0222	.0222	.9843	.0000	.0000	.8816	.6921	.5233	.7176	.9542
90	-1.68	4.92	17.49	33.45	45.96	.0002	.4630	.0767	.0305	.0305	.9798	.0000	.0000	.8493	.6769	.5025	.7109	.9497
95	-.61	6.14	17.91	34.96	46.75	.0006	.4949	.0933	.0380	.0378	.9764	.0000	.0000	.8226	.6591	.4778	.7005	.9517

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7383.	181.62	1.1350	1.4725	86.59	87.30

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	572.4	1071.2	572.4	604.2	.0	884.5	.00	55.66	36.45	-31.33	711.6	707.5	-422.8	367.9	422.8	516.6
10	14.100	16.790	584.3	1039.5	584.3	615.2	.0	837.8	.00	53.70	37.87	-25.72	740.2	683.5	-454.4	296.7	454.4	541.1
15	15.170	17.580	596.6	1000.3	596.6	622.3	.0	783.0	.00	51.51	39.32	-19.13	771.3	659.7	-488.9	216.5	488.9	566.5
30	18.260	19.910	626.9	904.5	626.9	615.2	.0	662.9	.00	47.12	43.19	-1.93	860.4	617.5	-589.1	21.4	589.1	641.6
50	22.190	23.090	653.6	813.0	653.6	587.7	.0	561.5	.00	43.67	47.55	17.18	968.9	617.2	-715.1	-182.5	715.1	744.1
70	25.880	26.260	666.4	750.2	666.4	573.5	.0	483.7	.00	40.14	51.35	32.25	1067.7	679.2	-834.0	-362.5	834.0	846.2
85	28.450	28.610	668.1	716.3	668.1	546.8	.0	462.7	.00	40.25	53.91	40.03	1134.4	714.3	-916.8	-459.3	916.8	922.0
90	29.320	29.410	667.3	697.1	667.3	517.6	.0	466.7	.00	42.06	54.77	42.92	1156.7	706.9	-944.8	-481.0	944.8	947.7
95	30.150	30.180	666.1	675.0	666.1	487.1	.0	467.4	.00	43.82	55.56	46.04	1178.0	701.8	-971.6	-505.2	971.6	972.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.56	2.35	5.37	67.78	70.84	.0002	.2867	.1968	.0345	.0345	1.5373	.8975	.8912	.1169	.5270	.9777	.6559	.6458
10	-3.65	3.02	5.26	63.59	65.86	.0005	.3457	.1258	.0248	.0247	1.5555	.9291	.9246	.6629	.5393	.9442	.6846	.6208
15	-2.99	3.31	7.73	58.45	62.90	.0016	.3971	.0846	.0185	.0182	1.5548	.9475	.9442	.8316	.5513	.9041	.7142	.5963
30	-2.03	3.66	11.77	45.12	53.23	.0058	.4929	.0377	.0099	.0084	1.5436	.9701	.9683	.9472	.5803	.8081	.7971	.5516
50	-1.08	3.91	12.63	30.37	39.10	.0088	.5376	.0354	.0100	.0075	1.5295	.9657	.9636	.9567	.6065	.7182	.8998	.5452
70	.09	4.29	12.19	19.11	27.01	.0103	.5125	.0293	.0081	.0052	1.5180	.9662	.9642	.9635	.6192	.6586	.9929	.5962
85	.58	4.26	10.08	13.88	19.70	.0155	.5122	.0722	.0192	.0151	1.5086	.9152	.9102	.9145	.6208	.6248	1.0566	.6229
90	.63	4.14	10.64	11.85	18.34	.0174	.5317	.1159	.0300	.0255	1.4948	.8647	.8569	.8679	.6199	.6054	1.0768	.6139
95	.54	3.91	11.88	9.53	17.48	.0198	.5471	.1533	.0383	.0333	1.4783	.8198	.8097	.8296	.6188	.5837	1.0954	.6069

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1370	1.5230	93.20	93.59	41.17

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	981.1	578.6	567.5	574.7	800.3	-59.2	54.66	-5.91	-22.00	48.84	612.3	873.8	229.2	-657.9	571.0	598.7
10	18.350	19.110	973.1	589.9	596.1	589.7	769.2	10.4	52.23	1.01	-16.62	45.75	622.1	845.1	177.9	-605.4	591.3	615.8
25	19.070	19.740	952.4	591.6	619.2	590.8	723.4	31.6	49.43	3.07	-9.98	45.65	629.3	845.2	108.9	-604.5	614.5	636.1
30	21.140	21.600	902.8	616.3	651.9	616.3	624.4	2.3	43.76	.21	4.94	48.37	655.4	928.0	-56.8	-693.8	681.2	696.1
50	23.970	24.200	854.5	622.7	661.2	622.6	541.0	4.5	39.28	.41	19.22	51.22	701.5	994.5	-231.4	-775.3	772.4	779.8
70	26.790	26.880	814.6	620.9	662.7	620.9	473.8	1.5	35.56	.14	30.42	54.31	769.1	1064.6	-389.5	-864.7	863.3	866.2
85	28.860	28.900	792.2	610.3	646.7	610.1	457.5	12.6	35.28	1.19	36.16	56.41	801.1	1102.9	-472.5	-918.7	930.0	931.3
90	29.570	29.600	778.2	589.8	625.2	589.5	463.2	18.9	36.54	1.84	38.08	57.77	794.3	1105.4	-489.7	-934.9	952.9	953.9
95	30.240	30.270	761.0	562.7	601.3	562.5	466.3	11.2	37.79	1.14	40.20	59.73	787.4	1116.3	-508.2	-964.2	974.5	975.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	4.69	8.67	10.59	60.56	62.54	.0309	.6138	.1512	.0357	.0284	.9399	.0000	.0000	.8163	.8798	.4958	.5526	.7488
10	4.21	8.46	16.95	51.21	59.56	.0278	.5818	.1644	.0405	.0337	.9355	.0000	.0000	.7967	.8705	.5062	.5599	.7252
15	3.43	7.76	18.51	46.36	57.04	.0216	.5616	.1586	.0406	.0351	.9399	.0000	.0000	.7943	.8521	.5085	.5648	.7264
30	1.29	6.08	14.30	43.54	51.77	.0081	.5113	.0833	.0237	.0214	.9710	.0000	.0000	.8729	.8067	.5323	.5850	.8015
50	-.16	5.33	11.10	38.86	44.65	.0020	.4727	.0385	.0124	.0118	.9878	.0000	.0000	.9308	.7595	.5387	.6222	.8603
70	-1.97	4.13	12.93	35.42	44.21	.0002	.4463	.0361	.0130	.0129	.9895	.0000	.0000	.9291	.7213	.5378	.6796	.9221
85	-1.53	4.97	16.21	34.09	45.27	.0003	.4477	.0574	.0223	.0222	.9841	.0000	.0000	.8861	.6979	.5268	.7053	.9521
90	-.39	6.20	17.56	34.70	45.96	.0010	.4694	.0753	.0300	.0296	.9798	.0000	.0000	.8547	.6833	.5071	.6970	.9503
95	.65	7.39	17.46	36.65	46.75	.0018	.5040	.0927	.0377	.0370	.9763	.0000	.0000	.8240	.6647	.4817	.6866	.9556

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7385.	179.66	1.1370	1.4878	87.72	88.38

Blade-Element and Over-All Performance with Uniform Inlet Flow, No Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	556.6	1052.8	556.6	577.3	.0	880.4	.00	56.74	37.25	-32.18	699.2	682.1	-423.2	363.3	423.2	517.1
10	14.100	16.790	568.0	1021.1	568.0	581.1	.0	839.4	.00	55.30	38.68	-27.11	727.7	653.5	-454.8	297.8	454.8	541.6
15	15.170	17.580	579.8	982.3	579.8	595.6	.0	781.4	.00	52.67	40.15	-19.74	758.8	633.9	-489.4	214.3	489.4	567.1
30	18.260	19.910	609.1	886.0	609.1	592.0	.0	659.9	.00	48.09	44.04	-1.64	847.9	594.1	-589.7	17.6	589.7	642.3
50	22.190	23.090	635.2	801.8	635.2	568.0	.0	565.7	.00	44.86	48.39	17.41	957.2	597.3	-715.8	-179.1	715.8	744.8
70	25.880	26.260	648.7	745.6	648.7	560.7	.0	491.4	.00	41.23	52.13	32.34	1057.4	664.7	-834.8	-355.7	834.8	847.1
85	28.450	28.610	650.9	714.6	650.9	536.7	.0	471.8	.00	41.33	54.65	40.06	1125.2	701.3	-917.8	-451.1	917.8	922.9
90	29.320	29.410	650.2	696.1	650.2	506.8	.0	476.9	.00	43.28	55.49	42.97	1147.8	692.8	-945.8	-471.8	945.8	948.7
95	30.150	30.180	649.1	674.1	649.1	474.2	.0	479.1	.00	45.29	56.28	46.18	1169.3	685.2	-972.6	-494.4	972.6	973.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.77	3.15	4.53	69.42	70.84	.0003	.3090	.1972	.0343	.0342	1.5371	.9003	.8941	.2793	.5116	.9581	.6433	.6208
10	-2.84	3.84	3.84	65.80	65.83	.0008	.3761	.1399	.0272	.0271	1.5535	.9239	.9191	.6769	.5232	.9243	.6715	.5916
15	-2.17	4.14	7.12	59.90	62.89	.0022	.4207	.0867	.0189	.0184	1.5543	.9478	.9445	.8411	.5346	.8857	.7007	.5713
30	-1.18	4.52	12.05	45.69	53.22	.0071	.5121	.0367	.0096	.0078	1.5424	.9716	.9698	.9504	.5624	.7902	.7831	.5295
50	-.25	4.75	12.85	30.98	39.08	.0103	.5541	.0315	.0089	.0060	1.5378	.9701	.9683	.9620	.5881	.7069	.8859	.5265
70	.86	5.07	12.29	19.79	27.02	.0119	.5238	.0191	.0052	.0020	1.5361	.9780	.9766	.9757	.6015	.6535	.9805	.5825
85	1.32	4.99	10.10	14.59	19.69	.0167	.5225	.0609	.0162	.0117	1.5314	.9304	.9262	.9281	.6036	.6223	1.0456	.6107
90	1.35	4.86	10.70	12.52	18.33	.0187	.5435	.1064	.0275	.0227	1.5186	.8799	.8727	.8797	.6029	.6035	1.0662	.6006
95	1.25	4.62	12.03	10.09	17.48	.0210	.5616	.1472	.0367	.0314	1.5023	.8332	.8234	.8384	.6019	.5819	1.0851	.5914

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1386	1.5344	93.92	94.27	40.44

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	960.3	552.0	536.3	546.1	796.5	-72.7	56.05	-7.60	-22.76	50.87	581.8	866.2	224.9	-672.0	571.6	599.4
10	18.350	19.110	951.1	561.3	557.0	561.1	770.9	5.4	54.15	.55	-17.81	47.44	585.1	829.6	178.9	-611.1	591.9	616.5
15	19.070	19.740	930.5	563.6	586.3	562.5	722.4	34.9	50.93	3.55	-10.37	46.93	596.5	823.8	107.2	-601.8	615.2	636.8
30	21.140	21.600	879.2	589.1	621.9	589.1	621.3	5.0	44.96	.49	5.53	49.58	625.8	908.7	-60.6	-691.8	681.9	696.8
50	23.970	24.200	838.5	605.3	637.0	605.3	545.0	5.2	40.54	.49	19.64	52.02	677.5	983.7	-228.2	-775.4	773.2	780.7
70	26.790	26.880	807.0	612.3	647.9	612.2	481.2	3.5	36.60	.33	30.56	54.66	753.0	1058.7	-383.0	-863.6	864.2	867.1
85	28.860	28.900	788.5	605.8	635.8	605.6	466.3	14.3	36.26	1.36	36.16	56.58	787.6	1099.7	-464.7	-917.9	931.0	932.3
90	29.570	29.600	775.5	587.3	614.4	587.0	472.9	19.9	37.60	1.94	38.06	57.88	780.4	1104.1	-480.9	-935.0	953.9	954.8
95	30.240	30.270	758.4	560.3	588.8	560.0	478.0	12.8	39.07	1.30	40.19	59.83	770.8	1114.6	-497.4	-963.7	975.5	976.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	6.16	10.14	8.89	63.65	62.54	.0367	.6356	.1594	.0375	.0289	.9389	.0000	.0000	.8076	.8584	.4720	.5227	.7408
10	6.11	10.35	16.48	53.60	59.57	.0361	.6039	.1748	.0430	.0342	.9341	.0000	.0000	.7869	.8481	.4804	.5252	.7101
15	4.96	9.28	18.99	47.37	57.01	.0267	.5801	.1723	.0441	.0373	.9372	.0000	.0000	.7797	.8303	.4833	.5337	.7064
30	2.56	7.33	14.65	44.48	51.81	.0101	.5271	.0943	.0268	.0240	.9686	.0000	.0000	.8587	.7841	.5077	.5564	.7831
50	1.16	6.65	11.09	40.04	44.54	.0032	.4845	.0435	.0140	.0130	.9867	.0000	.0000	.9225	.7438	.5225	.5980	.8492
70	-.93	5.17	13.12	36.27	44.20	.0006	.4542	.0395	.0142	.0140	.9886	.0000	.0000	.9246	.7133	.5294	.6635	.9153
85	-.57	5.92	16.38	34.90	45.25	.0008	.4542	.0600	.0233	.0230	.9835	.0000	.0000	.8843	.6937	.5221	.6924	.9479
90	.62	7.21	17.66	35.66	45.96	.0019	.4752	.0758	.0302	.0294	.9799	.0000	.0000	.8572	.6801	.5042	.6841	.9477
95	1.95	8.69	17.63	37.77	46.75	.0035	.5111	.0937	.0382	.0367	.9762	.0000	.0000	.8222	.6612	.4787	.6706	.9523

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7393.	176.45	1.1386	1.4974	88.26	88.90

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE ($90 - \beta_{10}$) UNIFORM INLET FLOW, NO TIP TREATMENT (probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 161.22			W_{COR} = 153.72			W_{COR} = 145.65		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	35.8	32.4	34.1	34.3	30.6	32.45	33.2	29.0	31.1
10	41.4	39.4	40.4	39.9	37.8	33.85	38.2	35.9	37.05
15	44.9	43.0	43.95	43.0	41.2	42.1	40.7	39.3	40.0
30	50.8	49.2	50.0	48.7	47.0	47.85	46.4	44.9	45.65
50	57.0	55.1	56.05	54.0	52.4	53.2	51.4	49.9	50.65
70	61.1	59.5	60.3	57.3	56.1	56.7	54.1	53.7	53.9
85	62.9	62.2	62.55	59.1	58.3	58.7	55.5	54.9	55.2
90	61.8	61.5	61.65	57.9	57.8	57.85	54.1	54.0	54.05
95	60.6	59.7	60.15	55.6	55.6	55.6	51.5	51.3	51.4

	W_{COR} = 137.59			W_{COR} = 128.38		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.7	27.8	29.75	30.9	27.6	29.25
10	36.7	34.1	35.4	36.3	33.5	34.9
15	39.9	37.8	33.85	38.2	36.7	37.45
30	44.5	42.8	43.65	41.8	41.1	41.45
50	48.3	47.5	47.9	46.0	45.0	45.5
70	51.4	51.5	51.45	49.0	49.2	49.1
85	51.8	50.9	51.35	46.7	47.8	47.25
90	50.2	49.6	49.9	43.3	45.6	44.45
95	47.1	46.9	47.0	39.6	41.3	40.45

100% SPEED

	W_{COR} = 184.37			W_{COR} = 183.73			W_{COR} = 183.19		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.3	26.9	29.1	31.7	27.3	29.5	32.8	27.2	30.0
10	39.0	35.8	37.4	38.5	35.7	37.1	39.1	35.3	37.2
15	43.0	40.8	41.9	41.7	40.4	41.05	41.3	39.9	40.6
30	48.8	48.0	48.4	48.3	46.8	47.55	47.8	46.2	47.0
50	55.1	54.3	54.7	54.0	52.0	53.0	52.8	51.0	51.9
70	59.4	58.7	59.05	57.5	56.1	56.8	55.6	54.6	55.1
85	61.5	61.5	61.5	59.1	58.0	58.55	57.5	56.1	56.8
90	59.9	60.8	60.35	57.6	57.1	57.35	56.1	55.3	55.7
95	57.7	57.5	57.6	55.4	54.0	54.7	53.0	52.5	52.75

	W_{COR} = 181.62			W_{COR} = 179.66			W_{COR} = 176.45		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.8	26.7	29.25	31.7	27.0	29.35	31.1	27.4	29.25
10	38.5	34.7	36.6	37.3	34.6	35.95	36.7	34.5	35.6
15	41.4	39.1	40.25	40.0	38.7	39.35	39.4	38.2	35.8
30	46.4	45.1	45.75	46.0	44.5	45.25	45.4	44.1	44.75
50	51.4	49.0	50.6	49.9	49.0	49.45	48.9	48.1	48.5
70	54.3	53.2	53.75	52.9	52.5	52.7	51.5	51.7	51.6
85	55.1	54.5	54.8	53.7	53.2	53.45	52.5	52.2	52.35
90	53.4	53.5	53.45	52.4	51.9	52.15	51.3	50.8	51.05
95	51.2	50.5	50.85	50.2	49.4	49.8	49.1	48.3	48.7

APPENDIX 3

Blade Element and Overall Performance
with
Radial Inlet Distortion
and
No Tip Treatment

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	495.8	923.4	495.8	585.8	.0	713.8	.00	50.62	34.29	-27.15	600.2	558.6	-338.1	300.6	338.1	413.2
10	14.100	16.790	515.5	900.0	515.5	579.0	.0	689.0	.00	49.96	35.18	-23.85	630.7	633.3	-363.4	286.2	363.4	432.7
15	15.170	17.580	529.9	869.7	529.9	583.4	.0	644.9	.00	47.85	36.41	-18.17	659.6	614.6	-391.0	191.8	391.0	453.1
30	18.280	19.910	554.3	701.6	554.3	587.9	.0	529.7	.00	41.98	40.33	-1.58	727.6	589.8	-471.1	16.6	471.1	513.2
50	22.190	23.090	566.4	695.1	566.4	540.6	.0	437.0	.00	38.95	45.27	16.31	805.0	553.8	-571.0	-158.1	571.0	595.1
70	25.880	26.260	487.2	610.0	487.2	463.4	.0	396.6	.00	40.57	53.84	31.18	826.5	549.4	-667.0	-280.2	667.0	676.8
85	28.450	28.610	403.1	557.9	403.1	391.2	.0	397.7	.00	45.47	61.20	40.97	836.8	518.1	-733.3	-330.7	733.3	737.4
90	29.320	29.410	385.4	538.9	385.0	349.6	.0	409.5	.00	49.65	62.94	46.97	848.7	494.0	-755.7	-348.3	755.7	758.0
95	30.150	30.180	381.2	523.8	381.2	323.8	.0	411.7	.00	51.83	63.87	48.51	865.5	489.0	-777.1	-366.2	777.1	777.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	-6.75	.16	10.06	61.44	71.39	.0000	.1716	.1669	.0305	.0305	1.3307	.9024	.8994	.9206	.4559	.8449	.5526	.6026
10	-6.34	.28	7.37	57.03	65.13	.0000	.2557	.1492	.0299	.0299	1.3360	.9055	.9016	.9087	.4750	.8201	.5830	.5771
15	-5.85	.41	9.76	54.59	62.98	.0000	.3103	.1181	.0260	.0260	1.3335	.9176	.9141	.9056	.4879	.7898	.6085	.5582
30	-4.84	.82	12.13	41.91	53.24	.0000	.3884	.0480	.0126	.0126	1.3227	.9566	.9548	.9038	.5100	.7137	.6719	.5317
50	-3.32	1.68	11.64	28.95	38.94	.0000	.4632	.0854	.0242	.0242	1.2893	.9058	.9024	.8714	.5207	.6207	.7412	.5035
70	-2.50	6.73	11.05	22.66	26.92	.0000	.5018	.0460	.0128	.0128	1.3156	.9484	.9454	.9340	.4457	.5593	.7545	.4795
85	7.99	11.68	10.88	20.23	19.56	.0000	.5461	.0470	.0123	.0123	1.3492	.9510	.9488	.9360	.3637	.4880	.7504	.4541
90	8.90	12.39	12.63	17.97	18.26	.0000	.5887	.0979	.0245	.0245	1.3498	.9020	.8977	.8773	.3487	.4703	.7490	.4312
95	8.83	12.17	14.37	15.35	17.53	.0000	.6064	.1309	.0312	.0312	1.3463	.8682	.8625	.8403	.3455	.4550	.7850	.4256

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0895	1.3206	92.28	92.58	33.16

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	846.2	572.6	548.9	572.5	544.1	2.8	49.56	.28	-18.85	30.74	580.0	744.6	187.3	-476.0	456.7	478.0
10	18.350	19.110	844.2	576.4	561.6	575.8	630.2	26.8	48.29	2.65	-15.64	38.97	583.4	740.6	157.3	-468.8	472.0	482.5
15	19.070	19.740	831.2	584.7	576.8	584.3	598.2	20.3	46.03	1.98	-10.50	38.89	587.2	761.7	106.7	-488.5	491.5	508.8
30	21.140	21.600	790.2	596.9	611.5	595.0	501.3	-1.6	39.37	-.15	4.04	43.07	613.3	817.4	-43.5	-558.3	544.0	556.7
50	23.970	24.200	724.3	563.2	588.7	563.1	421.9	7.9	35.62	.80	18.40	47.56	621.2	834.6	-105.0	-615.0	617.8	623.7
70	26.790	26.880	656.0	506.0	539.7	505.8	387.0	14.0	36.11	1.59	28.78	54.30	612.0	846.0	-303.5	-678.8	684.5	692.8
85	28.860	28.900	615.0	460.9	476.4	460.5	390.4	17.0	39.34	2.12	36.58	57.67	593.3	861.4	-353.4	-727.8	743.8	744.0
90	29.570	29.600	601.4	439.3	446.1	438.0	402.8	16.3	42.11	2.13	38.88	59.50	573.0	865.8	-359.3	-746.6	762.1	762.8
95	30.240	30.270	589.5	418.4	423.8	418.2	409.7	13.7	44.03	1.88	41.10	61.38	562.5	873.1	-369.7	-766.4	779.4	780.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	-.14	3.86	16.79	49.28	62.56	.0000	.4987	.0991	.0235	.0235	.9681	.0000	.0000	.8435	.7655	.5023	.5558	.6532
10	.51	4.77	18.53	48.63	59.60	.0000	.4894	.1203	.0296	.0296	.9615	.0000	.0000	.8127	.7607	.5086	.5569	.6496
15	-.16	4.17	17.43	44.04	57.07	.0000	.4719	.1054	.0271	.0271	.9671	.0000	.0000	.8343	.7478	.5138	.5720	.6602
30	-3.31	1.50	13.91	30.52	51.84	.0000	.4242	.0480	.0137	.0137	.9869	.0000	.0000	.9178	.7102	.5267	.5535	.7212
50	-3.86	1.64	11.51	34.81	44.69	.0000	.4060	.0253	.0092	.0092	.9939	.0000	.0000	.9453	.6493	.4063	.5564	.7355
70	-1.49	4.61	14.48	34.53	44.39	.0000	.4338	.0428	.0154	.0154	.9912	.0000	.0000	.9305	.5846	.4435	.5439	.7491
85	2.39	8.88	17.17	37.22	45.30	.0000	.4871	.0772	.0300	.0300	.9860	.0000	.0000	.8535	.5445	.4012	.5242	.7498
90	4.97	11.56	17.94	37.98	45.93	.0000	.5271	.0985	.0392	.0392	.9830	.0000	.0000	.8271	.5297	.3801	.5056	.7507
95	6.83	13.57	18.20	42.16	46.74	.0000	.5537	.1199	.0488	.0488	.9801	.0000	.0000	.7839	.5169	.3613	.4924	.7546

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5907.	147.07	1.0895	1.3000	86.98	87.47

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	488.5	917.1	488.5	578.9	.0	711.3	.00	50.85	34.69	-27.24	594.1	651.3	-338.1	208.2	338.1	413.1
10	14.100	16.790	508.3	892.7	508.3	573.9	.0	683.9	.00	50.00	35.55	-23.62	624.9	625.5	-363.4	251.2	363.4	432.7
15	15.170	17.580	523.1	869.2	523.1	578.7	.0	639.0	.00	47.82	36.75	-17.79	653.1	608.4	-390.9	185.9	390.9	453.0
30	18.280	19.910	546.7	785.3	546.7	580.9	.0	528.2	.00	42.25	40.72	-1.45	721.8	582.7	-471.1	15.1	471.1	513.1
50	22.190	23.090	558.0	692.1	558.0	535.0	.0	438.9	.00	39.36	45.69	16.27	790.1	557.0	-571.8	-156.1	571.8	595.0
70	25.880	26.260	478.0	606.9	478.0	455.0	.0	400.5	.00	41.33	54.36	31.24	821.1	533.8	-666.9	-276.2	666.9	676.7
85	28.450	28.610	395.0	553.3	395.0	378.4	.0	403.7	.00	46.85	61.68	41.40	832.9	504.5	-733.2	-333.5	733.2	737.3
90	29.320	29.410	383.2	537.6	383.2	341.1	.0	415.0	.00	50.52	63.10	45.20	847.3	484.0	-755.8	-342.0	758.6	757.0
95	30.150	30.180	376.1	525.9	376.1	320.0	.0	417.3	.00	52.53	64.17	48.39	863.2	482.1	-777.0	-360.4	777.0	777.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P P01	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.35	.55	9.99	61.93	71.39	.0000	.1744	.1540	.0291	.0291	1.3331	.9113	.9076	4.0355	.4400	.8384	.5469	.5054
10	-5.98	.64	7.51	59.17	66.13	.0000	.2525	.1374	.0276	.0276	1.3367	.9139	.9102	1.1232	.4685	.8129	.5777	.5746
15	-5.50	.75	9.15	54.55	62.99	.0000	.3119	.1083	.0239	.0239	1.3332	.9249	.9217	.6364	.4816	.7825	.6036	.5521
30	-4.45	1.21	12.25	42.18	53.24	.0000	.3928	.0445	.0117	.0117	1.3231	.9602	.9586	.9130	.5027	.7076	.6659	.5258
50	-2.88	2.11	11.59	29.41	38.93	.0000	.4674	.0820	.0233	.0233	1.2927	.9112	.9079	.8771	.5126	.6175	.7357	.4979
70	-3.08	7.31	11.11	23.11	26.92	.0000	.5098	.0502	.0140	.0140	1.3177	.9449	.9427	.9296	.4361	.5361	.7481	.4716
85	8.51	12.19	11.31	20.28	19.55	.0000	.5628	.0639	.0166	.0166	1.3481	.9352	.9323	.9166	.3556	.4844	.7555	.4417
90	9.03	12.53	12.85	17.90	18.26	.0000	.5922	.1145	.0285	.0285	1.3482	.8869	.8820	.8588	.3465	.4688	.7680	.4321
95	9.15	12.49	14.26	15.77	17.53	.0000	.6156	.1391	.0332	.0332	1.3487	.8523	.8563	.8317	.3404	.4575	.7825	.4194

T0/T0 INLET	P0/P0 INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0899	1.3223	92.31	82.51	32.78

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	840.6	566.6	542.5	566.4	642.1	5.8	49.81	.59	-18.88	39.86	573.4	738.0	185.5	-473.0	456.7	478.8
10	18.350	19.110	837.3	569.3	556.0	569.5	526.0	25.7	48.39	2.59	-15.40	39.38	574.9	735.7	153.1	-464.7	472.9	492.5
15	19.070	19.740	823.7	577.0	571.5	576.5	592.9	23.2	46.04	2.31	-10.08	40.10	581.0	753.7	101.4	-485.5	491.4	509.7
30	21.140	21.600	783.2	589.5	602.8	589.5	499.7	1.1	39.64	.11	4.24	43.29	605.7	810.1	-45.1	-555.5	544.9	556.6
50	23.970	24.200	719.8	557.8	581.9	557.7	423.6	8.9	36.04	.91	18.44	47.78	614.2	830.2	-194.1	-614.8	617.7	623.6
70	26.790	26.880	651.7	500.2	521.7	500.0	390.6	13.6	36.84	1.56	29.90	53.63	602.3	843.7	-299.8	-679.2	680.4	632.7
85	28.860	28.900	608.7	451.8	462.0	451.5	396.2	16.6	40.63	2.11	36.96	58.19	578.2	856.9	-347.5	-738.2	747.7	744.8
90	29.570	29.600	596.0	430.9	433.6	430.6	408.5	16.4	43.31	2.18	39.22	60.01	559.7	861.9	-353.6	-746.4	762.0	762.8
95	30.240	30.270	587.0	414.1	414.9	413.8	415.3	13.9	45.03	1.92	41.26	61.62	552.0	870.9	-364.0	-766.2	779.3	780.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P P01	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.06	4.07	17.08	49.22	62.56	.0000	.5012	.1015	.0241	.0241	.9677	.0000	.0000	.8416	.7507	.4968	.5195	.6479
10	.58	4.83	18.56	45.80	59.60	.0000	.4929	.1218	.0300	.0300	.9615	.0000	.0000	.8121	.7539	.4992	.5208	.6451
15	-.13	4.21	17.75	43.73	57.05	.0000	.4738	.1059	.0272	.0272	.9675	.0000	.0000	.8339	.7406	.5068	.5259	.6520
30	-3.02	1.79	14.17	39.53	51.84	.0000	.4258	.0472	.0135	.0135	.9867	.0000	.0000	.9120	.7036	.5199	.5461	.7144
50	-3.43	2.07	11.61	35.13	44.67	.0000	.4101	.0265	.0086	.0086	.9935	.0000	.0000	.9430	.6441	.4912	.5408	.7312
70	-.77	5.33	14.45	35.29	44.31	.0000	.4405	.0441	.0159	.0159	.9910	.0000	.0000	.9300	.5796	.4384	.5349	.7307
85	3.68	10.17	17.16	38.52	45.30	.0000	.4998	.0835	.0324	.0324	.9852	.0000	.0000	.8426	.5373	.4028	.5102	.7449
90	6.21	12.80	17.89	41.13	45.93	.0000	.5398	.1092	.0434	.0434	.9814	.0000	.0000	.8076	.5240	.3733	.4929	.7465
95	7.85	14.59	18.24	43.11	46.74	.0000	.5731	.1347	.0548	.0548	.9778	.0000	.0000	.7590	.5140	.3575	.4826	.7519

NCORR INLET RPM	WCORR INLET LBM/SEC	T0/T0 INLET	P0/P0 INLET	EFF-AD INLET %	EFF-P INLET %
5906.	145.41	1.0899	1.3013	86.93	87.43

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BT-1 DEGREE	BT-2 DEGREE	VT-1 FT/SEC	VT-2 FT/SEC	VOT-1 FT/SEC	VOT-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	470.9	913.5	470.9	572.2	.0	712.1	.00	51.21	35.11	-27.64	586.6	645.1	-337.4	220.8	337.4	412.7
10	14.100	16.790	499.0	887.9	499.0	565.1	.0	684.8	.00	50.47	36.00	-24.09	616.9	619.4	-362.5	252.0	362.5	431.8
15	15.170	17.580	513.6	856.9	513.6	558.4	.0	641.1	.00	48.43	37.21	-18.37	646.0	599.4	-390.2	180.0	390.2	452.1
30	18.280	19.910	535.5	782.4	535.5	573.4	.0	541.9	.00	42.82	41.20	-1.95	714.5	575.7	-470.1	10.0	470.1	512.1
50	22.190	23.090	546.5	689.5	546.5	528.1	.0	443.4	.00	40.01	46.23	15.92	790.3	549.5	-570.7	-150.5	570.7	593.9
70	25.890	26.260	466.9	593.5	466.9	445.7	.0	405.8	.00	42.41	54.95	31.11	813.5	521.2	-665.6	-258.5	665.6	675.4
85	28.450	28.610	385.2	549.1	385.2	362.5	.0	412.5	.00	48.69	62.23	41.73	827.0	485.8	-731.7	-323.4	731.7	735.8
90	29.320	29.410	373.5	533.4	373.5	333.7	.0	422.1	.00	51.69	63.64	45.08	841.5	472.5	-754.1	-344.3	754.1	756.4
95	30.150	30.180	366.4	530.1	366.4	318.5	.0	423.7	.00	53.06	64.70	47.88	857.7	475.3	-775.4	-352.5	775.4	776.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MT-1	MT-2
5	-5.92	.08	9.50	62.75	71.41	.0000	.1731	.1641	.0299	.0299	1.3312	.9076	.9038	.7542	.4409	.8348	.5308	.5004
10	-5.52	1.09	7.14	60.09	65.13	.0000	.2600	.1520	.0304	.0304	1.3335	.9069	.9030	.8278	.4596	.8080	.5701	.5536
15	-5.04	1.20	8.57	55.59	62.99	.0000	.3180	.1268	.0279	.0279	1.3293	.9143	.9107	.5832	.4725	.7770	.6057	.5436
30	-3.97	1.69	11.75	43.15	53.25	.0000	.3975	.0529	.0139	.0139	1.3225	.9540	.9521	.8957	.4999	.7045	.6877	.5190
50	-2.33	2.65	11.21	30.31	38.92	.0000	.4737	.0876	.0249	.0249	1.2940	.9077	.9042	.8592	.5014	.6150	.7270	.4901
70	3.70	7.93	10.94	23.94	26.93	.0000	.5233	.0658	.0194	.0194	1.3167	.9302	.9274	.9095	.4259	.5327	.7416	.4600
85	9.04	12.72	11.64	20.50	19.55	.0000	.5860	.0916	.0237	.0237	1.3447	.9100	.9052	.8840	.3460	.4002	.7498	.4248
90	9.56	13.06	12.74	18.56	18.25	.0000	.6160	.1289	.0322	.0322	1.3488	.8759	.8705	.8430	.3377	.4602	.7630	.4110
95	9.59	13.03	13.74	16.82	17.52	.0000	.6238	.1456	.0351	.0351	1.3523	.8591	.8530	.8245	.3316	.4611	.7767	.4134

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0908	1.3218	91.34	91.68	32.22

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BT-1 DEGREE	BT-2 DEGREE	VT-1 FT/SEC	VT-2 FT/SEC	VOT-1 FT/SEC	VOT-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	836.3	557.6	534.9	557.5	642.9	4.7	50.24	.48	-19.29	40.32	566.7	731.3	187.2	-473.2	455.7	477.0
10	18.350	19.110	831.3	559.6	545.9	558.0	626.7	27.1	48.89	2.78	-15.80	39.72	569.6	726.7	154.8	-464.4	471.0	491.5
15	19.070	19.740	816.0	566.1	559.8	565.4	594.6	27.1	46.72	2.74	-10.55	40.36	570.0	742.1	104.1	-480.6	490.5	507.7
30	21.140	21.600	778.5	581.0	578.7	580.9	503.2	.3	40.26	.03	3.87	43.69	596.3	803.7	-40.5	-585.3	543.7	555.5
50	23.970	24.200	715.0	550.5	573.9	550.4	427.8	8.0	36.69	.84	18.19	48.14	604.8	825.0	-188.7	-614.4	615.5	622.4
70	26.790	26.880	647.0	491.7	511.2	491.4	395.6	14.8	37.82	1.74	29.80	54.00	589.6	835.5	-292.5	-576.5	589.0	591.3
85	28.860	28.900	602.5	439.3	446.0	439.8	404.9	19.6	42.35	2.56	37.12	58.77	559.3	846.5	-337.3	-723.7	742.3	743.3
90	29.570	29.600	593.3	421.2	422.8	420.8	416.0	19.1	44.55	2.60	39.19	60.44	545.5	853.3	-344.5	-742.3	759.5	761.3
95	30.240	30.270	587.8	408.0	409.4	407.6	421.8	17.1	45.95	2.40	41.00	61.84	542.6	863.7	-356.0	-761.4	777.8	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MT-1	MT-2
5	.50	4.51	16.97	49.76	62.56	.0000	.5098	.1020	.0242	.0242	.9679	.0000	.0000	.8432	.7551	.4887	.5120	.5408
10	1.13	5.39	18.74	46.11	59.50	.0000	.5019	.1212	.0298	.0298	.9621	.0000	.0000	.8153	.7479	.4904	.5121	.5367
15	.58	4.91	18.19	43.97	57.06	.0000	.4821	.1048	.0269	.0269	.9693	.0000	.0000	.8378	.7339	.4867	.5153	.5512
30	-2.39	2.42	14.09	40.23	51.84	.0000	.4359	.0481	.0137	.0137	.9865	.0000	.0000	.9115	.6900	.5119	.5373	.5081
50	-2.78	2.72	11.53	35.85	44.66	.0000	.4192	.0257	.0083	.0083	.9939	.0000	.0000	.9458	.6401	.4844	.5410	.7259
70	.20	6.31	14.53	36.08	44.39	.0000	.4523	.0438	.0158	.0158	.9912	.0000	.0000	.9111	.5748	.4300	.5732	.7315
85	5.33	11.82	17.60	39.69	45.30	.0000	.5192	.0922	.0358	.0358	.9840	.0000	.0000	.8301	.5307	.3812	.4825	.7346
90	7.55	14.14	18.31	41.95	45.93	.0000	.5564	.1251	.0497	.0497	.9790	.0000	.0000	.7810	.5205	.3543	.4700	.7380
95	8.69	15.43	18.73	43.45	46.75	.0000	.5863	.1547	.0630	.0630	.9745	.0000	.0000	.7292	.5141	.3510	.4733	.7449

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5894.	142.92	1.0908	1.3006	85.92	86.45

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	553.0	1021.0	553.0	634.5	.0	799.8	.00	51.57	34.47	-27.90	670.7	718.1	-379.6	336.1	370.6	453.8
10	14.100	16.790	580.9	974.5	580.9	633.0	.0	766.9	.00	50.45	35.07	-23.92	700.8	693.0	-407.9	281.2	407.9	485.8
15	15.170	17.580	597.8	960.9	597.8	639.6	.0	717.7	.00	48.32	36.28	-18.11	741.6	672.7	-438.0	200.1	438.0	508.6
30	18.280	19.910	630.3	879.6	630.3	647.5	.0	594.9	.00	42.54	39.07	-1.64	822.9	649.6	-528.8	18.8	528.8	875.0
50	22.190	23.090	644.7	778.2	644.7	600.5	.0	494.9	.00	39.49	44.87	16.10	900.9	625.6	-642.0	-173.1	642.0	658.0
70	25.880	26.260	559.3	677.8	559.3	583.2	.0	453.8	.00	42.08	53.28	31.33	834.6	583.8	-748.8	-305.8	748.8	759.7
85	28.450	28.610	468.8	621.8	468.8	418.7	.0	459.6	.00	47.67	60.33	41.32	947.4	557.5	-823.1	-368.1	823.1	827.7
90	29.320	29.410	455.4	604.6	455.4	379.5	.0	470.1	.00	51.11	61.76	45.13	953.9	538.1	-848.3	-380.8	848.3	850.0
95	30.150	30.180	448.0	590.8	448.0	355.7	.0	471.6	.00	52.98	62.81	48.45	980.6	535.6	-872.3	-401.5	872.3	873.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	P02/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	-6.61	.29	9.22	62.37	71.27	.0000	.1988	.1605	.0292	.0292	1.4298	.9079	.9032*******	.5112	.8371	.5205	.5592	
10	-6.45	.19	7.28	58.99	65.09	.0000	.2805	.1466	.0293	.0293	1.4314	.9074	.9325	.3400	.5378	.6088	.6589	.6331
15	-6.00	.27	8.91	54.38	62.95	.0000	.3336	.1150	.0253	.0253	1.4285	.9200	.9158	.5822	.5534	.8741	.6884	.6120
30	-5.21	.46	12.05	41.61	53.22	.0000	.4081	.0391	.0103	.0103	1.4217	.9648	.9428	.9303	.5841	.7834	.7639	.5860
50	-3.70	1.29	11.43	28.77	38.94	.0000	.4763	.0637	.0181	.0181	1.3992	.9316	.9283	.9114	.5974	.6038	.8448	.5578
70	2.04	6.26	11.10	21.95	26.99	.0000	.5282	.0415	.0116	.0116	1.4203	.9548	.9525	.9463	.5193	.5962	.8587	.5188
85	7.19	10.87	11.24	18.01	19.56	.0000	.5802	.0497	.0129	.0129	1.4673	.9505	.9478	.9307	.4239	.5400	.8630	.4850
90	7.59	11.19	12.70	16.53	18.26	.0000	.5140	.0947	.0236	.0236	1.4587	.9087	.9036	.8900	.4138	.5236	.8782	.4550
95	7.80	11.14	14.31	14.36	17.52	.0000	.6260	.1195	.0285	.0285	1.4688	.8844	.8781	.8548	.4075	.5101	.8033	.4533

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1140	1.4253	93.33	93.65	35.72

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	932.4	603.6	589.5	603.4	722.5	-3.8	50.79	-.37	-19.59	41.90	625.7	810.7	209.8	-541.4	512.7	537.6
10	18.350	19.110	930.1	608.4	609.3	607.7	702.7	25.4	49.07	2.40	-15.75	40.90	633.3	804.0	171.8	-526.8	530.0	552.0
15	19.070	19.740	914.9	617.2	627.8	615.5	665.2	29.5	46.65	2.75	-10.27	41.29	638.7	820.6	113.4	-541.6	551.7	571.1
30	21.140	21.600	876.0	642.4	671.4	642.4	552.3	2.3	39.03	.21	4.16	40.09	674.5	894.7	-49.3	-622.7	611.6	624.8
50	23.970	24.200	810.4	617.3	654.8	617.2	477.5	9.1	36.09	.85	18.26	48.23	590.3	825.7	-216.0	-591.0	693.5	700.1
70	26.790	26.840	729.1	548.1	578.3	547.9	442.5	14.3	37.40	1.50	28.89	54.32	568.7	840.1	-332.5	-763.4	778.1	777.7
85	28.860	28.900	683.0	493.3	512.5	492.8	451.4	21.8	41.38	2.53	36.82	58.82	640.2	852.0	-383.5	-814.4	835.0	835.1
90	29.570	29.600	669.4	471.6	485.8	471.2	453.3	19.9	43.84	2.41	39.11	60.50	622.2	850.2	-392.2	-836.8	858.5	858.4
95	30.240	30.270	658.9	454.7	462.2	454.4	469.5	16.6	45.45	2.09	41.25	62.13	614.9	872.0	-405.4	-858.2	874.9	875.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	P02/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	.97	4.96	16.13	51.16	62.55	.0000	.5331	.1106	.0262	.0262	.9588	.0000	.0000	.8442	.8435	.5249	.5583	.7050
10	-1.20	5.45	18.45	46.58	59.60	.0000	.5212	.1350	.0332	.0332	.9500	.0000	.0000	.9122	.8377	.5292	.5724	.6994
15	.44	4.77	18.19	43.90	57.08	.0000	.5005	.1212	.0311	.0311	.9562	.0000	.0000	.8271	.8234	.5370	.5789	.7152
30	-2.73	2.08	14.25	38.72	51.81	.0000	.4468	.0601	.0171	.0171	.9797	.0000	.0000	.8975	.7888	.5632	.6008	.7843
50	-3.39	2.12	11.55	35.24	44.68	.0000	.4238	.0308	.0100	.0100	.9909	.0000	.0000	.9301	.7248	.5408	.6179	.8118
70	-.18	5.03	14.40	35.70	44.32	.0000	.4595	.0468	.0169	.0169	.9886	.0000	.0000	.9008	.6458	.4765	.5919	.8171
85	4.50	10.09	17.59	38.85	45.30	.0000	.5220	.0995	.0386	.0386	.9786	.0000	.0000	.8210	.5992	.4240	.5615	.8190
90	6.83	13.41	18.13	41.43	45.93	.0000	.5592	.1239	.0493	.0493	.9745	.0000	.0000	.7906	.5848	.4045	.5440	.8235
95	8.26	15.01	18.41	43.36	46.75	.0000	.5899	.1439	.0586	.0586	.9713	.0000	.0000	.7566	.5732	.3886	.5342	.8307

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6631.	162.86	1.1140	1.3946	87.48	89.97

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR — 90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	551.8	1024.2	551.8	642.1	.0	798.0	.00	51.18	34.55	-27.46	669.9	723.8	-379.9	333.8	379.9	464.2
10	14.100	16.790	572.5	995.9	572.5	638.5	.0	764.2	.00	50.11	35.49	-23.49	703.2	696.7	-408.3	277.9	408.3	486.2
15	15.170	17.580	587.7	960.2	587.7	641.9	.0	713.8	.00	48.02	36.77	-17.67	733.8	674.4	-439.3	204.8	439.3	509.1
30	18.280	19.910	617.1	873.1	617.1	635.3	.0	598.7	.00	43.27	40.59	-1.95	813.2	637.3	-529.4	22.1	529.4	576.6
50	22.190	23.090	632.9	778.5	632.9	593.6	.0	503.7	.00	40.31	45.42	15.54	902.1	616.7	-642.6	-165.0	642.6	668.7
70	25.880	26.260	547.4	681.6	547.4	501.4	.0	461.6	.00	42.66	53.84	30.83	928.7	584.6	-749.5	-298.8	749.5	760.5
85	28.450	28.610	458.1	623.2	458.1	407.4	.0	471.6	.00	49.18	60.92	41.23	942.8	541.7	-823.9	-356.9	823.9	828.5
90	29.320	29.410	445.1	608.8	445.1	369.6	.0	483.3	.00	52.62	62.33	44.95	958.7	522.2	-849.1	-368.4	849.1	851.7
95	30.150	30.180	437.9	597.4	437.9	348.6	.0	485.1	.00	54.30	63.36	48.11	976.8	522.4	-873.1	-388.9	873.1	874.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.48	.43	9.72	62.00	71.32	.0000	.1889	.1680	.0306	.0306	1.4267	.9037	.8988	14.1175	.5093	.9407	.6192	.6648
10	-6.01	.62	7.72	58.99	66.11	.0000	.2676	.1433	.0288	.0288	1.4321	.9108	.9061	.2486	.5298	.9102	.6526	.6368
15	-5.49	.77	9.27	54.43	62.97	.0000	.3228	.1150	.0254	.0254	1.4271	.9212	.9172	.6594	.5439	.8736	.6813	.6137
30	-4.58	1.08	11.76	42.54	53.23	.0000	.4175	.0702	.0184	.0184	1.4121	.9395	.9364	.8779	.5713	.7865	.7546	.5741
50	-3.15	1.84	10.87	29.88	38.94	.0000	.4846	.0869	.0247	.0247	1.3865	.9098	.9055	.8802	.5858	.6935	.8366	.5494
70	2.64	6.86	10.70	23.01	26.92	.0000	.5335	.0595	.0166	.0166	1.4197	.9377	.9346	.9238	.5012	.5992	.8524	.5139
85	7.80	11.47	11.14	19.69	19.55	.0000	.5994	.0852	.0222	.0222	1.4622	.9186	.9141	.8994	.4135	.5413	.8593	.4705
90	8.26	11.76	12.61	17.38	18.26	.0000	.6338	.1283	.0321	.0321	1.4658	.8801	.8735	.8547	.4040	.5265	.8740	.4516
95	8.34	11.68	13.97	15.25	17.53	.0000	.6440	.1496	.0360	.0360	1.4682	.8597	.8520	.8329	.3980	.5152	.8893	.4505

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1156	1.4220	91.32	91.74	36.204

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	936.3	607.8	597.5	607.6	720.9	-2.7	50.35	-.26	-19.17	41.67	632.6	813.4	207.7	-540.8	513.1	538.1
10	18.350	19.110	931.9	610.8	614.8	610.2	700.2	26.6	48.71	2.49	-15.35	40.81	637.8	806.1	168.8	-526.8	531.4	553.4
15	19.070	19.740	914.8	616.9	631.2	616.0	661.8	33.0	46.34	3.07	-9.86	41.16	641.4	818.3	109.5	-538.6	552.2	571.6
30	21.140	21.600	868.7	630.8	659.2	630.7	565.4	1.1	40.60	.10	4.02	44.69	662.1	887.6	-46.8	-624.4	612.2	625.5
50	23.970	24.200	808.5	610.0	646.3	609.9	485.7	9.9	36.92	.94	17.87	48.56	679.9	921.7	-208.5	-690.9	694.1	700.8
70	26.790	26.880	730.6	545.2	575.4	545.0	450.0	14.9	38.05	1.57	29.55	54.48	662.0	938.4	-325.8	-763.5	775.8	778.4
85	28.860	28.900	682.1	486.4	501.2	486.0	462.6	19.2	42.71	2.27	36.68	59.27	625.0	951.3	-373.2	-817.7	835.7	836.9
90	29.570	29.600	670.4	467.2	471.6	466.8	476.1	18.5	45.29	2.27	38.91	60.89	605.9	960.0	-380.2	-838.7	856.3	857.2
95	30.240	30.270	662.1	452.8	453.1	452.5	482.9	16.8	46.83	2.13	40.92	62.24	599.7	971.6	-392.8	-859.8	875.7	876.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.55	4.55	16.24	50.61	62.55	.0000	.5299	.1091	.0259	.0259	.9591	.0000	.0000	.8466	.8471	.5288	.5743	.7077
10	.86	5.12	18.46	46.22	59.59	.0000	.5187	.1301	.0320	.0320	.9516	.0000	.0000	.8187	.8395	.5315	.5765	.7015
15	.20	4.53	18.50	43.27	57.06	.0000	.4988	.1154	.0296	.0296	.9583	.0000	.0000	.8360	.8230	.5378	.5807	.7133
30	-2.03	2.78	14.15	40.50	51.82	.0000	.4571	.0550	.0157	.0157	.9817	.0000	.0000	.9074	.7802	.5521	.5967	.7770
50	-2.56	2.95	11.63	35.98	44.67	.0000	.4344	.0349	.0113	.0113	.9897	.0000	.0000	.9325	.7222	.5335	.6078	.8062
70	.47	6.58	14.46	36.48	44.32	.0000	.4680	.0552	.0199	.0199	.9865	.0000	.0000	.8932	.6465	.4734	.5855	.8147
85	5.81	12.30	17.32	40.44	45.30	.0000	.5393	.1116	.0433	.0433	.9761	.0000	.0000	.8053	.5975	.4181	.5476	.8177
90	8.27	14.85	17.98	43.02	45.93	.0000	.5749	.1369	.0545	.0545	.9718	.0000	.0000	.7727	.5845	.3999	.5291	.8217
95	9.65	16.39	18.45	44.70	46.74	.0000	.6027	.1590	.0647	.0647	.9681	.0000	.0000	.7348	.5750	.3863	.5201	.8289

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6636.84	160.55	1.1156	1.3903	85.37	86.05

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	545.2	1013.3	545.2	621.4	.0	800.5	.00	52.18	34.85	-28.43	664.4	706.8	-379.7	336.5	379.7	463.9
10	14.100	16.790	566.6	984.6	566.6	619.3	.0	765.4	.00	51.02	35.76	-24.26	698.3	679.8	-408.1	279.5	408.1	485.9
15	15.170	17.580	582.4	949.8	582.4	624.9	.0	715.0	.00	48.83	37.00	-18.24	729.4	658.8	-439.1	206.2	439.1	508.8
30	18.280	19.910	611.7	870.0	611.7	633.2	.0	596.4	.00	43.26	40.83	-1.79	808.9	635.2	-529.1	20.1	529.1	576.2
50	22.190	23.090	626.8	771.7	626.8	586.3	.0	501.8	.00	40.55	45.68	15.87	897.5	610.1	-642.2	-166.5	642.2	668.3
70	25.880	26.260	540.6	675.5	540.6	490.1	.0	464.7	.00	43.50	54.17	31.11	924.3	573.1	-749.0	-295.3	749.0	760.0
85	28.450	28.610	451.8	618.6	451.8	396.1	.0	475.2	.00	50.19	61.24	41.70	939.3	530.4	-823.4	-352.8	823.4	828.0
90	29.320	29.410	439.0	607.3	439.0	364.1	.0	485.7	.00	53.16	62.64	45.14	955.5	516.2	-848.6	-365.5	848.6	851.2
95	30.150	30.180	431.9	597.5	431.9	345.5	.0	487.5	.00	54.60	63.66	48.16	973.7	518.1	-872.6	-386.0	872.6	873.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.18	.72	8.71	63.28	71.29	.0000	.2086	.1684	.0304	.0304	1.4288	.9052	.9003	-4.1217	.5028	.9289	.6135	.6479
10	-5.76	.88	6.95	60.02	66.09	.0000	.2871	.1445	.0288	.0288	1.4329	.9113	.9067	.3800	.5238	.8982	.6472	.6201
15	-5.27	1.00	8.69	55.24	62.96	.0000	.3405	.1132	.0249	.0249	1.4287	.9233	.9193	.6966	.5383	.8627	.6761	.5984
30	-4.35	1.32	11.91	42.62	53.22	.0000	.4162	.0344	.0090	.0090	1.4257	.9696	.9681	.9392	.5658	.7836	.7498	.5721
50	-2.88	2.11	11.18	29.82	38.93	.0000	.4887	.0669	.0190	.0190	1.3951	.9307	.9274	.9082	.5798	.6870	.8323	.5431
70	2.99	7.21	10.98	23.06	26.93	.0000	.5449	.0505	.0141	.0141	1.4279	.9477	.9450	.9362	.4942	.5933	.8480	.5033
85	8.11	11.78	11.61	19.54	19.55	.0000	.6112	.0768	.0199	.0199	1.4714	.9275	.9235	.9105	.4077	.5369	.8558	.4604
90	8.57	12.07	12.80	17.50	18.26	.0000	.6397	.1131	.0282	.0282	1.4780	.8954	.8896	.8727	.3984	.5250	.8705	.4463
95	8.64	11.99	14.02	15.50	17.53	.0000	.6482	.1326	.0318	.0318	1.4820	.8770	.8701	.8524	.3925	.5151	.8859	.4447

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1158	1.4310	92.96	93.30	35.924

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	923.9	592.5	574.9	592.3	723.3	-1.6	51.52	-.15	-20.10	42.31	612.2	801.1	210.4	-539.3	512.9	537.7
10	18.350	19.110	919.2	595.1	593.7	594.3	701.7	28.3	49.76	2.72	-16.03	41.45	618.0	792.9	170.6	-524.8	531.1	553.1
15	19.070	19.740	901.6	600.8	610.8	600.1	662.8	28.3	47.33	2.70	-10.32	42.14	621.5	809.4	110.9	-543.1	551.9	571.3
30	21.140	21.600	863.6	627.6	654.1	627.6	563.4	1.0	40.72	.10	4.19	44.83	657.2	885.2	-48.4	-624.1	611.8	625.1
50	23.970	24.200	800.7	604.0	638.0	603.8	483.8	11.4	37.16	1.09	18.21	48.76	672.4	916.3	-210.0	-689.0	693.7	700.4
70	26.790	26.880	723.1	536.4	563.7	536.1	452.8	15.8	38.79	1.69	29.81	54.87	650.2	932.3	-322.6	-762.2	775.4	778.0
85	28.860	28.900	675.5	477.2	488.5	476.7	466.4	20.1	43.68	2.42	37.07	59.71	612.3	945.4	-368.8	-816.3	835.3	836.4
90	29.570	29.600	666.1	459.0	462.7	458.5	478.8	20.5	45.99	2.57	39.19	61.25	597.0	953.7	-377.0	-836.1	855.8	856.7
95	30.240	30.270	659.5	445.9	446.6	445.5	485.3	19.6	47.37	2.51	41.12	62.52	593.0	965.5	-390.0	-856.5	875.2	876.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.68	5.68	16.34	51.67	62.55	.0000	.5403	.1119	.0265	.0265	.9590	.0000	.0000	.8445	.8341	.5148	.5550	.6959
10	1.90	6.16	18.69	47.04	59.60	.0000	.5292	.1352	.0333	.0333	.9508	.0000	.0000	.8141	.8258	.5170	.5570	.6889
15	1.12	5.46	18.14	44.63	57.08	.0000	.5110	.1216	.0312	.0312	.9572	.0000	.0000	.8290	.8100	.5229	.5624	.7045
30	-1.92	2.89	14.14	40.63	51.81	.0000	.4569	.0591	.0169	.0169	.9806	.0000	.0000	.8999	.7755	.5493	.5921	.7747
50	-2.31	3.19	11.77	36.08	44.66	.0000	.4351	.0321	.0104	.0104	.9907	.0000	.0000	.9376	.7149	.5281	.6007	.8012
70	1.21	7.32	14.58	37.10	44.32	.0000	.4757	.0568	.0205	.0205	.9864	.0000	.0000	.8913	.6392	.4652	.5745	.8086
85	6.81	13.31	17.47	41.26	45.30	.0000	.5501	.1194	.0464	.0464	.9749	.0000	.0000	.7926	.5908	.4097	.5355	.8118
90	9.04	15.62	18.28	43.43	45.93	.0000	.5848	.1514	.0602	.0602	.9692	.0000	.0000	.7490	.5799	.3925	.5202	.8156
95	10.20	16.94	18.84	44.86	46.75	.0000	.6114	.1773	.0722	.0722	.9647	.0000	.0000	.7081	.5723	.3801	.5140	.8230

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6633.02	159.31	1.1158	1.3982	86.85	87.47

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

90% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	538.4	1010.3	538.4	615.8	.0	800.9	.00	52.44	35.19	-28.68	658.8	702.2	-379.7	337.0	372.7	453.8
10	14.100	16.790	559.3	991.1	559.3	614.3	.0	764.9	.00	51.22	36.11	-24.39	592.3	675.1	-409.1	279.0	408.1	485.9
15	15.170	17.580	574.8	945.7	574.8	618.9	.0	714.8	.00	49.10	37.36	-18.39	723.3	653.0	-439.0	206.1	439.0	508.8
30	18.280	19.910	603.5	865.5	603.5	627.3	.0	597.5	.00	43.58	41.20	-1.91	802.8	629.3	-529.0	21.3	529.0	576.2
50	22.190	23.090	619.1	768.9	619.1	579.8	.0	505.0	.00	41.05	46.08	15.74	891.5	602.0	-642.2	-163.3	642.2	658.2
70	25.880	26.250	531.7	674.8	531.7	483.1	.0	471.0	.00	44.38	54.62	30.94	918.1	563.7	-749.0	-299.0	749.0	769.0
85	28.450	28.610	443.1	618.9	443.1	385.2	.0	484.3	.00	51.50	61.71	41.74	935.1	516.3	-823.4	-343.7	823.4	828.0
90	29.320	29.410	430.5	610.5	430.6	355.3	.0	495.4	.00	54.29	63.09	44.98	951.5	503.8	-848.5	-355.7	848.5	851.1
95	30.150	30.180	423.5	601.5	423.5	337.9	.0	497.5	.00	55.82	64.10	48.04	969.9	505.6	-872.6	-375.0	872.6	873.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	POO/ POI	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	-5.84	1.06	8.47	63.87	71.30	.0000	.2090	.1610	.0290	.0290	1.4322	.9108	.9062	-4.2244	.4963	.8256	.5080	.6433
10	-5.41	1.23	6.89	60.50	65.10	.0000	.2877	.1370	.0273	.0273	1.4359	.9171	.9128	.4006	.5168	.8848	.5415	.6155
15	-4.90	1.36	8.54	55.75	62.96	.0000	.3429	.1089	.0240	.0240	1.4308	.9273	.9235	.7101	.5311	.8585	.5703	.5928
30	-3.97	1.59	11.71	43.12	53.23	.0000	.4195	.0317	.0083	.0083	1.4281	.9724	.9710	.9449	.5591	.7800	.7441	.5664
50	-2.47	2.51	11.04	30.34	39.92	.0000	.4944	.0680	.0193	.0193	1.3980	.9309	.9276	.9074	.5712	.5940	.9264	.5363
70	-3.49	7.70	10.81	23.69	26.94	.0000	.5548	.0569	.0159	.0159	1.4316	.9425	.9395	.9299	.4949	.5891	.8426	.4947
85	8.58	12.25	11.55	19.97	19.55	.0000	.6279	.0907	.0235	.0235	1.4748	.9166	.9119	.8961	.3995	.5365	.8518	.4477
90	9.02	12.52	12.64	18.11	18.26	.0000	.6549	.1241	.0310	.0310	1.4941	.8981	.8918	.8629	.3905	.5273	.8667	.4351
95	9.09	12.43	13.90	16.07	17.53	.0000	.6635	.1430	.0344	.0344	1.4889	.8706	.8632	.8428	.3846	.5180	.8821	.4355

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1168	1.4345	92.79	93.15	35.51

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	VOI-1 FT/SEC	VOI-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	921.8	587.3	570.8	587.1	723.8	-2.5	51.74	-.24	-20.29	42.61	608.5	797.8	211.0	-540.2	512.8	537.7
10	18.350	19.110	915.8	583.4	570.4	588.5	701.2	29.1	49.90	2.02	-16.07	41.59	614.7	788.0	170.2	-534.0	531.1	555.1
15	19.070	19.740	899.1	593.6	605.8	592.8	662.6	30.7	47.55	2.97	-10.38	42.35	616.5	802.3	110.7	-540.6	551.9	571.3
30	21.140	21.600	859.3	622.0	644.4	622.0	564.5	.9	41.02	.09	4.13	45.08	651.4	881.3	-47.3	-534.2	611.8	625.1
50	23.970	24.200	796.7	598.3	630.8	598.2	486.7	12.4	37.65	1.19	18.17	48.99	664.6	911.7	-207.0	-687.0	687.7	700.4
70	26.790	26.880	720.0	530.4	554.8	530.2	458.6	13.9	39.60	1.51	29.75	58.23	639.6	930.4	-316.7	-764.0	775.3	777.8
85	28.860	28.900	672.2	469.6	475.5	469.4	475.0	13.8	44.98	1.69	37.16	60.29	596.7	947.2	-360.3	-822.6	835.2	835.4
90	29.570	29.600	655.2	454.5	451.4	454.2	488.3	16.4	47.25	2.07	39.16	61.60	582.2	955.2	-367.5	-840.2	855.8	855.6
95	30.240	30.270	659.7	443.9	435.9	443.5	495.2	18.3	48.64	2.36	41.07	62.66	578.4	965.6	-380.0	-857.7	875.2	875.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	POO/ POI	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	1.87	5.86	16.25	51.38	62.55	.0000	.5454	.1121	.0266	.0266	.9590	.0000	.0000	.8459	.8320	.5100	.5518	.6027
10	-2.07	6.32	18.73	47.07	59.69	.0000	.5338	.1357	.0334	.0334	.9509	.0000	.0000	.8150	.8230	.5118	.5533	.5844
15	1.37	5.71	18.40	44.58	57.07	.0000	.5153	.1224	.0314	.0314	.9572	.0000	.0000	.8292	.8064	.5163	.5574	.5979
30	-1.61	3.20	14.14	40.93	51.82	.0000	.4614	.0576	.0164	.0164	.9812	.0000	.0000	.8031	.7718	.5441	.5865	.7708
50	-1.83	3.68	11.86	36.45	44.64	.0000	.4401	.0325	.0105	.0105	.9907	.0000	.0000	.9374	.7106	.5237	.5332	.7066
70	-2.03	8.14	14.40	38.10	44.32	.0000	.4355	.0658	.0237	.0237	.9843	.0000	.0000	.8754	.6356	.4586	.5544	.8060
85	8.12	14.61	16.73	43.29	45.29	.0000	.5578	.1365	.0530	.0530	.9717	.0000	.0000	.7562	.5869	.4026	.5211	.9120
90	-10.31	16.90	17.79	45.18	45.93	.0000	.5991	.1705	.0678	.0678	.9655	.0000	.0000	.7196	.5792	.3881	.5065	.9156
95	11.46	18.21	18.53	46.28	46.75	.0000	.6215	.1956	.0796	.0796	.9611	.0000	.0000	.6797	.5718	.3770	.5008	.9220

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6633.	157.53	1.1168	1.4002	86.46	87.11

