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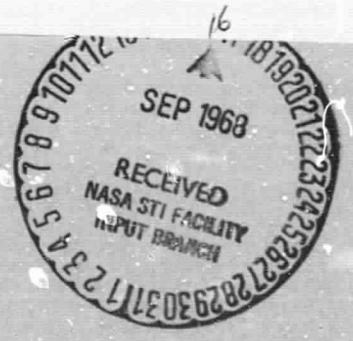
DATA AND PERFORMANCE REPORT DOUBLE-CIRCULAR-ARC STATOR

PREPARED FOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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EAST HARTFORD, CONNECTICUT

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EXPERIMENTAL EVALUATION OF TRANSONIC STATORS

DATA AND PERFORMANCE REPORT DOUBLE-CIRCULAR-ARC STATOR

by

M. J. Keenan and J. A. Bartok

prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



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EAST HARTFORD, CONNECTICUT

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FOREWORD

This report was produced in accordance with NASA Contract NAS3-7614 for NASA Lewis Research Center, Cleveland, Ohio. It describes test results and calculations on the performance of the Double-Circular-Arc Stator.

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I. SUMMARY

A transonic stator having double-circular-arc airfoils was tested over a range of flow angles and velocities. Stator inlet flow was generated by means of an inlet guide vane and flow generation rotor. Transonic stator inlet flow was achieved at design speed. Measured minimum stator losses at mid-span were lower than the NASA loss correlation for comparable Mach numbers. Near the blade ends the losses increased sharply. At mid-span the stator exhibited a minimum total pressure loss coefficient, $\bar{\omega}$, of 0.070 at design speed. The inlet Mach number and diffusion factor at minimum loss were 0.94 and 0.53, respectively. Near the hub at 90 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.147, 1.02 and 0.62, respectively. At 10 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.114, 0.87 and 0.50, respectively. At 5 and 95 percent of span, the stator minimum total pressure loss coefficients were 0.22 and 0.24, respectively. At design speed, minimum loss occurred at approximately 2 degrees negative incidence to the suction surface, except near the hub where minimum loss occurred at positive incidences. Stator deviations were within 1 degree of the predicted values at all spanwise locations, except at 90 percent of span where the deviation was 2.5 degrees greater than predicted. Test data are presented to show the variation of deviation, diffusion factor and stator loss coefficient as a function of incidence angle.

Maximum airflow at design speed was 136.7 pounds per second which is 1.7 pounds per second higher than the design value. Overall stage efficiency at design speed and 136.7 pounds per second airflow was approximately one-half point lower than predicted.

II. INTRODUCTION

Under Contract NAS3-7614 to NASA, the Pratt & Whitney Aircraft Division of United Aircraft Corporation investigated blade element performance of stators designed to operate in the transonic range.

The objective of this investigation was to obtain blade element data on a family of multiple-circular-arc (MCA) blade shapes, which are considered suitable for stator blade sections that operate at high flow Mach numbers. This new family of blade shapes is defined as two double-circular-arc blade segments joined at a common transition point, where the forward and rearward portions of the blade are circular-arc sections of different radii. These blade shapes are aimed at controlling the flow turning over the forward portion of the blade with respect to the total turning to minimize losses associated with flow shocks.

The contract included testing three different stator airfoil shapes utilizing an inlet guide vane and flow generation rotor. Two stators have multiple-circular-arc airfoils with the supersonic turning equal to 0.6 of that for an equivalent double-circular-arc airfoil stator. One multiple-circular-arc design (MCA Stator A) has the transition between the low curvature forward section and the rearward section at the assumed passage shock position. The other design (MCA Stator B) has its transition point moved to the rear of the shock location. A third stator with double-circular-arc (DCA) airfoils provides a basis for comparison.

The three sets of stators were designed for an inlet relative Mach number of 1.1 at the hub and an inlet flow angle of 48 degrees. The blading was designed to turn the flow to the axial direction at all radii. A hub solidity of 1.91 was selected along with an aspect ratio of 2.06, which resulted in 63 blades having a chord of 2.155 inches. Detail design of these stators, along with the design of the inlet guide vane and flow generation rotor, is given in Reference 1.

This report presents blade element performance of the DCA Stator. Also presented are overall performance data for the combination of inlet guide vane and rotor and for the combined overall performance of the inlet guide vane, rotor, and DCA Stator.

III. SYMBOLS

The following symbols are used:

A	- area, ft^2
A_{an}	- annulus area, ft^2 (3.76 at the inlet guide vane leading edge)
A_f	- frontal area, ft^2 (5.241 at the inlet guide vane leading edge)
c	- chord length, in
D	- diffusion factor
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
N	- rotor speed, rpm
P	- total pressure, psfa
p	- static pressure, psfa
r	- radius, ft
S	- blade spacing, in
T	- total temperature, °R
t	- static temperature, °R
t/c	- thickness-to-chord ratio
U	- rotor speed, ft/sec
V	- air velocity, ft/sec

W - weight flow, lbs/sec

β - air angle, angle between air velocity and axial direction, degrees

γ - ratio of specific heats

$\Delta\beta$ - air turning angle, degrees

δ - ratio of inlet total pressure to standard pressure of 2116.22 lbs/ft^2

δ° - deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, 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

$\bar{\omega}$ - total pressure loss coefficient

ω - angular velocity of rotor, radians/sec

Superscripts:

' - relative to moving blades

* - designates blade geometry

Subscripts:

ad - adiabatic

p - polytropic

r - radial direction

z - axial direction

θ - tangential direction

0 - plenum chamber

1 - instrument plane upstream of inlet guide vane (IGV)

2 - station at IGV leading edge

3 - station at IGV trailing edge

4 - instrument plane upstream of rotor

5 - station at rotor inlet

6 - station at rotor exit

7 - instrument plane upstream of stator

8 - station at stator leading edge

9 - station at stator trailing edge

10 - instrument plane downstream of stator

IV. APPARATUS AND PROCEDURE

A. Compressor Test Facility

The compressor test facility is shown schematically in Figure 1. It is equipped with a gas-turbine-drive engine using a 2.1:1 gearbox to give the optimum speed-range capability.

Air enters through a calibrated nozzle for flow measurements. A 72-foot straight section of 42-inch-diameter pipe runs from the nozzle to a 90-inch-diameter inlet plenum. Wire-mesh screen and an "egg-crate" structure located midway through the plenum provide a uniform pressure profile into the compressor.

The compressor airflow is exhausted into a toroidal collector and then into a 6-foot-diameter discharge stack. A 6-foot-diameter valve in the stack provides back pressure for the test compressor. Two smaller valves, one 24-inch and one 12-inch, in bypass lines provide vernier control of back pressure.

B. Test Compressor

The test compressor, as shown in Figure 2, is a single stage, axial-flow compressor with an inlet guide vane. It has a constant outside diameter of 31.0 inches and a hub/tip ratio at the stator inlet of 0.70. The inlet guide vane has 27 NACA M400 series vanes, the rotor 28 double-circular-arc blades, and the stator 63 vanes. Complete details of the design are given in Reference 1.

1. Inlet Guide Vane and Rotor

The inlet guide vane and rotor were designed to produce the desired stator inlet flow angle and Mach number distribution. Blade element performances for the inlet guide vane and rotor are given in Reference 2.

2. Stator

The double-circular-arc stator is a special case of the multiple-circular-arc airfoil in which the transition point and maximum thickness point are located at mid-chord, and the forward and rearward portions of the blade are circular-arc sections of the same radii. The blade sections were designed for the same stator inlet flow conditions and the same outlet flow angle as the MCA Stators A and B, which are described in References 2 and 3. The DCA Stator was tested to provide a reference or base condition in evaluating the performance of the two stator blade rows employing the MCA blade shapes. This blade has

1.67 times the supersonic turning of the multiple-circular-arc blades, so that acceleration in the supersonic flow region ahead of the shock is greater for the DCA Stator than for the MCA Stators A and B. A summary of the stator design values for eight streamlines at which blade element data were obtained is given in Table I. A photograph of the DCA Stator is shown in Figure 3.

TABLE I

STATOR DESIGN DATA, DCA STATOR
(Station 8 - Station 9)

	Percent of Stator Leading Edge Span from O. D.							
	5	10	30	50	70	80	90	95
Inlet Dia.	30.54	30.02	28.18	26.35	24.52	23.60	22.69	22.30
Exit Dia.	30.60	30.05	28.38	26.74	25.11	24.32	23.53	24.24
β_8	41.63	41.46	41.57	42.55	44.02	45.04	46.89	48.08
β_9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M_8	0.85	0.86	0.90	0.94	1.00	1.04	1.06	1.07
σ	1.412	1.437	1.525	1.627	1.740	1.803	1.870	1.896
t/c	0.078	0.076	0.068	0.060	0.052	0.048	0.044	0.042
c	2.155	2.155	2.155	2.155	2.155	2.155	2.155	2.155
i_m	7.5	7.3	6.4	5.5	4.6	4.2	3.8	3.6
$\delta°$	8.1	8.0	7.7	7.7	7.9	8.2	8.6	8.8
$\bar{\omega}$	0.105	0.105	0.110	0.120	0.135	0.150	0.170	0.185
D	0.50	0.50	0.50	0.52	0.54	0.55	0.57	0.58

Stator leading and trailing edge radii are both 0.01 inch across the span. Design incidence to the suction surface is 0°.

C. Instrumentation

Instrumentation was identical with that used for testing of MCA Stator B, which is described in Reference 3.

The general construction features of the temperature rake, pressure rakes and traverse probes are illustrated in Figure 4. Figure 5 shows the station number designation and location of instrumentation and blade leading and trailing edge planes. Figure 6 shows the circumferential location of instrumentation.

D. Test Procedure

Test procedure was the same as for the MCA Stator B tests, which is described in Reference 3, except that a rotor stress survey was not made prior to performance testing.

Overall performance and blade element performance tests were run at 50, 70, 90, 100, 110, and 120 percent of design speed. Five complete data points and one near stall point were obtained at all speeds except 120 percent. At 120 percent of design speed, the near stall point was not run because there was a possibility that a hard stall with the small tip clearances at this speed might damage the rig. Complete data points included radial traverse measurements before and after the stator of total pressure, static pressure, and air angle, together with wake rake traverses of stator exit total pressure and temperature. Near stall points were run without traversing ahead of the stator.

E. Calculation Procedure

Data were reduced using the procedure described in Reference 3. Stator vector diagram data and performance parameters were calculated at 5, 10, 30, 50, 70, 80, 90, and 95 percent of blade height.

Performance parameters are defined as follows:

a. Incidence Angle (based on mean camber line)

$$i_m = \beta_8 - \beta_{8m}^* \qquad \text{(Stator)}$$

b. Deviation

$$\delta^\circ = \beta_9 - \beta_9^* \qquad \text{(Stator)}$$

c. Diffusion Factor

$$D = 1 - \frac{V_9}{V_8} + \frac{r_8 V_{\theta 8} - r_9 V_{\theta 9}}{(r_8 + r_9)\,\sigma\, V_8} \qquad \text{(Stator)}$$

d. Loss Coefficient

$$\bar{\omega} = \frac{P_8 - P_9}{P_8 - p_8} \qquad \text{(Stator)}$$

e. Loss Parameter

$$\frac{\bar{\omega} \cos \beta_9}{2\sigma} \qquad \text{(Stator)}$$

f. Polytropic Efficiency

$$\eta_p = \frac{\frac{\gamma-1}{\gamma} \ln\left(\frac{p_9}{p_8}\right)}{\ln\left(\frac{t_9}{t_8}\right)} \qquad \text{(Stator)}$$

g. Adiabatic Efficiency

$$1.\ \eta_{ad} = \frac{\left(\frac{P_6}{P_0}\right)^{\frac{\gamma-1}{\gamma}} - 1}{\left(\frac{T_{10}}{T_0}\right) - 1} \qquad \text{(IGV - Rotor)}$$

2. $\eta_{ad} = \dfrac{\left(\dfrac{P_{10}}{P_0}\right)^{\frac{\gamma-1}{\gamma}} - 1}{\left(\dfrac{T_{10}}{T_0}\right) - 1}$ (IGV- Rotor -Stator)

h. Pressure Coefficients

1. $C_p = \dfrac{p_{(local)} - p_8}{1/2\, \rho_8\, V_8^2}$ (Stator)

2. S factor $= \dfrac{P_8 - p_{(local)}}{1/2\, \rho_8\, V_8^2}$ (Stator)

Note: Leading edge values of local static pressure for C_p and S factor were set equal to the inlet stagnation pressure; trailing edge values for C_p and S factor were based on calculated static pressure at the stator exit plane.

V. RESULTS AND DISCUSSION

Overall performance of the inlet guide vane, rotor, and stator and the blade element performance of the DCA Stator are presented. Overall performance is presented in plots of pressure ratio and efficiency versus weight flow, with corrected speed as a parameter. Stator blade element performance, including loss coefficient, diffusion factor, and deviation, are presented as functions of incidence. Curves have been drawn through data generated at common test speeds, with design values shown for comparison. Tabulations of Mach number ranges for each speed line were added for convenience. Static pressure distributions for the stator surfaces and hub channel are presented as a function of chord length for representative samplings of the data points. Velocity vectors and blade element performance parameters for the DCA Stator are tabulated in Appendix A. Static pressure distribution data for all the test points are tabulated in Appendix B.

Inlet guide vane performance and rotor performance are presented in Reference 2.

A. Overall Performance

Figure 7 presents overall performance of the inlet guide vane, rotor and stator in terms of pressure ratio and efficiency versus corrected weight flow, $W\sqrt{\theta}/\delta$, and versus corrected specific weight flow, $W\sqrt{\theta}/\delta\ A_{an}$, for six corrected rotor speeds. Values of corrected airflow were measured with the inlet nozzle. Stall lines were extrapolated from the characteristic speed lines to the measured stall airflows.

Figure 7 shows that the maximum flow obtained at design speed was 136.7 pounds per second, or 1.7 pounds per second higher than design flow. The stage efficiency and pressure ratio at this flow and design equivalent speed were 79.1 percent and 1.439 compared with the predicted values of 79.7 percent and 1.485. Maximum stage efficiency obtained at design speed was 80.5 percent at a pressure ratio of 1.482 and an airflow of 134.1 pounds per second. The low value of stage efficiency can be partially attributed to the fact that the stator loading is very high compared to the rotor work input and that the high stator losses result in a high ratio of loss to work input and therefore a low efficiency.

Figure 8 presents the overall performance of the inlet guide vane and rotor combination for the six corrected speeds.

B. Blade Element Performance

Blade element performance of the DCA Stator for six speeds is presented in Figures 9, 10, and 11. Figures show diffusion factor, deviation and total pressure loss coefficient versus incidence, with one plot for each spanwise location. Data were calculated at axial stations corresponding to the leading and trailing edges of the stator.

In general the loss plots exhibit the following trends:

- An increase in minimum loss with increasing Mach number.
- A narrowing of low loss incidence range as Mach number increases.
- Increased minimum loss incidence with increases in Mach number.

Measured mid-span minimum losses at design speed were lower than predicted for comparable values of Mach number. Near the blade ends losses were higher than predicted. At design speed, measured mid-span values of minumum loss coefficient, inlet Mach number and diffusion factor are 0.070, 0.94 and 0.53, respectively. Design mid-span values of loss coefficient, inlet Mach number and diffusion factor are 0.091, 0.94 and 0.54, respectively. Near the hub at 90 percent of span, the stator minimum total pressure loss coefficent, inlet Mach number and diffusion factor were 0.147, 1.02 and 0.62, respectively. At 10 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.114, 0.87 and 0.50, respectively. At 5 and 95 percent of span, the stator minimum total pressure loss coefficients were 0.22 and 0.24, respectively. Minimum loss values taken from the curves of Figure 11 are compared with design values in Figure 12.

Minimum loss levels and optimum incidence angles were defined by test data points for all blade elements. At design speed, minimum loss occurred at approximately two degrees negative incidence to the suction surface, except near the hub where minimum loss occurred at positive incidences. A summary of minimum loss coefficient and incidence at 100 percent of design speed for each spanwise location is given in Table II.

TABLE II
SPANWISE LOSS AND INCIDENCE DATA
DCA STATOR, 100% DESIGN SPEED

% Span from O.D.	Minimum Loss, ϖ	i_s @ Minimum Loss
5	0.220	-1
10	0.114	-2
30	0.060	-4
50	0.070	-2
70	0.085	-1
80	0.100	+1
90	0.160	+2
95	0.240	+2

Stator loadings for design speed and design incidences agree with predicted loadings at the tip section and mid-span section, but are higher than predicted at the hub. The measured D factors at zero degrees of incidence at 10, 50

and 90 percent of span are 0.52, 0.54 and 0.61, respectively, compared to predicted loadings of 0.52, 0.54 and 0.57.

Stator deviations were within 1 degree of the predicted values at all spanwise locations, except at 90 percent of span where the deviation was 2.5 degrees greater than predicted.

The stator loss parameter, $\frac{\bar{\omega} \cos \beta_9}{2\sigma}$, is presented versus diffusion factor for each of eight radial locations in Figure 13. Curves have been drawn through the points representing minimum loss for each speed. The curves shown for each radial position have been adjusted to reflect trends at other radial locations providing a smooth transition as a function of radius. Therefore, at a given radial location the curves will not necessarily represent a mean of the data points obtained at that radial location. The loss parameter as presented is calculated based on the measured total loss and thus includes any losses associated with flow shocks. As speed is increased the D factor at which minimum loss occurs increases due to compressibility. The curves drawn through the minimum loss points indicate an increase in the loss parameter with increasing D factor as might be expected. However, the magnitude of the increase in loss parameter with increase in D factor may, in part, be due to an increase in shock losses associated with the higher Mach number.

Figure 14 presents a comparison of the minimum loss parameter versus D factor for the eight radial locations. The curves indicate an increase in loss parameter in the end wall regions.

Chordwise distributions of the ratio of local static pressure on the hub to stator inlet pressure at 90 percent of span are shown in Figure 15. This figure represents wide open throttle, part throttle and near stall for 50, 100, and 110 percent of opeating speed. Static pressures were measured along the hub, midway between two stator vanes. Pressure discontinuities at the open throttle operating points at design speed and 110 percent of design speed indicate shocks in the channel.

Chordwise distributions of pressure coefficient, C_p, on the stator surfaces are shown in Figures 16 through 23. Pressure coefficients, S factor, are shown in Figures 24 through 31. The data are presented for wide open throttle, part throttle, and near stall for 50, 100, and 110 percent of design speed. The pressure distribution which corresponds to near minimum loss is indicated in the figure subtitles. A rapid increase in C_p (rapid decrease in S factor) on the blade suction surface indicates a sharp rise in static pressure due to the presence of a passage shock. The presence of these passage shocks is more apparent at the higher speeds where the flow Mach number is higher. Data for all speeds and throttle settings are tabulated in Appendix B.

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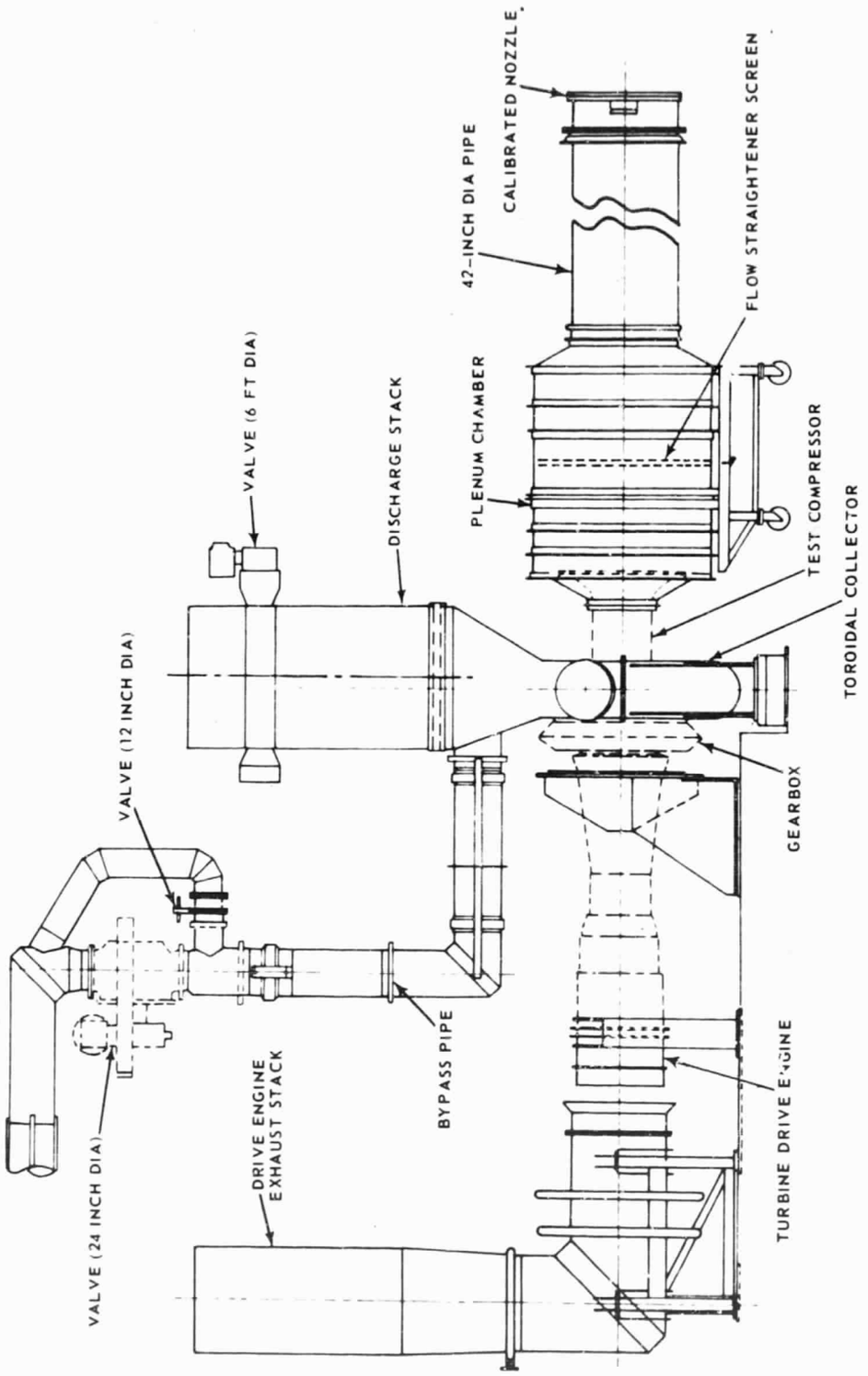


Figure 1 Schematic of Compressor Test Facility

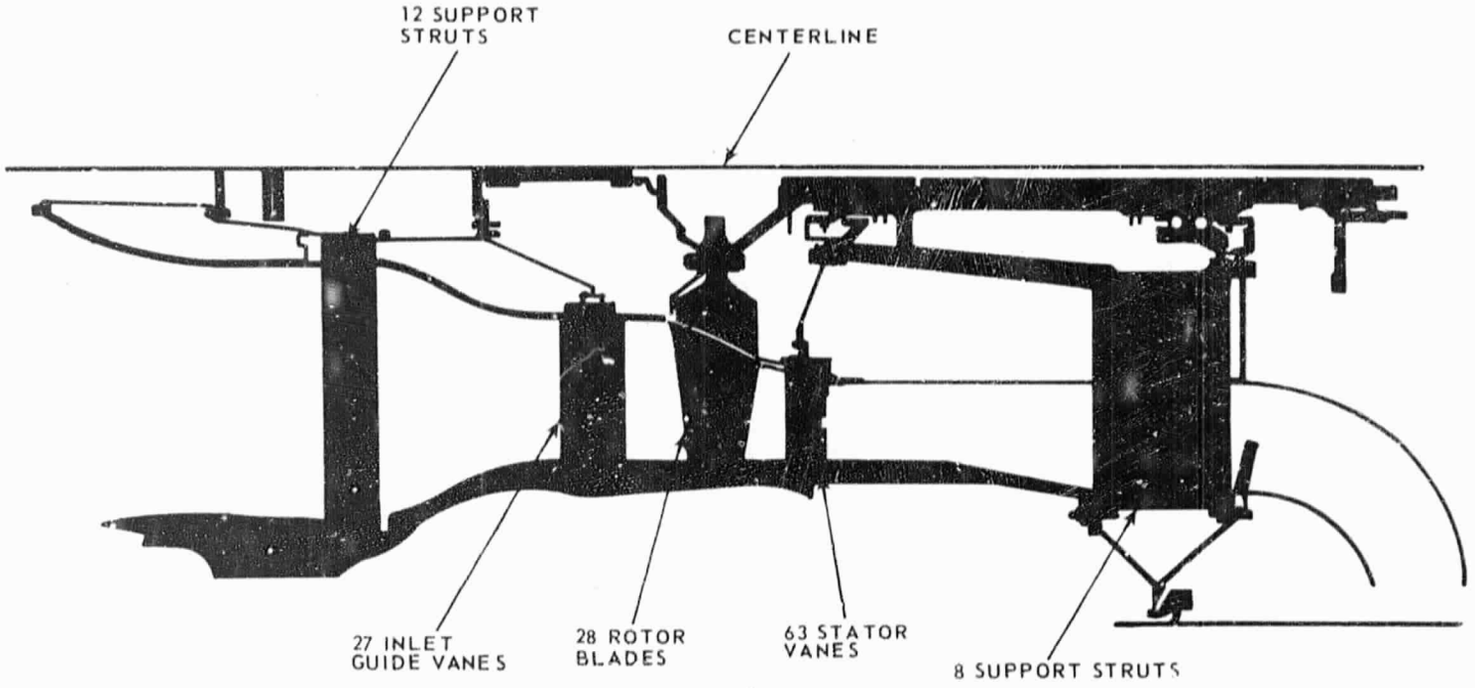


Figure 2 Cross Section of Test Compressor

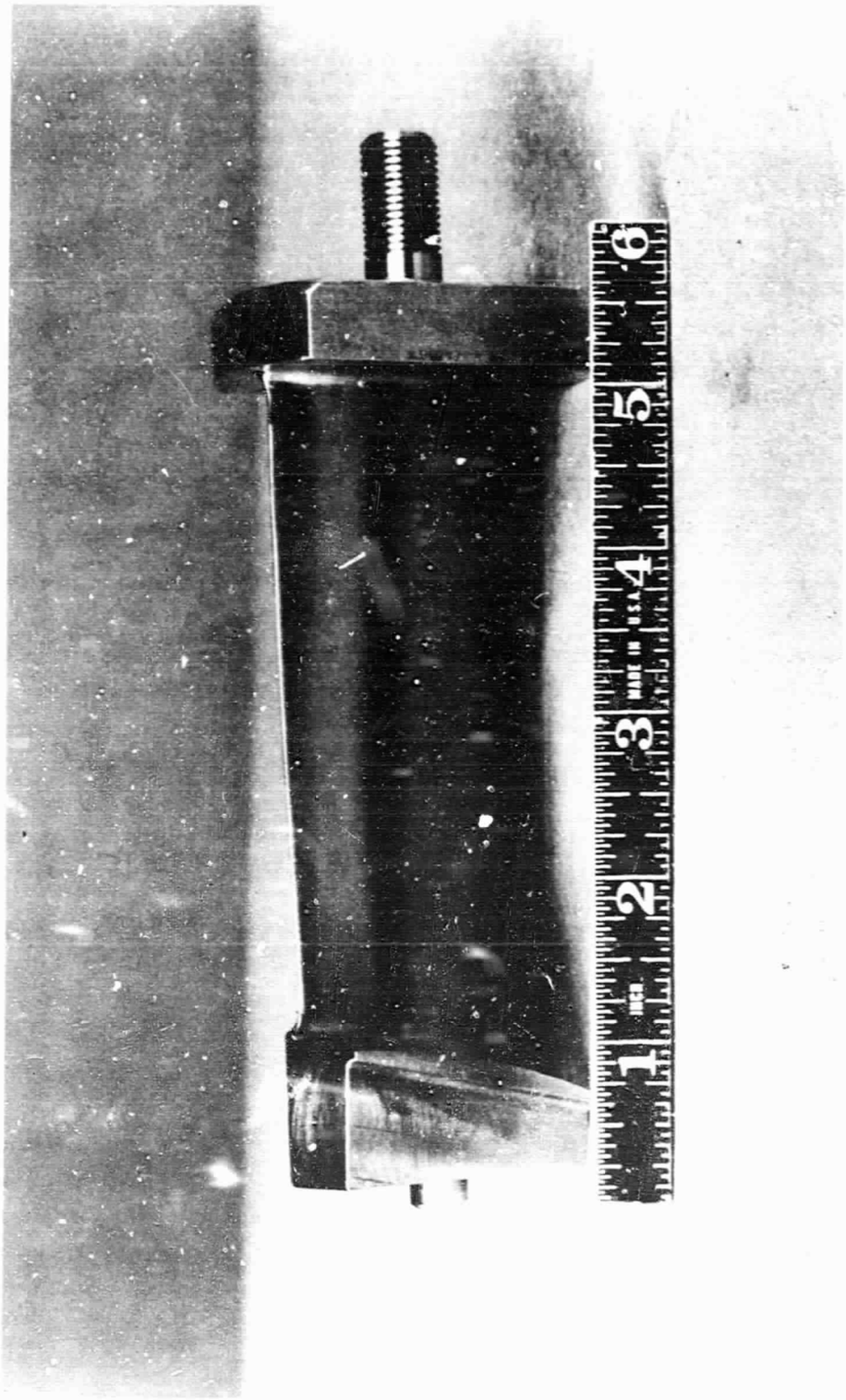
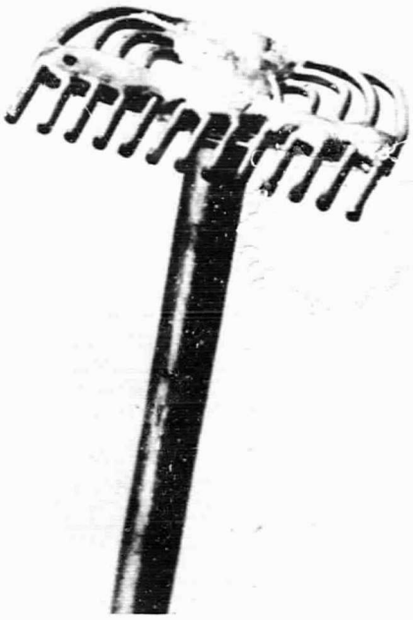
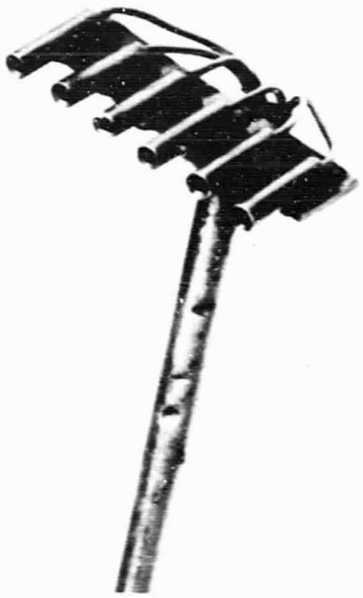


Figure 3 Double-Circular-Arc Stator



Pressure Wake Rake



Circumferential Temperature Rake



Radial Temperature Rake



Disk Probe

Figure 4 Compressor Instrumentation

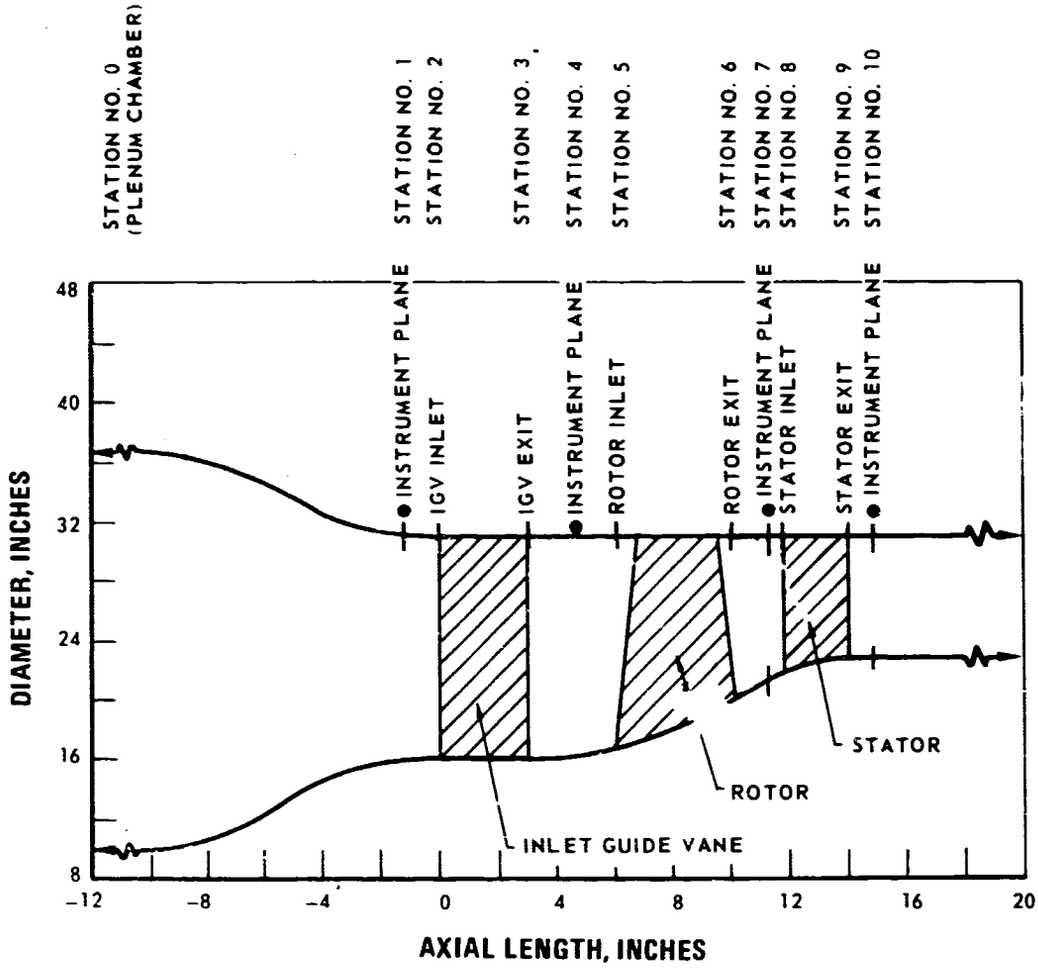


Figure 5 Station Number Designation and Location of Instrumentation and Blade Leading and Trailing Edge Planes

