AN EXPERIMENTAL STUDY
OF PRESSURES ON 60° DELTA WINGS
WITH LEADING EDGE VORTEX FLAPS
A FINAL REPORT (NAG-1-274)

JAMES F. MARCHMAN, III
JAMES E. TERRY
DENISE A. DONATELLI

Aerospace and Ocean Engineering
Virginia Polytechnic Institute and State University

JUNE 30, 1983
AN EXPERIMENTAL STUDY OF PRESSURES ON 60° DELTA WINGS
WITH LEADING EDGE VORTEX FLAPS - A FINAL REPORT (NAG-1-274)

by

J. F. Marchman, III, James E. Terry and Denise Donatelli
Aerospace and Ocean Engineering Department
Virginia Polytechnic Institute and State University
Blacksburg, Virginia

ABSTRACT

An experimental study was conducted in the Virginia Tech Stability Wind Tunnel to determine surface pressures over a 60° sweep delta wing with three vortex flap designs. Extensive pressure data was collected to provide a base data set for comparison with computational design codes and to allow a better understanding of the flow over vortex flaps. The results indicated that vortex flaps can be designed which will contain the leading edge vortex with no spillage onto the wing upper surface. However, the tests also showed that flaps designed without accounting for flap thickness will not be optimum and the result can be oversized flaps, early flap vortex reattachment and a second separation and vortex at the wing/flap hinge line.
# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>i</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF SYMBOLS</td>
<td>iv</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>EXPERIMENTAL PROCEDURE</td>
<td>2</td>
</tr>
<tr>
<td>DATA AND RESULTS</td>
<td>4</td>
</tr>
<tr>
<td>Force Data</td>
<td>4</td>
</tr>
<tr>
<td>Pressure Analysis</td>
<td>5</td>
</tr>
<tr>
<td>DATA ANALYSIS</td>
<td>9</td>
</tr>
<tr>
<td>CONCLUSIONS</td>
<td>11</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>13</td>
</tr>
<tr>
<td>FIGURES</td>
<td>14</td>
</tr>
<tr>
<td>APPENDIX A: TABULATED DATA</td>
<td>91</td>
</tr>
<tr>
<td>Figure No.</td>
<td>Title</td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Formation of Vortex on Leading Edge Vortex Flap and Resultant Force</td>
</tr>
<tr>
<td>2</td>
<td>Model Mounting in VPI 6' x 5' Stability Wind Tunnel</td>
</tr>
<tr>
<td>3</td>
<td>60° Wing Model Dimensions and Port Locations</td>
</tr>
<tr>
<td>4</td>
<td>Pressure Flap Model Configurations and Port Locations</td>
</tr>
<tr>
<td>5</td>
<td>Performance of the VPI-8 LEVF compared to Previously Tested LEVF(1)</td>
</tr>
<tr>
<td>6-16</td>
<td>Pressure Distributions for VPI-8 at $\delta_f = 15^\circ$</td>
</tr>
<tr>
<td>17-25</td>
<td>Pressure Distributions for CCF</td>
</tr>
<tr>
<td>26-36</td>
<td>Pressure Distributions for VPI-8 at $\delta_f = 30^\circ$</td>
</tr>
<tr>
<td>37</td>
<td>Construction of Rounded Hinge VPI-8</td>
</tr>
<tr>
<td>38-47</td>
<td>Pressure Distribution for Rounded Hinge VPI-8 at $\delta_f = 30^\circ$</td>
</tr>
<tr>
<td>48</td>
<td>Effect of Thickness on Vortex Reattachment position</td>
</tr>
<tr>
<td>49-59</td>
<td>Pressure Distributions for VPI-10 without Fuselage at $\delta_f = 30^\circ$</td>
</tr>
<tr>
<td>60-70</td>
<td>Pressure Distributions for VPI-10 with Fuselage at $\delta_f = 30^\circ$</td>
</tr>
<tr>
<td>71-76</td>
<td>Pressure Distributions for VPI-8 at $\delta_f = 30^\circ$ with Extensions</td>
</tr>
</tbody>
</table>
LIST OF SYMBOLS

\( \alpha \)  
angle of attack (degrees)

\( \delta_f \)  
flap deflection (degrees)

\( c \)  
pressure coefficient \( \left( \frac{p - p_{\infty}}{q_{\infty}} \right) \).