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	602.6	1083.6	602.6	669.4	.0	852.0	.00	51.84	33.65	-28.39	723.9	761.1	-401.2	361.9	401.2	490.1
10	14.100	16.790	625.1	1057.3	625.1	670.6	.0	817.4	.00	50.63	34.59	-24.36	759.3	736.7	-431.1	304.0	431.1	513.4
15	15.170	17.580	642.8	1022.7	642.8	678.2	.0	765.1	.00	48.43	35.80	-18.52	792.7	716.3	-463.8	227.6	463.8	537.5
30	18.280	19.910	677.8	937.2	677.8	688.2	.0	635.8	.00	42.71	39.48	-2.22	878.7	690.6	-558.9	27.1	558.9	608.8
50	22.190	23.090	698.2	827.2	698.2	637.0	.0	527.7	.00	39.63	44.16	15.66	973.7	662.4	-678.5	-178.3	678.5	706.0
70	25.880	26.260	610.0	716.6	610.0	532.7	.0	479.1	.00	41.99	52.36	31.33	999.7	624.5	-791.3	-323.8	791.3	802.9
85	28.450	28.610	516.7	657.1	516.7	448.2	.0	480.5	.00	46.99	59.29	41.34	1011.9	596.9	-869.9	-394.3	869.9	874.8
90	29.320	29.410	502.5	635.7	502.5	402.9	.0	491.2	.00	50.68	60.72	45.42	1027.8	573.9	-896.5	-408.1	896.5	899.2
95	30.150	30.180	495.1	618.0	495.1	372.8	.0	492.8	.00	52.90	61.76	49.07	1046.4	569.3	-921.9	-429.9	921.9	922.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.38	-.47	8.64	62.04	71.17	.0000	.2145	.2075	.0375	.0375	1.4720	.8780	.8713	-2.8701	.5578	.9978	.6707	.7009
10	-6.93	-.27	6.81	58.95	66.03	.0000	.2857	.1643	.0327	.0327	1.4859	.8955	.8896	.3102	.5803	.9687	.7062	.6750
15	-6.48	-.19	8.37	54.33	62.90	.0000	.3363	.1239	.0272	.0272	1.4864	.9135	.9086	.6706	.5972	.9327	.7376	.6533
30	-5.69	-.01	11.48	41.70	53.20	.0000	.4117	.0384	.0101	.0101	1.4847	.9653	.9633	.9341	.6312	.8465	.8190	.6238
50	-4.40	.58	11.00	28.51	38.95	.0000	.4830	.0688	.0196	.0196	1.4422	.9265	.9226	.9089	.6511	.7373	.9096	.5903
70	1.14	5.36	11.19	21.03	26.92	.0000	.5325	.0423	.0118	.0118	1.4750	.9538	.9512	.9477	.5623	.6291	.9232	.5482
85	6.18	9.85	11.26	17.94	19.56	.0000	.5752	.0368	.0096	.0096	1.5319	.9625	.9602	.9560	.4684	.5701	.9263	.5179
90	6.66	10.15	13.08	15.30	18.26	.0000	.6108	.0858	.0213	.0213	1.5303	.9164	.9113	.9040	.4582	.5487	.9413	.4954
95	6.74	10.07	14.93	12.69	17.53	.0000	.6256	.1158	.0273	.0273	1.5269	.8871	.8803	.8734	.4520	.5315	.9571	.4896

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1276	1.4826	93.16	93.53	38.90

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	987.3	624.9	618.4	624.7	769.7	-5.9	51.22	-.55	-20.23	42.58	659.0	848.4	227.9	-574.0	541.8	568.1
10	18.350	19.110	986.9	632.0	642.5	631.3	749.1	27.5	49.38	2.49	-16.31	41.41	669.6	841.8	188.0	-556.8	561.1	584.3
15	19.070	19.740	972.6	642.8	665.6	641.9	708.8	34.5	46.79	3.08	-10.72	41.55	678.1	857.8	125.7	-569.1	583.1	603.6
30	21.140	21.600	933.8	674.5	719.6	674.5	600.6	2.3	40.03	.20	3.62	44.28	717.4	942.5	-45.7	-658.2	646.4	660.4
50	23.970	24.200	862.8	651.1	696.6	651.0	509.1	10.3	36.15	.91	17.81	48.25	732.5	977.9	-223.8	-729.6	732.9	739.9
70	26.790	26.880	771.4	573.5	613.4	573.2	467.6	17.5	37.34	1.76	29.84	54.52	707.8	988.2	-351.5	-804.4	819.1	821.9
85	28.860	28.900	721.3	513.5	545.0	513.0	472.3	23.8	40.92	2.66	36.97	59.18	682.2	1001.4	-410.1	-859.9	882.4	883.6
90	29.570	29.600	704.3	489.5	511.1	489.0	484.2	21.2	43.47	2.47	39.44	61.04	661.7	1010.3	-420.0	-883.8	904.1	905.0
95	30.240	30.270	690.2	470.4	485.5	470.1	490.5	17.5	45.30	2.13	41.80	62.63	651.4	1022.5	-434.1	-908.0	924.6	925.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.39	5.37	15.95	51.77	62.55	.0000	.5491	.1138	.0270	.0270	.9539	.0000	.0000	.8479	.8944	.5407	.5998	.7341
10	1.44	5.69	18.46	46.89	59.61	.0000	.5359	.1419	.0350	.0350	.9426	.0000	.0000	.8131	.8902	.5471	.6069	.7287
15	.54	4.87	18.53	43.71	57.10	.0000	.5138	.1316	.0338	.0338	.9479	.0000	.0000	.8222	.8765	.5578	.6158	.7444
30	-2.64	2.18	14.24	39.83	51.82	.0000	.4584	.0697	.0199	.0199	.9741	.0000	.0000	.8872	.8409	.5892	.6486	.8233
50	-3.33	2.18	11.61	35.24	44.68	.0000	.4310	.0326	.0105	.0105	.9894	.0000	.0000	.9389	.7713	.5687	.6558	.8541
70	-.20	5.91	14.65	35.59	44.33	.0000	.4665	.0495	.0179	.0179	.9867	.0000	.0000	.9047	.6816	.4966	.6254	.8556
85	4.08	10.58	17.70	38.27	45.30	.0000	.5295	.1064	.0413	.0413	.9750	.0000	.0000	.8146	.6311	.4404	.5968	.8587
90	6.47	13.06	18.19	41.00	45.93	.0000	.5667	.1252	.0498	.0498	.9720	.0000	.0000	.7945	.6138	.4178	.5771	.8623
95	8.09	14.84	18.46	43.17	46.75	.0000	.5976	.1381	.0562	.0562	.9703	.0000	.0000	.7740	.5987	.4000	.5643	.8695

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7007.	172.53	1.1276	1.4455	87.03	87.70

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR — 95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	594.9	1076.1	594.8	659.2	.0	850.5	.00	52.22	34.04	-28.61	717.7	751.1	-401.7	359.7	401.7	499.8
10	14.100	16.790	616.5	1047.6	616.6	661.4	.0	812.3	.00	50.84	34.99	-24.24	752.7	725.0	-431.7	298.2	431.7	514.1
15	15.170	17.580	633.2	1011.9	633.2	659.4	.0	758.6	.00	48.56	36.25	-18.20	785.4	705.6	-464.5	220.4	464.5	538.3
30	18.230	19.910	663.5	928.2	663.5	675.9	.0	634.8	.00	43.14	40.13	-2.10	868.2	679.1	-559.7	28.2	559.7	609.6
50	22.190	23.090	686.6	821.9	686.6	627.8	.0	530.6	.00	40.20	44.69	15.72	966.1	652.9	-679.5	-176.5	679.5	707.0
70	25.880	26.260	598.9	715.4	598.9	524.9	.0	485.0	.00	42.83	52.91	31.26	893.9	614.7	-792.4	-318.1	792.4	804.1
85	28.450	28.610	505.9	654.0	505.9	429.9	.0	492.8	.00	48.90	59.85	41.72	1007.5	576.0	-871.1	-383.3	871.1	876.0
90	29.320	29.410	492.9	636.8	492.9	389.2	.0	503.5	.00	52.33	61.22	45.61	1024.3	556.4	-897.8	-397.0	897.8	900.8
95	30.150	30.180	485.9	623.6	485.8	365.2	.0	505.5	.00	54.15	62.24	48.89	1043.2	555.7	-923.2	-418.6	923.2	924.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.99	-.08	8.44	62.64	71.19	.0000	.2213	.1980	.0357	.0357	1.4767	.8855	.8791	1.8302	.5502	.8896	.6546	.6008
10	-6.52	.13	6.94	59.24	66.05	.0000	.2920	.1572	.0313	.0313	1.4871	.8913	.8856	.8823	.5720	.8886	.6006	.6448
15	-6.02	.27	8.70	54.45	62.91	.0000	.3417	.1169	.0257	.0257	1.4862	.9193	.9147	.7001	.5977	.9217	.7303	.6426
30	-5.05	.63	11.61	42.22	53.21	.0000	.4175	.0287	.0075	.0075	1.4900	.9741	.9727	.9509	.6170	.9372	.8885	.6126
50	-3.88	1.10	11.05	28.97	38.95	.0000	.4897	.0672	.0191	.0191	1.4474	.9296	.9258	.9116	.6305	.7318	.9020	.5812
70	1.75	5.97	11.12	21.65	26.92	.0000	.5420	.0462	.0129	.0129	1.4819	.9509	.9482	.9435	.5503	.6973	.9170	.5328
85	6.77	10.44	11.53	18.14	19.55	.0000	.5983	.0590	.0153	.0153	1.5346	.9426	.9391	.9323	.4575	.5663	.9318	.4088
90	7.16	10.65	13.27	15.62	18.26	.0000	.6308	.1031	.0255	.0255	1.5365	.9025	.8955	.8870	.4491	.5488	.9274	.4205
95	7.22	10.55	14.75	13.35	17.53	.0000	.6419	.1272	.0301	.0301	1.5375	.8794	.8719	.8627	.4431	.5356	.9534	.4273

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1288	1.4882	93.17	93.54	38.49

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	980.9	619.7	609.4	619.4	768.7	-7.7	51.59	-.72	-20.36	42.95	640.9	846.3	226.1	-576.6	542.6	558.0
10	18.350	19.110	978.1	624.3	633.7	623.5	745.0	28.2	49.61	2.59	-16.12	41.77	659.8	835.0	183.1	-556.9	561.0	595.1
15	19.070	19.740	961.7	632.7	655.9	631.7	702.9	36.2	46.97	3.28	-10.31	41.97	667.4	849.7	119.0	-568.2	593.0	604.4
30	21.140	21.600	923.3	655.9	702.7	655.8	599.4	4.3	40.45	.37	3.85	44.61	705.6	835.5	-47.9	-557.1	647.3	661.4
50	23.970	24.200	856.0	644.4	686.2	644.3	511.7	12.7	36.70	1.13	17.94	48.50	723.2	872.5	-222.2	-728.3	734.0	741.0
70	26.790	26.880	767.8	568.0	603.8	567.7	474.1	17.8	38.16	1.80	29.86	54.81	696.9	885.7	-346.2	-805.3	830.3	833.1
85	28.860	28.900	715.3	503.4	526.6	502.9	484.0	23.4	42.60	2.67	37.21	59.72	661.2	897.7	-399.7	-861.5	883.7	884.9
90	29.570	29.600	701.8	481.3	494.5	481.3	496.5	20.4	45.14	2.42	39.62	61.48	641.9	1008.4	-408.9	-886.9	908.4	906.3
95	30.240	30.270	690.8	465.7	473.4	465.4	503.1	16.8	46.75	2.06	41.77	62.91	634.8	1022.2	-422.8	-910.1	925.9	926.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.71	5.70	15.78	52.31	62.55	.0000	.5516	.1148	.0272	.0272	.9540	.0000	.0000	.8477	.8873	.5360	.5000	.7320
10	-1.66	5.92	18.55	47.03	59.61	.0000	.5394	.1417	.0349	.0349	.9435	.0000	.0000	.8142	.8806	.8402	.5069	.7234
15	.73	5.07	18.73	43.59	57.09	.0000	.5168	.1304	.0335	.0335	.9493	.0000	.0000	.8241	.8657	.5487	.6053	.7358
30	-2.20	2.62	14.42	40.07	51.81	.0000	.4510	.0659	.0188	.0188	.9759	.0000	.0000	.8929	.8318	.5811	.6360	.8165
50	-2.78	2.74	11.81	35.57	44.67	.0000	.4343	.0309	.0100	.0100	.9901	.0000	.0000	.9420	.7643	.6523	.6457	.8485
70	.63	6.75	14.70	36.36	44.33	.0000	.4741	.0572	.0206	.0206	.9949	.0000	.0000	.9996	.6773	.4912	.6148	.8523
85	5.78	12.28	17.71	39.93	45.30	.0000	.5463	.1224	.0475	.0475	.9718	.0000	.0000	.7988	.6242	.4307	.5770	.8535
90	8.19	14.78	18.14	42.72	45.93	.0000	.5832	.1456	.0583	.0583	.9676	.0000	.0000	.7598	.6091	.4103	.5581	.8597
95	9.56	15.31	18.39	44.68	46.75	.0000	.6125	.1670	.0680	.0680	.9642	.0000	.0000	.7294	.5978	.3952	.5488	.8674

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7018.	170.42	1.1288	1.4500	86.95	87.43

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

95% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BT-1 DEGREE	BT-2 DEGREE	VT-1 FT/SEC	VT-2 FT/SEC	VOT-1 FT/SEC	VOT-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	584.6	1076.0	584.6	661.4	.0	848.7	.00	52.07	34.53	-28.37	709.5	751.9	-402.2	357.3	402.2	491.4
10	14.100	16.790	605.4	1045.2	605.4	660.1	.0	811.6	.00	50.87	35.52	-24.19	743.8	724.1	-432.2	306.0	432.2	514.7
15	15.170	17.580	622.6	1009.9	622.6	663.9	.0	760.8	.00	48.87	36.75	-18.46	777.1	700.8	-465.0	221.9	465.0	538.9
30	18.280	19.910	656.3	927.2	656.3	671.5	.0	639.1	.00	43.56	40.46	-2.42	863.1	673.8	-560.4	38.7	560.4	610.3
50	22.190	23.090	674.2	821.5	674.2	621.4	.0	537.4	.00	40.85	45.24	15.35	957.8	645.0	-680.2	-170.4	680.2	707.8
70	25.880	26.260	585.8	714.1	585.8	515.4	.0	494.1	.00	43.89	53.55	31.14	996.8	602.9	-793.3	-318.9	793.3	835.8
85	28.450	28.610	493.9	653.6	493.8	415.7	.0	504.4	.00	50.50	60.48	41.88	1002.4	558.3	-872.1	-372.7	872.1	877.0
90	29.320	29.410	480.5	643.5	480.6	383.4	.0	516.5	.00	53.43	61.86	45.15	1019.3	543.7	-898.8	-385.0	898.8	901.4
95	30.150	30.180	473.2	634.0	473.2	363.1	.0	519.8	.00	55.07	62.88	48.14	1039.3	544.3	-924.2	-405.4	924.2	926.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MT-1	MT-2
5	-6.50	.41	8.73	62.90	71.24	.0000	.2107	.1858	.0336	.0336	1.4821	.8947	.8897	.5525	.5405	.8896	.5569	.5915
10	-5.99	.65	7.01	59.71	66.07	.0000	.2459	.1521	.0303	.0303	1.4906	.9065	.9012	.5570	.5615	.8870	.5915	.6424
15	-5.53	.75	8.46	55.20	62.93	.0000	.3416	.1223	.0269	.0269	1.4872	.9175	.9128	.5814	.5777	.9193	.7229	.6379
30	-4.71	.96	11.29	42.88	53.21	.0000	.4216	.0438	.0115	.0115	1.4870	.9522	.9600	.9261	.6101	.8358	.8038	.6874
50	-3.31	1.67	10.67	29.89	38.93	.0000	.4957	.0753	.0215	.0215	1.4509	.9233	.9192	.9013	.6269	.7307	.8033	.6737
70	-2.42	6.63	11.01	22.41	26.93	.0000	.5533	.0613	.0171	.0171	1.4831	.9372	.9337	.9261	.5369	.6255	.8093	.5981
85	7.38	11.05	11.79	19.60	19.55	.0000	.6179	.0842	.0217	.0217	1.5344	.9210	.9151	.9056	.4465	.5551	.9162	.4827
90	7.79	11.28	12.91	16.71	18.25	.0000	.6460	.1195	.0298	.0298	1.5440	.8904	.8836	.8704	.4375	.5539	.9319	.4688
95	7.87	11.21	14.00	14.74	17.52	.0000	.6561	.1404	.0337	.0337	1.5494	.8713	.8631	.8496	.4312	.5440	.9478	.4671

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1307	1.4903	92.15	92.57	37.94

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BT-1 DEGREE	BT-2 DEGREE	VT-1 FT/SEC	VT-2 FT/SEC	VOT-1 FT/SEC	VOT-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	981.0	617.3	611.7	617.0	757.0	-8.6	51.43	-.80	-20.10	43.13	651.3	845.6	223.8	-578.1	543.2	559.5
10	18.350	19.110	976.0	620.4	633.4	619.7	743.7	27.5	49.58	2.54	-15.97	42.01	659.0	834.1	181.2	-558.3	562.5	585.8
15	19.070	19.740	959.3	626.9	650.8	626.0	704.5	32.8	47.26	3.00	-10.46	42.43	662.5	848.2	119.0	-572.3	584.6	605.1
30	21.140	21.600	922.1	661.8	597.0	661.8	603.4	2.0	40.87	.19	3.62	46.91	690.7	934.8	-44.7	-660.1	649.0	652.1
50	23.970	24.200	854.3	640.8	679.2	640.7	518.1	12.1	37.33	1.08	17.69	48.72	713.7	971.2	-216.6	-722.7	734.8	741.8
70	26.790	26.880	764.2	561.0	593.0	563.7	492.0	18.8	39.13	1.93	29.81	55.14	684.1	881.6	-339.3	-805.9	821.9	824.0
85	28.850	28.900	711.0	494.3	509.9	493.9	495.4	22.5	44.18	2.61	37.37	60.23	641.7	994.8	-389.3	-863.4	884.7	885.0
90	29.570	29.600	702.3	477.4	493.2	476.9	509.3	21.9	46.51	2.63	39.43	61.69	625.6	1005.8	-397.1	-885.3	906.4	907.4
95	30.240	30.270	696.2	465.5	465.9	465.1	517.3	19.2	47.99	2.36	41.32	62.89	620.5	1020.8	-409.7	-908.7	927.0	927.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MT-1	MT-2
5	1.56	5.55	15.70	52.23	62.55	.0000	.5539	.1155	.0274	.0274	.9537	.0000	.0000	.8475	.8872	.5338	.5017	.7312
10	1.73	5.99	18.51	47.04	59.60	.0000	.5415	.1410	.0347	.0347	.9439	.0000	.0000	.8152	.8790	.5357	.5749	.7218
15	1.09	5.42	18.44	40.26	57.09	.0000	.5229	.1293	.0332	.0332	.9500	.0000	.0000	.8260	.8631	.5432	.6000	.7350
30	-1.78	3.04	14.23	40.68	51.82	.0000	.4552	.0532	.0190	.0190	.9770	.0000	.0000	.8979	.8299	.5771	.6311	.8152
50	-2.14	3.38	11.74	36.25	44.64	.0000	.4401	.0300	.0097	.0097	.9904	.0000	.0000	.9439	.7617	.5594	.6774	.8454
70	1.63	7.75	14.90	37.20	44.33	.0000	.4840	.0653	.0235	.0235	.9829	.0000	.0000	.9761	.6726	.4844	.6024	.8474
85	7.42	13.92	17.56	41.57	45.30	.0000	.5630	.1402	.0544	.0544	.9681	.0000	.0000	.7603	.6188	.4219	.5584	.8491
90	9.63	16.22	18.35	43.89	45.94	.0000	.5956	.1731	.0688	.0688	.9617	.0000	.0000	.7174	.6087	.4057	.5425	.8547
95	10.80	17.56	18.59	45.63	46.75	.0000	.6227	.1983	.0807	.0807	.9570	.0000	.0000	.6813	.6014	.3843	.5357	.8645

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7025.	168.30	1.1307	1.4505	85.75	85.49

Blade-Element and Over-All Performance with Radial Inlet Distortion, No Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	573.5	1068.9	573.5	655.2	.0	844.5	.00	52.19	35.01	-29.35	700.2	744.7	-401.7	353.7	401.7	490.8
10	14.100	16.790	594.7	1036.9	594.7	654.9	.0	803.8	.00	50.82	35.97	-23.83	734.9	715.5	-431.7	280.7	431.7	514.1
15	15.170	17.580	611.4	999.9	611.4	659.4	.0	751.4	.00	48.72	37.21	-17.89	767.9	693.6	-464.5	213.1	464.5	539.3
30	18.280	19.910	644.0	919.4	644.0	663.0	.0	635.4	.00	43.76	40.97	-2.19	853.4	665.1	-559.7	25.8	559.7	599.6
50	22.190	23.090	660.3	814.7	660.3	612.8	.0	536.8	.00	41.21	45.81	15.53	947.5	635.5	-579.4	-170.2	579.4	707.0
70	25.830	26.260	570.4	707.9	570.4	499.7	.0	501.2	.00	45.11	54.24	31.27	977.0	595.3	-799.4	-309.3	799.4	994.1
85	28.450	28.610	479.0	653.1	479.0	401.2	.0	515.4	.00	52.10	61.19	41.96	994.3	539.5	-871.1	-360.7	871.1	976.0
90	29.320	29.410	465.0	647.7	465.0	373.3	.0	529.1	.00	54.80	62.56	44.88	1011.5	526.8	-897.8	-371.4	897.8	990.5
95	30.150	30.180	459.1	640.6	459.1	355.6	.0	532.8	.00	56.29	63.56	47.72	1031.1	528.8	-923.2	-391.3	923.2	994.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	POI/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.01	.89	8.79	63.36	71.28	.0000	.2090	.1669	.0302	.0302	1.4868	.8071	.8019	-3.7397	.5300	.8822	.6480	.6843
10	-5.54	1.10	7.38	59.80	66.09	.0000	.2851	.1390	.0278	.0278	1.4905	.8156	.8107	.4120	.5514	.8477	.6832	.6540
15	-5.05	1.21	9.04	55.10	62.96	.0000	.3400	.1101	.0243	.0243	1.4854	.8263	.8221	.7122	.5672	.8094	.7144	.6300
30	-4.21	1.45	11.51	43.16	53.23	.0000	.4242	.0415	.0109	.0109	1.4948	.8546	.8626	.8322	.5982	.8272	.7049	.5998
50	-2.73	2.25	10.91	30.27	38.91	.0000	.4991	.0761	.0217	.0217	1.4501	.8238	.8197	.8003	.6129	.7241	.8832	.5657
70	-3.18	7.38	11.14	22.97	26.94	.0000	.5692	.0788	.0219	.0219	1.4908	.8220	.8176	.8060	.5210	.6181	.8998	.5118
85	8.08	11.75	11.87	19.24	19.55	.0000	.6376	.1039	.0268	.0268	1.5360	.8057	.8098	.8855	.4327	.5639	.8080	.4657
90	8.50	11.99	12.54	17.69	18.26	.0000	.6644	.1353	.0339	.0339	1.5504	.8798	.8722	.8550	.4236	.5549	.8337	.4828
95	8.54	11.88	13.59	15.83	17.53	.0000	.6732	.1540	.0373	.0373	1.5581	.8531	.8543	.8366	.4180	.5401	.8401	.4533

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1313	1.4904	91.74	92.19	37.33

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	975.1	617.5	606.4	617.2	763.6	-9.3	51.55	-.96	-20.03	43.13	645.4	845.7	221.0	-578.2	542.6	568.9
10	18.350	19.110	968.4	618.4	627.9	617.6	737.2	27.5	49.57	2.54	-15.50	42.08	652.2	832.1	175.3	-557.7	561.0	585.1
15	19.070	19.740	949.3	622.4	645.2	621.1	696.0	38.8	47.16	3.58	-9.88	42.32	655.6	840.1	112.1	-565.6	583.0	604.4
30	21.140	21.600	912.7	657.7	687.6	657.5	599.7	3.7	41.08	.33	-3.91	44.99	690.5	930.1	-47.6	-657.7	647.3	661.4
50	23.970	24.200	845.9	635.7	669.2	635.6	517.5	11.3	37.71	1.03	17.92	48.94	704.0	967.7	-216.4	-729.6	733.9	741.0
70	26.790	26.880	755.4	549.6	576.0	549.2	488.5	18.6	40.33	1.95	29.99	56.67	665.5	974.5	-331.8	-804.4	829.3	833.1
85	28.860	28.900	706.3	484.5	492.6	484.1	505.9	18.2	45.77	2.15	37.49	60.81	620.9	992.0	-377.7	-866.7	887.7	884.9
90	29.570	29.600	701.9	473.4	469.2	473.1	521.7	16.3	48.03	1.97	39.29	62.00	606.2	1009.0	-383.7	-890.0	905.4	906.3
95	30.240	30.270	698.5	466.2	454.5	466.0	530.3	13.7	49.40	1.69	41.03	62.96	602.6	1025.2	-395.6	-913.2	925.9	926.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	POI/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.64	5.64	15.64	52.41	62.56	.0000	.5504	.1174	.0278	.0278	.9534	.0000	.0000	.8447	.8807	.5342	.5959	.7316
10	1.70	5.95	18.51	47.03	59.60	.0000	.5391	.1401	.0345	.0345	.9450	.0000	.0000	.8153	.8703	.5351	.5981	.7301
15	1.01	5.34	19.01	43.58	57.07	.0000	.5188	.1281	.0328	.0328	.9513	.0000	.0000	.8263	.8535	.5305	.5933	.7282
30	-1.55	3.26	14.40	40.75	51.84	.0000	.4636	.0577	.0165	.0165	.9794	.0000	.0000	.9054	.8197	.5735	.6221	.8111
50	-1.75	3.77	11.64	36.69	44.59	.0000	.4407	.0268	.0087	.0087	.9916	.0000	.0000	.9404	.7534	.5538	.6281	.8430
70	2.86	9.99	14.94	32.39	44.33	.0000	.4964	.0772	.0278	.0278	.9802	.0000	.0000	.9551	.6633	.4737	.5847	.8398
85	9.04	15.54	17.19	43.62	45.29	.0000	.5822	.1650	.0645	.0645	.9628	.0000	.0000	.7205	.6133	.4127	.5392	.8457
90	11.18	17.76	17.70	46.06	45.94	.0000	.6122	.2001	.0797	.0797	.9559	.0000	.0000	.6749	.6071	.4016	.5247	.8550
95	12.22	18.97	18.01	47.72	46.75	.0000	.6338	.2246	.0915	.0915	.9512	.0000	.0000	.6387	.6024	.3942	.5194	.8669

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7017.	165.58	1.1313	1.4493	85.17	85.94

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE
$(90 - \beta_{10})$ RADIAL INLET DISTORTION, NO TIP TREATMENT
(probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	$W_{COR} = 147.07$			$W_{COR} = 145.41$			$W_{COR} = 142.92$		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	33.8	36.0	34.9	33.7	35.4	34.55	33.8	35.6	34.7
10	39.2	41.2	40.2	38.6	41.3	39.95	38.9	41.4	40.15
15	43.7	45.9	44.8	43.4	45.5	44.45	43.4	45.4	45.4
30	49.5	50.7	50.1	49.5	50.3	49.9	49.3	50.0	49.65
50	54.4	55.3	54.85	53.7	54.4	54.05	53.5	54.1	53.8
70	52.8	52.9	52.85	51.9	52.3	52.1	51.1	51.7	51.4
85	49.5	49.6	49.55	48.5	48.7	48.6	46.9	47.4	47.15
90	46.7	46.2	46.45	44.7	44.8	44.75	43.1	43.3	43.2
95	41.2	40.5	40.85	39.1	39.4	39.25	37.6	38.2	37.9

90% SPEED

	$W_{COR} = 162.86$			$W_{COR} = 160.55$			$W_{COR} = 159.31$		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	33.1	34.6	33.85	33.1	34.7	33.9	32.6	34.4	33.5
10	38.5	40.5	39.5	38.5	40.1	39.6	38.2	40.3	39.25
15	43.5	45.0	44.25	42.7	45.1	43.9	42.9	44.9	43.9
30	49.0	50.6	49.8	48;7	50.3	49.5	48.5	49.8	49.15
50	53.5	54.0	53.75	52.8	54.1	53.45	52.4	53.4	52.9
70	51.1	52.2	51.65	50.3	51.2	50.75	49.6	50.8	50.2
85	47.1	48.1	47.6	45.7	46.7	46.2	44.9	45.8	45.35
90	44.9	46.1	45.5	43.1	43.5	43.3	42.2	43.2	42.7
95	40.9	40.7	40.8	39.1	39.8	39.45	38.4	38.5	38.45

95% SPEED

	$W_{COR} = 172.53$			$W_{COR} = 170.42$			$W_{COR} = 168.30$		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	32.7	34.2	33.45	32.9	34.1	33.5	32.3	34.4	33.35
10	38.1	40.3	39.2	38.5	40.6	39.55	38.3	40.5	39.4
15	43.5	45.1	44.3	43.0	44.8	43.9	42.7	44.9	43.8
30	49.5	50.5	50.0	49.1	50.4	49.75	48.4	50.1	49.25
50	53.8	54.5	54.15	52.8	53.8	53.3	52.2	53.5	52.85
70	52.1	52.5	52.3	50.7	51.2	50.95	49.5	50.6	50.05
85	48.2	48.7	48.45	46.0	47.1	46.55	44.8	45.9	45.35
90	46.5	46.3	46.4	44.2	44.3	44.25	42.3	42.9	42.6
95	42.1	41.9	42.0	39.6	39.9	39.75	37.4	38.2	37.8

APPENDIX 4

Blade Element and Overall Performance with Radial Inlet Distortion and Vortex Generator Tip Treatment

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	499.7	936.5	499.7	581.4	.0	734.1	.00	51.62	34.11	-29.86	603.5	664.1	-358.5	320.6	336.5	413.5
10	14.100	16.730	516.0	903.4	516.0	544.2	.0	636.3	.00	50.02	35.17	-24.27	631.4	641.3	-363.7	263.7	363.7	433.1
15	15.170	17.580	527.5	679.2	527.5	585.1	.0	654.8	.00	48.20	36.58	-19.35	656.8	619.2	-391.3	201.3	391.3	453.5
30	18.280	19.310	550.2	738.0	550.2	534.1	.0	543.5	.00	42.30	40.57	-2.33	724.3	596.5	-471.5	23.3	471.6	513.6
50	22.130	23.090	563.0	703.5	563.0	544.1	.0	446.0	.00	39.33	45.46	15.39	803.0	564.9	-572.4	-145.7	572.4	595.7
70	25.880	26.260	473.5	612.7	473.6	452.0	.0	402.4	.00	41.03	54.30	30.90	822.5	536.5	-667.5	-275.0	667.6	677.4
85	29.450	28.610	404.6	554.7	404.6	330.7	.0	403.4	.00	46.66	61.13	41.32	839.1	506.3	-733.9	-334.7	733.9	739.1
90	29.320	29.410	385.4	533.3	385.4	347.4	.0	412.1	.00	49.36	62.99	44.37	849.1	491.1	-756.4	-346.6	756.4	758.7
95	30.150	30.180	374.9	527.7	374.9	328.1	.0	413.3	.00	51.56	64.26	49.06	863.4	491.1	-777.8	-365.3	777.8	778.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.90	.00	9.32	62.37	71.33	.0000	.1743	.2226	.0401	.0401	1.3281	.9718	.9665	4.3461	.4586	.8573	.5548	.6030
10	-6.31	.32	6.94	59.44	66.10	.0000	.2467	.1787	.0356	.0356	1.3323	.9879	.9832	-.4510	.4745	.8293	.5822	.5648
15	-5.67	.59	7.39	55.52	62.96	.0000	.3032	.1457	.0319	.0319	1.3323	.9004	.8963	.4639	.4949	.7979	.6059	.5626
30	-4.60	1.06	10.82	43.45	53.22	.0000	.3357	.0780	.0205	.0205	1.3227	.9323	.9296	.8450	.5058	.7193	.6676	.5286
50	-3.12	1.97	10.72	30.07	38.93	.0000	.4637	.0326	.0264	.0264	1.2941	.9004	.8967	.8595	.5174	.6292	.7387	.5045
70	-2.37	7.20	10.65	23.50	26.32	.0000	.5057	.0525	.0147	.0147	1.3139	.9427	.9404	.9258	.4393	.5415	.7504	.4753
85	7.89	11.57	11.24	19.81	19.55	.0000	.5625	.0795	.0207	.0207	1.3412	.9187	.9152	.8966	.3657	.4857	.7607	.4436
90	8.83	12.43	12.64	18.01	18.26	.0000	.5935	.1126	.0292	.0292	1.3462	.8978	.8929	.8537	.3496	.4705	.7699	.4285
95	9.25	12.39	13.32	16.20	17.52	.0000	.6036	.1301	.0313	.0313	1.3491	.9701	.8643	.8401	.3395	.4593	.7822	.4275

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0912	1.3215	90.85	91.20	32.35

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.590	853.9	575.7	545.9	573.6	554.2	7.2	50.59	.72	-20.78	39.36	583.9	744.4	207.1	-472.1	457.1	473.3
10	18.350	19.110	863.7	575.2	566.1	576.7	633.8	22.4	40.46	2.27	-16.30	39.08	590.0	746.5	165.5	-470.0	473.4	433.0
15	19.070	19.740	839.6	585.8	581.0	583.4	605.4	18.2	46.19	1.83	-11.10	39.83	592.6	763.5	113.9	-430.0	491.9	503.2
30	21.140	21.560	735.9	599.7	607.3	583.6	514.0	-3.5	40.22	-.53	2.92	47.65	603.4	815.2	-31.3	-562.7	545.3	557.2
50	23.970	24.200	731.5	563.3	591.3	563.3	430.7	3.9	38.06	.35	17.60	47.76	621.1	826.2	-187.6	-620.5	613.4	624.3
70	26.730	26.890	636.7	503.3	523.7	503.2	352.9	11.6	35.63	1.33	29.45	57.57	607.6	847.7	-248.2	-681.8	691.1	693.4
85	29.960	29.900	611.4	449.7	465.4	449.4	383.3	15.2	40.44	1.86	35.30	59.39	591.2	857.6	-349.0	-730.3	744.5	745.5
90	29.570	29.600	589.6	429.2	429.4	429.2	406.3	15.1	42.73	2.02	35.08	60.18	585.5	862.9	-356.5	-745.4	762.8	763.6
95	30.240	30.270	583.9	413.4	422.7	413.2	411.3	13.3	44.23	1.84	41.09	61.70	560.9	871.3	-368.6	-767.6	780.1	780.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.61	4.63	17.22	49.97	52.57	.0000	.3079	.0832	.0197	.0197	.9729	.0000	.0000	.8793	.7797	.5046	.5303	.6525
10	.52	4.77	16.24	46.19	53.83	.0000	.4455	.0575	.0241	.0241	.9662	.0000	.0000	.8539	.7820	.5079	.5340	.6538
15	.09	4.43	17.33	44.31	57.10	.0000	.4787	.0555	.0220	.0220	.9723	.0000	.0000	.8831	.7549	.5144	.5358	.6705
30	-2.51	2.31	13.55	40.75	51.88	.0000	.4434	.0436	.0133	.0133	.9359	.0000	.0000	.9155	.7143	.5134	.5439	.7190
50	-3.43	2.06	11.09	35.67	44.68	.0000	.4173	.0250	.0091	.0091	.9337	.0000	.0000	.9464	.6542	.4860	.5563	.7396
70	-.35	5.16	14.22	35.31	44.32	.0000	.4941	.0332	.0133	.0133	.9321	.0000	.0000	.9205	.5355	.4427	.5398	.7422
85	3.55	10.04	16.39	38.50	45.30	.0000	.5066	.0787	.0306	.0306	.9359	.0000	.0000	.9319	.5394	.3808	.5126	.7453
90	5.78	12.37	17.74	40.76	45.93	.0000	.5431	.1031	.0410	.0410	.9323	.0000	.0000	.8175	.5262	.3718	.4378	.7473
95	7.06	13.60	16.16	42.39	46.75	.0000	.5741	.1262	.0314	.0314	.9190	.0000	.0000	.7763	.5167	.3570	.4906	.7529

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5312.	146.20	1.0912	1.3023	86.00	86.52

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	495.1	932.9	495.1	578.2	.0	732.0	.00	51.69	34.37	-28.82	599.8	660.2	-338.6	318.3	338.6	413.7
10	14.100	16.790	511.5	905.6	511.5	580.6	.0	695.0	.00	50.11	35.42	-24.23	627.7	637.2	-363.9	261.6	363.9	433.3
15	15.170	17.580	522.8	874.9	522.8	581.4	.0	653.6	.00	48.34	36.82	-18.96	653.2	615.2	-391.5	199.9	391.5	453.7
30	18.280	19.910	545.4	797.7	545.4	581.4	.0	545.8	.00	43.16	40.83	-3.11	721.3	583.9	-471.8	32.0	471.8	513.8
50	22.190	23.090	557.6	699.6	557.6	537.5	.0	447.8	.00	39.79	45.75	15.42	799.4	558.1	-572.7	-148.1	572.7	595.9
70	25.880	26.260	473.9	609.6	473.9	455.8	.0	404.7	.00	41.62	54.63	30.96	819.5	532.2	-667.9	-273.0	667.9	677.7
85	28.450	28.610	399.1	551.0	399.1	371.7	.0	406.8	.00	47.58	61.47	41.74	835.7	498.1	-734.2	-331.6	734.2	738.4
90	29.320	29.410	380.5	538.4	380.5	342.2	.0	415.4	.00	50.54	63.30	45.15	847.1	485.2	-756.7	-343.6	756.7	759.0
95	30.150	30.180	370.4	528.3	370.4	324.5	.0	416.8	.00	52.10	64.54	48.12	861.8	486.4	-778.1	-362.1	778.1	778.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ POI	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.65	.26	8.38	63.19	71.35	.0000	.1751	.2146	.0386	.0386	1.3297	.8776	.8726	4.2988	.4544	.8537	.5514	.6042
10	-6.06	.57	6.98	59.66	66.11	.0000	.2482	.1727	.0345	.0345	1.3341	.8926	.8881	-.3650	.4702	.8255	.5789	.5808
15	-5.41	.84	7.98	55.77	62.96	.0000	.3071	.1401	.0307	.0307	1.3338	.9051	.9011	.4908	.4805	.7945	.6025	.5587
30	-4.34	1.32	10.59	43.94	53.23	.0000	.3973	.0696	.0182	.0182	1.3276	.9404	.9379	.8616	.5013	.7188	.6646	.5261
50	-2.83	2.17	10.73	30.33	38.92	.0000	.4706	.0945	.0249	.0249	1.2952	.8994	.8958	.8583	.5122	.6243	.7354	.4981
70	3.33	7.56	10.83	23.67	26.92	.0000	.5125	.0548	.0153	.0153	1.3203	.9409	.9385	.9234	.4324	.5384	.7473	.4700
85	8.23	11.92	11.66	19.73	19.56	.0000	.5732	.0869	.0225	.0225	1.3417	.9122	.9085	.8887	.3605	.4821	.7583	.4358
90	9.23	12.73	12.81	18.15	18.26	.0000	.6008	.1157	.0288	.0288	1.3486	.8860	.8811	.8570	.3441	.4695	.7679	.4232
95	9.53	12.87	13.98	16.42	17.52	.0000	.6098	.1319	.0317	.0317	1.3524	.8699	.8642	.8388	.3353	.4697	.7805	.4232

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.0916	1.3238	90.98	91.33	32.67

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	857.8	565.4	545.0	565.2	662.4	2.9	50.55	.29	-20.62	40.14	582.4	739.4	205.1	-476.6	457.3	479.5
10	18.350	19.110	851.0	569.7	564.1	568.8	637.0	29.9	48.47	3.01	-16.16	89.16	587.5	733.6	163.5	-463.2	473.6	493.2
15	19.070	19.740	836.3	576.6	577.7	576.1	604.6	24.2	46.30	2.40	-11.02	40.10	589.0	753.3	112.5	-485.3	492.2	509.4
30	21.140	21.600	795.0	587.0	604.5	587.0	516.0	-1.5	40.47	-.14	2.77	43.58	606.4	810.6	-29.5	-558.9	545.6	557.4
50	23.970	24.200	726.4	555.7	583.5	555.6	432.6	7.4	36.54	.77	17.68	48.00	613.3	830.5	-186.1	-617.1	618.6	624.5
70	26.790	26.880	653.4	495.4	520.4	495.2	395.1	13.6	37.22	1.59	29.69	53.93	599.6	841.6	-296.3	-680.1	691.4	693.7
85	28.860	28.900	604.9	441.1	453.8	440.7	399.9	18.7	41.40	2.44	37.25	58.78	570.2	850.4	-344.9	-727.1	744.8	745.8
90	29.570	29.600	594.3	422.4	430.2	422.0	409.7	18.3	43.61	2.48	39.42	60.48	556.9	856.9	-353.4	-745.6	763.1	763.9
95	30.240	30.270	587.1	408.4	415.3	408.1	414.9	16.2	44.98	2.27	41.35	61.92	553.3	867.1	-365.5	-765.0	780.4	781.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ POI	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.55	4.61	16.81	50.26	62.62	.0000	.5191	.0855	.0203	.0203	.9719	.0000	.0000	.8765	.7744	.4951	.5291	.6475
10	.55	4.81	18.99	45.46	59.66	.0000	.5026	.0996	.0246	.0246	.9677	.0000	.0000	.8540	.7655	.4993	.5311	.6429
15	.20	4.54	17.86	43.89	57.11	.0000	.4857	.0879	.0226	.0226	.9723	.0000	.0000	.8671	.7513	.5060	.5324	.6610
30	-2.27	2.56	13.96	40.61	51.90	.0000	.4454	.0475	.0136	.0136	.9862	.0000	.0000	.9180	.7131	.5168	.5470	.7137
50	-2.96	2.56	11.43	35.76	44.65	.0000	.4229	.0256	.0083	.0083	.9937	.0000	.0000	.9485	.6488	.4889	.5488	.7307
70	-.35	5.76	14.48	35.64	44.32	.0000	.4518	.0412	.0149	.0149	.9916	.0000	.0000	.9149	.5802	.4334	.5321	.7362
85	4.52	11.01	17.49	38.96	45.30	.0000	.5154	.0810	.0314	.0314	.9858	.0000	.0000	.8493	.5330	.3830	.5022	.7383
90	6.64	13.23	18.20	41.13	45.93	.0000	.5514	.1091	.0434	.0434	.9816	.0000	.0000	.8085	.5217	.3656	.4892	.7415
95	7.80	14.55	18.59	42.71	46.75	.0000	.5810	.1338	.0545	.0545	.9780	.0000	.0000	.7655	.5138	.3525	.4836	.7483

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5915.	144.93	1.0916	1.3036	85.92	86.60

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	488.3	925.4	493.3	570.4	.0	728.6	.00	51.34	34.68	-28.35	533.9	652.2	-337.3	315.8	337.9	412.8
10	14.100	16.730	504.5	897.1	504.5	572.8	.0	690.4	.00	50.31	35.73	-24.22	621.6	628.5	-363.1	258.0	363.1	432.4
15	15.170	17.550	515.7	865.3	515.7	573.7	.0	647.7	.00	48.45	37.13	-18.74	647.0	606.3	-390.6	195.0	390.6	452.7
30	18.280	19.910	537.8	797.3	537.8	572.0	.0	541.5	.00	43.40	41.17	-2.34	714.3	574.3	-470.7	28.8	470.7	512.7
50	22.190	23.030	549.4	635.8	549.4	533.1	.0	447.1	.00	38.38	46.11	15.47	792.8	553.7	-571.4	-147.5	571.4	594.6
70	25.880	26.260	467.0	607.6	467.0	445.6	.0	408.5	.00	42.25	54.97	30.21	814.3	524.1	-666.4	-267.7	666.4	676.2
85	28.450	29.610	383.7	549.4	383.7	360.4	.0	414.6	.00	49.00	61.75	41.73	831.8	493.4	-732.6	-322.1	732.6	736.7
90	28.320	28.410	376.6	540.3	375.6	337.0	.0	422.2	.00	51.42	63.55	44.86	843.4	475.5	-755.0	-335.2	755.0	757.3
95	30.150	30.180	366.2	532.8	366.2	324.2	.0	423.0	.00	52.54	64.75	47.52	858.4	480.2	-776.4	-354.2	776.4	777.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.34	.57	3.25	63.63	71.36	.0000	.1789	.2060	.0370	.0370	1.3300	.8840	.3792	4.6721	.4490	.8461	.5456	.5964
10	-5.75	.88	6.93	59.96	66.11	.0000	.2530	.1479	.0335	.0335	1.3325	.8966	.8922	-.2167	.4636	.8171	.5731	.5724
15	-5.10	1.16	8.19	55.88	62.97	.0000	.3118	.1376	.0302	.0302	1.3306	.9074	.9036	.5199	.4739	.7852	.5966	.5502
30	-4.01	1.66	10.66	44.01	53.23	.0000	.4036	.0730	.0191	.0191	1.3230	.9379	.9354	.8580	.4940	.7094	.6583	.5171
50	-2.46	2.53	10.79	30.84	38.92	.0000	.4715	.0884	.0252	.0252	1.2969	.9071	.9036	.8672	.5042	.6207	.7289	.4940
70	3.71	7.34	12.68	24.15	26.93	.0000	.5210	.0603	.0170	.0170	1.3208	.9356	.9330	.9157	.4254	.5363	.7423	.4626
85	8.51	12.15	11.71	18.86	18.56	.0000	.5921	.1057	.0273	.0273	1.3409	.8959	.8914	.8678	.3555	.4603	.7545	.4226
90	9.47	12.97	12.53	18.68	18.26	.0000	.6134	.1261	.0316	.0316	1.3504	.8793	.8730	.8461	.3387	.4710	.7642	.4145
95	9.73	13.08	13.37	17.23	17.52	.0000	.6181	.1370	.0333	.0333	1.3561	.8673	.8615	.8337	.3315	.4636	.7771	.4178

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0917	1.3234	90.84	81.20	32.32

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.560	548.8	565.0	534.5	564.8	658.4	-2.8	50.37	-.25	-20.80	40.44	571.9	742.1	203.1	-481.4	456.3	478.5
10	18.350	19.110	541.5	567.4	554.0	566.8	533.3	25.1	48.31	2.53	-16.19	39.43	577.1	734.4	150.7	-467.0	472.5	492.1
15	19.070	19.740	825.7	571.7	567.6	571.2	539.5	22.3	46.55	2.24	-10.62	40.38	578.4	750.0	108.4	-486.0	491.1	508.3
30	21.140	21.600	784.0	577.7	533.4	577.7	512.0	-3.1	40.76	-.30	3.03	44.06	595.6	804.2	-32.4	-559.3	544.4	556.2
50	23.970	24.200	721.6	552.0	578.2	552.0	431.7	5.4	36.73	.58	17.78	48.21	608.0	828.6	-185.6	-617.8	617.3	623.2
70	25.790	26.330	651.1	433.0	515.0	432.8	333.7	13.3	37.75	1.55	23.55	54.02	592.4	839.3	-231.5	-678.3	689.3	692.2
85	28.860	29.800	603.0	437.1	444.4	436.7	407.4	17.5	42.52	2.29	37.09	58.89	557.2	848.0	-335.8	-726.7	743.2	744.2
90	29.570	29.600	535.0	420.8	424.5	420.5	415.5	15.5	44.47	2.12	39.03	60.60	547.1	857.1	-344.8	-746.5	761.5	762.2
95	30.240	30.270	550.5	408.8	413.8	408.7	421.2	11.4	45.51	1.60	40.82	61.92	546.9	870.5	-357.5	-768.1	778.7	779.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.98	5.00	16.21	51.26	62.57	.0000	.5151	.0863	.0205	.0205	.9721	.0000	.0000	.8732	.7653	.4343	.5187	.6501
10	.90	5.15	18.51	46.28	59.62	.0000	.5000	.0936	.0245	.0245	.9683	.0000	.0000	.8521	.7565	.4973	.5210	.6437
15	.47	4.80	17.68	44.31	57.09	.0000	.4940	.0872	.0224	.0224	.9731	.0000	.0000	.8666	.7415	.5017	.5224	.6582
30	-1.84	2.59	13.78	41.02	51.68	.0000	.4465	.0465	.0140	.0140	.9862	.0000	.0000	.9143	.7031	.5084	.5366	.7077
50	-2.75	2.76	11.24	36.17	44.66	.0000	.4247	.0268	.0087	.0087	.9934	.0000	.0000	.9450	.6449	.4856	.5440	.7289
70	-.15	6.25	14.44	36.20	44.32	.0000	.4556	.0429	.0155	.0155	.9913	.0000	.0000	.9127	.5782	.4311	.5257	.7339
85	5.63	12.12	17.34	40.23	45.30	.0000	.5262	.0383	.0345	.0345	.9845	.0000	.0000	.8365	.5308	.3731	.4304	.7355
90	7.52	14.11	17.83	42.35	45.94	.0000	.5609	.1212	.0482	.0482	.9735	.0000	.0000	.7872	.5217	.3639	.4799	.7411
95	8.35	15.10	17.92	43.91	46.75	.0000	.5883	.1484	.0604	.0604	.9753	.0000	.0000	.7400	.5165	.3536	.4777	.7509

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5402.	143.37	1.0917	1.3032	85.77	85.31

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	483.0	922.2	483.0	565.7	.0	728.2	.00	52.16	34.96	-29.14	589.4	648.0	-337.7	315.6	337.7	412.6
10	14.100	16.790	499.3	893.3	499.3	568.4	.0	689.1	.00	50.47	36.01	-24.29	617.3	624.1	-363.0	256.9	363.0	432.2
15	15.170	17.580	510.6	861.7	510.6	570.3	.0	645.8	.00	48.55	37.40	-18.70	642.8	602.5	-390.5	193.3	390.5	452.5
30	18.280	19.910	532.4	787.9	532.4	571.3	.0	542.4	.00	43.49	41.44	-2.96	710.7	573.5	-470.6	29.9	470.6	512.5
50	22.190	23.090	543.1	692.5	543.1	526.8	.0	449.6	.00	40.47	46.43	15.38	788.3	546.8	-571.2	-144.8	571.2	594.4
70	25.880	26.260	459.7	603.2	459.7	441.5	.0	410.9	.00	42.97	55.38	31.03	809.9	515.7	-666.2	-265.1	666.2	676.0
85	28.450	28.610	386.5	548.4	386.5	353.2	.0	419.5	.00	49.91	62.18	41.90	828.1	474.6	-732.4	-316.9	732.4	736.5
90	29.320	29.410	368.6	540.2	368.6	329.7	.0	427.8	.00	52.39	63.96	44.99	840.1	466.2	-754.8	-329.3	754.8	757.1
95	30.150	30.180	359.6	533.1	359.6	317.0	.0	428.7	.00	53.52	65.14	47.68	855.4	471.0	-776.1	-348.2	776.1	776.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.06	.85	8.07	64.10	71.37	.0000	.1799	.2009	.0361	.0361	1.3315	.8883	.8837	4.6046	.4430	.8428	.5415	.5922
10	-5.47	1.15	6.93	60.30	66.12	.0000	.2544	.1638	.0327	.0327	1.3333	.9002	.8960	-.1693	.4587	.8133	.5691	.5682
15	-4.82	1.43	8.24	56.10	62.97	.0000	.3126	.1325	.0291	.0291	1.3312	.9116	.9080	.5393	.4689	.7816	.5927	.5465
30	-3.73	1.93	10.75	44.40	53.24	.0000	.4017	.0613	.0161	.0161	1.3276	.9483	.9461	.8791	.4889	.7094	.6547	.5163
50	-2.13	2.86	10.67	31.05	38.90	.0000	.4783	.0926	.0264	.0264	1.2974	.9041	.9005	.8623	.4982	.6175	.7250	.4875
70	4.17	8.39	10.90	24.35	26.93	.0000	.5296	.0688	.0192	.0192	1.3198	.9284	.9256	.9061	.4179	.5321	.7380	.4550
85	8.95	12.64	11.81	20.27	19.55	.0000	.6031	.1150	.0297	.0297	1.3421	.8887	.8839	.8578	.3485	.4791	.7510	.4146
90	9.90	13.40	12.65	18.98	18.26	.0000	.6253	.1361	.0340	.0340	1.3520	.8710	.8653	.8357	.3330	.4706	.7610	.4061
95	10.12	13.47	13.54	17.46	17.52	.0000	.6299	.1470	.0356	.0356	1.3577	.8601	.8539	.8235	.3253	.4635	.7741	.4095

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0921	1.3249	90.77	91.13	31.98

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	845.9	559.6	530.1	559.5	659.1	.6	51.19	.06	-20.96	40.49	567.7	735.7	203.0	-477.7	456.2	478.3
10	18.350	19.110	838.1	561.5	550.0	560.8	632.3	26.4	48.93	-2.70	-16.21	39.69	573.0	728.8	159.9	-465.5	472.4	491.9
15	19.070	19.740	821.9	565.0	563.6	564.5	597.9	24.2	46.63	2.45	-10.76	40.61	574.2	743.6	107.0	-484.0	490.9	508.1
30	21.140	21.600	783.9	577.1	592.6	577.1	512.7	-5.3	40.84	-.53	3.01	44.19	594.6	805.2	31.5	-561.4	544.2	556.0
50	23.970	24.200	718.2	547.1	572.1	547.1	434.1	4.5	37.13	.48	17.73	48.50	601.3	825.8	-182.9	-618.4	617.0	623.0
70	26.790	26.880	645.2	484.7	505.7	484.2	400.6	10.7	38.41	1.27	29.78	54.57	583.1	836.4	-289.0	-681.3	689.6	691.9
85	28.860	28.900	599.3	430.0	435.2	429.8	411.9	13.7	43.44	1.83	37.27	59.52	546.9	847.4	-331.0	-730.2	742.9	743.9
90	29.570	29.600	592.2	414.9	415.2	414.6	422.0	14.6	45.47	2.01	39.25	60.97	536.2	854.8	-339.2	-747.4	761.2	762.0
95	30.240	30.270	588.0	404.8	404.4	404.5	426.8	13.9	46.55	1.96	41.00	62.14	535.9	865.7	-351.6	-765.3	778.4	779.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.18	5.20	16.56	51.13	62.57	.0000	.5187	.0889	.0211	.0211	.9715	.0000	.0000	.8707	.7629	.4900	.5149	.6442
10	1.07	5.32	18.67	46.28	59.62	.0000	.5043	.1024	.0252	.0252	.9676	.0000	.0000	.8495	.7529	.4919	.5168	.6385
15	.59	4.92	17.90	44.23	57.08	.0000	.4886	.0902	.0232	.0232	.9724	.0000	.0000	.8631	.7380	.4956	.5187	.6522
30	-1.84	2.98	13.56	41.37	51.88	.0000	.4503	.0485	.0138	.0138	.9863	.0000	.0000	.9145	.7032	.5078	.5357	.7085
50	-2.30	3.22	11.13	36.70	44.63	.0000	.4302	.0253	.0082	.0082	.9939	.0000	.0000	.9486	.6413	.4810	.5376	.7259
70	.82	6.92	14.16	37.15	44.32	.0000	.4661	.0447	.0161	.0161	.9911	.0000	.0000	.9104	.5724	.4235	.5169	.7308
85	6.55	13.04	16.88	41.61	45.30	.0000	.5405	.0983	.0382	.0382	.9831	.0000	.0000	.8221	.5270	.3726	.4810	.7343
90	8.53	15.12	17.73	43.46	45.94	.0000	.5733	.1318	.0525	.0525	.9779	.0000	.0000	.7715	.5188	.3584	.4701	.7384
95	9.39	16.13	18.29	44.58	46.75	.0000	.5976	.1588	.0647	.0647	.9738	.0000	.0000	.7252	.5139	.3488	.4677	.7460

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5900.	141.85	1.0921	1.3041	85.61	86.15

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

90% of Design Speed

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	573.7	1047.8	573.7	648.4	.0	823.0	.00	51.76	33.52	-29.94	685.2	741.2	-390.1	359.7	380.1	464.4
10	14.100	16.730	591.0	1019.4	591.0	654.3	.0	781.7	.00	50.05	34.69	-24.27	713.4	713.2	-409.5	235.3	406.5	436.4
15	15.170	17.560	603.8	994.9	603.8	655.0	.0	735.4	.00	48.30	36.04	-19.02	746.5	693.5	-439.5	226.1	439.5	509.3
30	18.280	19.910	633.7	837.6	633.7	655.5	.0	513.1	.00	43.05	39.66	-3.13	826.0	658.4	-529.5	36.4	529.5	576.8
50	22.190	23.090	651.5	792.2	651.5	612.1	.0	302.9	.00	39.40	44.60	15.19	915.4	635.1	-642.9	-166.0	642.8	663.9
70	25.980	26.260	563.9	686.6	563.9	512.3	.0	457.0	.00	41.70	53.04	30.71	933.7	596.6	-743.7	-303.7	743.7	760.7
85	28.450	28.610	480.5	626.2	480.9	423.7	.0	459.1	.00	47.16	59.74	40.97	954.3	563.9	-824.2	-365.7	824.2	828.6
90	29.320	29.410	454.9	608.1	453.3	390.4	.0	465.3	.00	50.07	61.61	44.72	965.6	549.5	-843.4	-386.1	849.4	852.0
95	30.150	30.180	446.9	593.5	446.9	367.4	.0	486.0	.00	51.75	62.90	46.00	981.1	543.4	-873.4	-408.3	873.4	874.3

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.49	-.56	8.14	62.46	71.21	.0000	.1831	.2337	.0431	.0431	1.4169	.8595	.8524	17.8619	.5293	.3645	.6356	.6822
10	-6.95	-.13	6.32	59.31	66.05	.0000	.2583	.1316	.0362	.0362	1.4284	.8948	.8783	-.1151	.5464	.3340	.6656	.6530
15	-6.22	.07	7.89	55.05	62.91	.0000	.3161	.1450	.0318	.0318	1.4239	.9003	.8351	.5355	.5595	.8981	.6922	.6324
30	-5.32	.36	10.56	42.39	53.20	.0000	.4055	.0713	.0183	.0183	1.4224	.9376	.9344	.8634	.5871	.8105	.7659	.5944
50	-3.98	1.01	10.54	29.41	38.95	.0000	.4716	.0835	.0238	.0238	1.3965	.9110	.9068	.8827	.6043	.7070	.8497	.5667
70	-1.74	5.38	10.57	22.34	26.91	.0000	.5240	.0560	.0157	.0157	1.4161	.9397	.9367	.9277	.5186	.6043	.8628	.5251
85	5.49	10.19	10.92	18.76	19.59	.0000	.5763	.0703	.0184	.0184	1.4350	.9236	.9258	.9151	.4371	.5443	.8710	.4907
90	7.55	11.05	12.38	16.89	18.26	.0000	.6018	.0865	.0242	.0242	1.4628	.9058	.9007	.8873	.4172	.5270	.8800	.4762
95	7.89	11.23	13.86	14.30	17.52	.0000	.6111	.1137	.0274	.0274	1.4660	.8930	.8823	.8690	.4066	.5123	.8332	.4748

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1156	1.4216	91.28	91.70	36.35

STATOR

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.590	959.1	616.4	502.8	616.2	744.7	-7.6	51.01	-.71	-21.00	41.53	645.7	823.2	231.3	-545.9	513.3	536.2
10	18.350	19.110	954.3	623.2	630.2	622.7	716.5	23.8	49.65	2.19	-16.36	40.40	657.0	817.6	184.9	-529.8	531.6	553.6
15	19.070	19.740	939.2	632.5	647.6	631.9	680.0	28.1	46.39	2.54	-11.15	40.71	660.6	833.7	127.6	-543.8	552.4	571.8
30	21.140	21.600	895.1	647.0	681.9	647.0	579.3	-2.1	40.33	-.16	2.74	44.12	684.1	901.6	-33.1	-627.8	612.4	625.7
50	23.370	24.200	823.1	623.0	667.1	623.0	485.5	6.4	35.04	.53	17.39	49.11	693.9	933.2	-203.9	-694.6	694.4	701.0
70	26.790	26.880	739.1	550.3	583.3	550.2	446.0	11.0	37.14	1.15	29.28	54.36	676.3	944.9	-330.1	-767.7	776.1	776.7
85	28.860	28.900	689.2	494.1	520.5	493.8	451.6	17.0	40.96	1.98	36.46	59.34	647.2	957.5	-384.4	-820.2	836.0	837.2
90	29.570	29.600	674.7	471.5	493.2	471.2	460.1	15.3	43.02	1.33	38.82	60.75	633.1	964.7	-396.5	-841.6	856.6	857.5
95	30.240	30.270	663.5	452.6	474.1	452.4	464.1	12.2	44.39	1.53	40.98	62.38	628.2	976.0	-411.9	-864.7	876.0	876.9

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.98	4.98	15.80	51.72	62.56	.0000	.5380	.0942	.0224	.0224	.9634	.0000	.0000	.8736	.8681	.5358	.5890	.7155
10	.72	4.33	18.16	46.43	59.63	.0000	.5221	.1133	.0291	.0291	.9560	.0000	.0000	.8454	.8614	.5422	.5359	.7114
15	.27	4.61	17.59	43.85	57.11	.0000	.5017	.1011	.0260	.0260	.9619	.0000	.0000	.8579	.8462	.5513	.5387	.7267
30	-2.40	2.42	13.88	40.31	51.95	.0000	.4605	.0574	.0164	.0164	.9800	.0000	.0000	.9030	.8047	.5665	.6184	.7895
50	-3.46	2.06	11.28	35.44	44.68	.0000	.4314	.0283	.0091	.0091	.9914	.0000	.0000	.9463	.7376	.5457	.6271	.8173
70	-.41	5.71	14.05	35.33	44.33	.0000	.4672	.0425	.0154	.0154	.9833	.0000	.0000	.9166	.6544	.4792	.5387	.8211
85	4.12	10.62	17.03	38.98	45.31	.0000	.5279	.0864	.0335	.0335	.9811	.0000	.0000	.8461	.6045	.4256	.5675	.8245
90	6.03	12.69	17.64	41.10	45.34	.0000	.5633	.1038	.0437	.0437	.9770	.0000	.0000	.8147	.5996	.4044	.5533	.8275
95	7.21	13.95	17.86	42.85	46.75	.0000	.5952	.1313	.0535	.0535	.9735	.0000	.0000	.7820	.5777	.3870	.5463	.8345

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6633.	163.89	1.1156	1.3934	85.99	86.65

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	565.1	1028.5	565.1	638.6	.0	821.0	.00	52.21	33.93	-29.24	691.1	725.8	-380.2	356.5	380.2	464.5
10	14.100	16.730	532.3	1009.3	582.3	644.1	.0	777.8	.00	50.37	35.05	-24.31	711.4	707.3	-403.5	231.3	403.5	456.5
15	15.170	17.530	595.0	975.5	595.0	646.4	.0	730.5	.00	49.49	36.45	-18.85	733.3	683.7	-433.6	221.0	439.6	509.4
30	18.280	19.910	624.5	850.4	624.5	646.6	.0	611.7	.00	43.36	40.26	-3.04	819.0	649.4	-523.7	34.8	529.7	577.0
50	22.190	23.030	641.1	796.8	641.1	602.5	.0	506.1	.00	40.02	45.07	15.15	908.1	624.9	-643.0	-163.0	643.0	669.1
70	25.880	26.260	554.0	684.2	554.0	504.0	.0	462.7	.00	42.58	53.54	30.67	932.9	586.7	-743.9	-238.3	743.9	761.0
85	28.450	28.610	471.1	623.8	471.1	412.5	.0	467.8	.00	48.60	60.25	41.21	949.8	546.4	-824.4	-361.2	824.4	829.1
90	29.320	29.410	443.3	603.0	443.3	381.4	.0	474.5	.00	51.23	62.12	44.75	951.3	537.2	-843.6	-377.7	843.6	852.2
95	30.150	30.160	437.9	596.8	437.9	362.0	.0	474.5	.00	52.66	63.38	47.85	977.3	539.7	-873.7	-400.1	873.7	874.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.09	-.17	7.84	63.17	71.22	.0000	.2009	.2356	.0422	.0422	1.4181	.8842	.8574*******	.5210	.9549	.6286	.6708
10	-6.44	.21	6.98	59.36	66.09	.0000	.2656	.1770	.0353	.0353	1.4289	.8933	.8335	.5107	.5379	.9241	.6536	.6472
15	-5.81	.47	6.07	55.30	62.82	.0000	.3213	.1386	.0304	.0304	1.4293	.9057	.8009	.5725	.5500	.8865	.6853	.6227
30	-4.80	.78	10.68	43.71	53.20	.0000	.4111	.0677	.0177	.0177	1.4238	.9419	.9350	.8757	.5781	.8131	.7591	.5657
50	-3.51	1.49	10.49	28.92	38.84	.0000	.4737	.0833	.0238	.0238	1.3304	.9130	.9093	.9843	.5940	.7014	.8423	.5571
70	2.27	5.50	10.53	22.37	26.92	.0000	.5333	.0583	.0163	.0163	1.4213	.9332	.9350	.9243	.5085	.6016	.8568	.5158
85	7.02	10.70	11.15	18.04	19.59	.0000	.5939	.0325	.0215	.0215	1.4531	.9197	.9153	.9024	.4279	.5421	.8661	.4766
90	8.06	11.56	12.41	17.38	18.25	.0000	.6153	.1036	.0260	.0260	1.4558	.9013	.8959	.8806	.4092	.5273	.8755	.4651
95	8.36	11.71	13.70	15.53	17.52	.0000	.6227	.1176	.0294	.0294	1.4750	.8978	.8915	.8657	.3992	.5154	.8391	.4660

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1165	1.4254	91.34	81.77	36.52