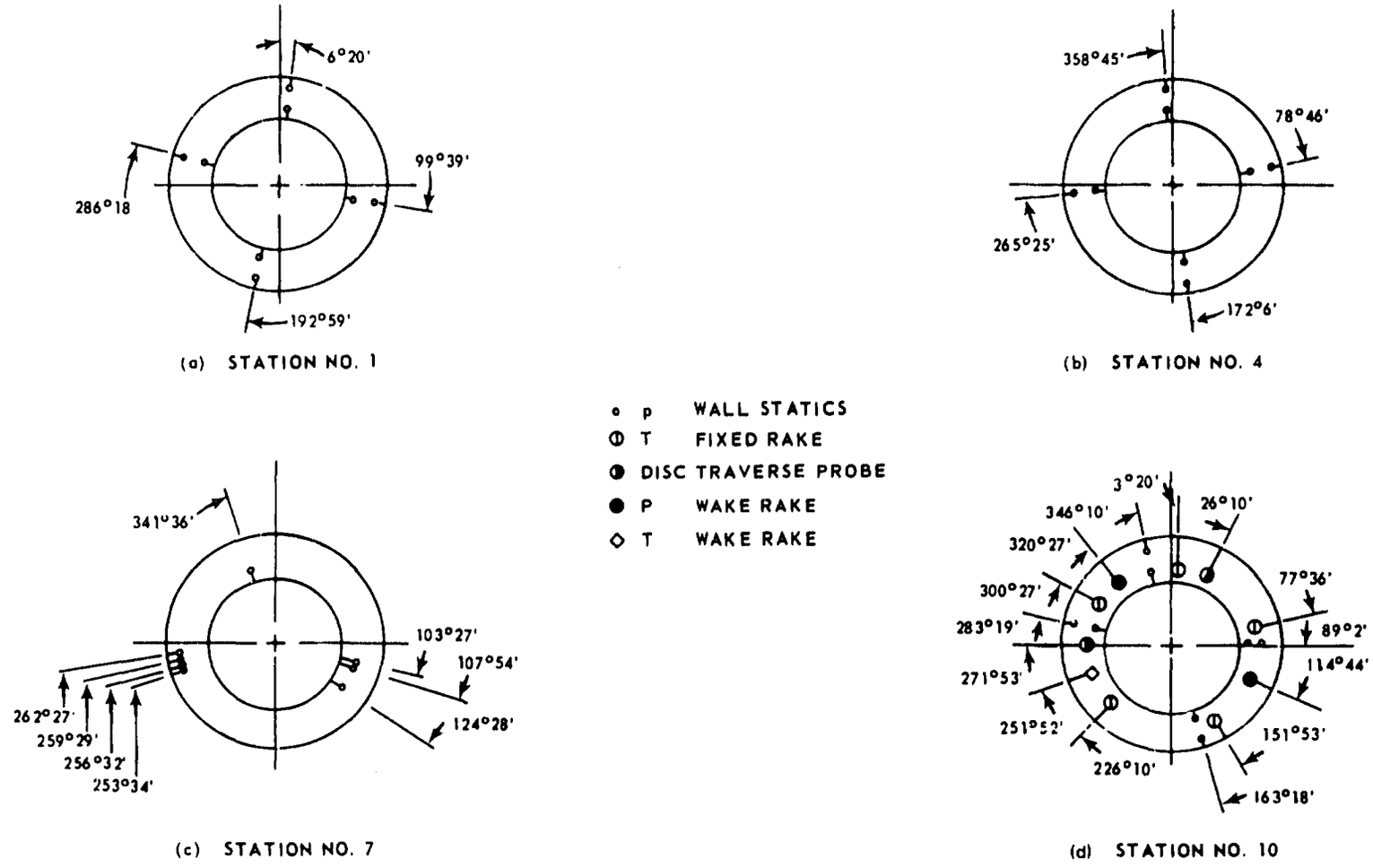


Figure 6 Circumferential Position of Instrumentation

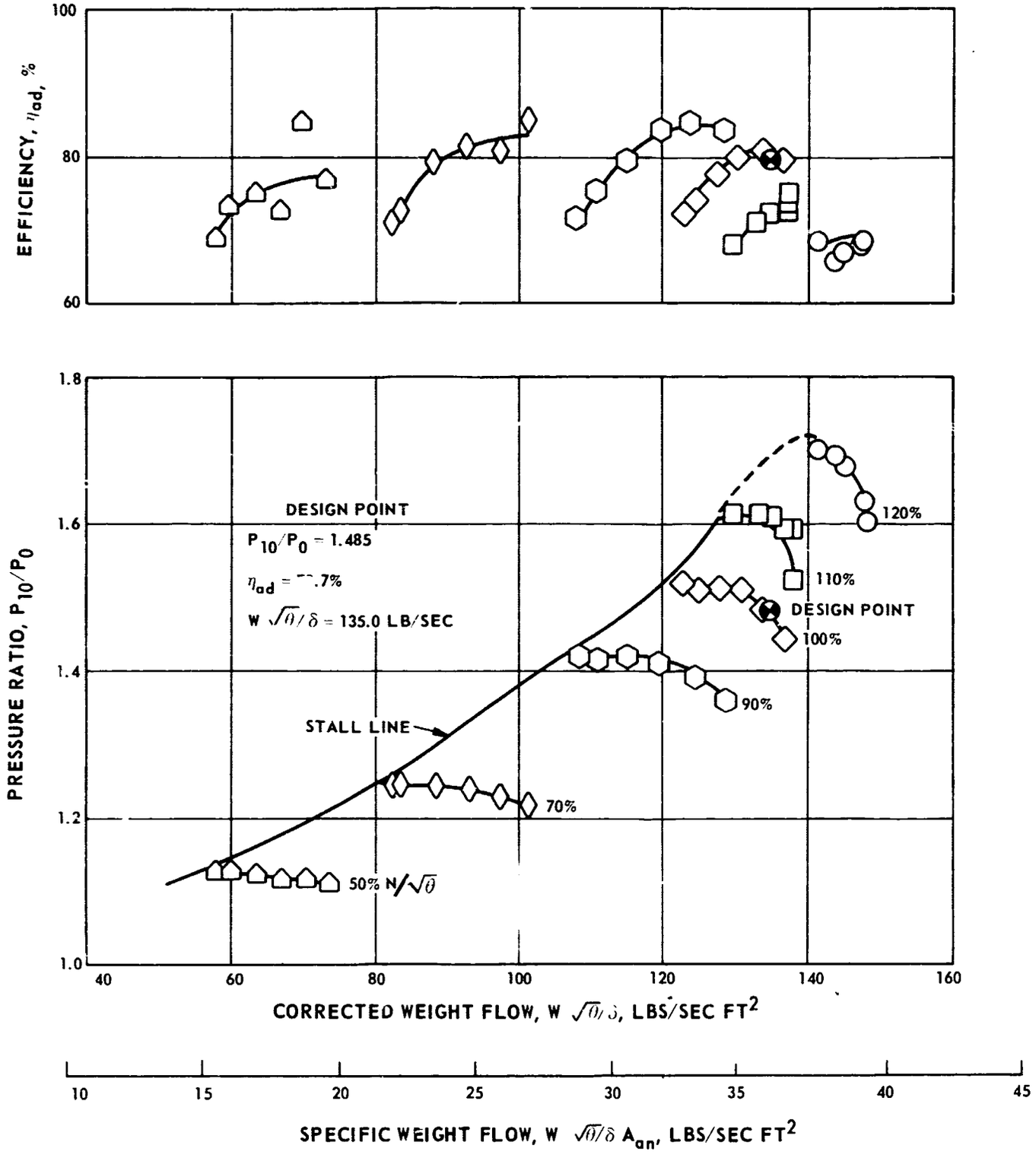


Figure 7 Overall Performance of Inlet Guide Vane, Rotor, and DCA Stator

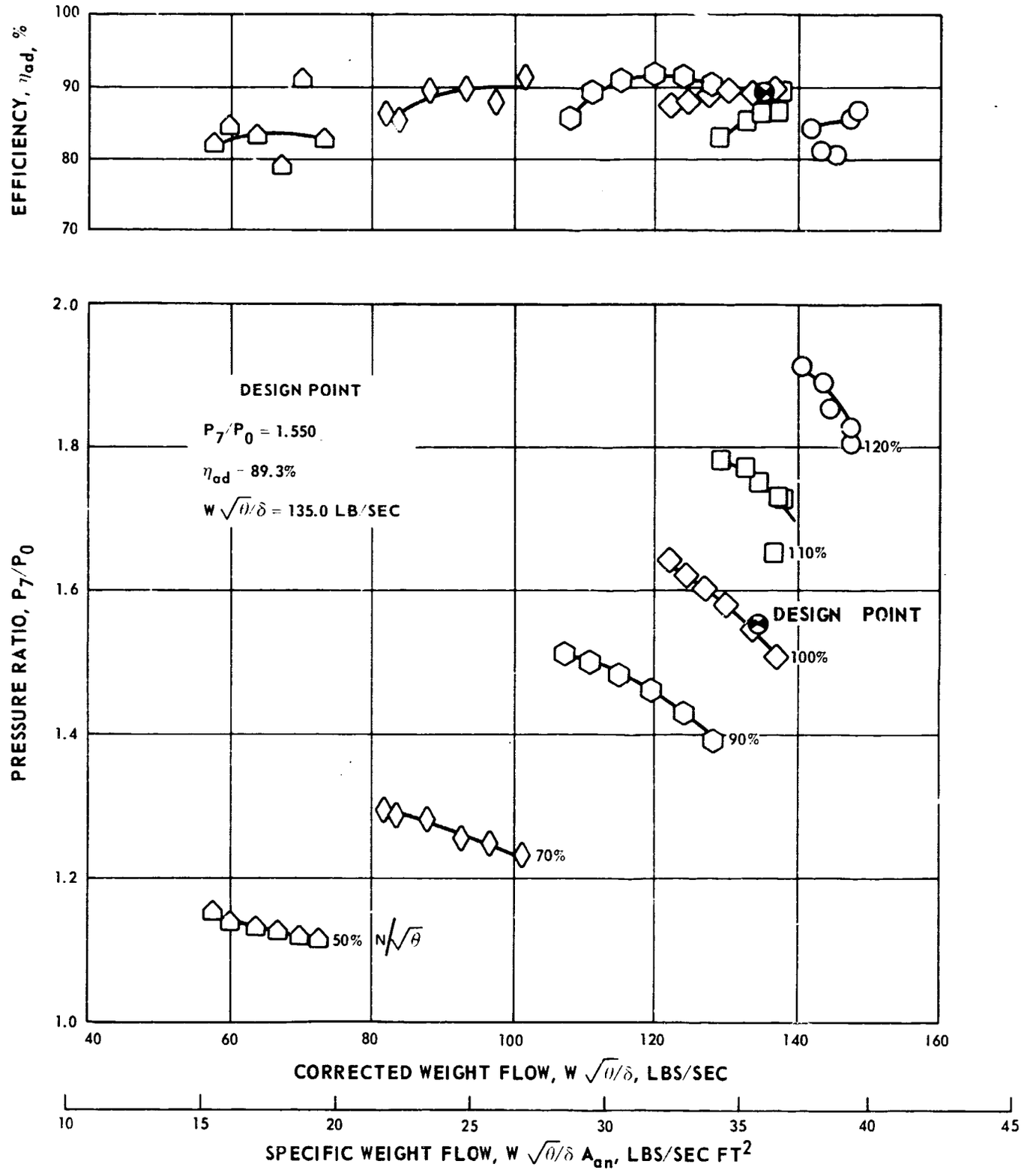
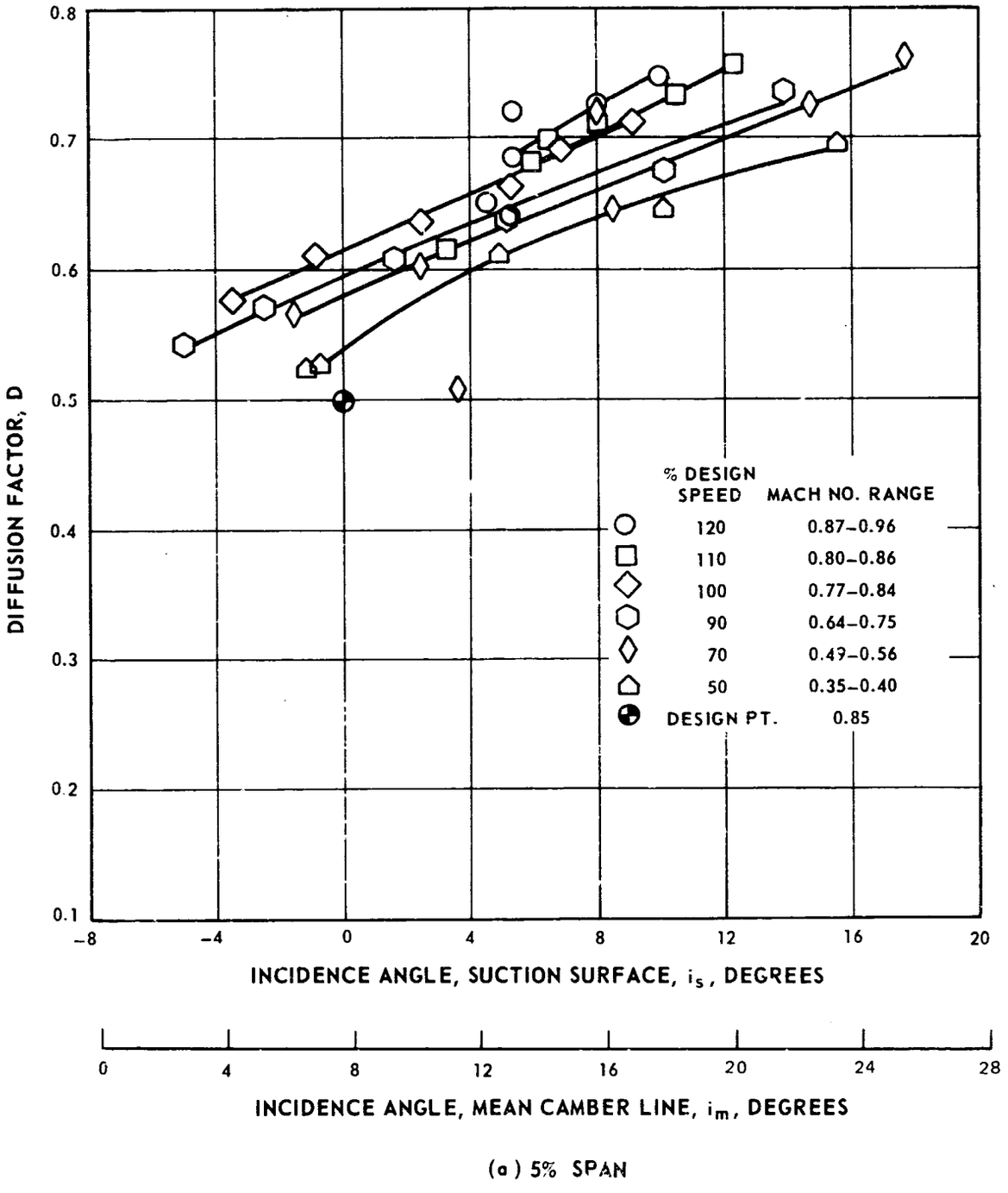
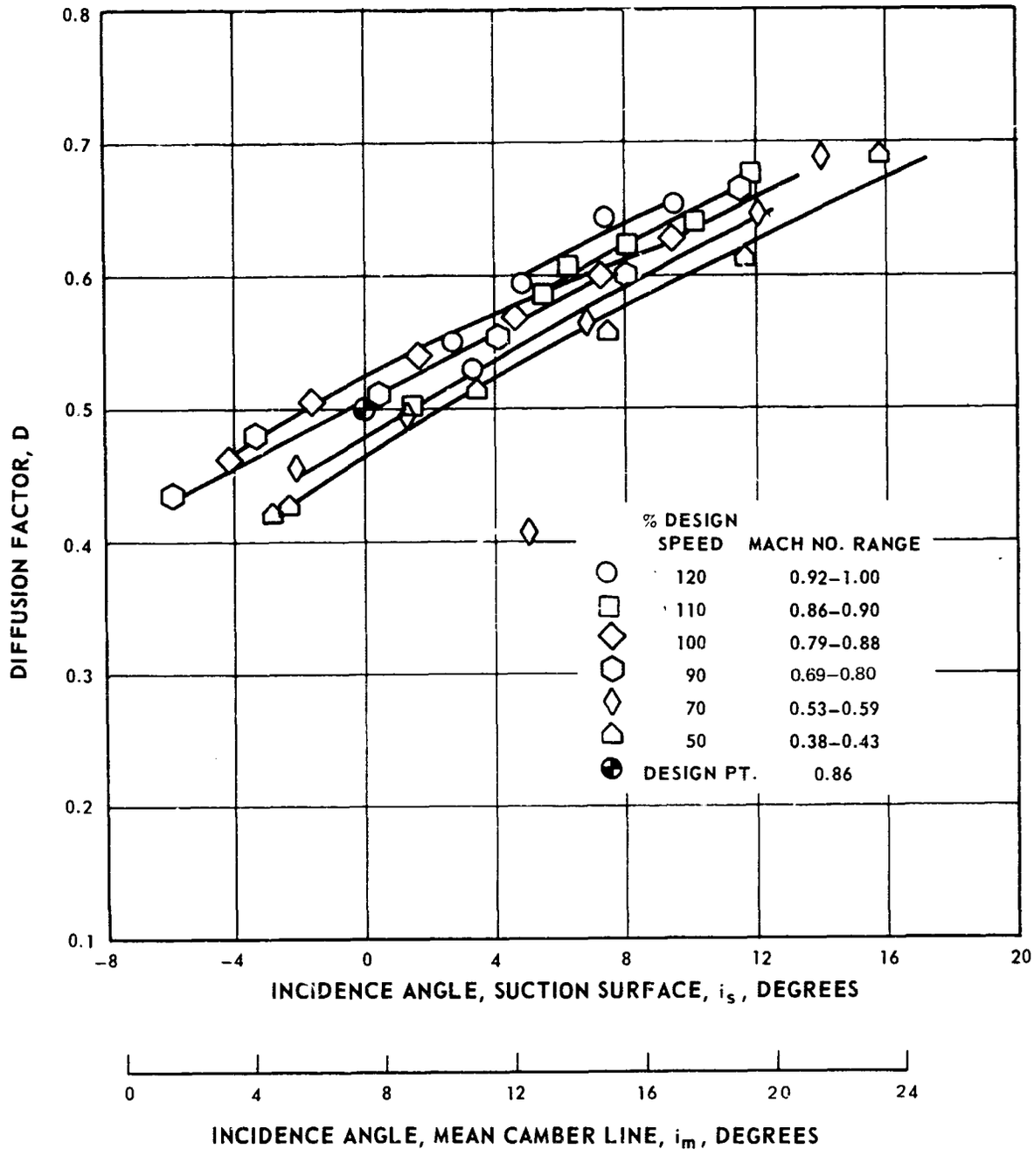


Figure 8 Overall Performance of Inlet Guide Vane and Rotor



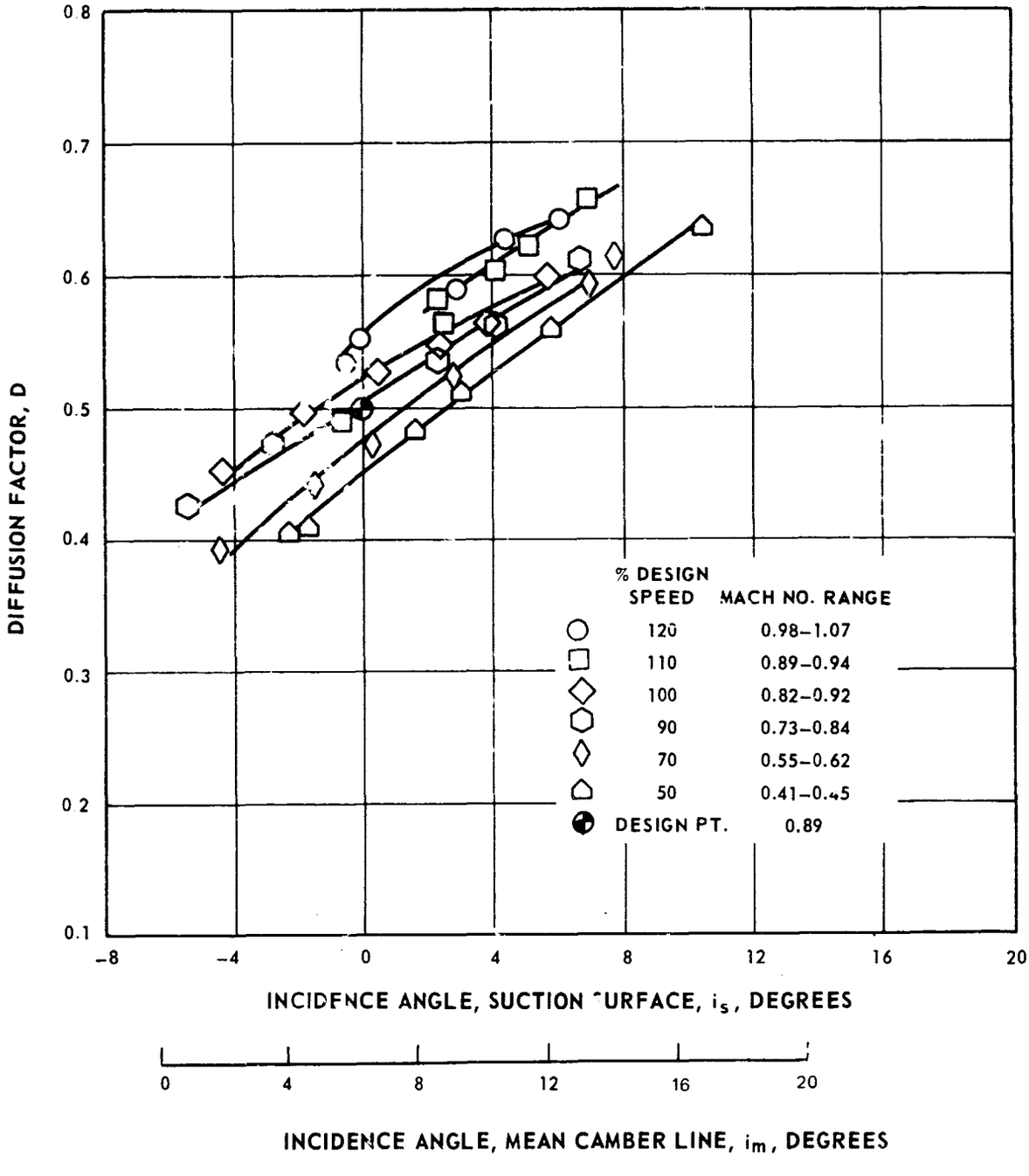
(a) 5% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



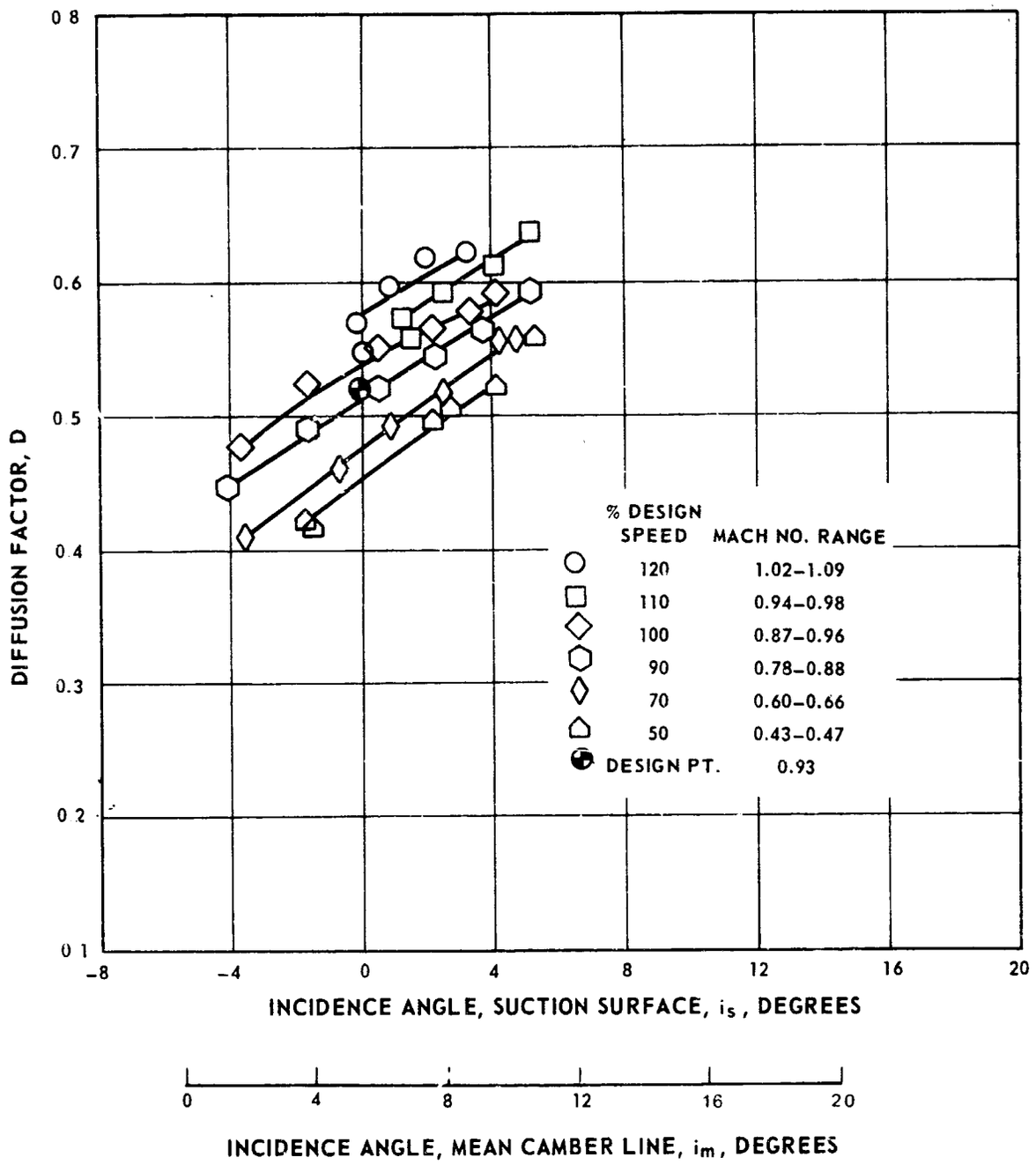
(b) 10% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



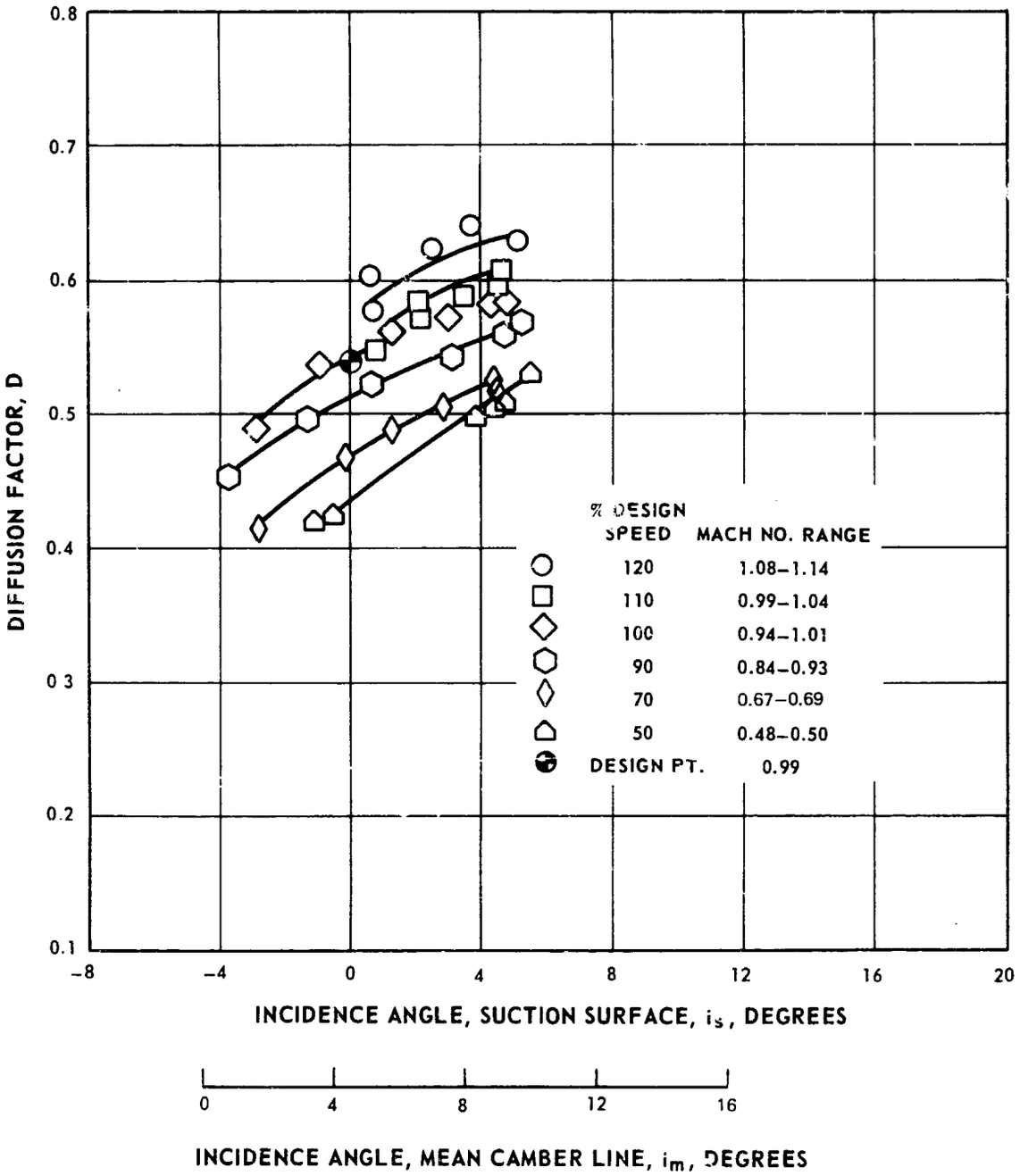
(c) 30% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



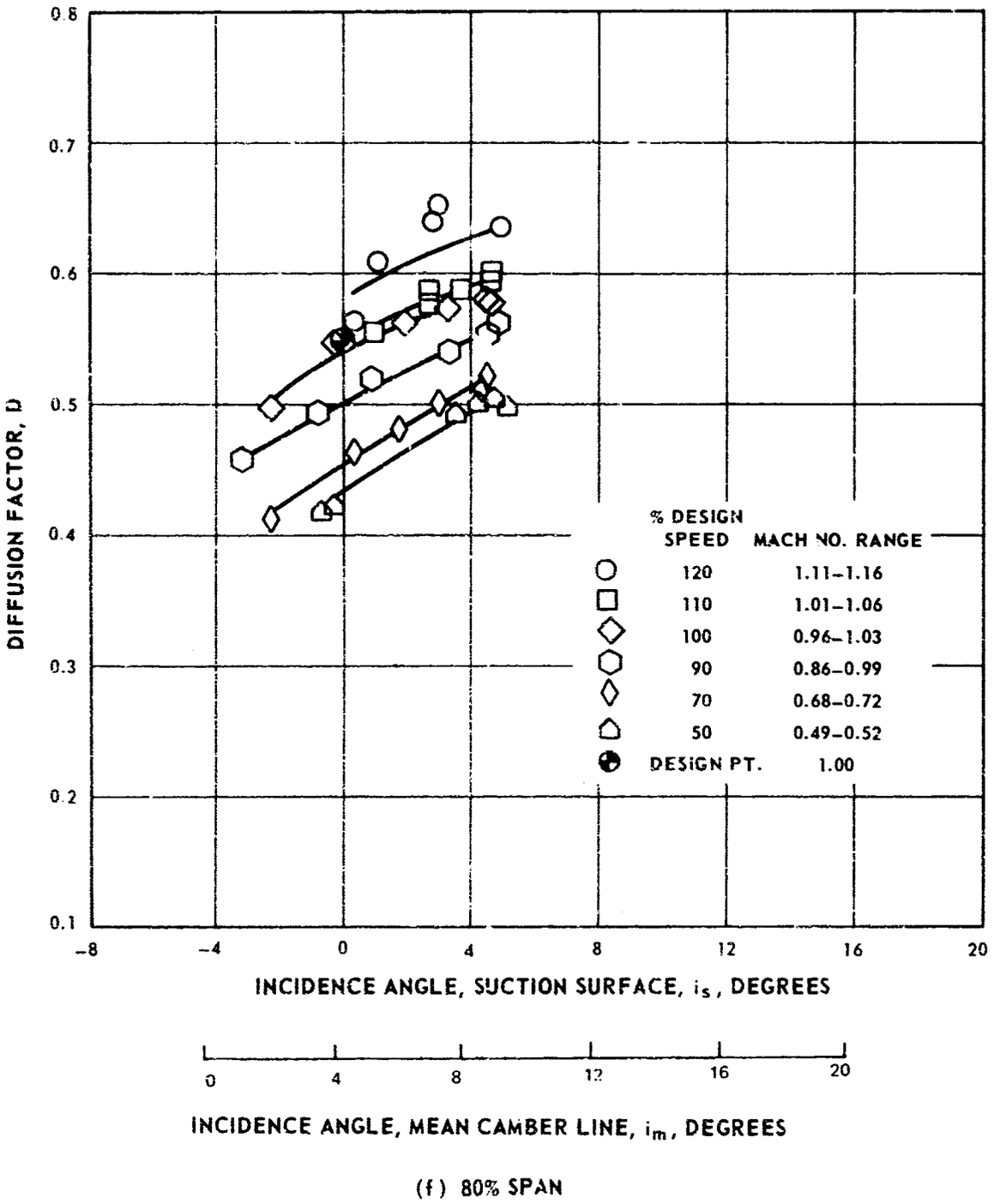
(d) 50% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



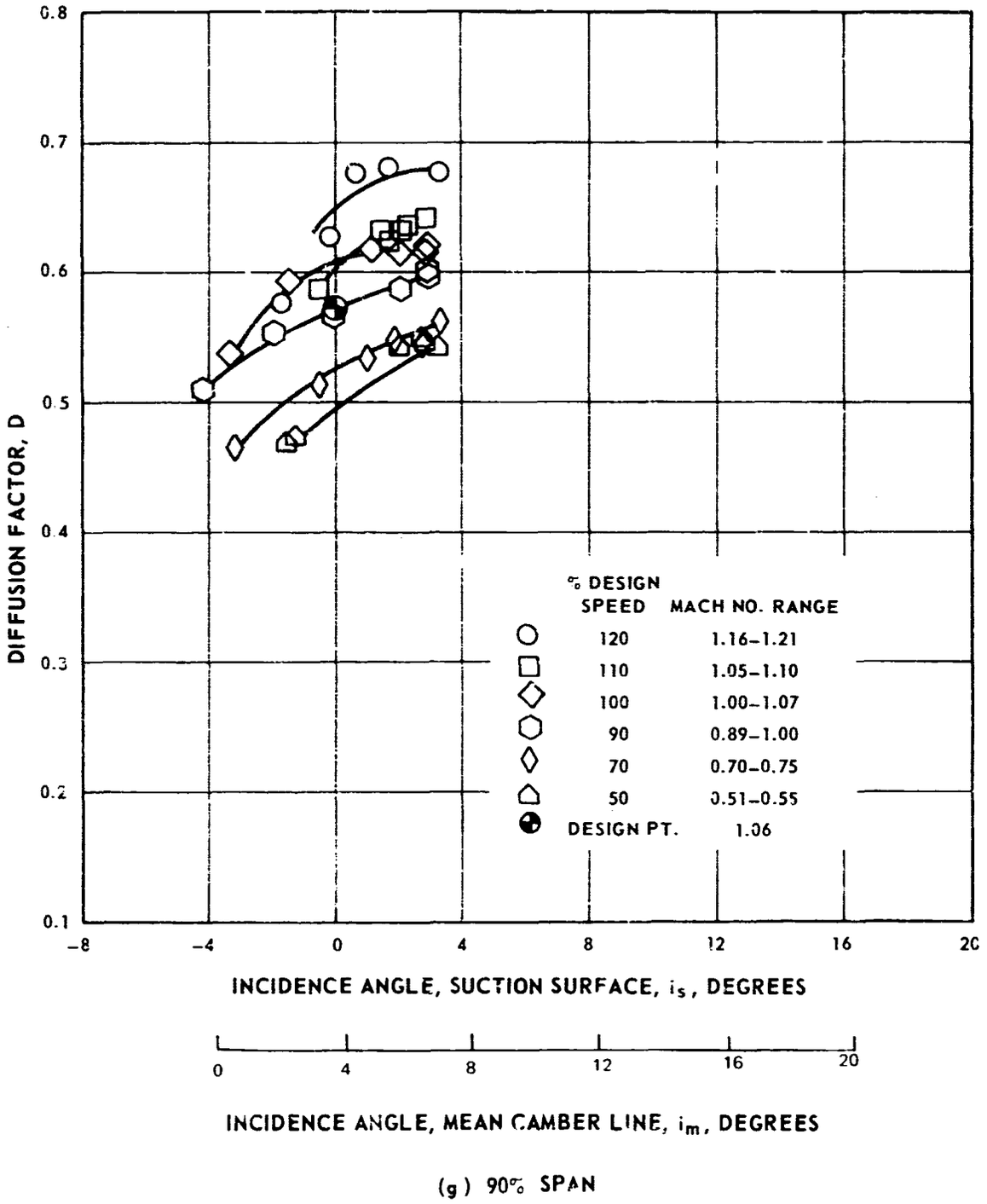
(e) 70% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



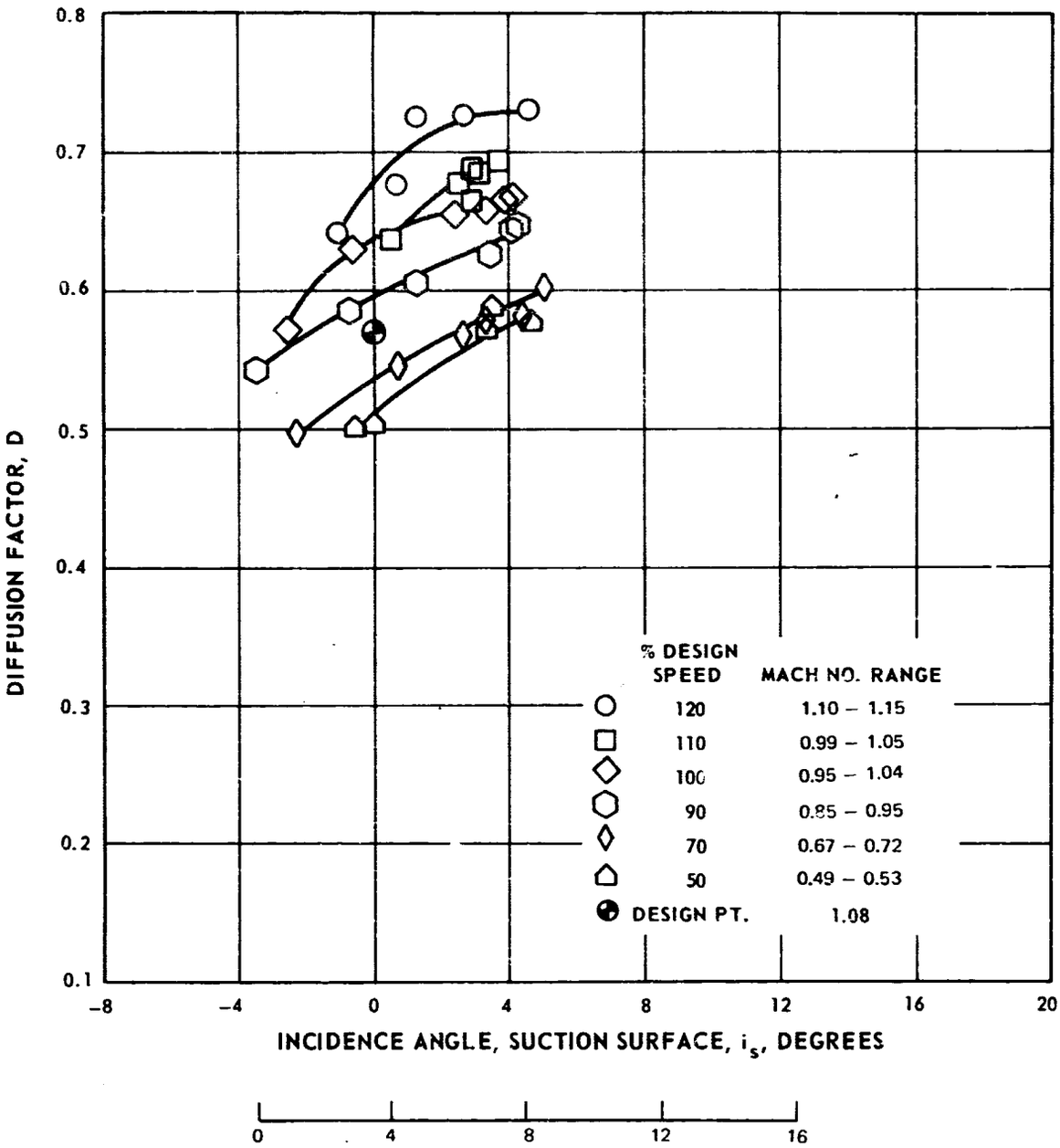
(f) 80% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



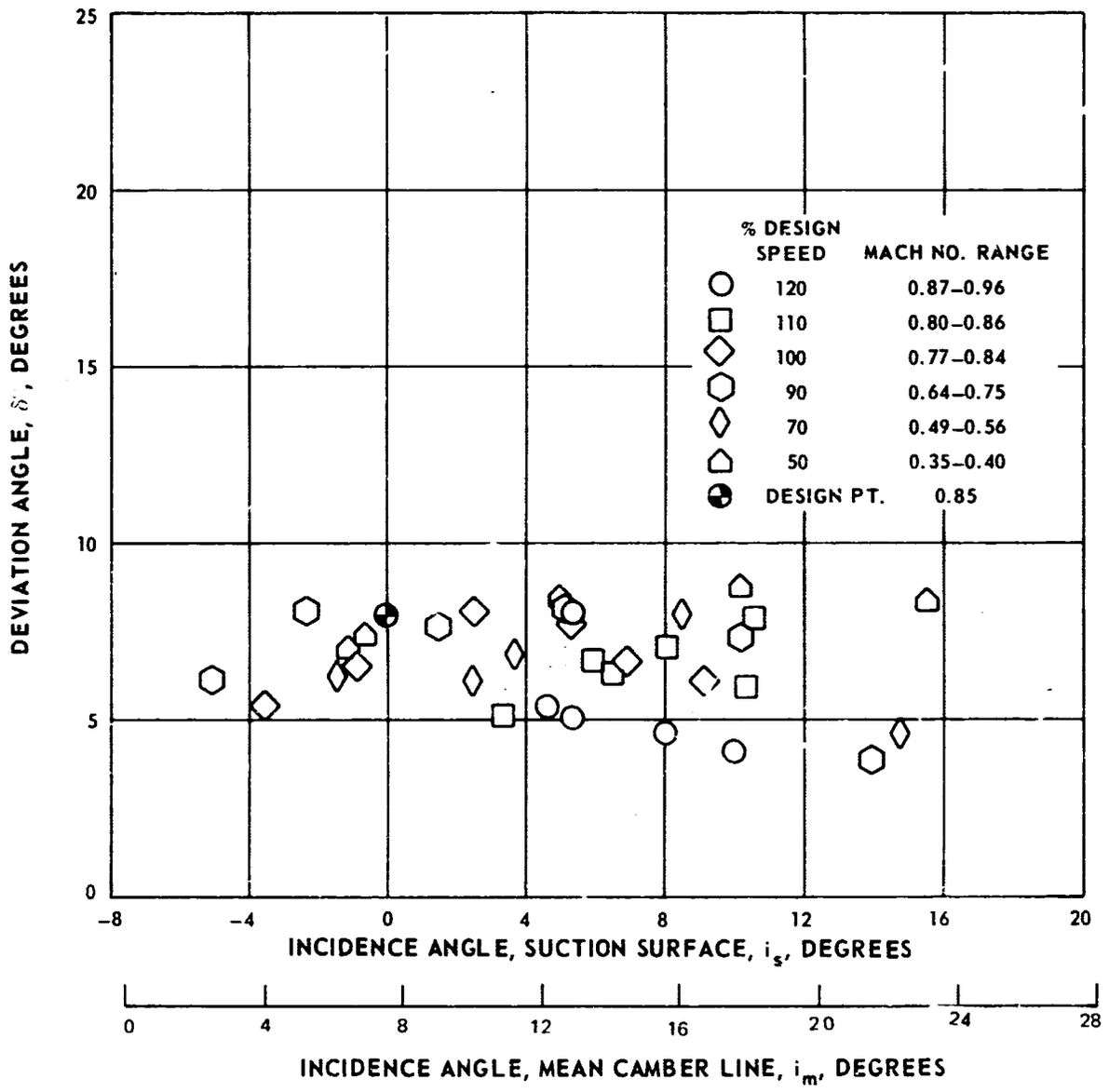
(g) 90% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



(h) 95% SPAN

Figure 9 DCA Stator, Diffusion Factor vs. Incidence



(a) 5% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence

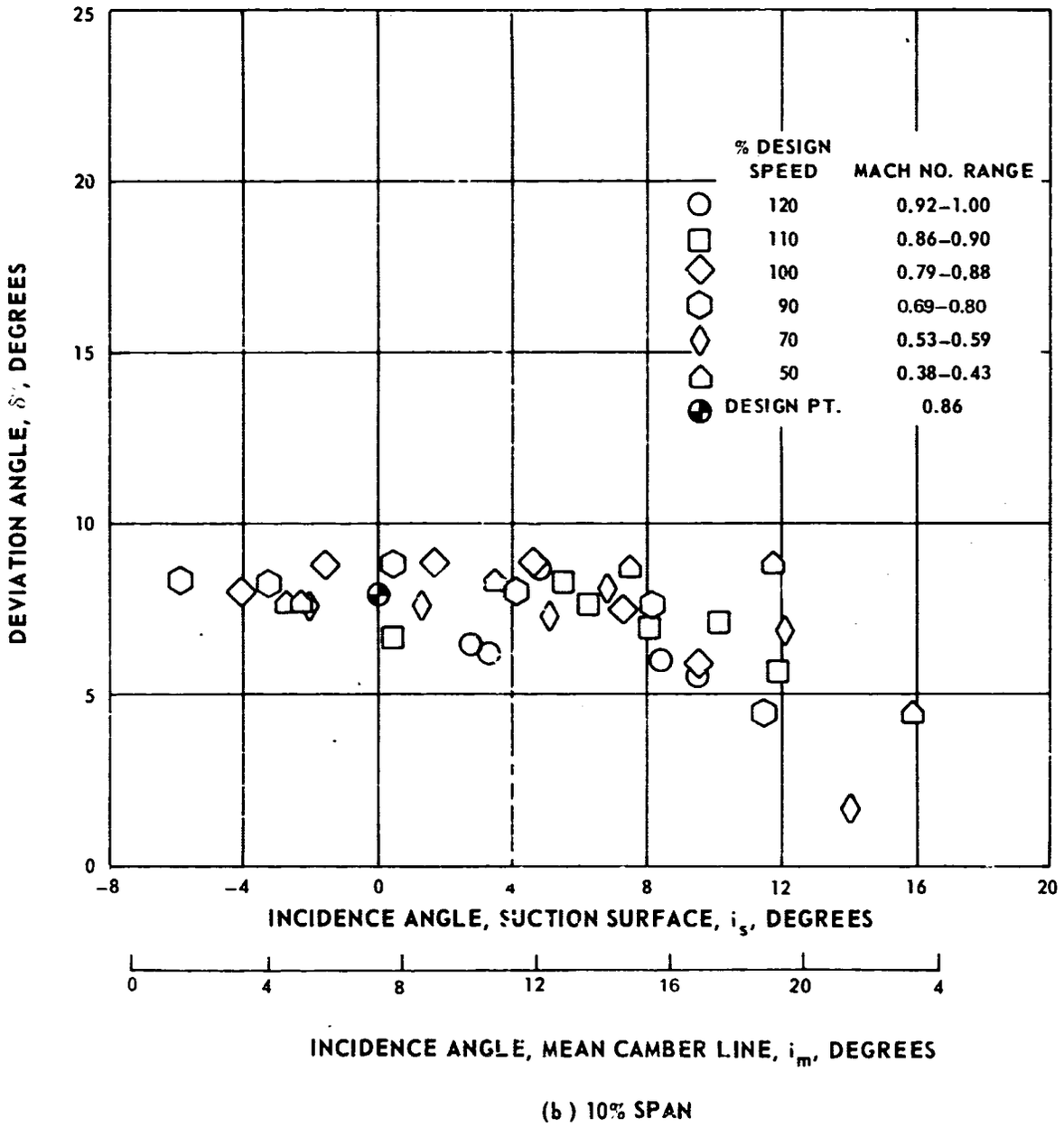
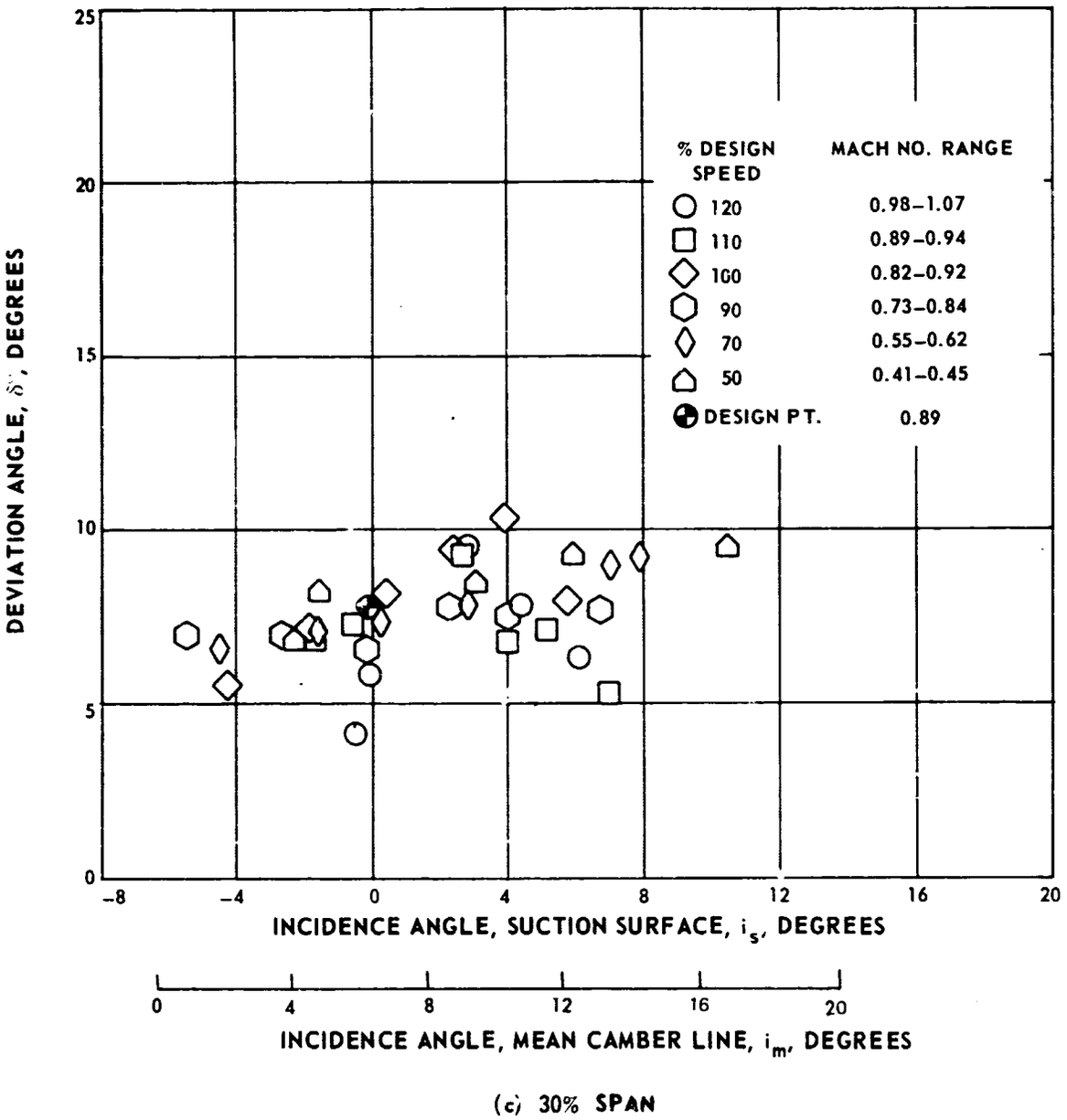
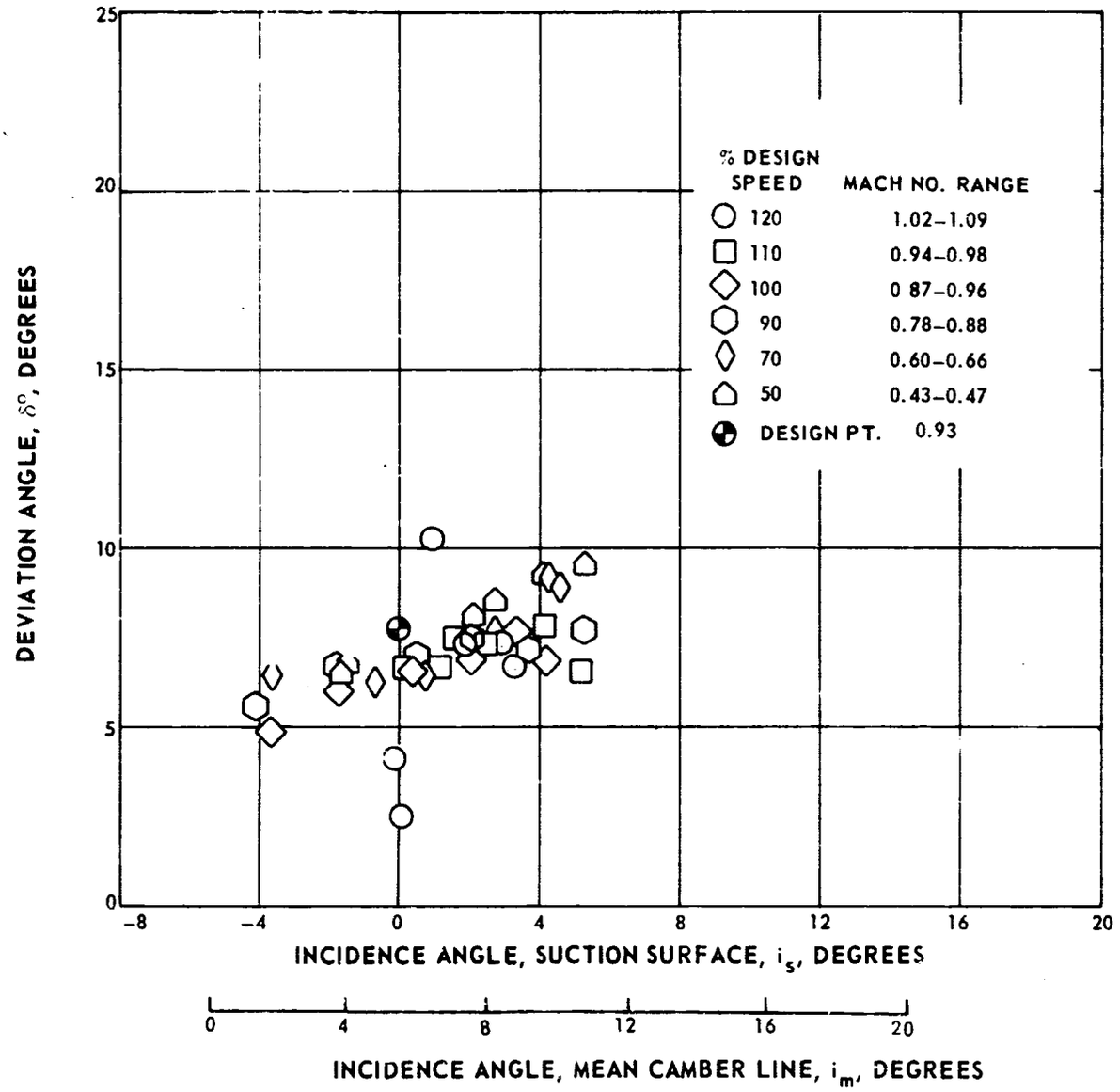