\( C_L \)  
lift coefficient \( \left( \frac{L}{q_{\infty}S} \right) \).

\( C_m \)  
moment coefficient \( \left( \frac{M}{q_{\infty}SC} \right) \).

\( L/D \)  
lift to drag ratio

\( p \)  
local static pressure

\( p_{\infty} \)  
freestream static pressure

\( q_{\infty} \)  
freestream dynamic pressure \( \left( \frac{1}{2} \rho V_{\infty}^2 \right) \)

\( L \)  
lift force (lb)

\( M \)  
pitching moment (ft-lb)

\( C \)  
root chord (ft)

\( S \)  
planform area (ft\(^2\))

\( \rho \)  
density \( \left( \frac{\text{slug}}{\text{ft}^3} \right) \)

\( V_{\infty} \)  
freestream velocity \( \left( \frac{\text{ft}}{\text{sec}} \right) \)
AN EXPERIMENTAL STUDY OF PRESSURES ON 60° DELTA WINGS WITH LEADING EDGE VORTEX FLAPS - FINAL REPORT (NAG-1-274)

by

J. F. Marchman, III*, James E. Terry**, and Denise Donatelli**

INTRODUCTION

In recent years, many studies have reported the success of the vortex flap concept of performance improvement for highly swept delta wings.(1-5) A vortex flap is designed to move the leading edge vortex normally produced on a highly swept delta wing from the wing onto the flap as shown in Figure 1. The downward deflection of the flap allows the low pressures in the vortex to produce a thrust instead of the drag normally produced by a leading edge vortex. The thrust results in an increased lift-to-drag ratio for the wing and significant improvement in performance. Previous force tests conducted at VPI have revealed L/D max improvements of up to 70%.(1)

In order to intelligently design vortex flaps for delta wings, there was a need for a large amount of surface pressure data over the wings and flaps. There was very little existing pressure data for vortex flaps(6-7) and such data was needed to better understand the nature of the flow around the wing flap system and to use as a basis of comparison with computer codes

* Principal Investigator
** Undergraduate Research Assistants
created for the design of such flap systems. Only such pressure data can confirm the effectiveness of a vortex flap design in containing the vortex over the flap. If the vortex spills over into the wing itself or if it leads to early reattachment on the flap with a subsequent secondary separation at the wing-flap hinge line, additional drag will be created, reducing the flap's performance.

The purpose of the present research was then to provide a data base of surface pressure coefficients over a 60° delta wing with several leading edge vortex flap designs. Tests were conducted using a semispan wing model mounted to the turntable in the flour of the VPI Stability wind tunnel. Three vortex flaps were tested and a wide range of angles of attack were investigated. Some tests included an idealized fuselage model as shown in Figure 2.

EXPERIMENTAL PROCEDURE

The model used for the tests was a 29 inch semispan, flat plate, 60° sweep, delta wing as shown in Figure 3. The wing was designed to be mounted to a circular turntable and mounted to the floor of the VPI Stability Wind Tunnel. The wing model was one and a half inches thick, constructed of two sheets of 3/4 inch plywood sandwiched together. Sandwiched into the wing was tubing for up to 48 pressure taps. Copper tubing was inlaid into the model's upper surface, as shown in Figure 3, such as to allow pressure taps to be drilled along lines either perpendicular to the wing centerline or to the wing's leading edge. All dimensions are given in inches in Figure 3.

Three flaps were tested as shown in Figure 4. The first flap, labeled CCCF for cropped constant chord flap, was designed to match the flap planform
found optimum in earlier force tests at VPI. This flap was designed with pressure taps in rows perpendicular to the flap's leading edge and was tested with similar pressure port alignment on the wing itself.

The other two flaps shown in Figure 4 were designed at NASA-Langley. They are cropped and have a slight inverse taper. The first flap, labeled VPI-8, spanned the entire wing leading edge. The second, VPI-10, was a partial span flap designed to be used with a half cylinder, 5.75 inch radius, idealized fuselage model shown in Figure 2. The fuselage model was constant radius with an ogive shaped nose and was ten feet long.