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	849.4	607.1	551.0	606.8	743.0	-8.4	51.50	-.85	-21.23	42.07	634.0	817.6	229.5	-547.6	513.5	536.4
10	18.350	19.110	844.6	613.1	613.1	612.4	713.4	23.3	43.04	2.41	-16.35	40.76	645.5	808.5	181.6	-527.3	531.7	553.3
15	19.070	19.740	829.0	621.5	637.4	620.8	675.7	30.9	46.66	2.85	-10.83	41.07	649.8	823.5	123.0	-541.1	552.6	572.0
30	21.140	21.600	886.4	638.2	671.2	638.2	577.3	-1.4	40.68	-.13	2.32	44.43	674.0	835.0	-34.7	-627.4	612.6	625.9
50	23.970	24.200	819.3	615.1	658.6	615.0	486.4	8.9	38.64	.93	17.43	48.34	683.0	826.4	-206.2	-681.4	694.6	701.3
70	26.730	26.830	735.1	543.8	580.1	543.6	461.3	14.1	37.30	1.43	23.23	54.53	665.8	838.3	-325.0	-754.9	776.3	774.3
85	28.860	28.900	684.8	465.9	507.2	485.6	460.0	18.3	42.22	2.16	36.58	59.34	631.7	852.4	-376.3	-819.2	836.3	837.5
90	29.570	29.600	672.8	466.0	482.4	465.6	468.7	17.4	44.18	2.13	38.84	61.00	613.4	860.3	-398.2	-840.4	856.3	857.7
95	30.240	30.270	663.9	450.5	466.4	450.3	472.6	14.5	45.38	1.86	40.89	62.42	616.9	872.8	-403.7	-862.3	876.3	877.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.44	5.44	15.61	52.39	62.56	.0000	.5442	.0363	.0228	.0228	.9631	.0000	.0000	.8720	.3599	.5274	.5777	.7102
10	1.07	5.33	16.39	46.63	59.63	.0000	.5265	.1156	.0285	.0285	.9561	.0000	.0000	.8444	.6514	.5331	.5848	.7031
15	.53	4.87	19.30	43.81	57.11	.0000	.5060	.1033	.0265	.0265	.9619	.0000	.0000	.8557	.8362	.5414	.5985	.7173
30	-2.02	2.80	13.94	40.91	51.86	.0000	.4644	.0576	.0165	.0165	.9802	.0000	.0000	.9071	.7264	.5594	.6065	.7431
50	-2.85	2.66	11.61	35.71	44.67	.0000	.4361	.0289	.0093	.0093	.9913	.0000	.0000	.9456	.7309	.5381	.6166	.8096
70	.35	6.46	14.39	36.42	44.33	.0000	.4742	.0454	.0175	.0175	.9860	.0000	.0000	.9071	.6502	.4721	.5868	.8148
85	5.38	11.88	17.21	40.06	45.31	.0000	.5409	.0972	.0377	.0377	.9791	.0000	.0000	.8297	.5997	.4178	.5531	.8198
90	7.26	13.35	17.85	42.05	45.34	.0000	.5744	.1236	.0432	.0432	.9743	.0000	.0000	.7934	.5863	.3931	.5405	.8230
95	8.21	14.96	16.21	43.49	46.75	.0000	.6022	.1481	.0595	.0595	.9705	.0000	.0000	.7589	.5774	.3848	.5358	.8308

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6641.	162.01	1.1165	1.3959	85.87	86.54

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

90% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	553.6	1026.6	555.6	625.0	.0	814.3	.00	52.46	34.35	-29.26	672.9	716.8	-379.7	350.4	379.7	463.9
10	14.100	16.730	572.6	996.6	572.6	631.4	.0	771.0	.00	50.56	35.47	-24.27	703.1	693.2	-408.1	285.1	408.1	485.9
15	15.170	17.530	585.1	961.8	585.1	633.6	.0	723.6	.00	49.78	36.98	-19.70	731.5	669.5	-439.0	214.8	439.0	508.8
30	18.280	19.310	613.7	879.0	613.7	633.9	.0	606.7	.00	43.81	40.74	-2.89	810.4	636.5	-529.0	32.5	529.0	576.2
50	22.130	23.030	629.0	777.0	629.0	586.1	.0	507.7	.00	40.80	45.58	15.23	899.0	610.4	-642.2	-160.5	642.2	663.3
70	25.880	26.260	542.6	676.5	542.6	499.6	.0	466.5	.00	43.66	54.07	30.38	925.4	571.8	-743.0	-233.4	743.0	760.0
85	28.450	28.610	461.9	625.0	461.8	405.0	.0	472.5	.00	49.12	60.71	41.00	944.1	542.0	-823.4	-355.5	823.4	826.0
90	29.320	29.410	440.6	613.0	440.6	382.5	.0	478.8	.00	51.40	62.55	44.25	956.3	534.1	-848.6	-372.4	848.6	851.2
95	30.150	30.190	429.5	598.2	429.5	359.1	.0	478.4	.00	53.12	63.79	47.72	972.6	534.1	-872.6	-395.0	872.6	873.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-3	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.66	.25	7.84	63.61	71.24	.0000	.2083	.2201	.0394	.0394	1.4139	.8750	.8697	-8.0322	.5119	.9421	.6207	.6578
10	-6.02	.63	6.92	59.74	66.07	.0000	.2743	.1676	.0334	.0334	1.4230	.8964	.8911	.1632	.5286	.9105	.6506	.6333
15	-5.37	.30	8.22	55.57	62.93	.0000	.3306	.1318	.0288	.0288	1.4278	.9112	.9067	.6185	.5403	.8747	.6773	.6089
30	-4.44	1.24	10.81	43.62	53.21	.0000	.4197	.0625	.0164	.0164	1.4236	.9470	.9443	.8906	.5675	.7918	.7505	.5734
50	-3.00	2.00	10.62	30.30	38.94	.0000	.4911	.0432	.0237	.0237	1.3921	.9143	.9107	.9364	.5820	.6917	.8329	.5434
70	2.77	7.00	10.84	23.09	26.91	.0000	.5474	.0613	.0171	.0171	1.4240	.9353	.9337	.9231	.4980	.5341	.8489	.5021
85	7.41	11.10	10.97	19.71	18.61	.0000	.5939	.0742	.0184	.0184	1.4692	.9289	.9250	.9124	.4202	.5425	.8603	.4709
90	9.46	11.37	11.91	18.30	18.26	.0000	.6187	.0913	.0231	.0231	1.4923	.9144	.9096	.8946	.4005	.5307	.8701	.4624
95	9.79	12.12	13.57	16.07	17.52	.0000	.6291	.1093	.0265	.0265	1.4950	.8973	.8915	.8756	.3904	.5164	.8841	.4610

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1165	1.4280	91.72	92.12	36.03

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	938.1	596.4	580.4	536.1	737.0	-9.7	51.78	-.93	-21.12	42.56	622.2	809.4	224.2	-547.4	512.8	537.7
10	18.350	19.110	932.1	601.3	606.9	607.8	707.3	23.0	49.37	2.19	-16.19	41.42	632.2	801.2	176.3	-530.1	531.1	553.1
15	19.070	19.740	915.2	609.4	623.9	600.7	669.4	29.8	47.01	2.91	-10.68	41.65	635.4	814.7	117.5	-541.5	551.9	571.3
30	21.140	21.600	874.0	626.6	658.0	626.6	574.9	-1.0	41.12	-.06	3.19	44.96	660.4	885.9	-37.0	-626.1	611.8	625.1
50	23.970	24.200	806.8	604.1	641.1	604.0	489.7	3.1	37.37	.37	17.69	49.85	673.6	918.1	-204.0	-691.3	693.7	700.4
70	26.790	26.980	725.0	535.2	564.2	535.0	455.1	16.0	36.92	1.74	23.62	54.92	649.6	931.4	-320.2	-761.3	775.3	777.9
85	28.860	28.900	680.9	479.3	497.5	479.0	464.7	16.9	43.06	2.02	36.69	59.69	620.4	949.3	-370.5	-819.5	835.2	836.4
90	29.570	29.600	672.2	463.1	477.3	462.7	473.1	18.3	44.76	2.26	38.73	61.10	611.9	957.7	-382.7	-838.4	855.8	856.7
95	30.240	30.270	661.9	450.4	459.3	450.0	476.6	18.3	46.06	2.32	40.35	62.31	609.2	968.7	-338.6	-857.8	875.2	876.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-3	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.73	5.73	15.57	52.71	62.59	.0000	.5487	.0339	.0235	.0235	.9629	.0000	.0000	.8699	.8474	.5178	.5660	.7027
10	-1.42	5.67	16.16	47.18	59.62	.0000	.5320	.1167	.0286	.0286	.9566	.0000	.0000	.8433	.8395	.5226	.5715	.6963
15	.98	5.22	19.25	44.20	57.10	.0000	.5103	.1017	.0261	.0261	.9633	.0000	.0000	.8581	.8227	.5305	.5748	.7093
30	-1.56	3.26	13.96	41.21	51.85	.0000	.4689	.0579	.0165	.0165	.9806	.0000	.0000	.9064	.7843	.5478	.5953	.7745
50	-2.12	3.40	11.55	36.50	44.67	.0000	.4425	.0296	.0096	.0096	.9913	.0000	.0000	.9443	.7196	.5279	.6018	.8023
70	1.38	7.50	14.62	37.19	44.33	.0000	.4797	.0522	.0188	.0188	.9874	.0000	.0000	.8933	.6400	.4641	.5735	.8075
85	6.27	12.77	17.07	41.04	45.31	.0000	.5515	.1239	.0491	.0491	.9736	.0000	.0000	.7822	.5351	.4117	.5423	.8154
90	7.87	14.46	17.98	42.50	45.94	.0000	.5805	.1550	.0617	.0617	.9679	.0000	.0000	.7391	.5858	.3963	.5333	.8197
95	8.87	15.62	19.65	43.74	46.75	.0000	.6015	.1690	.0688	.0688	.9661	.0000	.0000	.7182	.5754	.3945	.5282	.8269

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6633.	159.81	1.1165	1.3973	86.03	86.63

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	V0I-1 FT/SEC	V0I-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	545.7	1021.1	545.7	618.6	.0	812.3	.00	52.70	34.87	-29.33	665.1	709.9	-380.2	347.7	380.2	464.6
10	14.100	16.790	562.7	990.3	562.7	624.4	.0	768.6	.00	50.90	35.98	-24.27	695.5	685.5	-408.6	282.0	408.6	486.6
15	15.170	17.580	575.2	955.0	575.2	626.9	.0	720.3	.00	48.96	37.38	-18.56	724.0	661.9	-439.6	210.8	439.6	500.5
30	18.280	19.910	602.8	874.2	602.8	626.6	.0	609.4	.00	44.18	41.28	-2.92	802.6	620.0	-529.8	32.4	529.8	577.0
50	22.190	23.090	616.6	772.7	616.6	578.5	.0	512.1	.00	41.51	46.19	15.20	891.0	600.1	-643.1	-157.0	643.1	669.2
70	25.880	26.260	529.1	676.5	529.1	480.1	.0	476.5	.00	44.82	54.79	30.71	918.4	559.0	-750.0	-284.6	750.0	761.1
85	28.450	28.610	448.3	620.6	448.3	387.3	.0	484.9	.00	51.39	61.47	41.63	938.6	518.2	-824.5	-344.2	824.5	829.2
90	29.320	29.410	427.0	612.0	427.9	364.2	.0	491.7	.00	53.48	63.27	44.73	951.5	512.9	-849.7	-360.7	849.7	852.3
95	30.150	30.180	417.0	603.3	417.9	349.5	.0	491.8	.00	54.60	64.44	47.60	968.6	518.5	-873.8	-382.9	873.8	874.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	-6.14	.77	7.81	64.19	71.28	.0000	.2086	.2074	.0372	.0372	1.4248	.8847	.8788	-7.7535	.5025	.9363	.6133	.6509
10	-5.50	1.14	6.93	60.25	66.08	.0000	.2770	.1592	.0317	.0317	1.4311	.8035	.8985	.2266	.5192	.9038	.6435	.6257
15	-4.86	1.41	8.37	55.95	62.95	.0000	.3330	.1249	.0274	.0274	1.4297	.8173	.9130	.6436	.5309	.8677	.6703	.6014
30	-3.89	1.78	10.78	44.20	53.22	.0000	.4237	.0578	.0151	.0151	1.4275	.8519	.9404	.8093	.5570	.7869	.7434	.5662
50	-2.37	2.62	10.51	30.99	38.92	.0000	.4997	.0862	.0246	.0246	1.3962	.8138	.9006	.8834	.5697	.6871	.8252	.5336
70	3.57	7.79	10.58	24.08	26.93	.0000	.5615	.0708	.0198	.0198	1.4309	.8297	.9260	.9195	.4837	.5933	.8416	.4903
85	8.23	11.91	11.57	19.83	19.57	.0000	.6275	.1014	.0263	.0263	1.4700	.8064	.9013	.8840	.4063	.5381	.8546	.4493
90	9.19	12.70	12.39	18.54	18.26	.0000	.6439	.1152	.0289	.0289	1.4855	.8956	.8897	.8703	.3883	.5289	.8652	.4432
95	9.42	12.77	13.45	16.84	17.52	.0000	.6475	.1259	.0306	.0306	1.4932	.8855	.8789	.8590	.3795	.5201	.8798	.4470

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1182	1.4329	91.42	91.84	35.45

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	BI-1 DEGREE	BI-2 DEGREE	VI-1 FT/SEC	VI-2 FT/SEC	V0I-1 FT/SEC	V0I-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	933.0	583.4	576.8	583.1	735.2	-5.4	51.93	-.54	-21.06	43.00	617.1	797.4	221.7	-543.0	513.5	539.5
10	18.350	19.110	926.3	587.0	600.5	586.1	705.2	29.5	49.58	2.87	-16.10	41.82	625.3	786.4	173.4	-524.4	531.8	553.8
15	19.070	19.740	907.8	593.6	616.0	592.7	666.6	32.5	47.25	3.14	-10.49	42.31	627.0	801.6	113.0	-530.6	552.7	573.1
30	21.140	21.600	867.4	616.9	648.8	616.8	575.4	1.2	41.55	.12	3.25	45.35	651.1	870.0	-37.3	-624.8	612.7	626.0
50	23.970	24.200	800.0	593.5	629.3	593.3	493.8	13.0	38.11	1.26	17.70	49.24	661.4	908.0	-200.8	-688.4	694.7	701.3
70	26.790	26.880	721.5	525.5	552.1	525.1	464.3	19.0	40.09	2.08	29.52	55.35	630.9	924.2	-312.1	-760.0	776.4	779.0
85	28.860	28.900	674.0	467.8	476.3	467.4	476.8	20.1	45.04	2.47	37.07	60.24	597.0	941.7	-359.6	-817.4	836.4	837.6
90	29.570	29.600	666.0	454.7	456.7	454.3	485.8	17.0	46.77	2.14	39.11	61.61	588.7	955.0	-371.2	-840.0	857.0	857.8
95	30.240	30.270	661.7	445.4	444.9	445.2	489.8	12.1	47.75	1.56	40.99	62.77	580.4	973.0	-386.6	-865.1	876.4	877.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	MI-1	MI-2
5	1.84	5.87	15.98	52.47	62.61	.0000	.5592	.1047	.0249	.0249	.9610	.0000	.0000	.8641	.8435	.5060	.5612	.6017
10	1.64	5.90	18.86	46.70	59.65	.0000	.5423	.1240	.0306	.0306	.9544	.0000	.0000	.8374	.8314	.5095	.5640	.6027
15	1.11	5.45	18.58	44.11	57.10	.0000	.5222	.1099	.0282	.0282	.9608	.0000	.0000	.8503	.8140	.5161	.5667	.6070
30	-1.12	3.70	14.19	41.43	51.86	.0000	.4756	.0588	.0168	.0168	.9805	.0000	.0000	.9052	.7777	.5387	.5862	.7668
50	-1.36	4.15	11.91	36.86	44.64	.0000	.4511	.0302	.0098	.0098	.9913	.0000	.0000	.9438	.7137	.5179	.5901	.7931
70	2.55	8.66	14.98	38.01	44.33	.0000	.4937	.0610	.0220	.0220	.9855	.0000	.0000	.8961	.6360	.4548	.5597	.7907
85	8.23	14.73	17.52	42.57	45.31	.0000	.5690	.1275	.0495	.0495	.9734	.0000	.0000	.7820	.5890	.4000	.5309	.8060
90	9.89	16.48	17.85	44.64	45.94	.0000	.5981	.1576	.0627	.0627	.9679	.0000	.0000	.7396	.5798	.3883	.5119	.8163
95	10.58	17.33	17.88	46.20	46.75	.0000	.6209	.1805	.0735	.0735	.9639	.0000	.0000	.7041	.5738	.3794	.5107	.8288

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6642.	157.24	1.1182	1.4024	85.85	86.20

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	609.4	1101.6	609.4	675.7	.0	870.0	.00	52.16	33.35	-29.33	729.6	775.3	-401.2	379.8	401.2	490.2
10	14.100	16.730	627.3	1073.2	627.3	694.2	.0	826.7	.00	50.38	34.30	-24.38	761.2	752.3	-431.1	313.4	431.1	513.4
15	15.170	17.580	641.0	1037.5	641.0	686.4	.0	777.8	.00	46.56	35.88	-18.26	791.3	727.9	-463.9	240.3	463.9	537.6
30	18.280	19.910	674.5	944.8	674.5	636.1	.0	643.3	.00	43.33	39.62	-3.33	876.2	693.3	-553.0	40.5	553.0	606.8
50	22.190	23.090	696.0	835.9	696.0	642.6	.0	534.7	.00	39.76	44.26	14.55	972.1	666.0	-678.5	-171.4	678.5	706.0
70	25.980	26.260	608.3	723.8	608.3	538.5	.0	483.5	.00	41.35	52.44	30.72	938.7	627.3	-731.3	-319.4	791.3	803.0
85	28.450	29.610	521.3	658.0	521.3	446.5	.0	483.3	.00	47.27	59.06	41.26	1014.3	583.9	-868.9	-391.6	869.9	874.8
90	29.320	29.410	497.8	636.1	497.8	408.7	.0	489.7	.00	50.18	60.35	45.09	1025.7	579.0	-896.5	-408.6	896.5	899.3
95	30.150	30.180	485.0	622.1	485.0	383.6	.0	488.7	.00	51.93	62.25	49.46	1041.7	578.8	-921.9	-433.2	921.9	922.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-3	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.66	-.75	7.66	62.69	71.12	.0000	.2059	.2599	.0433	.0433	1.4591	.9414	.8329	*******	.3539	1.0163	.6755	.7153
10	-7.00	-.34	6.57	59.08	66.01	.0000	.2683	.3011	.0400	.0400	1.4772	.9727	.8656	-.0553	.5815	.3853	.7067	.6913
15	-6.39	-.03	7.63	55.14	62.87	.0000	.3242	.1585	.0346	.0346	1.4813	.9815	.8854	.8312	.5348	.3476	.7351	.6648
30	-5.55	.14	10.36	42.95	53.17	.0000	.4155	.0837	.0219	.0219	1.4732	.9280	.9240	.8569	.6273	.2533	.8150	.6625
50	-4.33	.67	10.32	29.31	38.36	.0000	.4304	.0387	.0253	.0253	1.4374	.9069	.9019	.8813	.6499	.7453	.9066	.5938
70	-1.15	5.39	10.59	21.72	26.91	.0000	.3806	.0574	.0161	.0161	1.4708	.9386	.9352	.9259	.5619	.6356	.9220	.5506
85	5.93	9.52	11.21	17.91	19.53	.0000	.3301	.0662	.0172	.0172	1.5160	.9333	.9299	.9228	.4753	.5707	.9288	.5152
90	6.89	10.40	12.76	15.86	14.26	.0000	.6043	.0307	.0226	.0226	1.5231	.9116	.9063	.8975	.4539	.5511	.9377	.5000
95	7.24	10.55	14.32	13.79	17.52	.0000	.8137	.1080	.0258	.0258	1.5286	.8943	.8885	.8736	.4426	.5354	.9512	.4982

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1291	1.4751	90.83	21.31	36.76

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	19.530	1004.9	623.1	624.7	628.3	787.1	-12.3	51.56	-1.13	-21.43	42.71	671.1	855.8	245.2	-580.5	541.8	569.1
10	18.350	19.140	1002.4	639.0	655.1	637.5	757.8	22.6	49.11	2.03	-16.69	41.38	685.2	849.7	136.7	-561.7	561.1	584.3
15	19.070	19.740	987.9	649.9	677.1	649.3	719.2	28.8	46.72	2.34	-11.37	41.51	691.3	867.2	136.0	-574.8	583.1	603.6
30	21.140	21.600	941.5	668.6	714.0	666.6	613.2	1.7	40.63	.15	2.63	44.56	716.3	938.7	-33.2	-658.8	646.4	660.5
50	23.970	24.200	871.0	649.9	701.7	646.7	516.0	11.6	36.32	1.03	17.18	48.30	735.4	975.5	-216.9	-728.4	732.9	740.0
70	26.790	26.890	779.5	572.4	620.2	572.2	472.1	14.0	31.30	1.41	23.26	54.66	711.6	990.5	-347.0	-807.9	819.2	821.9
85	29.960	28.300	724.5	511.3	546.4	510.9	475.6	21.0	41.05	2.35	36.68	59.37	681.4	1002.8	-406.9	-862.7	882.5	883.7
90	29.570	29.660	708.4	486.8	517.2	486.4	483.8	19.0	43.10	2.23	39.13	61.23	666.7	1011.0	-420.4	-886.1	904.2	905.1
95	30.240	30.270	635.9	466.3	496.4	466.1	487.5	14.9	44.49	1.82	41.36	62.89	661.5	1023.2	-437.0	-910.8	924.7	925.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-3	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.52	5.51	15.37	52.69	62.56	.0000	.5533	.0388	.0235	.0235	.9539	.0000	.0000	.9743	.9110	.5439	.6128	.7399
10	-1.12	5.37	18.00	47.08	59.63	.0000	.5405	.1216	.0300	.0300	.9496	.0000	.0000	.8437	.9057	.5523	.6226	.7355
15	.56	4.91	17.39	44.17	57.12	.0000	.5184	.1103	.0283	.0283	.9553	.0000	.0000	.8533	.8905	.5638	.6270	.7522
30	-2.10	2.72	14.20	40.49	51.85	.0000	.4731	.0621	.0177	.0177	.9766	.0000	.0000	.9054	.8466	.5931	.6477	.8186
50	-3.18	2.34	11.72	35.29	44.69	.0000	.4410	.0320	.0103	.0103	.9894	.0000	.0000	.9429	.7781	.5661	.6586	.8512
70	-.22	5.30	14.30	35.30	44.33	.0000	.4771	.0463	.0169	.0169	.9872	.0000	.0000	.9113	.6395	.4954	.6289	.8571
85	4.24	10.74	17.40	38.69	46.31	.0000	.5375	.0693	.0347	.0347	.9789	.0000	.0000	.8460	.6336	.4382	.5958	.8593
90	6.13	12.78	17.35	40.87	45.34	.0000	.6740	.1115	.0444	.0444	.9749	.0000	.0000	.8181	.6171	.4154	.5308	.8627
95	7.31	14.06	18.14	42.87	46.75	.0000	.8066	.1318	.0537	.0537	.9712	.0000	.0000	.7893	.6039	.3966	.5734	.8701

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7008.	171.91	1.1291	1.4413	85.33	35.03

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

95% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	601.4	1093.2	601.4	666.6	.0	866.4	.00	52.42	33.71	-29.42	723.0	765.6	-401.3	376.1	401.3	490.3
10	14.100	16.790	619.1	1063.7	619.1	676.3	.0	820.5	.00	50.47	34.66	-24.37	754.5	743.6	-431.3	306.9	431.3	513.6
15	15.170	17.590	632.7	1027.3	632.7	680.5	.0	769.4	.00	48.50	36.25	-19.77	784.6	719.5	-464.0	231.7	464.0	537.7
30	18.280	19.910	665.2	937.8	665.2	678.6	.0	647.0	.00	43.60	40.02	-3.16	869.1	681.6	-559.1	38.0	559.1	609.0
50	22.190	23.090	685.2	830.6	685.2	633.1	.0	537.6	.00	40.33	44.72	14.34	954.5	656.1	-678.7	-168.7	678.7	706.3
70	25.880	26.260	597.0	720.3	597.0	527.4	.0	430.5	.00	42.35	52.36	30.72	932.1	614.3	-731.6	-312.7	791.6	803.2
85	28.450	28.610	511.2	657.6	511.2	433.4	.0	494.6	.00	48.78	59.56	41.29	1009.4	576.8	-870.2	-380.5	870.2	875.1
90	29.320	29.410	489.5	641.7	489.5	393.7	.0	501.7	.00	51.49	61.41	44.83	1021.4	564.4	-896.9	-397.3	896.8	899.6
95	30.150	30.190	476.6	628.5	476.6	376.4	.0	501.8	.00	52.93	62.67	48.06	1038.1	566.4	-922.2	-421.3	922.2	923.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.30	-.39	7.60	63.13	71.15	.0000	.2117	.2554	.0457	.0457	1.4641	.8521	.8440	-6.4489	.5560	1.0073	.6690	.7055
10	-6.64	.02	5.80	59.22	66.02	.0000	.2121	.1875	.0374	.0374	1.4736	.8925	.8759	.0215	.5736	.9755	.7003	.6819
15	-6.01	.28	6.12	55.02	62.89	.0000	.3266	.1452	.0318	.0318	1.4817	.9011	.8956	.5811	.5867	.9373	.7288	.6565
30	-5.15	.53	10.33	43.19	53.19	.0000	.4190	.0749	.0196	.0196	1.4767	.9363	.9329	.8731	.6183	.8463	.8084	.6150
50	-3.86	1.13	10.29	29.78	38.95	.0000	.4876	.0677	.0250	.0250	1.4418	.9095	.9047	.8836	.6380	.7398	.8991	.5844
70	-1.71	5.34	10.58	27.25	26.92	.0000	.5430	.0645	.0181	.0181	1.4751	.9328	.9291	.9214	.5501	.6317	.9150	.5387
85	6.35	10.03	11.23	18.28	19.53	.0000	.5989	.0312	.0212	.0212	1.5214	.9214	.9167	.9073	.4654	.5636	.9236	.4935
90	7.36	10.86	12.55	16.52	18.26	.0000	.6213	.0124	.0256	.0256	1.5339	.9031	.8971	.8860	.4450	.5534	.9331	.4867
95	7.65	11.00	13.92	14.60	17.52	.0000	.6285	.1171	.0282	.0282	1.5337	.8892	.8823	.8711	.4347	.5404	.9473	.4870

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1301	1.4800	90.91	91.39	33.35

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.590	957.3	623.2	616.3	623.1	784.1	1.5	51.83	.13	-21.45	42.29	662.1	642.4	242.1	-566.8	542.0	568.3
10	18.350	19.110	933.7	630.5	643.7	630.0	752.7	22.8	43.24	2.07	-16.44	41.72	676.6	844.1	131.4	-561.7	561.3	584.5
15	19.070	19.740	977.4	639.9	669.7	639.3	711.7	28.1	46.73	2.52	-10.87	42.00	682.5	860.3	128.4	-575.6	583.3	603.8
30	21.140	21.600	933.6	662.0	705.7	662.0	610.8	2.0	40.86	.18	2.86	44.94	708.0	933.3	-35.8	-658.6	646.6	660.7
50	23.970	24.200	864.2	642.6	691.2	642.5	518.6	11.0	36.87	.98	17.24	48.61	724.7	972.0	-214.5	-725.2	733.2	740.2
70	26.790	26.880	773.3	565.8	607.2	565.6	473.6	16.0	38.27	1.62	23.34	54.34	697.2	985.2	-340.8	-806.2	819.4	822.2
85	28.860	28.900	720.0	504.6	530.6	504.3	486.5	15.4	42.53	1.75	36.76	59.86	662.4	1004.5	-396.2	-868.6	862.7	884.0
90	29.570	29.600	706.8	483.8	503.7	483.5	435.6	16.5	44.55	1.96	39.08	61.45	648.9	1012.0	-408.8	-888.9	904.5	905.4
95	30.240	30.270	697.0	467.6	485.8	467.3	433.8	16.4	45.82	2.01	41.19	62.80	645.6	1022.5	-425.2	-903.4	924.9	925.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.74	5.73	16.64	51.70	62.56	.0000	.5570	.1009	.0239	.0239	.9586	.0000	.0000	.8725	.9031	.5386	.6043	.7281
10	1.23	5.48	19.04	47.17	59.63	.0000	.5427	.1234	.0304	.0304	.9495	.0000	.0000	.8423	.9362	.5456	.6138	.7304
15	.57	4.91	17.97	44.21	57.11	.0000	.5217	.1118	.0287	.0287	.9554	.0000	.0000	.8519	.9804	.5549	.6188	.7460
30	-1.84	2.38	14.24	40.68	51.85	.0000	.4743	.0613	.0175	.0175	.9773	.0000	.0000	.9055	.9331	.5770	.6394	.8140
50	-2.62	2.30	11.66	35.89	44.67	.0000	.4450	.0307	.0099	.0099	.9900	.0000	.0000	.9448	.7712	.5602	.6482	.8473
70	.76	5.98	14.52	36.55	44.33	.0000	.4836	.0513	.0187	.0187	.9861	.0000	.0000	.9026	.6818	.4330	.6150	.8513
85	5.75	12.24	16.60	40.78	45.31	.0000	.5533	.1065	.0414	.0414	.9751	.0000	.0000	.8187	.6281	.4315	.5779	.8591
90	7.66	14.26	17.69	42.59	45.94	.0000	.5854	.1324	.0527	.0527	.9703	.0000	.0000	.7830	.6143	.4121	.5640	.8620
95	8.64	15.39	18.34	43.80	46.75	.0000	.6116	.1541	.0628	.0628	.9664	.0000	.0000	.7521	.6037	.3970	.5587	.8682

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7010.	170.10	1.1301	1.4450	85.24	86.00

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	585.2	1091.1	585.2	655.6	.0	859.5	.00	52.66	34.44	-29.37	709.6	752.6	-401.4	365.1	401.4	490.4
10	14.100	16.730	602.9	1043.8	602.9	663.8	.0	313.1	.00	50.26	35.58	-24.23	741.4	728.7	-431.4	233.5	431.4	513.7
15	15.170	17.580	616.4	1012.9	616.4	667.6	.0	761.5	.00	48.74	36.97	-19.49	771.6	704.8	-464.1	223.7	464.1	537.8
30	18.280	19.910	646.9	928.4	646.9	665.8	.0	646.3	.00	44.15	40.81	-3.20	855.3	668.5	-553.3	37.8	553.3	603.1
50	22.190	23.090	664.4	821.6	664.4	615.4	.0	544.4	.00	41.49	45.60	14.77	950.0	637.1	-678.9	-162.0	678.9	706.4
70	25.860	26.260	575.0	713.9	575.0	506.1	.0	503.4	.00	44.88	54.00	30.71	973.2	589.4	-791.8	-300.0	791.8	803.4
85	28.450	28.610	490.6	654.5	490.5	403.3	.0	510.2	.00	51.23	60.59	41.63	993.3	549.0	-870.4	-365.1	870.4	875.3
90	29.320	29.410	469.0	646.3	469.0	385.7	.0	518.4	.00	53.36	62.39	44.69	1012.4	542.6	-897.0	-381.3	897.0	899.8
95	30.150	30.190	459.3	638.1	459.3	370.2	.0	519.7	.00	54.54	63.59	47.46	1030.0	547.8	-922.4	-403.6	922.4	923.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.57	.35	7.71	53.81	71.21	.0000	.2130	.2313	.0414	.0414	1.4717	.8638	.8626	-5.2147	.5405	.3345	.6561	.6323
10	-5.91	.74	6.94	53.82	66.06	.0000	.2777	.1732	.0345	.0345	1.4825	.8941	.8881	.1896	.5582	.3603	.6878	.6670
15	-5.28	1.00	8.42	55.46	62.32	.0000	.3313	.1335	.0294	.0294	1.4924	.9103	.9057	.6264	.5710	.3225	.7165	.6419
30	-4.36	1.32	10.50	44.02	53.21	.0000	.4250	.0645	.0169	.0169	1.4931	.9464	.9434	.8312	.6006	.8366	.7954	.6023
50	-2.96	2.03	10.08	30.94	38.93	.0000	.5021	.0322	.0264	.0264	1.4477	.9094	.9035	.8735	.6171	.7304	.8345	.5663
70	2.80	7.02	10.58	23.28	25.32	.0000	.5667	.0310	.0227	.0227	1.4913	.9137	.9152	.9038	.5277	.6247	.9012	.5157
85	7.36	11.04	11.63	19.90	19.58	.0000	.6262	.0138	.0269	.0269	1.5282	.9041	.8988	.8848	.4460	.5655	.9128	.4743
90	8.32	11.82	12.35	17.70	18.26	.0000	.6453	.1172	.0294	.0294	1.5477	.8939	.8872	.8721	.4269	.5564	.9234	.4671
95	8.56	11.31	13.31	16.11	17.52	.0000	.6493	.1282	.0312	.0312	1.5579	.8933	.8764	.8608	.4174	.5478	.9383	.4703

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1320	1.4872	90.74	31.24	37.50

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.530	985.8	612.3	605.4	612.2	773.0	-3.3	52.11	-.31	-21.23	43.05	643.7	837.7	235.8	-571.8	542.1	568.4
10	18.350	19.110	980.1	617.2	635.4	616.6	746.2	23.3	49.58	2.21	-16.21	42.28	662.0	833.5	184.8	-560.6	561.4	584.7
15	19.070	19.740	951.8	623.6	654.4	622.7	704.6	33.1	47.11	3.04	-10.51	42.51	666.2	844.8	121.2	-570.8	583.4	603.9
30	21.140	21.600	922.2	650.8	690.9	650.8	610.4	1.2	41.44	.12	2.99	45.37	693.2	926.7	-36.3	-653.6	646.8	660.6
50	23.970	24.200	852.6	630.1	671.9	630.0	524.9	10.3	39.00	.94	17.24	49.20	704.2	964.4	-208.4	-730.1	733.3	740.4
70	26.730	26.880	762.5	551.5	583.2	551.3	431.1	17.2	40.13	1.73	29.44	55.60	670.3	976.3	-328.6	-805.2	819.6	822.4
85	29.960	28.900	710.4	487.4	502.5	487.1	502.0	17.9	44.39	2.10	37.19	60.65	630.7	934.0	-381.0	-866.3	882.9	884.2
90	29.570	29.600	703.3	474.6	481.7	474.3	512.3	16.7	46.77	2.01	39.17	61.91	621.4	1007.6	-392.4	-888.9	904.7	905.6
95	30.240	30.270	698.6	466.0	469.1	465.7	517.6	14.6	47.91	1.90	40.99	62.93	621.6	1023.6	-407.6	-911.4	925.2	926.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.03	6.02	16.19	52.43	62.56	.0000	.5625	.1040	.0247	.0247	.9580	.0000	.0000	.8687	.8910	.5289	.5918	.7236
10	1.62	5.87	13.19	47.37	59.62	.0000	.5430	.1255	.0303	.0303	.9438	.0000	.0000	.8402	.8818	.5337	.5385	.7207
15	.95	5.29	18.49	44.06	57.09	.0000	.5276	.1135	.0291	.0291	.9559	.0000	.0000	.8502	.8652	.5403	.6033	.7319
30	-1.21	3.61	14.18	41.33	51.85	.0000	.4907	.0610	.0174	.0174	.9778	.0000	.0000	.9048	.9279	.5666	.6247	.8068
50	-1.48	4.04	11.58	37.06	44.63	.0000	.4548	.0292	.0034	.0034	.9907	.0000	.0000	.9474	.7591	.5482	.6283	.8391
70	2.65	9.77	14.69	38.34	44.33	.0000	.5004	.0425	.0225	.0225	.9937	.0000	.0000	.8842	.6639	.4753	.5493	.8413
85	8.26	14.76	17.14	42.88	45.31	.0000	.5785	.1376	.0535	.0535	.9688	.0000	.0000	.7690	.6173	.4155	.5481	.8473
90	9.93	16.52	17.73	44.75	45.95	.0000	.6053	.1684	.0670	.0670	.9627	.0000	.0000	.7262	.6093	.4031	.5384	.8557
95	10.63	17.39	18.13	46.01	46.75	.0000	.6261	.1315	.0780	.0780	.9582	.0000	.0000	.6929	.6035	.3947	.5367	.8669

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
7012.	166.33	1.1320	1.4493	84.75	85.54	32.63

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	579.3	1072.9	579.3	643.7	.0	353.8	.00	52.72	34.73	-29.18	704.9	744.5	-401.7	363.0	401.7	490.7
10	14.100	16.790	597.1	1041.4	597.1	657.3	.0	907.6	.00	50.85	35.86	-24.04	736.8	720.4	-431.7	293.6	431.7	514.0
15	15.170	17.590	610.5	1005.0	610.5	661.0	.0	756.9	.00	48.96	37.25	-19.28	767.1	696.8	-464.4	219.7	464.4	538.2
30	19.280	19.910	640.2	921.8	640.2	653.5	.0	643.9	.00	44.29	41.13	-2.94	850.5	662.1	-559.6	34.4	559.6	609.5
50	22.190	23.090	657.0	815.4	657.0	608.4	.0	542.9	.00	41.74	45.94	15.10	945.2	630.7	-673.3	-164.0	679.3	706.9
70	25.880	26.260	567.6	703.3	567.6	433.3	.0	503.6	.00	45.23	54.37	31.08	375.2	593.7	-732.3	-300.3	792.3	803.9
85	28.450	28.610	483.3	650.9	483.3	402.4	.0	511.6	.00	51.91	60.97	42.16	995.2	542.3	-871.0	-364.3	971.0	875.9
90	29.320	29.410	461.8	644.3	461.8	380.6	.0	519.7	.00	53.80	62.77	45.01	1009.6	538.5	-897.6	-380.6	897.6	900.4
95	30.150	30.180	451.0	637.0	451.0	365.8	.0	521.5	.00	54.36	63.96	47.72	1027.3	544.0	-923.0	-402.5	923.0	923.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-6.28	.63	7.91	63.92	71.23	.0000	.2175	.2237	.0401	.0401	1.4718	.8750	.8681	-3.3466	.5348	.9859	.6516	.6841
10	-5.63	1.02	7.15	59.30	66.06	.0000	.2923	.1683	.0337	.0337	1.4313	.9374	.9316	.2605	.5526	.9522	.6835	.6537
15	-5.00	1.28	8.65	55.53	62.93	.0000	.3368	.1303	.0287	.0287	1.4913	.9137	.9088	.6486	.5654	.9144	.7122	.6341
30	-4.04	1.63	10.76	44.07	53.21	.0000	.4284	.0605	.0159	.0159	1.4831	.9500	.9472	.8983	.5340	.8300	.7907	.5961
50	-2.61	2.37	10.41	30.84	38.92	.0000	.5058	.0316	.0262	.0262	1.4474	.9096	.9048	.8809	.6098	.7244	.8797	.5603
70	3.19	7.41	10.35	23.23	26.33	.0000	.5709	.0323	.0231	.0231	1.4812	.9196	.9141	.9021	.5202	.6203	.8970	.5104
85	7.74	11.43	12.10	18.81	19.58	.0000	.6336	.1077	.0277	.0277	1.5261	.9013	.8953	.8811	.4391	.5621	.9095	.4688
90	8.70	12.20	12.67	17.76	18.26	.0000	.6483	.1193	.0237	.0237	1.5431	.8931	.8863	.8704	.4200	.5544	.9203	.4633
95	8.94	12.29	13.57	16.24	17.52	.0000	.6533	.1296	.0314	.0314	1.5603	.8835	.8760	.8596	.4106	.5466	.9353	.4666

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1319	1.4872	90.84	81.33	37.20

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.530	873.4	603.3	500.0	607.7	773.3	-15.3	52.17	-1.72	-21.00	44.00	642.7	845.0	230.3	-597.1	542.5	563.8
10	18.350	19.110	872.1	612.5	629.0	612.0	741.1	22.8	49.69	2.10	-15.82	42.59	654.3	831.3	173.3	-562.6	561.6	585.4
15	19.070	19.740	934.0	618.4	647.6	617.7	700.3	30.1	47.23	2.73	-10.21	42.31	658.6	843.4	116.5	-574.2	593.8	604.3
30	21.140	21.600	915.3	684.3	647.1	684.3	647.1	50.6	1.5	41.59	.14	3.26	45.54	696.7	924.2	-39.6	-655.5	647.2	661.3
50	23.970	24.200	845.6	625.8	564.1	626.7	533.4	10.7	33.24	.38	17.59	43.40	697.4	861.7	-210.4	-730.2	733.3	740.9
70	26.790	26.530	756.6	547.1	575.3	546.9	491.2	17.0	40.52	1.29	28.61	55.83	663.7	874.4	-329.0	-805.9	820.2	822.9
85	28.860	28.900	705.0	484.2	483.6	483.8	503.3	15.4	45.66	1.82	37.62	60.99	623.2	835.1	-330.3	-893.4	883.5	884.8
90	29.570	29.600	699.3	472.6	474.4	472.6	513.6	14.6	47.27	1.76	39.55	62.07	615.3	1003.2	-331.7	-891.6	905.3	906.2
95	30.240	30.270	695.5	465.3	462.7	465.1	519.3	13.1	48.30	1.62	41.29	63.02	616.0	1025.2	-406.5	-913.6	925.8	920.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.10	6.10	14.79	53.30	62.56	.0000	.5657	.1062	.0252	.0252	.9576	.0000	.0000	.8652	.8835	.5255	.5847	.7300
10	1.72	5.93	18.07	47.58	59.62	.0000	.5482	.1271	.0313	.0313	.9498	.0000	.0000	.8739	.8739	.5236	.5311	.7138
15	1.09	5.43	18.23	44.44	57.09	.0000	.5289	.1150	.0298	.0298	.9555	.0000	.0000	.8456	.8576	.5357	.5959	.7305
30	-1.06	3.76	14.21	41.45	51.85	.0000	.4738	.0817	.0176	.0176	.9779	.0000	.0000	.9030	.9213	.5633	.6184	.8045
50	-1.23	4.28	11.62	37.25	44.62	.0000	.4547	.0298	.0096	.0096	.9907	.0000	.0000	.9462	.9524	.5443	.6218	.8364
70	3.04	3.17	14.53	38.73	44.33	.0000	.5024	.0677	.0244	.0244	.9326	.0000	.0000	.9744	.6642	.4713	.5330	.8333
85	8.85	15.35	16.87	43.74	45.30	.0000	.5820	.1449	.0563	.0563	.9676	.0000	.0000	.7546	.6122	.4126	.5412	.8479
90	10.44	17.03	17.43	45.51	45.95	.0000	.6080	.1771	.0705	.0705	.9612	.0000	.0000	.7102	.6033	.4015	.5327	.9568
95	11.12	17.87	17.94	46.68	46.75	.0000	.6274	.2018	.0921	.0921	.9564	.0000	.0000	.6747	.6005	.3940	.5316	.8680

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7016.	164.99	1.1319	1.4486	84.71	83.43

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE
$(90 - \beta_{10})$ RADIAL INLET DISTORTION, VORTEX GENERATOR TIP TREATMENT
(probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 146.20			W_{COR} = 144.93			W_{COR} = 143.37		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	34.1	36.1	35.1	34.3	36.1	35.2	34	35.5	34.75
10	39.4	41.3	40.35	39.0	41.2	40.1	38.8	41.8	40.05
15	43.9	45.9	44.9	43.9	45.7	44.8	43.5	45.4	44.45
30	50.0	51.1	50.55	49.5	50.9	50.2	49.2	50.6	49.9
50	54.3	55.4	54.85	54.1	55.1	54.6	53.6	54.6	54.1
70	52.8	52.5	52.65	52.0	51.8	51.9	51.2	51.6	51.4
85	48.3	48.3	48.3	47.7	47.8	47.75	46	46.9	46.45
90	45.1	45.5	45.3	44.2	44.8	44.5	42.4	43.5	42.95
95	40.8	41.1	40.95	39.4	40.6	40.0	37.3	38.7	38.0

90% SPEED

	W_{COR} = 163.89			W_{COR} = 162.01			W_{COR} = 159.81		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	33.3	34.8	34.05	33.2	34.9	34.05	33.3	34.7	34.0
10	39.0	40.8	39.9	37.5	40.9	39.7	38.4	40.8	39.6
15	43.7	45.4	44.55	43.6	45.1	44.35	43.3	45.1	44.2
30	49.8	50.8	50.3	49.5	50.6	50.05	49.1	50.4	49.75
50	54.3	55.4	54.85	53.8	54.8	54.3	53.0	54.5	53.75
70	52.5	52.1	52.3	51.3	51.5	51.4	50.4	50.8	50.6
85	48.0	48.0	48.0	46.6	47.1	46.85	44.9	45.9	45.4
90	46.3	46.0	46.15	44.6	44.9	44.75	42.7	43.8	43.25
95	42.2	43.1	42.65	39.9	41.4	40.65	38.6	39.9	39.25

95% SPEED

	W_{COR} = 171.91			W_{COR} = 170.10			W_{COR} = 166.33		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	32.7	34.7	33.7	33.1	34.3	33.7	33.3	34.5	33.9
10	38.9	40.6	39.75	38.5	40.6	39.55	38.3	40.6	39.45
15	43.8	45.4	44.6	43.0	45.0	44.0	43.3	45.0	44.15
30	49.4	51	50.2	49.1	50.4	49.75	48.9	50.2	49.55
50	54.2	55	54.6	53.3	54.5	53.9	52.4	53.9	53.15
70	52.3	51.8	52.05	51.6	51.2	51.4	49.6	50.1	49.85
85	48.6	48.2	48.4	46.4	47.0	46.7	43.3	44.3	43.8
90	46	46.1	46.05	44.5	44.8	44.65	40.4	41.8	41.1
95	43.1	44.1	43.6	40.3	41.5	40.9	35.8	38.4	37.1

APPENDIX 5

Blade Element and Overall Performance with Radial Inlet Distortion and Combined Vortex Generators and Honeycomb Tip Treatment

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13,120	14,030	502,5	945,5	502,5	584,7	,0	742,9	,00	51,79	33,92	-29,44	605,6	671,7	-338,0	330,0	338,0	412,9
10	14,100	14,790	520,6	928,0	520,6	606,6	,0	702,2	,00	49,17	34,89	-23,95	634,8	664,2	-363,2	269,7	363,2	432,5
15	15,170	17,580	532,5	896,5	532,5	607,6	,0	659,0	,00	47,32	36,26	-18,72	660,5	642,0	-390,8	206,2	390,8	452,8
30	18,280	19,910	556,4	812,3	556,4	605,1	,0	541,5	,00	41,79	40,21	-2,67	729,1	607,4	-470,9	28,6	470,9	512,9
50	22,190	23,090	567,9	718,8	567,9	568,2	,0	440,3	,00	37,77	45,17	15,21	805,8	589,1	-571,6	-154,5	571,6	594,8
70	25,880	26,260	479,8	625,7	479,8	461,8	,0	421,9	,00	42,45	54,25	28,92	821,9	528,0	-666,6	-254,5	666,6	676,4
85	28,450	28,610	406,3	568,9	406,3	374,9	,0	427,8	,00	48,77	60,99	39,51	838,0	485,9	-732,8	-309,1	732,8	737,0
90	29,320	29,410	388,3	550,4	388,3	351,4	,0	423,5	,00	50,33	62,78	43,56	849,4	485,3	-755,2	-334,1	755,2	757,6
95	30,150	30,180	381,1	534,8	381,1	335,2	,0	416,7	,00	51,19	63,86	47,08	865,1	492,6	-776,6	-360,7	776,6	777,4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7,11	-,20	7,69	63,36	71,27	,0000	,1681	,2866	,0513	,0513	1,3158	,8350	,8285	4,1827	,4613	,8664	,5565	,6155
10	-6,60	,04	7,25	58,85	66,09	,0000	,2166	,1803	,0361	,0361	1,3345	,8863	,8815	-2,8112	,4788	,8485	,5855	,6073
15	-5,98	,28	8,22	54,98	62,97	,0000	,2762	,1465	,0322	,0322	1,3336	,8992	,8950	,2841	,4899	,8164	,6097	,5847
30	-4,96	,70	11,03	42,89	53,24	,0000	,3698	,0854	,0224	,0224	1,3179	,9249	,9219	,8134	,5121	,7337	,6728	,5486
50	-3,37	1,61	10,49	29,96	38,89	,0000	,4336	,0956	,0273	,0273	1,2877	,8952	,8914	,8442	,5221	,6434	,7433	,5273
70	3,13	7,34	8,79	25,32	26,94	,0000	,5261	,1213	,0346	,0346	1,3075	,8739	,8690	,8330	,4355	,5525	,7501	,4662
85	7,81	11,49	9,41	21,49	19,55	,0000	,5976	,1621	,0434	,0434	1,3287	,8421	,8356	,7972	,3663	,4974	,7611	,4249
90	8,74	12,24	11,22	19,23	18,26	,0000	,6051	,1696	,0434	,0434	1,3313	,8340	,8271	,7900	,3509	,4800	,7706	,4233
95	8,83	12,18	12,94	16,77	17,52	,0000	,6041	,1776	,0435	,0435	1,3294	,8223	,8150	,7805	,3453	,4656	,7843	,4289

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0925	1.3138	87.64	88.11	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17,720	18,580	863,9	569,9	542,2	569,8	672,6	-4,2	51,13	-,44	-21,74	40,28	583,7	746,9	216,1	-482,8	456,4	478,6
10	18,350	19,110	870,3	586,6	584,9	586,1	644,4	20,5	47,77	1,99	-16,36	38,83	609,8	752,4	171,7	-471,7	472,7	492,2
15	19,070	19,740	856,7	598,0	601,5	597,6	609,9	23,2	45,39	2,23	-11,16	39,07	613,5	769,8	118,6	-485,2	491,2	508,5
30	21,140	21,600	810,0	606,6	626,6	606,5	512,8	-3,9	39,27	-,37	2,86	42,72	628,8	825,9	-31,7	-560,3	544,5	556,4
50	23,970	24,200	747,3	577,8	614,4	577,8	425,4	1,0	34,69	,10	17,35	47,12	644,4	849,3	-192,1	-622,4	617,4	623,4
70	26,790	26,880	673,6	509,0	534,3	509,0	409,9	5,1	37,52	,58	27,72	53,47	603,9	855,6	-280,2	-687,3	690,1	692,4
85	28,860	28,900	627,6	456,0	465,4	455,9	421,0	10,1	42,14	1,27	34,73	58,17	566,3	864,5	-322,4	-734,4	743,4	744,4
90	29,570	29,600	612,5	434,5	445,9	434,3	419,8	10,7	43,28	1,42	37,48	59,98	562,1	868,3	-341,9	-751,7	761,7	762,5
95	30,240	30,270	600,1	416,2	432,9	416,0	415,5	10,5	43,83	1,45	40,00	61,59	565,3	874,5	-363,4	-769,2	778,9	779,7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	,69	4,70	16,07	51,56	62,59	,0000	,5219	,1089	,0258	,0258	,9638	,0000	,0000	,8437	,7854	,4990	,5377	,6540
10	-,25	4,01	17,97	45,77	59,63	,0000	,4989	,1347	,0332	,0332	,9546	,0000	,0000	,8007	,7862	,5146	,5539	,6601
15	-,64	3,70	17,67	43,16	57,08	,0000	,4746	,1152	,0296	,0296	,9622	,0000	,0000	,8194	,7722	,5256	,5554	,6766
30	-3,40	1,41	13,69	39,64	51,84	,0000	,4311	,0539	,0154	,0154	,9838	,0000	,0000	,9020	,7294	,5352	,5682	,7287
50	-4,78	,72	10,78	34,58	44,64	,0000	,4091	,0262	,0085	,0085	,9932	,0000	,0000	,9438	,6713	,5097	,5786	,7492
70	-,21	5,89	13,47	36,94	44,30	,0000	,4605	,0373	,0134	,0134	,9920	,0000	,0000	,9321	,6001	,4452	,5376	,7482
85	5,20	11,68	16,31	40,88	45,29	,0000	,5275	,0720	,0280	,0280	,9865	,0000	,0000	,8723	,5537	,3955	,4992	,7497
90	6,38	12,96	17,13	41,86	45,93	,0000	,5565	,0918	,0365	,0365	,9836	,0000	,0000	,8373	,5388	,3758	,4934	,7511
95	6,69	13,43	17,77	42,38	46,74	,0000	,5813	,1086	,0442	,0442	,9814	,0000	,0000	,8101	,5263	,3593	,4945	,7551

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5903.	147.16	1.0925	1.2915	82.02	82.68

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13,120	16,030	472,0	913,7	472,0	555,7	,0	725,1	,00	52,53	35,63	-29,29	580,8	637,5	-338,3	311,8	338,3	413,4
10	14,100	16,790	490,3	891,0	490,3	574,0	,0	681,3	,00	49,87	36,55	-23,37	610,4	625,8	-363,6	248,3	363,6	432,9
15	15,170	17,580	502,1	859,2	502,1	578,7	,0	635,0	,00	47,64	37,91	-17,41	636,5	606,9	-391,2	181,6	391,2	453,3
30	18,280	19,910	523,6	788,2	523,6	580,0	,0	533,5	,00	42,59	41,97	-1,96	704,7	581,5	-471,4	20,1	471,4	513,4
50	22,190	23,090	530,8	701,1	530,8	532,3	,0	456,3	,00	40,60	47,13	14,65	780,6	550,2	-572,2	-139,1	572,2	595,4
70	25,880	26,260	444,0	624,2	444,0	419,9	,0	461,6	,00	47,74	56,35	27,25	802,1	472,5	-667,3	-215,6	667,3	677,1
85	28,450	28,610	373,6	575,1	373,6	340,2	,0	463,6	,00	53,73	63,01	38,86	823,4	437,0	-733,6	-274,1	733,6	737,7
90	29,320	29,410	356,8	558,4	356,8	315,7	,0	460,5	,00	55,58	64,73	43,34	836,1	434,5	-756,0	-297,9	756,0	758,4
95	30,150	30,180	349,8	544,8	349,8	301,8	,0	453,5	,00	56,36	65,77	47,07	852,5	443,5	-777,5	-324,7	777,5	778,2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5,41	1,49	7,91	64,92	71,36	,0000	,1846	,2353	,0422	,0422	1,3238	,8725	,8673	6,2510	,4329	,8340	,5333	,5819
10	-4,95	1,68	7,86	59,92	66,13	,0000	,2403	,1546	,0311	,0311	1,3326	,9069	,9031	-,3948	,4505	,8112	,5629	,5698
15	-4,32	1,92	9,55	55,32	63,01	,0000	,2948	,1192	,0264	,0264	1,3295	,9208	,9176	,5334	,4612	,7796	,5874	,5507
30	-3,20	2,44	11,76	43,92	53,28	,0000	,3820	,0515	,0135	,0135	1,3256	,9565	,9548	,8913	,4809	,7101	,6505	,5239
50	-1,35	3,61	9,86	32,49	38,86	,0000	,4716	,1050	,0301	,0301	1,2995	,8949	,8909	,8391	,4859	,6252	,7195	,4907
70	5,41	9,60	7,13	29,10	26,96	,0000	,5999	,1663	,0482	,0482	1,3280	,8476	,8413	,7902	,3994	,5488	,7306	,4164
85	9,89	13,56	8,77	24,15	19,55	,0000	,6650	,1957	,0528	,0528	1,3527	,8284	,8209	,7705	,3349	,5011	,7470	,3808
90	10,71	14,21	11,00	21,38	18,26	,0000	,6752	,2055	,0528	,0528	1,3559	,8187	,8107	,7619	,3211	,4853	,7578	,3777
95	10,74	14,08	12,93	18,70	17,53	,0000	,6714	,2099	,0515	,0515	1,3559	,8106	,8022	,7564	,3163	,4726	,7719	,3848

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0961	1.3278	87.73	88.21	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17,720	18,580	830,9	525,6	508,8	525,3	656,9	-11,6	52,24	-1,28	-21,46	43,05	546,7	718,9	200,0	-490,7	456,9	479,1
10	18,350	19,110	831,2	537,0	546,0	536,3	626,6	22,0	48,92	2,34	-15,69	41,27	567,5	713,7	153,4	-470,8	473,2	492,8
15	19,070	19,740	813,3	540,3	560,9	539,3	588,8	32,1	46,38	3,41	-9,83	41,48	569,8	719,9	97,0	-476,9	491,7	509,0
30	21,140	21,600	777,1	561,1	590,7	561,0	504,6	4,4	40,49	,46	3,89	44,54	593,2	787,5	-40,5	-552,5	545,1	557,0
50	23,970	24,200	720,4	532,5	571,6	532,5	438,4	6,4	37,49	,70	17,45	49,23	599,6	815,6	-179,7	-617,6	618,1	624,0
70	26,790	26,880	662,1	476,7	488,9	476,6	444,2	10,0	42,42	1,20	26,64	55,09	547,1	833,3	-244,6	-683,2	690,8	693,1
85	28,860	28,900	623,8	433,4	425,7	433,2	455,9	12,6	46,97	1,67	34,11	59,40	514,3	851,2	-288,3	-732,6	744,2	745,2
90	29,570	29,600	610,4	415,8	405,9	415,6	455,8	10,2	48,32	1,39	37,08	61,10	509,1	860,3	-306,7	-753,1	762,5	763,3
95	30,240	30,270	599,4	400,9	393,6	400,8	452,1	6,5	48,96	,93	39,77	62,62	512,2	871,7	-327,6	-774,1	779,8	780,5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1,83	5,85	15,22	53,52	62,58	,0000	,5540	,1193	,0283	,0283	,9629	,0000	,0000	,8369	,7511	,4590	,5007	,6278
10	,97	5,22	18,30	46,59	59,59	,0000	,5291	,1415	,0348	,0348	,9559	,0000	,0000	,8014	,7462	,4697	,5117	,6243
15	,37	4,69	18,83	42,97	57,01	,0000	,5080	,1278	,0328	,0328	,9616	,0000	,0000	,8111	,7312	,4732	,5144	,6305
30	-2,01	2,78	14,45	40,03	51,71	,0000	,4591	,0644	,0183	,0183	,9821	,0000	,0000	,8853	,6993	,4933	,5334	,6924
50	-2,02	3,44	11,41	36,79	44,62	,0000	,4529	,0326	,0105	,0105	,9921	,0000	,0000	,9408	,6467	,4674	,5366	,7158
70	4,40	10,47	14,07	41,22	44,25	,0000	,5167	,0455	,0164	,0164	,9906	,0000	,0000	,9406	,5887	,4145	,4870	,7244
85	9,90	16,37	16,71	45,30	45,28	,0000	,5809	,0815	,0316	,0316	,9850	,0000	,0000	,8732	,5490	,3739	,4520	,7343
90	11,31	17,89	17,10	46,93	45,92	,0000	,6093	,0990	,0394	,0394	,9826	,0000	,0000	,8421	,5353	,3578	,4454	,7404
95	11,86	18,59	17,25	48,04	46,74	,0000	,6339	,1151	,0469	,0469	,9804	,0000	,0000	,8113	,5236	,3444	,4455	,7488

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5910.	139.19	1.0961	1.3033	81.86	82.54

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	454.6	895.4	454.6	537.4	.0	716.1	.00	53.11	36.49	-29.59	565.4	618.4	-336.3	305.2	336.3	410.9
10	14.100	16.790	472.5	873.1	472.5	555.6	.0	673.4	.00	50.46	37.40	-23.60	594.9	606.9	-361.4	243.1	361.4	430.3
15	15.170	17.580	484.2	842.2	484.2	561.7	.0	627.6	.00	48.17	38.75	-17.48	621.0	589.1	-388.8	177.0	388.8	450.6
30	18.280	19.910	504.0	773.7	504.0	562.3	.0	531.3	.00	43.36	42.88	-2.11	688.3	563.6	-468.5	21.0	468.5	510.3
50	22.190	23.090	509.7	692.2	509.7	510.3	.0	467.5	.00	42.50	48.12	13.71	763.8	525.4	-568.7	-124.3	568.7	591.8
70	25.880	26.260	423.7	622.6	423.7	393.3	.0	482.4	.00	50.83	57.42	25.92	787.6	437.4	-663.3	-190.6	663.3	673.1
85	28.450	28.610	355.9	577.4	355.9	318.2	.0	481.7	.00	56.56	63.99	38.33	811.4	405.9	-729.2	-251.5	729.2	733.3
90	29.320	29.410	333.1	562.0	333.1	296.0	.0	477.7	.00	58.23	66.09	43.01	822.2	405.2	-751.5	-276.1	751.5	753.8
95	30.150	30.180	313.5	548.0	313.5	282.5	.0	469.6	.00	58.98	67.91	47.07	834.0	415.1	-772.8	-303.9	772.8	773.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.55	2.35	7.65	66.08	71.40	.0000	.1928	.2171	.0388	.0388	1.3230	.8862	.8816	9.2627	.4165	.8159	.5189	.5435
10	-4.10	2.52	7.63	61.00	66.15	.0000	.2493	.1382	.0277	.0277	1.3313	.9193	.9160	-.0691	.4339	.7936	.5484	.5516
15	-3.46	2.77	9.49	56.23	63.03	.0000	.3030	.1022	.0226	.0226	1.3284	.9340	.9312	.6219	.4444	.7631	.5730	.5338
30	-2.27	3.36	11.61	45.00	53.29	.0000	.3926	.0412	.0108	.0108	1.3258	.9661	.9647	.9147	.4622	.6960	.6352	.5070
50	-.24	4.70	8.92	34.41	38.86	.0000	.4970	.1164	.0335	.0335	1.3035	.8898	.8856	.8280	.4639	.6162	.7027	.4677
70	6.54	10.72	5.82	31.50	26.98	.0000	.6457	.1919	.0563	.0563	1.3363	.8353	.8283	.3798	.5463	.7165	.3838	
85	10.84	14.51	8.23	25.66	19.55	.0000	.7062	.2125	.0578	.0578	1.3630	.8235	.8156	.7593	.3190	.5023	.7352	.3531
90	12.08	15.57	10.67	23.08	18.26	.0000	.7128	.2121	.0548	.0548	1.3706	.8234	.8153	.7612	.2994	.4878	.7435	.3517
95	12.91	16.25	12.94	20.84	17.54	.0000	.7050	.2027	.0497	.0497	1.3771	.8289	.8210	.7702	.2827	.4748	.7530	.3597

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0973	1.3333	87.86	88.35	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	809.8	498.0	484.7	497.6	648.6	-16.0	53.23	-1.86	-21.86	44.69	522.4	700.0	194.4	-492.2	454.2	476.2
10	18.350	19.110	809.8	507.7	521.3	506.8	619.5	21.8	49.91	2.45	-15.97	42.71	542.5	690.0	149.2	-468.0	470.3	489.8
15	19.070	19.740	791.9	510.7	536.5	509.3	582.3	37.7	47.34	4.23	-9.91	42.59	545.1	691.9	93.6	-468.3	488.8	505.9
30	21.140	21.600	756.9	534.2	566.0	534.1	502.3	10.3	41.57	1.11	3.96	45.47	568.4	761.9	-39.5	-543.3	541.8	553.6
50	23.970	24.200	705.6	506.4	546.6	506.2	446.1	13.4	39.22	1.52	17.12	50.16	572.3	790.5	-168.2	-606.9	614.4	620.3
70	26.790	26.880	655.7	456.6	462.0	456.4	464.9	13.4	45.21	1.68	25.70	55.94	512.9	815.6	-221.7	-675.5	686.6	689.0
85	28.860	28.900	621.8	419.1	402.9	418.9	473.6	13.0	49.62	1.78	33.46	60.07	483.0	839.8	-266.1	-727.7	739.7	740.7
90	29.570	29.600	609.9	403.8	385.4	403.7	472.7	11.5	50.82	1.63	36.51	61.61	479.7	849.4	-285.2	-747.2	757.9	758.7
95	30.240	30.270	599.1	389.5	373.7	389.5	468.2	8.2	51.40	1.21	39.38	63.10	483.7	860.8	-306.8	-767.6	775.1	775.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.83	6.85	14.64	55.08	62.57	.0000	.5753	.1242	.0295	.0295	.9630	.0000	.0000	.8337	.7305	.4344	.4775	.6105
10	1.98	6.23	18.40	47.46	59.57	.0000	.5508	.1507	.0371	.0371	.9551	.0000	.0000	.7937	.7259	.4434	.4883	.6025
15	1.39	5.71	19.64	43.11	56.97	.0000	.5279	.1388	.0355	.0355	.9601	.0000	.0000	.8000	.7112	.4465	.4909	.6050
30	-.83	3.94	15.08	40.46	51.64	.0000	.4768	.0704	.0200	.0200	.9813	.0000	.0000	.8779	.6807	.4688	.5095	.6686
50	-.39	5.06	12.24	37.70	44.58	.0000	.4785	.0403	.0130	.0130	.9905	.0000	.0000	.9371	.6332	.4434	.5119	.6921
70	6.97	13.01	14.54	43.53	44.21	.0000	.5508	.0549	.0197	.0197	.9889	.0000	.0000	.9404	.5825	.3958	.4573	.7070
85	12.49	18.96	16.82	47.83	45.26	.0000	.6131	.0896	.0348	.0348	.9837	.0000	.0000	.8704	.5466	.3607	.4239	.7226
90	13.80	20.37	17.33	49.19	45.91	.0000	.6386	.1073	.0427	.0427	.9812	.0000	.0000	.8378	.5343	.3468	.4189	.7293
95	14.31	21.04	17.53	50.20	46.74	.0000	.6624	.1239	.0504	.0504	.9790	.0000	.0000	.8052	.5228	.3339	.4198	.7378