Figure 10 DCA Stator, Deviation vs. Incidence



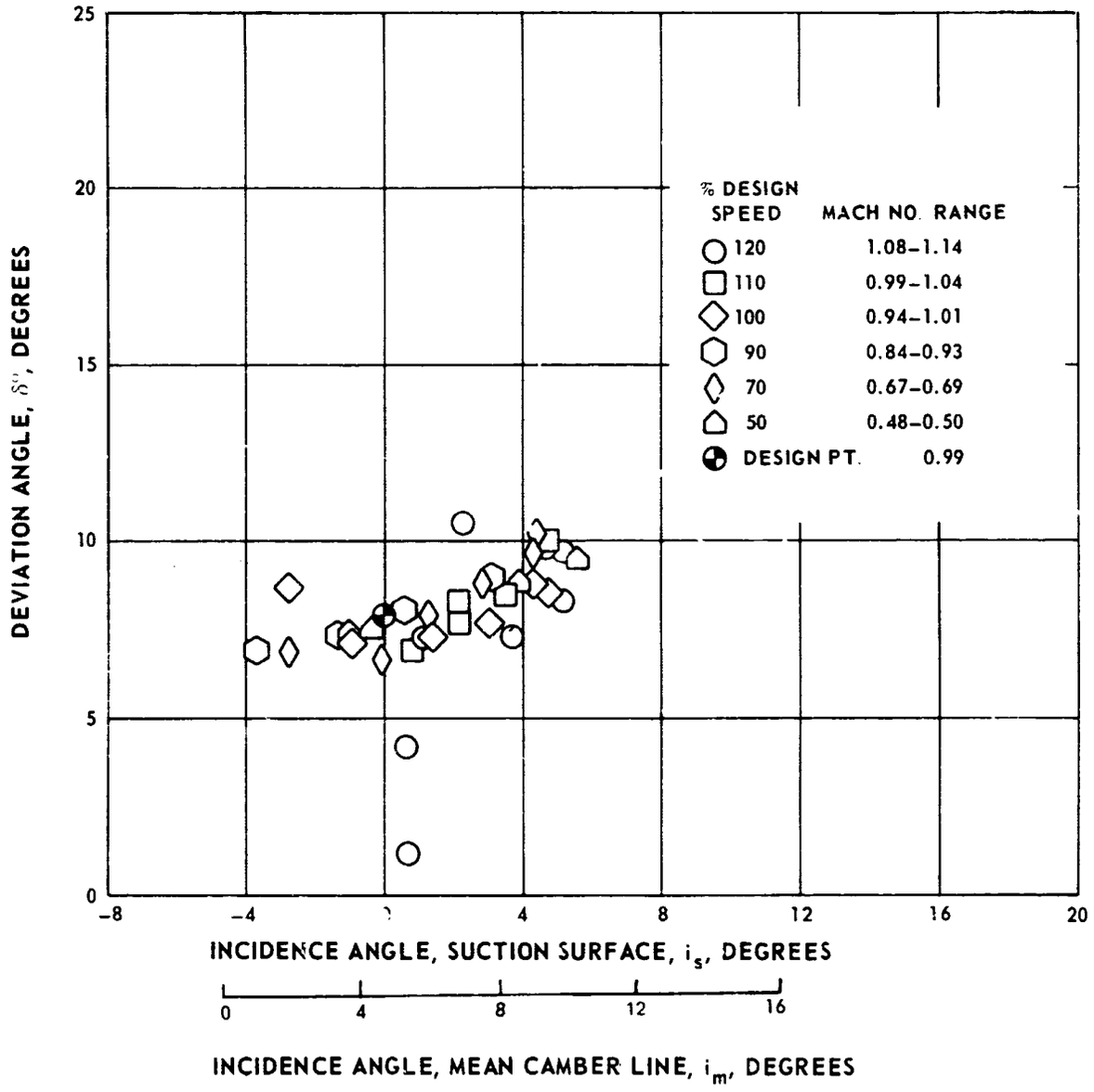
(c) 30% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence



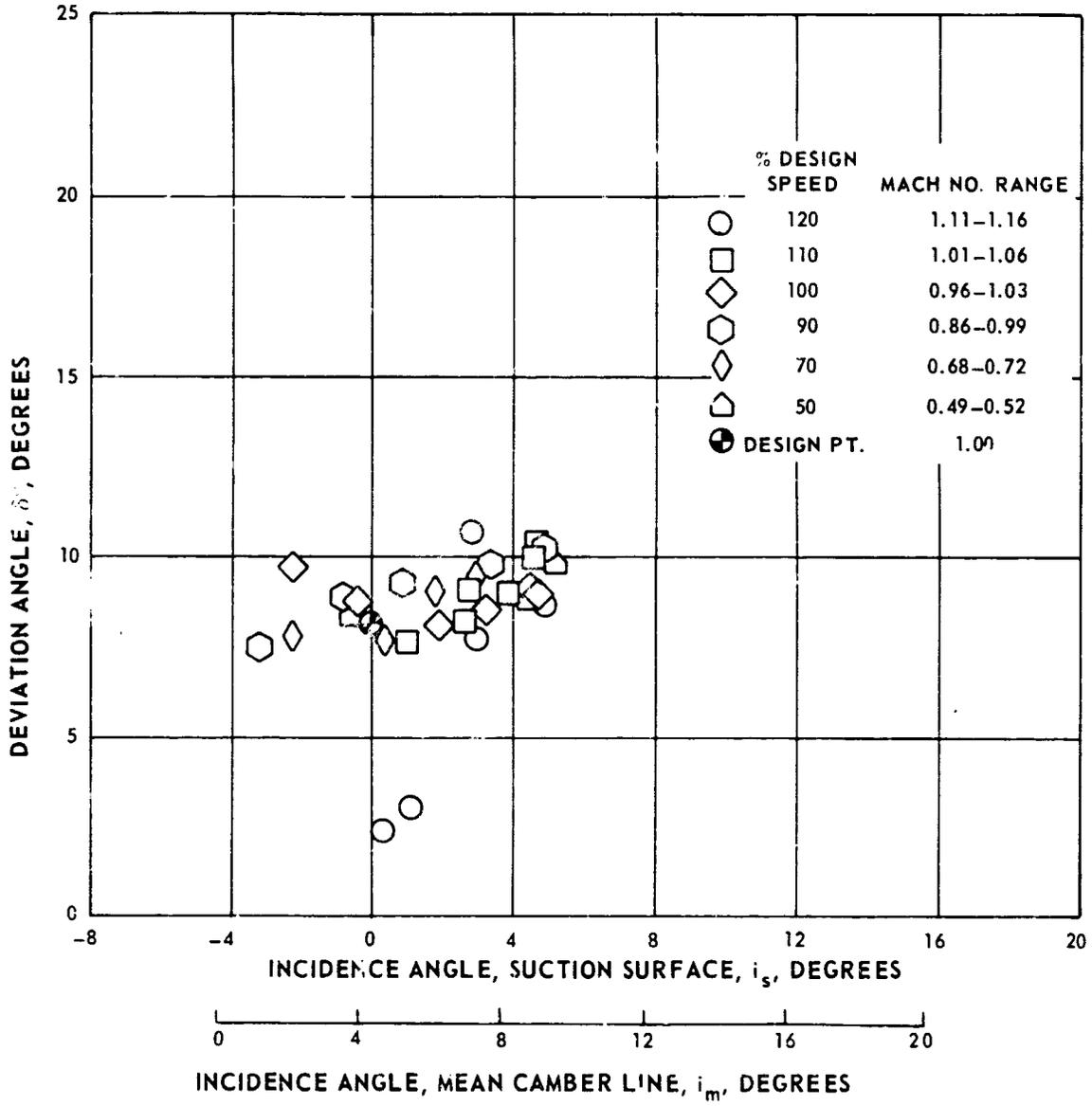
(d) 50% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence



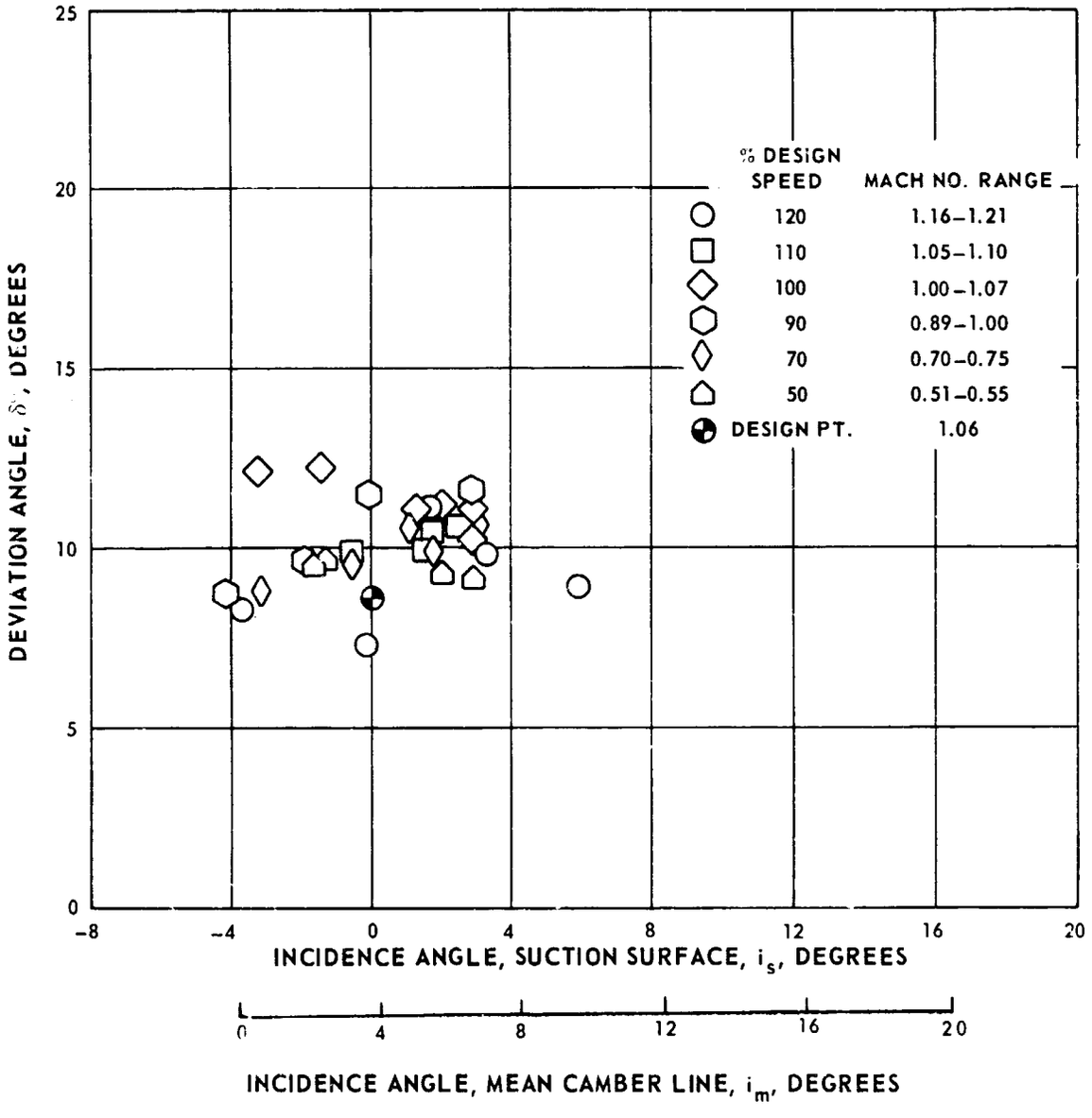
(e) 70% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence



(f) 80% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence



(g) 90% SPAN

Figure 10 DCA Stator, Deviation vs. Incidence

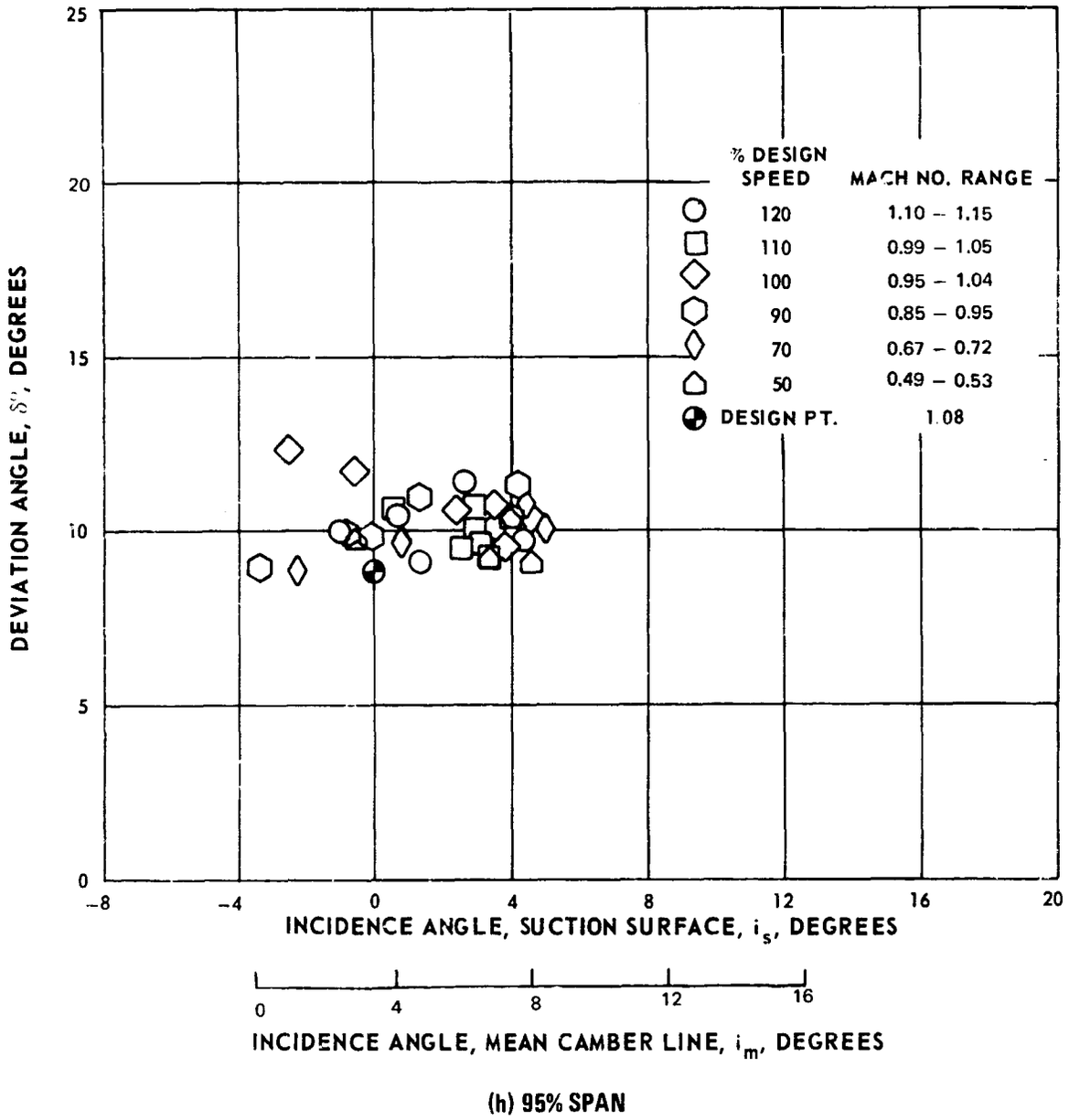
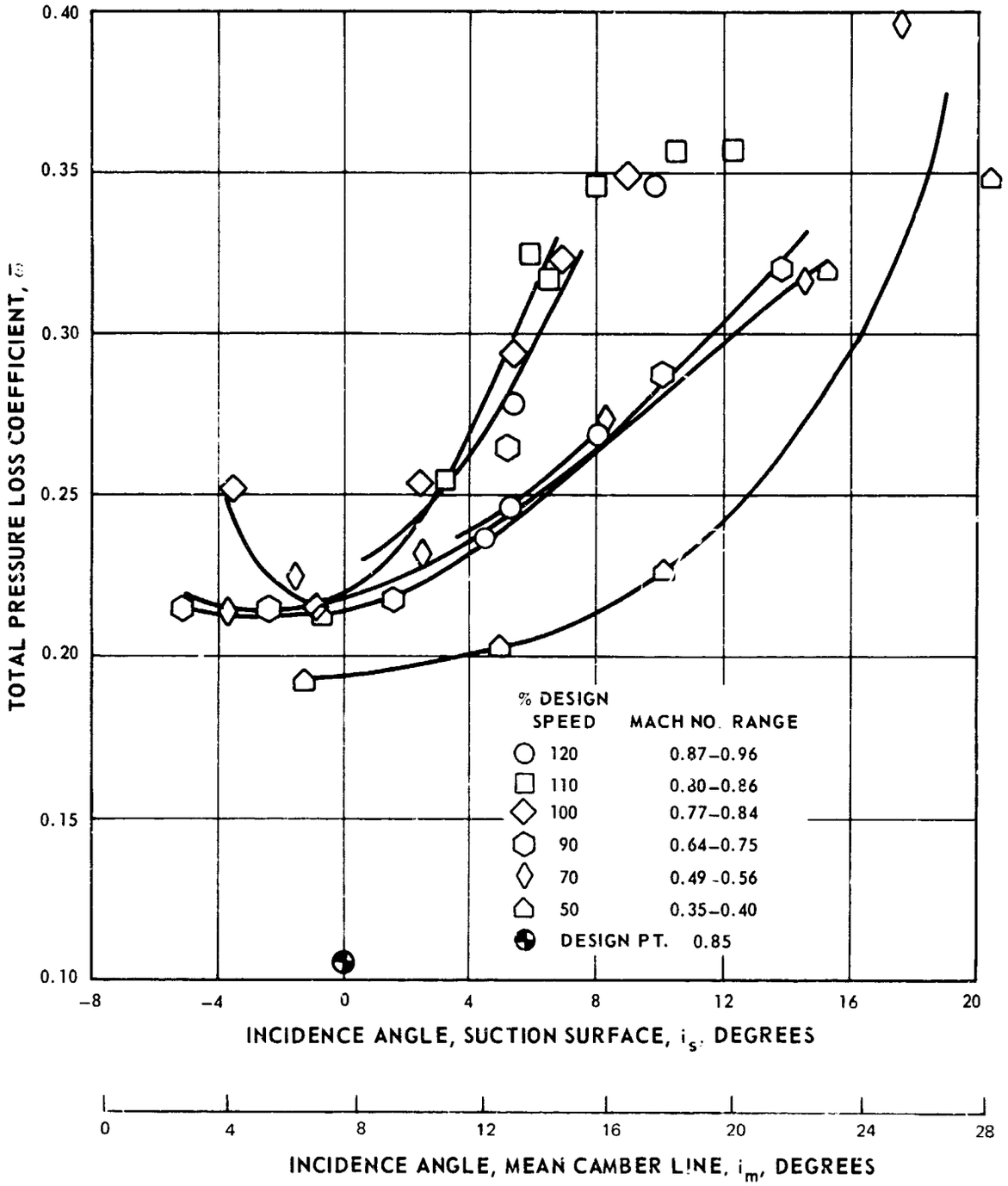
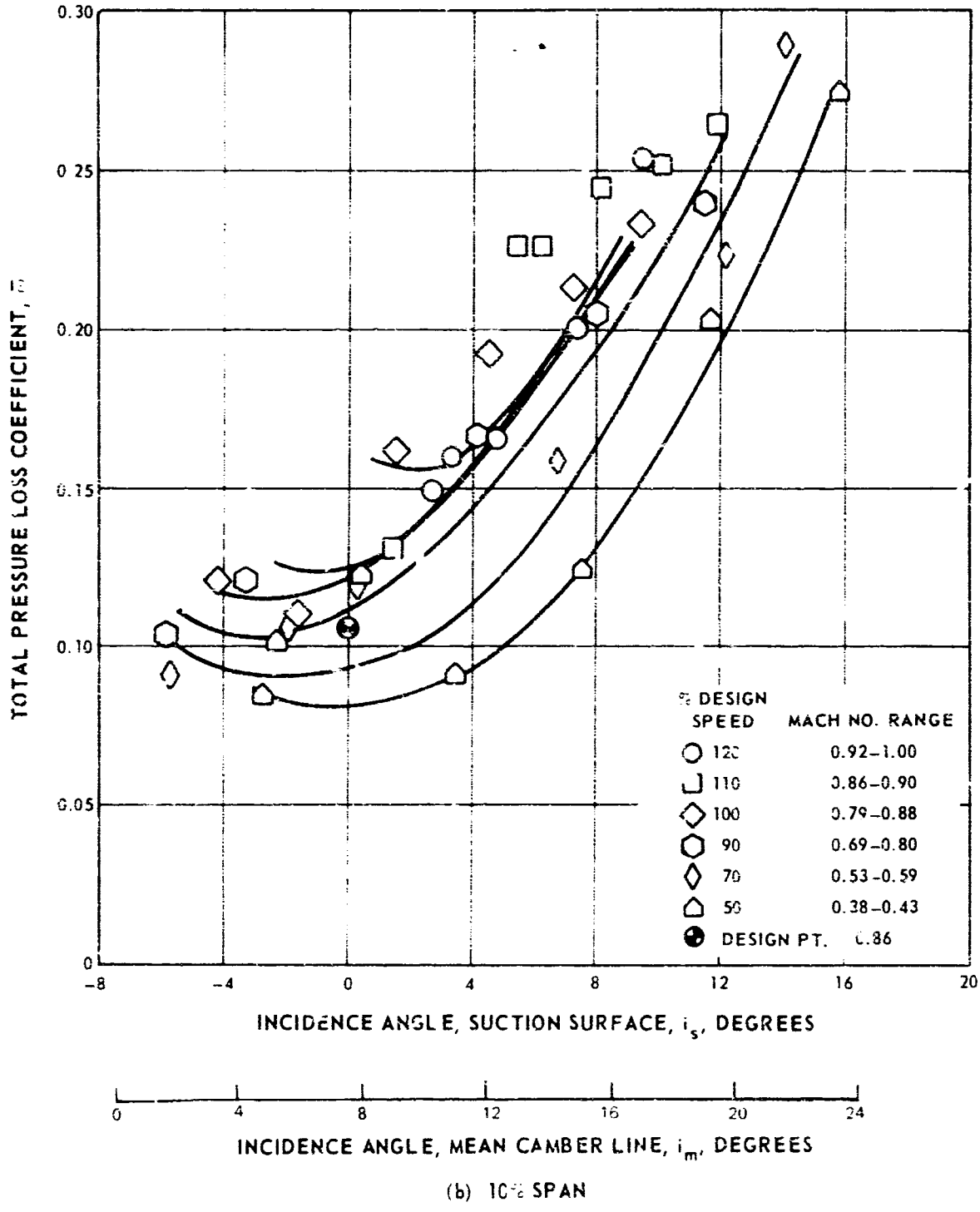


Figure 10 DCA Stator, Deviation vs. Incidence



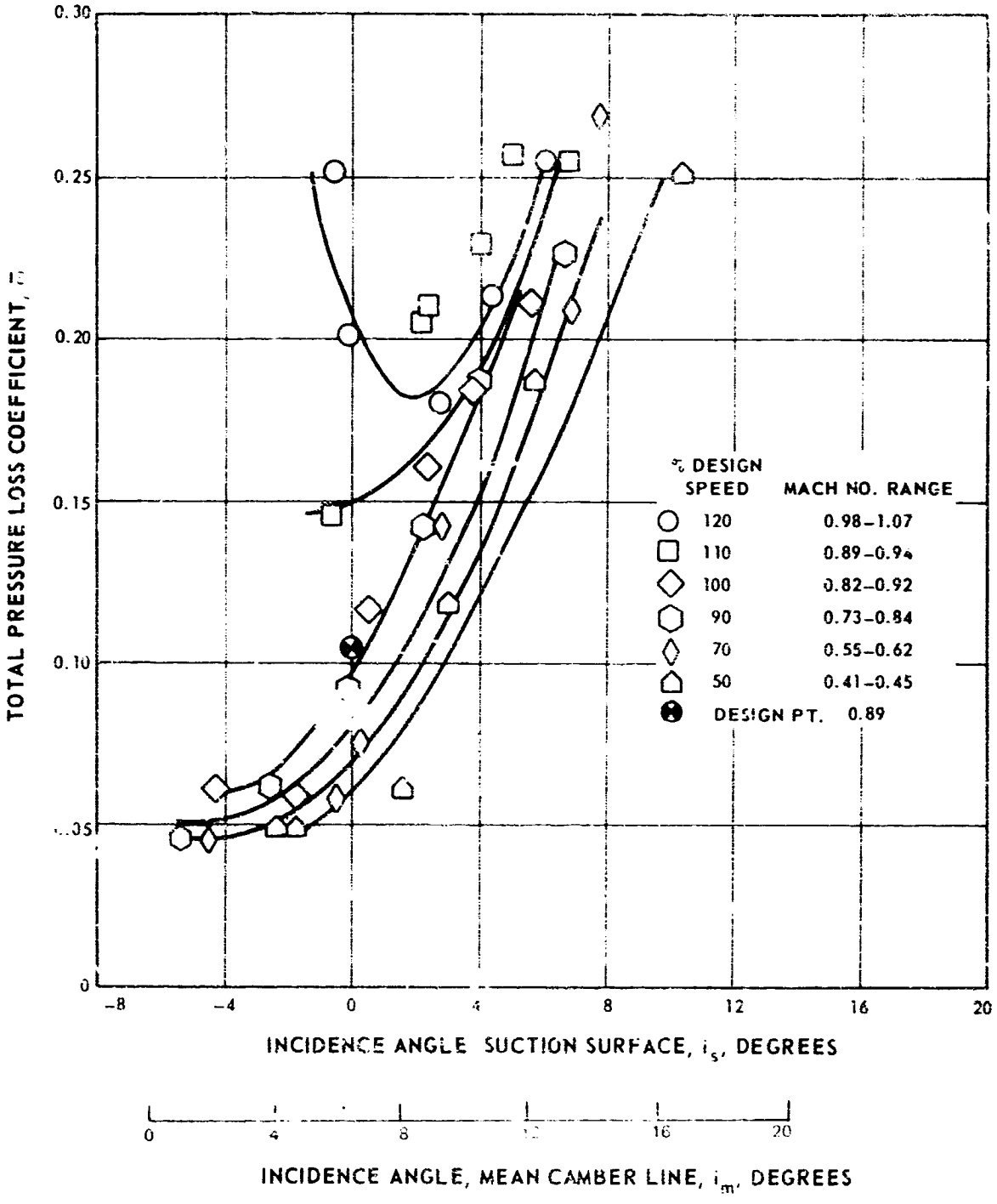
(a) 5% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence



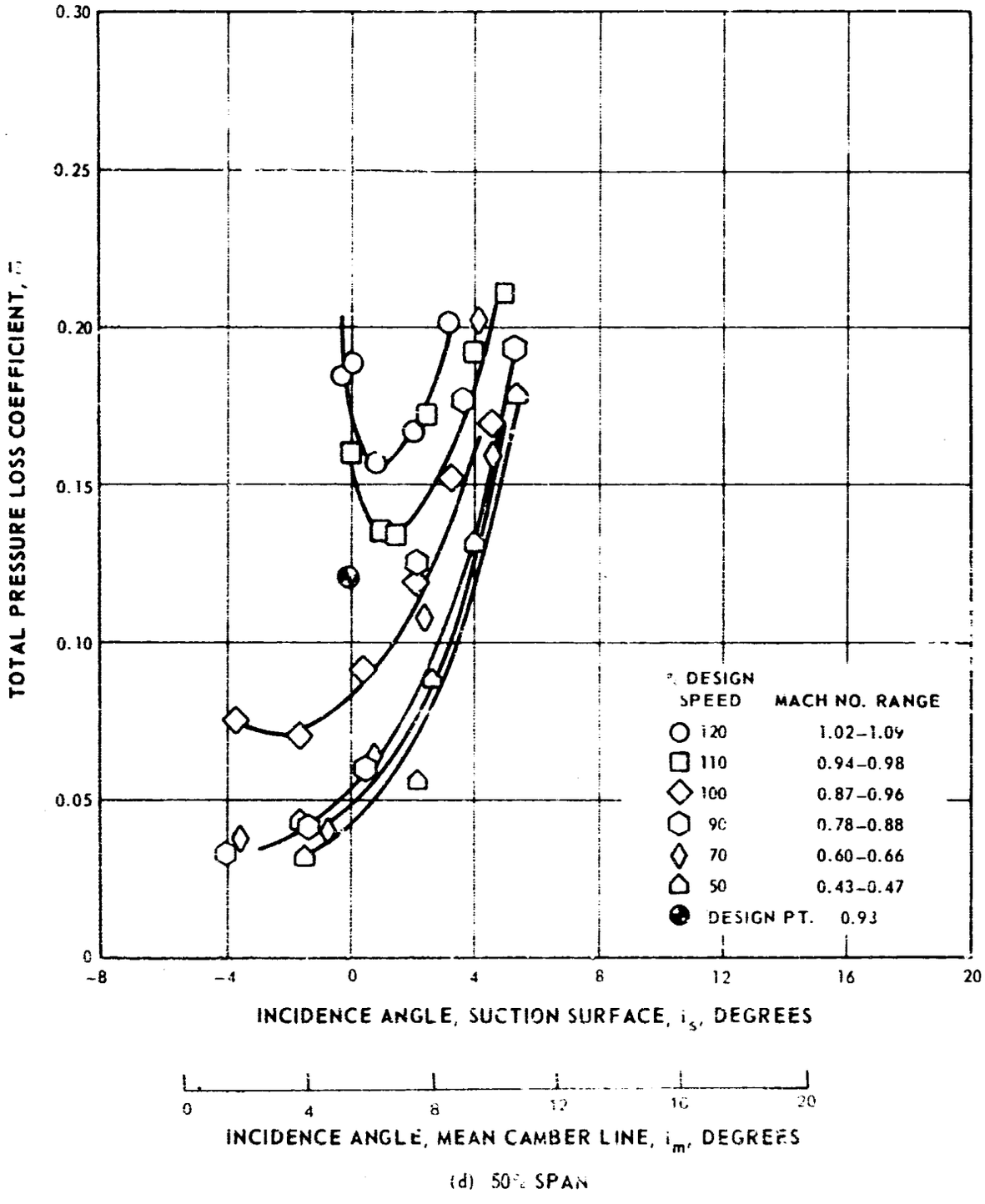
(b) 10% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence



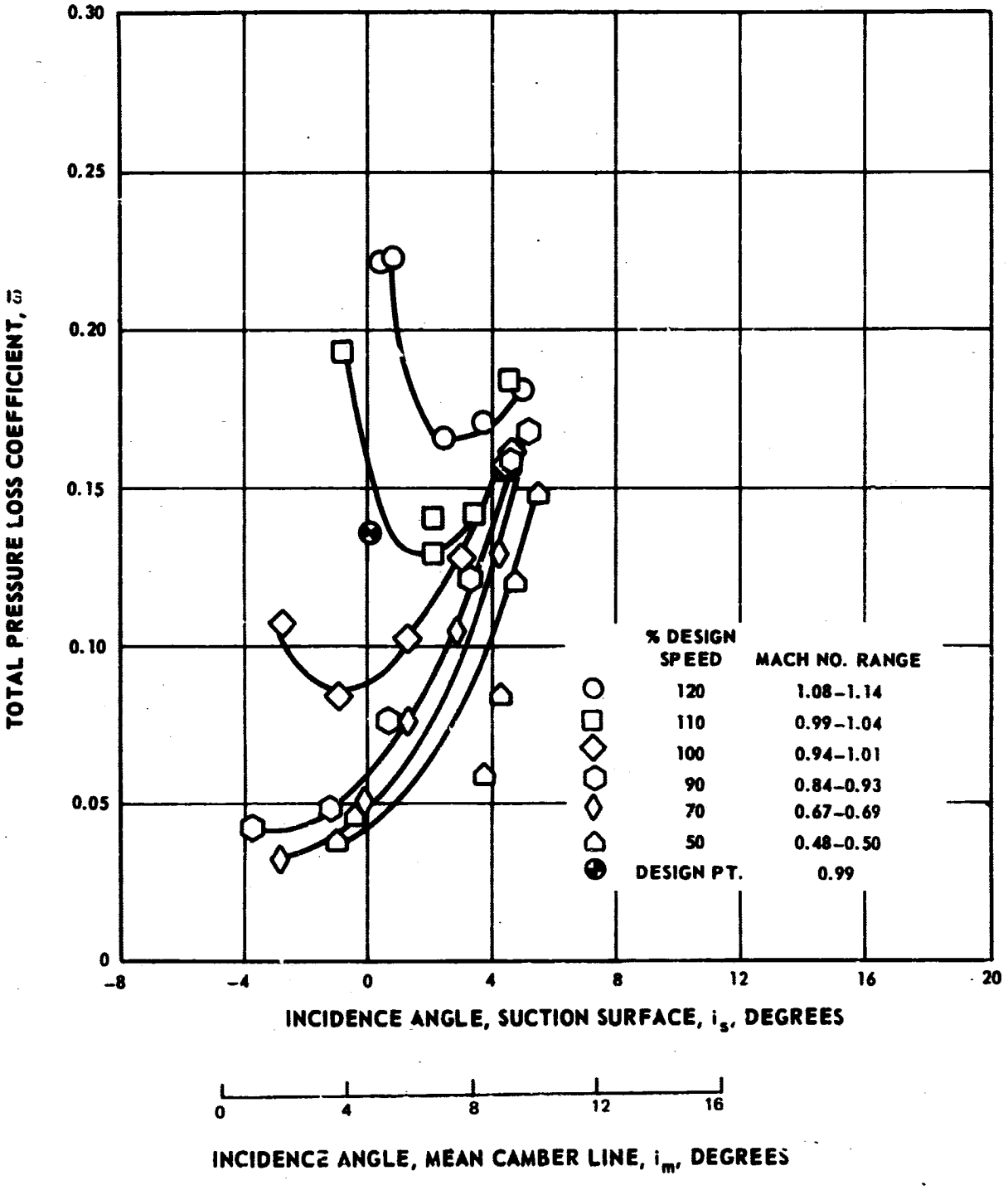
(c) 30% SPAN

Figure 1. D2A Stator, Total Pressure Loss Coefficient vs. Incidence



(d) 50% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence



(a) 70% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence

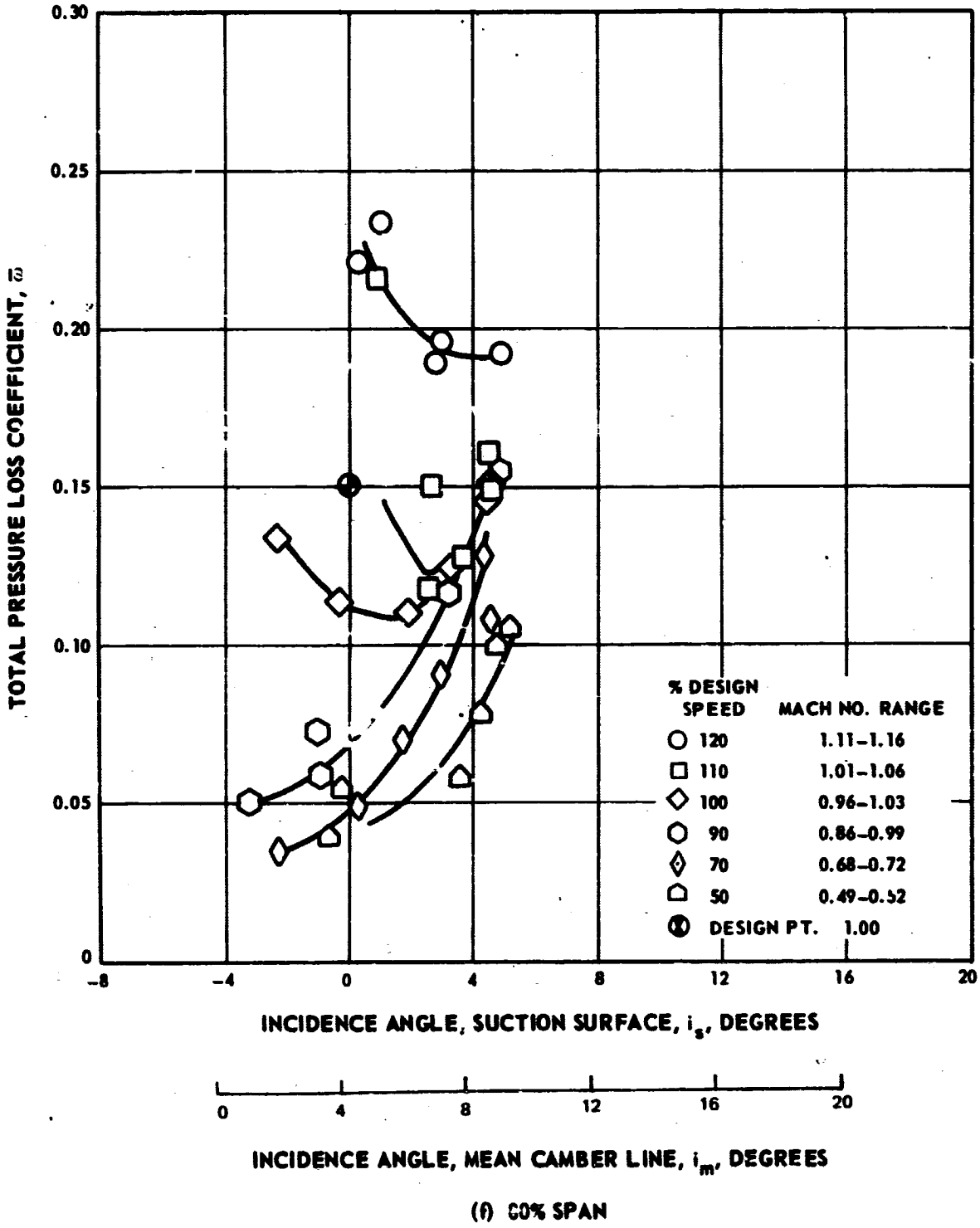
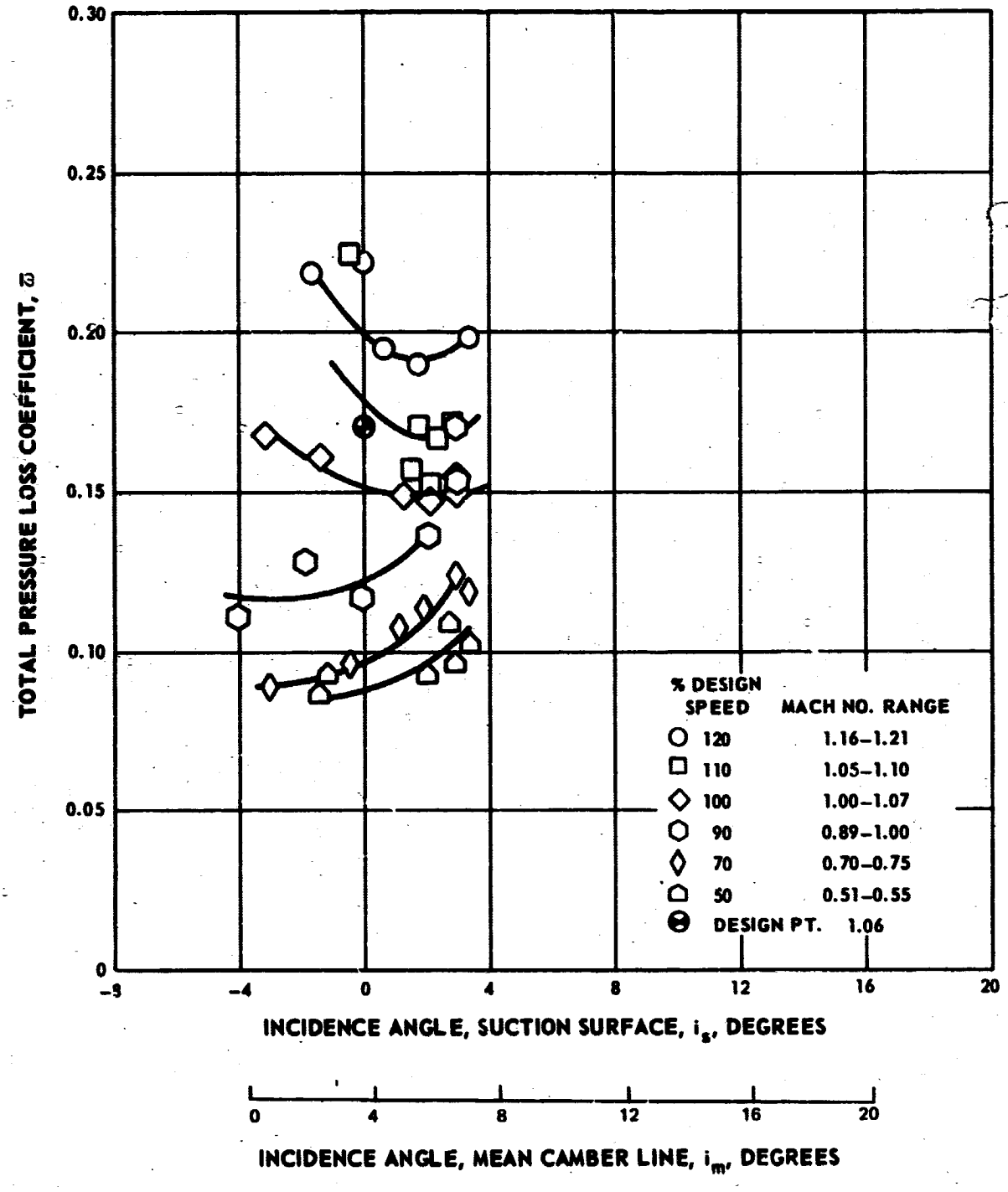
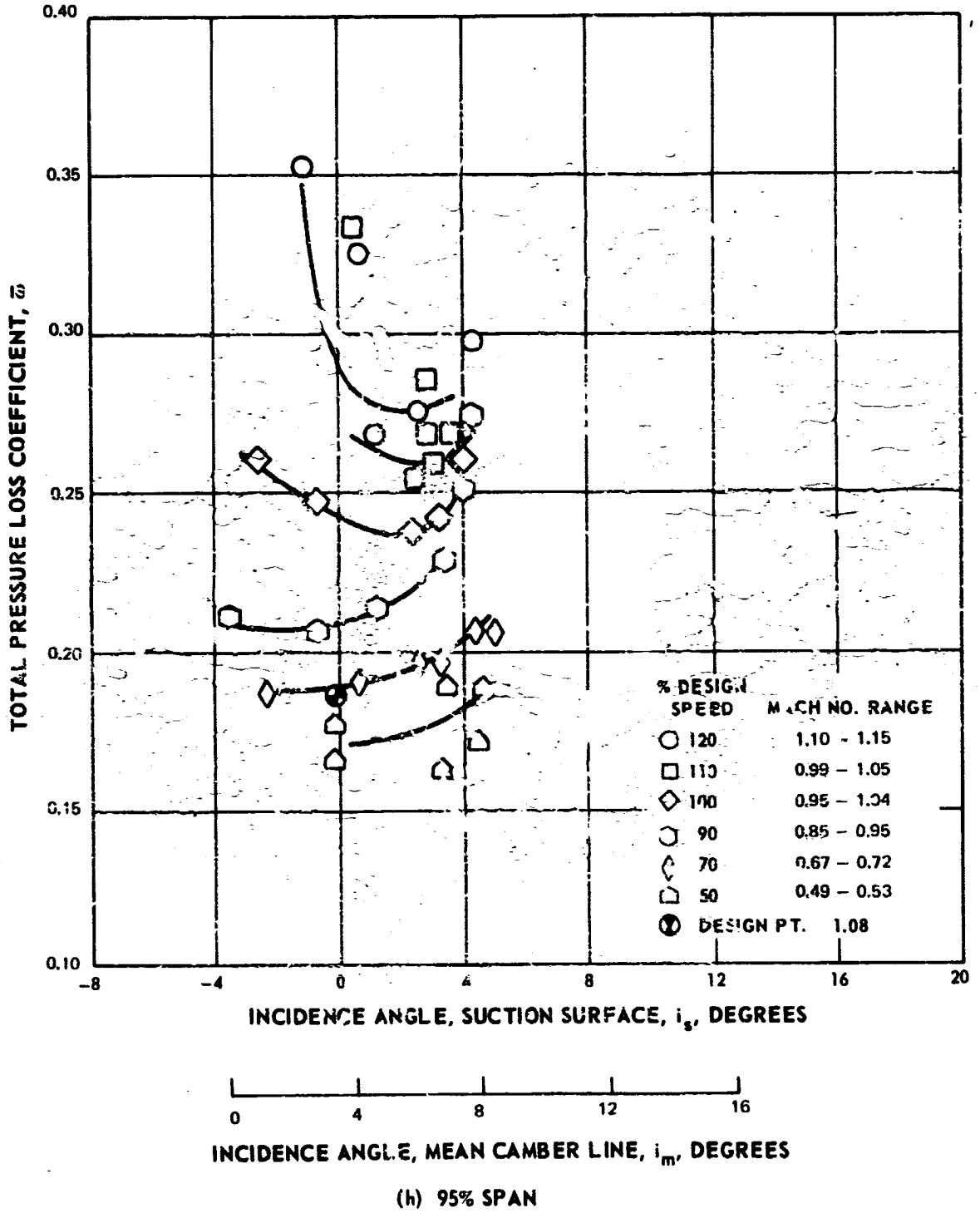


Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence



(g) 90% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence



(h) 95% SPAN

Figure 11 DCA Stator, Total Pressure Loss Coefficient vs. Incidence

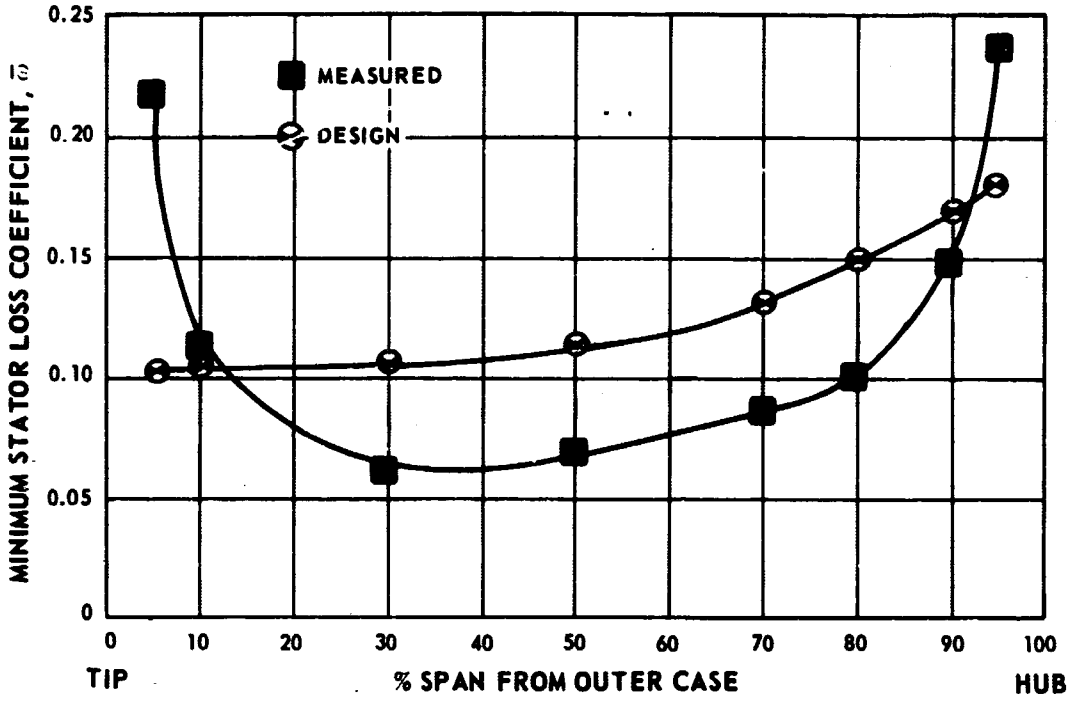
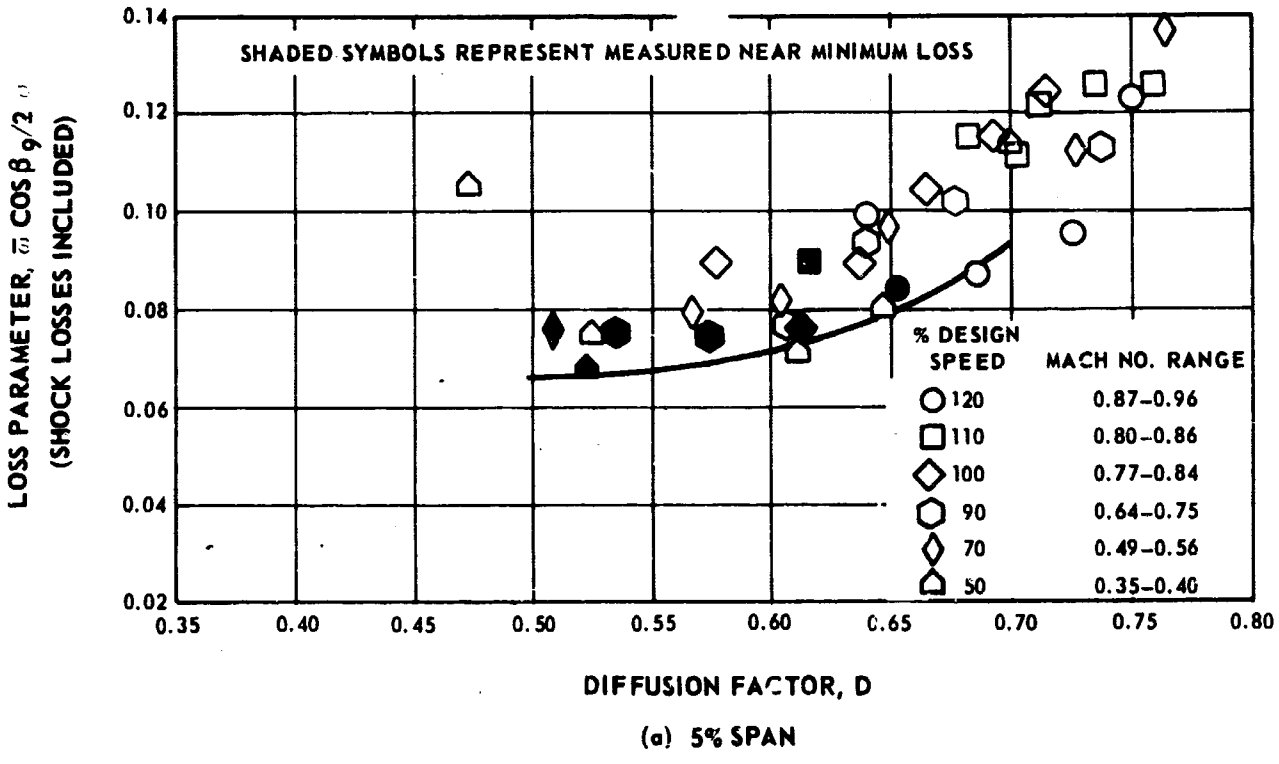
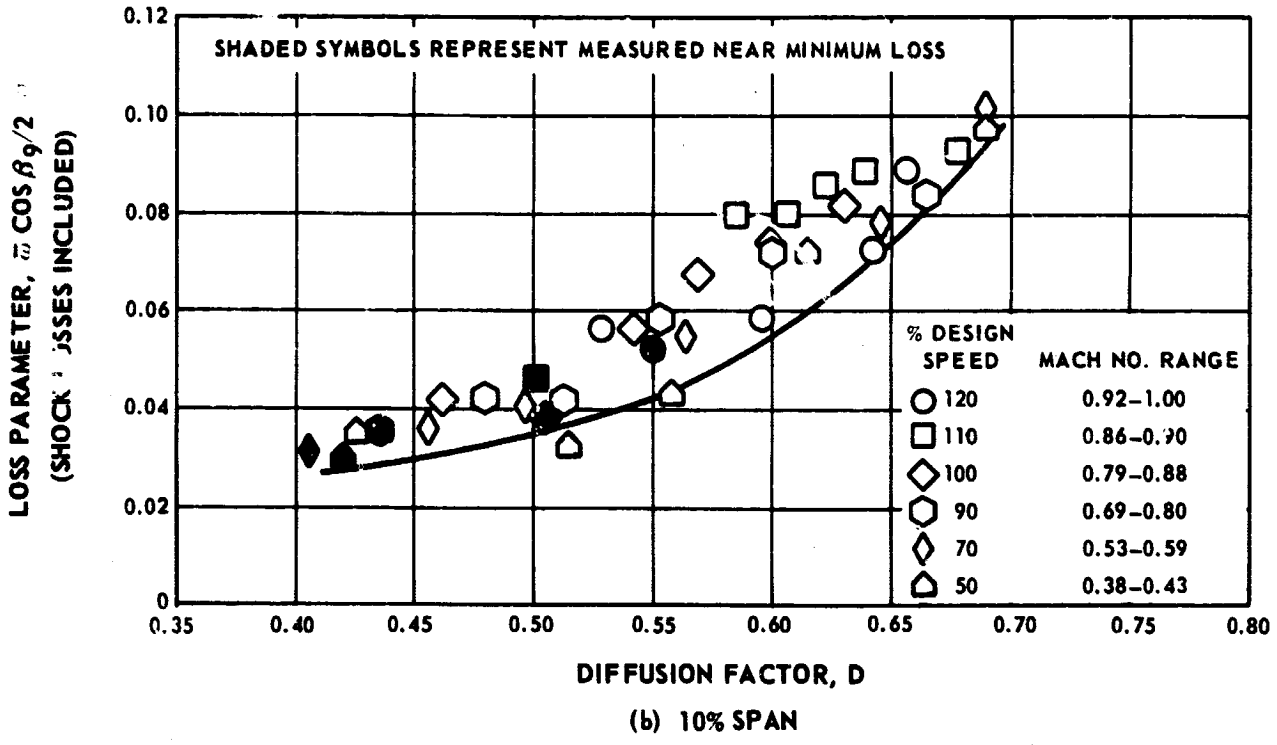


Figure 12 DCA Stator, Minimum Stator Loss Coefficient vs. Percent Span, 100% Design Speed



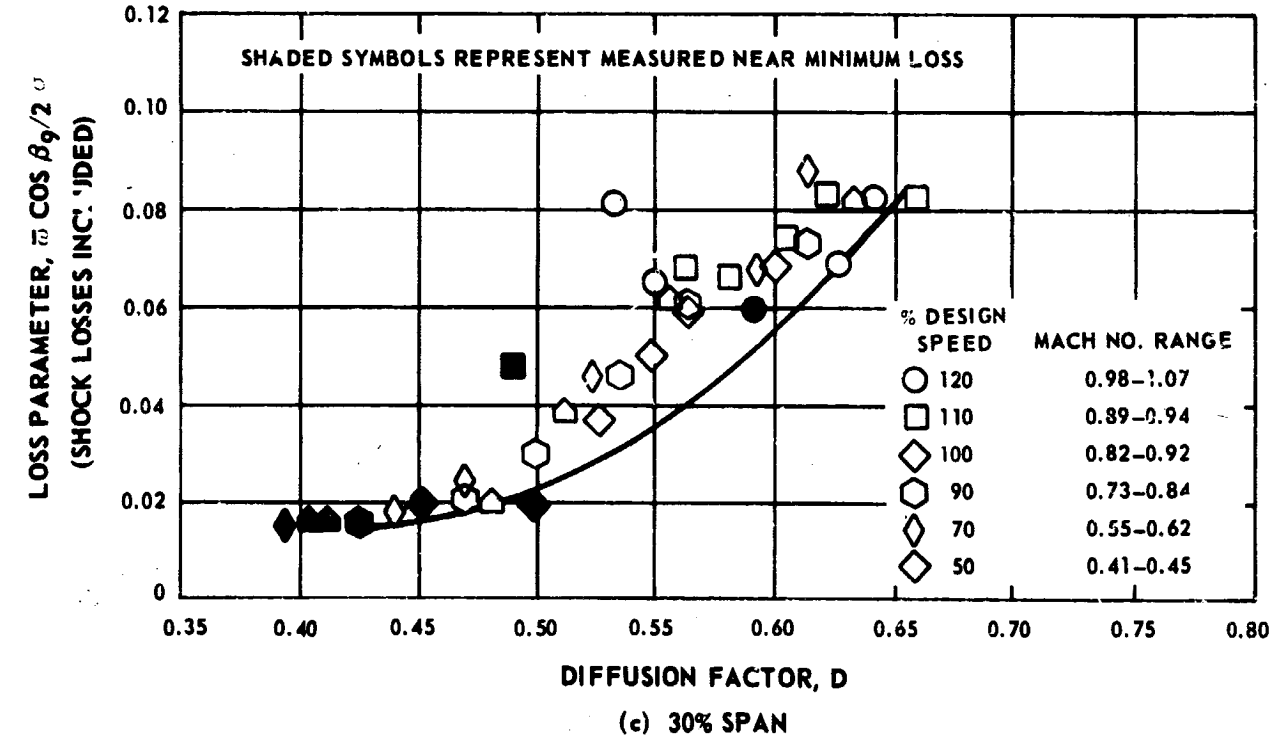
(a) 5% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



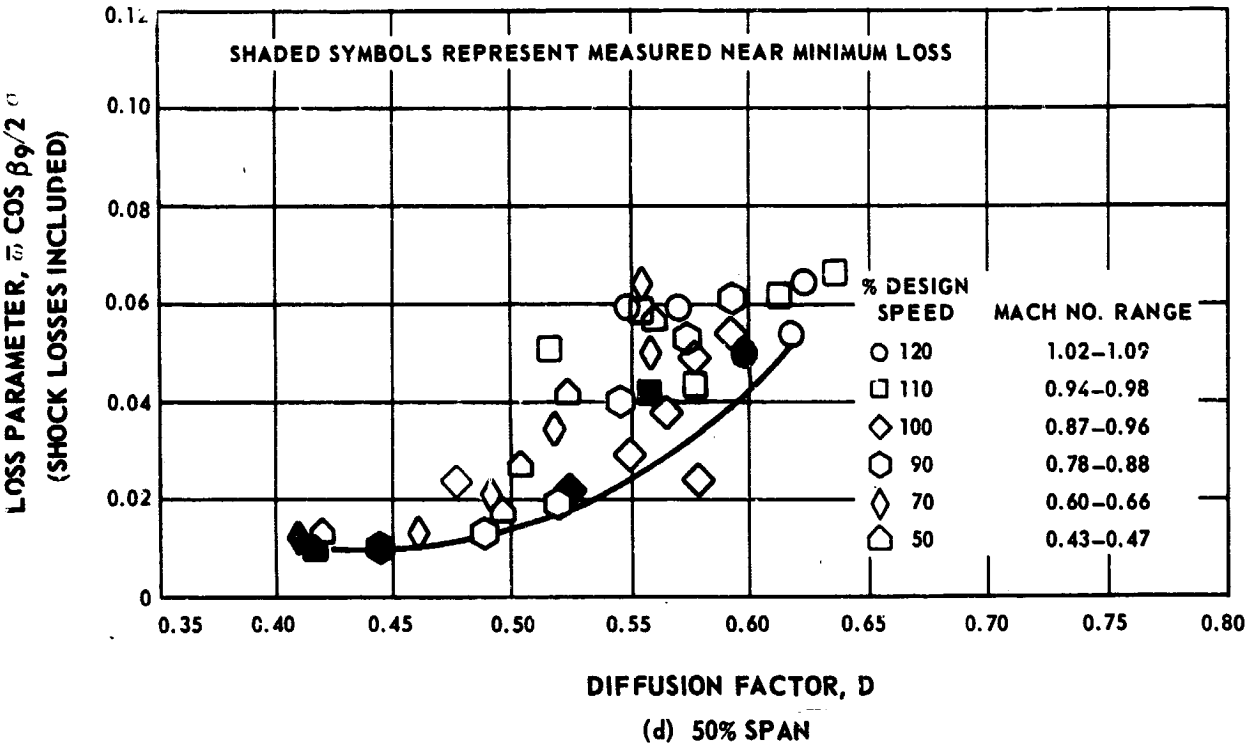
(b) 10% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



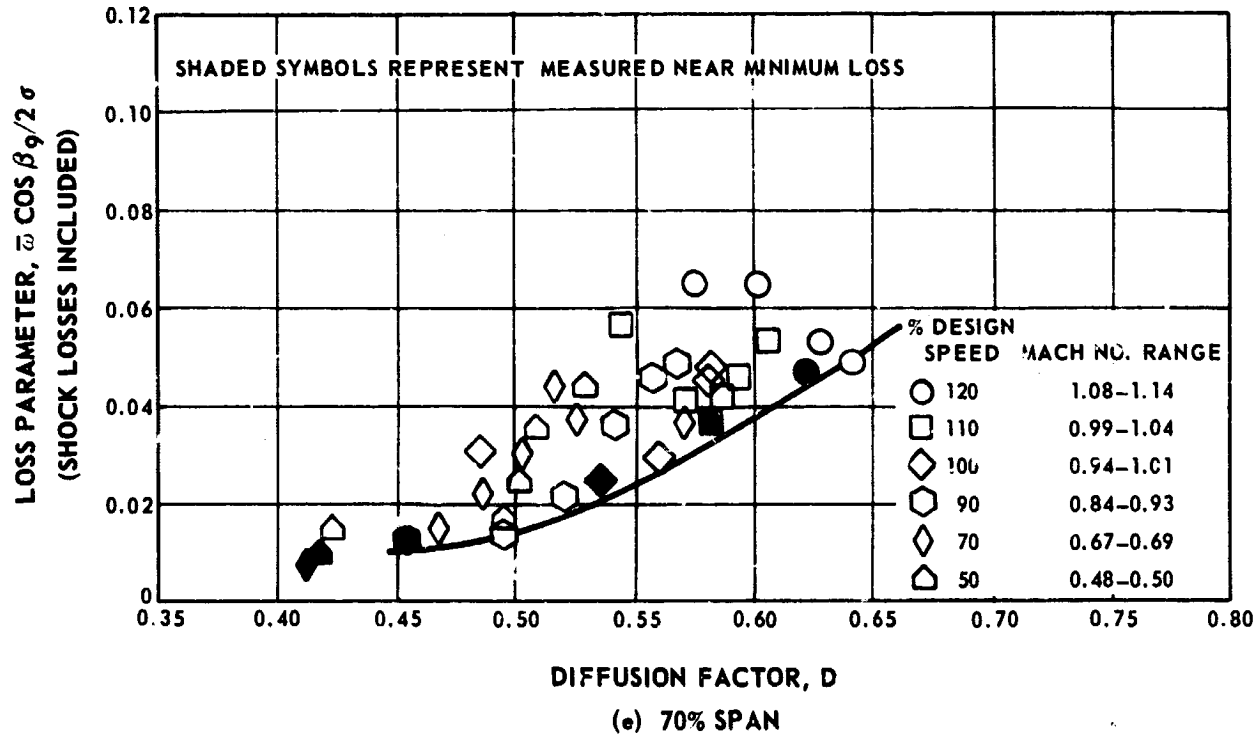
(c) 30% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



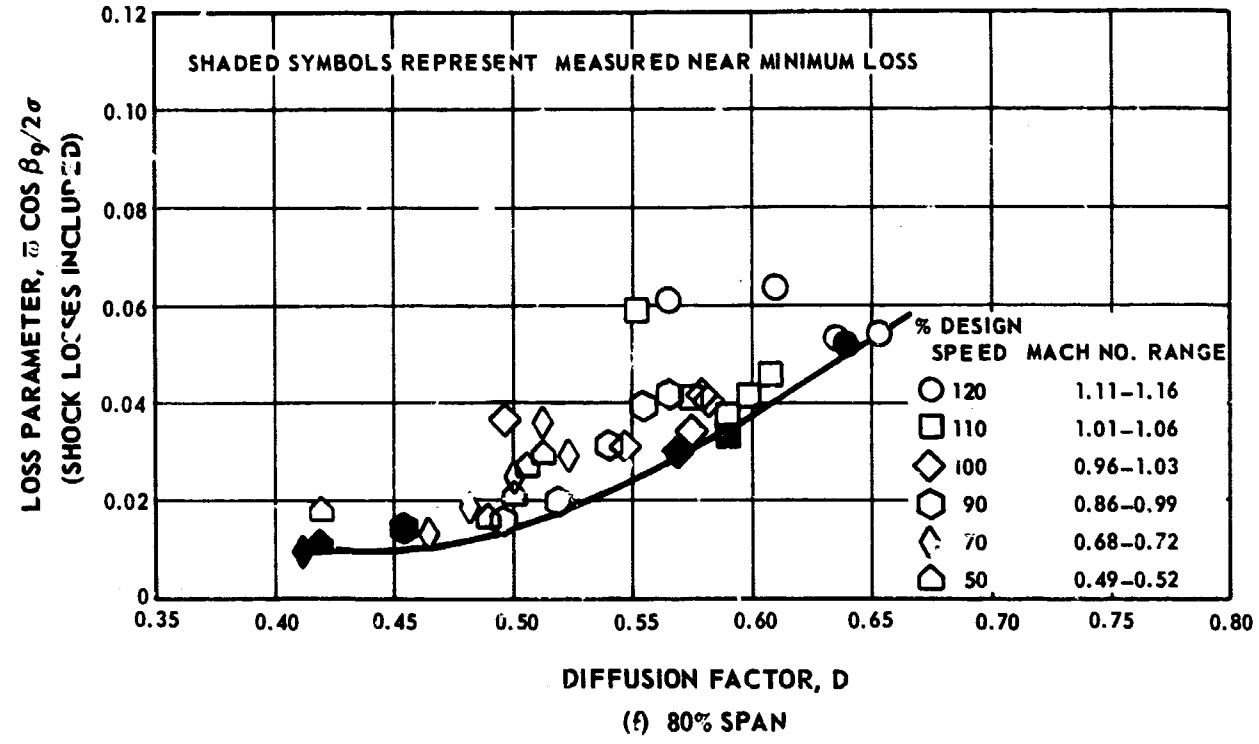
(d) 50% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



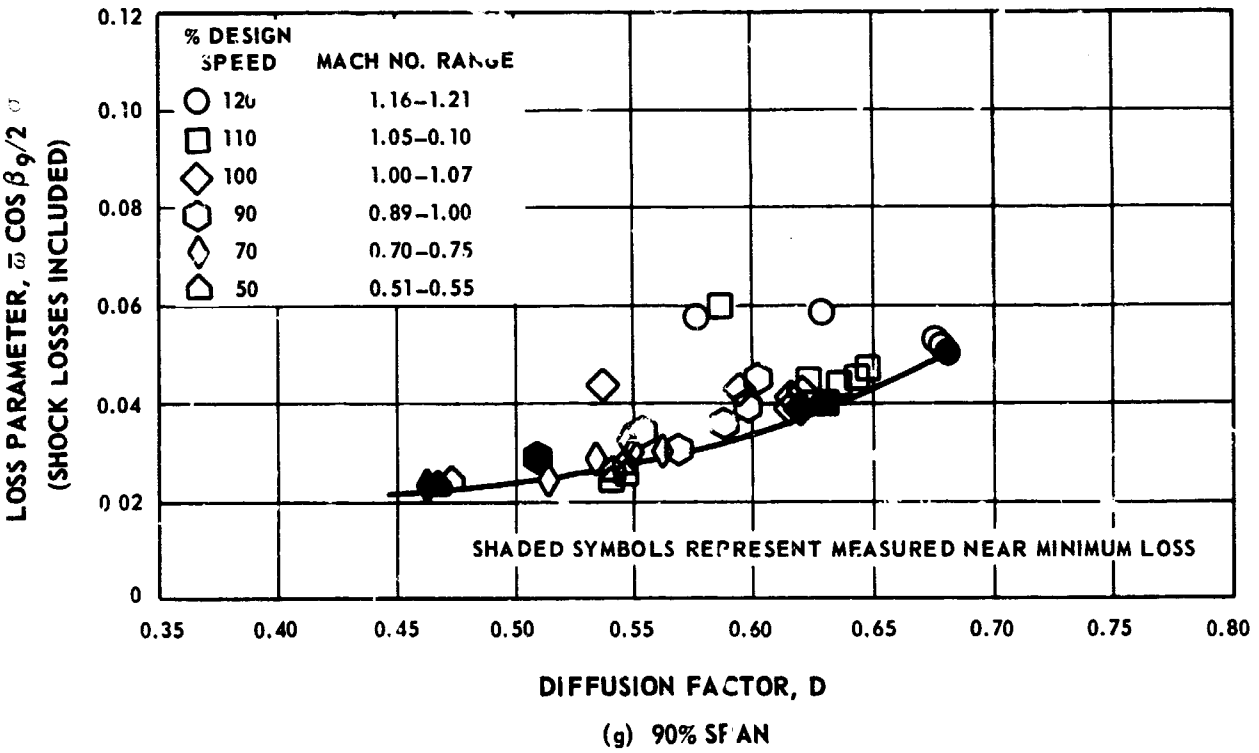
(e) 70% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



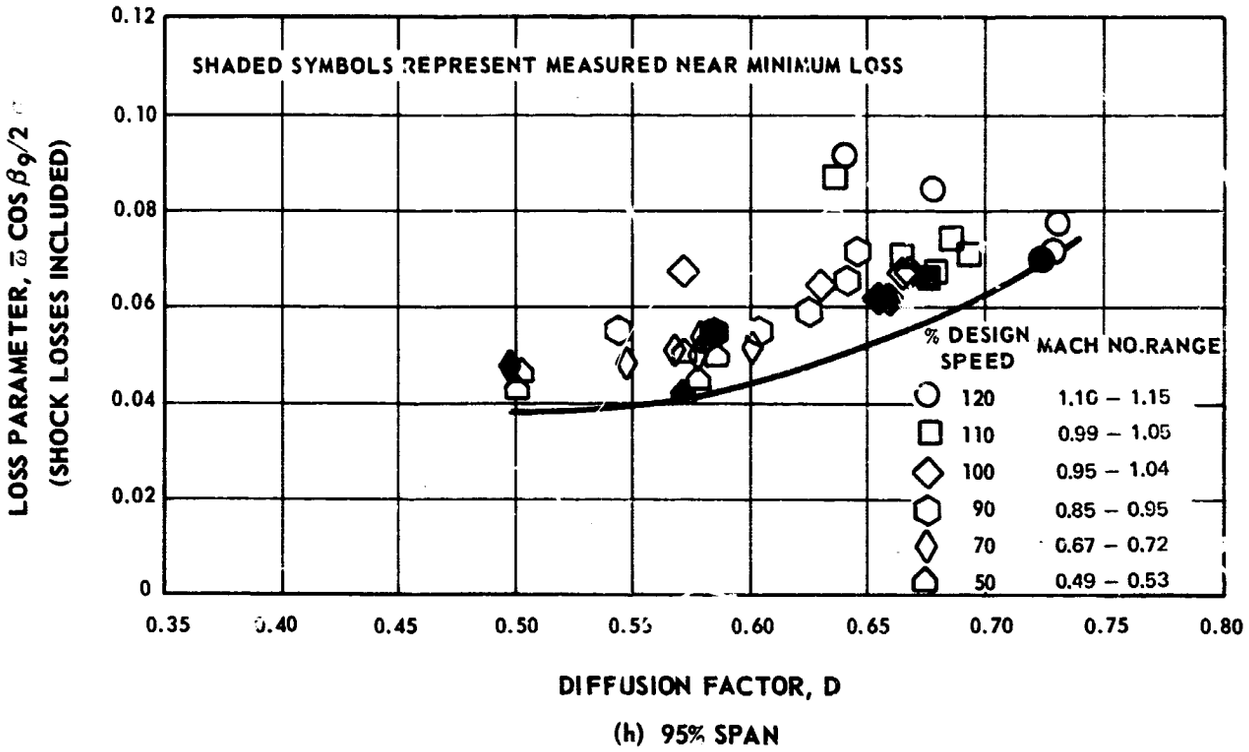
(f) 80% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



(g) 90% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor



(h) 95% SPAN

Figure 13 DCA Stator, Loss Parameter vs. Diffusion Factor

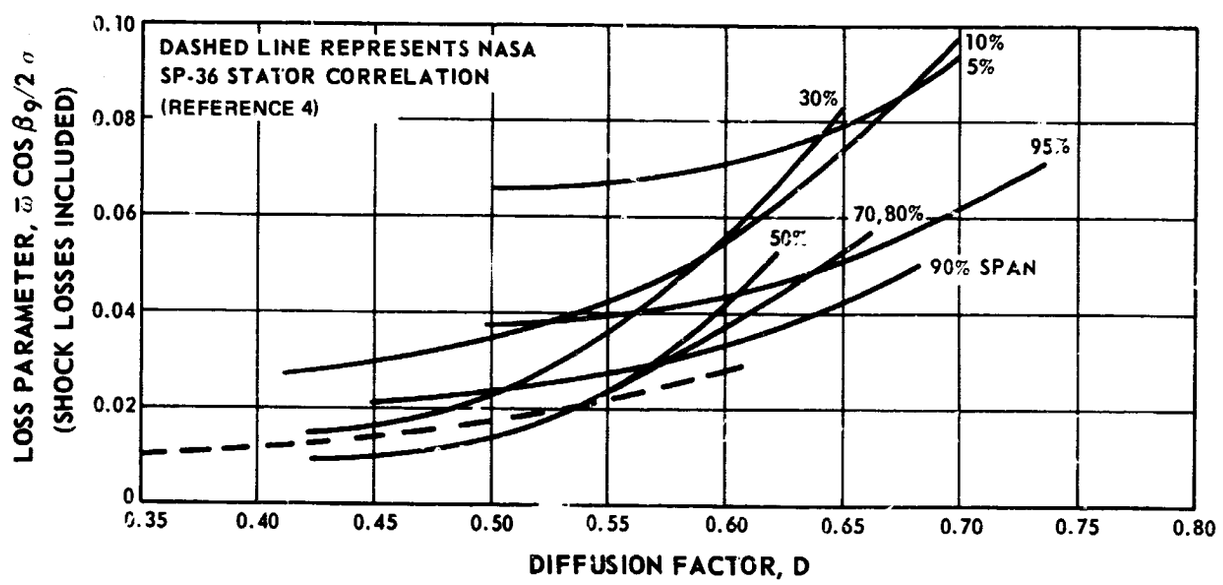
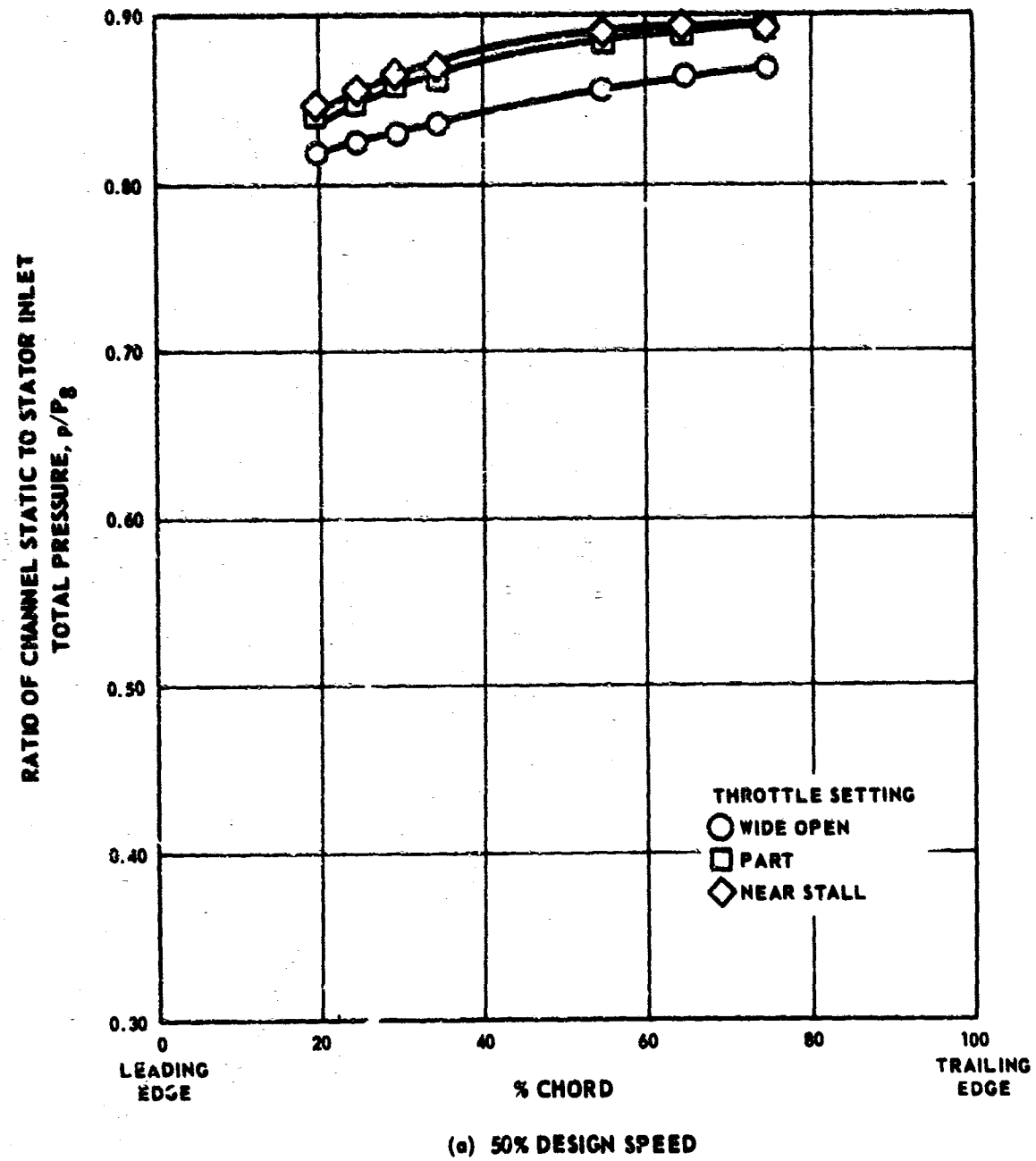
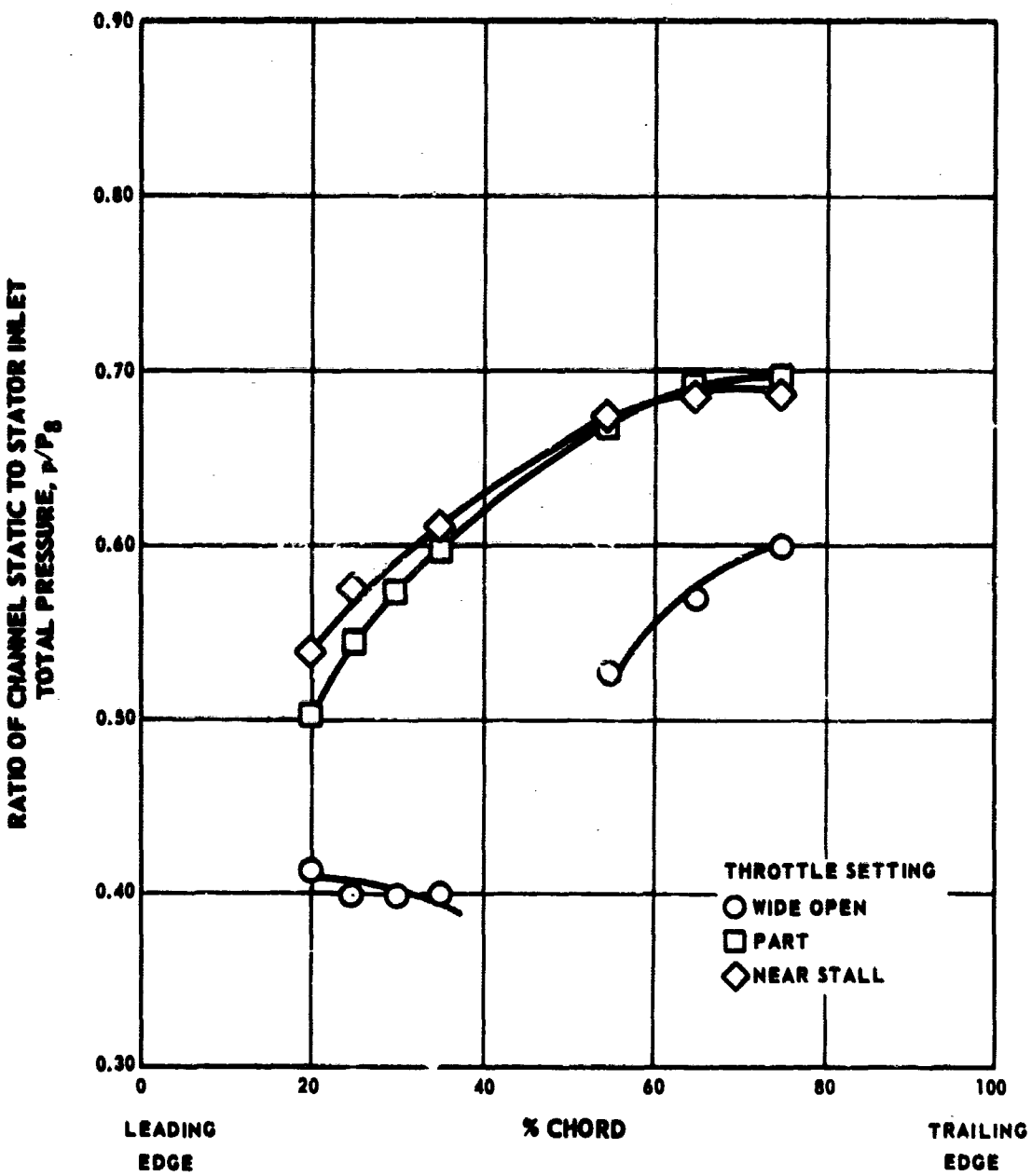