All flaps were constructed of fir and instrumented with copper tubing for pressure lines. These pressure lines were attached to plastic tubing which was run through the wing model. The CCCF flap was hinged for mounting at a range of deflection angles while the VPI-8 and 10 flaps were designed originally for a 30° upper surface deflection (15° chordline) and later redesigned for a 30° chordline (45° surface) deflection. All flaps were sanded to a smooth finish and sealed and were inspected by NASA personnel for accuracy prior to testing.

Tests were conducted in the six-by-six foot, straight test section of Virginia Tech's Stability Wind Tunnel. This tunnel was originally the NACA Stability Tunnel at Langley Field and is a continuous flow, subsonic facility with a freestream turbulence of less than 0.05%. Testing was usually done at a Reynolds number of $2.2 \times 10^6$ and the angles of attack ranged from $0° - 10°$ in $2°$ increments and $11° - 15°$ in $1°$ increments. Pressure data was collected by a Hewlett-Packard 9825A Acquisition system from a Scanivalve pressure scanning manifold and a Setra Systems transducer (range: 0 to ± 0.25 psig). Also read by the system were the tunnel static and dynamic pressures and temperature, from which Reynolds number, velocity, density, viscosity, and
pressure coefficients were then plotted on a scale drawing of the wing according
to pressure port location. Pressure coefficient was also tabulated.

A few preliminary force tests were conducted to provide global performance
data for the NASA flap designs. The force testing was achieved by scaling
down the NASA flaps to fit a 60° delta wing that had a 3 foot wing span and
2.667 foot root chord. Two flaps were cut from sheet metal, deflected to
30°, and attached to the leading edges of the wing by small bolts and tape.
The tunnel was run at a dynamic pressure of 3.0 inches of water and the
angles of attack ranged from 0° - 40° in 5° increments. Forces and moments
were measured by strut mounting the wing on a six-component strain gage
balance system. This data was collected by the HP Data Acquisition system
and reduced to the aerodynamic coefficients which were then printed out and
plotted.

Some flow visualization tests were conducted on occasion to verify
the results seen in other tests. These were conducted using both tufts
and smoke. The results did not photograph particularly well and are not
included in this report, but they did confirm some of the results noted by
the experimentors.

DATA AND RESULTS

Force Data

As noted, some force tests were run on a three foot span, 60° delta
model used in previously reported studies. Earlier test data showed
that cropped, constant chord flaps (CCCF) and full-span inverse tapered flaps
(FTF), both at 30° deflections, gave the highest lift-to-drag ratios. Since
the NASA flap design appears to be a hybrid combination of the CCCF and FTF,
it was suspected that the NASA design would perform as well as the previous
designs. The force data taken for the NASA VPI-8 flap (full span) showed that this was true. Figure 5 shows that the NASA flap is a good compromise between the CCCF and the FTF, incorporating the higher lift-to-drag ratio of CCCF while maintaining the desirable pitching properties of the FTF. The reduced pitch-up tendency of the NASA flap is due to the smaller flap area near the apex of the delta wing. Yet, even with the smaller flap design, the NASA flap's low drag and high lift-to-drag ratio is some evidence of the flap's ability to maintain a vortex over the majority of its length.

Pressure Analysis

In modeling the wing and flap for surface pressure measurements, appreciable thickness was added to the model for structural strength. The flap model for the force measurements had essentially no thickness (sheet metal construction) and while the delta wing had some thickness, its thickness ratio was approximately three times smaller than that for the wing pressure model.

Since the most computer codes used to predict surface pressures over a wing-flap system do not take into account flap or wing thickness, questions about the validity of comparing the computer and force results to the measured pressure results arise. If a valid comparison can be made, the primary questions become: 1) how should thickness be accounted for and 2) how should the flap deflection be defined on the model with thickness?

For the first tests conducted the flap angle was defined from the flap surface and tested at 30° surface deflection for both the CCCF and the VPI-8. Data for the VPI-8 flaps are shown in Figures 6 to 16. (These figures show the flap deflection as a chordline deflection of 15°). At angles of attack of 0° and 2°, no vortex appeared on either of the flaps. Low pressures were seen at the flap wing hinge line due to local flow acceleration around the
hinge line. At 4° angle of attack, negative pressures began to appear on the flap. By 8° angle of attack, strong negative pressures indicated a vortex on the flap. The design cruise angle of attack for the test system was supposed to be approximately 11° and the pressure distribution for this angle of attack for the VPI-8 is shown in Figure 12. Two problems are evident from Figure 12; first, the reattachment line for the vortex washes over onto the wing and secondly, the vortex as a whole moves off the flap and onto the wing over the aft portion of the wing. Both of these actions do not allow the full effect of the vortex to be used on the flap and also result in excess drag. As angle of attack is increased further, both of these effects grow worse. A more optimal angle of attack appears to be around 10° (Figure 11). Here, the reattachment is along the hinge line and the vortex movement off the flap is minimal.