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5874.	133.75	1.0973	1.3068	81.64	82.34

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	433.4	882.6	433.4	517.6	.0	714.6	.00	54.08	37.98	-30.20	549.9	599.3	-338.4	301.1	338.4	413.5
10	14.100	16.790	451.2	863.1	451.2	546.8	.0	667.7	.00	50.68	38.86	-23.21	579.5	595.4	-363.7	234.6	363.7	433.1
15	15.170	17.580	463.0	834.3	463.0	554.0	.0	623.8	.00	48.39	40.19	-17.09	606.2	579.7	-391.3	170.4	391.3	453.5
30	18.280	19.910	481.0	766.7	481.0	550.5	.0	533.6	.00	44.10	44.40	-2.07	673.7	551.3	-471.5	20.0	471.5	513.6
50	22.190	23.090	484.1	706.2	484.1	505.4	.0	492.5	.00	44.31	49.77	11.61	749.7	516.1	-572.4	-103.0	572.4	595.6
70	25.880	26.260	395.4	631.7	395.4	364.3	.0	515.9	.00	54.79	59.34	23.94	776.3	398.7	-667.5	-161.4	667.5	677.3
85	28.450	28.610	328.7	586.8	328.7	285.6	.0	512.5	.00	60.90	65.87	38.32	804.1	364.6	-733.8	-225.5	733.8	738.0
90	29.320	29.410	312.7	571.8	312.7	260.2	.0	509.1	.00	62.93	67.52	43.81	818.5	360.8	-756.3	-249.5	756.3	758.6
95	30.150	30.180	307.9	558.5	307.9	249.6	.0	499.6	.00	63.45	68.40	48.13	836.4	374.5	-777.7	-278.9	777.7	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.07	3.83	7.07	68.18	71.44	.0000	.2041	.2449	.0435	.0435	1.3214	.8787	.873887	.5413	.3968	.8025	.5043	.5449
10	-2.65	3.96	8.02	62.07	66.16	.0000	.2469	.1335	.0269	.0269	1.3332	.9257	.9226	-.0805	.4142	.7835	.5344	.5405
15	-2.01	4.20	9.90	57.28	63.07	.0000	.3004	.0939	.0208	.0208	1.3319	.9420	.9396	.6421	.4248	.7550	.5599	.5246
30	-.73	4.89	11.66	46.47	53.33	.0000	.3989	.0497	.0131	.0131	1.3279	.9614	.9598	.8981	.4407	.6888	.6229	.4953
50	1.88	6.78	6.95	38.15	39.01	.0000	.5103	.1268	.0368	.0368	1.3240	.8904	.8859	.8117	.4330	.6281	.6884	.4590
70	8.95	13.08	3.88	35.41	27.03	.0000	.7047	.2551	.0760	.0760	1.3467	.7998	.7912	.7068	.3471	.5526	.7072	.3488
85	12.86	16.49	8.40	27.55	19.72	.0000	.7682	.2780	.0756	.0756	1.3703	.7854	.7757	.6985	.2914	.5091	.7309	.3163
90	13.64	17.10	11.48	23.72	18.27	.0000	.7794	.2858	.0729	.0729	1.3742	.7770	.7668	.6931	.2785	.4947	.7420	.3121
95	13.31	16.64	14.01	20.27	17.55	.0000	.7674	.2838	.0682	.0682	1.3742	.7719	.7614	.6931	.2779	.4825	.7571	.3235

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1012	1.3421	86.53	87.08	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	794.8	471.8	459.9	470.2	648.2	-35.6	54.65	-4.35	-22.58	47.59	498.1	697.3	191.2	-514.8	457.1	479.2
10	18.350	19.110	795.7	481.0	504.3	480.2	615.3	11.1	50.66	1.30	-15.73	45.08	524.3	680.4	142.0	-481.8	473.3	492.9
15	19.070	19.740	780.6	486.9	523.7	485.4	578.7	38.2	47.85	4.50	-9.42	44.13	531.3	676.3	86.8	-471.0	491.9	509.2
30	21.140	21.600	743.6	509.2	546.6	509.0	504.0	13.7	42.66	1.55	4.28	46.86	549.1	744.7	-41.3	-543.5	545.3	557.1
50	23.970	24.200	712.9	494.2	542.5	494.1	462.5	8.4	40.45	.97	16.02	51.25	564.5	789.7	-155.8	-615.8	618.3	624.2
70	26.790	26.880	658.6	444.0	434.3	443.8	494.7	12.5	48.75	1.62	24.40	56.88	477.0	813.0	-196.3	-680.8	691.0	693.3
85	28.860	28.900	624.0	405.4	369.5	405.2	502.8	11.1	53.69	1.57	33.18	61.10	441.5	838.8	-241.6	-734.3	744.4	745.4
90	29.570	29.600	612.2	391.5	349.2	391.4	502.8	9.9	55.23	1.44	36.68	62.55	435.6	849.3	-259.9	-753.6	762.7	763.5
95	30.240	30.270	601.8	379.9	337.8	379.8	498.0	8.2	55.85	1.24	39.84	63.82	440.2	860.9	-282.0	-772.5	780.0	780.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	4.04	8.06	12.15	58.99	62.57	.0000	.4061	.1284	.0304	.0304	.9630	.0000	.0000	.8363	.7155	.4107	.4561	.4069
10	2.61	6.87	17.24	49.35	59.55	.0000	.5784	.1619	.0398	.0398	.9532	.0000	.0000	.7862	.7132	.4192	.4728	.5930
15	2.01	6.32	19.89	43.35	56.91	.0000	.5500	.1556	.0397	.0397	.9564	.0000	.0000	.7819	.7009	.4249	.4774	.5902
30	.39	5.13	15.47	41.12	51.52	.0000	.4999	.0858	.0243	.0243	.9779	.0000	.0000	.8584	.6686	.4457	.4902	.6519
50	.70	6.11	11.65	39.48	44.42	.0000	.5100	.0830	.0266	.0266	.9803	.0000	.0000	.8837	.6393	.4316	.5049	.6897
70	9.89	15.90	14.44	47.13	44.10	.0000	.5878	.0731	.0262	.0262	.9852	.0000	.0000	.9388	.5869	.3835	.4306	.7021
85	16.30	22.75	16.58	52.12	45.17	.0000	.6555	.1071	.0415	.0415	.9805	.0000	.0000	.8625	.5486	.3474	.3883	.7189
90	18.01	24.57	17.13	53.79	45.85	.0000	.6804	.1227	.0488	.0488	.9785	.0000	.0000	.8318	.5357	.3348	.3804	.7262
95	18.80	25.51	17.56	54.61	46.72	.0000	.6999	.1366	.0556	.0556	.9768	.0000	.0000	.7952	.5239	.3243	.3797	.7348

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5912.	127.95	1.1012	1.3091	79.05	79.86

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	426.4	878.0	426.4	515.1	.0	710.8	.00	54.06	38.43	-30.01	544.3	595.3	-338.3	297.4	338.3	413.4
10	14.100	16.790	443.6	858.9	443.6	544.7	.0	663.9	.00	50.63	39.33	-22.97	573.6	592.0	-363.6	231.0	363.6	433.0
15	15.170	17.580	455.2	831.0	455.2	551.6	.0	621.5	.00	48.41	40.66	-16.96	600.3	576.7	-391.2	168.2	391.2	453.3
30	18.280	19.910	471.8	762.7	471.8	544.3	.0	534.2	.00	44.46	44.94	-2.18	667.1	545.0	-471.4	20.8	471.4	513.4
50	22.190	23.090	474.2	696.0	474.2	486.4	.0	497.2	.00	45.67	50.34	11.50	743.2	496.4	-572.2	-98.2	572.2	595.4
70	25.880	26.260	386.0	634.1	386.0	361.9	.0	520.7	.00	55.21	59.94	23.43	771.3	394.5	-667.4	-156.5	667.4	677.2
85	28.450	28.610	321.1	588.5	321.1	281.2	.0	516.7	.00	61.47	66.36	38.22	800.8	358.5	-733.6	-221.0	733.6	737.8
90	29.320	29.410	303.6	573.0	303.6	253.6	.0	513.7	.00	63.73	68.11	43.97	814.9	352.6	-756.1	-244.6	756.1	758.4
95	30.150	30.180	297.0	559.2	297.0	242.1	.0	504.1	.00	64.35	69.09	48.52	832.3	365.9	-777.5	-274.2	777.5	778.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.62	4.28	7.29	68.44	71.47	.0000	.2017	.2537	.0452	.0452	1.3183	.8761	.871132	.2204	.3903	.7981	.4991	.5411
10	-2.18	4.42	8.25	62.30	66.16	.0000	.2436	.1384	.0279	.0279	1.3303	.9240	.9209	-.1932	.4072	.7793	.5291	.5372
15	-1.52	4.67	10.04	57.62	63.08	.0000	.2976	.0979	.0218	.0218	1.3299	.9405	.9380	.6159	.4176	.7518	.5547	.5217
30	-.16	5.44	11.55	47.12	53.34	.0000	.4028	.0636	.0167	.0167	1.3246	.9519	.9499	.8707	.4319	.6848	.6172	.4894
50	2.48	7.38	6.84	38.85	39.02	.0000	.5344	.1689	.0491	.0491	1.3132	.8570	.8514	.7593	.4234	.6180	.6819	.4408
70	9.49	13.62	3.37	36.51	27.03	.0000	.7103	.2640	.0790	.0790	1.3486	.7967	.7880	.6967	.3393	.5546	.7023	.3450
85	13.37	17.00	8.30	28.14	19.73	.0000	.7767	.2894	.0788	.0788	1.3703	.7796	.7696	.6873	.2841	.5103	.7274	.3108
90	14.25	17.72	11.65	24.14	18.27	.0000	.7904	.2975	.0757	.0757	1.3746	.7713	.7608	.6822	.2698	.4956	.7382	.3050
95	14.03	17.36	14.40	20.57	17.55	.0000	.7785	.2941	.0701	.0701	1.3752	.7673	.7567	.6838	.2676	.4829	.7528	.3140

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1018	1.3385	85.27	85.87	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	788.9	462.3	454.2	460.0	644.9	-42.1	54.84	-5.25	-22.49	48.56	491.7	695.3	188.0	-521.2	456.9	479.1
10	18.350	19.110	789.2	470.4	498.3	469.5	611.8	7.1	50.83	.85	-15.56	45.94	517.6	675.7	138.6	-485.7	473.2	492.8
15	19.070	19.740	775.2	476.8	518.2	475.3	576.4	37.3	48.04	4.49	-9.28	44.78	525.5	669.6	84.6	-471.7	491.8	509.0
30	21.140	21.600	738.4	499.1	539.1	498.8	504.5	15.6	43.09	1.80	4.29	47.32	541.5	736.2	-40.7	-541.4	545.1	557.0
50	23.970	24.200	700.5	484.5	523.1	484.4	465.9	9.7	41.69	1.14	16.23	51.74	544.9	782.5	-152.2	-614.4	618.1	624.0
70	26.790	26.880	659.0	438.4	429.9	438.2	499.1	12.6	49.29	1.64	24.10	57.21	471.0	809.7	-191.7	-680.6	690.8	693.1
85	28.860	28.900	624.9	400.4	365.8	400.3	506.6	11.3	54.17	1.62	33.01	61.39	436.3	836.1	-237.6	-733.9	744.2	745.2
90	29.570	29.600	612.7	386.6	343.7	386.5	507.1	10.4	55.88	1.54	36.64	62.82	428.6	846.4	-255.5	-752.8	762.5	763.3
95	30.240	30.270	601.8	374.9	331.2	374.8	502.4	9.1	56.61	1.39	39.93	64.08	432.1	857.7	-277.3	-771.4	779.8	780.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	4.26	8.28	11.24	60.10	62.56	.0000	.6163	.1317	.0311	.0311	.9625	.0000	.0000	.8337	.7095	.4022	.4496	.6049
10	2.81	7.07	16.78	49.98	59.53	.0000	.5884	.1659	.0408	.0408	.9527	.0000	.0000	.7827	.7075	.4098	.4666	.5886
15	2.25	6.55	19.88	43.54	56.87	.0000	.5593	.1615	.0412	.0412	.9553	.0000	.0000	.7759	.6962	.4158	.4718	.5840
30	.85	5.58	15.70	41.29	51.46	.0000	.5092	.0873	.0247	.0247	.9778	.0000	.0000	.8588	.6645	.4366	.4831	.6440
50	1.80	7.19	11.81	40.55	44.39	.0000	.5159	.0505	.0162	.0162	.9884	.0000	.0000	.9465	.6282	.4228	.4882	.6828
70	10.56	16.57	14.46	47.64	44.09	.0000	.5989	.0742	.0246	.0246	.9849	.0000	.0000	.9388	.5855	.3783	.4233	.6987
85	16.74	23.18	16.63	52.55	45.16	.0000	.6661	.1109	.0430	.0430	.9798	.0000	.0000	.8601	.5493	.3429	.3839	.7140
90	18.58	25.14	17.23	54.33	45.85	.0000	.6911	.1255	.0499	.0499	.9780	.0000	.0000	.8325	.5361	.3304	.3747	.7232
95	19.55	26.26	17.71	55.22	46.72	.0000	.7106	.1384	.0563	.0563	.9766	.0000	.0000	.7962	.5238	.3198	.3726	.7315

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5910.	125.53	1.1018	1.3079	78.35	79.17

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	577.3	1067.8	577.3	665.2	.0	835.1	.00	51.46	33.47	-29.00	632.1	760.8	-391.7	368.7	381.7	466.4
10	14.100	16.730	597.3	1048.8	597.3	687.3	.0	792.2	.00	49.05	34.48	-23.82	724.6	751.7	-410.2	303.7	410.2	488.5
15	15.170	17.580	610.4	1015.2	610.4	688.3	.0	745.6	.00	47.25	35.86	-19.74	753.3	728.1	-441.4	234.1	441.4	511.5
30	18.280	19.910	640.7	923.2	640.7	688.2	.0	614.3	.00	41.75	39.67	-2.33	832.9	691.0	-531.9	35.7	531.9	579.3
50	22.190	23.030	657.3	812.0	657.3	640.9	.0	498.7	.00	37.88	44.47	15.13	921.5	664.4	-645.6	-173.1	645.6	671.8
70	25.880	26.260	565.6	706.6	565.6	524.3	.0	473.5	.00	42.13	53.09	29.06	942.3	600.2	-753.0	-290.5	753.0	764.0
85	28.450	28.610	484.4	641.8	484.4	427.4	.0	478.8	.00	48.25	59.66	39.61	959.2	554.7	-827.8	-353.6	827.8	832.4
90	29.320	29.410	462.9	620.4	462.9	400.8	.0	473.4	.00	49.77	61.51	43.64	970.7	554.3	-853.1	-382.3	853.1	855.7
95	30.150	30.190	453.0	602.5	453.0	392.8	.0	465.2	.00	50.55	62.68	47.14	987.3	563.2	-877.2	-412.9	877.2	878.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	-7.56	-.64	8.02	62.47	71.15	.0000	.1733	.3334	.0599	.0599	1.3935	.8046	.7953	5.6129	.5327	.9851	.6391	.7019
10	-7.02	-.36	7.35	58.30	66.04	.0000	.2224	.2229	.0446	.0446	1.4216	.8584	.8513	-2.2769	.5524	.9648	.6715	.6915
15	-6.40	-.11	8.18	54.60	62.92	.0000	.2795	.1778	.0390	.0390	1.4258	.8778	.8715	.2054	.5650	.9293	.6987	.6665
30	-5.50	.17	10.78	42.59	53.21	.0000	.3720	.1006	.0264	.0264	1.4124	.9124	.9081	.7934	.5944	.8363	.7738	.6259
50	-4.08	.90	10.44	29.34	38.92	.0000	.4420	.1165	.0332	.0332	1.3666	.8739	.8682	.8250	.6100	.7266	.8573	.5945
70	1.93	6.14	8.93	24.02	26.93	.0000	.5279	.1334	.0380	.0380	1.3327	.8614	.8547	.8275	.5179	.6218	.8665	.5282
85	6.47	10.15	9.53	20.06	19.57	.0000	.5952	.1671	.0446	.0446	1.4234	.8377	.8295	.8016	.4395	.5578	.8758	.4821
90	7.46	10.96	11.31	17.86	18.26	.0000	.6016	.1715	.0439	.0439	1.4283	.8330	.8245	.7979	.4206	.5376	.8851	.4804
95	7.67	11.01	13.00	15.54	17.52	.0000	.5932	.1768	.0433	.0433	1.4272	.8247	.8157	.7919	.4124	.5210	.8993	.4870

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1177	1.4020	86.04	86.69	37.20

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	972.4	625.6	611.9	625.3	755.8	-13.1	51.00	-1.22	-21.43	41.53	657.4	835.3	240.2	-553.7	515.6	540.6
10	18.350	19.110	990.4	645.7	653.5	645.1	725.2	20.2	47.80	1.78	-16.29	39.71	686.2	838.7	192.3	-535.8	533.9	556.0
15	19.070	19.740	967.7	657.7	679.0	656.8	683.3	32.7	45.43	2.85	-11.21	39.51	692.7	851.4	134.5	-541.6	554.8	574.3
30	21.140	21.600	921.1	677.1	713.8	677.0	581.7	-.1	39.15	-.01	2.64	42.86	716.0	923.9	-33.4	-628.6	615.1	628.5
50	23.970	24.200	847.3	645.0	697.0	645.0	481.7	3.5	34.64	.31	17.20	47.36	730.5	952.5	-215.7	-700.6	697.4	704.1
70	26.730	26.890	763.1	567.8	608.1	567.7	460.7	10.2	37.17	1.04	27.71	53.66	687.3	958.6	-318.8	-771.8	779.5	782.1
85	28.860	28.900	710.0	506.3	531.0	506.0	471.2	14.8	41.60	1.68	34.77	58.51	646.5	969.8	-368.4	-826.0	839.7	840.9
90	29.570	29.600	692.5	481.1	508.9	480.3	469.6	12.6	42.71	1.49	37.52	60.45	641.9	975.7	-390.8	-848.6	860.3	861.2
95	30.240	30.270	678.1	460.4	494.4	460.3	464.0	7.7	43.18	.96	40.05	62.13	646.1	987.0	-415.8	-873.0	879.8	880.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	.67	4.67	15.29	52.22	62.58	.0000	.5401	.1165	.0277	.0277	.9537	.0000	.0000	.8448	.8862	.5437	.6064	.7259
10	-.20	4.05	17.76	46.02	59.63	.0000	.5151	.1448	.0357	.0357	.9416	.0000	.0000	.8017	.8889	.5624	.6256	.7306
15	-.64	3.70	18.29	42.57	57.09	.0000	.4915	.1338	.0344	.0344	.9471	.0000	.0000	.8092	.8753	.5740	.6295	.7431
30	-3.52	1.29	14.05	39.16	51.83	.0000	.4431	.0680	.0194	.0194	.9751	.0000	.0000	.8863	.8318	.5944	.6490	.8111
50	-4.84	.67	10.39	34.32	44.65	.0000	.4193	.0298	.0096	.0096	.9905	.0000	.0000	.9419	.7613	.5662	.6566	.8361
70	-.46	5.64	13.93	36.13	44.31	.0000	.4682	.0417	.0150	.0150	.9830	.0000	.0000	.9237	.6775	.4933	.6099	.8326
85	4.72	11.21	16.73	39.92	45.30	.0000	.5365	.0807	.0313	.0313	.9815	.0000	.0000	.8610	.6230	.4352	.5670	.8329
90	5.83	12.42	17.21	41.22	45.34	.0000	.5673	.1008	.0401	.0401	.9779	.0000	.0000	.8297	.6057	.4124	.5605	.8362
95	6.04	12.78	17.28	42.23	46.75	.0000	.5351	.1168	.0476	.0476	.9754	.0000	.0000	.8071	.5913	.3937	.5623	.8441

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6668.	165.0	1.1177	1.3695	79.89	80.79

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	544.7	1033.2	544.7	631.9	.0	917.3	.00	52.29	34.93	-29.15	664.4	723.9	-390.4	352.5	390.4	464.8
10	14.100	16.730	564.4	1008.4	564.4	651.8	.0	769.3	.00	49.72	35.91	-23.40	636.9	710.8	-408.8	282.4	408.8	486.8
15	15.170	17.580	577.1	973.4	577.1	657.8	.0	717.4	.00	47.47	37.30	-17.50	725.7	690.3	-439.9	207.7	439.9	509.7
30	18.280	19.310	604.3	893.7	604.3	656.8	.0	605.3	.00	42.67	41.20	-2.46	804.4	658.8	-530.0	28.6	530.0	577.3
50	22.190	23.090	616.2	798.3	616.2	605.7	.0	520.0	.00	40.65	46.22	13.87	831.0	624.1	-643.4	-149.5	643.4	669.5
70	25.880	26.260	524.9	710.0	524.9	476.6	.0	525.9	.00	47.85	55.01	26.39	916.4	532.4	-750.4	-235.6	750.4	761.4
85	28.450	28.610	445.8	650.6	445.8	390.3	.0	520.6	.00	53.14	61.61	38.37	937.8	497.8	-824.9	-309.0	824.9	829.6
90	29.320	29.410	425.9	630.3	425.9	365.4	.0	513.4	.00	54.58	63.39	42.88	951.0	499.2	-850.2	-339.3	850.2	852.8
95	30.150	30.180	417.2	614.9	417.2	352.0	.0	504.2	.00	55.08	64.48	46.47	968.7	511.5	-874.2	-370.9	874.2	875.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	-6.11	.81	7.36	64.08	71.26	.0000	.1885	.2862	.0514	.0514	1.4034	.8415	.8337	9.8092	.5018	.9489	.6127	.6649
10	-5.58	1.06	7.81	59.31	66.10	.0000	.2425	.1370	.0396	.0396	1.4185	.8801	.8740	-.6092	.5210	.9231	.6451	.6507
15	-4.94	1.32	9.44	54.91	62.98	.0000	.2947	.1516	.0335	.0335	1.4179	.8989	.8939	.4320	.5331	.8873	.6725	.6292
30	-3.98	1.68	11.26	43.66	53.25	.0000	.3870	.0807	.0212	.0212	1.4148	.9327	.9293	.8409	.5596	.8069	.7467	.5948
50	-2.23	2.68	9.14	32.35	38.90	.0000	.4756	.1226	.0352	.0352	1.3954	.8791	.8734	.8231	.5689	.7116	.8272	.5563
70	3.99	9.13	6.26	28.62	26.94	.0000	.6074	.1846	.0539	.0533	1.4225	.8326	.8241	.7801	.4767	.6213	.6399	.4659
85	8.47	12.14	9.29	23.24	19.56	.0000	.6622	.1377	.0537	.0537	1.4568	.8277	.8184	.7782	.4022	.5632	.8542	.4309
90	9.34	12.84	10.54	20.50	18.26	.0000	.6661	.2000	.0518	.0518	1.4615	.8242	.8147	.7769	.3857	.5440	.8652	.4309
95	9.46	12.81	12.33	18.01	17.52	.0000	.6595	.2008	.0498	.0498	1.4625	.8197	.8039	.7752	.3789	.5297	.8803	.4406

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1224	1.4203	86.02	86.69	35.44

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	936.4	577.0	573.5	576.4	740.2	-20.3	52.23	-2.03	-21.54	44.12	616.6	803.0	226.4	-559.0	513.8	538.7
10	18.350	19.110	937.1	598.9	614.8	588.2	707.1	20.1	49.39	1.95	-15.30	42.23	639.5	734.5	175.1	-534.0	532.1	554.1
15	19.070	19.740	918.8	592.6	634.0	591.4	664.8	38.1	46.35	3.68	-10.02	42.09	644.4	737.0	111.8	-534.3	552.9	572.4
30	21.140	21.600	880.7	620.9	669.0	620.9	522.4	7.1	40.53	.66	3.43	44.91	671.5	877.0	-40.6	-619.2	613.0	626.3
50	23.370	24.200	822.2	598.8	653.2	598.7	493.4	8.9	37.40	.85	16.68	43.16	682.4	915.8	-135.6	-692.8	695.0	701.7
70	26.790	26.880	755.6	535.7	557.8	535.6	509.3	13.6	42.43	1.46	25.68	55.02	619.2	934.9	-267.5	-765.8	776.8	779.4
85	28.860	28.900	709.3	483.6	489.2	483.3	513.1	17.2	46.43	2.04	33.56	59.51	586.0	952.6	-323.7	-820.7	836.8	838.0
90	29.570	29.600	691.3	462.2	467.5	462.0	509.2	13.4	47.45	1.65	36.68	61.32	583.2	963.1	-348.2	-844.9	857.4	858.3
95	30.240	30.270	678.5	446.1	455.5	446.1	502.9	7.6	47.83	.98	39.37	62.85	589.5	977.8	-374.0	-870.1	876.8	877.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	1.99	5.89	14.47	54.26	62.57	.0000	.5722	.1220	.0289	.0289	.9543	.0000	.0000	.8448	.8480	.5000	.5653	.6959
10	.99	5.25	17.91	47.04	59.60	.0000	.5482	.1492	.0368	.0368	.9440	.0000	.0000	.8062	.8436	.5112	.5787	.6897
15	.30	4.63	19.11	42.66	57.04	.0000	.5266	.1407	.0360	.0360	.9488	.0000	.0000	.8085	.8280	.5152	.5832	.6930
30	-1.96	2.83	14.65	39.88	51.70	.0000	.4756	.0743	.0211	.0211	.9748	.0000	.0000	.8731	.7338	.5426	.6048	.7663
50	-2.12	3.35	11.57	36.55	44.64	.0000	.4629	.0340	.0110	.0110	.9897	.0000	.0000	.9425	.7378	.5225	.6109	.7991
70	4.54	10.62	14.34	40.37	44.28	.0000	.5269	.0435	.0178	.0173	.9873	.0000	.0000	.9238	.6687	.4618	.5484	.8057
85	9.48	15.36	17.09	44.33	45.30	.0000	.5889	.0896	.0348	.0348	.9797	.0000	.0000	.8594	.6195	.4131	.5117	.8137
90	10.54	17.12	17.36	45.90	45.93	.0000	.6163	.1065	.0424	.0424	.9770	.0000	.0000	.8330	.6024	.3938	.5068	.8205
95	10.72	17.46	17.30	46.85	46.74	.0000	.6397	.1207	.0492	.0492	.9748	.0000	.0000	.8109	.5889	.3794	.5099	.8315

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6645.	157.21	1.1224	1.3859	79.87	80.80

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	525.4	1014.5	525.4	613.1	.0	808.1	.00	52.81	35.91	-29.24	648.7	703.0	-380.5	343.3	380.5	464.8
10	14.100	16.790	544.8	989.4	544.8	634.3	.0	759.2	.00	50.11	36.88	-23.20	681.2	690.8	-408.9	272.3	408.9	486.9
15	15.170	17.580	557.3	954.1	557.3	637.3	.0	709.9	.00	48.08	38.28	-17.41	710.0	668.4	-439.9	200.1	439.9	509.8
30	18.280	19.910	582.8	875.8	582.8	635.8	.0	602.1	.00	43.42	42.26	-2.20	787.9	637.5	-530.1	24.8	530.1	577.4
50	22.190	23.090	591.1	784.0	591.1	578.4	.0	529.3	.00	42.46	47.41	13.63	873.9	595.1	-643.5	-140.3	643.5	669.6
70	25.880	26.260	498.5	702.8	498.5	441.6	.0	546.4	.00	51.09	56.39	26.06	901.6	491.9	-750.5	-215.1	750.5	761.5
85	28.450	28.610	421.8	651.0	421.8	372.2	.0	534.1	.00	55.13	62.92	38.45	926.7	475.3	-825.0	-295.5	825.0	829.7
90	29.320	29.410	403.9	632.1	403.9	347.2	.0	528.2	.00	56.70	64.58	43.08	941.4	475.9	-850.2	-324.7	850.2	852.9
95	30.150	30.180	397.0	616.2	397.0	331.5	.0	519.4	.00	57.46	65.58	47.00	960.2	486.5	-874.3	-355.8	874.3	875.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.13	1.78	7.93	65.15	71.32	.0000	.1978	.2349	.0421	.0421	1.4170	.8747	.8684	29.5493	.4836	.9294	.5979	.6441
10	-4.61	2.02	8.02	60.08	66.13	.0000	.2511	.1487	.0299	.0299	1.4304	.9122	.9077	-.0271	.5026	.9036	.6306	.6308
15	-3.95	2.30	9.55	55.69	63.01	.0000	.3076	.1156	.0256	.0256	1.4274	.9252	.9213	.6083	.5143	.8675	.6582	.6077
30	-2.90	2.74	11.52	44.46	53.28	.0000	.4002	.0562	.0148	.0148	1.4234	.9543	.9519	.8932	.5383	.7889	.7316	.5743
50	-1.05	3.91	8.83	33.78	38.85	.0000	.5019	.1242	.0357	.0357	1.3955	.8836	.8780	.8278	.5440	.6969	.8108	.5290
70	5.45	9.64	5.93	30.33	26.95	.0000	.6534	.2020	.0592	.0592	1.4382	.8279	.8189	.7701	.4504	.6131	.8248	.4291
85	9.78	13.45	8.36	24.46	19.55	.0000	.6875	.1933	.0525	.0525	1.4780	.8390	.8300	.7874	.3797	.5626	.8429	.4107
90	10.54	14.04	10.74	21.50	18.26	.0000	.6931	.1987	.0513	.0513	1.4826	.8329	.8235	.7830	.3650	.5447	.8554	.4101
95	10.55	13.89	12.86	18.58	17.52	.0000	.6882	.2034	.0499	.0499	1.4819	.8249	.8150	.7777	.3600	.5299	.8717	.4183

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1243	1.4337	87.07	87.71	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	917.3	553.3	552.6	552.4	732.2	-26.8	52.96	-2.80	-21.57	45.68	594.2	790.7	218.4	-565.6	513.9	538.8
10	18.350	19.110	917.7	563.3	595.6	562.4	698.0	20.1	49.52	2.03	-15.56	43.51	618.6	775.7	165.9	-534.1	532.1	554.2
15	19.070	19.740	897.4	565.5	610.4	564.0	657.6	41.6	47.12	4.22	-9.73	43.26	619.9	774.5	104.6	-530.8	553.0	572.4
30	21.140	21.600	858.6	595.1	642.9	595.0	568.8	9.9	41.48	.96	3.90	46.00	645.6	856.9	-44.2	-616.5	613.0	626.4
50	23.970	24.200	802.5	569.9	622.4	569.8	506.5	9.7	39.14	.98	16.87	50.53	650.7	896.6	-188.6	-692.0	695.1	701.8
70	26.790	26.880	742.5	510.9	521.1	510.7	528.6	14.8	45.44	1.67	25.55	56.25	577.8	919.8	-248.3	-764.6	776.9	779.5
85	28.860	28.900	701.8	467.3	463.7	467.0	526.8	16.6	48.65	2.03	33.78	60.38	558.0	945.1	-310.1	-821.5	836.9	838.1
90	29.570	29.600	686.7	449.1	444.4	448.9	523.4	12.9	49.68	1.64	36.94	62.02	556.3	957.4	-334.1	-845.4	857.5	858.4
95	30.240	30.270	673.7	433.2	430.9	433.2	517.9	8.0	50.24	1.06	39.79	63.52	561.0	971.7	-359.0	-869.7	876.9	877.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.53	6.54	13.70	55.76	62.57	.0000	.5888	.1324	.0314	.0314	.9521	.0000	.0000	.8344	.8292	.4788	.5445	.6843
10	1.60	5.85	17.99	47.48	59.57	.0000	.5641	.1631	.0402	.0402	.9409	.0000	.0000	.7907	.8242	.4882	.5578	.6724
15	1.19	5.51	19.64	42.90	56.99	.0000	.5423	.1527	.0391	.0391	.9466	.0000	.0000	.7942	.8072	.4908	.5590	.6722
30	-.92	3.85	14.93	40.53	51.64	.0000	.4898	.0796	.0226	.0226	.9741	.0000	.0000	.8721	.7728	.5189	.5793	.7471
50	-.47	4.99	11.70	38.16	44.60	.0000	.4880	.0416	.0134	.0134	.9880	.0000	.0000	.9377	.7190	.4957	.5816	.7798
70	7.41	13.47	14.54	43.77	44.25	.0000	.5605	.0628	.0226	.0226	.9844	.0000	.0000	.9186	.6556	.4386	.5111	.7896
85	11.72	18.20	17.07	46.62	45.29	.0000	.6162	.1077	.0418	.0418	.9761	.0000	.0000	.8367	.6125	.3981	.4854	.8050
90	12.72	19.30	17.34	48.04	45.93	.0000	.6418	.1249	.0497	.0497	.9734	.0000	.0000	.8117	.5973	.3816	.4825	.8136
95	13.13	19.86	17.39	49.18	46.74	.0000	.6651	.1398	.0570	.0570	.9713	.0000	.0000	.7875	.5837	.3675	.4840	.8241

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6646.	152.11	1.1243	1.3955	80.40	81.31

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	512.6	1007.2	512.6	604.1	.0	805.8	.00	53.14	36.57	-29.45	638.3	694.2	-380.3	341.2	380.3	464.6
10	14.100	16.790	531.8	983.1	531.8	628.1	.0	756.1	.00	50.28	37.53	-23.20	670.7	683.9	-408.7	269.5	408.7	486.6
15	15.170	17.580	544.2	948.9	544.2	632.4	.0	707.4	.00	48.20	38.93	-17.36	699.7	662.9	-439.7	197.8	439.7	509.5
30	18.280	19.910	568.3	868.8	568.3	626.7	.0	601.6	.00	43.81	42.96	-2.20	777.1	628.2	-529.8	24.5	529.8	577.1
50	22.190	23.090	575.5	780.6	575.5	564.2	.0	539.3	.00	43.72	48.16	12.99	863.2	579.1	-643.2	-129.9	643.2	669.2
70	25.880	26.260	482.4	704.0	482.4	427.0	.0	559.4	.00	52.67	57.24	25.36	892.5	472.8	-750.1	-201.7	750.1	761.1
85	28.450	28.610	406.0	651.4	406.0	359.0	.0	543.5	.00	56.56	63.78	38.51	919.2	459.0	-824.6	-285.7	824.6	829.2
90	29.320	29.410	388.2	633.2	388.2	332.7	.0	538.6	.00	58.31	65.44	43.33	934.4	457.9	-849.8	-313.8	849.8	852.4
95	30.150	30.180	381.2	618.0	381.2	318.2	.0	529.9	.00	59.02	66.43	47.28	953.4	469.4	-873.9	-344.9	873.9	874.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.47	2.44	7.74	66.02	71.35	.0000	.1978	.2338	.0419	.0419	1.4176	.8786	.8725	20.9559	.4715	.9218	.5879	.6353
10	-3.95	2.67	8.03	60.73	66.14	.0000	.2486	.1402	.0282	.0282	1.4321	.9192	.9150	-.0294	.4903	.8971	.6208	.6241
15	-3.29	2.94	9.61	56.28	63.02	.0000	.3044	.1042	.0231	.0231	1.4303	.9340	.9306	.6342	.5019	.8622	.6486	.6024
30	-2.19	3.44	11.52	45.17	53.29	.0000	.4036	.0589	.0155	.0155	1.4222	.9532	.9509	.8882	.5245	.7819	.7218	.5654
50	-.19	4.75	8.19	35.17	38.86	.0000	.5178	.1433	.0413	.0413	1.3967	.8706	.8644	.8047	.5270	.6929	.7996	.5140
70	6.36	10.55	5.25	31.87	26.96	.0000	.6760	.2224	.0655	.0655	1.4428	.8173	.8077	.7508	.4342	.6133	.8156	.4119
85	10.65	14.32	8.42	25.27	19.55	.0000	.7063	.2101	.0570	.0570	1.4807	.8296	.8201	.7715	.3648	.5623	.8357	.3962
90	11.41	14.91	10.99	22.11	18.26	.0000	.7140	.2173	.0559	.0559	1.4855	.8222	.8122	.7659	.3502	.5450	.8485	.3941
95	11.39	14.73	13.14	19.15	17.53	.0000	.7078	.2202	.0538	.0538	1.4859	.8155	.8051	.7622	.3454	.5309	.8648	.4032

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1256	1.4358	86.45	87.15	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	907.5	541.3	538.7	539.7	730.3	-36.3	53.58	-3.87	-21.92	46.80	580.7	788.6	216.7	-574.9	513.6	538.5
10	18.350	19.110	907.5	550.0	583.0	549.1	695.4	15.1	50.02	1.56	-15.67	44.44	605.8	769.5	163.5	-538.8	531.9	553.9
15	19.070	19.740	888.9	553.6	600.5	551.9	655.3	43.1	47.49	4.47	-9.70	43.78	609.7	764.5	102.6	-529.0	552.7	572.1
30	21.140	21.600	847.7	581.3	629.0	581.1	568.1	13.7	42.07	1.36	4.03	46.48	631.7	844.3	-44.6	-612.4	612.7	626.1
50	23.970	24.200	794.9	556.3	606.8	556.2	513.5	10.1	40.24	1.04	16.64	51.17	633.6	887.5	-181.3	-691.3	694.8	701.4
70	26.790	26.880	740.3	498.7	505.1	498.4	540.9	15.6	46.99	1.79	25.08	56.85	558.0	912.2	-235.6	-763.5	776.5	779.1
85	28.860	28.900	699.6	456.2	449.9	456.0	535.8	15.2	49.98	1.90	33.76	60.99	541.3	940.5	-300.7	-822.5	836.5	837.6
90	29.570	29.600	685.1	440.3	429.8	440.1	533.4	11.7	51.14	1.51	36.99	62.51	538.4	954.0	-323.7	-846.2	857.1	857.9
95	30.240	30.270	672.9	426.9	416.7	426.9	528.3	6.5	51.73	.87	39.86	63.88	543.2	969.9	-348.1	-870.8	876.5	877.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.13	7.14	12.62	57.46	62.56	.0000	.5996	.1361	.0322	.0322	.9516	.0000	.0000	.8313	.8190	.4681	.5316	.6819
10	2.06	6.31	17.51	48.46	59.56	.0000	.5745	.1691	.0416	.0416	.9398	.0000	.0000	.7845	.8150	.4763	.5466	.6663
15	1.61	5.92	19.88	43.02	56.96	.0000	.5502	.1614	.0412	.0412	.9444	.0000	.0000	.7837	.7993	.4800	.5491	.6629
30	-.29	4.47	15.31	40.72	51.60	.0000	.4979	.0820	.0233	.0233	.9739	.0000	.0000	.8698	.7628	.5062	.5657	.7353
50	.54	5.98	11.75	39.20	44.56	.0000	.5028	.0430	.0138	.0138	.9878	.0000	.0000	.9426	.7118	.4831	.5662	.7706
70	8.87	14.92	14.65	45.20	44.23	.0000	.5811	.0717	.0258	.0258	.9824	.0000	.0000	.9115	.6532	.4272	.4935	.7814
85	13.00	19.47	16.94	48.08	45.27	.0000	.6366	.1123	.0436	.0436	.9753	.0000	.0000	.8370	.6105	.3879	.4705	.7997
90	14.13	20.71	17.21	49.63	45.92	.0000	.6603	.1255	.0499	.0499	.9734	.0000	.0000	.8187	.5955	.3735	.4667	.8093
95	14.65	21.37	17.20	50.86	46.74	.0000	.6812	.1372	.0559	.0559	.9719	.0000	.0000	.7957	.5823	.3615	.4676	.8213

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6643.	148.65	1.1256	1.3962	79.63	80.61

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	502.2	999.3	502.2	595.6	.0	802.2	.00	53.40	37.10	-29.59	629.6	685.3	-379.8	338.1	379.8	464.1
10	14.100	16.790	521.0	976.6	521.0	622.8	.0	752.1	.00	50.36	38.07	-23.11	661.9	677.7	-408.2	266.1	408.2	486.1
15	15.170	17.580	533.2	943.5	533.2	628.1	.0	704.0	.00	48.26	39.47	-17.24	690.8	657.9	-439.2	195.1	439.2	508.9
30	18.280	19.910	556.4	864.4	556.4	620.9	.0	601.3	.00	44.07	43.53	-2.26	768.0	622.3	-529.2	24.9	529.2	576.4
50	22.190	23.090	561.9	780.7	561.9	555.1	.0	548.6	.00	44.68	48.81	12.22	853.6	568.0	-642.4	-119.8	642.4	668.4
70	25.880	26.260	468.6	706.2	468.6	415.6	.0	570.8	.00	53.96	57.96	24.56	884.3	457.1	-749.2	-189.4	749.2	760.2
85	28.450	28.610	392.8	654.7	392.8	345.4	.0	556.0	.00	58.16	64.50	38.24	912.6	440.0	-823.6	-272.2	823.6	828.2
90	29.320	29.410	376.0	636.8	376.0	319.7	.0	550.6	.00	59.87	66.10	43.25	928.5	439.5	-848.8	-300.8	848.8	851.4
95	30.150	30.180	370.1	621.4	370.1	305.8	.0	541.0	.00	60.53	67.02	47.38	948.0	452.1	-872.8	-332.7	872.8	873.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.94	2.97	7.63	66.69	71.37	.0000	.1996	.2436	.0436	.0436	1.4135	.8760	.8698	29.2063	.4616	.9137	.5797	.6266
10	-3.41	3.20	8.12	61.18	66.14	.0000	.2465	.1391	.0280	.0280	1.4301	.9213	.9172	-.0717	.4800	.8906	.6124	.6181
15	-2.74	3.48	9.73	56.71	63.04	.0000	.3015	.1002	.0222	.0222	1.4294	.9377	.9344	.6375	.4914	.8569	.6404	.5975
30	-1.61	4.01	11.46	45.80	53.31	.0000	.4043	.0612	.0161	.0161	1.4211	.9525	.9500	.8832	.5131	.7775	.7135	.5597
50	.56	5.49	7.45	36.59	38.89	.0000	.5288	.1576	.0456	.0456	1.3994	.8624	.8557	.7867	.5121	.6923	.7899	.5037
70	7.21	11.38	4.46	33.39	26.98	.0000	.6951	.2432	.0721	.0721	1.4450	.8062	.7960	.7304	.4194	.6146	.8078	.3978
85	11.40	15.05	8.14	26.26	19.55	.0000	.7296	.2353	.0641	.0641	1.4817	.8146	.8042	.7477	.3519	.5645	.8299	.3794
90	12.10	15.58	10.91	22.85	18.26	.0000	.7365	.2417	.0622	.0622	1.4862	.8074	.7964	.7429	.3384	.5475	.8431	.3779
95	11.97	15.31	13.25	19.64	17.53	.0000	.7287	.2436	.0594	.0594	1.4858	.8007	.7894	.7401	.3351	.5332	.8598	.3879

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.1268	1.4365	85.81	86.51	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	897.1	530.5	525.2	527.7	727.2	-50.2	54.16	-5.46	-22.20	48.09	567.3	790.3	214.2	-588.1	513.0	537.9
10	18.350	19.110	898.0	539.1	572.3	538.2	691.9	8.3	50.40	.87	-15.69	45.33	594.8	766.1	160.7	-545.0	531.2	553.2
15	19.070	19.740	880.5	544.1	591.3	542.4	652.3	43.1	47.80	4.55	-9.62	44.24	600.3	757.2	100.2	-528.3	552.1	571.5
30	21.140	21.600	839.7	570.1	618.4	569.8	567.6	15.9	42.52	1.60	4.08	46.90	621.2	834.4	-44.4	-609.4	612.0	625.3
50	23.970	24.200	791.6	548.1	596.9	548.0	519.9	10.3	41.06	1.08	16.27	51.54	622.0	881.5	-174.0	-690.3	693.9	700.6
70	26.790	26.880	740.1	491.1	493.8	490.9	550.8	16.0	48.15	1.87	24.54	57.20	543.2	906.9	-224.7	-762.2	775.6	778.2
85	28.860	28.900	700.8	451.0	437.3	450.7	547.6	15.2	51.39	1.93	33.36	61.24	523.8	937.1	-287.9	-821.5	835.5	836.6
90	29.570	29.600	686.8	436.1	417.7	436.0	545.1	12.4	52.55	1.62	36.67	62.69	521.1	950.5	-311.0	-844.5	856.0	856.9
95	30.240	30.270	674.5	423.0	404.9	422.9	539.5	7.8	53.11	1.06	39.67	64.03	526.3	966.0	-336.0	-868.5	875.4	876.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.66	7.66	11.03	59.63	62.56	.0000	.6099	.1399	.0330	.0330	.9512	.0000	.0000	.8274	.8088	.4585	.5193	.6830
10	2.43	6.68	16.81	49.53	59.55	.0000	.5830	.1764	.0434	.0434	.9383	.0000	.0000	.7759	.8062	.4666	.5365	.6631
15	1.96	6.26	19.95	43.25	56.93	.0000	.5556	.1698	.0434	.0434	.9424	.0000	.0000	.7726	.7917	.4716	.5400	.6563
30	.21	4.96	15.53	40.92	51.54	.0000	.5052	.0915	.0259	.0259	.9713	.0000	.0000	.8567	.7556	.4960	.5554	.7261
50	1.25	6.67	11.78	39.98	44.52	.0000	.5132	.0493	.0158	.0158	.9861	.0000	.0000	.9407	.7087	.4754	.5563	.7646
70	9.87	15.90	14.72	46.28	44.19	.0000	.5955	.0771	.0277	.0277	.9811	.0000	.0000	.9130	.6534	.4202	.4816	.7758
85	14.34	20.81	16.96	49.46	45.25	.0000	.6510	.1127	.0437	.0437	.9751	.0000	.0000	.8434	.6115	.3829	.4551	.7956
90	15.50	22.07	17.32	50.93	45.90	.0000	.6734	.1246	.0496	.0496	.9736	.0000	.0000	.8252	.5968	.3694	.4512	.8051
95	16.04	22.76	17.38	52.05	46.73	.0000	.6937	.1359	.0553	.0553	.9722	.0000	.0000	.8010	.5834	.3577	.4522	.8167

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6635.	145.76	1.1268	1.3951	78.69	79.69

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	608.6	1120.0	608.6	692.1	.0	880.5	.00	51.83	33.42	-29.38	729.2	794.5	-401.7	389.7	401.7	490.8
10	14.100	16.790	629.4	1100.8	629.4	717.5	.0	834.6	.00	49.31	34.44	-24.06	763.3	786.3	-431.7	320.6	431.7	514.0
15	15.170	17.580	643.8	1066.3	643.8	722.8	.0	783.7	.00	47.30	35.80	-18.73	793.9	764.0	-464.4	245.5	464.4	538.2
30	18.280	19.910	677.9	970.3	677.9	724.0	.0	645.6	.00	41.69	39.52	-2.81	879.2	726.8	-559.7	36.0	559.7	609.6
50	22.190	23.090	696.3	855.9	696.3	676.9	.0	523.8	.00	37.73	44.28	15.14	972.9	701.7	-679.4	-183.1	679.4	706.9
70	25.880	26.260	602.6	738.9	602.6	547.5	.0	495.9	.00	42.20	52.74	29.42	996.1	628.9	-792.3	-308.1	792.3	804.0
85	28.450	28.610	516.6	665.9	516.6	437.5	.0	502.0	.00	48.94	59.33	40.53	1012.8	575.8	-871.0	-374.0	871.0	875.9
90	29.320	29.410	492.4	636.9	492.4	400.6	.0	495.0	.00	51.05	61.25	45.35	1024.0	570.5	-897.7	-405.4	897.7	900.4
95	30.150	30.180	480.0	614.3	480.0	376.3	.0	485.5	.00	52.22	62.52	49.34	1040.4	578.1	-923.1	-438.5	923.1	924.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.61	-.69	7.58	62.80	71.09	.0000	.1832	.3351	.0600	.0600	1.4417	.8045	.7942	7.8957	.5630	1.0359	.6750	.7349
10	-7.07	-.40	7.10	58.49	66.01	.0000	.2295	.2177	.0435	.0435	1.4763	.8627	.8550	-1.4889	.5838	1.0150	.7090	.7251
15	-6.46	-.17	8.18	54.53	62.90	.0000	.2829	.1640	.0360	.0360	1.4837	.8878	.8815	.3128	.5978	.9782	.7384	.7009
30	-5.65	.02	10.89	42.33	53.20	.0000	.3739	.0839	.0220	.0220	1.4703	.9271	.9231	.8340	.6316	.8800	.8203	.6592
50	-4.25	.72	10.43	29.14	38.90	.0000	.4411	.0978	.0279	.0279	1.4217	.8952	.8899	.8571	.6492	.7660	.9105	.6280
70	1.76	5.95	9.30	23.31	26.95	.0000	.5320	.1315	.0373	.0373	1.4394	.8640	.8569	.8361	.5508	.6488	.9194	.5523
85	6.26	9.92	10.44	18.80	19.55	.0000	.6038	.1745	.0460	.0460	1.4686	.8315	.8222	.8004	.4674	.5766	.9281	.4986
90	7.29	10.78	13.01	15.89	18.26	.0000	.6139	.1841	.0457	.0457	1.4690	.8215	.8117	.7922	.4466	.5495	.9366	.4922
95	7.50	10.84	15.21	13.18	17.53	.0000	.6124	.1905	.0447	.0447	1.4658	.8119	.8016	.7853	.4376	.5286	.9506	.4975

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1298	1.4343	86.99	87.65	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1017.7	646.0	633.1	645.5	796.8	-20.3	51.53	-1.82	-21.88	42.39	682.3	874.1	254.3	-589.1	542.5	568.8
10	18.350	19.110	1026.2	667.9	683.5	667.4	765.3	18.1	48.23	1.53	-16.59	40.35	713.4	875.8	203.5	-567.0	561.8	585.1
15	19.070	19.740	1014.3	680.2	709.4	679.4	724.8	31.9	45.61	2.69	-11.24	40.11	723.8	888.4	140.9	-572.4	583.8	604.4
30	21.140	21.600	960.5	703.3	748.8	703.3	610.5	2.1	39.17	.17	2.77	43.13	751.2	964.0	-36.7	-659.2	647.2	661.3
50	23.970	24.200	892.0	676.3	734.5	676.2	506.1	9.0	34.56	.77	17.23	47.26	769.8	996.6	-227.8	-731.9	733.9	740.9
70	26.790	26.880	796.5	586.3	633.5	586.1	482.5	14.6	37.33	1.43	28.11	54.05	718.6	999.0	-337.7	-808.4	820.2	823.0
85	28.860	28.900	735.1	513.7	544.0	513.4	494.3	18.3	42.27	2.05	35.60	59.35	669.0	1007.3	-389.2	-866.5	883.6	884.8
90	29.570	29.600	710.6	480.7	513.5	480.5	491.0	13.3	43.73	1.57	38.91	61.70	660.3	1014.4	-414.3	-892.9	905.3	906.2
95	30.240	30.270	690.9	454.3	492.7	454.2	484.2	6.5	44.50	.81	41.86	63.72	661.6	1026.3	-441.6	-920.3	925.8	926.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.19	5.18	14.69	53.35	62.58	.0000	.5515	.1265	.0300	.0300	.9463	.0000	.0000	.8375	.9277	.5590	.6297	.7563
10	.14	4.40	17.51	46.70	59.64	.0000	.5249	.1564	.0386	.0386	.9327	.0000	.0000	.7937	.9315	.5794	.6521	.7598
15	-.51	3.83	18.13	42.91	57.10	.0000	.5017	.1511	.0388	.0388	.9361	.0000	.0000	.7922	.9182	.5914	.6587	.7725
30	-3.51	1.31	14.23	38.99	51.83	.0000	.4498	.0840	.0240	.0240	.9670	.0000	.0000	.8643	.8738	.6156	.6816	.8439
50	-4.92	.59	11.42	33.79	44.62	.0000	.4207	.0370	.0120	.0120	.9872	.0000	.0000	.9301	.8019	.5923	.6923	.8728
70	-.30	5.80	14.32	35.90	44.31	.0000	.4752	.0469	.0169	.0169	.9867	.0000	.0000	.9160	.7061	.5074	.6367	.8644
85	5.40	11.89	17.09	40.22	45.28	.0000	.5526	.0861	.0334	.0334	.9792	.0000	.0000	.8581	.6430	.4393	.5850	.8613
90	6.85	13.43	17.29	42.16	45.92	.0000	.5910	.1018	.0405	.0405	.9769	.0000	.0000	.8364	.6195	.4096	.5746	.8643
95	7.34	14.09	17.14	43.69	46.74	.0000	.6240	.1139	.0464	.0464	.9755	.0000	.0000	.8219	.5999	.3862	.5734	.8724

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7017.	171.79	1.1298	1.4140	80.16	81.12

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	569.7	1078.1	569.7	659.2	.0	852.9	.00	52.29	35.19	-28.77	697.1	752.5	-401.7	362.1	401.7	490.8
10	14.100	16.790	590.2	1051.2	590.2	678.5	.0	802.8	.00	49.79	36.18	-23.02	731.3	737.9	-431.8	288.7	431.8	514.1
15	15.170	17.580	603.8	1014.5	603.8	683.3	.0	749.7	.00	47.64	37.56	-17.17	761.8	715.8	-464.5	211.4	464.5	538.3
30	18.280	19.910	633.5	933.3	633.5	682.2	.0	636.7	.00	43.00	41.44	-2.23	845.5	684.2	-559.7	27.0	559.7	609.7
50	22.190	23.090	645.1	836.0	645.1	621.8	.0	558.8	.00	41.95	46.47	13.42	937.1	639.3	-679.5	-148.2	679.5	707.0
70	25.880	26.260	550.2	745.6	550.2	475.1	.0	574.2	.00	50.44	55.21	25.93	965.4	528.7	-792.5	-229.9	792.5	804.1
85	28.450	28.610	469.4	687.6	469.4	404.5	.0	556.0	.00	53.97	61.68	38.35	989.7	515.9	-871.2	-320.0	871.2	876.1
90	29.320	29.410	449.4	666.9	449.4	383.0	.0	546.0	.00	54.96	63.40	42.77	1004.1	522.5	-897.8	-354.6	897.8	900.6
95	30.150	30.180	440.9	649.1	440.9	367.8	.0	534.9	.00	55.49	64.47	46.60	1023.1	535.7	-923.2	-389.2	923.2	924.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.84	1.07	8.34	63.96	71.26	.0000	.1971	.2596	.0468	.0468	1.4600	.8575	.8498	59.7237	.5260	.9916	.6444	.6921
10	-5.31	1.33	8.19	59.20	66.10	.0000	.2521	.1763	.0355	.0355	1.4757	.8937	.8878	-.1415	.5463	.9633	.6788	.6761
15	-4.68	1.58	9.78	54.73	62.98	.0000	.3053	.1356	.0300	.0300	1.4743	.9105	.9056	.5506	.5593	.9251	.7082	.6527
30	-3.74	1.91	11.48	43.67	53.26	.0000	.3968	.0681	.0179	.0179	1.4734	.9439	.9408	.8737	.5880	.8423	.7879	.6175
50	-2.02	2.94	8.66	33.05	38.88	.0000	.4977	.1309	.0377	.0377	1.4421	.8759	.8694	.8232	.5974	.7432	.8735	.5684
70	4.18	8.38	5.79	29.28	26.93	.0000	.6476	.2057	.0603	.0603	1.4884	.8219	.8118	.7713	.5010	.6490	.8868	.4602
85	8.46	12.14	8.31	23.33	19.61	.0000	.6741	.1853	.0504	.0504	1.5353	.8429	.8332	.7994	.4257	.5925	.9028	.4445
90	9.33	12.84	10.44	20.63	18.26	.0000	.6721	.1818	.0472	.0472	1.5419	.8441	.8343	.8033	.4082	.5732	.9146	.4490
95	9.45	12.80	12.45	17.87	17.51	.0000	.6647	.1832	.0453	.0453	1.5414	.8392	.8291	.8011	.4011	.5567	.9310	.4594

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1379	1.4840	86.37	87.09	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	973.0	583.8	591.7	582.4	772.5	-34.6	52.55	-3.42	-21.23	46.01	634.8	838.8	229.9	-603.5	542.6	568.9
10	18.350	19.110	972.9	594.3	633.9	593.6	737.9	15.2	49.33	1.46	-15.52	43.82	658.2	823.0	176.0	-570.0	561.9	585.2
15	19.070	19.740	952.7	596.9	652.1	595.5	694.4	40.8	46.79	3.92	-9.63	43.42	662.0	820.0	110.5	-563.7	583.9	604.5
30	21.140	21.600	915.5	631.3	690.3	631.2	601.1	12.6	41.03	1.15	3.79	45.77	693.0	905.3	-46.2	-648.8	647.3	661.4
50	23.970	24.200	858.2	609.6	670.9	609.5	535.1	10.8	38.58	1.02	16.52	50.14	700.2	951.3	-198.8	-730.2	734.0	741.0
70	26.790	26.880	791.0	542.8	561.7	542.7	556.5	13.3	44.77	1.41	25.23	56.16	621.2	975.1	-263.8	-809.7	820.3	823.1
85	28.860	28.900	744.3	494.6	502.2	494.3	549.3	18.9	47.57	2.20	33.66	60.28	603.6	997.2	-334.4	-866.0	883.7	884.9
90	29.570	29.600	727.5	474.6	485.1	474.3	542.1	16.9	48.18	2.03	36.83	61.92	606.5	1008.2	-363.4	-889.5	905.5	906.4
95	30.240	30.270	712.9	456.6	472.7	456.5	533.6	11.5	48.46	1.44	39.68	63.49	614.5	1022.9	-392.4	-915.4	926.0	926.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
	2.22	6.22	13.08	55.97	62.56	.0000	.5925	.1336	.0316	.0316	.9472	.0000	.0000	.8369	.8804	.5033	.5814	.7232
10	1.38	5.64	17.41	47.87	59.58	.0000	.5681	.1635	.0403	.0403	.9353	.0000	.0000	.7964	.8752	.5132	.5947	.7107
15	.81	5.13	19.34	42.87	57.01	.0000	.5459	.1552	.0397	.0397	.9406	.0000	.0000	.7974	.8583	.5162	.5982	.7092
30	-1.39	3.38	15.12	39.89	51.66	.0000	.4910	.0837	.0238	.0238	.9699	.0000	.0000	.8703	.8250	.5490	.6229	.7872
50	-1.01	4.45	11.74	37.56	44.62	.0000	.4854	.0392	.0126	.0126	.9874	.0000	.0000	.9415	.7691	.5288	.6262	.8253
70	6.85	12.92	14.29	43.36	44.27	.0000	.5605	.0613	.0220	.0220	.9832	.0000	.0000	.9168	.6968	.4641	.5478	.8335
85	10.72	17.20	17.24	45.37	45.31	.0000	.6120	.1051	.0408	.0408	.9743	.0000	.0000	.8396	.6475	.4194	.5235	.8456
90	11.31	17.90	17.74	46.15	45.94	.0000	.6348	.1225	.0487	.0487	.9713	.0000	.0000	.8145	.6309	.4016	.5243	.8530
95	11.33	18.07	17.77	47.02	46.75	.0000	.6576	.1374	.0560	.0560	.9690	.0000	.0000	.7940	.6162	.3857	.5295	.8640

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7018.	162.77	1.1379	1.4405	79.73	80.75

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment
Blade-Element and Overall Performance with Stator-Hub Slit Suction

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	550.7	1069.6	558.7	651.4	.0	848.1	.00	52.47	35.73	-28.72	688.2	743.2	-401.9	357.0	401.9	491.1
10	14.100	16.790	579.1	1042.7	579.1	671.8	.0	797.3	.00	49.87	36.71	-22.81	722.5	729.4	-432.0	283.0	432.0	514.4
15	15.170	17.580	592.4	1005.9	592.4	675.5	.0	745.2	.00	47.80	38.10	-16.99	753.0	706.9	-464.7	206.7	464.7	538.6
30	18.280	19.910	621.0	925.1	621.0	673.0	.0	634.5	.00	43.30	42.02	-2.06	836.3	674.7	-560.0	24.6	560.0	609.9
50	22.190	23.090	630.9	832.2	630.9	609.9	.0	566.1	.00	42.87	47.12	13.04	927.6	626.1	-679.8	-141.2	679.8	707.4
70	25.880	26.260	536.1	745.2	536.1	461.5	.0	584.7	.00	51.75	55.92	25.56	957.7	512.0	-792.8	-219.8	792.8	804.5
85	28.450	28.610	455.6	684.3	455.6	393.5	.0	559.8	.00	54.89	62.40	38.83	983.6	505.2	-871.6	-316.7	871.6	876.5
90	29.320	29.410	435.3	661.1	435.3	367.6	.0	549.5	.00	56.23	64.13	43.71	998.3	509.2	-898.2	-351.5	898.2	901.0
95	30.150	30.180	426.5	642.1	426.5	350.2	.0	538.2	.00	56.95	65.21	47.78	1017.4	521.7	-923.6	-386.4	923.6	924.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.30	1.61	8.43	64.45	71.30	.0000	.1986	.2447	.0441	.0441	1.4643	.8684	.8612	*******	.5156	.9826	.6359	.6828
10	-4.77	1.86	8.41	59.53	66.12	.0000	.2529	.1607	.0324	.0324	1.4793	.9047	.8993	-.0232	.5357	.9545	.6706	.6677
15	-4.13	2.12	9.97	55.10	63.00	.0000	.3075	.1238	.0275	.0275	1.4770	.9196	.9151	.5957	.5484	.9163	.7000	.6439
30	-3.15	2.49	11.66	44.07	53.27	.0000	.4010	.0641	.0168	.0168	1.4744	.9480	.9451	.8821	.5760	.8340	.7795	.6083
50	-1.34	3.61	8.24	34.08	38.85	.0000	.5093	.1377	.0397	.0397	1.4473	.8732	.8665	.8163	.5831	.7388	.8644	.5559
70	4.96	9.15	5.43	30.35	26.95	.0000	.6658	.2178	.0640	.0640	1.4951	.8169	.8063	.7610	.4863	.6478	.8789	.4451
85	9.24	12.91	8.74	23.57	19.56	.0000	.6842	.1921	.0519	.0519	1.5373	.8398	.8299	.7933	.4116	.5891	.8966	.4349
90	10.09	13.59	11.37	20.43	18.26	.0000	.6847	.1922	.0491	.0491	1.5410	.8376	.8275	.7939	.3945	.5676	.9088	.4372
95	10.19	13.53	13.64	17.43	17.52	.0000	.6777	.1945	.0471	.0471	1.5394	.8316	.8211	.7909	.3875	.5500	.9252	.4469

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1388	1.4875	86.35	87.08	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	964.9	574.8	583.7	573.2	768.3	-38.2	52.78	-3.83	-21.12	46.65	625.7	835.3	225.5	-607.4	542.9	569.2
10	18.350	19.110	964.4	583.8	626.7	583.0	733.0	14.4	49.46	1.41	-15.24	44.39	649.9	816.2	170.8	-571.0	562.2	585.4
15	19.070	19.740	943.7	585.9	643.4	584.3	690.2	42.5	47.01	4.16	-9.37	43.89	652.6	810.9	106.0	-562.3	584.2	604.7
30	21.140	21.600	905.4	620.0	678.9	619.8	598.8	14.5	41.40	1.34	4.07	46.22	681.7	896.2	-48.8	-647.2	647.6	661.7
50	23.970	24.200	851.3	599.1	657.2	598.9	541.1	12.7	39.47	1.21	16.40	50.57	685.4	943.4	-193.2	-728.7	734.3	741.4
70	26.790	26.880	787.1	533.8	545.9	533.6	566.6	14.6	46.10	1.57	25.04	56.57	602.9	969.5	-254.1	-808.9	820.7	823.5
85	28.860	28.900	737.6	483.0	488.0	482.8	553.4	16.3	48.60	1.93	34.13	60.94	589.8	994.3	-330.8	-869.1	884.1	885.3
90	29.570	29.600	718.7	463.6	467.9	463.4	545.5	13.5	49.38	1.67	37.60	62.57	591.1	1006.4	-360.4	-893.2	905.9	906.8
95	30.240	30.270	702.6	448.2	453.2	448.1	536.8	9.5	49.83	1.21	40.67	63.98	597.8	1021.4	-389.6	-917.8	926.4	927.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.41	6.41	12.66	54.61	62.56	.0000	.5983	.1364	.0323	.0323	.9468	.0000	.0000	.8345	.8723	.4953	.5730	.7198
10	1.54	5.79	17.36	48.05	59.57	.0000	.5742	.1684	.0415	.0415	.9343	.0000	.0000	.7910	.8669	.5038	.5866	.7044
15	1.08	5.39	19.57	42.85	56.99	.0000	.5517	.1600	.0409	.0409	.9397	.0000	.0000	.7918	.8496	.5063	.5889	.7008
30	-.99	3.77	15.31	40.06	51.63	.0000	.4965	.0849	.0241	.0241	.9700	.0000	.0000	.8692	.8154	.5386	.6118	.7786
50	-.17	5.28	11.92	38.25	44.59	.0000	.4950	.0442	.0142	.0142	.9860	.0000	.0000	.9376	.7621	.5189	.6125	.8172
70	8.13	14.20	14.44	44.53	44.26	.0000	.5737	.0733	.0264	.0264	.9801	.0000	.0000	.9009	.6927	.4555	.5313	.8271
85	11.73	18.21	16.98	46.66	45.29	.0000	.6277	.1172	.0455	.0455	.9718	.0000	.0000	.8240	.6418	.4090	.5109	.8419
90	12.47	19.05	17.37	47.72	45.93	.0000	.6494	.1269	.0505	.0505	.9710	.0000	.0000	.8111	.6232	.3918	.5105	.8505
95	12.71	19.44	17.53	48.62	46.74	.0000	.6677	.1320	.0538	.0538	.9711	.0000	.0000	.8030	.6067	.3782	.5141	.8618