Figure 14 DCA Stator, Minimum Loss Parameter vs. Diffusion Factor



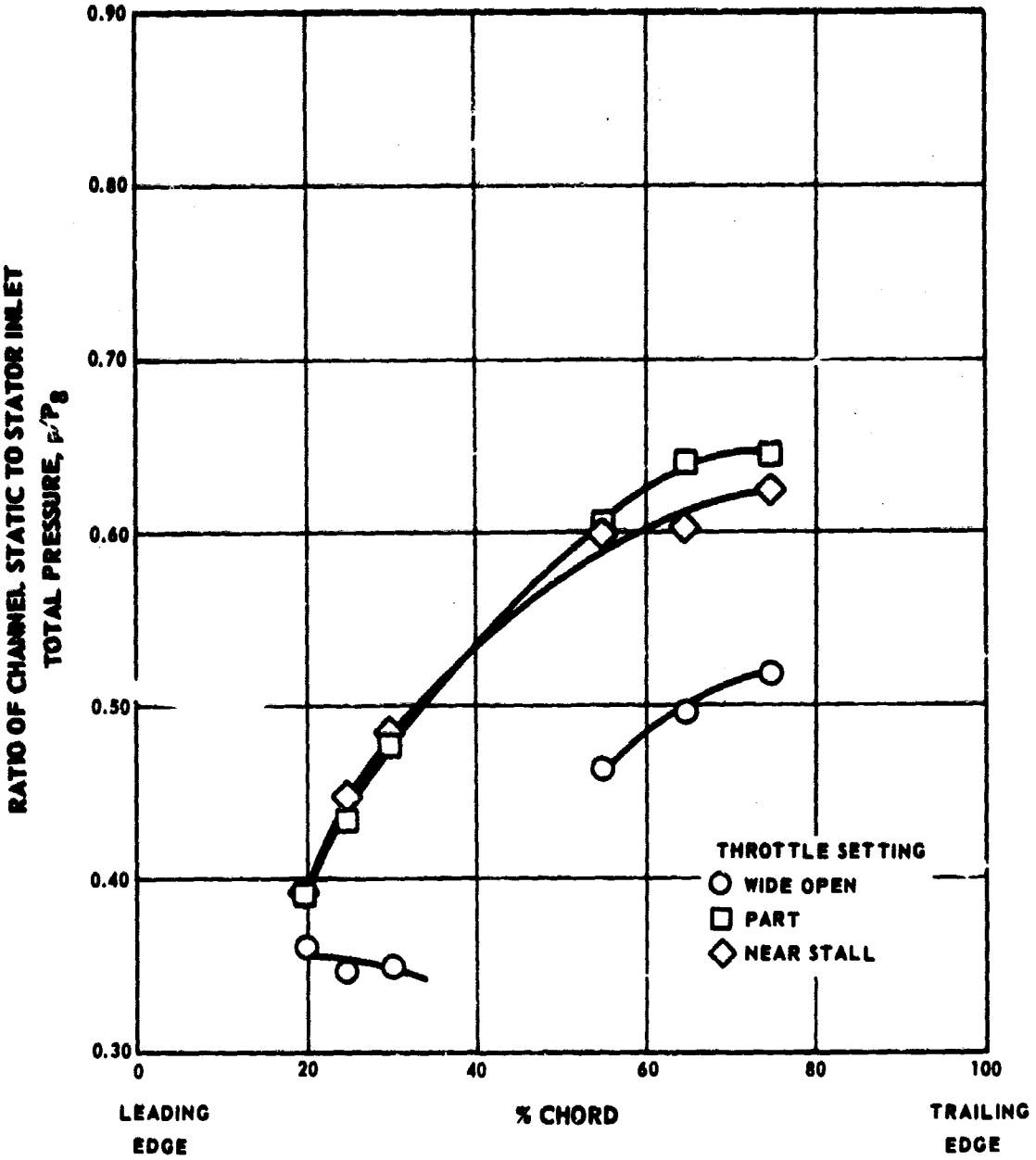
(a) 50% DESIGN SPEED

Figure 15 DCA Stator, Hub Mid-channel Static Pressure Gradient



(b) 100% DESIGN SPEED

Figure 15 DCA Stator, Hub Mid-channel Static Pressure Gradient



(c) 110% DESIGN SPEED

Figure 15 DCA Stator, Hub Mid-channel Static Pressure Gradient

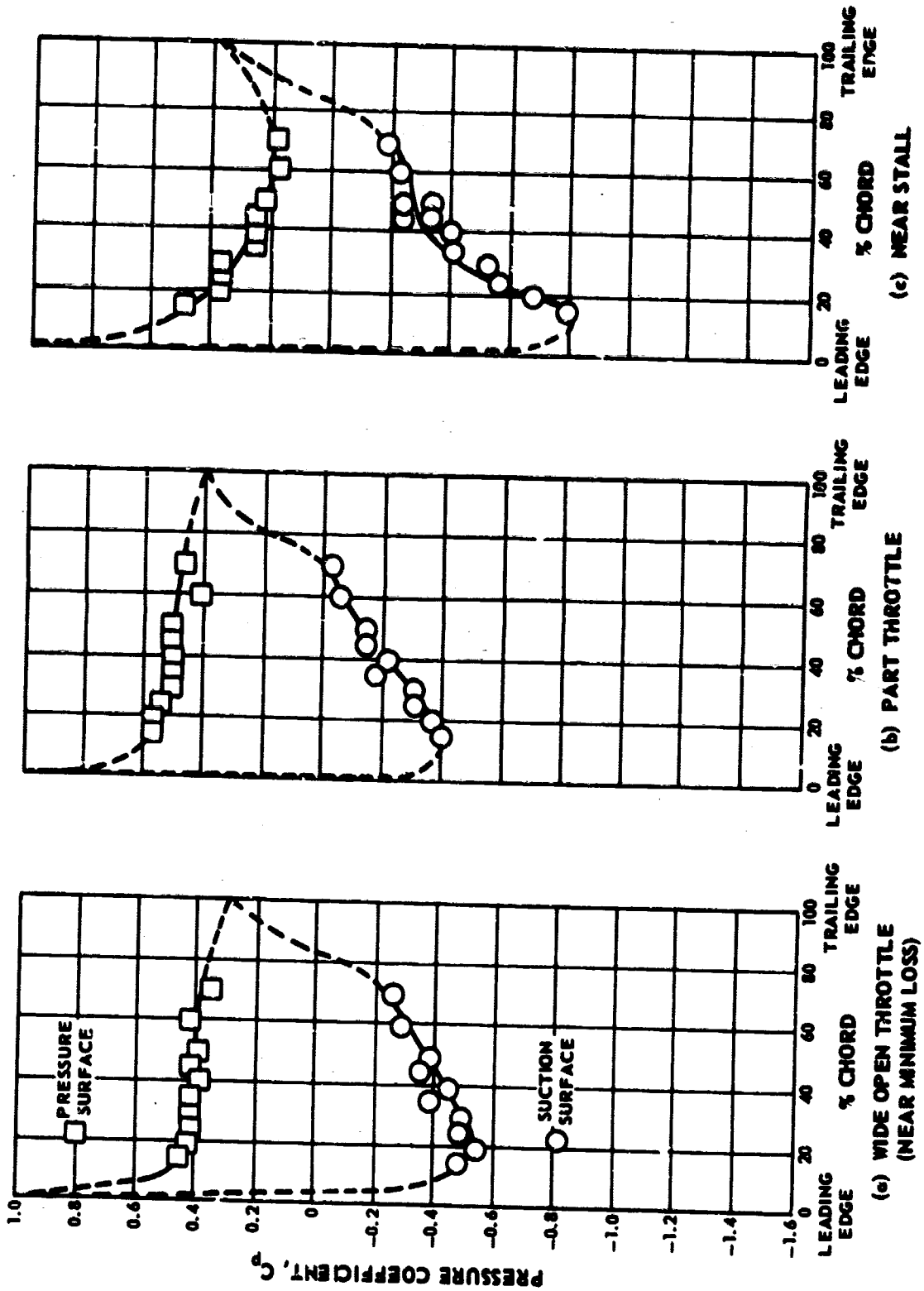


Figure 16 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 50% Design Speed, 10% Span

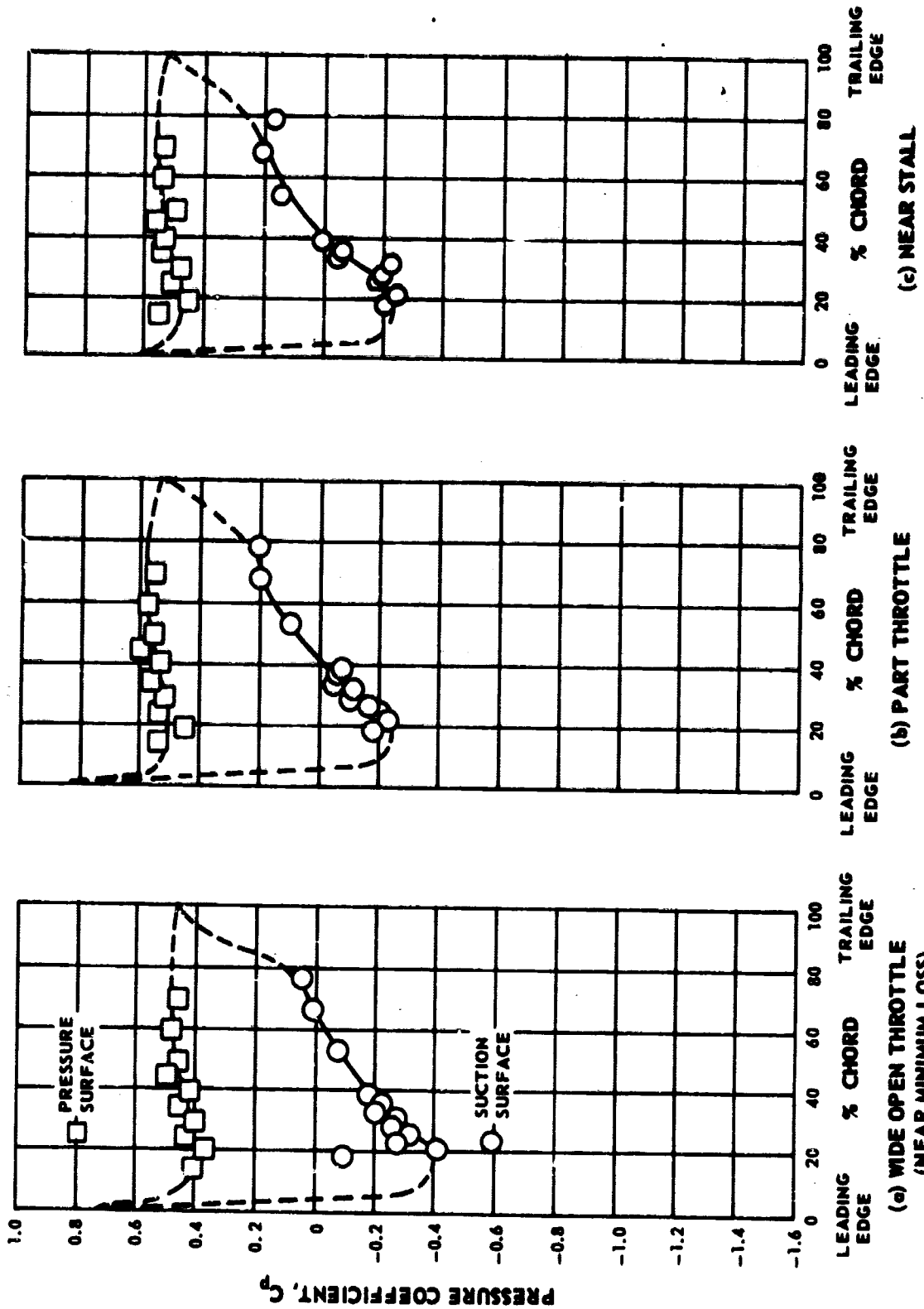


Figure 17 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 50% Design Speed, 90% Span

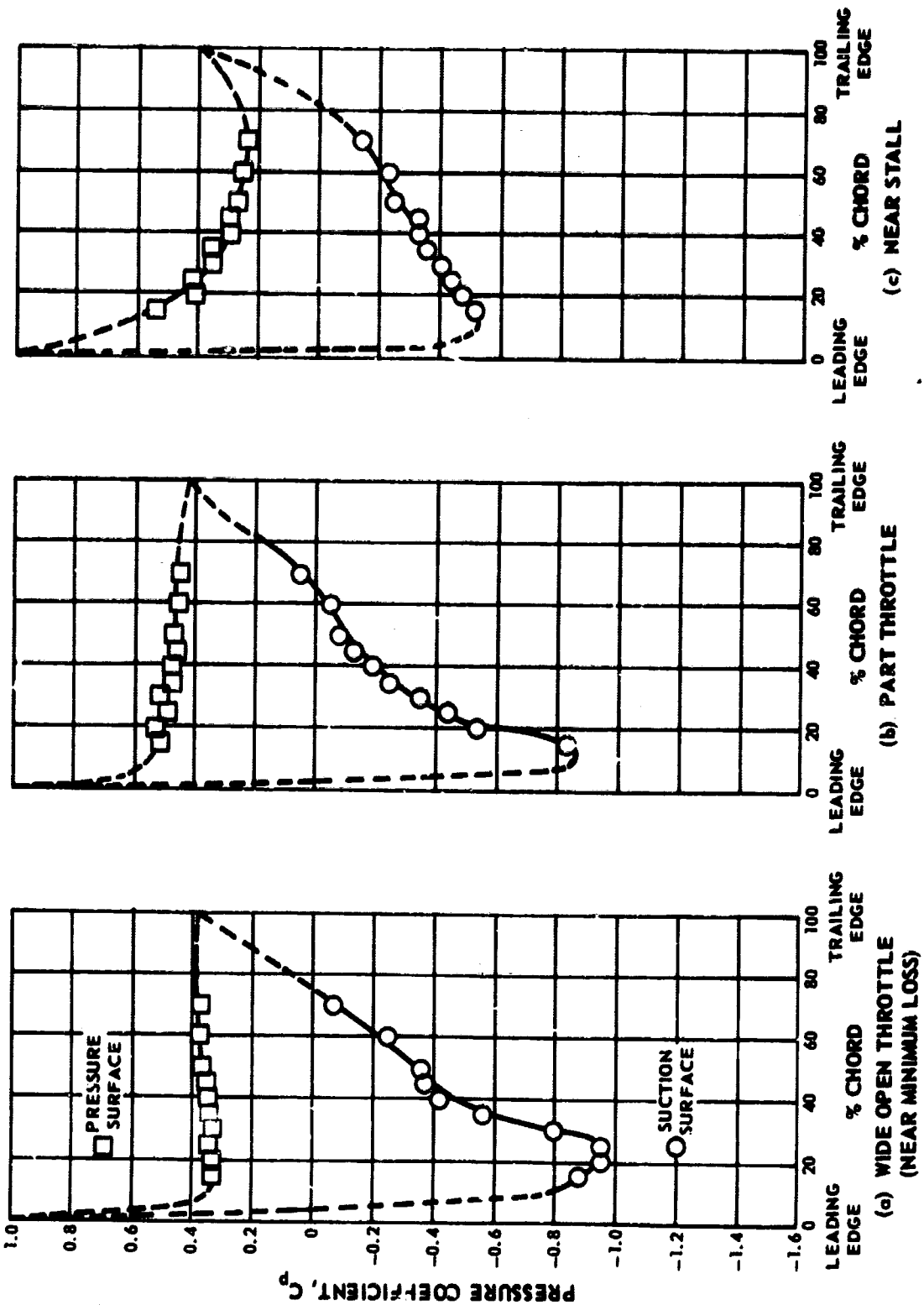


Figure 18 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 100% Design Speed, 10% Span

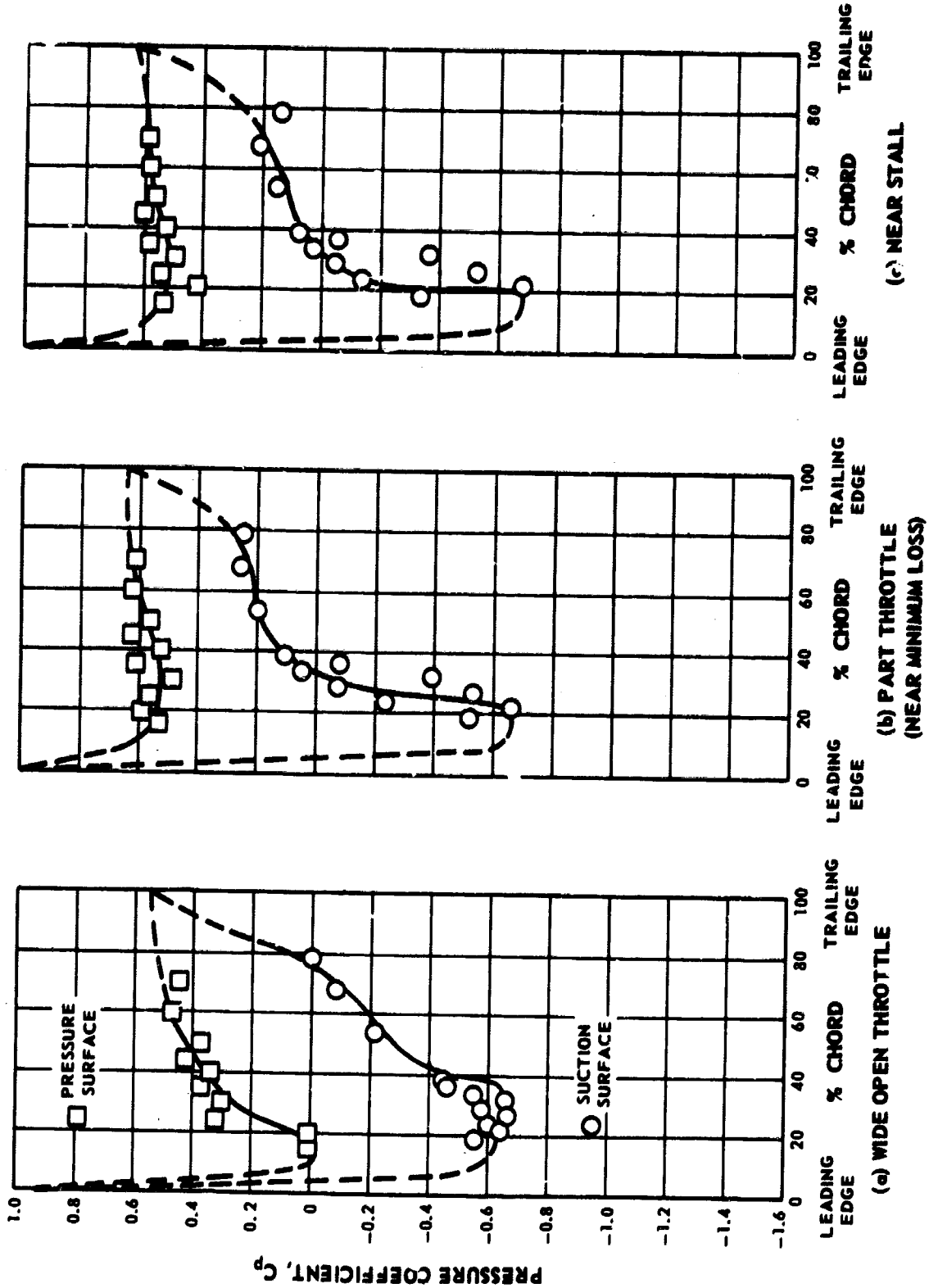


Figure 19 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 100% Design Speed, 90% Span

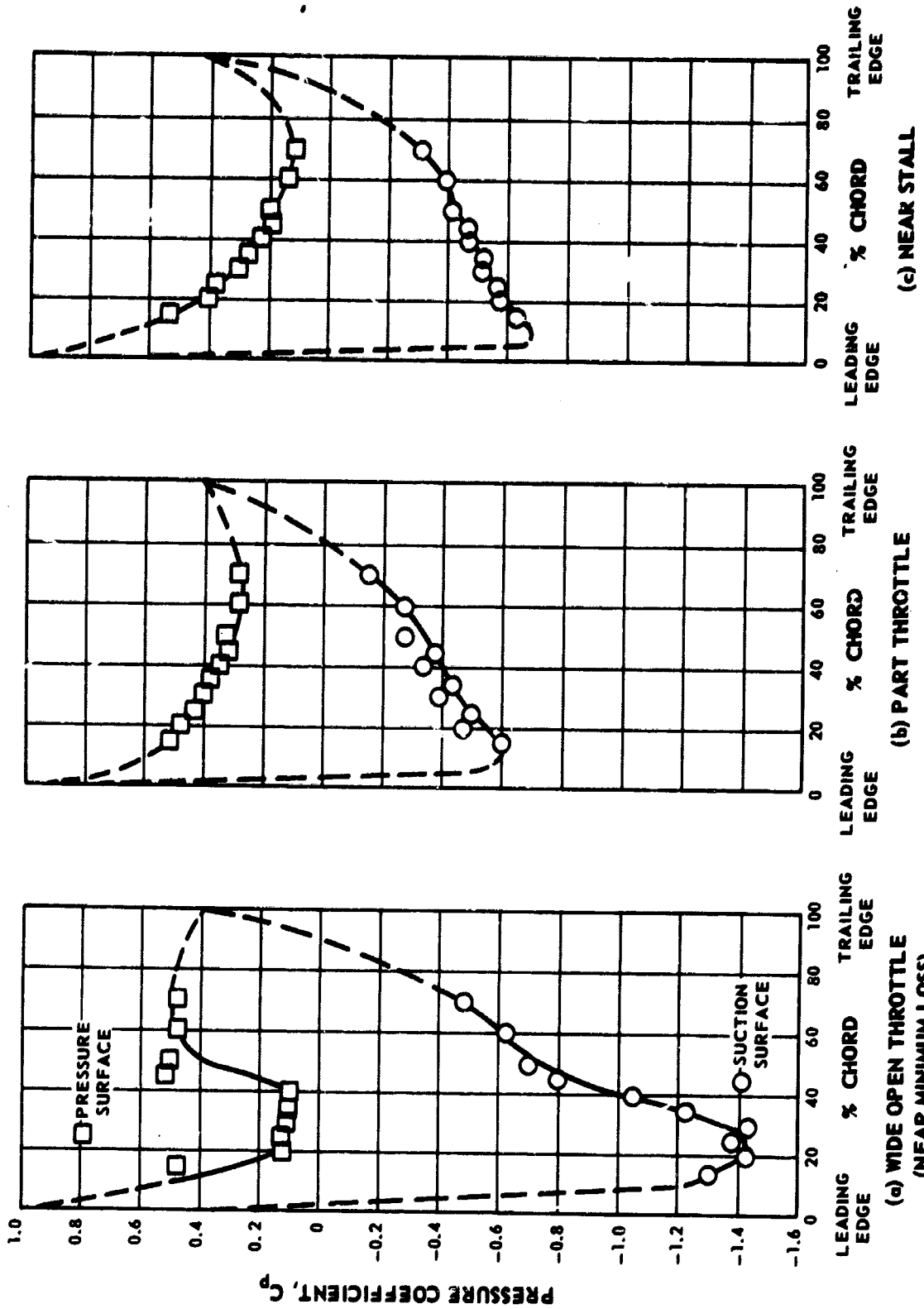


Figure 20 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 110% Design Speed, 10% Span

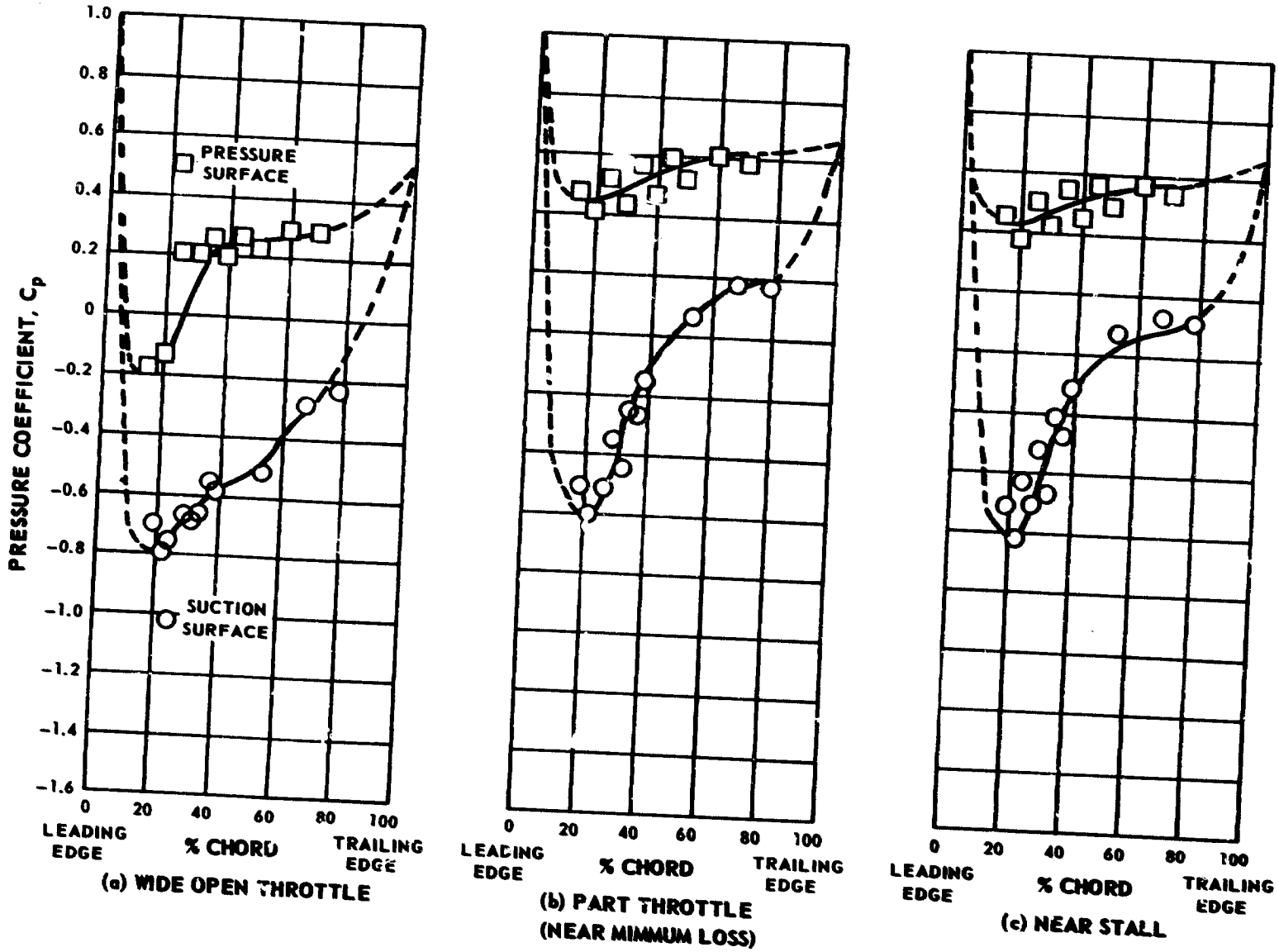


Figure 21 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 110% Design Speed, 90% Span

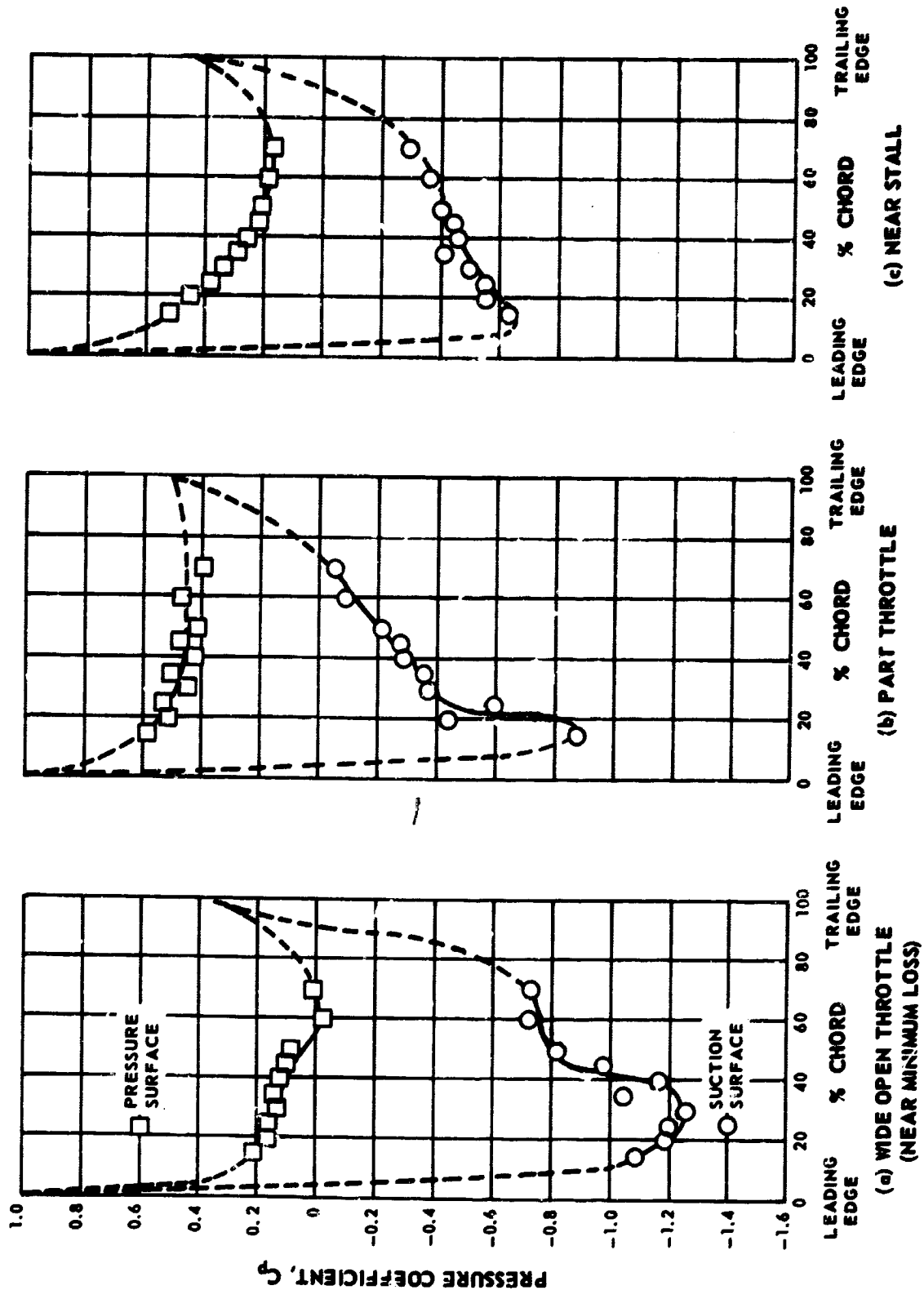


Figure 22 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 120% Design Speed, 10% Span

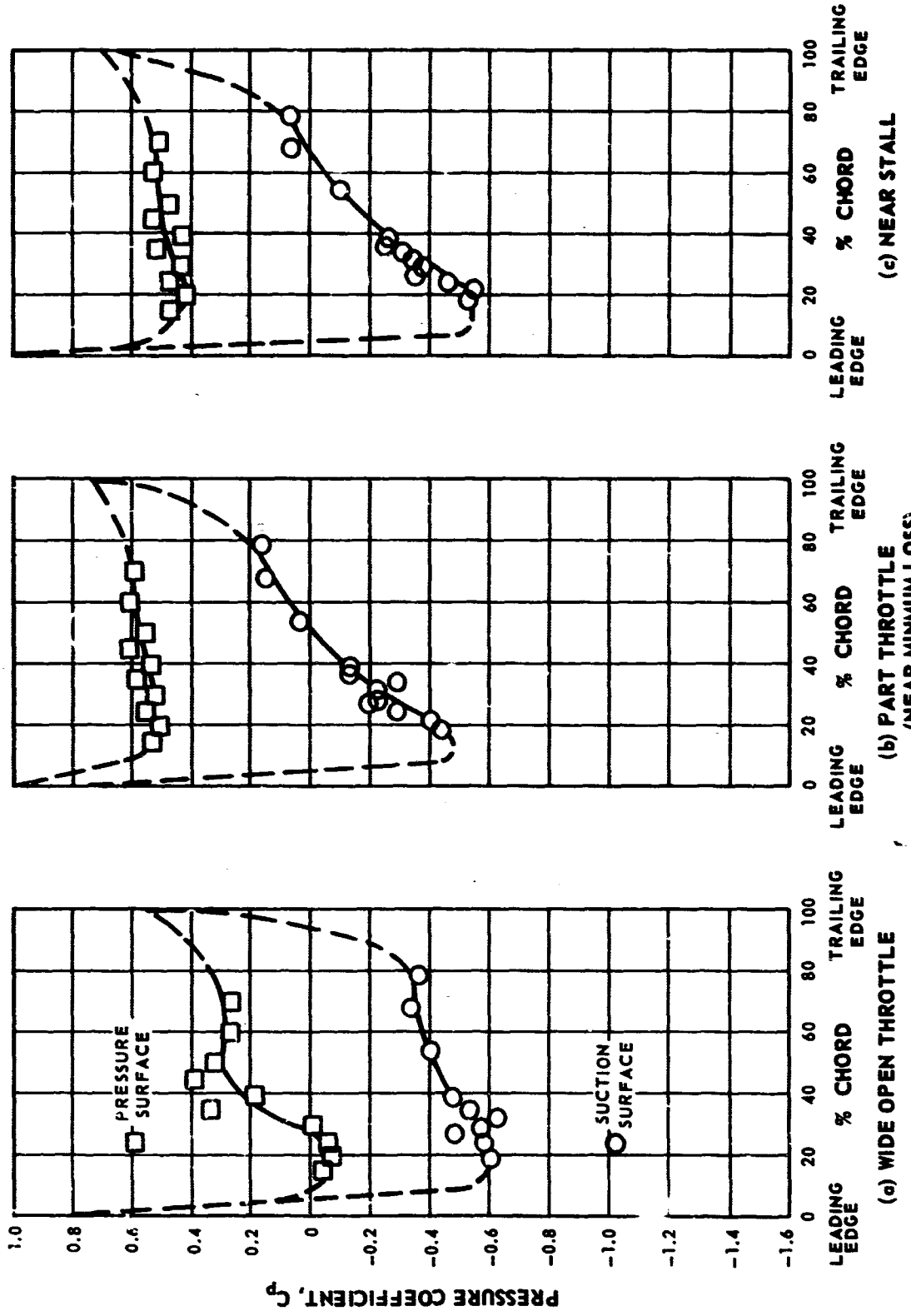


Figure 23 DCA Stator, Pressure Coefficient (C_p) vs. Percent Chord, 120% Design Speed, 90% Span

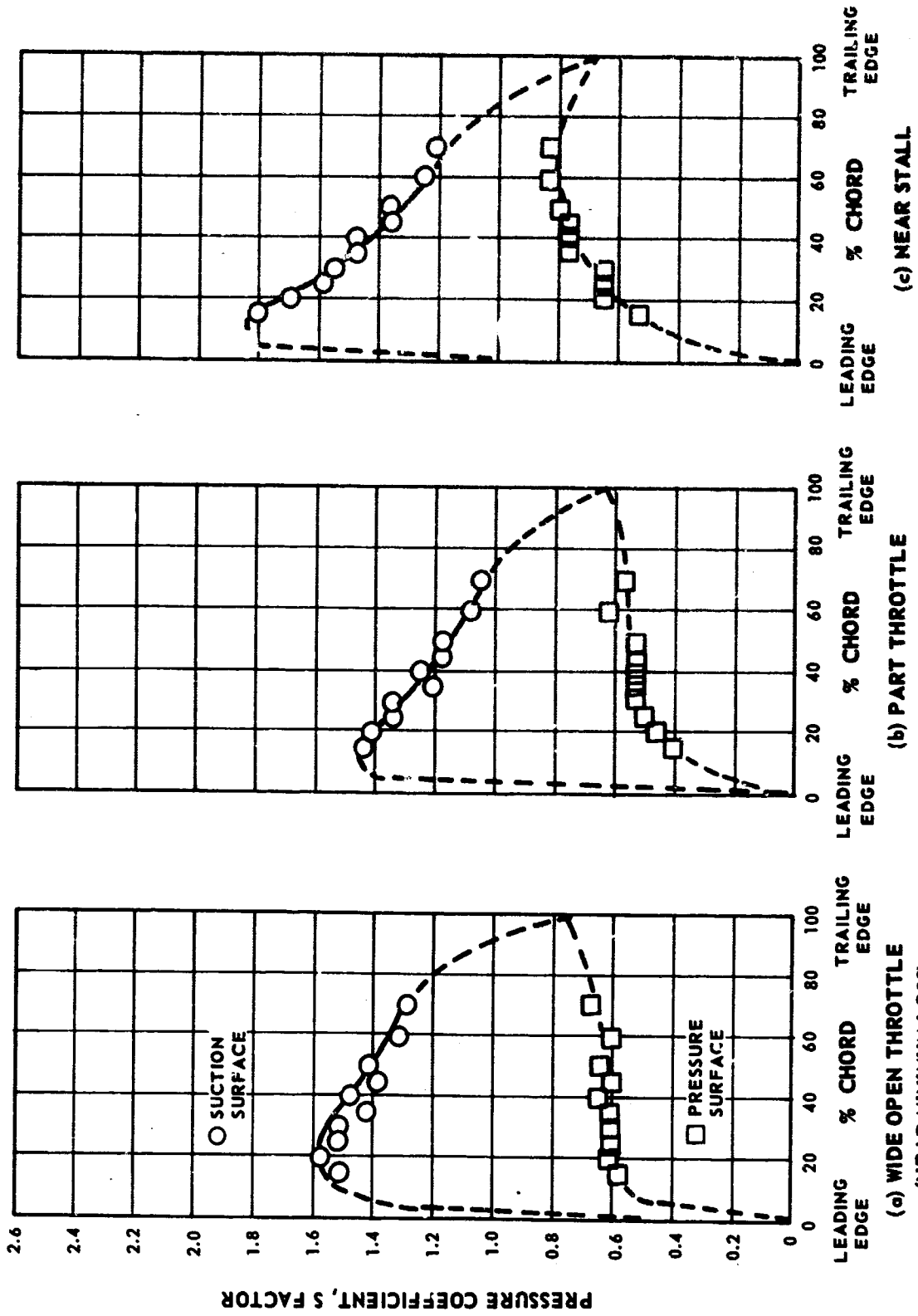


Figure 24 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 50% Design Speed, 10% Span

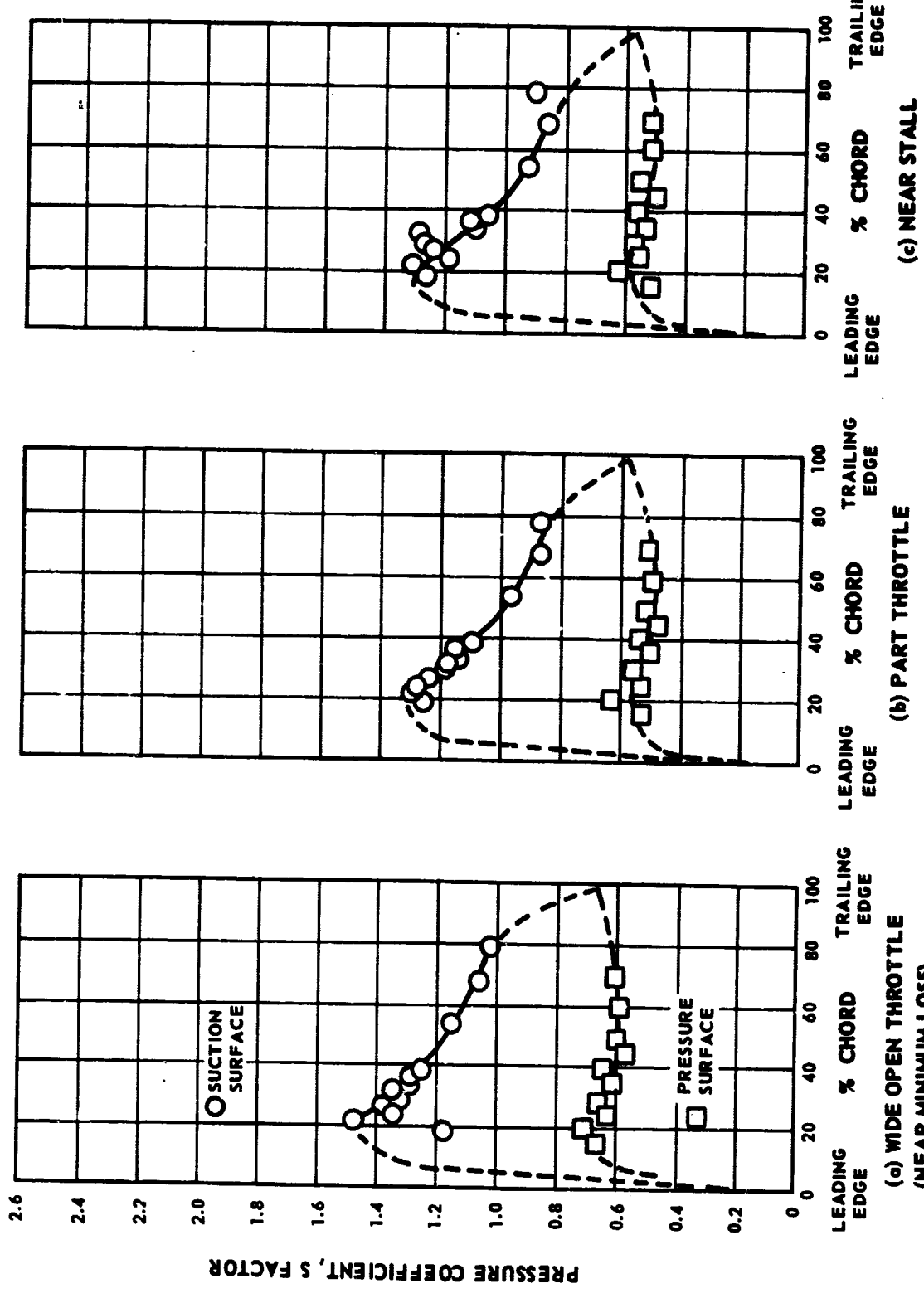


Figure 25 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 50% Design Speed, 90% Span