These results led to questions about a Reynolds number effect; hence, tests were run at Reynolds numbers of 2.2, 2.8 and 3.7 x 10^6. The results showed the data to be repeatable and independent of Reynolds-number.

The results of tests on the constant chord flap (CCCF) are shown in Figures 17-25. Due to the size of the CCCF, reattachment washover was not a problem, but the CCCF are apparently too large since the reattachment line is on the flap. The results for these flaps are shown in Figures 12 to 20. However, the problem of vortex movement onto the wing was also seen on the CCCF.

Analysis of this data lead to a redefinition of the flap deflection angle. The vortex over the flap was obviously not reattaching at the hinge line as it should on the NASA designed flaps. Since the design was based on a zero thickness model and the wind tunnel model has a substantial thickness, the problem appeared to be in the flap deflection definition. After conferring with NASA-Langley personnel it was decided that the design flap deflection
of 30° should be based on the flap chordline (centerline) rather than on the surface deflection.

Subsequent to the above described redefinition of the flap deflection angle the VPI-8 and VPI-10 flaps were rebuilt for mounting at chordline deflections of 30°. This gave flap surface deflections of 45°. The VPI-8 flap was then retested and the results are shown in Figures 26-36.

With the flap deflected to a 30° chordline valve a new problem is evident near the design wing angle of attack of 11° (Fig. 32). The flap vortex appears to be reattaching on the flap itself with a second vortex forming over the wing as the flow again separates over the hinge line. This appears to be the result of flap thickness effects on a flap designed based on a zero thickness assumption. This will be discussed later in a following section. This second vortex appears at all angles of attack above 4°.

Smoke and tuft flow visualization tests were conducted in an attempt to find the extent and origin of the second vortex. Smoke tests proved inconclusive due to the smoke stream being larger than the vortex and, therefore, covering the details of the flow. The tufts however, indicated that the second vortex formed due to the flow separation at the hinge line. The flow visualization showed the flow accelerating off the flap and over the hinge line.

Because flow visualization tests indicated that the second vortex was initiated at the hinge line, a rounded hinge line modification was made on the VPI-8 to try to eliminate or weaken the vortex. The new hinge line was made by inserting a 3/4" thick strip of styrofoam, "lowering" the flap junction edge approximately 0.24" below the surface of the wing and then contouring the styrofoam to make a smooth transition between the flap and the
wing (Figure 37). Flap deflection was maintained at a 30° chordline deflection. The dimensions were chosen in order to give the smoothest flap-to-wing transition. The insert effectively increases the flap size and thus ensures off-design conditions (i.e., early vortex impact) since the sharp hinged tests showed the flaps to be initially slightly oversized.

The local pressure coefficient plots for the rounded hinge case are shown in Figures 38 through 47. Again looking at the results at $\alpha = 11^\circ$ (Figure 40) it appears that the second vortex is significantly weakened, although it may still exist. The pressure distributions over the flap are virtually identical to those seen in the earlier tests with a sharp hinge line but the low pressure areas over the wing are substantially weakened.

Flow visualization with tufts indicated that a weak vortex still existed off the hinge line. It therefore appears that the rounded hinge decreased the strength of the wing hinge line vortex but further testing needs to be done to optimize hinge line radius.

The obvious solution to this problem of hinge line separation is not a rounded hinge line but a resized flap which is designed to account for flap thickness effects on the flow. The effects of flap thickness are illustrated in Figure 48. A flap designed with a zero thickness code to produce a vortex flow which will reattach at the hinge line will experience early reattachment on a flap with finite thickness. The thicker flap results in early vortex impact on the flap and a second separation at the wing flap hinge line.

The effects of thickness are, thus, twofold. The resulting greater then defined deflection angle of the flap surface ($45^\circ$ surface deflection for a $30^\circ$ chordline deflection on the VPI-8 and VPI-10) results in greater thrust at the defined angle, due to the increased forward tilt of the vortex-induced suction vector. However, the resulting flap chord is now too large for the
design flow and the early vortex reattachment leads to a second vortex over the wing and consequently a drag force.