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7021.	160.00	1.1388	1.4422	74.46	80.50

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	548.4	1062.4	548.4	642.1	.0	846.2	.00	52.81	36.24	-28.94	679.9	734.2	-402.0	355.1	402.0	491.1
10	14.100	16.790	568.6	1036.9	568.6	666.4	.0	794.3	.00	50.00	37.22	-22.76	714.1	723.2	-432.0	279.9	432.0	514.4
15	15.170	17.580	581.6	1000.1	581.6	669.9	.0	742.5	.00	47.94	38.62	-16.91	744.5	700.6	-464.8	203.9	464.8	538.6
30	18.280	19.910	608.6	916.6	608.6	664.3	.0	631.4	.00	43.53	42.59	-1.81	827.2	665.8	-560.1	21.4	560.1	610.0
50	22.190	23.090	617.1	828.6	617.1	597.0	.0	574.4	.00	43.90	47.75	12.58	918.3	611.7	-679.9	-133.1	679.9	707.4
70	25.880	26.260	521.2	744.4	521.2	446.9	.0	595.1	.00	53.12	56.67	25.21	949.5	494.3	-792.9	-209.5	792.9	804.6
85	28.450	28.610	442.0	679.7	442.0	379.6	.0	563.8	.00	56.04	63.11	39.48	977.4	491.9	-871.7	-312.8	871.7	876.6
90	29.320	29.410	421.9	659.7	421.9	356.7	.0	554.8	.00	57.28	64.83	44.13	992.6	497.7	-898.3	-346.2	898.3	901.1
95	30.150	30.180	413.4	643.9	413.4	344.1	.0	544.2	.00	57.69	65.89	47.84	1012.1	513.1	-923.7	-380.4	923.7	924.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.79	2.12	8.22	65.18	71.32	.0000	.2016	.2427	.0437	.0437	1.4656	.8721	.8651	******	.5057	.9749	.6279	.6737
10	-4.26	2.36	8.47	59.98	66.13	.0000	.2519	.1490	.0301	.0301	1.4827	.9132	.9083	.0288	.5257	.9484	.6626	.6615
15	-3.60	2.64	10.05	55.53	63.01	.0000	.3072	.1134	.0252	.0252	1.4801	.9276	.9235	.6268	.5380	.9104	.6920	.6378
30	-2.57	3.07	11.91	44.40	53.28	.0000	.4042	.0648	.0170	.0170	1.4720	.9483	.9454	.8815	.5640	.8255	.7710	.5996
50	-.62	4.32	7.78	35.17	38.86	.0000	.5228	.1514	.0438	.0438	1.4494	.8647	.8575	.8008	.5681	.7346	.8545	.5424
70	5.75	9.94	5.09	31.46	26.95	.0000	.6851	.2323	.0685	.0685	1.5001	.8102	.7992	.7482	.4713	.6463	.8704	.4292
85	9.95	13.62	9.39	23.63	19.55	.0000	.6973	.2035	.0544	.0544	1.5364	.8330	.8226	.7829	.3988	.5846	.8901	.4231
90	10.78	14.28	11.79	20.70	18.26	.0000	.6965	.2019	.0512	.0512	1.5429	.8323	.8218	.7849	.3821	.5658	.9027	.4269
95	10.86	14.21	13.69	18.05	17.52	.0000	.6866	.2009	.0486	.0486	1.5445	.8293	.8185	.7848	.3754	.5512	.9194	.4393

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1398	1.4893	86.04	86.79	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	955.8	567.1	570.4	566.2	766.9	-29.0	53.36	-2.95	-21.44	46.58	612.8	823.8	224.0	-598.3	542.9	569.3
10	18.350	19.110	956.3	575.6	617.2	574.7	730.3	13.3	49.79	1.31	-15.24	44.86	640.0	811.2	168.1	-572.2	562.2	585.5
15	19.070	19.740	935.8	578.2	634.4	576.5	687.8	44.0	47.31	4.36	-9.28	44.21	643.3	804.3	103.5	-560.8	584.3	604.8
30	21.140	21.600	893.9	608.4	666.3	608.2	595.8	16.0	41.79	1.51	4.42	46.70	669.4	887.2	-51.9	-645.8	647.7	661.8
50	23.970	24.200	844.5	589.1	643.7	588.9	546.7	12.5	40.34	1.22	16.27	51.05	670.8	937.3	-187.7	-728.9	734.4	741.4
70	26.790	26.880	784.3	524.5	531.1	524.2	576.7	17.6	47.39	1.93	24.76	56.95	585.3	961.8	-244.1	-805.9	820.8	823.6
85	28.860	28.900	731.9	473.9	474.2	473.6	557.6	16.4	49.63	1.99	34.56	61.41	576.1	989.8	-326.6	-869.0	884.2	885.4
90	29.570	29.680	714.9	457.2	456.0	457.0	550.5	12.7	50.37	1.58	37.93	62.92	578.6	1004.3	-355.5	-894.2	906.0	906.9
95	30.240	30.270	701.9	445.5	445.0	445.4	542.8	8.0	50.66	1.02	40.75	64.15	587.7	1021.7	-383.7	-919.5	926.5	927.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.90	6.91	13.55	56.31	62.56	.0000	.5999	.1401	.0332	.0332	.9462	.0000	.0000	.8305	.8633	.4884	.5616	.7095
10	1.85	6.10	17.26	48.48	59.56	.0000	.5787	.1761	.0433	.0433	.9322	.0000	.0000	.7814	.8591	.4965	.5775	.6997
15	1.42	5.73	19.77	42.95	56.96	.0000	.5549	.1679	.0429	.0429	.9375	.0000	.0000	.7810	.8419	.4995	.5797	.6948
30	-.58	4.18	15.46	40.28	51.60	.0000	.5014	.0872	.0248	.0248	.9699	.0000	.0000	.8662	.8046	.5282	.5996	.7702
50	.62	6.07	11.93	39.12	44.56	.0000	.5049	.0470	.0151	.0151	.9853	.0000	.0000	.9388	.7552	.5096	.5992	.8107
70	9.37	15.43	14.79	45.46	44.24	.0000	.5872	.0825	.0296	.0296	.9778	.0000	.0000	.8905	.6897	.4467	.5155	.8191
85	12.75	19.22	17.03	47.64	45.29	.0000	.6394	.1174	.0456	.0456	.9722	.0000	.0000	.8260	.6365	.4008	.4983	.8372
90	13.46	20.04	17.28	48.79	45.93	.0000	.6598	.1272	.0506	.0506	.9712	.0000	.0000	.8142	.6191	.3860	.4989	.8479
95	13.57	20.31	17.35	49.63	46.74	.0000	.6756	.1342	.0547	.0547	.9707	.0000	.0000	.8012	.6053	.3755	.5045	.8612

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7022.	157.17	1.1398	1.4427	76.97	80.04

Blade-Element and Over-All Performance with Radial Inlet Distortion, Vortex Generator and Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	537.9	1054.0	537.9	628.5	.0	845.8	.00	53.38	36.76	-29.45	671.4	722.3	-401.8	354.9	401.8	490.9
10	14.100	16.790	557.5	1030.0	557.5	657.8	.0	792.5	.00	50.30	37.75	-22.91	705.2	714.7	-431.8	278.3	431.8	514.2
15	15.170	17.580	570.3	994.0	570.3	663.3	.0	740.3	.00	48.13	39.16	-16.92	735.6	693.7	-464.6	201.9	464.6	538.4
30	18.280	19.910	596.2	909.9	596.2	654.1	.0	632.4	.00	44.02	43.17	-1.95	818.0	655.5	-559.8	22.6	559.8	609.7
50	22.190	23.090	603.1	826.5	603.1	584.7	.0	583.8	.00	44.97	48.39	11.94	908.7	597.6	-679.6	-123.3	679.6	707.1
70	25.880	26.260	506.9	743.0	506.9	430.8	.0	605.1	.00	54.58	57.38	24.90	941.4	475.4	-792.6	-199.1	792.6	804.2
85	28.450	28.610	429.7	680.7	429.7	369.8	.0	571.4	.00	57.09	63.75	39.49	971.5	479.2	-871.3	-304.7	871.3	876.2
90	29.320	29.410	410.3	663.8	410.3	350.0	.0	564.0	.00	58.19	65.43	43.87	987.3	486.2	-897.9	-336.7	897.9	900.7
95	30.150	30.180	401.7	649.3	401.7	338.7	.0	553.9	.00	58.56	66.49	47.52	1006.9	502.0	-923.3	-370.3	923.3	924.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.28	2.63	7.72	66.21	71.32	.0000	.2090	.2552	.0457	.0457	1.4627	.8684	.8613	*******	.4955	.9658	.6194	.6618
10	-3.73	2.89	8.32	60.66	66.13	.0000	.2539	.1478	.0298	.0298	1.4827	.9156	.9108	.0499	.5149	.9412	.6538	.6531
15	-3.06	3.18	10.05	56.07	63.02	.0000	.3077	.1082	.0240	.0240	1.4811	.9321	.9283	.6420	.5271	.9041	.6833	.6309
30	-1.99	3.64	11.78	45.11	53.29	.0000	.4105	.0704	.0185	.0185	1.4707	.9451	.9421	.8727	.5518	.8186	.7620	.5898
50	-.08	5.01	7.14	36.46	38.86	.0000	.5365	.1637	.0474	.0474	1.4535	.8583	.8507	.7873	.5532	.7319	.8444	.5292
70	6.48	10.66	4.78	32.48	26.96	.0000	.7060	.2476	.0732	.0732	1.5040	.8031	.7916	.7354	.4575	.6442	.8621	.4122
85	10.56	14.23	9.41	24.26	19.56	.0000	.7112	.2132	.0571	.0571	1.5409	.8286	.8179	.7744	.3879	.5850	.8840	.4118
90	11.37	14.87	11.53	21.56	18.26	.0000	.7098	.2105	.0536	.0536	1.5501	.8291	.8182	.7774	.3715	.5689	.8971	.4167
95	11.47	14.81	13.37	18.96	17.52	.0000	.6996	.2085	.0507	.0507	1.5534	.8269	.8158	.7782	.3644	.5554	.9138	.4294

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1411	1.4922	85.62	86.40	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	945.6	555.7	553.4	551.5	766.7	-62.8	54.18	-6.52	-22.05	48.87	597.1	838.8	224.1	-631.8	542.7	569.0
10	18.350	19.110	947.2	564.1	604.4	562.9	729.1	4.1	50.34	.40	-15.47	45.88	627.4	809.3	167.2	-581.2	562.0	585.2
15	19.070	19.740	927.6	568.2	624.1	566.3	686.0	47.1	47.70	4.76	-9.29	44.55	633.0	794.6	102.0	-557.4	584.0	604.5
30	21.140	21.600	884.3	596.4	652.7	596.1	596.4	20.0	42.41	1.93	4.44	47.08	655.7	875.8	-51.0	-641.5	647.4	661.5
50	23.970	24.200	839.7	579.1	631.5	578.9	553.4	15.2	41.24	1.50	15.98	51.42	657.0	928.7	-180.6	-725.9	734.1	741.1
70	26.790	26.880	781.5	518.9	516.1	518.6	586.5	18.2	48.69	2.01	24.46	57.19	567.5	957.9	-233.9	-805.0	820.4	823.2
85	28.860	28.900	731.0	473.3	463.9	473.2	565.0	12.9	50.61	1.56	34.50	61.51	563.2	992.3	-318.9	-872.1	883.8	885.0
90	29.570	29.600	716.6	457.7	448.2	457.6	559.1	9.9	51.29	1.24	37.69	62.95	566.8	1006.7	-346.4	-896.6	905.6	906.5
95	30.240	30.270	705.4	445.7	438.6	445.7	552.5	6.2	51.55	.80	40.41	64.17	576.3	1023.0	-373.6	-920.8	926.1	927.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.66	7.66	9.98	60.70	62.54	.0000	.6162	.1458	.0344	.0344	.9450	.0000	.0000	.8246	.8530	.4782	.5473	.7218
10	2.36	6.62	16.34	49.94	59.55	.0000	.5889	.1859	.0458	.0458	.9296	.0000	.0000	.7703	.8504	.4862	.5661	.6976
15	1.84	6.15	20.16	42.94	56.94	.0000	.5602	.1787	.0456	.0456	.9345	.0000	.0000	.7672	.8342	.4905	.5696	.6859
30	.08	4.83	15.86	40.48	51.55	.0000	.5081	.0963	.0273	.0273	.9673	.0000	.0000	.8541	.7956	.5172	.5863	.7594
50	1.39	6.82	12.21	39.73	44.53	.0000	.5152	.0580	.0186	.0186	.9821	.0000	.0000	.9298	.7504	.5003	.5873	.8022
70	10.61	16.66	14.87	46.68	44.22	.0000	.5970	.0871	.0313	.0313	.9767	.0000	.0000	.8870	.6872	.4413	.4997	.8146
85	13.73	20.21	16.61	49.05	45.29	.0000	.6454	.1191	.0462	.0462	.9719	.0000	.0000	.8244	.6350	.4000	.4864	.8385
90	14.38	20.96	16.94	50.05	45.93	.0000	.6662	.1358	.0540	.0540	.9692	.0000	.0000	.8030	.6197	.3860	.4882	.8490
95	14.47	21.20	17.12	50.76	46.74	.0000	.6834	.1500	.0611	.0611	.9670	.0000	.0000	.7789	.6078	.3753	.4942	.8613

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7019.	154.37	1.1411	1.4420	78.11	79.22

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE ($90 - \beta_{10}$) RADIAL INLET DISTORTION, VORTEX GENERATOR AND HONEYCOMB TIP TREATMENT

(probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 147.16			W_{COR} = 139.19			W_{COR} = 133.75			W_{COR} = 127.95		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	32.8	35.9	34.35	31.9	33.8	32.85	31.2	32.8	32.0	30.0	32.0	31.0
10	39.2	41.3	40.25	37.1	39.8	38.45	36.4	38.8	37.6	35.3	37.8	36.55
15	43.5	45.7	44.6	42.2	44.1	43.15	40.8	43.0	41.9	39.4	41.8	40.6
30	49.5	51.4	50.45	48.0	49.0	48.5	46.4	48.2	47.3	45.0	46.8	45.9
50	54.5	56.0	55.25	52.4	53.4	52.9	50.4	51.9	51.15	48.2	50.1	49.15
70	53.0	52.7	52.85	50.4	50.4	50.4	47.8	48.8	48.3	45.0	47.2	46.1
85	51.1	51.4	51.25	46.4	47.3	46.85	45.1	45.7	45.4	42.4	44.1	43.25
90	50.7	51.9	51.3	45.1	46.3	45.7	43.2	44.1	43.65	40.7	41.8	41.25
95	51.1	52.7	51.9	43.4	46.7	45.05	40.0	41.9	40.95	40.2	40.1	40.15

90% SPEED

	W_{COR} = 165.0			W_{COR} = 157.21			W_{COR} = 152.11			W_{COR} = 148.65		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.9	34.4	33.15	31.5	33.7	32.6	30.9	32.9	31.9	30.3	32.5	31.4
10	30.6	40.9	39.75	37.6	39.5	38.55	36.1	39.1	37.6	35.7	38.6	37.15
15	43.3	45.7	44.5	41.8	44.4	43.1	41.0	43.2	42.1	40.6	42.7	41.65
30	49.9	51.4	50.65	48.2	49.5	48.85	46.9	48.8	47.85	46.0	48.2	47.1
50	54.9	55.9	55.4	52.7	53.8	53.25	50.8	52.4	51.6	49.6	51.4	50.5
70	53.0	52.9	52.95	50.2	57.0	50.6	48.2	49.6	48.9	46.7	48.5	47.6
85	50.7	50.9	50.8	46.3	47.0	46.65	44.0	44.8	44.4	43.6	44.5	44.05
90	51.3	51.8	51.55	44.1	46.6	45.35	42.0	43.5	42.75	41.7	42.3	42.0
95	51.2	52.7	51.95	42.1	46.9	44.5	39.3	40.7	40.0	39.3	40.1	39.7

95% SPEED

	W_{COR} = 171.79			W_{COR} = 162.77			W_{COR} = 160.0			W_{COR} = 157.17		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.5	33.8	32.65	30.9	32.6	31.75	30.1	32.4	31.25	30.1	32.8	31.45
10	38.0	40.4	39.2	36.9	38.9	37.9	35.9	38.9	37.4	35.8	38.4	37.1
15	43.1	46.0	44.55	41.7	43.8	42.75	41.3	43.7	42.5	40.3	43.3	41.8
30	49.9	51.6	50.75	47.5	49.3	48.4	47.1	48.8	47.95	46.3	48.4	47.35
50	54.5	55.9	55.2	51.6	53.4	52.5	50.7	52.6	51.65	50.1	51.8	50.95
70	53.2	53.0	53.1	48.9	50.1	49.5	47.8	49.3	48.55	46.4	48.6	47.5
85	50.7	51.1	50.9	44.5	45.3	44.9	43.8	44.6	44.2	42.8	44.1	43.45
90	50.9	51.5	51.2	42.6	45.5	44.05	41.3	43.4	42.35	40.4	41.9	41.15
95	52.4	53.5	52.95	40.3	45.6	42.95	38.7	40.7	39.7	37.5	38.5	38.0

APPENDIX 6

Blade Element and Overall Performance
with
Radial Inlet Distortion
and
Honeycomb Tip Treatment

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
1	13.120	16.030	501.5	341.5	501.5	600.9	.0	724.7	.00	50.33	33.33	-27.47	604.4	677.5	-337.4	312.6	337.4	412.2
2	14.100	16.730	520.7	321.1	520.7	601.3	.0	697.7	.00	49.24	34.84	-23.93	634.5	657.7	-362.6	265.3	362.6	431.7
3	15.170	17.580	533.3	889.9	533.3	607.5	.0	650.0	.00	46.32	36.17	-18.03	660.8	639.4	-330.1	197.3	390.1	452.0
4	18.280	19.910	556.2	806.4	556.2	605.8	.0	532.0	.00	41.26	40.18	-1.86	728.3	607.6	-470.0	20.1	470.0	512.0
5	22.190	23.030	566.3	710.4	566.3	560.0	.0	437.2	.00	37.38	45.20	15.63	804.0	581.8	-570.6	-156.5	570.6	593.7
6	25.880	26.260	477.7	621.1	477.7	462.7	.0	414.2	.00	41.97	54.32	29.43	819.9	531.3	-665.5	-261.1	665.5	675.2
7	28.450	28.610	407.4	568.2	407.4	382.5	.0	420.2	.00	47.69	60.89	39.51	837.5	495.8	-731.6	-315.4	731.6	735.7
8	29.320	29.410	395.5	549.2	395.5	354.8	.0	419.0	.00	49.77	62.31	43.56	851.5	493.9	-753.9	-337.2	753.9	756.2
9	30.150	30.180	389.5	532.2	389.5	334.5	.0	413.9	.00	51.07	63.39	47.26	867.2	493.2	-775.3	-362.1	775.3	776.0

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.11	-.20	9.75	61.40	71.39	.0000	.1301	.2343	.0427	.0427	1.3185	.9626	.9571	2.9359	.4611	.8633	.5565	.6212
10	-6.65	-.03	7.33	58.68	66.12	.0000	.2250	.1653	.0371	.0371	1.3298	.8824	.8775	1.6190	.4736	.8416	.5863	.6010
15	-6.06	.19	8.31	54.20	62.38	.0000	.2770	.1419	.0313	.0313	1.3286	.9010	.8969	.3372	.4309	.8102	.6106	.5822
30	-4.39	.66	11.85	42.04	53.25	.0000	.3654	.0782	.0205	.0205	1.3132	.9300	.9272	.8280	.5120	.7284	.6728	.5488
50	-3.34	1.64	10.90	29.58	38.30	.0000	.4404	.1081	.0309	.0308	1.2739	.8909	.8767	.8271	.5205	.6355	.7416	.5204
70	3.19	7.39	5.36	24.83	26.93	.0000	.5169	.1115	.0316	.0316	1.3041	.8823	.8777	.8443	.4338	.5487	.7480	.4699
85	7.73	11.40	3.42	21.37	19.55	.0000	.5825	.1496	.0400	.0400	1.3260	.8518	.8459	.8031	.3669	.4373	.7608	.4338
90	8.25	11.74	11.22	16.75	18.26	.0000	.5969	.1730	.0443	.0443	1.3241	.8278	.8208	.7845	.3578	.4792	.7734	.4275
95	8.36	11.70	13.12	16.12	17.52	.0000	.6032	.1873	.0458	.0458	1.3209	.8101	.8024	.7687	.3520	.4635	.7868	.4295

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WI/AI LBM/SEC SQFT
1.0911	1.3088	87.72	88.18	.00

STATOR

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.530	864.4	582.7	564.7	582.2	634.4	-206.6	43.21	-2.04	-19.40	40.56	598.7	766.4	138.8	-438.4	455.6	477.8
10	19.350	19.110	866.1	592.1	585.7	591.7	638.0	13.2	47.45	1.26	-15.84	38.94	609.0	760.9	166.2	-478.2	471.8	491.4
15	13.070	19.740	852.7	601.8	602.0	601.6	603.5	16.4	45.06	1.56	-10.67	39.23	613.2	776.7	113.2	-431.2	490.4	507.6
30	21.140	21.600	805.7	606.8	628.5	606.6	503.7	-15.1	38.69	-1.42	3.60	43.23	631.1	832.8	-33.9	-570.5	543.6	555.4
50	23.970	24.200	739.5	574.4	607.1	574.3	422.1	-10.5	34.80	-1.04	17.74	47.77	638.0	854.6	-134.2	-632.8	616.4	622.3
70	26.730	26.880	668.1	508.8	532.8	508.8	402.8	-3.0	37.12	-.33	28.27	53.75	605.3	861.1	-286.0	-694.2	688.9	691.2
85	28.860	28.900	625.6	459.3	469.6	459.3	413.3	3.4	41.36	.42	35.01	58.16	573.4	870.9	-328.8	-739.8	742.1	743.1
90	29.570	29.600	610.5	438.2	447.8	438.2	414.9	2.3	42.83	.30	37.66	59.39	565.8	876.4	-345.5	-758.8	760.4	761.1
95	30.240	30.270	597.0	419.0	431.4	419.0	412.7	-1.2	43.73	-.16	40.22	61.74	565.2	885.0	-364.9	-775.5	777.6	778.4

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-.68	3.37	14.47	51.24	62.61	.0000	.5072	.0398	.0237	.0237	.9667	.0000	.0000	.8453	.7851	.5113	.5469	.6726
10	-.33	3.33	17.24	46.19	59.64	.0000	.4905	.1239	.0306	.0306	.9586	.0000	.0000	.8082	.7823	.5199	.5515	.6681
15	-1.21	3.12	17.01	43.50	57.08	.0000	.4680	.1079	.0277	.0277	.9648	.0000	.0000	.8336	.7682	.5295	.5570	.6834
30	-4.00	.81	12.66	40.11	51.87	.0000	.4286	.0548	.0156	.0156	.9837	.0000	.0000	.8995	.7253	.5359	.5704	.7355
50	-4.67	.94	9.62	35.85	44.63	.0000	.4111	.0263	.0085	.0085	.9933	.0000	.0000	.9432	.6636	.5067	.5726	.7540
70	-.57	5.53	12.56	37.45	44.31	.0000	.4568	.0422	.0152	.0152	.9911	.0000	.0000	.9181	.5950	.4454	.5385	.7536
85	4.41	10.30	15.47	40.93	45.30	.0000	.5202	.0822	.0319	.0319	.9847	.0000	.0000	.8497	.5522	.3988	.5058	.7561
90	5.87	12.46	16.01	42.53	45.93	.0000	.5512	.1005	.0400	.0400	.9822	.0000	.0000	.8193	.5375	.3794	.4974	.7588
95	6.56	13.30	16.16	43.89	46.74	.0000	.5904	.1157	.0471	.0471	.9903	.0000	.0000	.7935	.5239	.3620	.4946	.7646

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5893.	147.27	1.0911	1.2866	82.02	82.69

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	463.5	908.9	463.5	566.2	.0	711.0	.00	51.46	36.06	-27.80	573.3	640.3	-337.4	298.7	337.4	412.3
10	14.100	16.790	482.3	881.4	482.3	562.1	.0	678.8	.00	50.37	36.94	-23.69	603.4	614.3	-362.6	247.0	362.6	431.8
15	15.170	17.580	494.2	849.4	494.2	568.8	.0	630.9	.00	47.35	39.28	-17.42	629.7	596.5	-330.2	178.6	390.2	452.1
30	18.280	19.910	514.1	776.6	514.1	566.2	.0	531.3	.00	43.16	42.42	-1.91	696.8	567.7	-470.2	19.2	470.2	512.1
50	22.190	23.090	519.9	692.7	519.9	519.1	.0	458.6	.00	41.46	47.65	14.60	772.2	536.5	-570.7	-135.2	570.7	593.9
70	25.880	26.260	434.2	621.1	434.2	413.6	.0	463.1	.00	48.26	56.87	27.25	735.3	465.4	-665.6	-212.3	665.6	675.4
85	28.450	28.610	367.1	578.3	367.1	339.4	.0	468.2	.00	54.06	63.35	38.26	819.7	432.3	-731.7	-267.6	731.7	735.8
90	29.320	29.410	355.9	563.3	355.9	315.2	.0	466.7	.00	55.99	64.72	42.60	833.9	429.5	-754.1	-289.7	754.1	756.4
95	30.150	30.180	349.6	549.9	349.6	300.6	.0	460.5	.00	56.87	65.73	46.38	850.6	436.1	-775.4	-315.7	775.4	776.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	-4.99	1.91	9.50	63.85	71.46	.0000	.1635	.1824	.0332	.0332	1.3281	.9016	.8975	3.0242	.4256	.8301	.5274	.5848
10	-4.56	2.05	7.54	60.63	66.15	.0000	.2498	.1664	.0334	.0334	1.3280	.9014	.8974	-.2746	.4435	.8016	.5574	.5587
15	-3.94	2.29	9.54	55.70	63.03	.0000	.3022	.1283	.0284	.0284	1.3241	.9158	.9123	.5259	.4540	.7701	.5817	.5408
30	-2.74	2.30	11.80	44.33	53.29	.0000	.3940	.0697	.0183	.0183	1.3177	.9423	.9400	.8588	.4717	.6988	.6430	.5108
50	-.84	4.12	9.83	33.05	38.87	.0000	.4845	.1185	.0339	.0339	1.2961	.8839	.8795	.8223	.4754	.6171	.7109	.4780
70	-5.90	10.09	7.12	29.62	26.35	.0000	.6059	.1678	.0486	.0486	1.3287	.8485	.8423	.7891	.3906	.5459	.7239	.4091
85	10.23	13.30	8.16	25.10	19.55	.0000	.6708	.1371	.0537	.0537	1.3563	.8300	.8225	.7694	.3289	.5038	.7426	.3766
90	10.66	14.16	10.26	22.13	18.26	.0000	.6843	.2140	.0557	.0557	1.3577	.8137	.8055	.7534	.3210	.4895	.7562	.3723
95	10.71	14.05	12.24	19.35	17.52	.0000	.6823	.2202	.0547	.0547	1.3576	.8041	.7954	.7464	.3159	.4770	.7701	.3783

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0961	1.3257	87.17	87.67	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B*-1 DEGREE	B*-2 DEGREE	V*-1 FT/SEC	V*-2 FT/SEC	VO*-1 FT/SEC	VO*-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	930.0	527.0	525.5	526.2	542.4	-25.3	50.72	-2.76	-19.56	43.72	557.7	729.1	186.7	-503.2	455.7	477.9
10	18.350	19.110	822.5	530.5	537.8	529.6	622.3	15.3	49.16	2.08	-15.61	41.71	558.6	709.7	150.3	-472.2	472.0	491.5
15	19.070	19.740	804.7	530.6	551.1	529.6	586.1	33.4	46.76	3.61	-9.87	41.84	559.9	710.9	95.7	-474.3	490.5	507.7
30	21.140	21.600	764.9	544.2	576.6	544.2	502.3	-1.2	41.04	-.13	4.08	45.63	579.1	778.7	-41.4	-556.8	543.7	555.5
50	23.970	24.200	710.0	518.2	557.0	518.2	440.4	1.1	38.33	.13	17.55	50.16	584.6	803.2	-176.1	-621.3	616.5	622.4
70	26.790	26.880	656.9	467.4	480.5	467.4	447.5	5.5	42.99	.67	26.74	55.71	538.2	830.3	-241.5	-685.9	689.0	691.3
85	29.860	29.900	625.1	432.8	423.1	432.7	460.1	7.0	47.41	.33	33.71	59.55	509.7	854.1	-282.2	-736.3	742.3	743.3
90	29.570	29.600	613.7	416.9	404.2	416.9	461.6	4.2	48.80	.56	36.49	61.15	503.0	864.5	-298.9	-757.1	760.5	761.3
95	30.240	30.270	603.4	402.2	391.7	402.2	453.1	-1.0	49.53	-.14	39.12	62.71	503.0	877.1	-319.7	-773.5	777.8	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M*-1	M*-2
5	.91	4.96	13.74	53.48	62.53	.0000	.5518	.1140	.0270	.0270	.9645	.0000	.0000	.9377	.7480	.4607	.5044	.6365
10	1.38	5.63	16.04	47.08	59.53	.0000	.5317	.1276	.0314	.0314	.9609	.0000	.0000	.9192	.7380	.4639	.5023	.6206
15	.69	5.01	18.03	43.15	57.00	.0000	.5134	.1198	.0307	.0307	.9646	.0000	.0000	.9267	.7225	.4645	.5055	.6224
30	-1.46	3.33	13.97	41.17	51.71	.0000	.4739	.0642	.0183	.0183	.9926	.0000	.0000	.9898	.6873	.4779	.5202	.6838
50	-1.19	4.27	10.85	38.20	44.63	.0000	.4684	.0355	.0114	.0114	.9916	.0000	.0000	.9378	.6366	.4542	.5225	.7093
70	4.95	11.02	13.54	42.32	44.25	.0000	.5302	.0521	.0187	.0187	.9894	.0000	.0000	.9328	.5834	.4061	.4787	.7213
85	10.32	16.79	15.97	46.48	45.29	.0000	.5899	.0862	.0335	.0335	.9941	.0000	.0000	.8698	.5497	.3732	.4470	.7366
90	11.76	18.34	16.26	48.24	45.92	.0000	.6172	.1054	.0419	.0419	.9813	.0000	.0000	.8350	.5379	.3586	.4402	.7436
95	12.43	19.15	16.18	49.57	46.74	.0000	.6439	.1236	.0503	.0503	.9789	.0000	.0000	.7989	.5270	.3453	.4391	.7531

NCORR RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5894.	137.27	1.0961	1.3012	81.32	82.03

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	446.2	894.4	446.2	546.9	.0	707.6	.00	52.30	37.13	-29.32	559.7	621.5	-337.9	234.8	337.9	412.8
10	14.100	16.750	464.6	868.5	464.6	546.6	.0	674.8	.00	50.95	35.00	-23.90	589.7	598.2	-363.1	242.5	363.1	432.4
15	15.170	17.590	476.4	836.8	476.4	552.6	.0	623.3	.00	49.66	39.34	-17.62	616.1	580.1	-390.6	175.6	390.6	452.7
30	18.280	19.910	495.0	786.1	495.0	553.0	.0	570.0	.00	43.76	43.53	-1.76	683.2	554.3	-470.7	17.3	470.7	512.7
50	22.190	23.090	493.4	636.2	493.4	502.9	.0	466.9	.00	42.85	48.83	14.27	759.0	518.3	-571.4	-127.7	571.4	594.6
70	25.880	26.260	413.6	621.0	413.6	392.1	.0	481.3	.00	50.85	58.16	26.49	784.5	438.2	-666.4	-184.9	666.4	676.2
85	28.450	28.610	347.4	580.6	347.4	316.7	.0	486.8	.00	56.86	64.62	38.23	810.9	403.7	-732.6	-249.9	732.6	736.7
90	29.320	29.410	336.5	566.6	336.5	292.0	.0	485.4	.00	58.93	65.37	42.37	826.7	393.4	-755.0	-271.9	755.0	757.3
95	30.150	30.180	330.1	553.5	330.1	278.7	.0	478.2	.00	59.77	66.96	46.38	843.7	408.9	-776.4	-298.5	776.4	777.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.92	2.98	8.99	65.45	71.49	.0000	.1755	.1858	.0337	.0337	1.3279	.9038	.8999	3.9596	.4094	.8151	.5145	.5664
10	-3.50	3.10	7.33	61.90	66.16	.0000	.2590	.1586	.0318	.0318	1.3238	.9037	.9059	-.0817	.4270	.7886	.5445	.5432
15	-2.86	3.35	9.35	56.96	63.05	.0000	.3125	.1235	.0273	.0273	1.3257	.9220	.9188	.5725	.4372	.7574	.5690	.5250
30	-1.62	4.01	11.96	45.29	53.30	.0000	.4013	.0612	.0161	.0161	1.3207	.9510	.9491	.9779	.4537	.6884	.6306	.4991
50	.47	5.41	9.47	34.56	38.86	.0000	.5021	.1273	.0365	.0365	1.3013	.8812	.8767	.8135	.4542	.6104	.6982	.4616
70	7.37	11.54	6.38	31.67	26.98	.0000	.6430	.1358	.0571	.0571	1.3363	.8334	.8263	.7626	.3692	.5447	.7140	.3844
85	11.51	15.16	8.19	26.34	13.55	.0000	.7103	.2265	.0617	.0617	1.3644	.8145	.8062	.7436	.3105	.5050	.7360	.3510
90	11.93	15.42	10.63	23.00	18.26	.0000	.7248	.2426	.0627	.0627	1.3663	.7993	.7902	.7294	.3026	.4914	.7495	.3464
95	11.94	15.27	12.85	19.93	17.53	.0000	.7195	.2454	.0603	.0603	1.3668	.7920	.7826	.7256	.2978	.4792	.7634	.3540

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.0980	1.3311	86.79	87.32	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	812.1	502.5	500.7	500.9	639.4	-36.2	51.94	-4.14	-20.09	45.77	533.2	718.3	183.1	-514.6	456.3	478.4
10	18.350	19.110	806.6	506.8	517.2	505.7	618.9	17.2	50.11	1.94	-15.79	43.17	537.8	694.0	146.3	-474.9	472.5	492.1
15	19.070	19.740	798.2	506.3	529.3	504.9	583.7	37.5	47.79	4.25	-9.35	42.99	539.0	690.4	32.7	-470.8	491.1	508.3
30	21.140	21.600	749.5	523.2	557.1	523.1	501.1	1.5	41.95	.17	4.40	46.65	559.8	762.6	-43.3	-554.7	544.4	556.2
50	23.970	24.200	638.6	497.6	537.7	497.6	445.9	2.7	39.67	.31	17.69	51.26	564.7	795.6	-171.3	-620.5	617.2	623.2
70	26.790	26.880	652.2	449.9	458.3	449.9	463.6	4.8	45.35	.61	26.34	56.78	511.5	821.8	-226.3	-687.4	689.9	692.2
85	28.860	28.900	623.3	417.2	400.5	417.2	477.6	6.2	50.03	.86	33.56	60.52	480.6	847.8	-265.6	-738.0	743.2	744.2
90	29.570	29.600	612.8	403.4	381.3	403.4	479.6	4.6	51.52	.65	36.48	61.96	474.4	858.4	-281.8	-757.6	761.5	762.2
95	30.240	30.270	603.0	391.0	369.2	391.0	476.8	.2	52.25	.03	39.26	63.35	477.1	871.9	-301.9	-779.3	778.7	779.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.03	6.07	12.36	56.08	62.59	.0000	.5744	.1197	.0293	.0283	.9641	.0000	.0000	.8340	.7312	.4386	.4826	.6268
10	2.33	6.58	17.99	48.17	53.57	.0000	.5513	.1330	.0342	.0342	.9588	.0000	.0000	.8071	.7225	.4424	.4826	.6053
15	1.82	6.14	19.66	43.54	56.96	.0000	.5318	.1320	.0338	.0338	.9624	.0000	.0000	.8118	.7069	.4424	.4842	.6032
30	-.46	4.31	14.14	41.78	51.64	.0000	.4893	.0706	.0201	.0201	.9815	.0000	.0000	.8799	.6733	.4587	.5014	.6685
50	.06	5.51	11.03	39.36	44.58	.0000	.4907	.0405	.0130	.0130	.9907	.0000	.0000	.9376	.6262	.4353	.5044	.6959
70	7.09	13.13	13.46	44.74	44.21	.0000	.5626	.0604	.0217	.0217	.9879	.0000	.0000	.9356	.5789	.3899	.4558	.7120
85	12.81	19.27	15.89	49.17	45.25	.0000	.6239	.0961	.0373	.0373	.9825	.0000	.0000	.8680	.5475	.3586	.4222	.7291
90	14.40	20.37	16.34	50.88	45.30	.0000	.6500	.1131	.0450	.0450	.9801	.0000	.0000	.8362	.5365	.3461	.4148	.7364
95	15.17	21.89	16.35	52.22	46.73	.0000	.6734	.1279	.0521	.0521	.9782	.0000	.0000	.8008	.5258	.3347	.4134	.7465

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5302.	132.36	1.0980	1.3049	80.63	81.38

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

80% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	427.6	881.7	427.6	533.7	.0	701.8	.00	52.75	38.28	-28.46	544.8	607.3	-337.6	289.4	337.6	412.4
10	14.100	16.790	445.8	858.1	445.8	543.2	.0	664.2	.00	50.72	39.13	-23.13	574.7	591.0	-362.8	232.2	362.8	432.0
15	15.170	17.580	457.5	828.5	457.5	550.5	.0	619.1	.00	48.36	40.46	-16.86	601.4	575.3	-390.3	166.8	390.3	452.3
30	18.280	19.910	474.4	759.1	474.4	541.4	.0	532.1	.00	44.49	44.72	-2.07	668.2	542.3	-470.3	19.8	470.3	512.3
50	22.190	23.090	476.1	688.2	476.1	486.4	.0	486.6	.00	45.03	50.16	12.51	743.5	498.3	-570.9	-107.5	570.9	594.1
70	25.880	26.260	391.7	628.5	391.7	371.3	.0	507.1	.00	53.79	59.51	24.42	773.0	407.8	-665.8	-168.5	665.8	675.6
85	28.450	28.610	328.2	588.8	328.2	291.1	.0	511.6	.00	60.38	65.85	37.67	802.2	368.1	-732.0	-224.5	732.0	736.1
90	29.320	29.410	316.2	575.0	316.2	264.1	.0	510.7	.00	62.66	67.25	42.99	818.0	361.3	-754.4	-246.0	754.4	756.7
95	30.150	30.180	308.8	562.1	308.8	252.8	.0	502.0	.00	63.27	68.29	47.31	834.9	373.3	-775.7	-274.4	775.7	776.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.77	4.12	8.88	66.74	71.52	.0000	.1767	.2021	.0366	.0366	1.3228	.8998	.8957	4.2516	.3922	.8024	.5007	.5527
10	-2.37	4.21	8.09	62.26	66.16	.0000	.2469	.1469	.0296	.0296	1.3276	.9190	.9156	-.1932	.4097	.7786	.5311	.5363
15	-1.73	4.46	10.13	57.31	63.08	.0000	.3002	.1074	.0239	.0239	1.3251	.9342	.9315	.5910	.4199	.7495	.5561	.5205
30	-.40	5.21	11.66	46.79	53.33	.0000	.4068	.0740	.0195	.0195	1.3190	.9436	.9413	.8525	.4343	.6815	.6178	.4869
50	2.05	6.96	7.78	37.64	38.94	.0000	.5276	.1603	.0464	.0464	1.3067	.8611	.8557	.7708	.4288	.6112	.6831	.4426
70	8.99	13.14	4.35	35.09	27.02	.0000	.6879	.2440	.0725	.0725	1.3426	.8065	.7982	.7142	.3456	.5503	.7034	.3570
85	12.78	16.41	7.67	28.17	19.64	.0000	.7628	.2785	.0764	.0764	1.3683	.7850	.7753	.6959	.2918	.5109	.7292	.3195
90	13.28	16.74	10.46	24.26	18.27	.0000	.7793	.2931	.0758	.0758	1.3713	.7714	.7610	.6846	.2829	.4977	.7420	.3127
95	13.26	16.59	13.19	20.98	17.54	.0000	.7694	.2903	.0709	.0709	1.3728	.7677	.7571	.6859	.2780	.4857	.7554	.3226

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1005	1.3340	85.24	85.84	29.63

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	795.7	480.2	479.7	477.3	634.9	-49.1	52.93	-5.88	-20.47	47.83	512.1	711.2	179.0	-527.1	455.9	478.0
10	18.350	19.110	791.0	483.9	503.0	482.7	610.4	8.7	50.51	1.03	-15.38	44.97	521.9	683.1	138.3	-483.0	472.1	491.7
15	19.070	19.740	775.0	485.4	519.3	483.7	575.1	40.8	47.91	4.82	-9.25	44.00	526.6	672.4	84.4	-467.1	490.6	507.9
30	21.140	21.600	736.9	501.5	539.1	501.4	502.2	4.7	42.96	.54	4.40	47.67	541.6	745.1	-41.7	-551.0	543.9	555.7
50	23.970	24.200	694.5	481.3	520.0	481.3	460.5	1.8	41.53	.22	16.74	52.20	543.2	785.7	-156.3	-620.8	616.7	622.6
70	26.790	26.880	654.6	436.8	437.4	436.7	486.6	7.4	48.07	.97	24.93	57.43	482.5	812.0	-202.7	-684.2	689.3	691.6
85	28.860	28.900	626.4	403.7	376.1	403.7	500.8	3.8	53.10	.54	32.74	61.37	447.1	842.8	-241.7	-739.7	742.5	743.5
90	29.570	29.600	616.2	391.0	354.9	391.0	503.6	2.8	54.84	.41	35.95	62.73	438.5	853.6	-257.2	-758.7	760.8	761.6
95	30.240	30.270	606.6	380.0	342.8	380.0	500.4	.6	55.59	.09	38.98	63.97	441.2	866.1	-277.6	-778.2	778.0	778.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.86	6.90	10.61	58.81	62.57	.0000	.5963	.1253	.0296	.0296	.9638	.0000	.0000	.8324	.7153	.4185	.4638	.6199
10	2.61	6.86	16.97	49.48	59.54	.0000	.5713	.1494	.0368	.0368	.9572	.0000	.0000	.7984	.7089	.4220	.4695	.5957
15	2.08	6.39	20.21	43.09	56.89	.0000	.5466	.1456	.0371	.0371	.9597	.0000	.0000	.7949	.6956	.4237	.4731	.5870
30	.63	5.38	14.47	42.41	51.53	.0000	.5086	.0797	.0226	.0226	.9798	.0000	.0000	.8700	.6624	.4389	.4839	.6521
50	1.75	7.17	10.92	41.31	44.49	.0000	.5178	.0478	.0153	.0153	.9891	.0000	.0000	.9413	.6224	.4201	.4856	.6858
70	9.52	15.54	13.79	47.10	44.14	.0000	.5950	.0724	.0260	.0260	.9855	.0000	.0000	.9347	.5808	.3774	.4316	.7015
85	15.65	22.10	15.56	52.56	45.20	.0000	.6628	.1104	.0428	.0428	.9798	.0000	.0000	.8634	.5499	.3461	.3939	.7225
90	17.56	24.12	16.10	54.43	45.87	.0000	.6885	.1271	.0506	.0506	.9775	.0000	.0000	.8304	.5388	.3344	.3837	.7300
95	18.56	25.26	16.40	55.50	46.72	.0000	.7089	.1410	.0574	.0574	.9758	.0000	.0000	.7907	.5281	.3243	.3808	.7391

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5896.	126.99	1.1005	1.3050	78.60	79.43

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	419.3	874.7	419.3	521.4	.0	702.2	.00	53.40	38.89	-29.00	538.6	596.5	-338.1	289.1	338.1	413.1
10	14.100	16.790	437.0	851.9	437.0	534.7	.0	663.1	.00	51.11	39.74	-23.30	568.3	582.5	-363.3	230.5	363.3	432.7
15	15.170	17.580	449.7	823.6	449.7	541.0	.0	621.0	.00	48.93	41.05	-17.24	595.2	566.6	-390.9	168.0	390.9	453.0
30	18.280	19.910	464.5	755.6	464.5	537.1	.0	531.4	.00	44.69	45.37	-1.95	661.7	537.7	-471.1	18.4	471.1	513.1
50	22.190	23.090	465.8	683.6	465.8	473.3	.0	435.2	.00	45.37	50.82	11.95	737.6	489.8	-571.8	-99.8	571.8	595.0
70	25.880	26.260	378.4	631.4	378.4	358.5	.0	519.7	.00	55.42	60.41	23.70	767.2	391.6	-666.9	-157.0	666.9	676.7
85	28.450	28.610	315.3	590.3	315.3	275.5	.0	521.9	.00	62.20	66.73	38.07	798.1	350.5	-733.1	-215.4	733.1	737.2
90	29.320	29.410	304.2	576.5	304.2	248.2	.0	520.3	.00	64.50	68.06	43.76	814.5	343.8	-755.5	-237.6	755.5	757.9
95	30.150	30.180	236.6	564.2	236.6	240.3	.0	510.5	.00	64.79	69.10	48.00	831.6	359.6	-776.9	-267.2	776.9	777.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.19	4.72	8.36	67.87	71.53	.0000	.1875	.2227	.0401	.0401	1.3205	.8921	.8879	6.8401	.3843	.7952	.4948	.5423
10	-1.78	4.81	7.91	63.04	66.16	.0000	.2530	.1559	.0314	.0314	1.3263	.9158	.9124	-.1504	.4016	.7723	.5251	.5281
15	-1.13	5.06	8.75	59.29	63.09	.0000	.3083	.1180	.0262	.0262	1.3248	.9294	.9265	.5721	.4117	.7445	.5504	.5121
30	.27	5.87	11.78	47.32	53.34	.0000	.4079	.0728	.0192	.0192	1.3200	.9455	.9433	.8545	.4250	.6780	.6122	.4825
50	2.98	7.88	7.20	38.38	39.03	.0000	.5390	.1756	.0510	.0510	1.3098	.8526	.8468	.7515	.4153	.6120	.6767	.4347
70	10.01	14.14	3.63	36.72	27.03	.0000	.7121	.2693	.0801	.0801	1.3466	.7948	.7860	.6916	.3316	.5522	.6987	.3424
85	13.63	17.25	8.16	28.66	19.74	.0000	.7882	.3021	.0825	.0825	1.3704	.7729	.7626	.6755	.2804	.5117	.7261	.3038
90	14.11	17.57	11.43	24.31	18.27	.0000	.8040	.3155	.0805	.0805	1.3729	.7596	.7487	.6656	.2716	.4984	.7389	.2973
95	14.07	17.40	13.89	21.10	17.55	.0000	.7887	.3081	.0742	.0742	1.3751	.7587	.7476	.6704	.2668	.4871	.7522	.3104

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1016	1.3358	84.75	85.37	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	787.9	462.8	465.4	457.7	635.7	-64.6	53.73	-8.04	-21.05	43.88	498.8	710.6	173.1	-543.3	456.6	473.8
10	18.350	19.110	783.0	466.5	491.4	465.1	609.5	-.1	50.12	-.02	-15.55	46.58	510.4	677.6	136.6	-432.5	472.9	492.4
15	19.070	19.740	769.2	470.0	509.0	468.3	576.1	38.5	48.59	4.82	-9.47	45.05	515.4	662.9	84.7	-469.2	491.4	508.7
30	21.140	21.600	730.8	489.7	531.0	489.5	501.8	8.5	43.37	1.12	4.59	46.15	533.6	734.2	-42.9	-547.1	544.8	556.6
50	23.970	24.200	692.4	474.2	513.6	474.2	464.4	2.0	42.12	.32	16.62	52.62	536.1	781.5	-153.3	-621.0	617.7	623.6
70	26.790	26.880	654.2	430.5	424.8	430.5	437.1	4.9	43.51	.64	24.52	57.94	467.0	811.7	-133.2	-687.8	690.3	692.7
85	28.860	29.300	624.9	396.7	360.1	396.6	510.7	2.4	54.31	.36	32.31	61.88	429.0	841.7	-233.0	-742.3	743.7	744.7
90	29.570	29.600	614.6	384.8	338.5	384.7	512.9	4.8	56.59	.71	36.37	63.08	420.6	850.1	-249.1	-758.0	762.0	762.8
95	30.240	30.270	605.4	375.5	329.1	375.5	509.3	5.1	57.19	.78	39.47	64.15	425.3	861.1	-270.4	-774.9	779.2	780.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.65	7.69	8.44	61.83	62.57	.0000	.6193	.1327	.0312	.0312	.9623	.0000	.0000	.8279	.7072	.4028	.4516	.6185
10	3.21	7.47	15.91	51.14	53.52	.0000	.5916	.1581	.0383	.0383	.9555	.0000	.0000	.7913	.7015	.4064	.4590	.5903
15	2.81	7.12	20.20	43.77	56.86	.0000	.5633	.1559	.0397	.0397	.9578	.0000	.0000	.7845	.6894	.4097	.4624	.5779
30	1.12	5.86	15.02	42.25	51.46	.0000	.5184	.0977	.0248	.0248	.9781	.0000	.0000	.8536	.6572	.4291	.4758	.6419
50	2.22	7.62	10.89	41.80	44.39	.0000	.5276	.0543	.0174	.0174	.9877	.0000	.0000	.9412	.6207	.4136	.4800	.6816
70	10.69	16.63	13.45	48.36	44.07	.0000	.6111	.0736	.0295	.0295	.9840	.0000	.0000	.9383	.5803	.3715	.4200	.7003
85	17.22	23.66	15.36	54.46	45.15	.0000	.6801	.1172	.0454	.0454	.9786	.0000	.0000	.8615	.5490	.3396	.3786	.7205
90	19.22	25.77	16.39	55.97	45.84	.0000	.7025	.1326	.0527	.0527	.9766	.0000	.0000	.8233	.5374	.3286	.3681	.7259
95	20.20	26.91	17.09	56.40	46.72	.0000	.7163	.1451	.0591	.0591	.9752	.0000	.0000	.7878	.5267	.3201	.3658	.7340

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5306.	123.95	1.1016	1.3049	77.75	78.61

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

90% of Design Speed

ROTOR

% SPAN	IN	IN	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	DEGREE	DEGREE	DEGREE	DEGREE	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC	FT/SEC
5	13.120	16.030	573.4	1064.0	573.4	681.8	.0	816.9	.00	50.15	33.55	-27.32	688.0	767.5	-380.2	352.3	380.2	464.6
10	14.100	16.790	594.4	1040.6	594.4	680.5	.0	787.3	.00	49.16	34.50	-23.82	721.3	744.2	-408.6	300.7	408.6	486.6
15	15.170	17.580	606.5	1006.1	606.5	685.7	.0	735.9	.00	47.01	35.84	-18.25	750.6	722.8	-439.6	226.5	439.6	509.5
30	18.260	19.910	637.4	912.1	637.4	664.6	.0	602.4	.00	41.31	39.71	-2.09	828.9	686.8	-529.8	25.4	529.8	577.0
50	22.190	23.090	652.7	801.6	652.7	633.4	.0	491.3	.00	37.79	44.56	15.70	916.4	658.3	-643.1	-177.9	643.1	669.2
70	25.840	26.260	556.7	694.6	556.7	517.7	.0	462.9	.00	41.84	53.31	29.99	935.9	598.2	-750.0	-298.1	750.0	761.0
85	28.450	28.610	476.9	632.3	476.9	427.5	.0	465.9	.00	47.47	59.85	40.36	953.6	561.0	-824.5	-363.2	824.5	829.1
90	29.370	29.410	465.4	608.9	465.4	395.9	.0	462.4	.00	49.46	61.28	44.57	962.9	556.1	-849.7	-389.9	849.7	852.3
95	30.150	30.180	457.8	587.0	457.8	369.6	.0	456.0	.00	50.99	62.35	48.55	986.5	558.7	-873.8	-418.6	873.8	874.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-E	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.46	-.57	5.63	60.87	71.30	.0000	.1527	.2471	.0451	.0451	1.4101	.8541	.8469	3.1305	.5300	.9827	.6367	.7089
10	-6.99	-.35	7.39	58.32	66.09	.0000	.2278	.1965	.0393	.0393	1.4265	.8752	.8688	-1.3744	.5506	.9565	.6699	.6840
15	-6.51	-.14	8.66	54.09	62.95	.0000	.2669	.1504	.0331	.0331	1.4278	.8957	.8903	.3542	.5638	.9205	.6977	.6614
30	-5.46	.20	11.62	41.79	53.23	.0000	.3700	.0798	.0209	.0209	1.4100	.9293	.9258	.8366	.5915	.8261	.7713	.6220
50	-3.97	1.00	10.98	28.86	38.90	.0000	.4432	.1084	.0309	.0309	1.3628	.8817	.8764	.8380	.6054	.7170	.8532	.5889
70	2.24	6.45	9.66	23.32	26.94	.0000	.5231	.1209	.0341	.0341	1.3672	.8727	.8667	.8427	.5098	.6114	.8600	.5265
85	6.73	10.40	10.26	19.49	19.55	.0000	.5616	.1497	.0396	.0396	1.4171	.8519	.8445	.8192	.4328	.5501	.8710	.4881
90	7.23	10.72	12.23	16.71	16.26	.0000	.5950	.1712	.0431	.0431	1.4133	.8294	.8210	.7972	.4229	.5280	.8849	.4822
95	7.33	10.66	14.41	13.79	17.53	.0000	.6001	.1883	.0449	.0449	1.4065	.8088	.7994	.7792	.4167	.5076	.8996	.4832

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1150	1.3984	87.41	87.99	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VR-1 FT/SEC	VM-2 FT/SEC	VD-1 FT/SEC	VD-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VD'-1 FT/SEC	VD'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	975.4	645.4	638.1	644.6	737.6	-29.0	49.14	-2.56	-19.35	41.36	676.4	658.6	224.1	-567.4	513.5	538.5
10	18.350	19.110	977.1	656.9	660.6	656.5	720.0	9.9	47.47	.85	-15.90	39.64	686.9	852.6	168.2	-543.9	531.8	553.8
15	19.070	19.740	973.3	666.8	679.6	666.5	682.3	18.7	45.10	1.60	-10.82	39.70	692.6	866.4	129.7	-553.4	552.7	572.1
30	21.150	21.600	912.4	675.6	712.2	675.4	569.8	-16.5	38.64	-1.39	3.41	43.55	714.9	932.3	-42.9	-642.4	612.6	626.0
50	23.970	24.200	836.9	642.8	689.4	642.7	474.5	-10.7	34.53	-.95	17.71	47.93	724.4	959.3	-220.2	-712.0	694.7	701.3
70	26.790	26.880	747.6	561.5	596.9	561.5	450.9	.6	37.00	.07	28.57	54.20	682.4	960.2	-325.5	-778.4	776.4	779.0
85	28.860	28.900	696.0	499.3	526.0	499.2	458.8	9.1	41.10	1.05	35.68	58.93	647.6	967.3	-377.6	-828.4	836.4	837.5
90	29.570	29.600	679.1	473.9	501.0	473.9	458.3	4.8	42.47	.56	38.52	60.94	640.5	976.1	-398.6	-853.0	857.0	857.8
95	30.240	30.270	661.3	450.8	480.3	450.8	454.6	-2.5	43.43	-.33	41.28	62.86	639.3	988.6	-421.8	-879.7	876.4	877.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-.70	3.34	13.93	51.72	62.60	.0000	.5209	.1125	.0267	.0267	.9549	.0000	.0000	.8386	.8886	.5626	.6193	.7487
10	-.33	3.93	16.83	46.62	59.64	.0000	.5032	.1363	.0336	.0336	.9453	.0000	.0000	.8042	.8857	.5731	.6247	.7439
15	-1.19	3.15	17.05	43.50	57.10	.0000	.4617	.1257	.0323	.0323	.9506	.0000	.0000	.8202	.8706	.5832	.6313	.7577
30	-4.08	.75	12.70	40.03	51.88	.0000	.4408	.0719	.0205	.0205	.9740	.0000	.0000	.8785	.8232	.5939	.6481	.8194
50	-4.95	.57	9.69	35.88	44.61	.0000	.4181	.0336	.0109	.0109	.9895	.0000	.0000	.9331	.7512	.5647	.6508	.8427
70	-.60	5.50	12.94	36.93	44.32	.0000	.4672	.0505	.0182	.0182	.9871	.0000	.0000	.9034	.6652	.4682	.6051	.8347
85	4.25	10.74	16.09	40.05	45.29	.0000	.5348	.0972	.0378	.0378	.9783	.0000	.0000	.8290	.6127	.4298	.5681	.8326
90	5.57	12.15	16.28	41.90	45.93	.0000	.5679	.1133	.0451	.0451	.9760	.0000	.0000	.8067	.5944	.4067	.5599	.8375
95	6.25	12.99	16.60	43.76	46.74	.0000	.5998	.1240	.0505	.0505	.9750	.0000	.0000	.7934	.5770	.3659	.5567	.8462

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6642.	164.43	1.1150	1.3651	80.88	81.73

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	536.7	1023.2	536.7	638.0	.0	799.4	.00	51.37	35.31	-27.65	657.8	721.3	-380.2	334.8	380.2	464.5
10	14.100	16.790	557.5	994.1	557.5	636.4	.0	763.6	.00	50.18	36.23	-23.49	691.2	694.4	-408.6	277.0	408.6	486.6
15	15.170	17.580	571.1	957.2	571.1	641.7	.0	710.1	.00	47.89	37.58	-17.35	720.8	672.0	-439.6	200.7	439.6	509.5
30	18.280	19.910	597.0	873.2	597.0	639.0	.0	594.9	.00	42.93	41.55	-1.57	798.3	640.7	-629.8	17.9	529.8	577.0
50	22.190	23.090	607.2	782.7	607.2	589.0	.0	514.5	.00	41.10	46.63	14.70	894.6	610.1	-643.1	-154.7	643.1	669.1
70	25.880	26.260	515.0	697.4	515.0	465.1	.0	519.3	.00	48.19	55.51	27.54	910.5	525.0	-750.0	-241.7	750.0	761.0
85	28.450	28.810	440.3	649.6	440.3	395.5	.0	515.2	.00	52.49	61.69	38.44	934.8	505.0	-824.5	-313.9	824.5	829.1
90	29.320	29.410	427.4	629.8	427.4	367.0	.0	511.0	.00	54.27	63.29	42.86	951.2	502.4	-849.7	-341.3	849.7	852.3
95	30.150	30.180	420.3	611.8	420.3	347.5	.0	503.3	.00	55.36	64.31	46.86	969.6	509.0	-873.7	-371.3	873.7	874.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-R SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.72	1.18	9.56	62.96	71.37	.0000	.1781	.2019	.0368	.0368	1.4193	.8884	.8827	5.2266	.4950	.9395	.6075	.6623
10	-5.26	1.37	7.74	59.73	66.13	.0000	.2582	.1736	.0344	.0348	1.4234	.8953	.8900	-.0709	.5152	.9083	.6410	.6345
15	-4.66	1.59	9.60	54.92	63.00	.0000	.3116	.1380	.0305	.0305	1.4179	.9082	.9036	.5526	.5277	.8708	.6687	.6121
30	-3.62	2.04	12.14	43.13	53.26	.0000	.4013	.0767	.0202	.0202	1.4077	.9357	.9325	.8576	.5519	.7869	.7408	.5774
50	-1.88	3.08	9.97	31.92	38.91	.0000	.4858	.1151	.0329	.0329	1.3845	.8868	.8815	.8379	.5601	.6968	.8203	.5431
70	4.43	8.64	7.40	27.96	26.93	.0000	.6106	.1670	.0482	.0482	1.4261	.8488	.8411	.8026	.4680	.6100	.8337	.4592
85	8.72	12.39	8.39	23.46	19.60	.0000	.6514	.1678	.0456	.0456	1.4683	.8538	.8457	.8099	.3976	.5626	.8513	.4374
90	9.21	12.71	10.52	20.43	18.26	.0000	.6620	.1835	.0475	.0475	1.4682	.8383	.8294	.7949	.3876	.5438	.8659	.4337
95	9.29	12.63	12.71	17.45	17.52	.0000	.6620	.1936	.0477	.0477	1.4653	.8257	.8162	.7845	.3816	.5270	.8815	.4384

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1209	1.4217	87.26	87.87	36.25

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	931.8	582.0	588.7	580.6	722.3	-36.8	50.82	-3.64	-19.53	44.73	624.7	817.4	208.7	-575.3	513.5	538.4
10	18.350	19.110	926.3	587.1	606.5	586.3	700.1	13.6	49.10	1.32	-15.51	42.64	629.6	797.4	168.3	-540.2	531.8	553.8
15	19.070	19.740	905.8	587.0	620.9	586.0	659.2	33.5	46.71	3.27	-9.76	42.58	630.7	796.0	106.6	-538.6	552.6	572.1
30	21.140	21.600	860.5	603.4	651.2	603.4	562.1	-1.2	40.78	-.11	4.40	46.09	654.4	870.4	-50.5	-627.2	612.6	626.0
50	23.970	24.200	804.8	584.3	635.6	584.3	493.8	-.9	37.84	-.09	17.55	50.23	667.1	913.7	-200.9	-702.2	694.6	701.3
70	26.790	26.880	740.8	524.2	543.2	524.2	503.4	2.6	42.85	.29	26.74	55.96	608.6	937.1	-273.0	-776.4	776.4	779.0
85	28.860	28.900	704.0	484.9	487.6	484.8	507.7	7.5	46.16	.89	33.98	59.71	588.2	961.4	-328.7	-830.1	836.4	837.5
90	29.570	29.600	688.8	465.1	466.9	465.1	506.3	3.8	47.33	.44	36.91	61.42	584.2	972.7	-350.6	-854.1	856.9	857.8
95	30.240	30.270	674.3	446.0	450.4	446.0	501.9	-4.8	48.10	-.62	39.74	63.17	585.9	988.4	-374.5	-882.0	876.4	877.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-R SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.97	5.00	12.86	54.46	62.58	.0000	.5646	.1236	.0293	.0293	.9540	.0000	.0000	.8344	.8423	.5051	.5673	.7094
10	1.29	5.55	17.28	47.78	59.59	.0000	.5449	.1436	.0354	.0354	.9471	.0000	.0000	.8083	.8325	.5098	.5673	.6924
15	.60	4.92	18.69	43.44	57.03	.0000	.5259	.1356	.0348	.0348	.9518	.0000	.0000	.8157	.8144	.5104	.5703	.6921
30	-1.73	3.06	13.88	40.89	51.71	.0000	.4831	.0759	.0216	.0216	.9752	.0000	.0000	.8771	.7739	.5269	.5885	.7600
50	-1.68	3.79	10.64	37.93	44.65	.0000	.4710	.0408	.0131	.0131	.9881	.0000	.0000	.9312	.7210	.5095	.5962	.7967
70	4.96	11.04	13.17	42.56	44.27	.0000	.5354	.0583	.0210	.0210	.9855	.0000	.0000	.9150	.6547	.4518	.5380	.8075
85	9.24	15.72	15.93	45.27	45.30	.0000	.5869	.1018	.0395	.0395	.9772	.0000	.0000	.8375	.6153	.4145	.5131	.8218
90	10.37	16.95	16.15	46.88	45.93	.0000	.6151	.1205	.0480	.0480	.9741	.0000	.0000	.8092	.6004	.3965	.5082	.8292
95	10.95	17.69	15.70	48.72	46.74	.0000	.6446	.1363	.0555	.0555	.9719	.0000	.0000	.7844	.5855	.3794	.5071	.8407