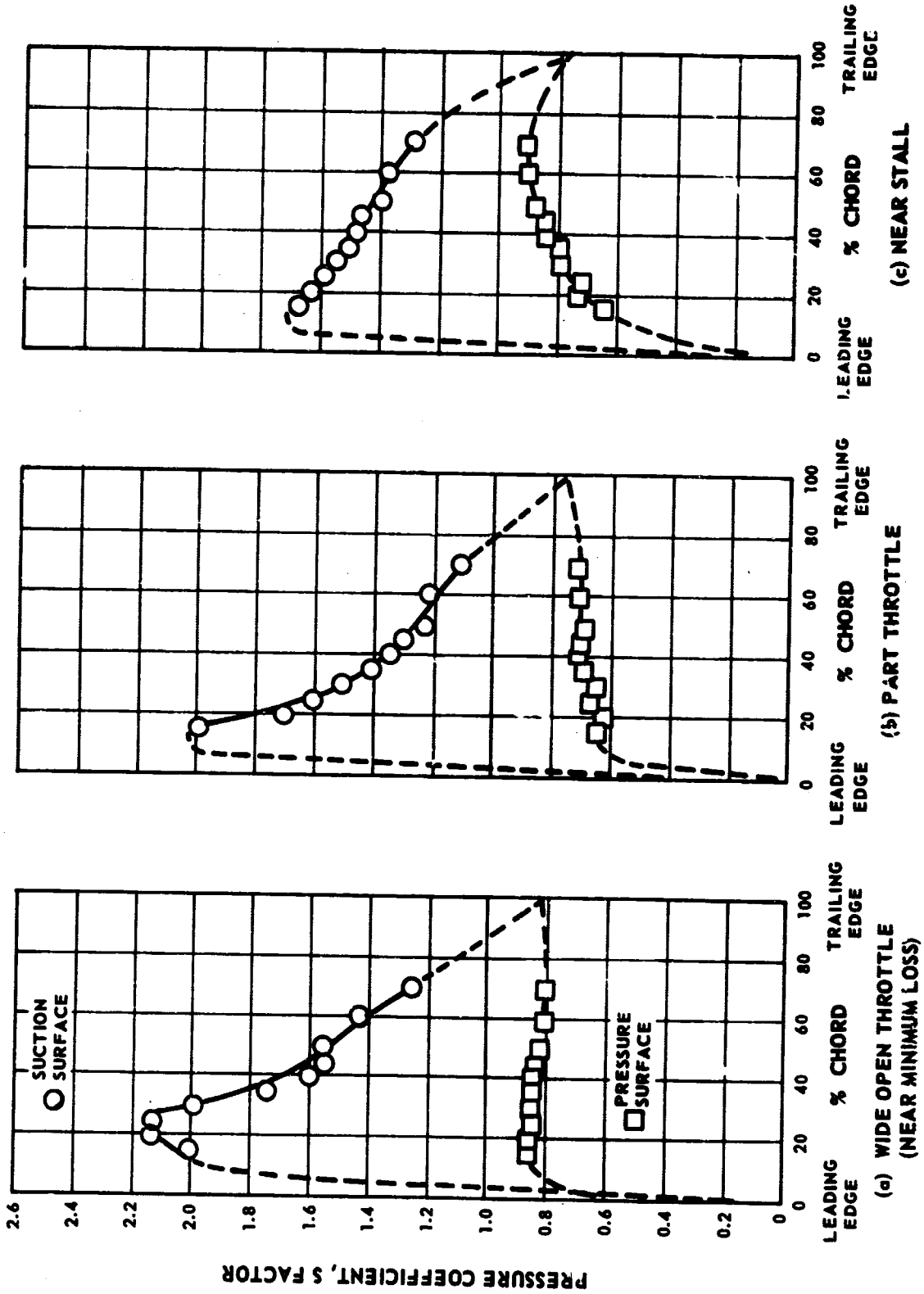


Figure 26 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 100% Design Speed, 16% Span

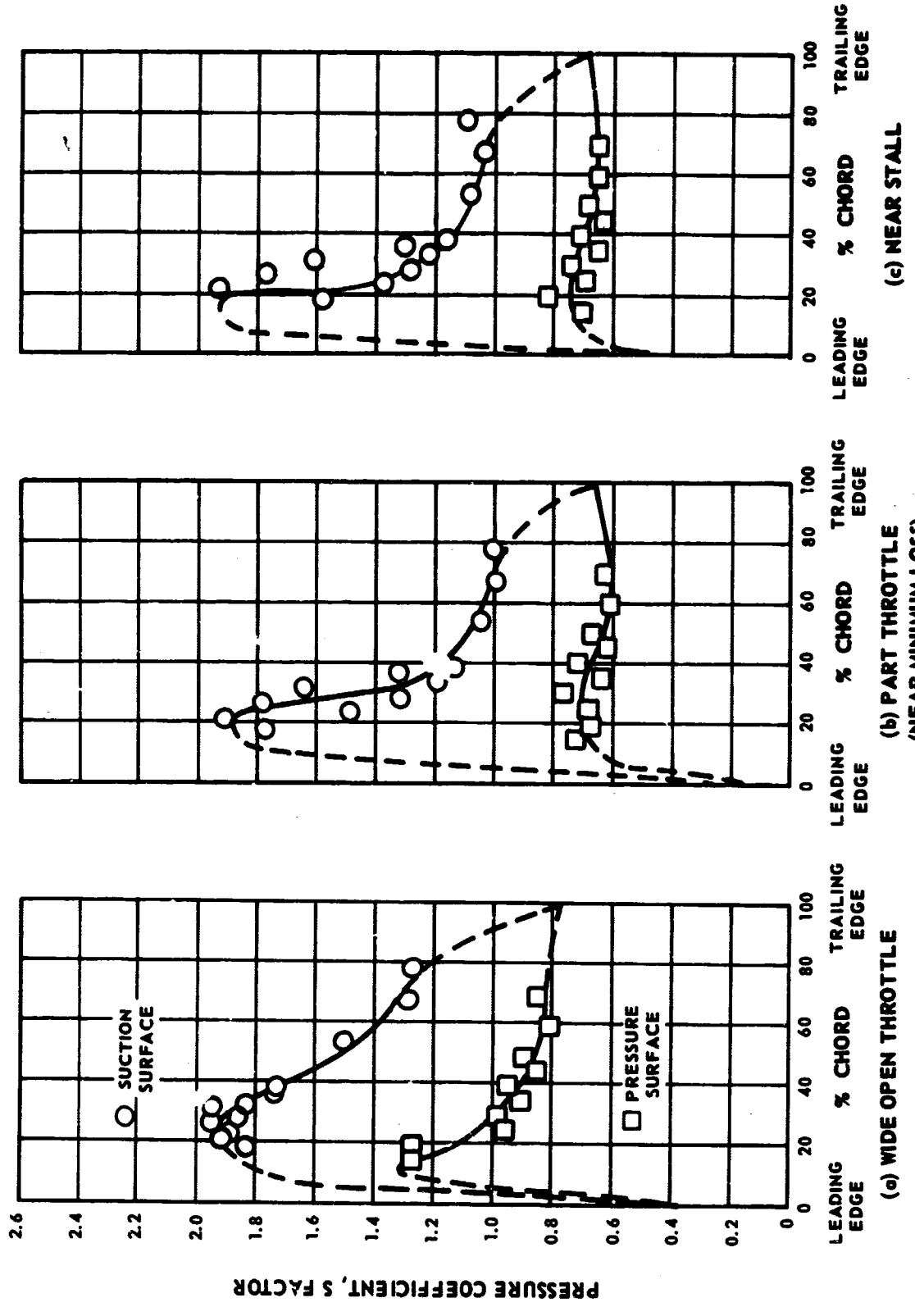


Figure 27 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 100% Design Speed, 90% Span

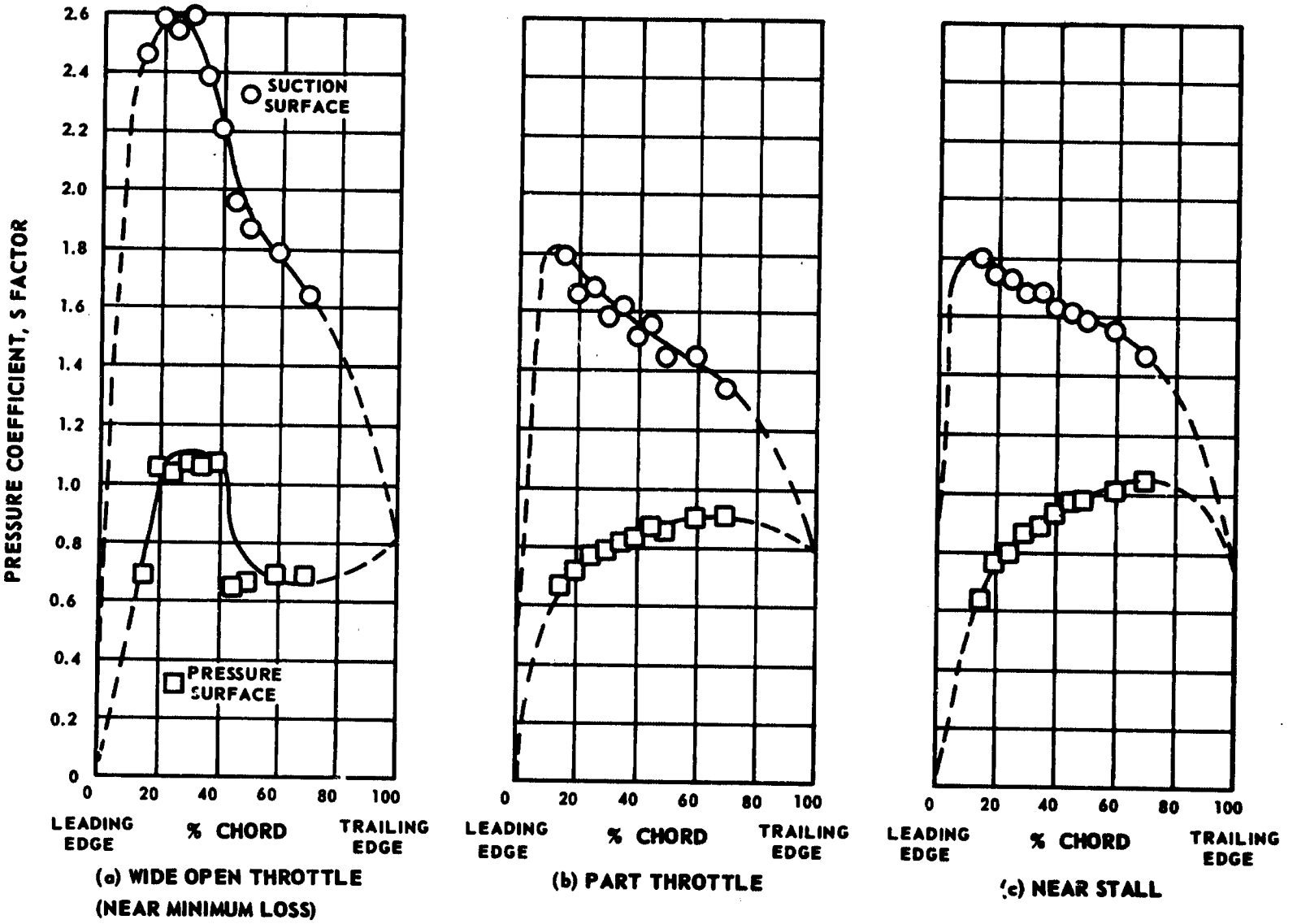


Figure 28 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 110% Design Speed, 10% Span

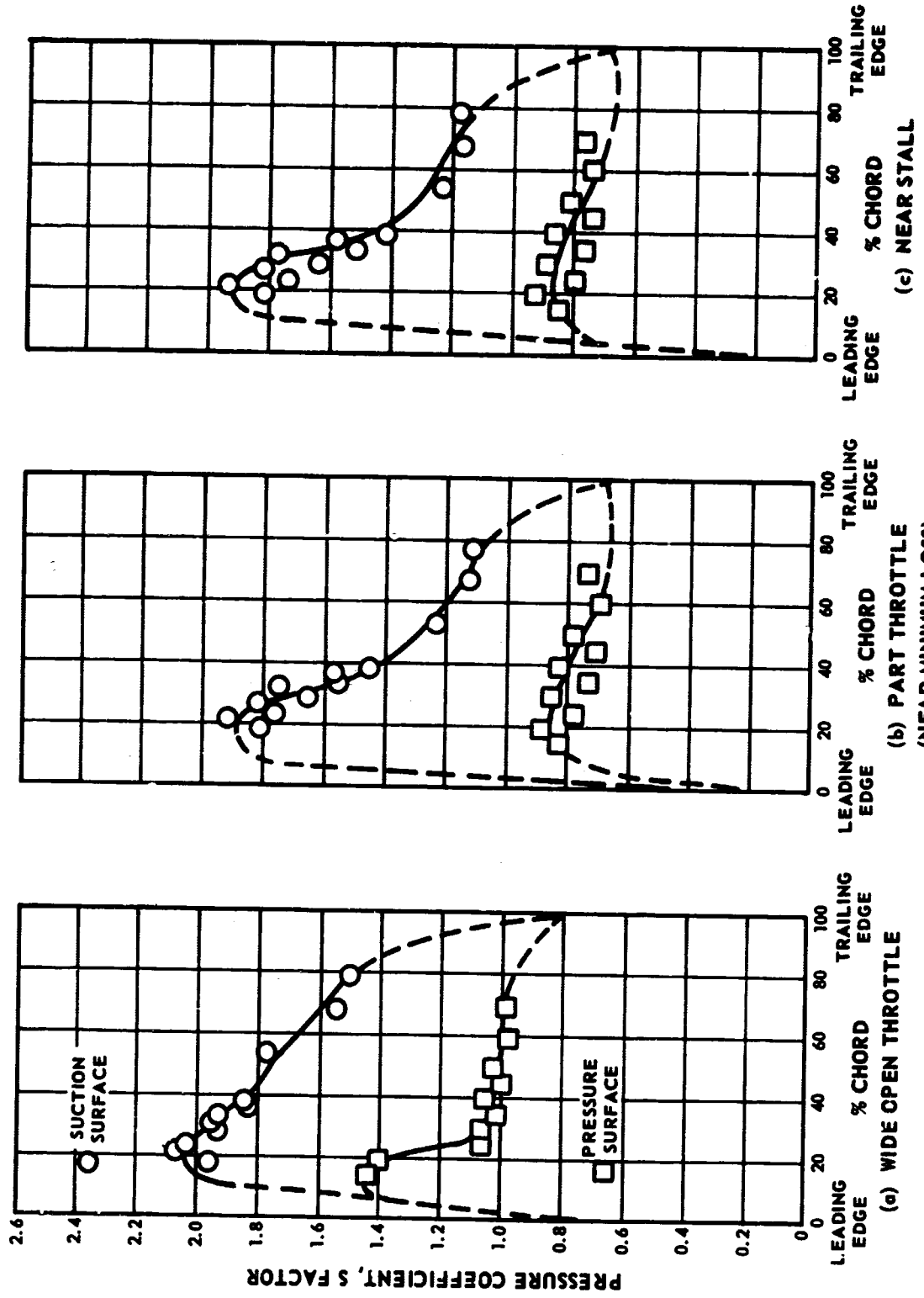


Figure 29 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 110% Design Speed, 90% Span

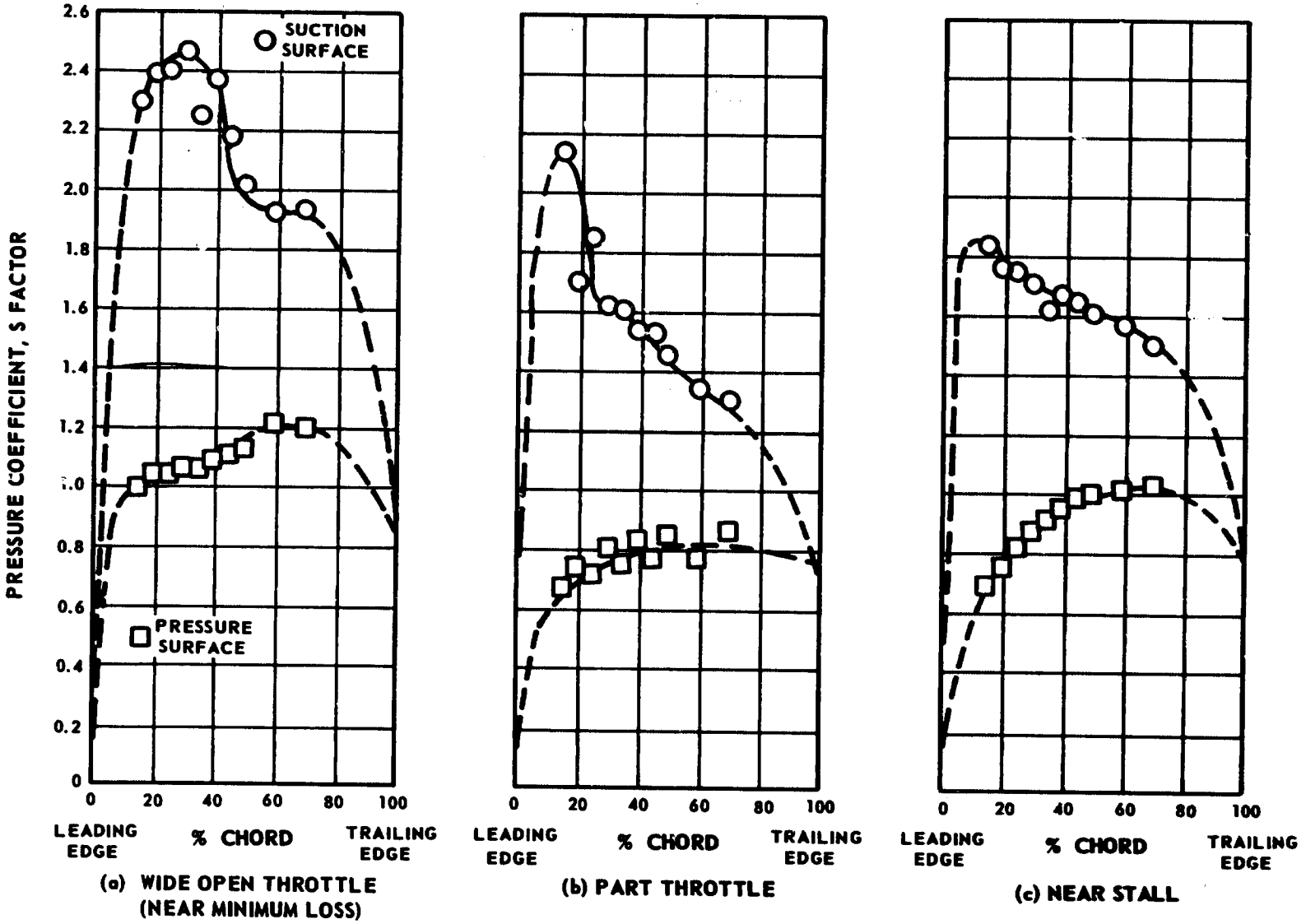


Figure 30 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 120% Design Speed, 10% Span

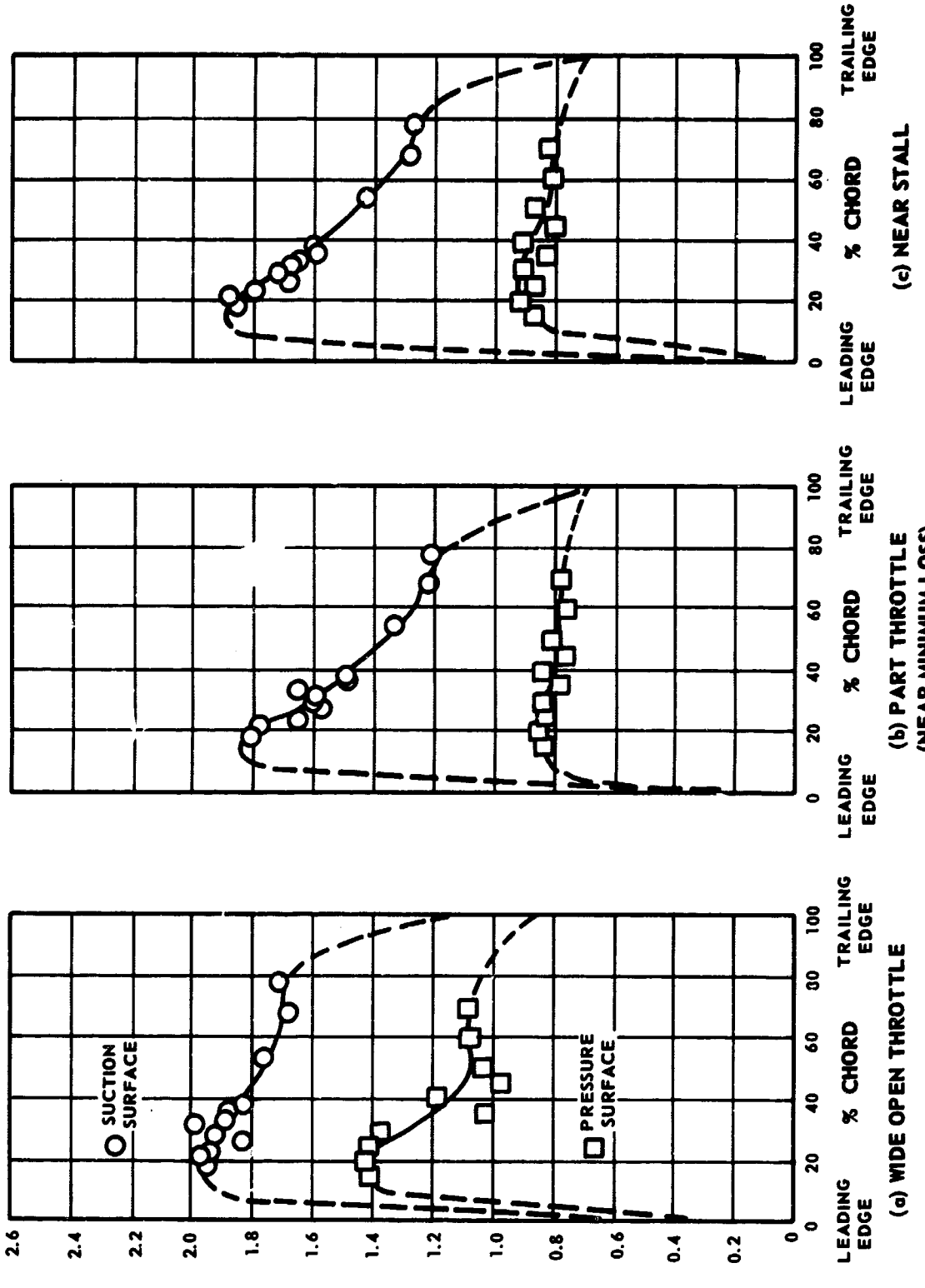


Figure 31 DCA Stator, Pressure Coefficient (S Factor) vs. Percent Chord, 120% Design Speed, 90% Span

APPENDIX A

BLADE ELEMENT DATA TABULATION

TABLE 1-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 1

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	47.505	45.434	44.150	43.046	40.954	39.999	38.719	40.436
β_g	1.006	.956	.288	-.498	-1.012	-.994	-.257	-1.047
V_s	382.174	604.951	577.783	556.883	524.789	505.175	476.928	444.054
V_g	397.813	431.464	445.328	435.567	416.234	406.178	380.614	316.443
V_{Zs}	392.475	425.711	413.950	407.950	396.104	386.916	372.097	337.989
V_{Zg}	396.659	430.307	444.413	434.824	415.803	405.980	380.582	316.378
$V_{\theta s}$	429.255	430.990	402.445	381.483	343.975	324.710	298.317	288.002
$V_{\theta g}$	6.982	7.200	2.240	-3.789	-7.355	-7.045	-1.710	-5.781
M_s	.525	.547	.521	.504	.472	.453	.427	.397
M_g	.354	.385	.397	.389	.371	.362	.338	.280
$\Delta\beta$	46.499	44.477	43.861	43.544	41.967	40.992	38.977	41.481
$\bar{\omega}$	.165	.086	.039	.037	.032	.046	.084	.192
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.043	.023	.011	.011	.010	.016	.029	.068
D	.501	.468	.417	.420	.418	.410	.421	.522
η_p	.718	.845	.916	.916	.921	.876	.783	.629
i_m	2.985	2.184	3.570	3.546	4.014	4.729	4.639	6.454
i_s	-.515	-1.526	-.680	-1.074	-1.536	-1.791	-2.831	-1.176
$\delta°$	9.706	9.446	8.388	7.482	6.718	6.716	7.673	6.983

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9729

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4432.600

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 73.190

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 13.9649

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 19.4654

TABLE 1-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 2

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	48.041	45.740	44.495	43.690	40.774	39.410	39.236	40.979
β_g	1.102	1.119	.699	-.477	-1.316	-1.015	-.259	-.649
V_s	550.981	576.610	552.970	533.319	495.085	474.680	454.780	422.887
V_g	375.869	408.908	424.478	414.419	391.425	382.334	360.541	299.953
V_{Zs}	367.619	401.654	393.846	385.173	374.703	366.678	352.240	319.257
V_{Zg}	374.762	407.785	423.578	413.714	390.981	382.149	360.513	299.924
$V_{\theta s}$	409.726	412.956	387.544	368.395	323.330	301.357	287.658	277.321
$V_{\theta g}$	7.231	7.984	5.175	-3.451	-8.990	-6.775	-1.630	-3.398
M_s	.496	.520	.498	.480	.444	.425	.407	.377
M_g	.334	.364	.379	.369	.349	.340	.320	.266
$\Delta\beta$	46.939	44.621	43.796	44.167	42.090	40.425	39.495	41.628
$\bar{\omega}$	.175	.092	.054	.046	.042	.049	.100	.212
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.045	.024	.015	.014	.013	.016	.035	.075
D	.503	.473	.420	.425	.421	.406	.428	.526
η_p	.698	.234	.882	.895	.867	.866	.747	.592
i_m	3.521	2.490	3.915	4.190	3.834	4.140	5.156	6.999
i_s	.021	-1.220	-.335	-.430	-1.716	-2.340	-2.314	-.631
$\delta°$	9.802	9.609	8.799	7.503	6.414	6.695	7.671	7.381

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9931

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4434.380

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 70.140

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 13.3829

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 18.6543

TABLE 1-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.407	48.967	48.367	47.965	44.682	43.363	45.018	46.607
β_θ	.588	.773	.844	.851	.405	.406	.407	.408
V_s	575.820	599.696	576.867	558.840	512.797	488.151	465.567	438.200
V_θ	359.380	391.085	408.396	399.720	371.518	361.178	339.642	282.280
V_{Zs}	358.469	392.965	382.695	373.911	364.417	354.839	329.100	301.043
$V_{Z\theta}$	358.445	390.089	407.554	399.044	371.207	361.060	339.613	282.264
$V_{\theta s}$	450.058	452.372	431.157	414.942	360.585	335.171	329.307	318.421
$V_{\theta\theta}$	3.687	5.273	6.012	5.934	2.625	2.562	2.411	2.011
M_s	.518	.541	.519	.502	.459	.436	.415	.390
M_θ	.318	.347	.362	.355	.329	.320	.300	.249
$\Delta\beta$	50.819	48.195	47.523	47.095	44.277	42.956	44.611	46.199
$\bar{\omega}$	.162	.093	.059	.059	.056	.060	.091	.202
$\bar{\omega}\cos\beta_\theta/2\sigma$	.042	.024	.016	.017	.018	.020	.032	.072
D	.573	.543	.492	.497	.496	.482	.515	.612
η_p	.757	.853	.892	.891	.893	.869	.816	.671
i_m	.887	5.717	7.787	8.445	7.742	8.093	10.938	12.627
i_s	3.387	2.007	3.537	3.[illegible]5	2.192	1.613	3.468	4.997
δ°	9.268	9.265	3.944	8.[illegible]	8.135	8.116	8.337	8.438

PERCENT DESIGN SPEED, $\frac{N\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = [illegible]

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4432.120

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = [illegible]

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 12.7800

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 17.8138

TABLE 1-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	52.590	49.859	49.057	48.488	45.158	44.775	49.025	51.723
β_θ	.472	.700	.795	.801	.775	.762	.764	.766
V_s	554.603	576.723	560.904	546.804	497.341	473.494	440.958	409.794
V_θ	344.430	376.132	393.834	388.371	354.734	337.546	308.771	256.900
V_{Zs}	336.242	372.461	367.097	362.058	350.561	336.091	289.146	253.851
$V_{Z\theta}$	343.586	375.272	393.120	387.805	354.471	337.442	308.732	256.872
$V_{\theta s}$	440.581	442.411	423.685	409.459	352.643	333.492	332.923	321.700
$V_{\theta\theta}$	2.639	4.594	5.462	5.430	4.798	4.490	4.117	3.435
M_s	.498	.521	.504	.490	.445	.423	.392	.363
M_θ	.305	.333	.349	.344	.314	.299	.272	.226
$\Delta\beta$	52.127	49.159	48.262	47.687	44.383	44.013	48.261	50.957
$\bar{\omega}$	.171	.097	.078	.084	.089	.118	.124	.226
$\bar{\omega}\cos\beta_\theta/2\sigma$	.044	.026	.022	.025	.028	.039	.043	.080
D	.579	.546	.500	.504	.507	.514	.559	.648
η_p	.743	.845	.856	.844	.834	.771	.770	.643
i_m	8.079	6.609	8.477	8.988	8.218	9.505	14.945	17.743
i_s	4.579	2.899	4.227	4.366	2.668	3.025	7.475	10.113
δ°	9.172	9.190	8.895	8.781	8.505	8.472	8.694	8.796

PERCENT DESIGN SPEED, $\frac{N\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 50.0239

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4437.120

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 63.660

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 12.1465

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 16.9309

TABLE 1-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 5

STATOR

SPAN	95	90	80	70	50	30	10	05
D_m	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_2	52.680	50.238	49.583	48.843	46.582	47.554	53.316	57.123
β_1	1.824	1.854	1.888	1.903	1.521	1.524	.969	.277
V_2	541.549	561.595	565.625	537.277	481.388	456.938	429.354	396.272
V_1	335.561	365.370	379.617	376.275	336.595	308.226	283.137	237.517
V_{Z2}	327.803	358.681	353.389	353.328	330.775	308.367	256.497	215.111
V_{Z1}	338.686	364.484	378.867	375.651	336.309	308.069	283.089	237.511
$V_{\theta 2}$	430.675	431.705	415.406	404.520	349.660	337.182	344.316	332.804
$V_{\theta 1}$	10.682	11.818	12.509	12.498	8.936	8.139	4.786	1.148
M_2	.486	.505	.489	.481	.430	.407	.381	.351
M_1	.297	.324	.336	.333	.298	.272	.249	.209
γ_{21}	50.856	48.385	47.694	46.939	45.061	46.030	52.347	56.846
$\frac{\omega}{V_1}$	.187	.102	.100	.121	.131	.187	.203	.319
$\frac{\pi}{\sigma}\frac{C_D}{C_L}\cos\beta_2$	.049	.027	.027	.036	.042	.061	.071	.113
D	.577	.543	.504	.511	.524	.560	.615	.697
η_p	.717	.835	.819	.779	.762	.672	.659	.518
η_m	8.160	6.988	9.003	9.343	9.642	12.284	19.236	23.143
η_s	4.662	3.278	4.753	4.723	4.092	5.804	11.766	15.513
η_e	10.524	10.384	9.988	9.883	9.251	9.234	8.899	8.307

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9359

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4429.310

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 58.970

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 11.4425

CORRECTED FLOW PER UNIT ANNULUS AREA $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 15.9495

TABLE 1-6

BLADE ELEMENT PERFORMANCE, DCA STATOR
50% DESIGN SPEED, POINT 6

STATOR

SPAN	95	90	80	70	50	30	10	05
D_m	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_2	51.479	49.724	49.043	48.703	47.818	52.213	57.397	61.947
β_1	1.553	1.601	1.701	1.716	1.747	1.622	-3.445	31.376
V_2	556.473	570.700	556.633	551.141	491.230	466.910	436.302	402.015
V_1	337.904	368.687	380.091	377.469	327.706	341.242	268.864	284.338
V_{Z2}	346.178	366.577	357.987	356.303	329.826	279.967	235.065	189.063
V_{Z1}	337.300	368.422	382.535	377.020	327.460	281.108	268.376	242.754
$V_{\theta 2}$	435.375	435.489	426.052	420.355	364.009	361.028	367.551	354.782
$V_{\theta 1}$	9.161	10.298	11.372	11.302	9.988	7.962	-16.159	148.048
M_2	.500	.515	.499	.494	.439	.406	.366	.355
M_1	.299	.328	.339	.334	.293	.247	.236	.250
γ_{21}	49.926	48.123	48.242	47.987	46.071	50.590	60.842	30.569
$\frac{\omega}{V_1}$	.188	.108	.106	.149	.178	.251	.275	.346
$\frac{\pi}{\sigma}\frac{C_D}{C_L}\cos\beta_2$	.049	.026	.029	.044	.057	.082	.096	.105
D	.587	.547	.513	.520	.560	.636	.690	.475
η_p	.724	.829	.811	.741	.699	.620	.582	.328
η_m	6.959	6.474	9.363	10.203	10.878	16.942	23.317	27.967
η_s	3.459	2.764	5.113	5.585	5.328	10.462	15.847	20.337
η_e	10.253	10.091	9.801	9.696	9.477	9.332	4.485	39.408

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9866

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4433.810

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 57.980

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 11.0628

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 15.4202

TABLE 2-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
D_{ie}	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	45.757	43.808	42.523	41.319	38.884	37.279	36.473	37.967
β_9	.273	.315	-.260	-1.125	-1.318	-1.133	-.614	-1.198
V_8	791.773	825.332	788.375	754.620	725.812	691.571	660.412	616.630
V_9	540.214	588.493	608.492	596.519	575.751	558.953	529.755	440.673
V_{Z8}	551.239	594.416	580.096	573.518	564.611	550.151	531.050	486.128
V_{Z9}	539.265	586.925	607.179	595.351	575.054	558.639	529.681	440.559
$V_{\theta 8}$	567.216	571.335	532.856	504.842	455.626	416.883	392.576	379.352
$V_{\theta 9}$	2.580	3.230	-2.849	-11.716	-13.242	-11.049	-5.675	-9.215
M_8	.720	.754	.717	.694	.656	.623	.593	.551
M_9	.479	.523	.542	.531	.512	.497	.470	.388
γ_β	45.484	43.494	42.792	42.444	40.202	38.412	37.087	39.165
σ	.186	.089	.035	.032	.038	.045	.091	.214
$\frac{\cos\beta_9}{\cos\beta_8}\,Z\sigma$	.048	.024	.010	.009	.012	.015	.032	.076
D	.498	.466	.412	.416	.411	.394	.407	.509
η_p	.734	.852	.932	.934	.914	.880	.776	.602
i_m	1.237	.558	1.943	1.819	1.944	2.009	2.393	3.987
i_s	-2.263	-3.152	-2.307	-2.801	-3.606	-4.471	-5.077	-3.643
Δ°	8.973	8.805	7.832	6.855	6.412	6.577	7.316	6.832

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 69.9034

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6200.430

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 101.670

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 19.3990

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 27.0399

TABLE 2-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
D_{ie}	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	48.750	46.448	45.136	43.970	41.726	40.195	39.462	40.077
β_9	.983	1.018	-.453	-1.338	-1.524	-.604	-.298	-1.797
V_8	782.536	820.007	785.714	762.314	712.956	684.126	652.560	624.005
V_9	500.815	549.523	573.521	562.334	538.066	526.998	499.674	417.256
V_{Z8}	514.670	563.872	553.374	547.926	531.740	522.443	503.794	477.470
V_{Z9}	499.311	547.976	572.264	561.177	537.352	526.764	499.622	417.030
$V_{\theta 8}$	588.338	594.301	556.897	529.259	474.525	441.528	414.742	401.745
$V_{\theta 9}$	8.595	9.760	-4.536	-13.134	-14.313	-5.558	-2.603	-13.085
M_8	.708	.746	.712	.689	.641	.613	.583	.556
M_9	.440	.485	.508	.498	.476	.465	.440	.365
γ_β	47.766	45.430	45.589	45.308	43.251	40.799	39.760	41.874
σ	.190	.096	.048	.050	.040	.058	.105	.225
$\frac{\cos\beta_9}{\cos\beta_8}\,Z\sigma$	.049	.025	.013	.015	.013	.019	.036	.080
D	.548	.515	.464	.469	.462	.443	.457	.567
η_p	.724	.857	.917	.910	.920	.875	.776	.631
i_m	4.230	3.198	4.556	4.470	4.786	4.925	5.382	6.097
i_s	.730	-.512	.306	-.150	-.764	-1.555	-2.088	-1.533
Δ°	9.085	9.508	7.647	6.642	6.206	7.106	7.632	6.233

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 70.0207

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6210.840

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 97.320

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 18.5690

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 25.8830

TABLE 2-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
r_{in}	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	50.708	48.023	46.625	45.402	43.368	42.010	42.883	44.011
β_g	1.832	1.975	.966	-.079	-1.288	-.362	-.299	-1.929
V_s	758.715	797.595	768.361	748.238	688.655	658.840	630.838	597.434
V_g	472.535	519.789	545.925	537.562	502.425	492.295	466.635	388.142
V_{Zs}	479.438	532.397	526.856	524.700	500.313	489.435	462.234	429.678
V_{Zg}	470.955	518.117	544.697	536.635	501.847	492.111	466.592	387.906
$V_{\theta s}$	587.192	592.939	558.499	532.782	472.685	440.932	429.286	415.092
$V_{\theta g}$	15.103	17.917	9.203	-.746	-10.939	-3.108	-2.435	-13.067
M_s	.684	.723	.694	.674	.617	.589	.561	.529
M_g	.414	.458	.482	.474	.443	.433	.409	.338
λ_β	48.676	46.047	45.659	45.481	44.615	42.371	43.182	45.940
σ	.196	.108	.070	.077	.065	.076	.119	.232
$\frac{1}{\sigma}\cos\beta_g^{2\sigma}$	.051	.029	.019	.022	.021	.025	.041	.082
D	.569	.535	.483	.488	.492	.472	.498	.604
η_p	.722	.842	.882	.867	.880	.841	.765	.631
i_m	6.188	4.773	6.045	5.902	6.428	6.740	8.803	10.031
i_s	2.688	1.063	1.795	1.282	.678	.260	1.333	2.401
$\delta°$	10.532	10.465	9.066	7.901	6.482	7.348	7.631	6.101

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 69.9640

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6205.788

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 92.998

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 17.7430

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 24.7314

TABLE 2-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
r_{in}	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.357	48.786	47.621	46.985	45.058	44.564	48.365	51.669
β_g	1.317	1.369	1.360	.926	-.017	.135	.165	-.078
V_s	787.274	781.196	756.787	739.899	678.440	639.930	604.512	569.879
V_g	459.403	501.288	526.127	519.992	475.916	449.844	419.732	355.816
V_{Zs}	465.868	513.863	507.502	504.262	476.213	455.878	401.621	365.788
V_{Zg}	456.177	500.136	525.071	519.207	474.691	449.733	419.710	355.869
$V_{\theta s}$	583.659	587.656	560.813	540.991	477.383	449.049	451.810	436.994
$V_{\theta g}$	10.561	11.917	12.485	8.399	-.140	1.069	1.207	-.465
M_s	.673	.706	.681	.665	.603	.569	.534	.562
M_g	.402	.446	.463	.457	.417	.394	.365	.368
λ_β	50.040	47.423	46.461	46.059	45.075	44.428	48.201	50.147
σ	.195	.114	.091	.105	.108	.144	.159	.274
$\frac{1}{\sigma}\cos\beta_g^{2\sigma}$	.050	.030	.025	.031	.034	.047	.055	.097
D	.580	.549	.501	.506	.519	.525	.565	.648
η_p	.727	.835	.847	.821	.812	.737	.721	.583
i_m	6.837	5.536	7.241	7.485	8.118	9.294	10.285	10.089
i_s	3.337	1.826	2.991	2.865	2.568	2.814	6.815	8.459
$\delta°$	10.017	9.852	9.460	8.906	7.713	7.846	8.095	7.952

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 78.0350

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6212.084

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 88.120

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 16.8136

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 23.4362

TABLE 2-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.660	23.670	24.480	26.350	28.190	30.000	30.540
β_s	53.031	50.317	49.356	48.516	47.159	48.755	53.658	56.284
β_g	1.499	1.650	1.790	1.804	1.222	1.222	-1.011	-3.343
V_s	753.421	785.474	764.177	751.310	681.732	637.934	603.530	565.782
V_g	449.069	495.223	518.053	512.957	455.413	412.149	384.823	328.607
V_{ZS}	452.400	500.855	497.250	497.303	463.425	420.556	357.658	314.052
V_{Zg}	447.991	494.004	517.069	512.142	455.082	411.988	384.752	328.044
$V_{\theta s}$	601.950	604.494	579.832	562.840	499.877	479.658	486.137	470.617
$V_{\theta g}$	11.751	14.262	16.183	16.149	9.710	6.791	-6.787	-19.165
M_s	.677	.708	.687	.674	.607	.565	.530	.495
M_g	.392	.434	.454	.449	.398	.354	.333	.283
Δi	51.531	48.667	47.566	46.712	45.937	47.532	54.668	59.628
$\frac{\omega}{V}$	.205	.119	.109	.129	.159	.208	.224	.317
$\frac{\sigma}{\cos\beta_g}$ 2σ	.053	.031	.040	.038	.050	.068	.078	.112
D	.604	.564	.522	.528	.559	.594	.646	.726
η_p	.723	.831	.825	.791	.747	.674	.655	.552
i_m	6.511	7.067	8.776	9.016	10.219	13.485	19.578	22.304
i_s	5.011	3.357	4.526	4.396	4.669	7.005	12.108	14.674
δ^*	10.199	10.140	9.890	9.784	8.952	8.932	6.919	4.687

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 70.0210

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6210.850

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 83.440

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 15.9250

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 22.1915

TABLE 2-6

BLADE ELEMENT PERFORMANCE, DCA STATOR
70% DESIGN SPEED, POINT 6

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.660	23.670	24.480	26.350	28.190	30.000	30.540
β_s	52.420	49.873	49.184	48.556	46.724	49.628	55.575	59.314
β_g	2.147	2.254	2.239	2.256	1.467	1.497	-6.191	-8.471
V_s	747.539	777.634	759.245	749.572	677.742	624.442	599.025	556.230
V_g	458.703	501.384	521.111	518.082	453.663	392.156	371.516	317.184
V_{ZS}	455.250	500.665	495.819	495.816	464.503	404.466	338.644	283.861
V_{Zg}	457.523	500.152	520.063	517.193	453.328	391.973	369.341	313.681
$V_{\theta s}$	592.428	594.751	574.608	561.884	493.439	475.736	494.117	478.345
$V_{\theta g}$	17.185	19.717	20.362	20.392	11.616	10.248	-40.068	-46.718
M_s	.672	.701	.682	.672	.604	.552	.525	.486
M_g	.401	.448	.457	.454	.396	.341	.320	.273
Δi	50.273	47.619	46.945	46.300	45.257	48.131	61.767	67.785
$\frac{\omega}{V}$	.214	.124	.129	.149	.202	.268	.290	.397
$\frac{\sigma}{\cos\beta_g}$ 2σ	.053	.033	.036	.044	.064	.088	.100	.139
D	.582	.547	.511	.518	.555	.615	.690	.764
η_p	.714	.816	.786	.755	.672	.593	.567	.448
i_m	7.906	6.623	8.684	9.056	9.784	14.358	21.495	25.334
i_s	4.400	2.913	4.354	4.436	4.234	7.878	14.025	17.704
δ^*	10.847	10.744	10.539	10.236	9.197	9.207	1.739	-.481