Further consideration needs to be given to the effects of flap thickness on vortex flap flow. These effects must be better understood if design codes are to be properly developed for vortex flaps. These codes must in some way account for flap thickness.

Figures 49-59 present the data for the VPI-10 flaps at a 30° chordline deflection. These flaps were designed for use with a fuselage model; however, they were first tested without the fuselage. A well defined vortex does not appear over the flap until an angle of attack of about 10 degrees is reached, although a well defined vortex appears to form off the hinge line at lower angles of attack. It also appears that a second inboard vortex or low pressure region appears over the wing in this case due to the leading edge vortex on the unflapped wing apex moving onto the wing after the flap begins. This vortex should not appear when a fuselage model is added.

The fuselage model was added to the wing with the VPI-10 flap and the results are shown in Figures 60-70. These results are very similar to those shown for the same flap without fuselage except that the inboard vortex off the wing apex noted in the earlier case is not present. It appears that the fuselage plays no significant role in the development of the vortex flows over the flap or wing.

DATA ANALYSIS

In examining the data the obvious problem noted is the hinge line vortex. As discussed previously, it is apparent that a flap planform designed without accounting for thickness results in excess flap chord for a flap of finite
thickness. The noted effect of thickness appears to call into question the accuracy of using a chordline code to predict optimum flap deflection angles and planform chords. When comparing the results of these tests for the full span VPI-8 flap with chordline deflections of 15° and 30° an optimum appears to lie somewhere between the two cases. Force tests with the VPI-8 (Figure 5) showed a maximum L/D to be achieved at an angle of attack around 7 to 8 degrees. Thus, examining Figures 10 and 30 (the α = 8° data for VPI-8 at δ_F = 15° and 30° respectively) it appears that the 15° chordline deflection (30° surface deflection) is much more likely to produce the L/D optimum at this angle of attack. This is an interesting result in that the force test results were for a near zero thickness flap at 30° deflection which should correspond more directly to the 30° chordline deflection case of Figure 30.

In Figure 10 there appears to be a good vortex on the flap with vortex reattachment quite near the hinge line, a case which should produce a good L/D. On the other hand, Figure 30 shows no vortex over the flap and a rather strong separation off the hinge line. This, in the authors' opinions calls into question the validity of using flap chordline deflection as the design condition rather than using flap surface deflection.

The problem is complex. Apparently, flap vortex strength depends on the flap chordline deflection. However, the effect of the vortex in producing thrust will depend on the deflection of the surface on which it acts. Obviously, a vortex which reattaches too early, producing a hinge line vortex, needs to be avoided. The results indicate that as the base thickness of the flap increases the flap chord needs to be decreased in order to avoid early vortex reattachment which leads to hinge line separation. The only answer to these problems which is readily apparent is that flap thickness should be kept as small as possible.
In the initial examination of the VPI-8 flap with 15° chordline 30° surface deflection it appeared that in the range of angle of attack between 10 and 15 degrees the primary problem was a tendency of the flap vortex to roll up over the wing itself. Consequently, several tests were run with a modified flap where a flap extension was added onto the rear portion of the existing flap. This was a sheet metal extension with the planform as indicated on the data figures (Fig. 71-76). The purpose of the extension was to pull the flap vortex back onto the flap over the aft portion of the wing. This extension appeared to work well, maintaining the vortex over the flap along the rear part of the wing. At higher angles of attack, however, the extension is not sufficient to the task and a large part of the vortex appears to extend over the wing's upper surface.

CONCLUSIONS

The reported research provided a large base of surface pressure data for a 60° delta wing with three vortex flap designs. The data has been presented in graphical form in the figures and is also tabulated in Appendix A. The data indicates that flap thickness plays an important role in determining the effectiveness of a vortex flap planform design and in the selection of an optimum design deflection angle.

Further research is needed to assess the effect of flap thickness on vortex flap behavior. Design codes developed for use with vortex flaps need to include at least some semi-empirical means of including thickness effects. A flap designed based on a zero thickness model will result in early reattachment of the flap vortex and may result in the formation of a second vortex of the flap wing hinge line. A smoothing or rounding of the hinge line may alleviate some of the hinge line separation problems; however, a design code which
includes the effects of thickness should result in a flap planform which will preclude hinge line separation problems.