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6642.	155.84	1.1209	1.3858	80.81	81.71

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	521.5	1012.8	521.5	628.8	.0	793.9	.00	51.61	36.09	-27.64	645.3	710.1	-380.1	329.5	380.1	464.4
10	14.100	16.790	541.7	962.5	541.7	626.0	.0	757.2	.00	50.41	37.01	-23.35	678.5	682.3	-408.5	270.7	408.5	486.4
15	15.170	17.580	555.0	945.6	555.0	630.0	.0	705.0	.00	48.20	38.37	-17.24	708.0	660.1	-439.5	195.6	439.5	509.3
30	18.280	19.910	578.9	863.2	578.9	625.9	.0	594.3	.00	43.49	42.42	-1.56	784.6	627.4	-529.6	17.4	529.6	576.8
50	22.190	23.090	567.1	774.1	587.1	570.6	.0	522.9	.00	42.50	47.58	14.36	870.7	589.2	-642.9	-146.0	642.9	669.0
70	25.880	26.260	494.2	696.6	494.2	443.1	.0	537.2	.00	50.51	56.60	26.87	896.7	497.1	-749.8	-223.6	749.8	760.8
85	28.450	28.610	421.3	650.3	421.3	377.9	.0	529.1	.00	54.47	62.92	38.42	925.8	482.4	-824.3	-299.8	824.3	828.9
90	29.320	29.410	409.1	631.8	409.1	350.6	.0	525.4	.00	56.30	64.28	42.98	942.9	479.7	-849.5	-326.6	849.5	852.1
95	30.150	30.180	402.4	615.4	402.4	332.8	.0	517.7	.00	57.27	65.26	46.96	961.8	488.1	-873.5	-356.7	873.5	874.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.95	1.95	9.62	63.73	71.42	.0000	.1776	.1770	.0322	.0322	1.4252	.9049	.9000	4.5464	.4807	.9287	.5959	.6511
10	-4.47	2.14	7.88	60.37	66.15	.0000	.2599	.1548	.0311	.0311	1.4269	.9091	.9044	.0653	.5004	.8964	.6293	.6226
15	-3.85	2.38	9.73	55.40	63.02	.0000	.3155	.1243	.0276	.0276	1.4205	.9194	.9153	.6054	.5124	.8590	.6570	.5997
30	-2.74	2.90	12.16	43.98	53.28	.0000	.4078	.0714	.0185	.0185	1.4107	.9427	.9398	.8707	.5345	.7768	.7285	.5646
50	-.89	4.06	9.56	33.23	36.67	.0000	.5046	.1293	.0371	.0371	1.3670	.8781	.8723	.8223	.5401	.6877	.8071	.5235
70	5.59	9.79	6.73	29.73	26.94	.0000	.6431	.1907	.0554	.0554	1.4344	.8359	.8275	.7807	.4471	.6079	.8217	.4338
85	9.77	13.44	8.35	24.50	19.57	.0000	.6776	.1855	.0504	.0504	1.4761	.8444	.8357	.7939	.3794	.5623	.8422	.4171
90	10.20	13.70	10.64	21.30	18.26	.0000	.6865	.2010	.0520	.0520	1.4769	.8294	.8199	.7796	.3704	.5447	.8575	.4135
95	10.24	13.58	12.82	18.20	17.52	.0000	.6864	.2086	.0513	.0513	1.4755	.8190	.8090	.7717	.3649	.5293	.8734	.4198

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1228	1.4272	86.93	87.56	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	920.1	567.3	575.9	565.2	717.5	-45.0	51.25	-4.56	-19.52	45.90	611.1	612.3	204.1	-583.3	513.4	538.3
10	18.350	19.110	912.9	570.4	592.6	569.3	694.3	13.6	49.52	1.36	-15.34	43.45	614.8	784.8	162.7	-539.9	531.6	553.7
15	19.070	19.740	891.3	568.1	604.9	566.6	654.4	40.7	47.24	4.11	-9.57	43.15	614.1	776.7	101.9	-531.2	552.5	571.9
30	21.140	21.600	848.7	585.6	633.5	565.5	561.4	2.3	41.53	.23	4.57	46.77	636.8	655.5	-51.0	-623.5	612.5	625.8
50	23.970	24.200	792.0	562.9	613.7	562.9	500.7	-.1	39.21	-.01	17.54	51.24	644.0	699.4	-193.8	-701.2	694.5	701.1
70	26.790	26.880	735.8	507.1	520.2	507.1	520.0	3.3	45.02	.36	26.27	56.80	580.4	926.8	-256.1	-775.4	776.2	778.8
85	28.860	28.900	701.1	469.2	468.6	469.2	521.4	7.7	48.06	.95	33.89	60.51	564.7	953.1	-314.7	-829.6	836.1	837.3
90	29.570	29.600	667.0	452.2	448.6	452.2	520.3	5.4	49.25	.67	36.88	62.04	561.0	964.9	-336.4	-852.2	856.7	857.6
95	30.240	30.270	674.1	436.9	433.5	436.9	516.2	-1.4	49.97	-.19	39.69	63.55	563.6	981.1	-359.9	-878.4	876.1	877.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.38	5.42	11.93	55.61	62.58	.0000	.5759	.1297	.0307	.0307	.9527	.0000	.0000	.8285	.8302	.4920	.5540	.7044
10	1.74	5.99	17.34	48.13	59.57	.0000	.5548	.1492	.0367	.0367	.9464	.0000	.0000	.8028	.8193	.4948	.5528	.6808
15	1.24	5.56	19.52	43.13	56.98	.0000	.5357	.1421	.0364	.0364	.9508	.0000	.0000	.8074	.6007	.4933	.5538	.6745
30	-.92	3.86	14.20	41.30	51.66	.0000	.4941	.0778	.0221	.0221	.9753	.0000	.0000	.8753	.7611	.5105	.5712	.7459
50	-.39	5.07	10.71	39.22	44.61	.0000	.4918	.0418	.0135	.0135	.9882	.0000	.0000	.9363	.7068	.4896	.5749	.7823
70	7.03	13.10	13.25	44.64	44.26	.0000	.5631	.0664	.0239	.0239	.9838	.0000	.0000	.9114	.6493	.4357	.5127	.7962
85	11.10	17.58	15.99	47.11	45.29	.0000	.6149	.1131	.0439	.0439	.9749	.0000	.0000	.8288	.6120	.4001	.4916	.8126
90	12.24	18.82	16.37	48.58	45.93	.0000	.6400	.1293	.0515	.0515	.9724	.0000	.0000	.8054	.5980	.3846	.4872	.8205
95	12.85	19.56	16.14	50.16	46.74	.0000	.6645	.1417	.0577	.0577	.9709	.0000	.0000	.7825	.5844	.3708	.4865	.8325

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6640.	151.67	1.1228	1.3899	80.33	81.25

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	506.8	1006.1	506.8	617.0	.0	703.9	.00	52.10	36.93	-27.98	634.1	700.0	-381.0	328.4	381.0	465.5
10	14.100	16.790	526.7	977.7	526.7	622.0	.0	754.2	.00	50.47	37.85	-23.17	667.1	677.2	-409.4	266.6	409.4	487.5
15	15.170	17.580	539.7	942.0	539.7	624.0	.0	704.9	.00	48.44	39.21	-17.27	696.7	654.6	-440.5	194.4	440.5	510.5
30	18.280	19.910	562.2	859.8	562.2	618.6	.0	596.9	.00	43.96	43.32	-1.71	773.3	620.0	-530.8	18.8	530.8	578.1
50	22.190	23.090	569.0	773.7	569.0	557.7	.0	536.1	.00	43.87	48.54	13.57	859.7	573.8	-644.3	-134.4	644.3	670.5
70	25.880	26.260	475.0	699.5	475.0	425.6	.0	554.8	.00	52.53	57.69	26.09	889.6	474.1	-751.5	-207.7	751.5	762.5
85	28.450	28.610	401.4	650.9	401.4	354.0	.0	545.6	.00	56.96	64.08	38.78	918.5	455.4	-826.1	-285.1	826.1	830.7
90	29.320	29.410	389.7	634.3	389.7	329.5	.0	541.8	.00	58.71	65.40	43.45	936.4	454.4	-851.4	-312.1	851.4	854.0
95	30.150	30.180	383.2	619.6	383.2	315.6	.0	533.2	.00	59.38	66.36	47.36	955.7	466.4	-875.5	-343.1	875.5	876.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.11	2.79	9.30	64.91	71.45	.0000	.1792	.1849	.0336	.0336	1.4258	.9041	.8992	4.6432	.4668	.9213	.5851	.6410
10	-3.63	2.97	8.06	61.03	66.15	.0000	.2540	.1438	.0290	.0290	1.4310	.9179	.9137	.0379	.4862	.8915	.6186	.6175
15	-2.99	3.23	9.70	56.48	63.04	.0000	.3124	.1158	.0257	.0257	1.4258	.9273	.9235	.6186	.4980	.8551	.6467	.5943
30	-1.83	3.80	12.02	45.03	53.30	.0000	.4098	.0705	.0185	.0185	1.4149	.9445	.9417	.8696	.5186	.7730	.7183	.5574
50	.19	5.13	8.78	34.97	38.86	.0000	.5210	.1500	.0432	.0432	1.3919	.8650	.8585	.7969	.5206	.6863	.7961	.5090
70	6.85	11.03	5.97	31.60	26.97	.0000	.6719	.2218	.0649	.0649	1.4399	.8178	.8083	.7502	.4266	.6093	.8127	.4130
85	10.96	14.62	8.69	25.30	19.55	.0000	.7108	.2212	.0598	.0598	1.4781	.8216	.8116	.7600	.3602	.5617	.8355	.3929
90	11.34	14.83	11.11	21.95	18.26	.0000	.7196	.2338	.0600	.0600	1.4802	.8089	.7982	.7490	.3520	.5457	.8511	.3909
95	11.33	14.67	13.22	19.00	17.53	.0000	.7129	.2364	.0577	.0577	1.4807	.8021	.7910	.7455	.3470	.5320	.8671	.4004

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1253	1.4318	86.01	86.70	34.35

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	910.2	552.5	559.3	549.0	718.0	-58.6	52.08	-6.10	-19.99	47.44	595.3	812.0	203.5	-598.1	514.5	539.5
10	18.350	19.110	904.6	555.7	582.6	554.5	691.9	6.4	49.90	.66	-15.27	44.65	604.2	780.3	159.1	-548.5	532.8	554.9
15	19.070	19.740	884.2	555.1	595.3	553.6	653.6	40.8	47.66	4.21	-9.53	43.88	604.2	768.1	99.9	-532.4	553.7	573.2
30	21.140	21.600	839.2	573.4	621.3	573.4	563.8	4.8	42.21	.48	4.57	47.33	624.5	846.4	-50.0	-622.4	613.8	627.2
50	23.970	24.200	786.8	548.9	598.5	548.9	510.7	2.0	40.48	.21	17.21	51.92	626.9	890.2	-185.3	-700.7	696.0	702.7
70	26.790	26.880	734.1	491.6	501.2	491.6	536.1	5.4	46.95	.63	25.82	57.60	557.1	918.2	-241.8	-775.2	777.9	780.5
85	28.860	28.900	697.8	454.0	445.5	454.0	537.1	5.8	50.33	.73	34.04	61.42	537.8	949.1	-300.9	-833.4	838.0	839.2
90	29.570	29.600	685.0	440.2	426.2	440.2	536.2	4.0	51.53	.52	37.11	62.76	534.7	962.2	-322.4	-855.5	858.6	859.5
95	30.240	30.270	673.9	429.0	414.0	429.0	531.7	-.5	52.10	-.07	39.91	63.99	539.9	978.6	-346.4	-879.5	878.1	879.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.06	6.10	10.40	58.18	62.57	.0000	.5912	.1334	.0315	.0315	.9523	.0000	.0000	.8275	.8206	.4785	.5404	.7032
10	2.08	6.33	16.61	49.24	59.56	.0000	.5682	.1581	.0389	.0389	.9440	.0000	.0000	.7940	.8118	.4815	.5436	.6761
15	1.78	6.09	19.61	43.45	56.94	.0000	.5463	.1518	.0388	.0388	.9482	.0000	.0000	.7951	.7943	.4815	.5438	.6662
30	-.18	4.59	14.44	41.72	51.61	.0000	.5038	.0814	.0231	.0231	.9745	.0000	.0000	.8711	.7543	.4992	.5590	.7368
50	.80	6.24	10.93	40.26	44.56	.0000	.5093	.0472	.0152	.0152	.9868	.0000	.0000	.9349	.7038	.4764	.5594	.7726
70	8.79	14.84	13.48	46.33	44.22	.0000	.5898	.0793	.0285	.0285	.9808	.0000	.0000	.9028	.6476	.4212	.4927	.7865
85	13.27	19.74	15.77	49.60	45.27	.0000	.6447	.1167	.0453	.0453	.9744	.0000	.0000	.8353	.6087	.3859	.4677	.8068
90	14.49	21.06	16.22	51.01	45.91	.0000	.6664	.1291	.0514	.0514	.9727	.0000	.0000	.8161	.5953	.3733	.4633	.8159
95	15.03	21.75	16.25	52.17	46.74	.0000	.6849	.1382	.0563	.0563	.9717	.0000	.0000	.7935	.5831	.3631	.4642	.8283

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6655.	147.56	1.1253	1.3923	79.13	80.12

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	498.6	1001.1	498.6	611.7	.0	792.5	.00	52.33	37.37	-28.19	627.0	694.3	-300.2	328.0	380.2	464.5
10	14.100	16.790	518.3	973.7	518.3	618.0	.0	752.3	.00	50.59	38.24	-23.25	660.0	673.1	-408.6	265.8	408.6	486.5
15	15.170	17.580	531.2	939.2	531.2	621.0	.0	704.6	.00	48.60	39.60	-17.43	689.5	651.2	-439.6	195.1	439.6	509.4
30	18.280	19.910	552.8	857.2	552.8	613.3	.0	598.7	.00	44.36	43.75	-2.00	765.8	614.6	-529.7	21.8	529.7	576.9
50	22.190	23.090	558.5	773.2	558.5	550.8	.0	542.4	.00	44.57	49.01	12.99	851.8	565.3	-643.0	-126.7	643.0	669.1
70	25.880	26.260	464.6	700.2	464.6	416.4	.0	562.8	.00	53.52	58.20	25.52	882.8	461.6	-749.9	-198.2	749.9	760.9
85	28.450	28.610	392.0	652.0	392.0	344.9	.0	553.3	.00	56.07	64.56	38.64	913.0	441.7	-824.4	-275.7	824.4	829.0
90	29.320	29.410	380.0	636.1	380.0	320.4	.0	549.4	.00	59.76	65.89	43.58	930.6	441.3	-849.6	-302.8	849.6	852.2
95	30.150	30.180	373.2	622.0	373.2	307.9	.0	540.4	.00	60.33	66.86	47.30	950.1	454.6	-873.7	-334.1	873.7	874.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SPOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.72	3.18	9.10	65.51	71.46	.0000	.1786	.1943	.0352	.0352	1.4222	.9009	.8959	4.5152	.4591	.9163	.5784	.6354
10	-3.25	3.35	7.96	61.49	66.15	.0000	.2516	.1467	.0295	.0295	1.4267	.9176	.9133	-.0403	.4783	.8874	.6119	.6135
15	-2.60	3.61	9.54	57.03	63.05	.0000	.3103	.1164	.0258	.0258	1.4251	.9281	.9249	.6052	.4899	.8524	.6400	.5910
30	-1.40	4.23	11.72	45.75	53.31	.0000	.4117	.0755	.0199	.0199	1.4139	.9417	.9388	.8597	.5095	.7704	.7113	.5524
50	.74	5.67	8.21	36.02	38.88	.0000	.5267	.1606	.0464	.0464	1.3928	.8588	.8520	.7833	.5093	.6854	.7881	.5012
70	7.44	11.61	5.41	32.69	26.98	.0000	.6865	.2379	.0700	.0700	1.4407	.8089	.7989	.7344	.4158	.6095	.8062	.4018
85	11.44	15.10	8.55	25.92	19.55	.0000	.7269	.2388	.0647	.0647	1.4770	.8110	.8009	.7434	.3515	.5622	.8305	.3809
90	11.64	15.33	11.04	22.51	18.26	.0000	.7348	.2494	.0641	.0641	1.4801	.7999	.7887	.7344	.3429	.5469	.8458	.3795
95	11.84	15.17	13.17	19.56	17.53	.0000	.7264	.2498	.0610	.0610	1.4814	.7947	.7831	.7329	.3377	.5337	.8617	.3901

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1261	1.4316	85.46	86.17	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.560	900.7	542.3	550.2	537.7	716.8	-66.6	52.49	-7.07	-20.29	48.36	586.7	809.5	203.3	-605.0	513.5	538.4
10	18.350	19.110	896.0	595.3	579.3	596.0	690.3	2.8	50.23	.29	-15.43	45.32	596.1	774.6	150.5	-551.0	531.7	553.8
15	19.070	19.740	677.3	544.2	566.6	564.6	653.1	41.6	47.96	4.36	-9.69	44.24	597.7	760.3	100.5	-530.5	552.6	572.0
30	21.140	21.600	834.3	565.0	613.3	564.9	566.4	4.4	42.66	.45	4.37	47.71	616.2	840.0	-47.2	-621.5	612.6	625.9
50	23.970	24.200	769.0	550.7	590.9	540.7	515.2	.1	41.09	.02	16.90	52.35	617.6	865.5	-179.3	-701.1	694.6	701.3
70	26.790	26.880	735.2	484.2	492.0	484.2	543.2	4.4	47.86	.52	25.42	57.97	545.0	913.8	-233.1	-774.6	776.3	778.9
85	28.860	28.900	697.3	447.8	435.8	447.8	544.4	4.8	51.33	.62	33.82	61.72	524.7	945.5	-291.9	-832.6	836.3	837.4
90	29.570	29.600	685.2	434.8	417.0	434.8	543.6	2.1	52.51	.27	36.92	63.05	521.9	959.9	-313.3	-855.6	856.9	857.7
95	30.240	30.270	674.5	424.2	405.7	424.2	538.9	-3.4	53.62	-.45	39.73	64.28	527.6	977.4	-337.4	-880.5	876.3	877.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SPOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.46	6.49	9.42	59.56	62.57	.0000	.6014	.1360	.0320	.0320	.9519	.0000	.0000	.8261	.6139	.4694	.5321	.7006
10	2.39	6.69	16.23	49.94	59.54	.0000	.5771	.1615	.0397	.0397	.9435	.0000	.0000	.7914	.6061	.4722	.5366	.6707
15	2.12	6.45	19.76	43.66	56.92	.0000	.5534	.1570	.0401	.0401	.9469	.0000	.0000	.7892	.7900	.4734	.5375	.6590
30	.31	5.07	14.39	42.21	51.57	.0000	.5115	.0645	.0240	.0240	.9738	.0000	.0000	.8677	.7500	.4915	.5510	.7307
50	1.35	6.79	10.73	41.07	44.54	.0000	.5204	.0503	.0162	.0162	.9641	.0000	.0000	.9350	.7013	.4086	.5515	.7679
70	9.60	15.69	13.57	47.34	44.20	.0000	.6032	.0611	.0291	.0291	.9604	.0000	.0000	.9070	.6468	.4144	.4826	.7819
85	14.23	20.69	15.65	50.71	45.25	.0000	.6577	.1161	.0447	.0447	.9748	.0000	.0000	.8434	.6082	.3803	.4562	.8029
90	15.46	22.03	15.97	52.24	45.90	.0000	.6757	.1278	.0506	.0506	.9730	.0000	.0000	.8228	.5951	.3684	.4518	.8131
95	15.98	22.76	15.67	53.48	46.73	.0000	.6964	.1378	.0561	.0561	.9718	.0000	.0000	.7976	.5833	.3587	.4532	.8264

NCORR INLET RPM	VCORR INLET FT/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6641.	145.28	1.1261	1.3914	78.51	79.51

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.171	16.030	607.3	1172.7	607.3	716.5	.0	664.3	.00	50.34	33.39	-27.04	727.0	609.0	-400.1	375.4	400.1	488.9
10	14.101	16.790	529.1	1123.3	529.1	717.0	.0	632.0	.00	59.24	34.35	-24.03	762.1	785.4	-430.0	319.9	430.0	512.1
15	15.171	17.540	544.2	1143.4	544.2	724.0	.0	778.6	.00	57.07	35.68	-18.49	793.2	764.3	-462.7	242.4	462.7	536.2
30	18.281	19.910	676.3	943.5	676.3	723.7	.0	635.7	.00	51.26	39.47	-2.22	876.6	726.2	-557.5	28.5	557.5	607.2
50	22.191	23.090	694.7	849.2	694.7	673.5	.0	517.2	.00	37.62	44.24	15.53	970.0	699.5	-676.8	-187.0	676.8	704.2
70	25.491	26.260	597.3	730.9	599.3	546.9	.0	484.7	.00	41.56	52.78	30.09	991.7	632.6	-789.3	-316.2	789.3	800.9
85	28.451	28.910	515.5	661.0	515.5	442.1	.0	491.3	.00	48.07	59.28	40.77	1009.4	583.9	-867.7	-381.2	867.7	872.6
90	29.320	29.410	501.0	636.8	501.2	410.2	.0	486.9	.00	49.90	60.73	45.00	1025.1	580.6	-894.2	-410.1	894.2	897.0
95	30.151	30.130	492.3	615.3	492.3	386.4	.0	478.8	.00	51.10	61.81	46.60	1043.3	587.1	-919.5	-441.6	919.5	920.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.63	-.72	9.04	61.04	71.22	.0000	.1558	.2771	.0504	.0504	1.4514	.8367	.8277	3.4715	.5624	1.0406	.6742	.7499
10	-7.15	-.50	7.15	59.38	66.06	.0000	.2289	.2184	.0436	.0436	1.4720	.8617	.8540	-1.5467	.5843	1.0128	.7093	.7242
15	-6.53	-.30	8.13	54.16	62.93	.0000	.2804	.1638	.0360	.0360	1.4774	.8870	.8807	.3027	.5987	.9757	.7388	.7013
30	-5.71	-.03	11.49	41.69	53.21	.0000	.3697	.0866	.0227	.0227	1.4582	.9238	.9197	.8272	.6302	.8740	.8186	.6587
50	-4.27	.68	10.01	23.71	33.90	.0000	.4396	.1066	.0304	.0304	1.4080	.8844	.8787	.8439	.6475	.7600	.9078	.6260
70	1.83	6.00	9.25	22.69	26.94	.0000	.5226	.1292	.0364	.0364	1.4264	.8639	.8569	.8366	.5476	.6424	.9150	.5559
85	6.23	9.36	10.03	14.51	17.55	.0000	.5908	.1708	.0449	.0449	1.4559	.8321	.8231	.8014	.4666	.5730	.9251	.5062
90	5.69	10.18	12.05	15.73	18.25	.0000	.6017	.1890	.0472	.0472	1.4525	.8126	.8028	.7836	.4563	.5501	.9391	.5015
95	-6.79	-10.12	14.66	13.01	17.53	.0000	.6026	.2010	.0477	.0477	1.4465	.7969	.7861	.7710	.4497	.5302	.9542	.5058

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	AI/AI INLET LBM/SEC SQFT
1.1273	1.4425	86.67	87.34	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1027.2	667.6	667.6	666.6	780.7	-39.1	49.46	-2.94	-19.79	42.03	709.6	897.4	240.2	-600.8	540.4	566.7
10	18.350	19.110	1026.8	680.7	692.1	680.3	761.2	10.8	47.72	.49	-16.24	40.05	721.0	889.0	201.5	-572.0	559.7	582.8
15	19.070	19.740	1016.6	692.4	716.2	692.0	721.4	24.8	45.20	2.00	-11.06	39.83	730.5	901.1	139.8	-577.2	581.6	602.1
30	21.140	21.600	963.2	703.6	752.2	703.4	601.1	-13.5	38.40	-1.09	3.29	43.68	755.0	973.1	-43.7	-672.2	644.8	658.8
50	23.970	24.200	866.7	676.4	732.6	676.3	499.5	-10.0	34.26	-.84	17.54	47.88	769.0	1008.5	-231.6	-748.1	731.1	738.1
70	26.790	26.880	769.3	585.4	632.3	585.4	472.2	.4	36.78	.01	28.66	54.46	721.0	1007.6	-344.9	-819.5	817.1	819.8
85	28.860	28.900	729.9	513.9	546.6	513.8	463.6	6.2	41.51	.69	35.77	59.58	675.4	1015.1	-376.6	-875.3	880.2	881.4
90	29.570	29.600	705.6	484.2	520.1	466.2	462.7	1.4	42.88	.15	38.08	61.45	668.3	1024.4	-419.2	-901.4	901.9	902.8
95	30.250	30.270	651.9	462.4	501.7	462.3	477.5	-6.3	43.05	-.79	41.61	63.55	669.7	1038.2	-444.7	-929.5	922.3	923.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-.37	3.66	13.57	52.40	62.60	.0000	.5343	.1185	.0241	.0241	.9489	.0000	.0000	.8386	.9368	.5795	.6503	.7791
10	-.18	4.07	16.87	46.83	59.64	.0000	.5149	.1422	.0351	.0351	.9385	.0000	.0000	.8059	.9351	.5915	.6586	.7725
15	-1.12	5.25	17.51	43.14	57.11	.0000	.4919	.1370	.0342	.0342	.9418	.0000	.0000	.8130	.9205	.6033	.6670	.7852
30	-4.12	.70	13.00	39.70	51.08	.0000	.4456	.0816	.0233	.0233	.9680	.0000	.0000	.8689	.8705	.6166	.6857	.8529
50	-5.20	.37	9.79	35.12	44.60	.0000	.4218	.0359	.0119	.0119	.9879	.0000	.0000	.9324	.7967	.5929	.6917	.8841
70	-.81	5.30	12.54	36.78	44.32	.0000	.4733	.0465	.0168	.0168	.9870	.0000	.0000	.9134	.6995	.5073	.6387	.8730
85	4.66	11.16	15.73	40.82	45.79	.0000	.5499	.0910	.0359	.0359	.9782	.0000	.0000	.8464	.6387	.4401	.5909	.8693
90	6.00	12.59	15.86	42.73	45.53	.0000	.5647	.1078	.0429	.0429	.9755	.0000	.0000	.8233	.6169	.4150	.5821	.8743
95	6.48	13.23	15.53	44.44	46.74	.0000	.6165	.1201	.0469	.0469	.9740	.0000	.0000	.8076	.6015	.3937	.5812	.8840

WCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6990.	171.96	1.1273	1.4039	79.96	80.53

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	559.0	1073.5	559.0	668.3	.0	840.1	.00	51.50	35.67	-27.62	688.2	754.5	-401.3	349.8	401.3	490.3
10	14.100	16.790	580.7	1040.9	580.7	665.9	.0	800.0	.00	50.22	36.59	-23.25	723.3	725.2	-431.2	286.5	431.2	513.5
15	15.170	17.580	594.8	1002.4	594.8	668.4	.0	745.8	.00	48.16	37.94	-17.36	754.4	700.9	-464.0	209.2	464.0	537.7
30	18.280	19.910	621.7	918.1	621.7	667.2	.0	630.5	.00	43.36	41.93	-1.82	836.3	668.9	-559.1	21.5	559.1	608.9
50	22.190	23.090	632.8	827.5	632.8	608.5	.0	560.7	.00	42.66	46.99	13.46	928.0	625.8	-678.7	-145.5	678.7	706.2
70	25.880	26.260	537.3	741.1	537.3	465.9	.0	576.0	.00	51.07	55.81	26.10	957.4	519.3	-791.5	-227.2	791.5	803.2
85	28.450	28.610	459.1	687.0	459.1	403.2	.0	556.2	.00	54.06	62.18	38.33	984.0	514.2	-870.1	-318.8	870.1	875.0
90	29.320	29.410	446.2	666.3	446.2	377.8	.0	548.8	.00	55.48	63.54	42.86	1001.7	516.0	-896.7	-350.7	896.7	899.5
95	30.150	30.180	439.2	646.2	439.2	360.0	.0	539.1	.00	56.27	64.53	46.82	1021.4	526.5	-922.1	-384.0	922.1	923.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.37	1.54	9.60	63.28	71.37	.0000	.1796	.2009	.0366	.0366	1.4729	.8910	.8849	5.5114	.5167	.9877	.6370	.6942
10	-4.90	1.72	7.99	59.84	66.13	.0000	.2605	.1758	.0354	.0354	1.4745	.8957	.8899	-.0171	.5379	.9524	.6724	.6636
15	-4.29	1.96	9.60	55.30	63.00	.0000	.3174	.1451	.0321	.0321	1.4684	.9055	.9003	.5559	.5510	.9125	.7018	.6381
30	-3.23	2.41	11.90	43.75	53.27	.0000	.4065	.0781	.0205	.0205	1.4632	.9365	.9330	.8598	.5765	.8272	.7788	.6027
50	-1.50	3.46	8.70	33.53	38.88	.0000	.5080	.1381	.0398	.0398	1.4434	.8713	.8646	.8159	.5851	.7347	.8641	.5557
70	4.77	8.97	5.96	29.72	26.93	.0000	.6551	.2055	.0601	.0601	1.4916	.8250	.8149	.7725	.4888	.6447	.8784	.4517
85	8.98	12.65	8.30	23.85	19.61	.0000	.6740	.1796	.0489	.0489	1.5397	.8492	.8398	.8049	.4157	.5920	.8971	.4431
90	9.45	12.95	10.53	20.67	18.26	.0000	.6787	.1894	.0491	.0491	1.5401	.8387	.8280	.7960	.4054	.5725	.9128	.4433
95	9.51	12.86	12.67	17.71	17.51	.0000	.6746	.1954	.0481	.0481	1.5379	.8297	.8191	.7896	.3994	.5556	.9296	.4513

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1377	1.4824	86.23	86.96	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.560	970.2	590.0	608.5	587.1	759.1	-59.0	51.30	-5.26	-19.07	46.66	646.2	355.6	217.5	-622.3	542.0	568.3
10	18.350	19.110	965.1	591.4	626.8	590.4	733.7	7.4	49.49	.72	-15.38	44.32	650.4	325.7	172.5	-577.1	561.2	584.5
15	19.070	19.740	944.7	589.2	639.5	587.5	692.4	39.1	47.27	3.80	-9.70	43.84	649.4	315.2	109.2	-564.7	583.3	603.7
30	21.140	21.600	899.6	618.1	674.2	614.0	595.2	2.9	41.42	.28	4.31	46.94	677.4	899.9	-51.3	-657.7	646.6	660.6
50	23.970	24.200	847.0	595.2	655.6	595.2	536.3	-2.0	39.29	-.19	16.73	51.26	684.9	951.5	-176.9	-742.2	733.1	740.2
70	26.790	26.860	769.0	532.9	549.8	532.9	558.6	1.9	45.49	.21	25.44	56.97	609.2	978.5	-260.8	-820.2	819.4	822.1
85	28.860	28.900	741.9	489.9	498.7	489.8	549.3	6.6	47.77	.77	33.76	60.82	600.1	1004.9	-333.3	-877.3	882.7	883.9
90	29.570	29.600	725.6	472.1	479.8	472.1	544.3	5.1	48.61	.61	36.89	62.32	600.2	1016.6	-360.1	-900.2	904.4	905.3
95	30.240	30.270	711.0	456.7	465.3	456.7	537.7	-1.0	49.33	-.13	37.76	63.76	605.4	1033.2	-367.2	-926.8	924.9	925.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.41	5.45	11.23	56.56	62.58	.0000	.5879	.1322	.0312	.0312	.9476	.0000	.0000	.8330	.6788	.5093	.5865	.7387
10	1.79	5.95	16.66	48.76	59.57	.0000	.5686	.1543	.0380	.0380	.9397	.0000	.0000	.8051	.6670	.5107	.5855	.7131
15	1.28	5.66	19.27	43.47	57.01	.0000	.5493	.1960	.0379	.0379	.9443	.0000	.0000	.8077	.6477	.5094	.5861	.7047
30	-1.02	2.76	14.25	41.15	51.66	.0000	.5025	.0325	.0235	.0235	.9712	.0000	.0000	.8735	.6093	.5335	.6080	.7818
50	-.33	5.13	10.53	39.48	44.62	.0000	.5009	.0491	.0158	.0158	.9846	.0000	.0000	.9280	.7578	.5157	.6117	.8244
70	7.17	13.64	13.01	45.28	44.26	.0000	.5755	.0744	.0268	.0268	.9799	.0000	.0000	.8977	.6899	.4551	.5364	.8356
85	10.90	17.38	15.12	47.00	45.30	.0000	.6235	.1187	.0461	.0461	.9712	.0000	.0000	.8212	.6456	.4153	.5203	.8519
90	11.69	18.27	16.52	48.00	45.93	.0000	.6451	.1316	.0529	.0529	.9693	.0000	.0000	.8037	.6296	.3993	.5191	.8598
95	12.01	18.75	16.26	49.26	46.74	.0000	.6662	.1401	.0571	.0571	.9686	.0000	.0000	.7895	.6145	.3856	.5212	.8723

RCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7010.	160.71	1.1377	1.4374	79.34?	80.39

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VU-1 FT/SEC	VU-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VU'-1 FT/SEC	VU'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	549.5	1065.7	549.5	665.0	.0	832.7	.00	51.39	35.97	-27.44	679.0	749.5	-398.8	345.4	398.8	487.3
10	14.100	16.790	570.7	1033.0	570.7	663.1	.0	792.0	.00	50.06	36.90	-22.98	713.8	720.7	-428.6	281.6	428.6	510.4
15	15.170	17.580	584.5	994.2	584.5	665.8	.0	738.2	.00	47.94	38.26	-17.00	744.6	696.8	-461.2	203.8	461.2	534.4
30	18.280	19.910	610.5	909.8	610.5	662.5	.0	623.5	.00	43.25	42.28	-1.55	825.7	663.9	-555.7	18.3	555.7	605.3
50	22.190	23.090	620.0	823.5	620.0	602.2	.0	561.7	.00	43.01	47.40	13.11	916.4	618.3	-674.6	-140.2	674.6	701.9
70	25.880	26.260	524.4	741.6	524.4	460.1	.0	581.3	.00	51.67	56.30	25.34	946.2	509.5	-786.7	-217.0	786.7	798.3
85	28.450	28.610	447.4	681.5	447.4	391.6	.0	557.8	.00	54.93	62.64	38.54	973.9	500.8	-864.9	-312.0	864.9	869.7
90	29.320	29.410	434.5	657.7	434.5	360.3	.0	550.1	.00	56.80	64.00	43.68	991.7	498.8	-891.3	-344.0	891.3	894.1
95	30.150	30.180	427.5	636.1	427.5	340.3	.0	539.6	.00	57.70	64.99	47.96	1011.3	508.6	-916.5	-377.7	916.5	917.5

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.06	1.84	9.81	63.41	71.41	.0000	.1734	.1870	.0341	.0341	1.4704	.6996	.8940	4.0389	.5077	.9801	.6283	.6894
10	-4.58	2.03	8.26	59.88	66.14	.0000	.2543	.1625	.0328	.0328	1.4714	.9044	.8991	-.0314	.5285	.9449	.6636	.6593
15	-3.96	2.26	9.96	55.26	63.02	.0000	.3111	.1330	.0295	.0295	1.4644	.9140	.9093	.5747	.5412	.9049	.6928	.6342
30	-2.84	2.76	12.16	43.63	53.28	.0000	.4027	.0742	.0195	.0195	1.4563	.9400	.9367	.8643	.5657	.8197	.7693	.5981
50	-1.05	3.89	8.31	34.29	38.65	.0000	.5104	.1437	.0414	.0414	1.4366	.8683	.8614	.8073	.5722	.7310	.8531	.5488
70	5.38	9.57	5.21	30.96	26.95	.0000	.6632	.2170	.0639	.0639	1.4890	.8169	.8086	.7594	.4744	.6450	.8676	.4431
85	9.54	13.26	8.45	24.10	19.55	.0000	.6849	.1992	.0540	.0540	1.5264	.8346	.8246	.7844	.4028	.5871	.8880	.4314
90	9.94	13.43	11.34	20.32	18.26	.0000	.6934	.2136	.0546	.0546	1.5229	.8197	.8087	.7716	.3939	.5647	.9040	.4283
95	9.97	13.31	13.82	17.04	17.52	.0000	.6893	.2201	.0531	.0531	1.5190	.8095	.7980	.7647	.3882	.5466	.9204	.4357

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1367	1.4762	85.94	86.68	.00

STATOR

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VU-1 FT/SEC	VU-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VU'-1 FT/SEC	VU'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	965.6	589.3	604.5	585.8	752.9	-60.4	51.24	-5.89	-19.52	46.66	641.4	656.9	214.2	-625.2	538.7	564.8
10	18.350	19.110	957.0	589.6	622.6	588.4	726.6	6.8	49.39	.67	-15.15	44.26	645.6	822.3	168.8	-574.2	557.8	580.9
15	19.070	19.740	934.2	586.2	635.2	584.7	684.6	42.0	47.14	4.11	-9.40	43.67	644.5	808.3	105.1	-558.1	579.7	600.1
30	21.140	21.600	890.1	608.7	667.5	606.6	588.6	3.9	41.39	.37	4.60	46.96	670.8	892.6	-54.1	-652.8	642.6	656.6
50	23.970	24.200	840.7	589.6	647.4	589.7	556.4	-3.7	39.65	-.36	16.55	51.41	675.7	945.4	-192.3	-739.4	728.7	735.7
70	26.790	26.880	782.1	527.6	542.1	527.8	563.4	.5	46.13	.05	24.91	57.12	598.2	972.7	-251.1	-816.7	814.4	817.1
85	28.860	28.900	735.1	479.6	486.7	479.6	550.8	4.4	48.54	.53	35.86	61.25	586.4	997.2	-326.5	-874.2	877.3	878.5
90	29.570	29.600	715.7	461.7	463.3	461.7	545.5	3.8	49.67	.47	37.35	62.73	583.1	1008.1	-353.5	-896.0	898.9	899.8
95	30.250	30.270	699.2	448.1	448.1	448.1	538.4	.9	50.36	.12	40.48	64.01	586.7	1022.7	-380.9	-919.3	919.3	920.2

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.34	5.37	10.00	57.13	62.57	.0000	.5654	.1343	.0317	.0317	.9474	.0000	.0000	.8288	.6718	.5092	.5820	.7404
10	1.60	5.85	16.62	48.73	59.57	.0000	.5652	.1567	.0386	.0386	.9395	.0000	.0000	.8000	.8597	.5096	.5812	.7107
15	1.19	5.51	19.52	43.03	56.97	.0000	.5455	.1505	.0385	.0385	.9441	.0000	.0000	.8022	.8402	.5071	.5814	.6993
30	-1.02	3.75	14.33	41.02	51.64	.0000	.5008	.0811	.0231	.0231	.9721	.0000	.0000	.8745	.8009	.5290	.6017	.7758
50	-.00	5.45	10.35	40.60	44.55	.0000	.5043	.0494	.0159	.0159	.9847	.0000	.0000	.9304	.7520	.5109	.6034	.8195
70	8.15	14.22	12.92	46.07	44.28	.0000	.5837	.0841	.0302	.0302	.9774	.0000	.0000	.8855	.6685	.4505	.5271	.8303
85	11.61	16.08	15.57	48.01	45.28	.0000	.6359	.1721	.0474	.0474	.9708	.0000	.0000	.8197	.6405	.4064	.5087	.8450
90	12.67	19.25	16.17	49.20	45.92	.0000	.6559	.1280	.0496	.0496	.9716	.0000	.0000	.8172	.6217	.3904	.5046	.8523
95	13.24	19.97	16.44	50.24	46.74	.0000	.6720	.1729	.0501	.0501	.9733	.0000	.0000	.8159	.6042	.3782	.5044	.8632

NCORE INLET RPM	WCORE INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6967.	158.25	1.1367	1.4317	78.98	80.05

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

95% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VU-1 FT/SEC	VU-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VU'-1 FT/SEC	VU'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.170	16.030	530.9	1053.8	536.9	644.9	.0	833.3	.00	52.26	36.63	-28.17	669.1	731.9	-399.3	345.5	399.3	487.8
10	14.100	16.790	557.6	1023.5	557.6	651.6	.0	789.2	.00	50.45	37.58	-23.09	703.6	708.9	-429.1	278.2	429.1	511.0
15	15.170	17.580	571.2	985.2	571.2	653.1	.0	737.6	.00	48.47	38.94	-17.22	734.5	684.1	-461.7	202.6	461.7	535.0
30	18.280	19.910	596.1	898.4	596.1	647.1	.0	623.0	.00	43.90	42.99	-1.48	815.5	648.5	-556.3	17.1	556.3	605.9
50	22.190	23.090	604.6	813.7	604.6	583.5	.0	567.1	.00	44.16	48.15	13.09	906.5	599.1	-675.3	-135.6	675.3	702.7
70	25.880	26.260	508.8	737.4	508.8	444.4	.0	586.2	.00	52.96	57.12	25.47	938.3	492.7	-787.6	-210.9	787.6	799.2
85	28.450	28.610	432.2	678.4	432.2	381.9	.0	560.7	.00	55.74	63.47	39.07	967.8	492.0	-865.8	-310.0	865.8	870.7
90	29.320	29.410	419.6	653.6	419.6	346.1	.0	554.2	.00	56.04	64.80	44.58	986.1	486.5	-892.3	-340.8	892.3	895.0
95	30.150	30.180	412.6	636.5	412.6	329.8	.0	544.4	.00	58.79	65.78	48.57	1006.1	498.9	-917.6	-374.1	917.6	918.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.40	2.50	9.07	64.80	71.40	.0000	.1878	.1953	.0354	.0354	1.4705	.8961	.8925	8.0058	.4954	.9670	.6184	.6717
10	-3.91	2.70	8.14	60.47	66.14	.0000	.2554	.1494	.0301	.0301	1.4762	.9142	.9094	.1125	.5157	.9348	.6535	.6475
15	-3.28	2.95	9.75	56.15	63.02	.0000	.3186	.1237	.0274	.0274	1.4694	.9220	.9177	.6207	.5283	.8954	.6829	.6218
30	-2.16	3.47	12.24	44.47	53.29	.0000	.4140	.0756	.0199	.0199	1.4567	.9403	.9370	.8660	.5516	.8080	.7592	.5833
50	-.77	4.68	8.29	35.06	38.86	.0000	.5280	.1539	.0444	.0444	1.4386	.8629	.8557	.7988	.5564	.7210	.8426	.5308
70	6.18	10.37	5.34	31.65	26.95	.0000	.6807	.2209	.0650	.0650	1.4973	.8203	.8099	.7586	.4599	.6405	.8592	.4279
85	10.35	14.01	6.98	24.40	19.55	.0000	.6931	.1945	.0523	.0523	1.5354	.8413	.8315	.7907	.3888	.5840	.8816	.4235
90	10.74	14.23	12.24	20.22	18.26	.0000	.7056	.2135	.0537	.0537	1.5306	.8230	.8121	.7738	.3800	.5606	.8979	.4173
95	10.76	14.10	14.43	17.21	17.52	.0000	.6991	.2174	.0518	.0518	1.5293	.8153	.8039	.7691	.3744	.5448	.9146	.4269

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	W1/A1 LBM/SEC SQFT
1.1376	1.4809	86.07	86.81	.00

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VU-1 FT/SEC	VU-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VU'-1 FT/SEC	VU'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	953.4	574.7	563.3	570.4	754.1	-65.6	52.27	-6.56	-20.22	47.88	621.7	650.7	214.8	-631.0	539.3	565.4
10	18.350	19.110	947.1	576.4	610.0	575.0	724.4	3.7	49.69	.38	-15.21	45.10	632.5	615.5	166.0	-577.8	558.4	581.6
15	19.070	19.740	924.8	574.6	622.5	572.9	683.6	43.6	47.67	4.35	-9.43	44.20	631.6	799.1	103.3	-557.1	580.4	600.7
30	21.140	21.600	877.1	559.8	650.5	594.7	588.1	5.5	42.10	.53	4.82	47.60	654.0	862.6	-55.2	-651.9	643.4	657.4
50	23.970	24.200	828.4	576.2	627.9	576.2	540.2	-2.3	40.71	-.23	16.79	52.04	656.1	937.1	-189.3	-738.8	729.5	736.5
70	26.790	26.880	774.1	518.1	523.2	518.1	570.2	1.9	47.48	.21	25.16	57.58	578.5	967.1	-245.1	-816.1	815.3	818.0
85	28.860	28.900	728.8	471.4	473.7	471.4	553.8	2.1	49.46	.25	34.42	61.75	574.5	996.2	-324.5	-877.5	878.3	879.5
90	29.570	29.600	708.1	455.2	446.8	455.2	549.2	.2	50.89	.03	38.15	63.18	568.5	1009.2	-350.7	-900.6	899.9	900.8
95	30.240	30.270	693.0	445.2	430.6	445.2	542.9	-3.5	51.58	-.45	41.21	64.29	572.7	1026.3	-377.4	-924.7	920.3	921.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.19	6.22	9.93	58.84	62.58	.0000	.5971	.1371	.0323	.0323	.9475	.0000	.0000	.8283	.6598	.4959	.5653	.7341
10	2.05	6.31	16.33	49.52	59.56	.0000	.5748	.1646	.0405	.0405	.9376	.0000	.0000	.7918	.6500	.4976	.5693	.7041
15	1.77	6.09	19.76	43.32	56.96	.0000	.5525	.1582	.0404	.0404	.9422	.0000	.0000	.7924	.8307	.4966	.5686	.6906
30	-.29	4.47	14.49	41.57	51.61	.0000	.5084	.0646	.0240	.0240	.9716	.0000	.0000	.8700	.7883	.5163	.5855	.7661
50	1.00	6.45	10.49	40.94	44.58	.0000	.5140	.0534	.0172	.0172	.9839	.0000	.0000	.9277	.7396	.4984	.5853	.8105
70	9.53	15.59	13.08	47.27	44.25	.0000	.5944	.0990	.0356	.0356	.9739	.0000	.0000	.8631	.6800	.4416	.5084	.8241
85	12.50	18.97	15.29	49.21	45.28	.0000	.6468	.1459	.0566	.0566	.9657	.0000	.0000	.7846	.6349	.3991	.4981	.8433
90	13.80	20.36	15.73	50.86	45.92	.0000	.6655	.1434	.0571	.0571	.9681	.0000	.0000	.7912	.6147	.3846	.4919	.8525
95	14.52	21.25	15.87	52.03	46.74	.0000	.6785	.1392	.0567	.0567	.9702	.0000	.0000	.7901	.5977	.3755	.4909	.8656

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6975.	154.99	1.1376	1.4329	78.66	79.74

Blade-Element and Over-All Performance with Radial Inlet Distortion, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	530.2	1050.5	530.2	642.4	.0	831.1	.00	52.29	36.98	-28.11	663.7	728.8	-399.2	343.3	399.2	487.8
10	14.100	16.790	550.6	1021.5	550.6	653.9	.0	784.6	.00	50.18	37.92	-22.69	698.1	709.3	-429.0	273.7	429.0	510.9
15	15.170	17.580	564.2	984.5	564.2	653.3	.0	736.5	.00	48.42	39.28	-17.13	729.0	683.9	-461.6	201.5	461.6	534.9
30	18.280	19.910	588.1	897.0	588.1	642.9	.0	625.4	.00	44.19	43.37	-1.71	809.7	644.3	-556.2	19.5	556.2	605.8
50	22.190	23.090	595.2	813.5	595.2	575.8	.0	574.5	.00	44.95	48.59	12.57	900.2	590.0	-675.2	-128.1	675.2	702.6
70	25.880	26.260	498.6	734.3	498.6	430.1	.0	594.9	.00	54.16	57.64	25.48	932.8	476.9	-787.5	-204.1	787.5	799.1
85	28.450	28.610	423.0	674.1	423.0	367.6	.0	565.1	.00	56.96	63.95	39.73	963.6	478.0	-865.7	-305.5	865.7	870.6
90	29.320	29.410	411.0	657.9	411.0	347.4	.0	558.6	.00	58.13	65.26	44.05	982.4	484.0	-892.2	-336.3	892.2	894.9
95	30.150	30.180	404.3	643.9	404.3	336.6	.0	548.9	.00	58.48	66.22	47.63	1002.6	499.9	-917.4	-369.4	917.4	918.3

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.06	2.85	9.15	65.09	71.42	.0000	.1851	.1978	.0359	.0359	1.4689	.8981	.8924	6.5929	.4890	.9637	.6133	.6685
10	-3.57	3.04	8.54	60.61	66.15	.0000	.2515	.1398	.0283	.0283	1.4769	.9204	.9160	.0699	.5093	.9330	.6485	.6479
15	-2.92	3.30	9.84	56.41	63.04	.0000	.3136	.1179	.0261	.0261	1.4714	.9266	.9225	.6233	.5217	.8947	.6781	.6215
30	-1.77	3.85	12.02	45.08	53.30	.0000	.4159	.0816	.0214	.0214	1.4565	.9367	.9332	.8550	.5439	.8064	.7541	.5792
50	.26	5.19	7.78	34.02	38.87	.0000	.5374	.1686	.0487	.0487	1.4390	.8531	.8455	.7811	.5458	.7202	.8359	.5223
70	6.74	10.92	5.36	32.16	26.95	.0000	.6981	.2421	.0712	.0712	1.4933	.8065	.7954	.7386	.4497	.6371	.8536	.4138
85	10.79	14.46	9.65	24.23	19.57	.0000	.7079	.2140	.0571	.0571	1.5292	.8274	.8168	.7720	.3811	.5797	.8768	.4110
90	11.17	14.67	11.71	21.21	18.26	.0000	.7085	.2193	.0557	.0557	1.5333	.8204	.8093	.7672	.3724	.5642	.8932	.4151
95	11.20	14.54	13.48	18.59	17.52	.0000	.6986	.2187	.0531	.0531	1.5354	.8166	.8052	.7666	.3667	.5512	.9102	.4279

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1385	1.4788	85.40	86.18	35.61

STATOR

%SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	948.3	568.7	577.0	563.2	752.5	-74.8	52.52	-7.57	-20.30	48.65	615.3	852.8	213.3	-640.2	539.2	565.4
10	18.350	19.110	942.7	570.5	608.0	569.0	720.3	-.9	49.83	-.09	-14.91	45.62	629.5	814.6	161.9	-582.4	558.4	581.5
15	19.070	19.740	922.1	570.4	620.6	568.7	681.8	43.4	47.68	4.36	-9.29	44.42	629.3	796.2	101.5	-557.3	580.3	600.7
30	21.140	21.600	873.8	589.1	644.2	589.0	590.2	5.0	42.48	.49	4.68	47.89	647.5	879.0	-53.1	-652.3	643.3	657.3
50	23.970	24.200	826.5	567.8	620.8	567.8	545.6	-1.9	41.31	-.19	16.50	52.43	647.7	931.5	-183.8	-738.2	729.4	736.4
70	26.790	26.880	771.4	512.0	512.0	512.0	576.8	2.3	48.44	.26	25.04	57.86	565.6	963.3	-238.4	-815.6	815.2	817.9
85	28.860	28.900	723.5	467.2	460.3	467.2	558.2	-.4	50.50	-.05	34.80	62.02	560.8	996.2	-320.0	-879.8	878.2	879.4
90	29.570	29.600	710.0	453.3	444.4	453.3	553.7	-2.4	51.26	-.30	37.91	63.34	563.5	1010.5	-346.1	-903.1	899.8	900.7
95	30.240	30.270	699.4	444.8	435.2	444.8	547.5	-4.7	51.52	-.60	40.56	64.34	573.0	1027.1	-372.7	-925.8	920.2	921.1

%SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.33	6.36	8.92	60.09	62.57	.0000	.6032	.1402	.0330	.0330	.9467	.0000	.0000	.8263	.8549	.4906	.5600	.7356
10	1.96	6.21	15.85	49.92	59.55	.0000	.5791	.1694	.0417	.0417	.9362	.0000	.0000	.7862	.8466	.4925	.5672	.7032
15	1.84	6.15	19.76	43.32	56.92	.0000	.5553	.1638	.0419	.0419	.9405	.0000	.0000	.7846	.8287	.4928	.5663	.6879
30	.11	4.87	14.43	41.99	51.58	.0000	.5138	.0875	.0248	.0248	.9709	.0000	.0000	.8665	.7855	.5110	.5791	.7625
50	1.54	6.97	10.52	41.50	44.55	.0000	.5249	.0584	.0188	.0188	.9824	.0000	.0000	.9254	.7380	.4906	.5780	.8048
70	10.39	16.44	13.12	48.18	44.23	.0000	.6036	.0899	.0323	.0323	.9765	.0000	.0000	.8616	.6781	.4359	.4976	.8200
85	13.58	20.05	14.99	50.55	45.29	.0000	.6538	.1244	.0483	.0483	.9711	.0000	.0000	.8183	.6289	.3952	.4850	.8426
90	14.33	20.91	15.40	51.56	45.92	.0000	.6731	.1366	.0551	.0551	.9690	.0000	.0000	.8000	.6144	.3827	.4856	.8530
95	14.46	21.19	15.72	52.12	46.74	.0000	.6854	.1463	.0596	.0596	.9682	.0000	.0000	.7824	.6030	.3749	.4914	.8657

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6974.	153.04	1.1385	1.4326	78.11	79.20

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE
$(90 - \beta_{10})$ RADIAL INLET DISTORTION, HONEYCOMB TIP TREATMENT
(probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 147.27			W_{COR} = 137.27			W_{COR} = 132.36			W_{COR} = 126.99		
%SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.9	34.8	33.35	31.3	32.6	31.95	30.4	31.9	31.15	29.1	31.2	30.15
10	38.1	40.5	39.3	36.9	38.8	37.85	35.9	37.9	36.9	34.6	37.1	35.85
15	43.1	45.0	44.05	41.4	43.1	42.25	40.2	40.2	40.2	39.0	40.7	39.85
30	49.3	50.4	49.85	46.9	48.3	47.60	46.0	42.4	44.2	44.3	46.0	45.15
50	54.2	55.4	54.8	51.3	52.4	51.85	49.5	51.0	50.25	47.6	49.6	48.6
70	52.5	52.4	52.45	48.8	49.2	49.0	47.0	47.8	47.4	45.0	46.6	45.8
85	49.5	51.4	50.45	45.6	46.1	45.85	44.5	44.7	44.6	42.3	43.0	42.65
90	49.4	52.4	50.9	44.0	45.1	44.55	42.3	43.0	42.65	41.4	41.5	41.45
95	50.7	52.4	51.55	42.6	44.1	43.35	41.0	41.1	41.05	40.9	39.9	40.4

90% SPEED

	W_{COR} = 164.43			W_{COR} = 155.84			W_{COR} = 151.67			W_{COR} = 147.56		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.2	33.3	32.25	30.8	32.3	31.55	30.1	31.7	30.9	29.3	31.1	30.2
10	37.3	40.2	38.75	37.0	38.5	37.75	36.0	37.7	36.85	35.3	37.0	36.15
15	43.3	44.8	44.05	41.5	43.2	42.35	41.0	42.7	41.85	39.5	41.5	40.5
30	49.4	50.4	49.9	47.5	48.6	48.05	46.5	47.6	47.05	45.7	46.7	46.2
50	53.8	55.0	54.4	51.7	52.9	52.3	50.2	51.8	51.0	49.0	50.4	49.7
70	51.7	52.1	51.9	49.0	49.7	49.35	47.7	48.7	48.2	45.7	47.4	46.55
85	49.6	51.3	50.45	45.0	46.4	45.7	44.0	44.4	44.2	42.8	43.4	43.1
90	50.4	52.0	51.2	42.9	46.3	44.6	41.7	43.0	42.35	41.2	41.5	41.35
95	50.3	52.3	51.3	40.9	45.0	42.95	39.5	41.4	40.45	39.6	39.3	39.45

95% SPEED

	W_{COR} = 171.96			W_{COR} = 160.71			W_{COR} = 158.25			W_{COR} = 154.99		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	30.2	32.4	31.3	29.4	31.3	30.35	29.1	31.3	30.2	28.5	31.2	29.85
10	37.0	39.3	38.15	35.7	37.6	36.65	35.7	37.8	36.75	35.2	37.2	36.2
15	43.1	45.1	44.1	41.1	42.4	41.75	40.2	42.4	41.3	40.0	42.0	41.0
30	49.2	50.7	49.95	46.4	48.1	47.25	46.5	47.3	46.9	45.7	46.9	46.3
50	53.5	55.3	54.4	50.2	51.6	50.9	49.5	51.3	50.4	48.5	50.2	49.35
70	52.0	52.3	52.15	46.8	48.5	47.65	46.3	47.7	47.0	45.6	47.2	46.4
85	49.3	51.2	50.25	43.1	44.1	43.6	42.6	43.5	43.05	41.8	42.9	42.35
90	49.6	52.1	50.85	40.9	43.7	42.3	40.6	42.1	41.35	39.4	40.6	40.0
95	50.1	52.2	51.15	39.1	43.0	41.05	38.7	39.2	38.95	37.9	38.0	37.95

APPENDIX 7

Blade Element and Overall Performance
with
Radial Inlet Distortion
and
20 Percent Banded Honeycomb Tip Treatment

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	506.8	955.2	506.8	617.5	.0	728.7	.00	49.72	33.87	-26.87	610.4	692.5	-340.2	313.0	340.2	415.7
10	14.100	16.790	528.0	333.6	529.0	615.0	.0	702.5	.00	48.80	34.69	-23.46	542.2	670.6	-365.6	267.1	365.6	435.4
15	15.170	17.580	542.0	902.3	542.0	615.3	.0	659.9	.00	46.39	35.96	-18.33	669.8	648.7	-393.4	204.0	393.4	455.8
30	18.290	19.910	564.1	820.0	564.1	615.0	.0	542.0	.00	41.35	40.01	-2.36	736.9	617.1	-474.0	25.7	474.0	516.3
50	22.190	23.090	575.9	717.4	575.8	561.3	.0	446.8	.00	38.52	44.96	15.16	814.1	581.9	-575.4	-151.9	575.4	598.7
70	25.880	26.260	485.0	623.8	485.0	472.0	.0	416.8	.00	41.47	54.13	29.28	828.6	541.6	-671.1	-264.1	671.1	680.9
85	28.450	28.610	412.1	583.0	412.1	395.7	.0	428.1	.00	47.25	60.81	38.41	845.1	505.0	-737.7	-313.7	737.7	741.8
90	29.320	29.410	402.6	563.4	402.6	361.5	.0	431.9	.00	50.10	62.09	42.43	860.3	490.4	-760.3	-330.7	760.3	762.6
95	30.150	30.180	397.3	546.3	397.3	338.4	.0	428.8	.00	51.72	63.06	46.26	876.9	489.8	-781.8	-353.8	781.8	782.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.18	-.27	10.37	60.74	71.40	.0000	.1354	.2160	.0336	.0336	1.3277	.9728	.8675	2.3677	.4667	.8772	.5629	.6359
10	-6.82	-.20	7.77	58.15	66.13	.0000	.2160	.1803	.0362	.0362	1.3364	.9847	.8798	2.5346	.4873	.8541	.5946	.6135
15	-6.28	-.03	8.62	54.28	62.93	.0000	.2767	.1525	.0336	.0336	1.3339	.9933	.8888	.2784	.4997	.8222	.6199	.5910
30	-5.15	.50	11.35	42.37	53.25	.0000	.3637	.0803	.0212	.0212	1.3218	.9280	.9251	.8203	.5196	.7411	.6813	.5577
50	-3.59	1.39	10.44	29.91	38.91	.0000	.4507	.1291	.0369	.0369	1.2808	.8585	.8535	.7988	.5298	.6414	.7513	.5202
70	-2.92	-7.15	9.14	24.86	26.93	.0000	.5114	.1055	.0300	.0300	1.3113	.8832	.8837	.8513	.4417	.5565	.7564	.4785
85	7.67	11.34	8.32	22.40	19.55	.0000	.5786	.1395	.0379	.0379	1.3411	.8635	.8577	.8211	.3710	.5102	.7679	.4419
90	-8.01	11.51	10.15	13.60	18.26	.0000	.6077	.1786	.0465	.0465	1.3370	.9256	.8182	.7800	.3646	.4914	.7821	.4277
95	8.04	11.38	12.12	16.80	17.52	.0000	.6176	.1998	.0497	.0497	1.3325	.8016	.7934	.7577	.3601	.4753	.7962	.4261

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0934	1.3135	86.77	87.77	34.75

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	875.7	591.1	577.8	591.0	658.0	1.9	46.72	.18	-18.97	39.08	611.0	761.3	198.5	-479.9	459.5	481.8
10	18.350	19.110	876.7	599.7	597.1	598.1	641.9	39.2	47.07	3.74	-15.54	37.33	619.9	752.4	166.1	-456.3	475.8	495.5
15	19.070	19.740	863.1	608.7	608.9	607.3	611.4	41.0	45.11	3.86	-10.88	37.78	620.6	768.5	117.0	-470.9	494.5	511.8
30	21.140	21.600	818.4	615.7	637.4	615.6	513.0	6.6	39.81	.62	3.13	41.34	639.6	828.0	-35.1	-553.4	548.2	560.1
50	23.970	24.200	746.9	575.8	609.7	575.7	431.4	7.7	35.27	.77	17.32	47.11	639.4	846.1	-190.2	-619.8	621.5	627.5
70	26.790	26.880	677.3	513.1	542.4	512.9	405.5	13.8	36.81	1.37	28.08	53.09	615.1	854.5	-283.0	-683.1	694.7	697.0
85	28.860	28.900	641.7	470.4	485.0	469.8	420.1	21.7	40.91	2.65	34.10	57.15	585.7	866.2	-328.2	-727.6	748.3	749.4
90	29.570	29.600	627.0	448.2	459.3	447.8	426.6	18.2	42.31	2.30	36.54	59.13	571.7	873.2	-340.1	-749.4	766.7	767.5
95	30.240	30.270	613.5	427.6	440.2	427.4	427.3	11.8	44.15	1.58	39.02	61.06	566.8	883.4	-356.8	-773.1	784.1	784.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.16	2.89	15.69	48.54	62.61	.0000	.4987	.0393	.0236	.0236	.9662	.0000	.0000	.8466	.7359	.5187	.5583	.6681
10	-.62	3.63	13.72	43.33	59.62	.0000	.4815	.1223	.0301	.0301	.9583	.0000	.0000	.8104	.7923	.5265	.5610	.6606
15	-1.01	3.32	13.31	41.25	57.07	.0000	.4612	.1059	.0272	.0272	.9648	.0000	.0000	.8342	.7784	.5354	.5631	.6759
30	-3.87	.95	14.70	39.19	51.87	.0000	.4222	.0537	.0153	.0153	.9836	.0000	.0000	.9019	.7372	.5435	.5783	.7309
50	-4.20	1.30	11.44	34.50	44.64	.0000	.4112	.0270	.0087	.0087	.9330	.0000	.0000	.9430	.6700	.5074	.5736	.7456
70	-.86	5.24	14.45	35.25	44.31	.0000	.4504	.0410	.0148	.0148	.9311	.0000	.0000	.9218	.6032	.4489	.5472	.7476
85	3.92	10.40	17.70	39.26	45.30	.0000	.5080	.0904	.0312	.0312	.9343	.0000	.0000	.8584	.5666	.4083	.5172	.7519
90	5.86	12.44	18.02	40.60	45.93	.0000	.5443	.1001	.0398	.0398	.9814	.0000	.0000	.8272	.5521	.3877	.5034	.7553
95	6.98	13.72	17.30	42.57	46.74	.0000	.5783	.1176	.0473	.0473	.9730	.0000	.0000	.7947	.5381	.3683	.4958	.7621

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5943.	146.87	1.0934	1.2912	81.14	82.32

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	442.4	883.5	442.4	542.5	.0	697.2	.00	52.11	37.33	-27.70	556.4	613.1	-337.4	285.0	337.4	412.2
10	14.100	16.790	462.0	859.9	462.0	546.0	.0	662.6	.00	50.40	38.12	-22.82	587.3	594.9	-362.6	230.8	362.6	431.8
15	15.170	17.580	474.9	830.0	474.9	549.9	.0	621.6	.00	48.50	39.39	-17.13	614.7	575.6	-390.1	169.5	390.1	452.1
30	18.280	19.910	492.4	758.9	492.4	544.0	.0	529.0	.00	44.19	43.64	-1.76	680.5	545.2	-470.1	17.0	470.1	512.0
50	22.190	23.090	498.9	680.2	498.9	499.9	.0	461.2	.00	42.70	48.82	14.97	758.1	517.3	-570.6	-132.6	570.6	593.8
70	25.880	26.260	411.2	616.6	411.2	399.1	.0	469.8	.00	49.66	58.28	27.28	782.9	449.1	-665.5	-205.5	665.5	675.3
85	28.450	28.610	342.7	577.9	342.7	305.8	.0	490.2	.00	58.06	64.89	38.80	808.0	392.6	-731.6	-245.6	731.6	735.7
90	29.320	29.410	334.1	564.0	334.1	277.2	.0	491.0	.00	60.56	66.10	43.77	824.7	384.1	-754.0	-265.3	754.0	756.3
95	30.150	30.180	329.3	551.5	329.3	264.8	.0	483.8	.00	61.30	66.99	47.80	842.4	394.7	-775.3	-292.4	775.3	776.1