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 69.9951

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 6208.570

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 82.220

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = [illegible]

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = [illegible]

TABLE 3-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 1

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	44.557	42.802	41.623	40.376	37.772	36.307	35.650	36.556
β_g	.212	.195	-.600	-1.126	-2.130	-.715	.450	-1.914
V_s	1027.202	1071.504	1032.362	1010.715	962.719	924.224	880.494	835.527
V_g	651.483	713.014	747.903	745.221	727.495	713.110	673.136	564.417
V_{Zs}	730.283	784.456	770.339	768.846	760.391	744.569	715.454	671.152
V_{Zg}	649.502	710.990	745.625	743.635	726.211	712.739	673.039	564.067
$V_{\theta s}$	720.744	728.051	685.723	654.739	589.683	547.248	513.180	497.642
$V_{\theta g}$	2.414	2.431	-7.832	-14.645	-27.033	-8.897	5.287	-18.854
M_s	.948	.996	.953	.930	.880	.840	.795	.749
M_g	.571	.629	.662	.660	.644	.630	.592	.491
λ_β	44.345	42.607	42.223	41.502	39.901	37.022	35.200	38.470
$\bar{\omega}$	.211	.111	.052	.042	.033	.048	.104	.215
$\bar{\omega} \cos\beta_g / 2\sigma$	.055	.029	.014	.012	.010	.016	.036	.076
D	.583	.510	.458	.455	.446	.425	.436	.543
η_p	.728	.854	.920	.933	.943	.908	.799	.667
i_m	.037	-.448	1.043	.876	.832	1.037	1.570	2.576
i_s	-3.463	-4.158	-3.207	-3.744	-4.718	-5.443	-5.900	-5.054
$\delta°$	8.912	8.685	7.500	6.854	5.600	6.995	8.380	6.116

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 89.9096

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 7974.980

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 128.660

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 24.5106

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 34.1649

TABLE 3-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 2

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	47.282	45.073	43.936	42.921	40.808	39.154	38.197	39.223
β_g	1.136	1.264	.278	-.664	-1.117	-.810	.253	.072
V_s	993.990	1043.761	1000.518	971.515	921.091	887.651	857.122	811.973
V_g	595.594	654.382	680.125	682.435	663.773	653.764	628.149	528.350
V_{Zs}	672.756	735.500	719.197	710.387	696.626	688.080	675.579	629.015
V_{Zg}	593.659	652.356	687.431	681.057	662.926	653.408	628.073	528.318
$V_{\theta s}$	730.289	738.992	694.212	661.592	601.961	560.528	530.012	513.448
$V_{\theta g}$	11.803	14.432	11.557	-7.910	-12.982	-9.238	2.777	.662
M_s	.909	.963	.916	.886	.834	.799	.768	.725
M_g	.518	.572	.605	.599	.582	.572	.548	.457
λ_β	46.146	43.809	43.058	43.585	41.926	39.969	37.943	39.152
$\bar{\omega}$	.206	.128	.059	.048	.041	.063	.121	.215
$\bar{\omega} \cos\beta_g / 2\sigma$	.054	.034	.016	.014	.013	.021	.042	.076
D	.584	.553	.496	.497	.490	.473	.481	.573
η_p	.746	.843	.917	.929	.934	.888	.786	.682
i_m	2.762	1.823	3.356	3.421	3.868	3.889	4.117	5.243
i_s	-.738	-1.887	-.894	-1.199	-1.682	-2.591	-3.353	-2.387
$\delta°$	9.836	9.754	8.978	7.316	6.613	6.900	8.183	8.102

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 89.9045

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 7974.530

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 124.870

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 23.6730

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 32.9973

TABLE 3-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 3

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	49.285	46.934	45.717	44.729	43.031	41.624	41.992	43.257
β_g	2.409	3.002	1.240	.046	-.745	.781	.890	-.425
V_s	965.683	1014.682	978.284	953.021	893.629	868.043	829.125	783.653
V_g	560.196	626.992	656.253	649.218	623.450	616.997	592.586	497.872
V_{Zs}	628.635	691.423	681.885	676.129	652.763	648.709	616.219	570.717
V_{Zg}	558.007	618.444	654.637	648.019	622.766	618.686	592.455	497.832
$V_{\theta s}$	732.109	741.293	700.348	670.695	609.804	576.592	554.705	537.015
$V_{\theta g}$	23.543	32.522	14.196	.516	-8.108	8.937	9.201	-3.698
M_s	.877	.929	.890	.864	.803	.776	.736	.691
M_g	.485	.540	.573	.566	.543	.538	.512	.427
$\frac{\Delta\beta}{\bar{\omega}}$	46.877	43.932	44.477	44.684	43.776	40.843	41.102	43.683
$\bar{\omega}$	.212	.116	.073	.076	.060	.093	.122	.218
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.055	.031	.020	.022	.019	.031	.042	.077
D	.606	.569	.519	.522	.520	.500	.514	.609
η_p	.744	.858	.896	.90?	.904	.840	.793	.683
i_m	4.755	3.684	5.137	5.229	6.091	6.354	7.912	9.277
i_s	1.265	-.026	.887	.609	.541	-.126	.442	1.647
$\delta°$	11.109	11.492	9.340	8.026	6.985	8.491	8.820	7.605

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 89.9702

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 7991.360

CORRECTED WEIGHT FLOW $W\sqrt{\theta}/\delta$ = 119.860

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 22.8697

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 31.8777

TABLE 3-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 4

STATOR

SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.511	49.033	48.132	47.316	44.703	44.119	45.673	46.737
β_g	1.784	2.160	1.690	1.043	-.287	-.011	.101	.062
V_s	953.747	1000.337	969.595	948.611	880.445	841.377	806.401	767.024
V_g	546.240	601.859	635.515	631.678	595.890	581.190	559.627	474.301
V_{Zs}	592.299	654.520	646.872	642.282	625.381	603.837	563.456	525.672
V_{Zg}	544.408	599.846	633.685	630.466	595.321	580.973	559.577	474.276
$V_{\theta s}$	748.520	755.336	722.045	697.326	619.331	585.722	576.674	556.559
$V_{\theta g}$	16.679	22.662	18.744	11.499	-2.936	-.144	.980	.516
M_s	.882	.911	.877	.855	.788	.748	.716	.672
M_g	.467	.521	.551	.546	.516	.502	.480	.404
$\frac{\Delta\beta}{\bar{\omega}}$	49.727	46.873	46.442	46.273	44.990	44.130	45.572	46.675
$\bar{\omega}$	.228	.136	.116	.122	.125	.145	.167	.265
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.059	.036	.032	.036	.040	.047	.058	.094
D	.628	.588	.541	.543	.546	.536	.554	.639
η_p	.726	.833	.839	.827	.810	.763	.726	.623
i_m	6.901	5.783	7.552	7.516	7.763	8.849	11.593	12.757
i_s	2.491	2.073	3.302	3.196	2.213	2.369	4.123	5.127
$\delta°$	10.499	10.650	7.[illegible]	4.023	7.443	7.699	8.031	8.032

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 89.9151

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 7975.490

CORRECTED WEIGHT FLOW $W\sqrt{\theta}/\delta$ = 115.240

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 21.9863

CORRECYED FLOW PER UNIT ANNULUS AREA [illegible]

TABLE 3-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.660	22.660	23.070	24.480	26.350	28.190	30.000	30.540
β_s	52.360	49.844	49.368	44.756	46.256	45.929	49.729	51.736
β_g	1.663	2.429	.896	.473	-.705	-.121	-.324	-.647
V_s	940.006	983.899	956.377	940.238	873.977	824.544	783.794	737.311
V_g	515.899	586.369	618.273	618.170	582.423	553.298	521.766	445.522
V_{Zs}	572.868	633.322	621.941	617.212	604.002	573.428	506.644	456.606
V_{Zg}	515.375	574.497	617.056	617.225	561.934	553.138	521.725	445.479
$V_{\theta s}$	744.443	752.036	725.804	706.973	631.348	592.417	598.029	578.910
$V_{\theta g}$	14.997	24.585	9.961	5.106	-7.163	-1.189	-2.955	-5.028
M_s	.847	.892	.862	.844	.779	.729	.685	.641
M_g	.444	.501	.535	.534	.502	.476	.445	.377
$\Delta\beta$	50.706	47.421	48.472	44.283	46.961	46.052	50.053	52.382
$\bar{\omega}$	.273	.170	.146	.158	.166	.185	.206	.287
$\bar{\omega}\cos\beta_g^{2\sigma}$	.071	.045	.040	.046	.053	.061	.072	.102
D	.647	.582	.556	.559	.564	.564	.601	.676
η_p	.876	.793	.798	.776	.754	.707	.679	.596
t_m	7.843	6.599	8.788	9.256	9.316	10.659	15.649	17.756
t_s	4.348	2.889	4.538	4.636	3.766	4.179	8.179	10.126
δ°	10.561	10.918	8.996	8.453	7.025	7.587	7.606	7.383

PERCENT DESIGN SPEED $\frac{N\sqrt{\theta}}{N\sqrt{\theta}_{DESIGN}} \times 100$ = [illegible]

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = [illegible]

CORRECTED WEIGHT FLOW $W\sqrt{\theta}/\delta$ = [illegible]

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 21.1238

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 29.4441

TABLE 3-6

BLADE ELEMENT PERFORMANCE, DCA STATOR
90% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.660	22.660	23.070	24.480	26.350	28.190	30.000	30.540
β_s	52.192	49.942	49.662	49.338	47.685	48.471	53.084	55.569
β_g	2.595	3.141	2.243	1.721	-.058	-.039	-3.437	-4.227
V_s	966.419	1005.382	979.414	964.640	890.331	830.315	789.262	740.919
V_g	533.469	596.079	623.858	622.536	570.254	522.825	494.025	422.694
V_{Zs}	591.490	646.967	633.253	628.020	599.166	550.450	474.064	418.928
V_{Zg}	531.752	593.989	622.408	621.483	569.906	522.709	493.113	421.533
$V_{\theta s}$	763.524	769.513	746.553	731.746	658.357	621.588	631.027	611.113
$V_{\theta g}$	24.151	32.665	24.411	18.699	-.581	-.357	-29.620	-31.159
M_s	.872	.912	.883	.866	.792	.731	.686	.640
M_g	.456	.514	.530	.536	.489	.446	.418	.356
$\Delta\beta$	49.596	46.801	47.420	47.617	47.743	48.510	56.521	59.796
$\bar{\omega}$	.250	.153	.154	.168	.193	.227	.240	.320
$\bar{\omega}\cos\beta_g^{2\sigma}$	.065	.040	.042	.049	.061	.074	.083	.113
D	.642	.597	.563	.569	.593	.614	.665	.737
η_p	.707	.815	.793	.771	.729	.675	.657	.573
t_m	7.671	6.692	9.082	9.838	10.745	13.201	19.004	21.589
t_s	4.171	2.982	4.832	5.218	5.195	6.721	11.534	13.959
δ°	11.295	11.631	10.343	9.701	7.672	7.671	4.493	3.803

PERCENT DESIGN SPEED, $\frac{N\sqrt{\theta}}{N\sqrt{\theta}_{DESIGN}} \times 100$ = 89.9653

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 7979.920

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 108.060

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 20.6182

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 28.7394

TABLE 4-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	45.469	43.679	42.522	41.294	38.699	37.441	37.352	38.011
β_g	3.677	1.663	1.622	.805	-2.864	-2.206	-.613	-2.649
V_s	1098.074	1148.761	1110.412	1090.453	1050.171	1016.455	980.939	939.414
V_g	657.476	725.059	755.596	763.223	766.071	767.882	736.607	612.159
V_{Zs}	768.312	829.033	816.948	818.114	818.959	806.809	779.741	740.142
V_{Zg}	654.139	721.533	753.535	761.664	764.276	766.957	736.469	611.459
$V_{\theta s}$	782.790	793.347	750.503	719.613	656.603	617.948	595.143	578.507
$V_{\theta g}$	42.164	46.321	21.391	10.726	-38.276	-29.553	-7.879	-28.294
M_s	1.014	1.071	1.027	1.005	.960	.923	.883	.840
M_g	.570	.634	.662	.670	.672	.673	.641	.526
$\Delta\beta$	41.792	40.016	40.900	40.489	41.563	39.647	37.965	40.661
ω	.260	.168	.135	.107	.075	.061	.120	.252
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.067	.044	.037	.031	.024	.020	.042	.089
D	.572	.537	.497	.488	.479	.452	.463	.577
η_p	.692	.799	.818	.848	.882	.889	.786	.641
i_m	.949	.429	1.942	1.794	1.759	2.171	3.272	4.031
i_s	-2.551	-3.281	-2.308	-2.826	-3.791	-4.309	-4.198	-3.599
$\delta°$	12.377	12.153	9.722	8.785	4.866	5.504	7.317	5.381

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9522

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8865.760

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 136.730

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.0885

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 36.3644

TABLE 4-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	47.412	45.532	44.457	43.137	40.770	39.919	39.939	40.735
β_g	3.005	3.714	.625	-.882	-1.737	-.571	.873	-1.447
V_s	1087.268	1137.396	1094.344	1073.239	1031.336	998.650	967.885	924.705
V_g	596.781	661.208	700.384	711.680	708.856	712.833	690.432	577.364
V_{Zs}	734.247	795.208	779.918	782.207	780.622	765.793	742.104	700.678
V_{Zg}	594.287	658.097	698.863	710.357	707.864	712.527	690.277	577.142
$V_{\theta s}$	800.486	811.699	766.446	733.827	673.485	640.834	621.352	603.431
$V_{\theta g}$	31.286	42.827	7.643	-10.958	-21.482	-7.105	10.514	-14.578
M_s	.997	1.053	1.005	.982	.936	.899	.864	.820
M_g	.513	.572	.608	.619	.616	.618	.595	.492
$\Delta\beta$	44.407	41.819	43.831	44.020	42.506	40.490	39.066	42.182
ω	.247	.161	.114	.084	.070	.060	.110	.215
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.064	.043	.031	.025	.022	.020	.038	.076
D	.631	.594	.548	.538	.525	.498	.506	.612
η_p	.729	.823	.860	.890	.900	.901	.825	.711
i_m	2.892	2.288	3.877	3.637	3.830	4.649	5.859	6.755
i_s	-.608	-1.428	-.373	-.983	-1.720	-1.831	-1.611	-.875
$\delta°$	11.705	12.204	8.728	7.098	5.993	7.139	8.603	6.583

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9827

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8868.470

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 134.050

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 25.5772

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 35.6516

TABLE 4-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	50.433	48.175	46.818	45.407	42.996	42.231	43.188	44.051
β_g	1.864	2.602	.030	-.738	-1.119	.461	1.014	.001
V_s	1061.653	1115.255	1075.518	1053.221	1001.487	974.548	943.693	901.774
V_g	567.901	633.087	675.940	681.052	670.327	671.547	651.443	549.736
V_{Zs}	674.591	741.999	734.611	738.303	731.904	721.378	688.035	648.114
V_{Zg}	565.804	630.564	674.301	679.620	669.444	671.211	651.260	549.698
$V_{\theta s}$	818.406	831.073	784.250	750.007	682.959	655.020	645.853	627.002
$V_{\theta g}$	18.469	28.745	.348	-8.771	-13.097	5.407	11.530	.005
M_s	.965	1.024	.981	.957	.902	.871	.835	.793
M_g	.485	.544	.583	.588	.578	.577	.556	.465
γ_β	48.569	45.573	46.788	46.145	44.115	41.770	42.173	44.050
$\frac{\sigma}{\cos\beta_g}$	.237	.149	.110	.102	.092	.116	.162	.254
$\frac{\sigma}{\cos\beta_g}\,2\sigma$	.062	.039	.030	.030	.029	.038	.056	.096
D	.656	.619	.569	.562	.550	.528	.543	.637
η_p	.742	.839	.866	.869	.871	.819	.750	.661
i_m	5.413	4.925	6.238	5.907	6.056	6.961	9.108	10.071
i_s	2.413	1.215	1.988	1.287	.506	.481	1.638	2.441
$\delta°$	10.564	11.092	8.130	7.242	6.611	8.171	8.944	8.031

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.8601

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8857.590

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 130.670

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 24.9323

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 34.7527

TABLE 4-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.335	49.012	48.115	47.120	44.624	44.170	46.165	46.924
β_g	1.731	2.531	.481	-.329	-.923	1.700	.965	-.251
V_s	1048.496	1100.245	1065.411	1045.788	983.113	953.098	926.194	887.383
V_g	561.326	627.953	667.097	668.485	649.201	640.304	626.443	528.776
V_{Zs}	653.571	720.113	710.092	710.641	699.231	683.471	641.450	606.049
V_{Zg}	559.406	625.608	665.575	667.232	648.456	639.757	626.286	528.538
$V_{\theta s}$	818.678	830.519	793.180	766.334	690.586	664.110	668.101	648.188
$V_{\theta g}$	16.956	27.733	5.602	-3.842	-10.462	18.998	10.549	-2.312
M_s	.950	1.006	.967	.945	.881	.847	.813	.774
M_g	.479	.538	.574	.574	.558	.547	.531	.444
γ_β	49.604	46.481	47.634	47.449	45.547	42.470	45.200	47.175
$\frac{\sigma}{\cos\beta_g}$	.241	.147	.124	.128	.119	.160	.193	.294
$\frac{\sigma}{\cos\beta_g}\,2\sigma$	.062	.039	.034	.038	.038	.052	.067	.104
D	.659	.616	.574	.574	.565	.549	.570	.664
η_p	.735	.837	.845	.836	.833	.756	.709	.612
i_m	6.815	5.762	7.535	7.620	7.684	8.900	12.085	12.944
i_s	3.315	2.052	3.285	3.000	2.134	2.420	4.615	5.314
$\delta°$	10.431	11.021	8.581	7.651	6.807	9.417	8.695	7.779

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9495

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8865.520

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 127.470

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 24.3217

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 33.9016

TABLE 4-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.175	49.890	49.315	48.498	45.783	45.641	48.788	48.512
β_9	1.917	2.699	1.217	.838	-.043	2.626	-.367	-1.515
V_8	1048.093	1096.477	1065.052	1043.914	977.686	939.360	912.982	890.273
V_9	553.565	624.753	661.038	662.626	634.814	618.744	603.950	514.091
V_{Z8}	641.316	704.956	693.148	694.137	681.359	656.59.	601.496	569.765
V_{Z9}	551.647	622.373	659.438	661.352	634.185	617.844	603.876	513.882
$V_{\beta 8}$	827.878	838.593	807.638	785.561	700.708	671.620	686.816	666.899
$V_{\beta 9}$	18.514	29.422	14.039	9.694	-.478	28.352	-3.864	-13.592
M_8	.947	.999	.963	.944	.873	.831	.796	.774
M_9	.471	.534	.566	.567	.543	.527	.509	.430
$\Delta\beta$	50.259	47.190	48.098	47.659	45.826	45.015	49.155	50.027
$\frac{\Delta\beta}{\sigma}$	.259	.154	.145	.156	.153	.183	.213	.323
$\frac{1}{\sigma}$ Cosβ_9 2π	.067	.041	.040	.046	.049	.060	.074	.115
D	.668	.621	.581	.582	.577	.564	.601	.693
η_p	.717	.828	.819	.803	.789	.724	.686	.584
i_m	7.655	6.640	8.735	8.998	8.843	10.371	14.708	14.532
i_s	4.155	2.930	4.485	4.378	3.293	3.891	7.238	6.902
$\delta°$	10.617	11.189	9.517	8.818	7.687	10.336	7.563	6.515

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9032

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8861.410

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 124.460

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 23.7474

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 33.1011

TABLE 4-6

BLADE ELEMENT PERFORMANCE, DCA STATOR
100% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	51.946	49.845	49.485	48.863	46.551	47.451	51.038	50.692
β_9	.848	1.722	.914	.529	-.805	.269	-2.004	-1.975
V_8	1062.301	1107.065	1076.981	1060.974	976.781	926.948	907.850	885.267
V_9	563.623	636.765	671.425	671.612	624.922	591.120	587.591	501.944
V_{Z8}	653.558	712.632	698.708	697.208	671.379	626.707	570.844	560.805
V_{Z9}	562.097	634.946	670.042	670.519	624.329	590.911	587.182	501.622
$V_{\beta 8}$	836.486	846.138	818.740	799.062	709.135	682.881	705.914	684.974
$V_{\beta 9}$	8.344	19.129	10.713	6.205	-8.778	2.775	-20.551	-17.295
M_8	.961	1.009	.974	.955	.870	.816	.788	.766
M_9	.479	.544	.575	.574	.533	.501	.493	.418
$\Delta\beta$	51.098	48.124	48.569	48.334	47.356	47.182	53.043	52.666
$\frac{\Delta\beta}{\sigma}$	.260	.151	.149	.163	.170	.211	.234	.349
$\frac{1}{\sigma}$ Cosβ_9 2π	.067	.040	.041	.048	.054	.069	.081	.124
D	.667	.618	.580	.583	.592	.601	.631	.714
η_p	.716	.831	.813	.792	.769	.696	.664	.555
i_m	7.426	6.595	8.903	9.363	9.611	12.181	16.958	16.712
i_s	3.926	2.885	4.653	4.743	4.061	5.701	9.488	9.082
$\delta°$	9.548	10.212	9.014	8.509	6.925	7.979	5.926	6.055

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.857

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8857.340

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 122.550

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 23.3829

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 32.5931

TABLE 5-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	25.350	28.190	30.000	30.540
β_8	48.605	46.425	45.816	44.933	42.550	41.125	43.017	44.847
β_9	1.920	1.490	-.479	-.996	-1.015	-.381	-1.243	-3.029
V_8	1082.394	1143.797	1109.163	1094.913	1053.353	1026.537	980.521	917.893
V_9	594.019	683.401	714.550	725.013	735.129	745.175	725.099	592.959
V_{Z8}	714.218	786.877	771.823	774.145	775.497	773.104	716.892	650.775
V_{Z9}	591.990	681.353	712.977	723.602	734.283	744.850	724.850	592.100
$V_{\theta 8}$	811.983	828.648	795.392	773.313	712.314	675.154	668.929	647.313
$V_{\theta 9}$	19.905	17.768	-5.978	-12.598	-13.019	-4.954	-15.725	-31.328
M_8	.985	1.052	1.012	.994	.948	.918	.864	.801
M_9	.507	.588	.616	.625	.633	.641	.618	.499
$\frac{\Delta\beta}{\sigma}$	46.685	44.935	46.296	45.929	43.565	41.506	44.260	47.876
	.333	.225	.214	.193	.160	.146	.131	.255
$\frac{1}{\sigma}$ Cosβ_9 2σ	.086	.060	.059	.057	.051	.048	.046	.090
D	.637	.586	.552	.546	.519	.490	.503	.616
η_p	.625	.741	.727	.744	.764	.762	.774	.635
i_m	4.085	3.175	5.236	5.433	5.610	5.855	8.937	10.867
i_s	.585	-.535	.986	.813	.060	-.625	1.467	3.237
$\delta°$	10.620	9.980	7.621	6.984	6.715	7.329	6.687	5.001

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.8309

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9742.000

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 137.280

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.1935

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 36.5106

TABLE 5-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.972	48.683	47.571	46.264	44.018	44.311	47.127	47.559
β_9	2.586	2.050	1.034	.338	-.308	1.510	.374	-1.377
V_8	1118.664	1175.573	1134.568	1113.928	1059.400	1036.102	1001.315	964.582
V_9	591.939	665.627	700.787	707.645	701.149	681.583	668.146	563.910
V_{Z8}	702.926	774.454	764.109	769.000	761.269	741.182	681.246	650.916
V_{Z9}	584.939	663.341	699.069	706.286	700.399	681.044	668.053	563.710
$V_{\theta 8}$	869.192	852.936	837.444	804.844	736.157	723.777	733.824	711.837
$V_{\theta 9}$	16.366	23.813	12.647	4.170	-3.772	17.955	4.360	-13.550
M_8	1.015	1.078	1.032	1.009	.950	.918	.873	.836
M_9	.501	.567	.599	.605	.599	.577	.559	.468
$\frac{\Delta\beta}{\sigma}$	49.386	46.633	46.537	45.926	44.326	42.802	46.753	46.936
	.268	.171	.150	.140	.133	.210	.226	.324
$\frac{1}{\sigma}$ Cosβ_9 2σ	.070	.045	.041	.041	.042	.069	.079	.115
D	.665	.623	.579	.573	.559	.564	.586	.682
η_p	.715	.818	.823	.827	.817	.698	.674	.589
i_m	6.452	5.433	6.991	6.764	7.078	9.041	13.047	13.579
i_s	2.952	1.723	2.741	2.144	1.528	2.561	5.577	5.949
$\delta°$	10.286	10.540	9.134	8.318	7.422	9.220	8.304	6.653

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 110.0564

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9762.000

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 137.280

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.1935

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 36.5106

TABLE 5-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.563	48.476	47.484	46.218	43.724	44.143	47.770	48.110
β_9	.820	1.391	.138	-.278	-1.065	.031	-.250	-1.651
V_8	1144.489	1198.376	1159.754	1142.505	1089.891	1059.952	1031.538	995.640
V_9	591.132	667.658	708.983	715.404	705.065	683.064	672.293	568.874
V_{Z8}	725.332	792.737	782.394	789.413	786.352	760.423	693.279	664.775
V_{Z9}	589.317	665.615	707.379	714.056	704.214	682.768	672.209	568.601
$V_{\theta 8}$	883.918	897.192	854.839	824.857	752.622	738.210	763.806	741.188
$V_{\theta 9}$	8.455	16.208	1.710	-3.473	-13.100	.374	-2.938	-16.390
M_8	1.041	1.102	1.057	1.037	.979	.941	.899	.863
M_9	.500	.568	.605	.611	.601	.577	.560	.470
$\frac{\Delta\beta}{\sigma}$	49.744	47.085	47.346	46.496	44.788	44.112	48.020	49.761
$\frac{1}{\sigma}\cos\beta_9/2\sigma$	.254	.157	.128	.128	.134	.205	.227	.317
D	.066	.042	.035	.037	.043	.067	.079	.112
η_p	.678	.633	.588	.584	.574	.582	.607	.698
i_m	.739	.838	.853	.848	.825	.715	.688	.611
i_s	6.043	5.226	6.904	6.718	6.784	8.673	13.690	14.130
$\delta°$	2.543	1.516	2.654	2.098	1.234	2.393	6.220	5.500
	9.520	9.881	8.238	7.702	6.665	7.741	7.680	6.379

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.7786

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9737.360

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 137.500

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.2355

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 36.5691

TABLE 5-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	51.214	49.096	48.519	47.559	44.970	45.868	49.694	49.615
β_9	1.103	1.751	.926	.590	-.448	-.890	-.990	-.857
V_8	1133.299	1185.423	1150.009	1135.197	1070.085	1039.388	1016.753	988.383
V_9	585.760	664.676	702.811	708.132	675.244	656.900	657.121	554.229
V_{Z8}	708.324	774.592	760.462	765.030	756.350	723.561	657.691	640.379
V_{Z9}	583.964	662.583	701.185	708.816	674.556	656.553	656.955	554.135
$V_{\theta 8}$	883.400	895.950	861.554	837.750	756.263	746.012	775.371	752.863
$V_{\theta 9}$	11.276	20.306	11.361	7.295	-5.279	-10.201	-11.356	-8.290
M_8	1.028	1.086	1.043	1.025	.957	.917	.881	.852
M_9	.494	.565	.598	.602	.573	.552	.545	.456
$\frac{\Delta\beta}{\sigma}$	50.111	47.345	47.592	46.969	45.418	46.758	50.684	50.472
$\frac{1}{\sigma}\cos\beta_9/2\sigma$	.258	.152	.137	.142	.172	.229	.244	.345
D	.067	.040	.038	.042	.054	.075	.085	.122
η_p	.679	.631	.589	.588	.593	.605	.623	.712
i_m	.733	.840	.839	.830	.778	.686	.664	.580
i_s	6.694	5.846	7.939	8.059	8.030	10.598	15.614	15.635
$\delta°$	3.194	2.136	3.689	3.439	2.480	4.118	8.144	8.005
	9.803	10.241	9.026	8.570	7.282	6.820	6.940	7.173

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.9488

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9752.460

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 135.110

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 25.7794

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 35.9335

TABLE 5-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.006	49.311	49.444	48.713	46.529	46.873	51.691	52.135
β_g	1.820	2.514	2.312	1.903	.081	-.574	-.829	-.194
V_s	1146.454	1188.540	1145.635	1131.322	1059.776	1033.642	1009.239	973.451
V_g	581.116	659.787	692.467	696.056	651.085	638.403	642.426	531.628
V_{Zs}	719.920	773.403	743.757	745.586	728.689	706.484	625.617	597.508
V_{Zg}	579.267	657.513	690.516	694.527	650.507	638.142	642.303	531.600
$V_{\theta s}$	891.038	901.219	870.417	850.089	769.102	754.390	791.928	768.495
$V_{\theta g}$	18.459	28.936	27.937	23.119	.921	-6.400	-9.294	-1.804
M_s	1.041	1.088	1.036	1.018	.943	.909	.870	.835
M_g	.490	.560	.587	.589	.550	.534	.530	.435
$\Delta\beta$	49.186	46.797	47.132	46.809	46.448	47.447	52.520	52.329
$\frac{\Delta\beta}{\sigma}$	.285	.167	.147	.156	.191	.256	.252	.356
$\frac{\omega}{\sigma}\cos\beta_g/2\sigma$	.074	.044	.041	.046	.061	.084	.088	.126
D	.686	.635	.595	.596	.614	.622	.639	.734
η_p	.708	.826	.828	.815	.759	.660	.658	.571
i_m	6.486	6.061	8.864	9.213	9.589	11.603	17.611	18.155
i_s	2.986	2.351	4.614	4.593	4.039	5.123	10.141	10.525
$\delta°$	10.520	11.004	10.412	9.883	7.811	7.136	7.101	7.836

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.5466

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9716.780

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 132.890

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 25.3558

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 35.3431

TABLE 5-6

BLADE ELEMENT PERFORMANCE, DCA STATOR
110% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	51.754	49.836	49.442	48.720	47.648	48.729	53.489	53.922
β_g	1.378	2.047	1.999	1.907	-1.155	-2.481	-2.199	-2.072
V_s	1159.430	1204.058	1170.273	1156.020	1075.622	1021.007	1000.455	966.191
V_g	583.255	662.819	699.974	698.672	644.083	607.170	609.787	516.725
V_{Zs}	716.330	775.233	759.920	761.893	724.278	673.379	595.237	568.967
V_{Zg}	581.663	660.904	698.296	697.270	643.459	606.414	609.292	516.365
$V_{\theta s}$	910.631	920.173	889.119	868.738	794.912	767.384	804.109	780.894
$V_{\theta g}$	14.030	23.677	24.410	23.252	-12.985	-26.287	-23.398	-18.679
M_s	1.059	1.100	1.059	1.040	.954	.893	.858	.824
M_g	.490	.560	.592	.589	.540	.505	.500	.421
$\Delta\beta$	50.380	47.791	47.444	46.813	48.804	51.210	55.688	55.994
$\frac{\Delta\beta}{\sigma}$	.268	.170	.159	.164	.211	.254	.265	.356
$\frac{\omega}{\sigma}\cos\beta_g/2\sigma$	.070	.045	.044	.054	.067	.083	.092	.126
D	.693	.643	.602	.607	.638	.659	.678	.758
η_p	.729	.825	.819	.786	.745	.677	.656	.577
i_m	7.239	6.588	8.862	9.220	10.708	13.459	19.409	19.942
i_s	3.759	2.878	4.612	4.600	5.158	6.979	11.939	12.312
$\delta°$	10.078	10.537	10.099	9.867	6.575	5.229	5.731	5.958

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.8873

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9747.000

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 129.810

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 24.7682

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 34.5239

TABLE 6-1

BLADE ELEMENT PERFORMANCE, DCA STATOR
120% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	46.965	45.274	45.159	44.854	42.497	41.219	44.846	46.922
β_g	1.254	-.185	-5.675	-6.777	-5.206	-3.556	-1.676	-2.902
V_s	1219.830	1275.661	1236.772	1218.032	1172.751	1180.513	1074.261	1002.110
V_g	661.134	777.136	797.081	791.700	803.567	820.382	776.667	630.991
V_{Zs}	830.759	895.987	870.752	862.396	864.146	887.806	761.637	684.432
V_{Zg}	659.199	775.187	791.560	784.847	799.512	818.476	776.246	630.141
$V_{\theta s}$	891.621	906.329	876.950	859.081	792.260	777.681	757.575	731.963
$V_{\theta g}$	14.466	-2.507	-78.824	-93.424	-72.907	-50.877	-22.711	-31.942
M_s	1.123	1.189	1.138	1.112	1.060	1.059	.939	.866
M_g	.561	.667	.684	.676	.686	.696	.652	.522
$\Delta\beta$	45.711	45.459	50.834	51.631	47.703	44.774	46.522	49.823
$\bar{\omega}$	.352	.219	.221	.222	.188	.251	.160	.279
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.091	.058	.060	.065	.059	.082	.056	.099
D	.641	.576	.565	.577	.548	.534	.530	.640
η_p	.629	.762	.736	.728	.745	.642	.746	.624
i_m	2.445	2.024	4.579	5.354	5.557	5.949	10.766	12.942
i_s	-1.055	-1.686	.329	.734	.007	-.531	3.296	5.312
$\delta°$	9.954	8.305	2.425	1.203	2.524	4.154	6.254	5.128

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 119.9636

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10640.770

CORRECTED WEICHT FLOW, $W\sqrt{\theta}/\delta$ = 147.720

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 28.1855

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 39.2872

TABLE 6-2

BLADE ELEMENT PERFORMANCE, DCA STATOR
120% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	46.778	46.804	45.860	44.744	42.320	41.719	44.335	46.165
β_g	1.721	-1.094	-5.091	-3.777	-3.585	-1.907	-1.331	-2.635
V_s	1232.163	1292.930	1254.637	1238.062	1204.754	1191.552	1115.599	1046.366
V_g	626.959	728.883	751.277	759.074	789.876	802.104	777.955	640.543
V_{Zs}	810.246	883.235	872.340	878.210	890.218	889.200	797.929	724.692
V_{Zg}	624.908	726.836	746.712	756.083	787.559	801.325	777.651	639.823
$V_{\theta s}$	926.796	942.566	900.378	871.523	811.127	792.955	779.638	754.781
$V_{\theta g}$	18.832	-13.914	-66.667	-49.998	-49.389	-26.694	-18.077	-29.448
M_s	1.150	1.201	1.154	1.133	1.092	1.068	.978	.907
M_g	.527	.619	.639	.645	.672	.678	.651	.529
$\Delta\beta$	47.056	47.898	50.951	48.521	45.905	43.626	45.666	48.800
$\bar{\omega}$	.325	.222	.234	.222	.185	.201	.149	.237
$\bar{\omega}\ \mathrm{Cos}\beta_g/2\sigma$	.084	.059	.064	.065	.059	.066	.052	.084
D	.678	.628	.610	.603	.570	.551	.551	.653
η_p	.676	.777	.745	.750	.771	.732	.785	.699
i_m	4.258	3.554	5.280	5.244	5.380	6.449	10.255	12.185
i_s	.758	-.156	1.030	.624	-.170	-.031	2.785	4.555
$\delta°$	10.421	7.396	3.009	4.203	4.145	5.863	6.599	5.395

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 119.9232

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10637.190

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 148.150

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 28.2675

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 39.4016

TABLE 6-3

BLADE ELEMENT PERFORMANCE, DCA STATOR
120% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.19	30.000	30.540
β_s	50.659	48.674	47.638	46.369	43.443	44.61	46.385	46.969
β_g	2.699	2.650	2.683	2.453	2.484	1.88	.744	.057
V_s	1245.063	1301.689	1263.609	1247.377	1208.049	1193.51	1153.374	1111.154
V_g	575.160	661.216	699.142	721.306	737.312	745.09	753.244	637.184
V_{Zs}	787.499	857.731	849.971	859.499	876.481	849.31	795.580	758.235
V_{Zg}	572.798	658.658	696.766	719.261	735.826	744.34	753.082	637.137
$V_{\theta s}$	962.917	977.529	933.685	902.851	830.691	838.31	835.027	812.232
$V_{\theta g}$	27.086	30.566	52.729	30.892	31.951	24.53	9.775	.638
M_s	1.135	1.202	1.155	1.135	1.089	1.05	1.004	.960
M_g	.478	.554	.587	.606	.620	.61	.621	.520
$\sum\beta$	47.960	46.025	44.955	43.915	40.959	42.73	45.641	46.911
$\sum \cos\beta_g \frac{2\sigma}{}$	.275	.190	.189	.166	.157	.18	.166	.246
D	.071	.050	.052	.048	.050	.06	.058	.087
η_p	.729	.681	.640	.624	.598	.59	.596	.685
i_m	.746	.825	.810	.827	.823	.77	.785	.715
i_s	6.139	5.424	7.058	6.869	6.503	9.34	12.305	12.989
$\delta°$	2.639	1.714	2.808	2.249	.953	2.86	4.835	5.359
	11.399	11.140	10.783	10.435	10.214	9.59	8.674	8.087

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 119.9053

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10635.600

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 145.210

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 27.7065

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 38.6197

TABLE 6-4

BLADE ELEMENT PERFORMANCE, DCA STATOR
120% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_s	49.228	47.557	47.779	47.795	44.535	46.193	49.001	49.622
β_g	.511	.473	-.503	-.666	-.401	.108	-1.810	-3.274
V_s	1253.527	1303.225	1268.705	1250.829	1201.021	1183.495	1135.167	1091.521
V_g	585.637	668.213	697.997	717.005	726.297	718.942	712.462	606.833
V_{Zs}	816.945	877.807	851.253	839.249	855.586	819.075	744.700	707.109
V_{Zg}	584.024	666.500	696.526	715.725	725.591	718.655	712.029	605.807
$V_{\theta s}$	949.317	961.719	939.546	926.550	842.327	854.099	856.735	831.507
$V_{\theta g}$	5.225	5.510	-6.130	-8.338	-5.080	1.360	-22.501	-34.641
M_s	1.148	1.206	1.158	1.132	1.077	1.043	.980	.935
M_g	.488	.561	.585	.600	.608	.594	.582	.491
$\sum\beta$	48.717	47.085	48.282	48.461	44.936	46.085	50.811	52.896
$\sum \cos\beta_g \frac{2\sigma}{}$	.267	.195	.197	.171	.167	.213	.206	.269
D	.069	.052	.054	.050	.053	.070	.072	.085
η_p	.724	.678	.652	.643	.618	.627	.642	.725
i_m	.754	.819	.806	.824	.811	.744	.742	.691
i_s	4.708	4.307	7.199	8.295	7.595	10.923	14.921	15.642
$\delta°$	1.208	.597	2.949	3.675	2.045	4.443	7.451	8.012
	9.211	8.963	7.597	7.314	7.329	7.818	6.120	4.786

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 120.0993

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10652.810

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 143.970

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 27.4699

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 38.2899

TABLE 6-5

BLADE ELEMENT PERFORMANCE, DCA STATOR
120% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.424	50.256	49.807	49.194	45.727	47.844	51.090	51.595
β_9	1.025	1.323	.630	.399	-.998	-1.326	-2.299	-3.881
V_8	1211.028	1265.735	1226.209	1203.802	1141.593	1119.784	1074.780	1035.336
V_9	566.783	659.123	697.381	709.080	692.387	676.988	670.473	561.259
V_{Z8}	736.853	807.583	790.044	785.648	796.397	751.384	675.048	643.163
V_{Z9}	565.087	657.210	695.842	707.803	691.610	676.536	669.862	559.939
$V_{\theta 8}$	959.799	973.232	936.663	911.187	817.412	830.116	836.323	811.329
$V_{\theta 9}$	10.135	15.220	7.671	4.939	-12.063	-15.672	-26.901	-37.986
M_8	1.095	1.157	1.108	1.081	1.016	.979	.921	.882
M_9	.470	.551	.584	.593	.579	.558	.547	.454
$\Delta\beta$	51.400	48.933	49.176	48.795	46.726	49.170	53.390	55.476
$\frac{\Delta\beta}{\sigma}$	.297	.199	.192	.181	.201	.255	.254	.345
$\frac{\sigma}{\sigma}\cos\beta_9/2\sigma$	.077	.053	.053	.053	.064	.083	.088	.123
D	.731	.676	.636	.629	.623	.642	.655	.748
η_p	.716	.808	.797	.801	.759	.681	.671	.394
i_m	7.904	7.006	9.227	9.694	8.787	12.574	17.010	17.615
i_s	4.404	3.296	4.977	5.074	3.237	6.094	9.540	9.985
$\delta°$	9.725	9.813	8.730	8.379	6.732	6.384	5.631	4.149

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 119.9234

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10637.210

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 141.180

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.9376

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 37.5479

APPENDIX B

PRESSURE COEFFICIENT DATA TABULATION

TABLE 1-1

PRESSURE COEFFICIENT DATA, DCA STATOR 50% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.475	0.453	1.517	0.590	0.399	0.672	18.6	-0.101	1.173	7.7	0.818
20	-0.539	0.421	1.581	0.622	0.361	0.711	21.8	-0.409	1.481	13.8	0.825
25	-0.475	0.421	1.517	0.622	0.438	0.634	24.0	-0.274	1.346	19.1	0.831
30	-0.475	0.421	1.517	0.622	0.399	0.672	27.1	-0.315	1.384	23.9	0.837
35	-0.379	0.421	1.421	0.622	0.457	0.614	29.2	-0.255	1.327	34.2	
40	-0.443	0.389	1.485	0.654	0.419	0.653	32.3	-0.274	1.346	46.5	0.856
45	-0.347	0.421	1.389	0.622	0.496	0.576	34.3	-0.217	1.288	58.5	0.865
50	-0.379	0.389	1.421	0.654	0.457	0.614	37.3	-0.217	1.288	73.1	0.868
60	-0.283	0.421	1.325	0.622	0.476	0.595	39.3	-0.178	1.250		
70	-0.251	0.357	1.293	0.686	0.457	0.614	49.3				
							54.0	-0.082	1.153		
							58.9				
							68.2	0.014	1.057		
							78.6	0.053	1.019		

TABLE 1-2

PRESSURE COEFFICIENT DATA, DCA STATOR 50% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.560	0.131	1.598	0.907	0.416	0.647	18.6	-0.359	1.423	7.7	0.829
20	-0.560	0.407	1.598	0.631	0.374	0.689	21.8	-0.339	1.402	13.8	0.836
25	-0.525	0.407	1.564	0.631	0.437	0.627	24.0	-0.297	1.360	19.1	0.844
30	-0.491	0.407	1.529	0.631	0.374	0.689	27.1	-0.339	1.402	23.9	0.851
35	-0.422	0.407	1.460	0.631	0.458	0.605	29.2	-0.275	1.339	34.2	
40	-0.457	0.372	1.495	0.666	0.416	0.647	32.3	-0.296	1.360	46.5	0.869
45	-0.353	0.407	1.391	0.631	0.478	0.584	34.3	-0.233	1.297	58.5	0.875
50	-0.353	0.372	1.391	0.666	0.437	0.626	37.3	-0.213	1.276	73.1	0.878
60	-0.284	0.407	1.322	0.631	0.479	0.584	39.3	-0.171	1.234		
70	-0.215	0.303	1.253	0.735	0.458	0.605	49.3				
							54.0	-0.066	1.129		
							58.9				
							68.2	0.039	1.024		
							78.6	0.059	1.003		

TABLE 1-3

PRESSURE COEFFICIENT DATA, DCA STATOR
50% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P
15	-0.402	0.568	1.442	0.471	0.524	0.544	18.6	-0.192	1.261	7.7	0.839
20	-0.369	0.568	1.410	0.471	0.447	0.621	21.8	-0.231	1.301	13.8	0.848
25	-0.305	0.536	1.345	0.504	0.524	0.544	24.0	-0.212	1.281	19.1	0.860
30	-0.305	0.503	1.345	0.536	0.505	0.563	27.1	-0.173	1.242	23.9	0.863
35	-0.175	0.503	1.215	0.536	0.563	0.505	29.2	-0.115	1.184	34.2	
40	-0.208	0.503	1.248	0.536	0.524	0.544	32.3	-0.115	1.184	46.5	0.884
45	-0.143	0.503	1.183	0.536	0.583	0.486	34.3	-0.056	1.126	58.5	0.890
50	-0.143	0.503	1.183	0.536	0.544	0.525	37.3	-0.056	1.126	73.1	0.893
60	-0.046	0.406	1.086	0.633	0.563	0.505	39.3	-0.018	1.087		
70	-0.013	0.471	1.054	0.568	0.544	0.525	49.3				
							54.0	0.098	0.971		
							58.9				
							68.2	0.195	0.874		
							78.6	0.195	0.874		

TABLE 1-4

PRESSURE COEFFICIENT DATA, DCA STATOR
50% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P
15	-0.698	0.614	1.733	0.420	0.325	0.738	18.6	-0.207	1.271	7.7	0.840
20	-0.698	0.614	1.733	0.420	0.407	0.656	21.8	-0.228	1.292	13.8	0.852
25	-0.516	0.541	1.551	0.493	0.325	0.738	24.0	-0.125	1.189	19.1	0.861
30	-0.406	0.541	1.441	0.493	0.387	0.676	27.1	-0.187	1.251	23.9	0.867
35	-0.370	0.541	1.405	0.493	0.305	0.758	29.2	-0.125	1.189	34.2	
40	0.261	0.505	1.295	0.529	0.346	0.717	32.3	-0.125	1.189	46.5	0.885
45	-0.261	0.505	1.295	0.529	0.264	0.800	34.3	-0.043	1.107	58.5	0.894
50	-0.151	0.505	1.186	0.529	0.325	0.738	37.3	-0.043	1.107	73.1	0.891
60	-0.188	0.505	1.222	0.529	0.305	0.758	39.3	-0.002	1.066		
70	-0.078	0.541	1.113	0.493	0.305	0.758	49.3				
							54.0	0.120	0.943		
							58.9				
							68.2	0.202	0.861		
							78.6	0.182	0.881		

TABLE 1-5

PRESSURE COEFFICIENT DATA, DCA STATOR
50% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.730	0.576	1.762	0.455	0.544	0.516	18.6	-0.239	1.300	7.7	0.849
20	-0.615	0.461	1.647	0.570	0.438	0.622	21.8	-0.282	1.342	13.8	0.858
25	-0.499	0.461	1.531	0.570	0.501	0.559	24.0	-0.154	1.215	19.1	0.870
30	-0.461	0.461	1.493	0.570	0.480	0.580	27.1	-0.218	1.279	23.9	0.873
35	-0.346	0.346	1.377	0.685	0.544	0.516	29.2	-0.239	1.300	34.2	
40	-0.346	0.346	1.377	0.685	0.501	0.559	32.3	-0.260	1.321	46.5	0.894
45	-0.269	0.346	1.301	0.685	0.565	0.495	34.3	-0.070	1.131	58.5	0.897
50	-0.269	0.307	1.301	0.724	0.501	0.559	37.3	-0.091	1.152	73.1	0.897
60	-0.153	0.269	1.185	0.762	0.544	0.516	39.3	-0.027	1.088		
70	-0.115	0.269	1.147	0.762	0.544	0.516	49.3				
							54.0	0.120	0.940		
							58.9				
							68.2	0.183	0.876		
							78.6	0.141	0.919		

TABLE 1-6

PRESSURE COEFFICIENT DATA, DCA STATOR
50% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.778	0.488	1.810	0.543	0.539	0.525	18.6	-0.204	1.269	7.7	0.845
20	-0.666	0.376	1.698	0.655	0.438	0.625	21.8	-0.245	1.309	13.8	0.854
25	-0.554	0.376	1.586	0.655	0.498	0.565	24.0	-0.124	1.188	19.1	0.866
30	-0.517	0.376	1.549	0.655	0.478	0.585	27.1	-0.184	1.249	23.9	0.869
35	-0.405	0.264	1.437	0.767	0.539	0.525	29.2	-0.204	1.269	34.2	
40	-0.405	0.264	1.437	0.767	0.498	0.565	32.3	-0.224	1.289	46.5	0.890
45	-0.331	0.264	1.363	0.767	0.539	0.505	34.3	-0.043	1.108	58.5	0.893
50	-0.331	0.227	1.363	0.804	0.498	0.565	37.3	-0.064	1.128	73.1	0.893
60	-0.219	0.190	1.251	0.841	0.539	0.525	39.3	-0.003	1.068		
70	-0.182	0.190	1.214	0.841	0.539	0.525	49.3				
							54.0	0.137	0.927		
							58.9				
							68.2	0.197	0.867		
							78.6	0.157	0.907		

TABLE 2-1

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span		S Factor 10% Span		C_p 90% Span	S Factor 90% Span	% Chord	C_p 90% Span	S Factor 90% Span	% Chord	Hub/Mid Channel Ratio
	Suction Surface	Pressure Surface	Suction Surface	Pressure Surface	Pressure Surface	Pressure Surface		Suction Surface	Suction Surface		P/P_∞
15	-0.575	0.416	1.656	0.664	0.334	0.801	18.6	-0.409	1.546	7.7	0.661
20	-0.611	0.433	1.692	0.646	0.300	0.836	21.8	-0.501	1.638	13.8	0.676
25	-0.558	0.416	1.638	0.664	0.392	0.744	24.0	-0.363	1.500	19.1	0.688
30	-0.558	0.416	1.638	0.664	0.357	0.778	27.1	-0.409	1.546	23.9	0.696
35	-0.469	0.380	1.550	0.700	0.438	0.698	29.2	-0.340	1.477	34.2	0.882
40	-0.522	0.380	1.603	0.700	0.380	0.756	32.3	-0.352	1.489	46.5	0.744
45	-0.398	0.398	1.479	0.682	0.472	0.664	34.3	-0.283	1.420	58.5	0.752
50	-0.434	0.380	1.514	0.700	0.403	0.733	37.3	-0.272	1.409	73.1	0.761
60	-0.345	0.398	1.426	0.682	0.483	0.652	39.3	-0.237	1.374		
70	-0.221	0.345	1.302	0.735	0.460	0.675	49.3				
							54.0	-0.111	1.248		
							58.9				
							68.2	0.025	1.111		
							78.6	0.025	1.111		

TABLE 2-2

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span		S Factor 10% Span		C_p 90% Span	S Factor 90% Span	% Chord	C_p 90% Span	S Factor 90% Span	% Chord	Hub/Mid Channel Ratio
	Suction Surface	Pressure Surface	Suction Surface	Pressure Surface	Pressure Surface	Pressure Surface		Suction Surface	Suction Surface		P/P_∞
15	-0.478	0.730	1.559	0.350	0.768	0.363	18.6	-0.314	1.446	7.7	0.691
20	-0.478	0.713	1.559	0.367	0.825	0.306	21.8	-0.439	1.571	13.8	0.708
25	-0.394	0.764	1.475	0.316	0.711	0.420	24.0	-0.257	1.389	19.1	0.725
30	-0.394	0.478	1.475	0.602	0.780	0.351	27.1	-0.314	1.446	23.9	0.736
35	-0.310	0.445	1.391	0.635	0.677	0.454	29.2	-0.223	1.355	34.2	
40	-0.327	0.478	1.408	0.602	0.757	0.374	32.3	-0.257	1.389	46.5	0.776
45	-0.226	0.461	1.307	0.619	0.654	0.477	34.3	-0.257	1.389	58.5	0.788
50	-0.243	0.445	1.324	0.635	0.723	0.408	37.3	-0.166	1.298	73.1	0.794
60	1.032	0.461	0.048	0.619	0.654	0.477	39.5	-0.097	1.229		
70	-0.109	0.428	1.190	0.652	0.700	0.431	49.3				
							54.0	0.027	1.104		
							58.9				
							68.2	0.141	0.990		
							78.6	0.107	1.024		

TABLE 2-3

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.585	0.554	1.659	0.518	0.472	0.650	18.6	-0.301	1.424	7.7	0.712
20	-0.514	0.518	1.588	0.554	0.413	0.709	21.8	-0.418	1.541	13.8	0.734
25	-0.372	0.500	1.445	0.572	0.507	0.615	24.0	-0.219	1.342	19.1	0.745
30	-0.372	0.483	1.445	0.590	0.460	0.662	27.1	-0.289	1.412	23.9	0.759
35	-0.265	0.500	1.338	0.572	0.554	0.568	29.2	-0.172	1.295	34.2	
40	-0.265	0.465	1.338	0.608	0.484	0.638	32.3	-0.219	1.342	46.5	0.796
45	-0.229	0.483	1.303	0.590	0.566	0.556	34.3	-0.102	1.224	58.5	0.804
50	-0.193	0.465	1.267	0.608	0.507	0.615	37.3	-0.125	1.248	73.1	0.810
60	-0.122	0.465	1.196	0.608	0.554	0.568	39.3	-0.043	1.166		
70	-0.069	0.441	1.142	0.661	0.530	0.591	49.3				
							54.0	0.73	1.049		
							58.9				
							68.2	0.167	0.955		
							78.6	0.132	0.990		

TABLE 2-4

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.804	0.543	1.869	0.521	0.520	0.598	18.6	-0.285	1.404	7.7	0.721
20	-0.669	0.505	1.735	0.560	0.425	0.693	21.8	-0.345	1.463	13.8	0.743
25	-0.534	0.486	1.600	0.579	0.520	0.598	24.0	-0.190	1.309	19.1	0.757
30	-0.476	0.486	1.542	0.579	0.460	0.657	27.1	-0.250	1.368	23.9	0.765
35	-0.380	0.486	1.446	0.579	0.543	0.574	29.2	-0.155	1.273	34.2	0.832
40	-0.322	0.428	1.388	0.637	0.472	0.645	32.3	-0.179	1.297	46.5	0.804
45	-0.245	0.428	1.311	0.637	0.567	0.550	34.3	-0.072	1.190	58.5	0.785
50	-0.207	0.409	1.273	0.656	0.520	0.598	37.3	-0.072	1.190	73.1	0.818
60	-0.130	0.409	1.195	0.656	0.555	0.562	39.3	-0.013	1.131		
70	-0.091	0.370	1.157	0.695	0.543	0.574	49.3				
							54.0	0.105	1.013		
							58.9				
							68.2	0.164	0.953		
							78.6	0.129	0.989		

TABLE 2-5

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.699	0.501	1.762	0.562	0.187	0.932	18.6	-0.263	1.383	7.7	0.722
20	-0.660	0.462	1.724	0.601	0.244	0.875	21.8	-0.333	1.453	13.8	0.744
25	-0.563	0.404	1.627	0.659	0.187	0.932	24.0	-0.171	1.291	19.1	0.760
30	-0.524	0.346	1.588	0.717	0.233	0.886	27.1	-0.217	1.337	23.9	0.769
35	-0.466	0.326	1.530	0.736	0.164	0.956	29.2	-0.020	1.141	34.2	0.818
40	-0.428	0.307	1.491	0.756	0.210	0.909	32.3	-0.148	1.268	46.5	0.801
45	-0.370	0.307	1.433	0.756	0.140	0.979	34.3	-0.044	1.164	58.5	0.809
50	-0.311	0.288	1.375	0.775	0.175	0.944	37.3	-0.055	1.175	73.1	0.809
60	-0.253	0.268	1.317	0.794	0.152	0.967	39.3	0.013	1.106		
70	-0.176	0.249	1.240	0.814	0.152	0.967	49.3				
							54.0	0.117	1.002		
							58.9				
							68.2	0.175	0.944		
							78.6	0.140	0.979		

TABLE 2-6

PRESSURE COEFFICIENT DATA, DCA STATOR
70% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.776	0.459	1.837	0.601	0.165	0.953	18.6	-0.289	1.407	7.7	0.720
20	-0.736	0.419	1.797	0.641	0.223	0.223	21.8	-0.359	1.477	13.8	0.742
25	-0.636	0.359	1.697	0.701	0.165	0.953	24.0	-0.196	1.314	19.1	0.758
30	-0.596	0.299	1.657	0.761	0.211	0.211	27.1	-0.242	1.361	23.9	0.766
35	-0.537	0.279	1.598	0.781	0.141	0.976	29.2	-0.044	1.162	34.2	0.815
40	-0.497	0.259	1.558	0.801	0.188	0.188	32.3	-0.172	1.291	46.5	0.799
45	-0.437	0.259	1.498	0.801	0.118	0.999	34.3	-0.067	1.186	58.5	0.807
50	-0.377	0.240	1.438	0.820	0.153	0.153	37.3	-0.079	1.197	73.1	0.807
60	-0.317	0.220	1.378	0.840	0.130	0.988	39.3	-0.009	1.127		
70	-0.238	0.200	1.299	0.860	0.130	0.130	49.3				
							54.0	0.095	1.023		
							58.9				
							68.2	0.153	0.964		
							78.6	0.118	0.999		

TABLE 3-1

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.562	0.410	1.712	0.739	0.289	0.956	18.6	-0.588	1.834	7.7	0.459
20	-0.530	0.410	1.680	0.739	0.202	1.043	21.8	-0.676	1.921	13.8	0.456
25	-0.583	0.410	1.734	0.739	0.360	0.884	24.0	-0.668	1.913	19.1	0.453
30	-0.519	0.389	1.670	0.761	0.297	0.948	27.1	-0.731	1.976	23.9	0.470
35	-0.444	0.399	1.595	0.750	0.439	0.805	29.2	-0.620	1.865	34.2	0.835
40	-0.455	0.389	1.605	0.761	0.344	0.909	32.3	-0.778	2.024	46.5	0.607
45	-0.359	0.410	1.509	0.739	0.487	0.758	34.3	-0.588	1.834	58.5	0.646
50	-0.370	0.399	1.520	0.750	0.408	0.837	37.3	-0.596	1.842	73.1	0.660
60	-0.220	0.421	1.370	0.729	0.518	0.726	39.3	-0.399	1.644		
70	-0.060	0.399	1.210	0.750	0.487	0.758	49.3				
							54.0	-0.027	1.272		
							58.9				
							68.2	0.099	1.145		
							78.6	0.083	1.161		

TABLE 3-2

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.463	0.487	1.603	0.652	0.437	0.786	18.6	0.150	1.073	7.7	0.504
20	-0.463	0.508	1.603	0.631	0.373	0.850	21.8	0.118	1.105	13.8	0.544
25	-0.389	0.476	1.528	0.663	0.493	0.730	24.0	-0.383	1.607	19.1	0.547
30	-0.453	0.476	1.592	0.663	0.493	0.730	27.1	-0.479	1.703	23.9	0.596
35	-0.282	0.465	1.421	0.673	0.541	0.683	29.2	-0.120	1.344	34.2	0.809
40	-0.282	0.465	1.421	0.673	0.461	0.762	32.3	-0.200	1.424	46.5	0.679
45	-0.218	0.465	1.357	0.673	0.573	0.651	34.3	-0.056	1.280	58.5	0.695
50	-0.196	0.465	1.336	0.673	0.509	0.714	37.3	-0.104	1.328	73.1	0.704
60	-0.111	0.465	1.250	0.673	0.581	0.643	39.3	-0.016	1.241		
70	-0.025	0.433	1.165	0.706	0.557	0.667	49.3				
							54.0	0.102	1.121		
							58.9				
							68.2	0.198	1.025		
							78.6	0.166	1.057		

TABLE 3-3

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.555	0.541	1.683	0.586	0.528	0.679	18.6	-0.183	1.391	7.7	0.595
20	-0.533	0.530	1.661	0.597	0.424	0.783	21.8	-0.527	1.734	13.8	0.629
25	-0.336	0.508	1.463	0.619	0.568	0.639	24.0	-0.095	1.303	19.1	0.629
30	-0.314	0.607	1.441	0.520	0.488	0.719	27.1	-0.199	1.407	23.9	0.668
35	-0.226	0.475	1.354	0.651	0.592	0.615	29.2	-0.055	1.263	34.2	
40	-0.193	0.486	1.321	0.641	0.512	0.695	32.3	-0.127	1.335	46.5	0.715
45	-0.149	0.464	1.277	0.662	0.608	0.599	34.3	-0.047	1.255	58.5	0.725
50	-0.106	0.475	1.233	0.651	0.552	0.655	37.3	-0.039	1.247	73.1	0.731
60	-0.051	0.464	1.178	0.662	0.608	0.599	39.3	0.072	1.135		
70	0.025	0.442	1.101	0.684	0.584	0.623	49.3				
							54.0	0.184	1.023		
							58.9				
							68.2	0.248	0.959		
							78.6	0.200	1.007		

TABLE 3-4

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.778	0.499	1.897	0.619	0.516	0.683	18.6	-0.199	1.398	7.7	0.615
20	-0.611	0.477	1.731	0.642	0.412	0.786	21.8	-0.501	1.700	13.8	0.643
25	-0.500	0.466	1.619	0.653	0.540	0.659	24.0	-0.119	1.319	19.1	0.664
30	-0.389	0.444	1.508	0.675	0.476	0.723	27.1	-0.215	1.414	23.9	0.674
35	-0.333	0.421	1.453	0.697	0.563	0.635	29.2	-0.071	1.271	34.2	
40	-0.255	0.421	1.375	0.697	0.492	0.707	32.3	-0.143	1.343	46.5	0.714
45	-0.222	0.399	1.342	0.719	0.587	0.612	34.3	-0.001	1.200	58.5	0.727
50	-0.155	0.410	1.275	0.708	0.532	0.667	37.3	-0.040	1.239	73.1	0.730
60	-0.111	0.399	1.231	0.719	0.579	0.620	39.3	0.063	1.136		
70	-0.033	0.377	1.153	0.742	0.563	0.635	49.3				
							54.0	0.166	1.033		
							58.9				
							68.2	0.230	0.969		
							78.6	0.174	1.025		

TABLE 3-5

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio p/p_s
15	-0.859	0.494	1.968	0.613	0.492	0.760	18.6	-0.278	1.478	7.7	0.608
20	-0.695	0.459	1.803	0.649	0.404	0.787	21.8	-0.492	1.685	13.8	0.610
25	-0.624	0.435	1.732	0.672	0.500	0.692	24.0	-0.175	1.367	19.1	0.632
30	-0.506	0.400	1.614	0.707	0.460	0.731	27.1	-0.302	1.494	23.9	0.667
35	-0.459	0.376	1.567	0.731	0.531	0.660	29.2	-0.119	1.311	34.2	
40	-0.377	0.376	1.485	0.731	0.476	0.716	32.3	-0.206	1.399	46.5	0.710
45	-0.341	0.341	1.449	0.766	0.539	0.652	34.3	-0.055	1.248	58.5	0.717
50	-0.271	0.353	1.379	0.755	0.508	0.684	37.3	-0.079	1.272	73.1	0.717
60	-0.223	0.341	1.332	0.766	0.531	0.660	39.3	-0.001	1.192		
70	-0.141	0.306	1.249	0.802	0.539	0.652	49.3				
							54.0	0.095	1.097		
							58.9				
							68.2	0.150	1.041		
							78.6	0.134	1.057		

TABLE 3-6

PRESSURE COEFFICIENT DATA, DCA STATOR
90% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio p/p_s
15	-0.983	0.460	1.991	0.646	0.491	0.713	18.6	-0.244	1.448	7.7	0.599
20	-0.719	0.425	1.827	0.681	0.408	0.796	21.8	-0.448	1.653	13.8	0.601
25	-0.649	0.402	1.757	0.705	0.499	0.705	24.0	-0.145	1.350	18.1	0.623
30	-0.532	0.367	1.640	0.740	0.461	0.743	27.1	-0.266	1.471	23.9	0.658
35	-0.486	0.344	1.593	0.763	0.528	0.675	29.2	-0.092	1.297	34.2	
40	-0.404	0.344	1.511	0.763	0.476	0.728	32.3	-0.175	1.380	46.5	0.699
45	-0.369	0.308	1.476	0.798	0.537	0.667	34.3	-0.031	1.236	58.5	0.707
50	-0.298	0.320	1.406	0.787	0.506	0.698	37.3	-0.054	1.259	73.1	0.707
60	-0.252	0.308	1.359	0.798	0.529	0.675	39.3	0.021	1.183		
70	-0.170	0.273	1.278	0.833	0.537	0.667	49.3				
							54.0	0.112	1.092		
							58.9				
							68.2	0.165	1.039		
							78.6	0.156	1.054		

TABLE 4-1

PRESSURE COEFFICIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.864	0.330	2.055	0.860	0.013	1.270	18.6	-0.556	1.840	7.7	0.413
20	-0.950	0.330	2.141	0.860	0.013	1.270	21.8	-0.634	1.918	13.8	0.399
25	-0.950	0.339	2.140	0.851	0.326	0.957	24.0	-0.605	1.889	19.1	0.399
30	-0.804	0.330	1.994	0.860	0.297	0.986	27.1	-0.669	1.953	23.9	0.399
35	-0.554	0.339	1.745	0.851	0.383	0.900	29.2	-0.577	1.861	34.2	0.806
40	-0.417	0.339	1.607	0.851	0.333	0.950	32.3	-0.662	1.946	46.5	0.524
45	-0.365	0.347	1.556	0.842	0.426	0.858	34.3	-0.548	1.832	58.5	0.570
50	-0.357	0.364	1.547	0.825	0.383	0.900	37.3	-0.456	1.740	73.1	0.599
60	-0.245	0.373	1.435	0.817	0.468	0.815	39.3	-0.449	1.733		
70	-0.073	0.373	1.264	0.817	0.447	0.836	49.3				
							54.0	-0.221	1.505		
							58.9				
							68.2	-0.008	1.292		
							78.6	0.006	1.277		

TABLE 4-2

PRESSURE COEFFECIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-1.045	0.489	2.226	0.692	0.440	0.834	18.6	-0.556	1.830	7.7	0.431
20	-0.640	0.497	1.821	0.683	0.359	0.904	21.8	0.676	1.950	13.8	0.475
25	-0.303	0.489	1.485	0.692	0.503	0.770	24.0	-0.521	1.795	19.1	0.509
30	-0.252	0.480	1.433	0.700	0.425	0.848	27.1	-0.613	1.887	23.9	0.533
35	-0.200	0.480	1.381	0.700	0.567	0.706	29.2	-0.358	1.632	34.2	0.780
40	-0.165	0.480	1.347	0.700	0.461	0.812	32.3	-0.492	1.767	46.5	0.634
45	-0.148	0.480	1.330	0.700	0.602	0.671	34.3	-0.181	1.456	58.5	0.663
50	-0.105	0.489	1.287	0.692	0.517	0.756	37.3	-0.238	1.512	73.1	0.666
60	-0.053	0.497	1.235	0.683	0.609	0.664	39.3	-0.026	1.300		
70	0.058	0.471	1.123	0.709	0.588	0.685	49.3				
							54.0	0.164	1.109		
							58.9				
							68.2	0.221	1.053		
							78.6	0.220	1.053		

TABLE 4-3

PRESSURE COEFFICIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.825	0.513	1.994	0.654	0.530	0.724	18.6	-0.518	1.773	7.7	0.501
20	-0.535	0.531	1.704	0.637	0.579	0.675	21.8	-0.658	1.913	13.8	0.544
25	-0.441	0.488	1.610	0.680	0.572	0.682	24.0	-0.231	1.486	19.1	0.574
30	-0.347	0.505	1.516	0.663	0.488	0.766	27.1	-0.532	1.787	23.9	0.594
35	-0.245	0.471	1.414	0.697	0.614	0.640	29.2	-0.063	1.319	34.2	0.755
40	-0.185	0.471	1.354	0.697	0.523	0.731	32.3	-0.392	1.647	46.5	0.669
45	-0.143	0.462	1.311	0.705	0.628	0.626	34.3	0.054	1.200	58.5	0.689
50	-0.074	0.471	1.243	0.697	0.572	0.682	37.3	-0.077	1.333	73.1	0.697
60	-0.049	0.454	1.217	0.714	0.635	0.619	39.3	0.110	1.144		
70	0.053	0.445	1.115	0.722	0.614	0.640	49.3				
							54.0	0.201	1.053		
							58.9				
							68.2	0.257	0.997		
							78.6	0.250	1.004		

TABLE 4-4

PRESSURE COEFFICIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.536	0.514	1.697	0.645	0.515	0.731	18.6	-0.405	1.652	7.7	0.518
20	-0.528	0.497	1.688	0.662	0.418	0.828	21.8	-0.675	1.922	13.8	0.560
25	-0.468	0.506	1.628	0.654	0.549	0.696	24.0	-0.197	1.444	19.1	0.736
30	-0.400	0.446	1.560	0.713	0.473	0.772	27.1	-0.516	1.762	23.9	0.604
35	-0.357	0.412	1.517	0.748	0.591	0.654	29.2	-0.080	1.326	34.2	0.739
40	-0.280	0.412	1.440	0.748	0.508	0.738	32.3	-0.357	1.603	46.5	0.673
45	-0.263	0.377	1.423	0.782	0.605	0.641	34.3	0.016	1.229	58.5	0.690
50	-0.186	0.386	1.346	0.773	0.549	0.696	37.3	-0.073	1.319	73.1	0.501
60	-0.152	0.352	1.312	0.807	0.598	0.647	39.3	0.072	1.174		
70	-0.058	0.360	1.218	0.799	0.591	0.654	49.3				
							54.0	0.162	1.084		
							58.9				
							68.2	0.224	1.021		
							78.6	0.196	1.049		

TABLE 4-5

PRESSURE COEFFICIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.555	0.497	1.714	0.661	0.510	0.734	18.6	-0.319	1.564	7.7	0.539
20	-0.555	0.447	1.714	0.911	0.401	0.843	21.8	-0.707	1.952	13.8	0.573
25	-0.446	0.405	1.606	0.735	0.538	0.706	24.0	-0.169	1.414	19.1	0.594
30	-0.388	0.389	1.547	0.770	0.469	0.774	27.1	-0.564	1.809	23.9	0.611
35	-0.388	0.347	1.547	0.811	0.578	0.666	29.2	-0.074	1.319	34.2	0.724
40	-0.296	0.347	1.455	0.811	0.497	0.747	32.3	-0.401	1.646	46.5	0.669
45	-0.304	0.305	1.463	0.853	0.592	0.652	34.3	0.003	1.244	58.5	0.686
50	-0.212	0.322	1.371	0.836	0.544	0.700	37.3	-0.101	1.346	73.1	0.688
60	-0.212	0.272	1.371	0.887	0.578	0.666	39.3	0.054	1.190		
70	-0.095	0.288	1.254	0.870	0.578	0.666	49.3				
							54.0	0.143	1.101		
							58.9				
							68.2	0.211	1.033		
							78.6	0.163	1.081		

TABLE 4-6

PRESSURE COEFFICIENT DATA, DCA STATOR
100% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.524	0.523	1.679	0.632	0.539	0.713	18.6	-0.325	1.578	7.7	0.537
20	-0.482	0.406	1.637	0.749	0.426	0.825	21.8	-0.682	1.935	13.8	0.572
25	-0.440	0.422	1.596	0.732	0.552	0.700	24.0	-0.127	1.380	19.1	0.592
30	-0.406	0.347	1.562	0.805	0.499	0.753	27.1	-0.524	1.776	23.9	0.610
35	-0.356	0.347	1.512	0.808	0.591	0.660	29.2	-0.035	1.288	34.2	0.712
40	-0.331	0.288	1.487	0.866	0.525	0.726	32.3	-0.358	1.611	46.5	0.672
45	-0.331	0.288	1.487	0.866	0.605	0.647	34.3	0.030	1.222	58.5	0.686
50	-0.247	0.263	1.403	0.892	0.565	0.687	37.3	-0.055	1.207	73.1	0.686
60	-0.230	0.246	1.386	0.907	0.591	0.660	39.3	0.083	1.169		
70	-0.138	0.238	1.294	0.917	0.591	0.660	49.3				
							54.0	0.162	1.089		
							58.9				
							68.2	0.215	1.037		
							78.6	0.149	1.103		

TABLE 5-1

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-1.290	0.484	2.463	0.689	-0.174	1.441	18.6	-0.701	1.968	7.7	0.359
20	-1.425	0.119	2.599	1.054	-0.133	1.400	21.8	-0.804	2.071	13.8	0.346
25	-1.383	0.127	2.557	1.045	0.201	1.064	24.0	-0.756	2.023	19.1	0.349
30	-1.434	0.110	2.608	1.062	0.201	1.064	27.1	-0.098	1.167	23.9	
35	-1.222	0.110	2.395	1.062	0.242	1.023	29.2	-0.674	1.941	34.2	
40	-1.043	0.102	2.217	1.071	0.201	1.064	32.3	-0.688	1.954	46.5	0.463
45	-0.789	0.518	1.962	0.655	0.263	1.003	34.3	-0.667	1.934	58.5	0.496
50	-0.704	0.501	1.877	0.672	0.228	1.037	37.3	-0.571	1.838	73.1	0.518
60	-0.619	0.484	1.792	0.689	0.283	0.982	39.3	-0.585	1.852		
70	-0.474	0.484	1.648	0.689	0.276	0.589	49.3				
							54.0	-0.517	1.783		
							58.9				
							68.2	-0.284	1.550		
							78.6	-0.243	1.509		

TABLE 5-2

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.628	0.503	1.815	0.683	0.410	0.874	18.6	-0.583	1.868	7.7	0.376
20	-0.515	0.466	1.703	0.721	0.353	0.931	21.8	-0.678	1.963	13.8	0.421
25	-0.523	0.406	1.710	0.781	0.461	0.823	24.0	-0.514	1.799	19.1	0.473
30	-0.433	0.391	1.620	0.796	0.391	0.893	27.1	-0.609	1.894	23.9	
35	-0.455	0.338	1.643	0.848	0.518	0.766	29.2	-0.425	1.710	34.2	
40	-0.365	0.331	1.553	0.856	0.423	0.861	32.3	-0.514	1.799	46.5	0.615
45	-0.388	0.293	1.575	0.893	0.549	0.734	34.3	-0.324	1.609	58.5	0.632
50	-0.298	0.308	1.485	0.878	0.473	0.810	37.3	-0.317	1.602	73.1	0.641
60	-0.290	0.264	1.478	0.923	0.562	0.722	39.3	-0.235	1.520		
70	-0.178	0.256	1.365	0.931	0.543	0.741	49.3				
							54.0	-0.007	1.292		
							58.9				
							68.2	0.125	1.159		
							78.6	0.131	1.152		

TABLE 5-3

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio p/p_s
15	-0.595	0.523	1.798	0.877	0.465	0.835	18.6	-0.517	1.818	7.7	0.391
20	-0.459	0.486	1.689	0.720	0.403	0.897	21.8	-0.616	1.918	13.8	0.433
25	-0.488	0.429	1.688	0.770	0.515	0.785	24.0	-0.467	1.768	19.1	0.476
30	-0.387	0.409	1.588	0.792	0.434	0.866	27.1	-0.523	1.824	23.9	
35	-0.423	0.372	1.624	0.827	0.565	0.735	29.2	-0.361	1.662	34.2	
40	-0.323	0.365	1.523	0.835	0.465	0.835	32.3	-0.448	1.750	46.5	0.605
45	-0.366	0.322	1.566	0.878	0.590	0.710	34.3	-0.255	1.557	58.5	0.640
50	-0.258	0.336	1.459	0.863	0.515	0.785	37.3	-0.274	1.575	73.1	0.645
60	-0.258	0.293	1.459	0.906	0.602	0.698	39.3	-0.162	1.463		
70	-0.143	0.286	1.344	0.914	0.578	0.723	49.3				
							54.0	0.061	1.239		
							58.9				
							68.2	0.167	1.133		
							78.6	0.173	1.127		

TALBE 5-4

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Spar Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio p/p_s
15	-0.590	0.532	1.785	0.662	0.472	0.820	18.6	-0.548	1.841	7.7	0.394
20	-0.505	0.433	1.701	0.761	0.380	0.912	21.8	-0.665	1.957	13.8	0.450
25	-0.505	0.412	1.701	0.783	0.509	0.783	24.0	-0.480	1.773	19.1	0.487
30	-0.442	0.348	1.637	0.846	0.423	0.869	27.1	-0.566	1.859	23.9	
35	-0.449	0.320	1.644	0.874	0.558	0.734	29.2	-0.363	1.656	34.2	
40	-0.385	0.292	1.581	0.903	0.447	0.844	32.3	-0.505	1.798	46.5	0.613
45	-0.392	0.256	1.588	0.938	0.582	0.709	34.3	-0.259	1.552	58.5	0.641
50	-0.327	0.256	1.524	0.938	0.490	0.801	37.3	-0.308	1.601	73.1	0.643
60	-0.322	0.214	1.517	0.980	0.582	0.709	39.3	-0.148	1.441		
70	-0.223	0.200	1.418	0.994	0.552	0.740	49.3				
							54.0	0.066	1.226		
							58.9				
							68.2	0.140	1.152		
							78.6	0.127	1.134		

TABLE 5-5

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.598	0.533	1.785	0.653	0.436	0.864	18.6	-0.534	1.835	7.7	0.390
20	-0.541	0.412	1.728	0.774	0.366	0.934	21.8	-0.645	1.946	13.8	0.449
25	-0.527	0.390	1.714	0.796	0.494	0.806	24.0	-0.458	1.759	19.1	0.484
30	-0.484	0.312	1.671	0.874	0.412	0.887	27.1	-0.534	1.835	23.9	
35	-0.477	0.291	1.664	0.895	0.529	0.770	29.2	-0.347	1.648	34.2	
40	-0.434	0.241	1.621	0.945	0.430	0.870	32.3	-0.493	1.794	46.5	0.600
45	-0.427	0.212	1.614	0.973	0.553	0.747	34.3	-0.230	1.531	58.5	0.603
50	-0.384	0.205	1.571	0.981	0.477	0.823	37.3	-0.294	1.595	73.1	0.625
60	-0.363	0.163	1.550	1.023	0.547	0.753	39.3	-0.130	1.431		
70	-0.278	0.141	1.465	1.045	0.529	0.770	49.3				
							54.0	0.062	1.238		
							58.9				
							68.2	0.120	1.180		
							78.6	0.102	1.197		

TABLE 5-6

PRESSURE COEFFICIENT DATA, DCA STATOR
110% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-0.621	0.532	1.803	0.649	0.445	0.861	18.6	-0.517	1.824	7.7	0.390
20	-0.563	0.409	1.745	0.772	0.375	0.931	21.8	-0.627	1.934	13.8	0.448
25	-0.548	0.387	1.730	0.794	0.503	0.803	24.0	-0.441	1.748	19.1	0.483
30	-0.505	0.307	1.687	0.874	0.422	0.884	27.1	-0.517	1.824	23.9	
35	-0.498	0.285	1.680	0.896	0.538	0.768	29.2	-0.331	1.638	34.2	
40	-0.454	0.235	1.636	0.946	0.439	0.867	32.3	-0.476	1.783	46.5	0.599
45	-0.447	0.206	1.629	0.975	0.561	0.745	34.3	-0.215	1.522	58.5	0.602
50	-0.403	0.198	1.585	0.983	0.485	0.821	37.3	-0.279	1.586	73.1	0.624
60	-0.381	0.155	1.563	1.026	0.555	0.751	39.3	-0.117	1.424		
70	-0.294	0.133	1.476	1.048	0.538	0.768	49.3				
							54.0	0.074	1.232		
							58.9				
							68.2	0.132	1.174		
							78.6	0.114	1.192		

TABLE 6-1

PRESSURE COEFFICIENT DATA, DCA STATOR
120% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-1.089	0.204	2.293	0.999	-0.047	1.404	18.6	-0.596	1.953	7.7	0.328
20	-1.187	0.158	2.391	1.044	-0.064	1.421	21.8	-0.614	1.970	13.8	0.307
25	-1.202	0.158	2.406	1.044	-0.050	1.415	24.0	-0.579	1.936	19.1	0.310
30	-1.262	0.136	2.466	1.067	-0.012	1.369	27.1	-0.475	1.832	23.9	0.298
35	-1.052	0.143	2.256	1.059	0.334	1.022	29.2	-0.567	1.924	34.2	
40	-1.172	0.113	2.376	1.090	0.178	1.178	32.3	-0.631	1.988	46.5	0.393
45	-0.977	0.098	2.180	1.105	0.392	0.964	34.3	-0.527	1.884	58.5	0.403
50	-0.819	0.076	2.022	1.127	0.316	1.039	37.3	-0.521	1.878	73.1	0.389
60	-0.721	-0.014	1.925	1.218	0.270	1.085	39.3	-0.475	1.832		
70	-0.728	0.008	1.932	1.197	0.270	1.085	49.3				
							54.0	-0.406	1.762		
							58.9				
							68.2	-0.325	1.681		
							78.6	-0.359	1.716		

TABLE 6-2

PRESSURE COEFFICIENT DATA, DCA STATOR
120% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_∞
15	-1.008	0.349	2.233	0.875	0.121	1.239	18.6	-0.511	1.873	7.7	0.331
20	-1.113	0.335	2.338	0.889	0.075	1.286	21.8	-0.575	1.937	13.8	0.314
25	-1.078	0.321	2.303	0.903	0.435	0.926	24.0	-0.465	1.826	19.1	0.326
30	-1.008	0.300	2.233	0.924	0.429	0.932	27.1	-0.198	1.559	23.9	0.347
35	-0.700	0.272	1.925	0.952	0.423	0.937	29.2	-0.424	1.786	34.2	
40	-0.693	0.286	1.918	0.938	0.371	0.990	32.3	-0.453	1.815	46.5	0.448
45	-0.574	0.251	1.799	0.973	0.417	0.943	34.3	-0.343	1.704	58.5	0.464
50	-0.441	0.286	1.666	0.938	0.353	1.007	37.3	-0.354	1.716	73.1	0.476
60	-0.406	0.265	1.631	0.959	0.412	0.949	39.3	-0.308	1.669		
70	-0.252	0.307	1.477	0.917	0.394	0.966	49.3				
							54.0	-0.227	1.588		
							58.9				
							68.2	-0.116	1.478		
							78.6	-0.134	1.495		

TABLE 6-3

PRESSURE COEFFICIENT DATA, DCA STATOR
120% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.881	0.577	2.134	0.675	0.528	0.837	18.6	-0.440	1.805	7.7	0.311
20	-0.444	0.509	1.696	0.742	0.595	0.859	21.8	-0.411	1.776	13.8	0.374
25	-0.598	0.534	1.850	0.718	0.539	0.825	24.0	-0.285	1.650	19.1	0.434
30	-0.370	0.448	1.623	0.804	0.522	0.842	27.1	-0.205	1.570	23.9	0.462
35	-0.358	0.497	1.610	0.755	0.585	0.779	29.2	-0.222	1.587	34.2	
40	-0.290	0.417	1.543	0.835	0.522	0.842	32.3	-0.222	1.587	46.5	0.531
45	-0.277	0.473	1.530	0.779	0.502	0.762	34.3	-0.285	1.650	58.5	0.568
50	-0.210	0.405	1.463	0.847	0.551	0.814	37.3	-0.125	1.490	73.1	0.582
60	-0.087	0.473	1.339	0.779	0.602	0.762	39.3	-0.125	1.490		
70	-0.050	0.532	1.303	0.859	0.585	0.779	49.3				
							54.0	0.035	1.329		
							58.9				
							68.2	0.149	1.215		
							78.6	0.155	1.209		

TABLE 6-4

PRESSURE COEFFICIENT DATA, DCA STATOR
120% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.705	0.574	1.943	0.664	0.525	0.848	18.6	-0.394	1.768	7.7	0.323
20	-0.438	0.512	1.676	0.726	0.492	0.881	21.8	-0.399	1.774	13.8	0.356
25	-0.531	0.505	1.769	0.732	0.530	0.843	24.0	-0.306	1.680	19.1	0.417
30	-0.376	0.425	1.614	0.813	0.514	0.859	27.1	-0.223	1.597	23.9	0.448
35	-0.407	0.450	1.645	0.788	0.574	0.799	29.2	-0.245	1.619	34.2	
40	-0.326	0.375	1.564	0.863	0.525	0.848	32.3	-0.234	1.608	46.5	0.524
45	-0.332	0.412	1.571	0.825	0.597	0.777	34.3	-0.184	1.559	58.5	0.565
50	-0.258	0.338	1.496	0.900	0.547	0.826	37.3	-0.113	1.487	73.1	0.580
60	-0.189	0.400	1.427	0.838	0.591	0.782	39.3	-0.140	1.515		
70	-0.133	0.319	1.372	0.918	0.585	0.788	49.3				
							54.0	0.002	1.372		
							58.9				
							68.2	0.145	1.228		
							78.6	0.161	1.212		

TABLE 6-5

PRESSURE COEFFICIENT DATA, DCA STATOR
120% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio p/p_s
15	-0.631	0.514	1.841	0.695	0.455	0.880	18.6	-0.525	1.861	7.7	0.324
20	-0.554	0.450	1.764	0.759	0.417	0.919	21.8	-0.541	1.878	13.8	0.336
25	-0.547	0.380	1.758	0.829	0.466	0.870	24.0	-0.459	1.796	19.1	0.392
30	-0.503	0.335	1.713	0.874	0.428	0.908	27.1	-0.345	1.681	23.9	0.431
35	-0.413	0.290	1.623	0.919	0.510	0.826	29.2	-0.378	1.714	34.2	
40	-0.458	0.258	1.668	0.951	0.428	0.908	32.3	-0.339	1.676	46.5	0.526
45	-0.438	0.220	1.649	0.989	0.531	0.804	34.3	-0.312	1.649	58.5	0.569
50	-0.400	0.207	1.610	1.002	0.466	0.870	37.3	-0.252	1.589	73.1	0.582
60	-0.362	0.188	1.572	1.021	0.526	0.810	39.3	-0.263	1.600		
70	-0.291	0.175	1.501	1.034	0.510	0.826	49.3				
							54.0	-0.094	1.431		
							58.9				
							68.2	0.057	1.278		
							78.6	0.068	1.267		

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DATE

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