% SPAN	ANGS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.74	3.16	9.61	65.03	71.49	.0000	.1816	.1551	.0283	.0263	1.3284	.9194	.9160	4.9624	.4062	.8045	.5117	.5583
10	-3.41	3.13	8.40	60.94	66.16	.0000	.2558	.1178	.0238	.0238	1.3319	.9320	.9232	.2250	.4252	.7805	.5430	.5400
15	-2.82	3.38	9.85	56.52	63.06	.0000	.3157	.0361	.0213	.0213	1.3282	.9388	.9362	.6803	.4363	.7509	.5682	.5207
30	-1.50	4.12	11.96	45.40	53.31	.0000	.4122	.0521	.0137	.0137	1.3224	.9583	.9566	.8996	.4512	.6815	.6286	.4896
50	.44	5.39	10.07	33.95	38.86	.0000	.5013	.1090	.0312	.0312	1.3029	.8972	.8933	.8409	.4539	.6050	.6973	.4601
70	[illegible]	11.76	7.19	30.99	26.99	.0000	.6233	.1607	.0466	.0466	1.3395	.8610	.8551	.6011	.3655	.5413	.7122	.3943
85	[illegible]	15.43	8.76	26.10	19.61	.0000	.7250	.2260	.0611	.0611	1.3680	.8171	.8089	.7477	.3058	.5022	.7347	.3412
90	42.05	15.52	11.44	22.33	18.27	.0000	.7450	.2495	.0637	.0637	1.3697	.7962	.7869	.7268	.3004	.4887	.7491	.3329
95	41.95	15.27	13.67	19.19	17.54	.0000	.7383	.2528	.0611	.0611	1.3688	.7881	.7785	.7222	.2970	.4772	.7630	.3415

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0969	1.3307	87.80	88.75	30.74

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.560	801.3	498.5	494.3	497.6	630.6	-20.8	51.91	-2.40	-19.50	45.04	524.4	704.6	174.9	-498.6	455.7	477.6
10	18.350	19.110	797.3	503.3	516.0	501.4	607.7	31.2	49.66	3.54	-14.75	42.52	533.8	680.9	135.8	-460.3	471.9	491.4
15	19.070	19.740	791.2	506.6	527.5	502.4	576.1	56.3	47.52	6.40	-9.24	41.33	534.9	675.4	85.7	-451.3	490.4	507.6
30	21.140	21.600	742.5	522.1	549.8	521.5	499.9	22.7	42.32	2.49	4.52	45.59	551.5	745.7	-43.7	-532.8	543.6	555.5
50	23.970	24.200	692.4	499.8	533.3	499.5	441.7	16.4	39.63	1.98	18.14	50.49	561.6	785.5	-174.7	-606.0	616.4	622.3
70	26.790	26.990	646.3	450.5	462.3	450.1	451.2	17.0	44.33	2.16	27.27	56.26	520.2	811.0	-237.7	-674.3	686.9	691.2
85	28.860	28.900	613.9	411.9	391.4	411.6	479.2	15.7	50.77	2.18	33.91	60.50	471.6	836.0	-262.9	-727.5	742.2	743.2
90	29.570	29.600	608.5	396.0	369.6	397.7	484.0	15.1	52.72	2.18	36.89	61.93	461.0	845.5	-276.4	-746.0	760.4	761.2
95	30.240	30.270	599.2	397.4	355.8	397.1	482.1	13.5	53.37	1.95	39.70	63.15	462.7	857.4	-295.5	-765.0	777.7	776.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P POI	PO2/ TOTAL	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.85	5.30	14.09	54.32	62.58	.0000	.3665	.1242	.0234	.0234	.9536	.0000	.0000	.8279	.7213	.4352	.4757	.6152
10	1.83	6.09	19.50	46.12	53.56	.0000	.5427	.1461	.0359	.0359	.9576	.0000	.0000	.7949	.7148	.4396	.4800	.5946
15	1.64	5.35	21.80	41.12	56.34	.0000	.5193	.1385	.0353	.0353	.9612	.0000	.0000	.7580	.7009	.4420	.4809	.5904
30	-.09	4.68	16.45	39.82	51.63	.0000	.4773	.0721	.0205	.0205	.9815	.0000	.0000	.8754	.6668	.4577	.4936	.6538
50	.11	5.55	12.53	37.76	44.58	.0000	.4747	.0382	.0123	.0123	.9913	.0000	.0000	.9365	.6204	.4374	.5007	.6875
70	6.02	12.06	15.01	42.17	44.20	.0000	.5441	.0652	.0234	.0234	.9671	.0000	.0000	.9288	.5739	.3903	.4640	.7037
85	13.27	19.73	17.21	49.59	45.23	.0000	.6248	.1155	.0448	.0448	.9392	.0000	.0000	.8498	.5436	.3541	.4167	.7187
90	15.46	22.02	17.87	50.54	45.88	.0000	.6524	.1332	.0529	.0529	.9768	.0000	.0000	.8111	.5326	.3412	.4039	.7249
95	16.51	23.23	18.31	51.58	46.73	.0000	.6713	.1455	.0592	.0592	.9754	.0000	.0000	.7742	.5222	.3314	.4002	.7335

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5834.	131.64	1.0969	1.3040	81.31	82.43

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	434.3	876.1	434.3	532.3	.0	693.7	.00	52.57	37.84	-28.03	550.0	603.4	-337.4	283.5	337.4	412.2
10	14.100	16.790	453.0	853.5	453.0	542.8	.0	658.5	.00	50.49	38.67	-22.65	580.3	588.6	-362.6	226.8	362.6	431.8
15	15.170	17.580	465.8	824.7	465.8	546.5	.0	617.5	.00	48.49	33.93	-16.84	607.7	571.1	-330.1	165.4	390.1	452.1
30	18.280	19.910	482.2	754.3	482.2	540.9	.0	525.7	.00	44.17	44.24	-1.42	673.5	541.8	-470.1	13.7	470.1	512.0
50	22.190	23.090	486.9	681.4	486.9	495.3	.0	467.9	.00	43.38	49.51	14.30	750.3	511.3	-570.7	-125.9	570.7	593.8
70	25.880	26.260	398.4	620.3	398.4	386.8	.0	484.9	.00	51.42	59.08	26.22	726.3	431.2	-665.6	-190.5	665.6	675.3
85	28.450	28.610	331.3	591.2	331.3	284.7	.0	506.4	.00	60.69	65.63	39.30	903.2	366.2	-731.6	-229.3	731.6	735.8
90	29.320	29.410	321.9	568.3	321.9	256.2	.0	507.2	.00	63.21	66.87	44.22	813.9	357.6	-754.0	-249.2	754.0	756.3
95	30.150	30.180	316.3	556.7	316.3	247.7	.0	498.6	.00	63.58	67.80	48.21	837.4	372.2	-775.4	-277.5	775.4	776.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.22	3.68	9.30	65.87	71.50	.0000	.1891	.1595	.0290	.0290	1.3274	.9187	.9154	8.1930	.3984	.7970	.5055	.5489
10	-2.86	3.73	8.57	61.32	66.16	.0000	.2560	.1067	.0216	.0216	1.3327	.9334	.9368	.3026	.4168	.7743	.5364	.5339
15	-2.27	3.93	10.15	56.77	63.07	.0000	.3136	.0804	.0179	.0175	1.3301	.9494	.9473	.7287	.4278	.7458	.5619	.5165
30	-.88	4.73	12.30	45.67	53.32	.0000	.4096	.0391	.0103	.0103	1.3243	.9689	.9676	.9235	.4416	.6772	.6223	.4864
50	1.33	6.26	9.55	35.21	39.91	.0000	.5069	.1092	.0313	.0313	1.3090	.9004	.8965	.8408	.4399	.6058	.6895	.4546
70	9.65	12.73	6.16	32.95	27.03	.0000	.6496	.1843	.0541	.0541	1.3449	.8458	.8402	.7765	.3505	.5439	.7064	.3781
85	12.56	16.18	8.96	26.73	19.70	.0000	.7633	.2592	.0699	.0699	1.3711	.7979	.7867	.7187	.2947	.5044	.7316	.3178
90	12.87	16.33	11.30	22.65	18.27	.0000	.7929	.2795	.0708	.0708	1.3731	.7799	.7699	.7017	.2884	.4918	.7452	.3095
95	12.76	16.08	14.10	19.59	17.55	.0000	.7700	.2767	.0664	.0664	1.3746	.7762	.7659	.7023	.2849	.4811	.7585	.3216

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0981	1.3349	87.69	88.63	30.08

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	732.1	486.4	480.5	485.2	629.6	-28.6	52.65	-3.38	-19.51	46.22	511.1	701.4	173.9	-506.4	455.7	477.8
10	18.350	19.110	738.2	490.8	505.5	483.0	604.6	27.5	50.09	3.20	-14.71	43.45	522.9	674.4	132.7	-464.0	471.9	491.5
15	19.070	19.740	773.4	494.7	513.9	491.4	572.4	56.6	47.75	6.57	-8.97	42.54	526.7	667.0	82.0	-451.0	490.4	507.7
30	21.140	21.600	734.7	511.0	541.2	510.4	436.7	24.5	42.53	2.75	-4.32	46.11	544.2	736.6	-46.9	-531.0	543.7	555.5
50	23.970	24.200	683.9	491.8	526.5	491.4	445.7	19.2	40.25	2.24	17.97	50.82	553.8	778.2	-170.7	-603.1	616.4	622.4
70	26.790	26.880	646.5	441.9	450.2	441.4	463.6	13.8	45.87	2.58	26.66	56.66	503.7	803.8	225.4	-671.4	689.0	691.3
85	28.860	28.900	618.5	401.7	371.3	401.4	494.5	17.4	53.11	2.49	33.72	61.05	446.3	829.5	-247.6	-725.8	742.2	743.2
90	29.570	29.600	609.0	383.0	348.4	388.6	499.3	16.0	55.11	2.36	36.88	62.45	435.6	840.5	-261.1	-745.2	760.5	761.2
95	30.240	30.270	600.6	380.2	337.4	379.9	496.3	14.0	55.82	2.11	39.75	63.57	439.1	853.7	-280.8	-764.5	777.7	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.51	6.56	13.11	56.09	62.58	.0000	.5789	.1230	.0305	.0305	.9530	.0000	.0000	.9246	.7121	.4243	.4637	.6119
10	2.20	6.45	19.15	46.89	59.55	.0000	.5534	.1533	.0377	.0377	.9563	.0000	.0000	.7880	.7065	.4284	.4706	.5896
15	1.90	6.22	21.37	41.17	56.91	.0000	.5276	.1472	.0375	.0375	.9594	.0000	.0000	.7869	.6938	.4322	.4732	.5628
30	-.18	4.94	16.69	39.78	51.57	.0000	.4847	.0793	.0225	.0225	.9800	.0000	.0000	.8651	.6601	.4477	.4864	.6454
50	.66	6.10	12.94	38.01	44.52	.0000	.4846	.0450	.0144	.0144	.9999	.0000	.0000	.9315	.6183	.4301	.4938	.6605
70	7.27	13.30	15.41	43.29	44.16	.0000	.5626	.0730	.0262	.0262	.9956	.0000	.0000	.9327	.5743	.3928	.4514	.6964
85	15.34	21.79	17.50	50.62	45.19	.0000	.6493	.1215	.0470	.0470	.9782	.0000	.0000	.8559	.5433	.3447	.3961	.7117
90	17.74	24.30	18.05	52.75	45.86	.0000	.6768	.1398	.0555	.0555	.9757	.0000	.0000	.8131	.5324	.3328	.3818	.7191
95	18.82	25.53	18.42	53.71	46.72	.0000	.6943	.1522	.0619	.0619	.9743	.0000	.0000	.7711	.5227	.3246	.3785	.7239

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5894.	128.73	1.0981	1.3062	80.82	82.00

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	425.0	869.1	425.0	520.9	.0	695.5	.00	53.16	36.51	-28.45	543.1	592.9	-338.2	282.3	338.2	413.2
10	14.100	16.730	444.1	847.5	444.1	537.9	.0	654.9	.00	50.60	39.29	-22.43	573.8	592.2	-363.4	222.1	363.4	432.8
15	15.170	17.580	457.1	819.5	457.1	542.2	.0	614.6	.00	48.58	40.53	-16.58	601.6	565.7	-391.0	161.4	391.0	453.1
30	19.280	19.910	472.0	750.1	472.0	533.9	.0	526.8	.00	44.61	44.92	-1.44	667.1	534.5	-471.2	13.6	471.2	513.2
50	22.190	23.090	476.6	681.5	476.6	488.4	.0	475.1	.00	44.23	50.19	13.87	744.6	503.3	-572.0	-120.0	572.0	595.2
70	25.890	26.260	385.6	623.6	385.6	374.4	.0	438.4	.00	53.10	59.96	25.55	771.0	415.0	-667.1	-178.5	667.1	676.9
85	28.450	28.610	317.5	585.5	317.5	268.9	.0	519.7	.00	62.67	66.59	39.06	799.1	346.9	-733.3	-217.7	733.3	737.4
90	29.320	29.410	309.8	573.9	309.8	241.7	.0	520.5	.00	65.05	67.70	44.52	816.8	339.0	-755.7	-237.6	755.7	758.1
95	30.150	30.180	304.8	563.3	304.8	237.3	.0	510.8	.00	65.09	68.58	48.34	834.8	357.4	-777.1	-267.1	777.1	777.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.56	4.34	8.89	66.96	71.52	.0000	.1981	.1805	.0326	.0326	1.3247	.9104	.906891	.5009	.3898	.7897	.4990	.5387
10	-2.25	4.34	8.78	61.72	66.15	.0000	.2573	.1109	.0225	.0225	1.3310	.9381	.9356	.2328	.4096	.7684	.5306	.5278
15	-1.67	4.52	10.41	57.11	63.08	.0000	.3144	.0840	.0187	.0187	1.3287	.9481	.9459	.7185	.4198	.7407	.5566	.5113
30	-.18	5.42	12.28	46.36	53.33	.0000	.4154	.0503	.0132	.0132	1.3230	.9612	.9597	.9032	.4319	.6723	.6167	.4795
50	2.24	7.15	9.19	36.32	38.99	.0000	.5170	.1275	.0367	.0367	1.3098	.8872	.8828	.8161	.4287	.6054	.6831	.4471
70	9.65	13.78	5.49	34.40	27.03	.0000	.6741	.2139	.0629	.0629	1.3480	.8295	.8221	.7466	.3369	.5461	.7022	.3635
85	13.43	17.04	9.19	27.53	19.79	.0000	.7921	.2867	.0772	.0772	1.3749	.7937	.7739	.6944	.2831	.5074	.7287	.3006
90	13.70	17.15	12.19	23.18	18.26	.0000	.8105	.3052	.0763	.0763	1.3773	.7668	.7561	.6735	.2774	.4860	.7424	.2930
95	13.53	16.85	14.23	20.24	17.55	.0000	.7923	.2979	.0713	.0713	1.3796	.7657	.7549	.6835	.2744	.4862	.7558	.3085

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.0994	1.3362	86.87	87.72	29.47

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.590	784.3	469.7	466.9	468.1	630.1	-33.3	53.46	-4.09	-20.37	47.57	939.2	694.0	173.3	-512.2	456.7	473.9
10	18.350	19.110	780.9	474.9	497.1	473.2	602.1	23.8	50.45	2.86	-14.57	44.69	513.9	666.4	129.1	-468.8	473.0	492.6
15	19.070	19.740	766.8	480.3	513.2	477.0	569.6	55.9	47.97	6.68	-8.65	43.52	519.5	657.8	78.0	-453.0	491.5	508.8
30	21.140	21.600	729.4	498.6	531.7	497.8	497.6	26.5	43.09	3.05	5.05	46.78	534.7	727.4	-47.3	-530.2	544.9	556.8
50	23.970	24.200	696.8	493.6	519.0	483.2	449.9	19.7	40.92	2.34	17.94	51.33	545.7	773.7	-168.0	-604.0	617.8	623.8
70	26.790	26.880	646.3	435.0	433.1	434.5	473.3	19.4	47.20	2.55	26.32	57.15	499.9	801.9	-216.7	-673.5	690.5	692.9
85	28.860	28.900	618.9	396.1	354.4	395.9	507.3	14.4	55.06	2.08	33.73	61.54	426.1	831.0	-236.6	-730.6	743.9	744.9
90	29.570	29.600	611.0	385.3	333.0	385.1	512.1	14.5	56.97	2.16	36.83	62.77	416.7	841.7	-250.1	-748.4	762.2	763.0
95	30.240	30.270	603.7	378.2	324.6	377.8	509.0	15.5	57.47	2.35	39.77	63.71	422.6	853.0	-270.4	-764.7	779.5	780.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.18	7.22	12.41	57.54	62.58	.0000	.5975	.1337	.0316	.0316	.9623	.0000	.0000	.8243	.7044	.4092	.4526	.6046
10	2.50	6.76	16.80	47.60	59.54	.0000	.5699	.1600	.0393	.0393	.9552	.0000	.0000	.7845	.6937	.4141	.4627	.5810
15	2.17	6.48	22.06	41.30	56.88	.0000	.5415	.1544	.0393	.0393	.9581	.0000	.0000	.7809	.6879	.4132	.4663	.5742
30	.79	5.53	16.97	40.03	51.51	.0000	.4966	.0834	.0236	.0236	.9783	.0000	.0000	.8615	.6546	.4363	.4772	.6366
50	1.31	6.72	13.02	38.58	44.44	.0000	.4357	.0482	.0155	.0155	.9832	.0000	.0000	.9322	.6156	.4225	.4863	.6759
70	8.35	14.36	15.37	44.65	44.10	.0000	.5787	.0806	.0289	.0289	.9841	.0000	.0000	.9360	.5743	.3764	.4409	.6937
85	17.02	23.46	17.08	52.39	45.13	.0000	.6682	.1296	.0498	.0498	.9770	.0000	.0000	.8596	.5435	.3393	.3802	.7119
90	19.54	26.10	17.85	54.91	45.84	.0000	.6928	.1499	.0591	.0591	.9741	.0000	.0000	.8080	.5333	.3291	.3651	.7189
95	20.52	27.23	18.66	55.12	46.72	.0000	.7063	.1630	.0663	.0663	.9723	.0000	.0000	.7585	.5247	.3224	.3630	.7272

NCORR INLET RPM.	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5307.	125.77	1.0994	1.3060	79.75	80.94

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	609.8	1112.1	509.3	721.4	.0	946.3	.00	49.55	33.30	-26.37	728.4	805.4	-333.9	357.7	399.9	484.6
10	14.100	16.730	634.6	1092.0	634.6	725.5	.0	816.2	.00	48.36	34.10	-22.75	766.4	787.0	-423.5	304.4	429.8	511.8
15	15.170	17.580	651.6	1058.0	651.6	726.2	.0	769.3	.00	46.64	35.35	-17.90	793.0	763.4	-462.4	233.4	462.4	535.9
30	18.280	19.910	691.9	960.3	621.9	719.8	.0	635.2	.00	41.40	39.22	-2.21	880.9	722.2	-557.2	26.4	557.2	606.9
50	22.190	23.090	700.3	838.1	700.3	656.3	.0	521.2	.00	39.45	43.99	15.56	973.7	691.9	-676.4	-182.6	676.4	703.8
70	25.880	26.260	605.3	726.1	605.3	546.2	.0	478.3	.00	41.23	52.49	30.57	995.0	635.1	-738.8	-322.1	788.8	800.4
85	28.450	28.610	519.5	671.5	519.5	457.6	.0	491.4	.00	47.04	59.12	39.75	1010.5	595.2	-867.2	-380.6	867.2	872.1
90	29.320	29.410	506.8	647.8	506.8	417.9	.0	494.6	.00	49.84	60.43	43.91	1027.5	580.2	-833.7	-401.8	893.7	896.4
95	30.150	30.180	500.9	626.1	500.9	389.0	.0	490.5	.00	51.59	61.40	47.92	1046.7	579.7	-919.0	-429.4	919.0	919.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P TOTAL	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-7.74	-.84	10.75	53.67	71.26	.0000	.1565	.2326	.0428	.0426	1.4554	.8601	.8526	3.4693	.5649	1.0303	.6765	.7462
10	-7.41	-.77	8.46	56.83	66.03	.0000	.2263	.1729	.0349	.0349	1.4784	.8877	.8614	.8361	.5906	1.0072	.7150	.7259
15	-6.90	-.63	9.14	53.15	62.85	.0000	.2840	.1371	.0302	.0302	1.4811	.9032	.8979	.9597	.6066	.9706	.7459	.7604
30	-5.94	-.28	11.50	41.43	53.22	.0000	.3771	.0737	.0193	.0193	1.4639	.9344	.9308	.9578	.6360	.8707	.8236	.6548
50	-4.55	.43	10.87	28.43	33.92	.0000	.4610	.1226	.0349	.0349	1.4017	.9670	.9605	.8297	.6532	.7497	.9112	.6091
70	-1.36	5.57	10.43	21.92	26.92	.0000	.5154	.1051	.0295	.0295	1.4332	.9673	.9814	.9675	.5560	.6383	.9164	.5582
85	5.03	9.70	9.66	19.37	19.55	.0000	.5300	.1271	.0339	.0339	1.4945	.9754	.9684	.8506	.4697	.5828	.9256	.5165
90	6.36	9.85	11.57	16.53	18.26	.0000	.6057	.1645	.0419	.0419	1.4766	.9334	.9304	.8131	.4625	.5597	.9418	.5013
95	6.39	3.72	13.68	13.59	17.52	.0000	.6150	.1877	.0464	.0464	1.4701	.9137	.9035	.7838	.4575	.5391	.9579	.4932

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.1271	1.4451	87.29	88.45	40.22

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1016.6	664.6	670.2	664.4	764.3	-7.0	48.75	-.61	-18.50	40.73	706.9	877.6	224.2	-573.3	540.1	566.3
10	18.350	19.110	1023.6	680.4	700.8	678.3	746.1	38.6	46.73	3.23	-14.33	38.69	725.4	870.1	186.8	-543.3	559.3	582.5
15	19.070	19.740	1012.2	693.2	719.4	691.3	711.8	49.9	44.69	4.13	-10.30	39.59	731.9	894.6	130.6	-551.8	581.3	601.7
30	21.140	21.600	961.3	705.5	750.4	705.3	600.4	15.4	38.64	1.25	3.33	42.34	753.2	954.5	-44.0	-643.0	644.4	658.4
50	23.970	24.200	877.2	666.6	719.4	666.5	503.2	11.1	35.00	.35	17.57	47.46	754.4	986.1	-227.4	-726.5	730.6	737.6
70	25.330	25.880	784.4	583.1	630.6	582.8	466.3	17.9	36.50	1.77	29.08	53.97	722.1	991.3	-350.2	-801.4	816.6	819.3
85	29.860	28.900	739.7	526.5	560.6	526.0	492.6	24.2	40.73	2.64	35.32	59.45	697.1	1005.3	-397.1	-856.7	879.7	880.9
90	29.570	29.600	721.5	499.9	530.3	499.6	483.1	17.8	42.70	2.02	37.88	60.53	671.9	1016.1	-412.3	-884.4	901.3	902.2
95	30.240	30.270	704.1	475.2	505.7	475.1	488.9	8.1	43.99	.97	40.50	62.54	666.6	1030.7	-432.8	-914.5	921.7	922.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P TOTAL	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.13	2.84	15.30	49.37	52.53	.0000	.5223	.1148	.0273	.0273	.9511	.0000	.0000	.9412	.3292	.5775	.6505	.7626
10	-1.01	3.24	13.21	43.56	59.63	.0000	.5015	.1449	.0357	.0357	.9372	.0000	.0000	.7930	.3309	.5920	.6620	.7570
15	-1.44	2.30	13.37	40.56	57.09	.0000	.4733	.1353	.0349	.0349	.9426	.0000	.0000	.9098	.3173	.6044	.6672	.7714
30	-4.04	.78	13.34	37.39	51.87	.0000	.4377	.0773	.0221	.0221	.9639	.0000	.0000	.9734	.2683	.6184	.6834	.8368
50	-4.47	1.04	11.60	34.05	44.62	.0000	.4201	.0336	.0105	.0105	.9887	.0000	.0000	.9363	.2865	.5836	.6772	.8633
70	-1.07	5.04	14.67	34.73	44.32	.0000	.4623	.0423	.0176	.0176	.9865	.0000	.0000	.8079	.2950	.5055	.6396	.8534
85	3.85	10.34	17.65	38.09	45.30	.0000	.5288	.1038	.0403	.0403	.9745	.0000	.0000	.8231	.6481	.4515	.6020	.8620
90	5.75	12.33	17.74	40.68	46.93	.0000	.5671	.1232	.0430	.0430	.9712	.0000	.0000	.7979	.6299	.4266	.5364	.8674
95	6.78	13.54	17.29	43.01	46.74	.0000	.6032	.1392	.0362	.0362	.9692	.0000	.0000	.7769	.6122	.4043	.5784	.8770

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5996.	172.63	1.1271	1.4063	80.53	81.38

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	564.7	1070.4	564.7	671.9	.0	833.3	.00	51.12	35.40	-27.03	692.8	754.5	-401.3	342.9	401.3	490.3
10	14.100	16.790	588.2	1042.4	588.2	674.5	.0	734.7	.00	49.67	38.25	-22.60	729.4	731.0	-431.3	281.1	431.3	513.6
15	15.170	17.590	603.6	1006.1	603.6	674.2	.0	746.7	.00	47.31	37.54	-17.20	761.4	706.3	-464.0	208.9	464.0	537.8
30	19.280	19.910	630.9	922.1	630.9	669.9	.0	633.5	.00	43.39	41.53	-2.06	843.1	671.7	-559.2	24.5	559.2	609.0
50	22.190	23.090	644.0	825.2	644.0	616.0	.0	549.1	.00	41.72	46.49	14.32	935.9	636.0	-678.8	-157.2	678.8	706.3
70	25.880	26.260	547.7	736.5	547.7	431.7	.0	548.1	.00	49.14	55.31	27.50	963.4	554.6	-791.6	-255.2	791.6	803.3
85	28.450	28.610	464.7	684.0	464.7	337.2	.0	556.8	.00	54.51	61.30	39.72	936.7	509.2	-870.3	-319.3	870.3	875.1
90	29.320	29.410	453.0	662.0	453.0	363.4	.0	553.2	.00	56.72	63.19	43.65	1004.9	502.6	-836.9	-346.4	896.9	899.6
95	30.150	30.180	447.2	642.9	447.2	341.7	.0	544.5	.00	57.85	64.13	47.91	1025.0	510.3	-922.3	-378.6	922.3	923.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.64	1.26	10.17	62.43	71.36	.0000	.1828	.1699	.0348	.0348	1.4712	.8950	.8691	7.8195	.5223	.9848	.6417	.6942
10	-5.26	1.36	8.63	58.84	66.13	.0000	.2370	.1522	.0308	.0308	1.4787	.9077	.9026	.1146	.5456	.9544	.6788	.6693
15	-4.69	1.55	9.76	54.74	63.00	.0000	.3164	.1275	.0283	.0283	1.4747	.9156	.9109	.6122	.5537	.9165	.7090	.6434
30	-3.64	2.01	11.66	43.59	53.26	.0000	.4090	.0675	.0177	.0177	1.4705	.9444	.9413	.8801	.5854	.8311	.7858	.6054
50	-2.01	2.35	9.57	32.17	38.89	.0000	.4975	.1170	.0336	.0336	1.4339	.9875	.9816	.8430	.5364	.7335	.8721	.5653
70	4.41	8.53	7.38	27.81	26.95	.0000	.6111	.1580	.0457	.0457	1.4979	.9586	.9505	.8190	.4964	.6425	.8849	.4838
85	8.84	12.49	9.62	23.19	13.55	.0000	.6802	.1892	.0504	.0504	1.5357	.9430	.9333	.7595	.4181	.5932	.9016	.4386
90	9.13	12.61	11.31	19.55	18.26	.0000	.6947	.2078	.0532	.0532	1.5326	.9229	.9119	.7800	.4111	.5682	.9182	.4314
95	9.10	12.43	13.77	16.22	17.53	.0000	.6935	.2186	.0528	.0528	1.5278	.9033	.7977	.7693	.4067	.5504	.9347	.4369

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.1356	1.4776	87.04	88.25	37.80

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	969.9	591.9	610.9	590.9	753.3	-27.3	50.96	-2.72	-19.08	45.25	646.5	935.5	211.3	-596.3	542.0	566.3
10	18.350	19.110	966.9	597.4	635.9	595.9	729.3	30.3	49.87	2.90	-14.71	42.31	657.7	813.9	167.0	-554.3	561.3	584.6
15	19.070	19.740	947.8	600.0	643.3	597.0	691.2	60.3	46.83	5.77	-9.46	42.31	657.9	807.4	107.9	-543.5	583.3	603.8
30	21.140	21.600	906.3	629.6	580.6	628.0	593.1	26.0	41.23	3.38	4.04	45.28	683.6	893.0	-48.5	-634.9	646.6	660.7
50	23.970	24.200	847.1	608.4	662.9	608.1	527.4	16.7	38.50	1.57	17.25	49.54	694.7	945.4	-205.8	-723.6	733.2	740.3
70	26.730	26.890	778.9	540.5	570.0	540.2	530.3	18.2	42.36	1.33	26.95	56.09	639.8	969.0	-289.2	-804.0	819.5	822.2
85	28.860	28.900	738.0	492.0	495.3	491.5	547.0	23.8	47.85	2.78	34.15	60.26	598.5	990.8	-335.8	-860.2	882.8	884.0
90	29.570	29.600	720.7	470.7	469.5	470.2	547.5	21.6	49.46	2.62	37.33	61.39	583.4	1001.4	-357.0	-883.9	904.5	905.4
95	30.240	30.270	704.9	452.5	449.5	452.2	542.9	15.9	50.38	2.02	40.35	63.57	590.1	1016.2	-382.1	-910.0	925.0	925.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	.97	5.00	13.78	53.88	62.57	.0000	.5766	.1319	.0313	.0313	.9480	.0000	.0000	.8321	.8776	.5113	.5890	.7253
10	1.08	5.33	18.86	45.97	59.57	.0000	.6553	.1590	.0391	.0391	.9376	.0000	.0000	.7863	.8702	.5164	.5934	.7035
15	.89	5.20	21.19	41.06	56.99	.0000	.5341	.1313	.0386	.0386	.9425	.0000	.0000	.7935	.8533	.5132	.5939	.6936
30	-1.16	3.62	16.35	38.92	51.67	.0000	.4838	.0800	.0227	.0227	.9717	.0000	.0000	.8745	.8157	.5467	.6141	.7767
50	-1.01	4.46	12.29	36.93	44.63	.0000	.4750	.0393	.0126	.0126	.9876	.0000	.0000	.9359	.7582	.5281	.6201	.8207
70	5.02	11.03	14.81	41.03	44.27	.0000	.5423	.0657	.0236	.0236	.9823	.0000	.0000	.9094	.6872	.4635	.5650	.8308
85	10.76	17.24	17.82	45.07	45.28	.0000	.6083	.1129	.0438	.0438	.9729	.0000	.0000	.8374	.6428	.4174	.5213	.8405
90	12.41	18.99	18.32	46.85	45.92	.0000	.6372	.1272	.0506	.0506	.9708	.0000	.0000	.8138	.6285	.3980	.5106	.8466
95	13.24	19.97	18.34	49.36	46.74	.0000	.6624	.1369	.0557	.0557	.9598	.0000	.0000	.7950	.6088	.3817	.5074	.8571

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7010.	162.23	1.1356	1.4363	80.38	81.90

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	554.0	1059.2	554.0	658.3	.0	829.6	.00	51.56	35.30	-27.28	683.9	741.1	-401.0	339.7	401.0	490.0
10	14.100	16.730	577.2	1030.3	577.2	666.4	.0	796.4	.00	49.71	36.74	-22.26	720.4	720.6	-431.0	273.2	431.0	513.2
15	15.170	17.580	592.4	994.6	592.4	666.6	.0	736.2	.00	47.75	38.04	-16.55	752.3	697.9	-463.7	198.8	463.7	537.4
30	18.280	19.910	618.7	911.2	619.7	661.2	.0	626.3	.00	43.45	42.06	-1.54	833.8	662.7	-558.8	18.2	558.8	608.6
50	22.190	23.030	631.0	820.5	631.0	605.3	.0	554.0	.00	42.46	47.05	14.08	926.5	624.1	-678.3	-151.8	678.3	705.8
70	25.880	26.260	532.5	736.0	532.5	476.1	.0	561.1	.00	49.71	56.04	26.37	954.3	534.4	-791.1	-241.6	791.1	802.7
85	28.450	28.610	449.2	681.2	449.2	380.3	.0	564.7	.00	56.01	62.68	39.14	978.3	431.3	-869.6	-308.8	869.6	874.5
90	29.320	29.410	437.8	660.1	437.8	346.6	.0	561.6	.00	58.34	63.96	44.25	997.5	484.2	-896.2	-337.4	896.2	899.0
95	30.150	30.180	431.3	642.0	431.3	326.4	.0	552.3	.00	59.44	64.89	48.33	1017.3	433.4	-921.6	-369.7	921.6	922.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.15	1.76	3.94	63.18	71.33	.0000	.1307	.1776	.0325	.0325	1.4739	.9036	.898222	.7143	.5121	.9729	.6331	.6807
10	-4.76	1.86	8.37	59.01	66.14	.0000	.2594	.1320	.0269	.0269	1.4803	.9203	.9163	.2687	.5350	.9427	.6701	.6590
15	-4.13	2.05	10.42	54.59	63.01	.0000	.3160	.1053	.0234	.0234	1.4762	.9306	.9269	.6827	.5491	.9051	.7006	.6352
30	-3.10	2.53	12.19	43.60	53.29	.0000	.4111	.0576	.0151	.0151	1.4693	.8529	.8502	.8382	.5737	.8205	.7774	.5367
50	-1.42	3.53	9.29	32.37	38.86	.0000	.5069	.1207	.0346	.0346	1.4435	.8868	.8806	.8397	.5833	.7285	.8634	.5541
70	-5.24	9.42	6.86	29.06	26.37	.0000	.6331	.1722	.0502	.0502	1.4851	.8502	.8421	.8046	.4802	.6411	.8756	.4655
85	9.61	13.26	9.05	23.34	19.55	.0000	.6987	.1975	.0531	.0531	1.5395	.9375	.9273	.7301	.4036	.5861	.8944	.4227
90	9.90	13.38	11.31	19.70	18.26	.0000	.7138	.2194	.0555	.0555	1.5370	.8174	.8061	.7207	.3566	.5658	.9110	.4151
95	9.85	13.18	14.40	16.35	17.54	.0000	.7109	.2281	.0544	.0544	1.5335	.8057	.7936	.7618	.3923	.5490	.9274	.4219

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.1363	1.4814	87.17	88.35	37.15

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	957.4	582.4	594.3	530.9	750.6	-34.8	51.63	-3.44	-19.38	46.05	630.0	837.2	203.0	-602.7	541.7	567.9
10	18.350	19.110	953.6	596.6	623.1	584.7	721.8	29.6	49.19	2.69	-14.47	43.45	643.8	806.1	160.8	-554.5	560.9	584.1
15	19.070	19.740	934.0	598.3	637.3	584.7	682.0	65.1	46.30	6.35	-8.84	42.63	646.1	794.8	99.1	-538.3	582.9	603.4
30	21.140	21.600	892.2	616.0	667.6	615.3	591.5	27.7	41.53	2.59	4.65	45.77	671.0	882.6	-54.7	-632.5	646.2	660.3
50	23.970	24.200	839.1	597.6	643.9	597.3	530.8	17.9	39.24	1.71	17.26	50.38	680.9	937.1	-201.9	-721.9	732.7	739.7
70	26.790	26.880	776.0	530.4	554.8	530.1	542.1	18.0	44.37	1.95	26.57	56.58	620.6	963.2	-276.8	-803.7	818.9	821.6
85	28.860	28.900	733.7	479.8	480.0	479.3	554.8	20.9	49.15	2.48	34.31	60.94	581.1	987.0	-327.3	-862.6	882.2	883.4
90	29.570	29.600	716.9	461.0	453.0	460.5	553.4	20.0	50.81	2.43	37.59	62.43	571.9	997.6	-348.5	-884.8	903.9	904.8
95	30.240	30.270	702.1	446.6	434.9	446.3	551.1	17.7	51.72	2.28	40.62	63.81	573.3	1011.3	-373.3	-907.5	924.4	925.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.54	5.56	13.06	55.06	62.57	.0000	.5821	.1374	.0325	.0325	.9470	.0000	.0000	.8262	.8647	.5029	.5739	.7229
10	1.32	5.58	18.84	46.30	53.57	.0000	.5535	.1656	.0407	.0407	.9365	.0000	.0000	.7885	.8572	.5068	.5307	.6956
15	.99	5.31	21.77	40.55	56.97	.0000	.5358	.1582	.0403	.0403	.9413	.0000	.0000	.7897	.8403	.5090	.5826	.6676
30	-.89	3.88	16.55	39.94	51.64	.0000	.4870	.0315	.0231	.0231	.9719	.0000	.0000	.8720	.8026	.5354	.6017	.7671
50	-.32	5.14	12.42	37.53	44.60	.0000	.4836	.0418	.0135	.0135	.9871	.0000	.0000	.9361	.7506	.5181	.6073	.8125
70	-6.32	12.33	14.81	42.42	44.25	.0000	.5591	.0740	.0266	.0266	.9803	.0000	.0000	.9031	.6843	.4533	.5482	.8241
85	12.00	18.47	17.52	46.66	45.26	.0000	.6284	.1196	.0464	.0464	.9715	.0000	.0000	.8334	.6388	.4063	.5058	.8358
90	13.70	20.27	18.19	48.33	45.30	.0000	.6540	.1298	.0518	.0518	.9705	.0000	.0000	.8169	.6218	.3832	.4952	.8421
95	14.60	21.32	18.60	49.44	46.74	.0000	.6731	.1342	.0546	.0546	.9707	.0000	.0000	.8020	.6058	.3762	.4919	.8519

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7005.	159.40	1.1363	1.4388	80.34	81.83

Blade-Element and Over-All Performance with Radial Inlet Distortion, Banded Honeycomb Tip Treatment

95% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	541.1	1046.5	541.1	640.3	.0	827.7	.00	52.27	36.49	-27.95	673.2	724.6	-400.4	338.5	400.4	489.2
10	14.100	16.730	563.9	1018.4	563.9	652.9	.0	761.5	.00	50.12	37.34	-22.38	709.3	706.6	-430.3	269.1	430.3	512.4
15	15.170	17.580	573.1	992.3	573.1	653.6	.0	733.2	.00	49.28	38.63	-16.73	741.4	692.9	-462.9	196.7	462.9	536.5
30	18.280	19.910	604.4	897.3	604.4	642.1	.0	626.6	.00	44.28	42.68	-1.66	822.6	643.6	-557.8	19.0	557.8	607.6
50	22.190	23.030	614.9	811.9	614.9	587.9	.0	560.0	.00	43.61	47.75	13.83	914.9	606.4	-677.2	-144.6	677.2	704.6
70	25.880	26.260	519.2	733.0	519.2	461.4	.0	569.3	.00	51.00	56.71	26.77	945.3	517.1	-789.8	-232.1	789.8	801.4
85	28.450	28.610	437.2	679.7	437.2	369.0	.0	570.9	.00	57.13	63.26	39.32	972.2	477.1	-868.2	-302.2	868.2	873.1
90	29.320	29.410	426.3	662.7	426.3	342.4	.0	567.2	.00	59.30	64.52	43.97	991.2	476.2	-894.7	-330.3	894.7	897.5
95	30.150	30.180	420.9	648.1	420.8	329.1	.0	556.3	.00	59.48	65.42	47.75	1011.7	490.0	-920.1	-362.7	920.1	921.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.55	2.35	9.37	64.35	71.39	.0000	.2016	.1758	.0320	.0320	1.4738	.9070	.9019	-9.6638	.4997	.9594	.6224	.6643
10	-4.17	2.44	8.86	59.71	66.14	.0000	.2661	.1225	.0248	.0248	1.4910	.9281	.9240	.3728	.5222	.9298	.6593	.6451
15	-3.60	2.63	10.23	55.36	63.02	.0000	.3252	.1010	.0224	.0224	1.4756	.9349	.9313	.7107	.5362	.8925	.6899	.6205
30	-2.48	3.15	12.06	44.34	53.28	.0000	.4262	.0664	.0174	.0174	1.4650	.9470	.9441	.8872	.5596	.8065	.7659	.5785
50	-.73	4.22	9.04	33.92	38.86	.0000	.5230	.1259	.0362	.0352	1.4472	.8953	.8732	.8361	.5674	.7196	.8508	.5366
70	5.86	10.04	6.65	29.34	26.36	.0000	.6507	.1752	.0510	.0510	1.5038	.9526	.9440	.8046	.4675	.6377	.8664	.4498
85	10.19	13.83	9.23	23.94	19.55	.0000	.7134	.1965	.0527	.0527	1.5484	.8415	.8315	.7934	.3929	.5843	.8868	.4101
90	10.44	13.93	11.63	20.55	18.26	.0000	.7221	.2112	.0537	.0537	1.5504	.8276	.8166	.7802	.3863	.5678	.9036	.4081
95	10.39	13.73	13.61	17.67	17.53	.0000	.7145	.2150	.0521	.0521	1.5507	.8204	.8089	.7755	.3820	.5541	.9205	.4189

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WCI/AI LBM/SEC SQFT
1.1371	1.4851	87.23	88.43	36.47

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VC-1 FT/SEC	VC-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VC'-1 FT/SEC	VC'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	544.9	565.2	575.6	563.1	749.4	-43.6	50.47	-4.43	-19.93	47.31	612.3	830.7	209.6	-610.5	540.7	567.0
10	19.350	19.110	540.3	566.3	607.6	566.5	717.5	23.4	49.74	2.35	-14.54	44.61	628.0	736.7	157.6	-559.8	560.0	593.2
15	19.070	19.740	520.9	570.7	622.0	567.0	678.9	54.1	47.43	6.45	-8.86	43.51	630.0	781.8	96.8	-539.2	581.9	602.4
30	21.140	21.600	876.2	596.6	646.6	596.0	591.1	25.1	42.42	2.43	4.75	46.75	650.0	870.3	-54.1	-634.1	645.1	659.2
50	23.370	24.200	827.9	583.4	631.1	583.1	535.6	18.5	40.32	1.82	17.25	50.93	661.2	926.7	-135.9	-720.0	731.5	738.5
70	26.790	26.880	770.6	523.7	539.4	523.3	550.0	16.4	45.59	2.02	26.45	56.85	602.7	957.9	-267.6	-801.8	817.5	820.3
85	29.860	28.900	729.4	474.8	466.0	474.4	561.0	18.0	50.30	2.17	34.46	61.22	565.3	985.7	-319.7	-863.9	880.7	881.9
90	29.570	29.600	715.9	459.9	444.3	459.6	561.2	16.6	51.64	2.07	37.52	62.59	560.4	998.8	-341.1	-896.6	902.4	903.3
95	30.240	30.270	704.7	450.6	432.0	450.4	556.7	13.5	52.18	1.73	40.26	63.67	566.4	1015.5	-366.1	-910.2	922.8	923.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.29	6.31	12.06	56.91	62.57	.0000	.5366	.1433	.0339	.0339	.9459	.0000	.0000	.8223	.8516	.4875	.5573	.7164
10	1.85	5.11	19.31	47.39	59.55	.0000	.5733	.1731	.0426	.0426	.9351	.0000	.0000	.7817	.8943	.4305	.5660	.6377
15	1.62	5.94	21.86	41.04	56.95	.0000	.5476	.1657	.0422	.0422	.9339	.0000	.0000	.7516	.8274	.4931	.5669	.6756
30	.03	4.73	16.37	40.00	51.60	.0000	.5004	.0852	.0242	.0242	.9715	.0000	.0000	.8685	.7872	.5177	.5913	.7553
50	.72	6.17	12.54	39.50	44.53	.0000	.4951	.0460	.0148	.0148	.9861	.0000	.0000	.9335	.7393	.5051	.5688	.8022
70	7.51	13.57	14.88	43.57	44.24	.0000	.5982	.0831	.0233	.0233	.9782	.0000	.0000	.8310	.6786	.4476	.5319	.8136
85	13.15	19.62	17.21	48.12	45.27	.0000	.6379	.1346	.0522	.0522	.9684	.0000	.0000	.8109	.6343	.4017	.4913	.8340
90	14.61	21.13	17.77	49.57	45.31	.0000	.6602	.1497	.0591	.0591	.9663	.0000	.0000	.7873	.6197	.3880	.4838	.8426
95	15.13	21.85	18.05	50.46	46.74	.0000	.6743	.1552	.0632	.0632	.9659	.0000	.0000	.7681	.6073	.3794	.4852	.8551

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6394.	156.44	1.1371	1.4400	80.06	81.59

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE
$(90 - \beta_{10})$ RADIAL INLET DISTORTION, BANDED HONEYCOMB TIP TREATMENT
(probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 131.64			W_{COR} = 128.73			W_{COR} - 125.77		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	30.2	31.4	30.8	29	30	29.5	28.5	30.3	29.4
10	36.0	36.8	36.4	34	36	35.0	34.3	35.7	35.0
15	40.2	41.4	40.8	39	39	39.0	38.6	39.7	39.15
30	45.5	45.9	45.7	45	45	45.0	43.6	44.9	44.25
50	49.4	49.8	49.6	48	49	48.5	47.7	48.3	48.0
70	46.7	46.5	46.6	45	45	45.0	43.7	45.0	44.35
85	42.7	43.5	43.1	41	41	41.0	40.3	39.3	39.8
90	40.0	43.2	41.6	39	40	39.5	38.4	38.0	38.2
95	38.7	42.1	40.4	39	39	39.0	37.8	37.2	37.5

95% SPEED

	W_{COR} = 162.23			W_{COR} = 159.40			W_{COR} = 156.44		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	29.5	35.0	32.25	29.0	30.7	29.82	29.0	30	29.5
10	36.3	37.7	37.0	35.0	36.0	35.5	35	36	35.5
15	41.0	42.3	41.65	40.0	41.0	40.5	39	39	39.0
30	46.7	47.1	46.9	46.5	46.0	46.25	45	46	45.5
50	50.8	51.5	51.15	49.6	50.2	49.9	49	49.9	49.45
70	46.7	47.3	47.0	46.0	46.0	46.0	45	46	45.5
85	43.1	44.3	43.7	42.0	43.1	42.55	40	41	40.5
90	41.8	42.9	42.35	40.0	41.6	40.8	38	40	39.0
95	39.8	40.4	40.1	38.0	40.0	39.0	37	39	38.0

APPENDIX 8

Blade Element and Overall Performance
with
Uniform Inlet Flow
and
Honeycomb Tip Treatment

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	478.5	937.6	478.5	605.1	.0	716.1	.00	49.80	35.26	-26.57	586.1	676.7	-338.4	302.7	338.4	413.4
10	14.100	16.790	488.3	917.3	488.3	597.5	.0	696.1	.00	49.36	36.67	-23.74	608.8	653.0	-363.6	263.1	363.6	433.0
15	15.170	17.580	498.0	883.8	498.0	592.6	.0	655.4	.00	47.86	38.15	-18.78	633.3	626.9	-391.2	202.0	391.2	453.4
30	18.280	19.910	520.5	791.6	520.5	585.0	.0	532.9	.00	42.28	42.14	-1.86	702.4	587.6	-471.4	19.4	471.4	513.5
50	22.190	23.090	537.1	701.4	537.1	563.0	.0	418.0	.00	36.55	46.79	17.45	785.0	592.1	-572.3	-177.5	572.3	595.5
70	25.880	26.260	540.3	625.7	540.3	525.2	.0	340.1	.00	32.93	50.99	32.67	858.8	624.8	-667.4	-337.1	667.4	677.2
85	28.450	28.610	536.8	588.0	536.8	480.4	.0	338.8	.00	35.21	53.81	39.72	909.1	624.7	-733.7	-399.0	733.7	737.8
90	29.320	29.410	534.9	565.6	534.9	451.5	.0	340.4	.00	37.05	54.72	42.81	926.2	615.7	-756.1	-418.0	756.1	758.5
95	30.150	30.180	533.1	542.2	533.1	424.5	.0	337.3	.00	38.48	55.56	46.09	942.8	612.2	-777.5	-441.0	777.5	778.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.69	1.21	10.51	61.83	71.25	.0000	.1217	.1693	.0311	.0311	1.3335	.9056	.9017	1.8555	.4381	.8596	.5382	.6204
10	-4.77	1.83	7.47	60.41	66.14	.0000	.1997	.1140	.0229	.0229	1.3519	.9328	.9299	33.6268	.4484	.8377	.5621	.5963
15	-4.12	2.13	8.14	56.93	63.02	.0000	.2679	.0937	.0206	.0206	1.3492	.9398	.9372	.4652	.4577	.8036	.5857	.5700
30	-3.05	2.57	11.87	44.00	53.32	.0000	.3709	.0549	.0144	.0144	1.3238	.9538	.9520	.8787	.4783	.7136	.6497	.5297
50	-1.78	3.15	12.92	29.34	39.16	.0000	.4062	.0425	.0120	.0120	1.2916	.9528	.9511	.9250	.4932	.6279	.7268	.5300
70	-.19	3.96	12.50	18.32	26.92	.0000	.4024	.0749	.0206	.0206	1.2510	.8972	.8939	.8753	.4953	.5573	.7935	.5565
85	.51	4.15	9.82	14.09	19.75	.0000	.4425	.1665	.0444	.0444	1.2301	.7663	.7595	.7486	.4916	.5202	.8383	.5526
90	.59	4.09	10.53	11.91	18.33	.0000	.4654	.2113	.0548	.0548	1.2161	.7019	.6936	.6955	.4899	.4987	.8525	.5429
95	.53	3.87	11.94	9.48	17.48	.0000	.4795	.2435	.0608	.0608	1.2021	.6499	.6406	.6590	.4884	.4768	.8659	.5384

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0828	1.2788	87.99	88.40	35.704

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	880.5	622.8	598.1	622.7	646.2	6.6	47.21	.60	-17.55	37.20	627.3	781.8	189.2	-472.6	457.0	479.2
10	18.350	19.110	882.7	631.2	611.9	630.4	636.1	31.2	46.11	2.83	-14.90	36.22	633.3	781.3	162.9	-461.6	473.2	492.8
15	19.070	19.740	866.8	640.1	619.2	639.5	606.3	27.2	44.38	2.44	-10.48	36.99	630.3	800.8	114.5	-481.9	491.8	509.1
30	21.140	21.600	810.6	629.9	635.5	629.9	502.6	4.7	38.31	.42	3.80	41.23	638.5	838.0	42.5	-552.4	545.2	557.0
50	23.970	24.200	747.0	610.2	628.7	610.1	403.1	3.4	32.64	.32	18.85	45.48	665.7	870.5	-215.1	-620.7	618.2	624.1
70	26.790	26.880	682.4	571.6	595.6	571.6	333.1	-8.6	29.22	-.86	30.98	50.83	695.3	905.3	-357.7	-701.8	690.9	693.2
85	28.860	28.900	650.2	535.8	557.2	535.8	334.8	1.9	31.01	.21	36.31	54.22	691.6	916.5	-409.4	-743.4	744.3	745.3
90	29.570	29.600	631.7	510.3	533.6	510.3	338.0	1.4	32.37	.15	38.52	56.19	682.1	917.2	-424.5	-761.9	762.6	763.4
95	30.240	30.270	612.1	484.0	511.2	483.9	336.6	-3.5	33.36	-.42	40.93	58.32	676.7	921.5	-443.3	-784.2	779.9	780.6

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.42	1.61	17.11	46.61	62.59	.0000	.4609	.1013	.0240	.0240	.9651	.0000	.0000	.8269	.8019	.5487	.5729	.6887
10	-1.52	2.74	18.80	43.28	59.63	.0000	.4500	.1241	.0306	.0306	.9572	.0000	.0000	.7911	.7985	.5562	.5734	.6885
15	-1.83	2.51	17.88	41.94	57.11	.0000	.4299	.0998	.0256	.0256	.9666	.0000	.0000	.8322	.7810	.5651	.5718	.7070
30	-4.47	.36	14.43	37.89	51.81	.0000	.3962	.0576	.0164	.0164	.9827	.0000	.0000	.8891	.7288	.5576	.5778	.7417
50	-6.95	-1.43	11.12	32.32	44.82	.0000	.3549	.0302	.0098	.0098	.9921	.0000	.0000	.9293	.6703	.5411	.5997	.7720
70	-8.31	-2.19	12.03	30.08	44.32	.0000	.3425	.0321	.0116	.0116	.9928	.0000	.0000	.9053	.6110	.5065	.6230	.8022
85	-5.78	.72	15.26	30.80	45.33	.0000	.3747	.0835	.0324	.0324	.9830	.0000	.0000	.7707	.5789	.4719	.6157	.8072
90	-4.51	2.09	15.86	32.22	45.96	.0000	.4044	.1056	.0421	.0421	.9797	.0000	.0000	.7300	.5612	.4480	.6056	.8052
95	-3.81	2.94	15.91	33.78	46.75	.0000	.4356	.1196	.0487	.0487	.9784	.0000	.0000	.7126	.5421	.4237	.5987	.8067

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5910.46	156.138	1.0827	1.2580	81.96	82.53

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
1	13.120	16.030	428.5	870.2	428.5	526.8	.0	692.5	.00	52.74	38.30	-27.90	546.1	596.3	-338.4	279.0	338.4	413.5
2	14.100	16.790	437.1	853.8	437.1	534.5	.0	665.6	.00	51.23	39.76	-23.50	568.6	583.3	-363.7	232.5	363.7	433.1
3	15.170	17.580	445.6	829.5	445.6	544.2	.0	625.9	.00	48.98	41.28	-17.54	593.1	571.5	-391.3	172.4	391.3	453.5
4	18.280	19.910	464.7	737.8	464.7	516.0	.0	527.2	.00	45.59	45.38	-1.43	662.2	518.1	-471.5	13.6	471.5	513.6
5	22.190	23.090	478.2	659.3	478.2	491.8	.0	439.0	.00	41.73	50.09	17.61	746.0	517.6	-572.4	-156.6	572.4	595.6
6	25.880	26.260	480.9	605.1	480.9	460.7	.0	392.0	.00	40.42	54.21	31.80	822.9	542.5	-667.6	-285.4	667.6	677.4
7	28.450	28.610	478.1	572.6	478.1	406.5	.0	403.3	.00	44.78	56.91	39.47	875.9	526.8	-733.9	-334.8	733.9	738.0
8	29.320	29.410	476.8	558.5	476.8	392.3	.0	397.5	.00	45.38	57.77	42.61	894.1	533.5	-756.3	-361.1	756.3	758.6
9	30.150	30.180	475.6	544.2	475.6	381.5	.0	388.0	.00	45.48	58.55	45.65	911.6	546.0	-777.7	-390.5	777.7	778.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.65	4.25	9.17	66.20	71.23	.0000	.1949	.1489	.0271	.0271	1.3295	.9251	.9220	30.1394	.3907	.7910	.4994	.5420
10	-1.67	4.94	7.71	63.26	66.13	.0000	.2527	.0572	.0115	.0115	1.3498	.9686	.9672	.5755	.3996	.7741	.5228	.5289
15	-.97	5.28	9.40	58.82	63.03	.0000	.2993	-.0056	-.0012	-.0012	1.3575	1.0018	1.0019	1.0208	.4077	.7501	.5464	.5168
30	.20	5.83	12.30	46.81	53.32	.0000	.4355	.0284	.0075	.0075	1.3295	.9778	.9769	.9480	.4250	.6610	.6099	.4641
50	1.51	6.45	13.09	32.49	39.16	.0000	.4836	.0404	.0114	.0114	1.3109	.9609	.9593	.9390	.4368	.5863	.6865	.4603
70	3.00	7.16	11.64	22.41	26.92	.0000	.4971	.0879	.0244	.0244	1.2949	.9023	.8986	.8750	.4386	.5349	.7557	.4796
85	3.59	7.24	9.57	17.44	19.75	.0000	.5586	.1946	.0521	.0521	1.2839	.7825	.7747	.7501	.4359	.5022	.8028	.4620
90	3.63	7.13	10.34	15.16	18.34	.0000	.5606	.2102	.0547	.0547	1.2784	.7595	.7510	.7318	.4347	.4889	.8181	.4670
95	3.52	6.88	11.50	12.90	17.48	.0000	.5543	.2165	.0545	.0545	1.2728	.7446	.7357	.7227	.4337	.4758	.8326	.4774

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0889	1.3083	89.85	90.23	32.604

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	801.0	520.7	500.4	520.6	625.5	-1.1	51.34	-.12	-18.60	42.69	528.0	708.4	168.4	-480.3	457.1	479.3
10	18.350	19.110	801.0	527.7	519.6	526.5	609.4	31.8	49.55	3.45	-14.70	41.21	537.4	700.0	136.1	-461.1	473.3	493.0
15	19.070	19.740	795.9	535.0	546.1	533.2	578.7	43.1	46.65	4.62	-9.03	41.15	553.5	708.2	86.8	-466.1	491.9	509.2
30	21.140	21.600	737.7	535.8	545.0	535.5	497.0	15.1	42.34	1.61	5.05	45.33	548.4	762.2	-48.3	-542.1	545.3	557.2
50	23.970	24.200	688.2	523.8	542.7	523.6	423.0	13.2	37.92	1.44	19.73	49.39	577.7	804.9	-195.3	-611.1	618.3	624.3
70	26.790	26.880	650.2	508.3	525.4	508.3	382.9	7.5	36.09	.84	30.41	53.45	609.4	853.8	-308.2	-685.9	691.1	693.4
85	28.860	28.900	627.0	488.4	483.7	488.3	398.9	12.7	39.52	1.49	35.54	56.33	594.6	880.7	-345.5	-732.8	744.5	745.5
90	29.570	29.600	616.2	469.7	472.7	469.5	395.3	14.5	39.90	1.76	37.86	57.92	598.9	884.1	-367.5	-749.1	762.8	763.6
95	30.240	30.270	604.8	453.4	464.5	453.3	387.2	7.8	39.81	.99	40.21	59.61	608.4	896.1	-392.8	-773.0	780.1	780.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.59	5.60	16.38	51.46	62.57	.0000	.5311	.1161	.0276	.0276	.9660	.0000	.0000	.8252	.7209	.4554	.4772	.6195
10	1.39	5.65	19.40	46.10	59.58	.0000	.5147	.1429	.0352	.0352	.9581	.0000	.0000	.7870	.7223	.4617	.4893	.6124
15	.65	4.98	20.05	42.02	57.04	.0000	.4970	.1541	.0394	.0394	.9554	.0000	.0000	.7650	.7136	.4687	.4982	.6205
30	-.20	4.60	15.56	40.73	51.69	.0000	.4576	.0716	.0204	.0204	.9818	.0000	.0000	.8702	.6605	.4703	.4913	.6691
50	-1.53	3.95	12.22	36.48	44.77	.0000	.4298	.0387	.0125	.0125	.9913	.0000	.0000	.9185	.6147	.4600	.5147	.7069
70	-1.62	4.47	13.66	35.25	44.23	.0000	.4259	.0374	.0135	.0135	.9924	.0000	.0000	.9292	.5785	.4458	.5418	.7487
85	2.70	9.19	16.53	38.02	45.30	.0000	.4601	.0645	.0250	.0250	.9879	.0000	.0000	.8590	.5536	.4255	.5240	.7672
90	3.07	9.67	17.48	38.14	45.96	.0000	.4836	.0944	.0376	.0376	.9829	.0000	.0000	.7970	.5430	.4084	.5265	.7686
95	2.68	9.42	17.32	38.82	46.75	.0000	.5058	.1110	.0452	.0452	.9806	.0000	.0000	.7700	.5319	.3937	.5342	.7781

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5911.92	142.532	1.0889	1.2861	83.93	84.49

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

80% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	392.3	833.9	392.3	474.4	.0	685.7	.00	55.32	40.59	-30.09	516.6	548.6	-336.1	275.0	336.1	410.7
10	14.100	16.790	400.0	811.0	400.0	485.1	.0	649.7	.00	53.24	42.08	-24.33	539.0	533.0	-361.2	219.6	361.2	430.2
15	15.170	17.580	407.7	783.5	407.7	492.9	.0	609.0	.00	51.00	43.62	-17.80	563.3	518.3	-388.7	158.6	388.7	450.4
30	18.280	19.910	425.1	713.6	425.1	475.5	.0	532.0	.00	48.19	47.74	-2.56	632.6	477.8	-468.3	21.9	468.3	510.1
50	22.190	23.090	437.1	644.5	437.1	452.7	.0	458.8	.00	45.38	52.41	16.32	717.3	472.9	-568.5	-132.8	568.5	591.6
70	25.880	26.260	439.3	603.8	439.3	422.9	.0	430.9	.00	45.55	56.45	29.77	795.5	488.0	-663.0	-241.9	663.0	672.8
85	28.450	28.610	436.7	570.8	436.7	380.0	.0	425.9	.00	48.27	59.07	38.94	849.7	488.8	-728.9	-307.1	728.9	733.0
90	29.320	29.410	435.3	553.8	435.3	359.3	.0	421.3	.00	49.56	59.90	42.76	868.2	489.7	-751.2	-332.2	751.2	753.5
95	30.150	30.180	434.1	535.4	434.1	339.1	.0	414.3	.00	50.71	60.66	46.61	886.1	493.8	-772.4	-358.9	772.4	773.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-.36	6.54	6.97	70.68	71.22	.0000	.2383	.1983	.0353	.0353	1.3169	.9088	.9052	1.2253	.3567	.7548	.4713	.4965
10	.64	7.26	6.88	66.41	66.13	.0000	.2980	.1146	.0229	.0229	1.3275	.9424	.9400	.5127	.3647	.7320	.4944	.4811
15	1.37	7.62	9.13	61.42	63.03	.0000	.3492	.0627	.0139	.0139	1.3296	.9648	.9634	.8241	.3720	.7054	.5176	.4666
30	2.55	8.18	11.17	50.30	53.33	.0000	.4750	.0504	.0132	.0132	1.3253	.9647	.9632	.9162	.3875	.6374	.5810	.4268
50	3.82	8.76	11.80	36.09	39.16	.0000	.5338	.0654	.0186	.0186	1.3174	.9435	.9413	.9086	.3980	.5714	.6583	.4192
70	5.23	9.39	9.61	26.68	26.92	.0000	.5644	.1202	.0340	.0340	1.3170	.8840	.8793	.8423	.3995	.5317	.7284	.4296
85	5.74	9.40	9.04	20.12	19.75	.0000	.5990	.1917	.0517	.0517	1.3092	.8059	.7984	.7622	.3968	.4994	.7768	.4277
90	5.75	9.26	10.49	17.14	18.34	.0000	.6077	.2152	.0558	.0558	1.3021	.7771	.7686	.7370	.3957	.4834	.7924	.4275
95	5.63	8.98	12.46	14.05	17.48	.0000	.6111	.2328	.0576	.0576	1.2940	.7521	.7429	.7179	.3946	.4664	.8071	.4302

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.0922	1.3162	88.65	89.08	30.254

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	760.4	455.9	439.8	454.7	620.3	-26.9	54.60	-3.39	-20.72	47.87	470.2	678.1	166.3	-502.9	454.0	476.0
10	18.350	19.110	754.2	460.2	461.1	459.2	596.7	19.6	52.30	2.43	-15.37	45.65	478.4	657.2	126.6	-470.0	470.1	489.6
15	19.070	19.740	740.7	465.6	481.3	463.1	562.9	48.1	49.46	5.93	-8.79	44.66	487.5	651.1	74.3	-457.6	488.6	505.7
30	21.140	21.600	703.7	484.3	493.9	483.7	501.1	23.7	45.40	2.81	4.65	47.57	496.6	717.4	-40.5	-529.7	541.6	553.4
50	23.970	24.200	665.0	483.2	497.7	482.7	441.1	20.4	41.55	2.42	19.13	51.15	527.5	769.8	-173.0	-599.6	614.1	620.0
70	26.790	26.880	642.8	484.4	485.8	484.2	420.8	14.7	40.90	1.74	28.66	54.29	554.1	830.0	-265.6	-674.0	686.4	688.7
85	28.860	28.900	619.7	462.7	454.7	462.4	421.1	15.1	42.81	1.88	34.99	57.48	555.2	860.2	-318.3	-725.3	739.4	740.4
90	29.570	29.600	606.7	446.0	439.3	445.6	418.5	17.5	43.62	2.25	37.67	58.97	555.2	864.6	-339.1	-740.8	757.6	758.4
95	30.240	30.270	591.4	428.1	422.9	427.9	413.5	12.6	44.35	1.68	40.50	60.71	556.3	874.8	-361.3	-763.0	774.8	775.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	4.70	8.70	13.10	58.06	62.55	.0000	.5979	.1338	.0317	.0317	.9642	.0000	.0000	.8198	.6801	.3972	.4236	.5907
10	4.25	8.50	18.38	49.87	59.55	.0000	.5740	.1541	.0379	.0379	.9594	.0000	.0000	.7914	.6738	.4012	.4305	.5728
15	3.52	7.84	21.35	43.53	57.01	.0000	.5458	.1495	.0381	.0381	.9618	.0000	.0000	.7862	.6622	.4063	.4368	.5682
30	2.96	7.73	16.78	42.59	51.64	.0000	.5021	.0859	.0244	.0244	.9799	.0000	.0000	.8565	.6290	.4234	.4425	.6272
50	2.09	7.55	13.14	39.12	44.66	.0000	.4760	.0488	.0157	.0157	.9897	.0000	.0000	.9136	.5922	.4224	.4672	.6731
70	3.19	9.27	14.52	39.17	44.19	.0000	.4734	.0514	.0185	.0185	.9899	.0000	.0000	.9097	.5698	.4225	.4898	.7239
85	5.96	12.45	16.90	40.93	45.28	.0000	.5076	.0904	.0351	.0351	.9835	.0000	.0000	.8234	.5461	.4015	.4879	.7465
90	6.69	13.28	17.96	41.37	45.96	.0000	.5279	.1087	.0433	.0433	.9809	.0000	.0000	.7891	.5339	.3862	.4872	.7488
95	7.23	13.96	18.01	42.67	46.75	.0000	.5522	.1179	.0480	.0480	.9803	.0000	.0000	.7738	.5184	.3701	.4863	.7562

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
5871.69	132.259	1.0922	1.2924	82.54	83.16

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	491.9	984.7	491.9	602.2	.0	779.1	.00	52.30	37.76	-27.50	622.2	679.1	-381.0	313.6	381.0	465.5
10	14.100	16.790	501.9	959.5	501.9	599.9	.0	748.9	.00	51.30	39.21	-23.51	647.7	654.6	-409.4	261.3	409.4	487.6
15	15.170	17.580	511.8	925.0	511.8	599.7	.0	704.1	.00	49.56	40.71	-17.85	675.3	631.0	-440.5	193.6	440.5	510.5
30	18.280	19.910	535.0	835.3	535.0	585.1	.0	596.0	.00	45.50	44.74	-1.67	753.8	587.5	-530.8	17.8	530.8	578.2
50	22.190	23.090	551.9	745.0	551.9	551.6	.0	500.6	.00	42.21	49.39	17.08	848.6	578.9	-644.4	-169.9	644.4	670.5
70	25.880	26.260	555.9	680.4	555.9	512.8	.0	447.0	.00	41.10	53.49	31.62	934.9	602.7	-751.5	-315.5	751.5	762.6
85	28.450	28.610	553.1	646.9	553.1	458.2	.0	456.6	.00	44.91	56.19	39.23	994.3	591.8	-826.2	-374.2	826.2	830.8
90	29.320	29.410	551.7	630.8	551.7	440.7	.0	451.3	.00	45.68	57.06	42.41	1014.5	597.4	-851.4	-402.8	851.4	854.0
95	30.150	30.180	550.3	611.9	550.3	424.3	.0	440.9	.00	46.10	57.85	45.73	1034.1	608.1	-875.5	-435.5	875.5	876.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.20	3.71	9.53	65.26	71.18	.0000	.1917	.1557	.0284	.0284	1.4260	.0207	.9167	16.4832	.4505	.8996	.5714	.6204
10	-2.24	4.38	7.69	62.71	66.11	.0000	.2644	.0985	.0198	.0198	1.4433	.9461	.9432	.4230	.4609	.8727	.5979	.5954
15	-1.55	4.70	9.07	58.56	62.99	.0000	.3253	.0671	.0148	.0148	1.4428	.9596	.9574	.7929	.4705	.8377	.6244	.5714
30	-.45	5.19	12.05	46.41	53.30	.0000	.4370	.0416	.0109	.0109	1.4261	.9681	.9664	.9282	.4919	.7487	.6970	.5265
50	.80	5.74	12.56	32.31	39.16	.0000	.4958	.0617	.0175	.0175	1.4007	.9420	.9391	.9138	.5074	.6611	.7851	.5137
70	2.27	6.44	11.47	21.87	26.93	.0000	.5123	.1108	.0307	.0307	1.3772	.8804	.8749	.8546	.5104	.5989	.8635	.5306
85	2.87	6.53	9.33	16.96	19.74	.0000	.5645	.2064	.0554	.0554	1.3659	.7751	.7650	.7503	.5076	.5642	.9168	.5161
90	2.91	6.42	10.14	14.65	18.34	.0000	.5686	.2247	.0586	.0586	1.3584	.7503	.7393	.7307	.5063	.5488	.9341	.5197
95	2.82	6.18	11.58	12.11	17.48	.0000	.5655	.2355	.0592	.0592	1.3485	.7305	.7189	.7181	.5051	.5313	.9505	.5280

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1135	1.3951	87.97	88.52	36.474

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	906.1	571.7	570.9	571.2	703.7	-14.6	50.95	-1.48	-18.33	44.13	601.4	795.9	189.1	-554.2	514.6	539.5
10	18.350	19.110	902.7	578.0	586.9	576.7	685.8	30.3	49.44	3.00	-14.61	42.28	606.7	779.7	153.0	-524.7	532.9	554.9
15	19.070	19.740	885.4	582.3	600.2	579.9	650.8	52.5	47.31	5.18	-9.19	41.91	608.6	779.4	97.0	-520.7	553.8	573.2
30	21.140	21.600	835.0	593.1	617.7	592.8	561.5	20.2	42.25	1.95	4.82	45.66	621.3	848.6	-52.4	-607.0	613.9	627.2
50	23.970	24.200	779.1	579.6	611.7	579.4	482.3	15.6	38.24	1.55	19.21	49.85	649.1	898.9	-213.8	-687.1	696.1	702.7
70	26.790	26.880	732.9	559.5	588.3	559.4	436.9	12.8	36.61	1.31	30.11	53.91	680.3	950.1	-341.0	-767.8	777.9	780.6
85	28.860	28.900	709.0	535.7	546.5	535.3	451.7	18.9	39.58	2.03	35.26	56.87	669.4	979.6	-386.4	-820.3	838.1	839.2
90	29.570	29.600	696.9	515.2	533.3	514.9	448.7	18.5	40.08	2.05	37.55	58.52	672.9	986.3	-410.0	-841.1	858.7	859.5
95	30.240	30.270	681.6	498.0	520.6	497.5	440.0	9.4	40.21	1.08	40.08	60.20	680.4	1002.1	-438.1	-869.6	878.1	879.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.23	5.23	15.02	52.42	62.56	.0000	.5529	.1258	.0298	.0298	.9552	.0000	.0000	.8256	.8172	.4963	.5444	.6910
10	1.60	5.86	18.95	46.45	59.58	.0000	.5345	.1478	.0363	.0363	.9478	.0000	.0000	.7971	.8107	.5020	.5469	.6772
15	1.28	5.60	20.60	42.13	57.05	.0000	.5122	.1381	.0353	.0353	.9528	.0000	.0000	.8043	.7942	.5064	.5482	.6778
30	-.29	4.51	15.91	40.30	51.69	.0000	.4720	.0727	.0207	.0207	.9774	.0000	.0000	.8786	.7478	.5174	.5568	.7403
50	-1.23	4.25	12.33	36.69	44.77	.0000	.4481	.0397	.0128	.0128	.9891	.0000	.0000	.9239	.6949	.5057	.5779	.7843
70	-1.04	5.05	14.13	35.30	44.24	.0000	.4448	.0397	.0143	.0143	.9902	.0000	.0000	.9268	.6499	.4871	.6028	.8270
85	2.77	9.26	17.06	37.55	45.30	.0000	.4815	.0821	.0319	.0319	.9811	.0000	.0000	.8368	.6231	.4627	.5876	.8462
90	3.23	9.82	17.76	38.03	45.96	.0000	.5064	.1112	.0443	.0443	.9753	.0000	.0000	.7839	.6113	.4439	.5891	.8496
95	3.06	9.81	17.41	39.13	46.75	.0000	.5266	.1174	.0478	.0478	.9749	.0000	.0000	.7759	.5963	.4284	.5944	.8620

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6655.18	159.449	1.1135	1.3655	82.05	82.82

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

90% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	464.5	950.6	464.5	555.2	.0	771.6	.00	54.26	39.38	-28.84	600.9	634.0	-381.2	305.9	381.2	465.7
10	14.100	16.790	473.9	926.0	473.9	568.4	.0	730.9	.00	52.12	40.84	-23.13	626.4	618.8	-409.7	243.1	409.7	487.8
15	15.170	17.580	483.2	895.7	483.2	574.5	.0	687.1	.00	50.09	42.36	-17.02	654.1	601.5	-440.8	176.3	440.8	510.8
30	18.280	19.910	504.5	815.3	504.5	551.2	.0	600.6	.00	47.43	46.44	-2.22	732.7	553.5	-531.1	22.1	531.1	579.5
50	22.190	23.090	519.6	734.0	519.6	519.2	.0	518.9	.00	44.98	51.11	16.31	828.2	542.4	-644.7	-152.0	644.7	670.9
70	25.880	26.260	522.6	679.7	522.6	477.1	.0	484.0	.00	45.42	55.18	30.30	915.8	553.5	-751.0	-278.9	751.9	763.0
85	28.450	28.610	520.0	645.0	520.0	435.3	.0	476.0	.00	47.57	57.82	39.20	976.6	562.2	-826.6	-355.2	826.6	831.3
90	29.320	29.410	518.6	624.2	518.6	415.6	.0	465.6	.00	48.26	58.66	43.08	997.4	569.6	-851.9	-388.9	851.9	854.5
95	30.150	30.180	517.4	603.5	517.4	397.0	.0	454.5	.00	48.86	59.43	46.76	1017.4	579.8	-876.0	-422.4	876.0	876.9

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.59	5.32	8.17	68.22	71.16	.0000	.2352	.1936	.0349	.0349	1.4142	.9070	.9023	-1.0077	.4244	.8642	.5506	.5764
10	-.61	6.02	8.07	63.97	66.11	.0000	.2898	.1036	.0209	.0209	1.4313	.9456	.9428	.5621	.4342	.8391	.5770	.5607
15	.10	6.35	9.91	59.38	63.00	.0000	.3420	.0554	.0123	.0123	1.4353	.9676	.9659	.8477	.4432	.8086	.6037	.5431
30	1.25	6.88	11.51	48.66	53.31	.0000	.4690	.0501	.0132	.0132	1.4281	.9640	.9622	.9197	.4627	.7285	.6764	.4946
50	2.52	7.46	11.79	34.79	39.16	.0000	.5341	.0750	.0213	.0213	1.4139	.9349	.9316	.9008	.4762	.6493	.7647	.4797
70	3.96	8.13	10.15	24.88	26.93	.0000	.5692	.1385	.0390	.0390	1.4042	.8657	.8591	.8297	.4784	.5957	.8436	.4851
85	4.50	8.15	9.30	18.62	19.74	.0000	.5938	.1996	.0536	.0536	1.3963	.7976	.7879	.7647	.4758	.5611	.8979	.4890
90	4.52	8.02	10.81	15.58	18.34	.0000	.5941	.2155	.0556	.0556	1.3853	.7747	.7641	.7474	.4746	.5417	.9157	.4943
95	4.40	7.76	12.61	12.67	17.48	.0000	.5910	.2274	.0561	.0561	1.3744	.7547	.7435	.7340	.4735	.5227	.9324	.5022

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1173	1.4097	87.90	88.47	34.834

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	865.9	517.1	512.2	515.0	698.2	-38.7	53.74	-4.31	-19.69	48.31	544.0	774.7	183.3	-578.6	514.9	539.8
10	18.350	19.110	860.7	522.5	539.1	521.3	670.8	20.3	51.21	2.22	-14.33	45.71	556.7	747.1	137.6	-534.9	533.2	555.2
15	19.070	19.740	847.0	529.9	560.9	526.9	634.5	56.2	48.52	6.09	-8.17	44.47	567.2	738.4	80.5	-517.3	554.1	573.5
30	21.140	21.600	805.5	553.1	573.3	552.4	565.6	26.5	44.60	2.74	4.81	47.40	576.6	816.5	-48.6	-601.1	614.2	627.6
50	23.970	24.200	760.5	548.8	573.8	548.4	499.1	20.8	41.01	2.17	18.95	51.20	607.6	875.6	-197.4	-682.4	696.4	703.1
70	26.790	26.880	726.8	540.1	551.8	540.0	472.9	11.6	40.60	1.23	28.96	54.93	631.2	940.1	-305.5	-769.4	778.4	781.0
85	28.860	28.900	703.3	520.7	521.9	520.3	471.5	19.2	42.10	2.12	35.11	57.62	638.2	971.6	-367.1	-820.5	838.5	839.7
90	29.570	29.600	686.5	500.7	506.9	500.2	463.0	22.5	42.41	2.57	38.00	59.15	643.6	975.6	-396.2	-837.5	859.2	860.0
95	30.240	30.270	669.3	479.6	492.1	479.4	453.6	12.6	42.66	1.51	40.81	61.05	650.4	990.6	-425.1	-866.9	878.6	879.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.73	7.71	12.18	58.05	62.55	.0000	.6004	.1403	.0332	.0332	.9538	.0000	.0000	.8194	.7759	.4472	.4915	.6701
10	3.18	7.43	18.16	48.99	59.55	.0000	.5748	.1638	.0403	.0403	.9466	.0000	.0000	.7867	.7705	.4523	.5017	.6467
15	2.60	6.92	21.51	42.43	57.01	.0000	.5457	.1596	.0407	.0407	.9493	.0000	.0000	.7810	.7583	.4593	.5087	.6401
30	2.15	6.92	16.71	41.85	51.65	.0000	.5013	.0874	.0248	.0248	.9746	.0000	.0000	.8601	.7201	.4806	.5139	.7095
50	1.53	7.00	12.89	38.85	44.68	.0000	.4798	.0483	.0155	.0155	.9873	.0000	.0000	.9171	.6766	.4767	.5380	.7606
70	2.93	9.01	14.02	39.37	44.20	.0000	.4850	.0508	.0183	.0183	.9877	.0000	.0000	.9138	.6417	.4675	.5559	.8137
85	5.32	11.81	17.15	39.98	45.28	.0000	.5092	.0896	.0348	.0348	.9798	.0000	.0000	.8275	.6170	.4481	.5581	.8362
90	5.55	12.15	18.28	39.85	45.96	.0000	.5260	.1050	.0418	.0418	.9774	.0000	.0000	.8014	.6010	.4301	.5617	.8380
95	5.53	12.27	17.83	41.16	46.75	.0000	.5517	.1159	.0472	.0472	.9762	.0000	.0000	.7870	.5838	.4113	.5662	.8495

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6658.87	152.263	1.1173	1.3775	81.71	82.52

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	567.4	1113.1	567.4	709.9	.0	857.3	.00	50.37	35.27	-27.34	694.9	799.3	-401.2	367.1	401.2	490.2
10	14.100	16.790	579.6	1097.8	579.6	714.7	.0	833.3	.00	49.38	36.65	-24.08	722.4	783.1	-431.2	319.8	431.2	513.5
15	15.170	17.580	591.8	1053.7	591.8	698.8	.0	788.5	.00	48.43	38.08	-19.69	752.0	743.3	-463.9	250.8	463.9	537.6
30	18.280	19.910	620.9	941.0	620.9	684.8	.0	645.0	.00	43.24	41.97	-2.96	835.7	686.4	-559.1	36.1	559.1	608.9
50	22.190	23.090	642.6	833.6	642.6	657.7	.0	511.9	.00	37.86	46.54	16.43	934.8	687.9	-678.6	-194.3	678.6	706.2
70	25.880	26.260	645.0	727.8	645.0	600.9	.0	410.5	.00	34.33	50.80	33.13	1021.2	719.2	-791.5	-392.6	791.5	803.1
85	28.450	28.610	638.0	660.3	638.0	529.0	.0	395.0	.00	36.76	53.74	42.23	1079.0	714.6	-870.1	-480.0	870.1	875.0
90	29.320	29.410	634.8	634.6	634.8	494.4	.0	397.6	.00	38.84	54.70	45.45	1098.7	704.9	-896.7	-501.8	896.7	899.4
95	30.150	30.180	632.0	612.0	632.0	466.3	.0	396.5	.00	40.38	55.57	48.47	1117.9	703.5	-922.1	-526.5	922.1	923.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.70	1.20	9.63	62.61	71.12	.0000	.1288	.2088	.0381	.0381	1.4812	.8868	.8804	2.0586	.5233	1.0302	.6426	.7398
10	-4.81	1.81	7.10	60.73	66.09	.0000	.1905	.0994	.0199	.0199	1.5292	.9428	.9393	3.7504	.5365	1.0119	.6718	.7219
15	-4.18	2.06	7.22	57.78	62.99	.0000	.2727	.1050	.0229	.0229	1.5178	.9348	.9309	.4444	.5487	.9642	.7011	.6802
30	-3.23	2.40	10.76	44.93	53.31	.0000	.3874	.0741	.0195	.0195	1.4773	.9407	.9374	.8547	.5765	.8498	.7809	.6216
50	-2.01	2.90	11.89	30.11	39.15	.0000	.4293	.0634	.0180	.0180	1.4314	.9349	.9315	.9022	.5967	.7450	.8765	.6147
70	-.31	3.82	12.95	17.68	26.91	.0000	.4276	.1094	.0299	.0299	1.3532	.8598	.8537	.8422	.5969	.6452	.9560	.6375
85	.49	4.11	12.31	11.52	19.73	.0000	.4650	.2124	.0545	.0545	1.3000	.7124	.7015	.7188	.5895	.5796	1.0068	.6273
90	.58	4.07	13.15	9.25	18.32	.0103	.4865	.2568	.0637	.0611	1.2809	.6507	.6383	.6719	.5868	.5547	1.0226	.6161
95	.53	3.87	14.31	7.10	17.48	.0117	.4985	.2863	.0683	.0655	1.2657	.6061	.5928	.6413	.5846	.5331	1.0374	.6127

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1179	1.4006	85.73	86.39	40.48

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1043.7	710.9	700.2	710.8	774.0	-4.1	47.86	-.34	-18.34	38.84	737.7	912.6	232.0	-572.4	541.9	568.2
10	18.350	19.110	1058.8	729.7	735.8	728.6	761.4	35.3	45.98	2.76	-15.21	37.00	762.7	912.5	200.2	-549.1	561.2	584.4
15	19.070	19.740	1035.1	740.8	735.3	739.8	728.3	38.1	44.72	2.95	-11.16	37.40	750.1	931.3	145.1	-565.6	583.2	603.7
30	21.140	21.600	965.1	718.2	749.2	717.8	607.7	23.3	39.02	1.86	2.94	41.59	752.0	960.1	-38.8	-637.3	646.5	660.6
50	23.970	24.200	888.3	705.5	738.6	705.3	493.3	16.7	33.72	1.35	17.96	45.71	777.9	1010.5	-239.7	-723.4	733.1	740.1
70	26.790	26.880	794.2	646.7	684.7	646.6	402.5	-4.4	30.44	-.40	31.32	51.95	802.7	1049.9	-416.9	-826.5	819.3	822.1
85	28.860	28.900	731.9	577.5	619.0	577.5	390.5	-2.0	32.26	-.19	38.50	56.90	791.0	1057.6	-492.2	-885.8	882.6	883.8
90	29.570	29.600	709.5	546.2	589.6	546.[illegible]	394.5	3.5	33.80	.38	40.87	58.80	779.7	1054.5	-509.9	-901.8	904.3	905.3
95	30.240	30.270	690.5	520.4	566.0	520.4	395.4	6.7	34.94	.74	43.08	60.48	775.1	1056.2	-529.4	-919.0	924.8	925.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.11	1.91	16.17	48.21	62.59	.0000	.4917	.1177	.0279	.0279	.9478	.0000	.0000	.8266	.9618	.6200	.6855	.7960
10	-1.48	2.78	18.74	43.22	59.64	.0000	.4762	.1596	.0393	.0393	.9278	.0000	.0000	.7678	.9622	.6372	.6920	.7968
15	-1.45	2.90	18.40	41.77	57.13	.0000	.4526	.1248	.0321	.0321	.9455	.0000	.0000	.8159	.9362	.6484	.6828	.8151
30	-3.80	1.04	15.90	37.16	51.86	.0000	.4266	.1035	.0296	.0296	.9594	.0000	.0000	.8282	.8691	.6300	.6824	.8423
50	-5.87	-.35	12.12	32.36	44.79	.0000	.3781	.0605	.0196	.0196	.9792	.0000	.0000	.8756	.7966	.6209	.7010	.8893
70	-7.09	-.96	12.50	30.84	44.34	.0000	.3701	.0509	.0184	.0184	.9854	.0000	.0000	.8750	.7080	.5683	.7172	.9226
85	-4.48	2.02	14.87	32.44	45.33	.0000	.4191	.1045	.0406	.0406	.9743	.0000	.0000	.7583	.6470	.5031	.6995	.9213
90	-3.05	3.55	16.09	33.43	45.96	.0000	.4494	.1271	.0506	.0506	.9706	.0000	.0000	.7267	.6252	.4738	.6870	.9146
95	-2.24	4.51	17.07	34.20	46.75	.0000	.4755	.1398	.0570	.0570	.9693	.0000	.0000	.7141	.6065	.4498	.6803	.9129

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7009.	177.05	1.1179	1.3581	77.57	78.52

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

95% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	526.1	1038.3	526.1	630.5	.0	824.9	.00	52.60	37.29	-28.00	661.3	714.3	-400.6	335.4	400.6	489.5
10	14.100	16.790	537.0	1013.2	537.0	633.6	.0	790.6	.00	51.29	38.72	-23.66	688.3	692.3	-430.5	278.0	430.5	512.7
15	15.170	17.580	547.9	977.2	547.9	635.6	.0	742.1	.00	49.40	40.20	-17.86	717.5	668.8	-463.2	205.3	463.2	536.8
30	18.280	19.910	573.5	880.4	573.5	618.9	.0	626.1	.00	45.31	44.19	-1.61	800.5	621.3	-558.2	18.2	558.2	608.0
50	22.190	23.090	592.6	784.8	592.6	582.7	.0	525.7	.00	42.04	48.80	17.09	900.3	611.3	-677.6	-179.4	677.6	705.1
70	25.880	26.260	597.1	718.6	597.1	538.5	.0	475.6	.00	41.47	52.91	31.22	990.6	630.4	-790.2	-326.2	790.2	801.8
85	28.450	28.610	594.2	679.9	594.2	482.2	.0	479.3	.00	44.83	55.62	39.27	1052.5	623.2	-868.7	-394.3	868.7	873.6
90	29.320	29.410	592.6	660.8	592.6	461.7	.0	472.8	.00	45.69	56.50	42.64	1073.6	628.1	-895.3	-425.2	895.3	898.0
95	30.150	30.180	591.1	638.8	591.1	441.6	.0	461.6	.00	46.27	57.30	46.16	1094.1	637.8	-920.6	-460.0	920.6	921.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.68	3.22	8.97	65.29	71.12	.0000	.2019	.1727	.0313	.0313	1.4752	.9114	.9065*******		.4832	.9506	.6087	.6540
10	-2.74	3.89	7.52	62.38	66.08	.0000	.2675	.0998	.0200	.0200	1.4986	.9449	.9417	.4522	.4945	.9235	.6367	.6310
15	-2.07	4.20	9.05	58.06	62.97	.0000	.3254	.0625	.0138	.0138	1.4992	.9618	.9596	.8120	.5052	.8865	.6649	.6067
30	-1.01	4.64	12.11	45.80	53.29	.0000	.4379	.0400	.0105	.0105	1.4775	.9689	.9671	.9328	.5292	.7895	.7423	.5571
50	.21	5.15	12.56	31.72	39.15	.0000	.4970	.0615	.0174	.0174	1.4481	.9420	.9389	.9166	.5469	.6960	.8359	.5421
70	1.69	5.86	11.07	21.69	26.93	.0000	.5213	.1193	.0333	.0333	1.4233	.8730	.8665	.8498	.5505	.6312	.9185	.5537
85	2.31	5.96	9.37	16.35	19.74	.0000	.5662	.2085	.0560	.0560	1.4072	.7738	.7627	.7557	.5474	.5914	.9744	.5421
90	2.35	5.86	10.36	13.86	18.34	.0000	.5709	.2285	.0594	.0594	1.3967	.7470	.7348	.7351	.5460	.5732	.9925	.5448
95	2.27	5.63	12.00	11.14	17.48	.0145	.5690	.2416	.0602	.0566	1.3835	.7245	.7116	.7208	.5446	.5529	1.0096	.5519

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1257	1.4416	87.66	88.28	38.41

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	954.7	594.6	596.5	594.0	745.4	-17.9	51.33	-1.74	-18.91	44.57	630.6	834.0	204.3	-585.3	541.1	567.3
10	18.350	19.110	952.7	602.7	618.6	601.4	724.4	31.4	49.50	2.98	-14.86	42.54	640.2	816.5	164.1	-552.1	560.3	583.5
15	19.070	19.740	935.3	607.8	635.8	605.3	685.8	55.9	47.16	5.28	-9.25	42.09	644.8	815.8	103.5	-546.9	582.3	602.8
30	21.140	21.600	880.6	620.8	653.5	620.4	589.9	21.0	42.05	1.94	4.83	45.80	657.3	890.4	-55.6	-638.5	645.5	659.6
50	23.970	24.200	822.0	606.1	647.5	605.9	506.3	16.7	38.01	1.58	19.17	49.99	686.7	942.9	-225.7	-722.3	731.9	738.9
70	26.790	26.880	775.4	587.8	620.4	587.6	465.1	13.2	36.87	1.29	29.64	53.95	714.2	998.9	-352.9	-807.6	818.0	820.8
85	28.860	28.900	746.9	558.0	577.0	557.6	474.2	21.5	39.41	2.22	35.20	57.07	706.3	1025.9	-407.1	-861.0	881.2	882.5
90	29.570	29.600	732.2	534.4	561.3	533.9	470.1	20.8	39.95	2.22	37.63	58.83	709.0	1032.0	-432.8	-883.0	902.9	903.8
95	30.240	30.270	714.0	515.7	545.5	515.6	460.7	9.8	40.18	1.09	40.30	60.58	715.4	1049.8	-462.7	-914.5	923.4	924.3

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B TOTAL	LOSS-P PROFILE	LOSS-P	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.52	5.52	14.76	53.07	62.56	.0000	.5626	.1315	.0312	.0312	.9494	.0000	.0000	.8252	.8619	.5141	.5723	.7211
10	1.58	5.84	18.93	46.53	59.58	.0000	.5425	.1567	.0385	.0385	.9400	.0000	.0000	.7930	.8567	.5215	.5785	.7064
15	1.12	5.45	20.71	41.88	57.05	.0000	.5194	.1489	.0381	.0381	.9446	.0000	.0000	.7964	.8397	.5267	.5814	.7069
30	-.49	4.31	15.90	40.11	51.69	.0000	.4768	.0762	.0217	.0217	.9743	.0000	.0000	.8770	.7891	.5400	.5895	.7745
50	-1.47	4.02	12.36	36.43	44.77	.0000	.4536	.0420	.0136	.0136	.9874	.0000	.0000	.9228	.7331	.5273	.6114	.8203
70	-.76	5.33	14.11	35.58	44.25	.0000	.4516	.0421	.0152	.0152	.9886	.0000	.0000	.9224	.6867	.5098	.6319	.8664
85	2.62	9.11	17.26	37.20	45.30	.0000	.4882	.0883	.0343	.0343	.9779	.0000	.0000	.8297	.6551	.4801	.6189	.8826
90	3.10	9.69	17.93	37.73	45.96	.0000	.5144	.1172	.0467	.0467	.9718	.0000	.0000	.7811	.6409	.4584	.6195	.8853
95	3.02	9.77	17.41	39.09	46.75	.0000	.5349	.1189	.0484	.0484	.9726	.0000	.0000	.7811	.6231	.4416	.6235	.8991

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
6998.	167.88	1.1257	1.4066	81.49	82.36

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

95% of Design Speed

ROTOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	503.6	1010.8	503.6	596.4	.0	816.1	.00	53.84	38.52	-28.67	643.7	680.0	-400.9	326.3	400.9	489.8
10	14.100	16.790	513.9	986.2	513.9	610.9	.0	774.1	.00	51.71	39.97	-23.11	670.7	664.9	-430.9	261.0	430.9	513.1
15	15.170	17.580	524.3	953.5	524.3	616.0	.0	727.7	.00	49.74	41.47	-17.15	699.9	645.5	-463.6	190.5	463.6	537.2
30	18.280	19.910	548.2	866.7	548.2	593.8	.0	631.2	.00	46.72	45.51	-2.11	782.8	596.3	-558.6	22.8	558.6	608.4
50	22.190	23.090	565.2	776.0	565.2	555.8	.0	541.5	.00	44.25	50.16	16.44	882.9	581.0	-678.1	-164.1	678.1	705.6
70	25.880	26.260	568.6	717.4	568.6	507.8	.0	506.7	.00	44.95	54.26	30.22	974.2	588.5	-790.8	-295.8	790.8	802.4
85	28.450	28.610	565.8	680.7	565.8	459.4	.0	502.3	.00	47.56	56.94	38.99	1037.3	591.4	-869.4	-372.0	869.4	874.3
90	29.320	29.410	564.4	661.1	564.4	442.0	.0	491.5	.00	48.04	57.79	42.62	1058.9	601.4	-896.0	-407.2	896.0	898.7
95	30.150	30.180	563.1	641.5	563.1	428.2	.0	477.7	.00	48.13	58.57	46.06	1079.8	617.3	-921.3	-444.5	921.3	922.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-2.45	4.46	8.30	67.19	71.12	.0000	.2303	.1965	.0354	.0354	1.4648	.9033	.8980	-1.2610	.4616	.9218	.5914	.6201
10	-1.48	5.14	8.07	63.08	66.08	.0000	.2833	.1013	.0204	.0204	1.4875	.9457	.9426	.5516	.4724	.8961	.6193	.6041
15	-.79	5.47	9.77	58.62	62.99	.0000	.3367	.0553	.0123	.0123	1.4919	.9670	.9651	.8466	.4825	.8628	.6476	.5841
30	.31	5.95	11.61	47.62	53.30	.0000	.4590	.0439	.0115	.0115	1.4817	.9676	.9658	.9294	.5047	.7753	.7249	.5334
50	1.57	6.51	11.92	33.72	39.16	.0000	.5270	.0760	.0216	.0216	1.4586	.9329	.9292	.9012	.5202	.6862	.8183	.5137
70	3.04	7.21	10.07	24.04	26.93	.0000	.5666	.1463	.0412	.0412	1.4448	.8570	.8494	.8248	.5227	.6277	.9010	.5149
85	3.61	7.27	9.08	17.95	19.74	.0000	.5982	.2149	.0579	.0579	1.4348	.7821	.7708	.7549	.5199	.5903	.9575	.5129
90	3.64	7.15	10.35	15.17	18.34	.0000	.5964	.2277	.0592	.0592	1.4247	.7625	.7505	.7412	.5186	.5720	.9760	.5203
95	3.54	6.90	11.91	12.51	17.48	.0000	.5876	.2330	.0582	.0582	1.4145	.7489	.7364	.7340	.5175	.5541	.9935	.5332

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1296	1.4551	87.34	87.99	37.12

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	VO-1 FT/SEC	VO-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	VO'-1 FT/SEC	VO'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	921.1	550.0	550.7	547.8	738.3	-40.7	53.28	-4.26	-19.67	47.98	584.8	818.9	196.9	-608.4	541.5	567.8
10	18.350	19.110	917.8	557.2	581.3	556.0	710.1	20.6	50.69	2.11	-14.42	45.35	600.5	791.7	149.4	-563.3	560.7	584.0
15	19.070	19.740	903.1	564.9	603.0	562.0	672.1	57.1	48.09	5.80	-8.43	44.18	610.2	783.6	89.3	-546.1	582.7	603.2
30	21.140	21.600	858.2	590.1	618.7	589.5	594.5	27.2	43.84	2.64	4.73	47.01	622.2	865.0	-51.5	-632.9	646.0	660.1
50	23.970	24.200	806.2	579.1	615.3	578.7	521.0	20.4	40.25	2.02	18.94	51.15	651.5	923.2	-211.5	-719.1	732.5	739.5
70	26.790	26.880	769.4	568.8	588.9	568.6	495.0	13.2	40.06	1.33	28.79	54.86	672.4	988.3	-323.6	-808.2	818.6	821.4
85	28.860	28.900	744.0	547.6	553.4	547.0	497.3	25.2	41.94	2.64	34.79	57.48	674.1	1017.6	-384.6	-858.0	881.9	883.1
90	29.570	29.600	728.3	524.8	539.8	524.1	489.0	25.5	42.17	2.77	37.52	59.19	680.9	1023.6	-414.6	-879.0	903.6	904.5
95	30.240	30.270	712.3	503.4	529.1	503.2	476.8	12.6	42.02	1.43	40.20	61.12	692.9	1042.0	-447.3	-912.4	924.1	925.0

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	PO2/ PO1	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	3.25	7.24	12.23	57.55	62.55	.0000	.5992	.1421	.0336	.0336	.9485	.0000	.0000	.8208	.8272	.4741	.5298	.7059
10	2.68	6.94	18.05	48.58	59.55	.0000	.5737	.1688	.0415	.0415	.9392	.0000	.0000	.7846	.8228	.4808	.5418	.6831
15	2.16	6.48	21.22	42.29	57.01	.0000	.5454	.1638	.0418	.0418	.9425	.0000	.0000	.7802	.8094	.4881	.5480	.6772
30	1.38	6.16	16.61	41.20	51.66	.0000	.4980	.0868	.0247	.0247	.9720	.0000	.0000	.8634	.7679	.5116	.5554	.7499
50	.77	6.23	12.76	38.23	44.70	.0000	.4806	.0469	.0151	.0151	.9864	.0000	.0000	.9209	.7174	.5018	.5773	.7999
70	2.38	8.46	14.13	38.73	44.21	.0000	.4859	.0470	.0169	.0169	.9876	.0000	.0000	.9228	.6787	.4908	.5921	.8527
85	5.16	11.65	17.67	39.30	45.29	.0000	.5104	.0857	.0333	.0333	.9788	.0000	.0000	.8403	.6510	.4693	.5885	.8721
90	5.34	11.94	18.48	39.40	45.96	.0000	.5328	.1112	.0443	.0443	.9736	.0000	.0000	.7967	.6357	.4487	.5927	.8752
95	4.88	11.62	17.76	40.59	46.75	.0000	.5587	.1270	.0517	.0517	.9710	.0000	.0000	.7759	.6200	.4298	.6022	.8896

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7003.	162.26	1.1296	1.4184	81.08	81.98

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	590.6	1169.6	590.6	729.7	.0	914.1	.00	51.40	35.62	-28.54	726.6	830.8	-423.2	397.0	423.2	517.1
10	14.100	16.790	603.6	1154.6	603.6	743.2	.0	883.5	.00	49.93	37.00	-24.70	755.8	818.4	-454.8	341.9	454.8	541.6
15	15.170	17.580	616.8	1120.3	616.8	745.9	.0	835.8	.00	48.24	38.41	-19.77	787.4	793.6	-489.3	268.7	489.3	567.1
30	18.280	19.910	648.4	993.7	648.4	716.1	.0	688.5	.00	43.83	42.25	-3.62	876.6	720.4	-589.6	46.3	589.6	642.2
50	22.190	23.090	671.2	869.4	671.2	681.0	.0	540.2	.00	38.39	46.82	16.69	981.4	713.4	-715.8	-204.5	715.8	744.8
70	25.880	26.260	672.6	747.9	672.6	614.9	.0	425.7	.00	34.69	51.12	34.38	1072.2	746.9	-834.8	-421.3	834.8	847.0
85	28.450	28.610	664.5	677.8	664.5	539.2	.0	410.6	.00	37.30	54.09	43.54	1133.0	744.0	-917.7	-512.3	917.7	922.8
90	29.320	29.410	660.9	650.2	660.9	504.0	.0	410.5	.00	39.20	55.05	46.89	1153.8	737.7	-945.7	-538.1	945.7	948.6
95	30.150	30.180	657.8	626.1	657.8	475.6	.0	407.1	.00	40.56	55.92	49.97	1174.1	739.8	-972.5	-566.4	972.5	973.5

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-5.36	1.54	8.33	64.17	71.03	.0000	.1410	.2647	.0478	.0478	1.5302	.8603	.8517	2.4867	.5457	1.0849	.6727	.7706
10	-4.48	2.15	6.44	61.69	66.03	.0000	.1953	.1313	.0261	.0261	1.5894	.9264	.9215	5.2484	.5596	1.0667	.7035	.7561
15	-3.86	2.39	7.14	58.18	62.98	.0000	.2564	.0752	.0164	.0164	1.6041	.9537	.9505	.4842	.5732	1.0291	.7353	.7290
30	-2.94	2.68	10.11	45.87	53.31	.0000	.3932	.0823	.0216	.0216	1.5438	.9364	.9324	.8438	.6041	.8977	.8222	.6507
50	-1.72	3.18	12.14	30.12	39.15	.0000	.4391	.0822	.0233	.0233	1.4765	.9179	.9133	.8795	.6252	.7758	.9242	.6364
70	.03	4.15	14.20	16.74	26.91	.0000	.4336	.1299	.0350	.0350	1.3769	.8353	.8276	.8207	.6241	.6614	1.0077	.6605
85	.84	4.45	13.62	10.55	19.73	.0159	.4693	.2321	.0583	.0543	1.3192	.6894	.6770	.7033	.6156	.5930	1.0608	.6510
90	.93	4.42	14.59	8.16	18.31	.0180	.4865	.2719	.0657	.0612	1.2979	.6324	.6186	.6620	.6126	.5664	1.0773	.6427
95	.88	4.21	15.82	5.95	17.48	.0205	.4948	.2976	.0689	.0641	1.2812	.5911	.5766	.6352	.6102	.5435	1.0929	.6423

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1306	1.4428	84.54	85.31	41.59

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1096.5	743.2	721.2	742.7	825.9	-23.6	48.87	-1.83	-19.42	39.99	764.7	969.4	254.3	-622.9	571.6	599.3
10	18.350	19.110	1109.3	768.0	760.3	767.5	807.7	18.4	46.73	1.35	-15.85	37.92	790.4	973.2	215.8	-598.1	591.9	616.4
15	19.070	19.740	1100.0	783.8	783.7	783.3	771.7	27.4	44.55	2.01	-11.30	37.88	799.8	992.4	156.6	-609.3	615.1	636.7
30	21.140	21.600	1016.9	746.5	782.9	745.3	648.6	43.2	39.61	3.32	2.43	41.25	785.5	991.4	-33.3	-653.5	681.9	696.7
50	23.970	24.200	924.0	728.5	763.1	728.0	520.8	26.1	34.28	2.05	18.28	46.01	805.4	1048.7	-252.4	-754.5	773.2	780.6
70	26.790	26.880	815.9	663.5	701.0	663.5	417.4	-4.7	30.77	-.41	32.49	52.71	832.4	1096.0	-446.7	-871.7	864.1	867.0
85	28.860	28.900	751.5	593.0	632.4	593.0	405.9	1.8	32.71	.18	39.71	57.49	822.1	1103.5	-525.0	-930.4	930.9	932.2
90	29.570	29.600	727.4	560.8	602.5	560.0	407.5	6.0	34.00	.62	42.21	59.42	813.6	1102.4	-546.3	-948.8	953.8	954.8
95	30.240	30.270	707.0	534.5	578.8	534.5	406.0	6.1	35.05	.66	44.53	61.15	812.0	1107.8	-569.4	-970.3	975.4	976.4

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-1.11	2.92	14.69	50.70	62.60	.0161	.5021	.1191	.0283	.0245	.9436	.0000	.0000	.8320	1.0084	.6455	.7092	.8419
10	-1.22	3.04	17.34	45.39	59.67	.0174	.4795	.1519	.0375	.0332	.9268	.0000	.0000	.7834	1.0171	.6685	.7296	.8470
15	-1.65	2.71	17.47	42.54	57.16	.0157	.4584	.1507	.0388	.0347	.9283	.0000	.0000	.7848	.9966	.6843	.7298	.8665
30	-3.19	1.66	17.39	36.29	51.89	.0000	.4337	.1457	.0416	.0416	.9383	.0000	.0000	.7664	.9143	.6521	.7117	.8660
50	-5.31	.21	12.81	32.23	44.77	.0000	.3835	.0930	.0300	.0300	.9661	.0000	.0000	.8130	.8274	.6387	.7247	.9195
70	-6.77	-.65	12.48	31.18	44.33	.0000	.3728	.0615	.0222	.0222	.9817	.0000	.0000	.8509	.7261	.5814	.7423	.9603
85	-4.05	2.45	15.24	32.52	45.33	.0000	.4197	.1102	.0428	.0428	.9718	.0000	.0000	.7474	.6627	.5148	.7251	.9578
90	-2.77	3.82	16.33	33.47	45.96	.0000	.4488	.1300	.0518	.0518	.9687	.0000	.0000	.7212	.6394	.4847	.7148	.9527
95	-2.12	4.63	16.98	34.40	46.75	.0000	.4743	.1395	.0568	.0568	.9682	.0000	.0000	.7137	.6193	.4604	.7106	.9542

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7393.	181.91	1.1306	1.3845	74.60	75.73

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	562.4	1095.4	562.4	663.7	.0	871.4	.00	52.70	36.89	-28.17	703.3	753.1	-422.2	355.5	422.2	515.9
10	14.100	16.790	574.5	1068.6	574.5	670.1	.0	832.3	.00	51.15	38.30	-23.51	732.1	731.4	-453.8	291.9	453.8	540.3
15	15.170	17.580	586.6	1030.4	586.6	675.3	.0	778.0	.00	49.02	39.76	-17.41	763.2	708.8	-488.2	212.3	488.2	565.7
30	18.280	19.910	615.2	935.1	615.2	661.8	.0	660.4	.00	44.91	43.69	-1.64	851.4	664.1	-588.3	19.7	588.3	640.7
50	22.190	23.090	635.3	841.0	635.3	625.7	.0	561.9	.00	41.91	48.31	16.13	956.0	653.0	-714.1	-181.1	714.1	743.1
70	25.880	26.260	636.9	766.0	636.9	568.6	.0	512.9	.00	42.08	52.58	30.33	1048.6	659.5	-832.9	-332.2	832.9	845.1
85	28.450	28.610	630.3	713.4	630.3	493.8	.0	514.9	.00	46.20	55.45	39.40	1111.6	639.5	-915.6	-405.8	915.6	920.7
90	29.320	29.410	627.7	690.1	627.7	476.0	.0	499.6	.00	46.38	56.36	43.15	1133.3	653.5	-943.6	-446.9	943.6	946.5
95	30.150	30.180	625.5	665.3	625.5	459.3	.0	481.3	.00	46.34	57.19	46.83	1154.4	671.7	-970.3	-489.9	970.3	971.2

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-4.08	2.82	8.78	65.06	71.10	.0000	.2094	.2009	.0364	.0364	1.5261	.8959	.8896	-4.8009	.5183	1.0055	.6496	.6913
10	-3.17	3.46	7.65	61.81	66.07	.0000	.2714	.1213	.0244	.0244	1.5527	.9323	.9280	.3884	.5311	.9761	.6797	.6682
15	-2.52	3.74	9.50	57.17	62.99	.0000	.3252	.0779	.0172	.0172	1.5530	.9520	.9490	.7743	.5432	.9365	.7104	.6442
30	-1.51	4.12	12.08	45.33	53.32	.0000	.4323	.0446	.0117	.0117	1.5369	.9653	.9631	.9262	.5706	.8395	.7948	.5962
50	-.24	4.68	11.59	32.18	39.15	.0000	.4943	.0702	.0200	.0200	1.5087	.9349	.9311	.9066	.5892	.7457	.8951	.5789
70	1.43	5.57	10.15	22.24	26.91	.0000	.5317	.1516	.0426	.0426	1.4691	.8434	.8348	.8166	.5890	.6712	.9801	.5779
85	2.16	5.79	9.51	16.05	19.76	.0177	.5858	.2551	.0683	.0635	1.4359	.7296	.7156	.7143	.5824	.6176	1.0353	.5536
90	2.23	5.72	10.87	13.21	18.33	.0197	.5793	.2638	.0680	.0629	1.4214	.7110	.6965	.7040	.5801	.5961	1.0529	.5645
95	2.15	5.50	12.68	10.36	17.48	.0220	.5683	.2676	.0659	.0604	1.4055	.6955	.6807	.6979	.5783	.5737	1.0698	.5792

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1407	1.4903	85.84	86.61	40.18

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	1009.2	622.9	630.9	621.5	787.7	-34.5	51.31	-3.19	-19.02	45.49	667.3	886.8	217.4	-632.4	570.3	597.9
10	18.350	19.110	1007.0	629.5	656.7	628.3	763.4	24.4	49.29	2.22	-14.75	43.21	679.3	862.4	172.8	-590.6	590.5	615.0
15	19.070	19.740	988.1	633.9	677.0	631.2	719.4	58.5	46.72	5.29	-8.88	42.42	686.0	855.0	105.7	-576.8	613.7	635.3
30	21.140	21.600	937.7	656.4	701.2	655.9	622.2	25.0	41.57	2.19	4.70	45.59	705.0	937.8	58.1	-670.1	680.3	695.1
50	23.970	24.200	881.7	645.3	696.0	644.9	541.2	21.1	37.86	1.88	18.27	49.58	734.1	995.1	-230.2	-757.6	771.4	778.8
70	26.790	26.880	824.1	612.2	654.4	612.0	500.8	17.0	37.44	1.59	28.93	54.17	748.1	1046.1	-361.4	-848.0	862.1	865.0
85	28.860	28.900	780.2	561.9	590.8	561.6	509.6	19.0	40.78	1.95	35.35	58.35	724.6	1070.3	-419.2	-911.0	928.8	930.0
90	29.570	29.600	761.2	538.2	576.1	537.8	497.5	18.5	40.81	1.96	38.23	60.06	733.9	1078.0	-454.1	-934.1	951.6	952.6
95	30.240	30.270	740.0	519.6	562.7	519.4	480.5	13.2	40.49	1.45	41.19	61.61	748.0	1092.4	-492.6	-961.0	973.2	974.1

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	1.44	5.43	13.31	54.49	62.56	.0000	.5718	.1363	.0323	.0323	.9432	.0000	.0000	.8260	.9122	.5364	.6068	.7636
10	1.31	5.57	18.17	47.07	59.59	.0000	.5517	.1650	.0406	.0406	.9315	.0000	.0000	.7913	.9064	.5424	.6149	.7431
15	.67	5.00	20.73	41.43	57.06	.0000	.5265	.1566	.0400	.0400	.9368	.0000	.0000	.7937	.8888	.5472	.6198	.7381
30	-.95	3.85	16.16	39.38	51.70	.0000	.4792	.0780	.0222	.0222	.9710	.0000	.0000	.8781	.8420	.5692	.6330	.8133
50	-1.62	3.86	12.66	35.98	44.76	.0000	.4573	.0419	.0135	.0135	.9860	.0000	.0000	.9263	.7870	.5595	.6542	.8628
70	-.21	5.89	14.45	35.85	44.27	.0000	.4683	.0469	.0169	.0169	.9861	.0000	.0000	.9185	.7289	.5282	.6612	.9024
85	3.99	10.48	17.00	38.83	45.32	.0000	.5239	.0973	.0378	.0378	.9740	.0000	.0000	.8279	.6815	.4797	.6319	.9137
90	3.99	10.59	17.68	38.85	45.96	.0000	.5434	.1151	.0458	.0458	.9706	.0000	.0000	.7984	.6638	.4585	.6382	.9184
95	3.35	10.10	17.78	39.04	46.75	.0000	.5550	.1084	.0441	.0441	.9737	.0000	.0000	.8127	.6438	.4424	.6494	.9301

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7375.	175.78	1.1407	1.4499	79.62	80.65

Blade-Element and Over-All Performance with Uniform Inlet Flow, Honeycomb Tip Treatment

ROTOR

100% of Design Speed

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	13.120	16.030	550.8	1082.4	550.8	649.0	.0	866.2	.00	53.15	37.52	-28.29	694.4	737.3	-422.9	349.5	422.9	516.7
10	14.100	16.790	562.3	1054.7	562.3	659.2	.0	823.3	.00	51.31	38.94	-23.14	723.0	717.5	-454.5	282.1	454.5	541.2
15	15.170	17.580	573.9	1017.4	573.9	663.3	.0	771.2	.00	49.29	40.42	-17.10	754.1	695.0	-489.0	204.6	489.0	566.7
30	18.280	19.910	601.3	921.4	601.3	644.6	.0	658.3	.00	45.58	44.39	-1.40	842.0	646.8	-589.2	16.5	589.2	641.8
50	22.190	23.090	621.2	832.2	621.2	607.3	.0	569.0	.00	43.13	49.00	16.10	947.5	633.6	-715.3	-175.3	715.3	744.3
70	25.880	26.260	624.7	767.5	624.7	549.4	.0	535.7	.00	44.31	53.15	29.53	1042.3	632.1	-834.2	-310.7	834.2	846.5
85	28.450	28.610	620.5	718.1	620.5	480.7	.0	533.4	.00	47.98	55.91	38.95	1107.3	618.7	-917.1	-388.8	917.1	922.2
90	29.320	29.410	618.6	693.6	618.6	462.8	.0	516.5	.00	48.13	56.79	42.95	1129.6	633.3	-945.1	-431.5	945.1	948.0
95	30.150	30.180	616.9	670.2	616.9	449.7	.0	496.9	.00	47.85	57.59	46.61	1151.1	654.9	-971.9	-476.0	971.9	972.8

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	-3.45	3.45	8.64	65.81	71.08	.0000	.2202	.1954	.0354	.0354	1.5270	.9007	.8947	2.0380	.5068	.9915	.6404	.6754
10	-2.52	4.11	8.03	62.09	66.06	.0000	.2785	.1112	.0224	.0224	1.5515	.9388	.9349	.4943	.5190	.9618	.6701	.6543
15	-1.85	4.41	9.81	57.52	62.97	.0000	.3330	.0693	.0154	.0154	1.5527	.9578	.9551	.8098	.5304	.9232	.7002	.6306
30	-.81	4.84	12.32	45.79	53.29	.0000	.4458	.0464	.0122	.0122	1.5355	.9646	.9624	.9259	.5564	.8256	.7831	.5796
50	.42	5.35	11.57	32.90	39.15	.0000	.5126	.0728	.0207	.0207	1.5168	.9344	.9305	.9059	.5750	.7364	.8831	.5605
70	1.95	6.11	9.36	23.62	26.92	.0000	.5623	.1573	.0446	.0446	1.4952	.8454	.8364	.8165	.5774	.6706	.9702	.5523
85	2.60	6.25	9.05	16.96	19.75	.0189	.6088	.2454	.0662	.0610	1.4700	.7507	.7369	.7319	.5732	.6203	1.0284	.5344
90	2.65	6.15	10.68	13.85	18.34	.0208	.6012	.2529	.0654	.0600	1.4550	.7339	.7196	.7233	.5714	.5978	1.0472	.5458
95	2.56	5.92	12.46	10.98	17.48	.0231	.5865	.2526	.0625	.0567	1.4411	.7236	.7092	.7211	.5700	.5768	1.0651	.5637

TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %	WC1/A1 LBM/SEC SQFT
1.1438	1.5050	86.17	86.93	39.65

STATOR

% SPAN	DIA-1 IN	DIA-2 IN	V-1 FT/SEC	V-2 FT/SEC	VM-1 FT/SEC	VM-2 FT/SEC	V0-1 FT/SEC	V0-2 FT/SEC	B-1 DEGREE	B-2 DEGREE	B'-1 DEGREE	B'-2 DEGREE	V'-1 FT/SEC	V'-2 FT/SEC	V0'-1 FT/SEC	V0'-2 FT/SEC	U-1 FT/SEC	U-2 FT/SEC
5	17.720	18.580	988.3	591.3	602.5	588.9	783.5	-46.6	52.44	-4.54	-19.41	47.62	638.8	873.9	212.3	-645.5	571.2	598.9
10	18.350	19.110	984.1	595.6	630.9	594.4	755.2	17.2	50.12	1.65	-14.55	45.19	652.1	843.9	163.7	-598.8	591.5	616.0
15	19.070	19.740	965.8	600.2	651.7	597.5	712.6	56.3	47.54	5.38	-8.55	44.15	659.7	832.8	97.9	-580.0	614.7	636.3
30	21.140	21.600	914.9	626.6	672.6	626.1	620.0	24.0	42.65	2.20	-5.18	47.01	676.7	918.8	61.4	-672.2	681.4	696.3
50	23.970	24.200	867.5	623.8	673.0	623.5	547.4	21.2	39.12	1.95	18.48	50.58	710.5	982.3	225.2	-758.9	772.6	780.1
70	26.790	26.880	825.5	605.6	638.4	605.4	523.3	17.1	39.36	1.62	28.07	54.51	723.9	1043.2	340.3	-849.3	863.5	866.4
85	28.860	28.900	788.3	567.7	585.0	567.3	528.5	20.7	42.10	2.09	34.48	58.08	709.9	1073.2	401.8	-910.9	930.3	931.6
90	29.570	29.600	768.1	543.8	570.4	543.4	514.4	19.6	42.04	2.06	37.55	59.82	719.9	1081.2	438.7	-934.5	953.2	954.1
95	30.240	30.270	748.3	523.4	560.3	523.2	496.0	11.8	41.51	1.29	40.51	61.50	737.1	1096.8	478.8	-963.9	974.8	975.7

% SPAN	INCS DEGREE	INCM DEGREE	DEV DEGREE	TURN DEGREE	CAMBER DEGREE	OMEGA-B SHOCK	D-FAC	OMEGA-B	LOSS-P TOTAL	LOSS-P PROFILE	P02/ P01	EFF-P TOTAL	EFF-AD TOTAL	EFF-P STATIC	M-1	M-2	M'-1	M'-2
5	2.49	6.48	11.96	56.98	62.55	.0000	.5968	.1461	.0346	.0346	.9411	.0000	.0000	.8197	.8899	.5079	.5793	.7506
10	2.14	6.39	17.59	48.47	59.56	.0000	.5754	.1758	.0433	.0433	.9296	.0000	.0000	.7825	.8837	.5119	.5889	.7254
15	1.58	5.90	20.81	42.16	57.02	.0000	.5492	.1700	.0434	.0434	.9339	.0000	.0000	.7803	.8669	.5167	.5938	.7169
30	.18	4.97	16.17	40.45	51.66	.0000	.4981	.0836	.0238	.0238	.9702	.0000	.0000	.8724	.8198	.5420	.6053	.7946
50	-.37	5.10	12.70	37.17	44.72	.0000	.4753	.0438	.0141	.0141	.9858	.0000	.0000	.9276	.7728	.5394	.6309	.8493
70	1.66	7.74	14.44	37.74	44.23	.0000	.4869	.0519	.0187	.0187	.9846	.0000	.0000	.9158	.7283	.5207	.6380	.8968
85	5.32	11.81	17.13	40.01	45.30	.0000	.5299	.0952	.0370	.0370	.9742	.0000	.0000	.8315	.6878	.4836	.6179	.9142
90	5.24	11.84	17.77	39.99	45.96	.0000	.5484	.1108	.0441	.0441	.9714	.0000	.0000	.8054	.6686	.4623	.6247	.9193
95	4.37	11.12	17.62	40.22	46.75	.0000	.5641	.1137	.0463	.0463	.9719	.0000	.0000	.8056	.6498	.4448	.6391	.9321

NCORR INLET RPM	WCORR INLET LBM/SEC	TO/TO INLET	PO/PO INLET	EFF-AD INLET %	EFF-P INLET %
7387.	173.25	1.1438	1.4627	79.82	80.86

MEASURED AIR ANGLES, STATOR INLET INSTRUMENT PLANE ($90 - \beta_{10}$) UNIFORM INLET FLOW, HONEYCOMB TIP TREATMENT (probe 1 at 30 degrees, probe 2 at 210 degrees, Figure 13)

80% SPEED

	W_{COR} = 156.14			W_{COR} = 142.53			W_{COR} = 132.26		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	31.7	36.7	34.2	29.8	33.2	31.5	29.8	31.4	30.6
10	37.6	41.8	39.7	35.5	38.1	36.8	34.7	35.9	35.3
15	42.2	45.2	43.7	39.3	41.2	40.25	37.9	39.2	38.55
30	47.5	50.6	49.05	45.3	46.1	45.7	42.9	43.3	43.1
50	54.1	56.2	55.15	50.2	51.0	50.6	47.2	48.1	47.65
70	58.2	60.8	59.5	53.0	54.9	53.95	50.2	50.2	50.2
85	58.8	62.1	60.45	53.7	53.6	53.65	50.2	50.9	50.55
90	58.3	63.4	60.85	55.5	55.7	55.6	50.5	52.6	51.55
95	57.4	65.5	61.45	57.5	57.4	57.45	52.0	53.1	52.55

90% SPEED

	W_{COR} = 159.45			W_{COR} = 152.26		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	29.7	32.6	31.15	29.9	31.7	30.8
10	36.2	37.9	37.05	35.2	36.6	35.9
15	40.4	41.3	40.85	39.2	39.8	39.5
30	45.5	46.3	45.9	43.3	44.1	43.7
50	50.6	51.2	50.9	48.3	48.8	48.55
70	53.2	55.0	54.1	50.6	51.1	50.85
85	53.2	52.9	53.05	51.0	52.4	51.7
90	54.8	55.0	54.9	51.7	53.2	52.45
95	56.1	57.0	56.55	53.3	53.1	53.2

95% SPEED

	W_{COR} = 177.05			W_{COR} = 167.88			W_{COR} = 162.26		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	26.9	34.3	30.6	28.3	32.3	30.3	28.3	31.6	29.95
10	36.1	40.4	38.25	35.6	37.8	36.2	35.0	36.7	35.85
15	41.7	44.6	43.15	39.9	41.3	40.6	39.2	40.2	39.7
30	47.4	50.3	48.85	45.4	46.4	45.9	43.6	44.6	44.1
50	52.8	55.6	54.2	49.6	51.3	50.45	48.3	49.4	48.85
70	56.6	60.3	58.45	52.7	55.0	53.85	50.5	52.0	51.25
85	56.6	62.1	59.85	52.8	52.6	52.7	52.4	52.2	52.3
90	54.3	61.9	58.1	53.7	53.7	53.7	54.2	53.1	53.65
95	52.2	61.9	57.55	56.3	56.2	56.25	55.8	54.3	55.05

100% SPEED

	W_{COR} = 181.91			W_{COR} = 175.78			W_{COR} = 173.25		
% SPAN	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.	PROBE 1	PROBE 2	AVG.
5	24.1	33.0	28.55	27.9	31.7	29.8	27.4	31.6	29.5
10	35.2	39.9	37.55	35.9	37.4	36.65	35.5	37.0	36.25
15	41.8	44.2	43.0	40.1	41.4	40.75	39.8	40.7	40.25
30	47.7	49.8	48.75	45.6	46.3	45.95	44.8	45.7	45.25
50	53.0	55.2	54.1	50.7	51.2	50.95	49.5	50.2	49.85
70	55.7	60.4	58.55	52.1	54.7	53.4	51.4	53.3	52.35
85	55.2	61.7	58.45	53.1	52.6	52.85	53.5	52.5	53.0
90	53.0	61.9	57.45	53.4	53.4	53.4	54.3	53.0	53.65
95	51.1	62.3	56.70	55.4	54.4	54.9	55.7	54.1	54.90

APPENDIX 9

One-Third-Octave Broadband Sound Pressure Levels
for
Fan Stage With Honeycomb Tip Treatment

APPENDIX 9
ONE-THIRD-OCTAVE BROADBAND PRESSURE LEVELS (dB 0.0002 DYNES/CM^2)
HONEYCOMB TIP TREATMENT

			Frequency Band (Hz)											
	% Design Speed	Tip Relative Mach No.	560 – 710	710 – 890	890 – 1120	1120 – 1400	1400 – 1800	1800 – 2240	2240 – 2910	2910 – 3540	3540 – 4470	4470 – 5620	5620 – 7100	7100 – 8900
Open Throttle														
	110	1.214	115.8	115.4	115.9	117.0	116.9	117.8	119.3	122.0	122.3	121.7	122.0	121.0
	105	1.162	115.5	115.7	115.6	115.7	116.1	117.2	119.2	118.8	120.4	120.1	121.1	119.7
	100	1.102	115.2	114.7	114.6	114.3	114.5	116.0	117.5	118.5	118.4	119.5	119.3	118.0
	95	1.046	115.2	115.0	115.1	115.1	115.6	115.3	117.8	118.2	118.0	119.0	119.2	118.0
	90	0.994	115.0	115.5	114.6	115.8	115.6	117.1	117.5	118.0	118.4	120.5	119.7	118.5
	80	0.876	114.4	115.0	114.9	114.8	116.0	117.4	118.5	117.3	118.5	119.6	119.4	118.5
Part Throttle														
	100	1.078	114.6	114.5	114.7	115.0	115.7	117.3	119.4	121.4	123.3	122.2	122.4	120.0
	95	1.021	113.6	113.5	113.7	114.2	115.2	115.6	119.0	120.3	120.0	122.0	121.7	120.7
	90	0.966	115.3	115.0	115.8	117.2	117.5	118.8	120.1	121.3	121.4	124.4	123.4	123.7
	80	0.845	113.9	113.6	114.8	114.6	115.3	117.5	119.2	119.2	120.6	121.1	120.2	120.2
Near Stall														
	100	1.074	114.9	114.4	114.5	114.6	115.8	116.9	119.6	121.9	120.6	121.0	121.7	119.8
	95	1.003	115.0	114.8	115.0	115.3	116.1	117.1	118.9	120.8	120.7	122.7	122.2	127.0
	90	0.938	115.5	115.4	115.5	116.1	117.3	118.5	121.1	121.9	122.2	124.8	124.9	124.3
	80	0.811	112.8	113.5	114.1	115.0	116.1	118.1	119.7	119.9	123.0	124.0	123.4	123.7

APPENDIX 10

One-Third-Octave Broadband Sound Power Levels
for
Fan Stage With Honeycomb Tip Treatment

APPENDIX 10
BROADBAND SOUND POWER LEVELS (dB 10^{-13} WATTS)
HONEYCOMB TIP TREATMENT

	% Design Speed	Tip Relative Mach No.	Frequency Band (Hz) 560 – 710	710 – 890	890 – 1120	1120 – 1400	1400 – 1800	1800 – 2240	2240 – 2810	2810 – 3540	3540 – 4470	4470 – 5620	5620 – 7100	7100 – 8900	Total Power
Open Throttle															
	110	1.214	118.1	117.7	118.2	119.5	119.6	120.7	122.1	124.8	125.2	124.8	125.6	125.1	133.0
	105	1.162	117.8	118.0	117.9	118.2	118.8	120.1	122.0	121.6	123.3	123.2	124.7	123.8	132.0
	100	1.102	117.5	117.0	116.9	116.8	117.2	118.9	120.3	121.3	121.3	122.6	122.9	122.1	131.2
	95	1.046	117.5	117.3	117.4	117.6	118.3	118.2	120.6	121.0	120.9	122.1	122.8	122.1	131.1
	90	0.994	117.3	117.8	116.9	118.3	118.3	120.0	120.3	120.8	121.3	123.6	123.3	122.6	131.5
	80	0.876	116.7	117.3	117.2	117.3	118.7	120.3	121.2	120.1	121.4	122.7	123.0	122.6	131.3
Part Throttle															
	100	1.078	116.9	116.8	117.0	117.5	118.4	120.2	122.2	124.2	125.2	125.3	126.0	124.1	133.3
	95	1.021	115.6	115.8	116.0	116.7	117.9	118.5	121.8	123.1	122.9	125.1	125.3	124.8	131.9
	90	0.966	117.6	117.3	116.1	119.7	120.2	121.7	122.9	124.1	124.3	127.5	127.0	127.8	134.5
	80	0.845	116.2	115.9	117.1	117.1	118.0	120.4	122.0	122.0	123.5	124.2	123.8	124.3	132.1
Near Stall															
	100	1.074	117.2	116.7	116.8	117.1	118.5	119.8	122.4	124.7	123.5	124.1	125.3	123.9	132.7
	95	1.003	117.3	117.1	117.5	117.8	118.8	120.0	121.7	123.6	123.6	125.8	125.8	126.1	133.2
	90	0.938	117.8	117.7	117.8	118.6	120.0	121.4	123.9	124.7	125.1	127.9	128.5	128.4	135.4
	80	0.811	115.1	115.8	116.4	117.5	118.8	121.0	122.5	122.7	125.9	127.1	127.0	127.8	134.4

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