A primary result of this research was to show that by proper flap design it is possible to create a vortex flap which will contain the leading edge vortex without spillover of that vortex onto the wing's upper surface. The results also largely confirmed earlier research which indicated that a thirty degree flap deflection was optimal for a 60° delta wing.
REFERENCES


Figure 1  Formation of Vortex on Leading Edge
Vortex Flap and Resultant Force[1]
Figure 2 Model Mounting in VPI 6' x 6' Stability Wind Tunnel (Configuration Shown is VPI-10 Flap with Fuselage).
Figure 3 60 Degree Wing Model Dimensions and Port Locations (without flap)

Note: Wing Secured to Turntable by Steel "L" Brackets Inlaid Into Both Wing and Turntable

- Dimensions in Inches
- Fuselage Line
- Inlaid Copper Tubes With Ports
- Spacing For All
Figure 4: Pressure Flap Model Configurations and Port Locations

All Ports Equally Spaced

Dimensions in Inches

VPI-8: Port Rows Align With Wing Port Rows Perpendicular to Root Chord

VPI-10: Port Rows Align With Wing Port Rows Perpendicular to Root Chord

CCCF: Port Rows Align With Wing Port Rows Perpendicular to Leading Edge
Figure 5 Performance of the NASA VPI-8 LEVF Compared to Previously Tested LEVF

L/D

CCCF
NASA VPI-8
FTF
No LEVF

CL

Cm

Alpha (Deg)
FIGURE 6
NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 0 DEG
REYNOLDS NO.: 2.143 x 10^6
FIGURE 7

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 2 DEG
REYNOLDS NO.: 2.200.06

[Diagram of pressure coefficients with axes labeled and data points indicated]
FIGURE 8

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 4 DEG
REYNOLDS NO.: 2.206e06
FIGURE 9

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 6 DEG
REYNOLDS NO.: 2.202e06
FIGURE 10

NASA FULL SPAN FLAP (VPI-B)

PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 8 DEG
REYNOLDS NO.: 2,187

0

-1

-2

-3

-4

0

-1

-2

-3

-4

0

-1

-2

-3

-4
FIGURE 11

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.197e06
FIGURE 12

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 deg
ANGLE OF ATTACK: 11 deg
REYNOLDS NO.: 2.184e06
FIGURE 13

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 2.202e 06
FIGURE 14

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 2.2110^6
FIGURE 15

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 14 DEG
REYNOLDS NO.: 2.1980 × 10^6
FIGURE 16

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.189 \times 10^6
FIGURE 17
CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 26 DEG
ANGLE OF ATTACK: 5 DEG
REYNOLDS NO.: 2.235e 06
FIGURE 18
CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 26 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.232e06

CENTERLINE DISTANCE (IN)

PRESSURE COEFFICIENT
FIGURE 19

CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 26 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.229 x 10^6

CENTERLINE DISTANCE (IN)

PRESSURE COEFFICIENT
FIGURE 20

CROPPED CONSTANT CHORD FLAP PRESSURE COEFFICIENTS

FLAP DEFLECTION: 21 DEG
ANGLE OF ATTACK: 5 DEG
REYNOLDS NO.: 2.242e06

CENTERLINE DISTANCE (IN)

PRESSURE COEFFICIENT
FIGURE 21
CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 21 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.231\times10^6

CENTERLINE DISTANCE (IND)
FIGURE 22
CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 21 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.240e06

CENTERLINE DISTANCE (IN)
FIGURE 23
CROPPED CONSTANT CHORD FLAP PRESSURE COEFFICIENTS

FLAP DEFLECTION: 31 DEG
ANGLE OF ATTACK: 5 DEG
REYNOLDS NO.: 2.160 x 06

CENTERLINE DISTANCE (IN)

PRESSURE COEFFICIENT

OF POOR QUALITY
ORIGINAL PAGE IS
FIGURE 24
CROPPED CONSTANT CHORD FLAP
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 31 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.159e 06

PRESSURE COEFFICIENT

CENTERLINE DISTANCE (IN)
FIGURE 25

CROPPED CONSTANT CHORD FLAP PRESSURE COEFFICIENTS

FLAP DEFLECTION: 31 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.173 x 10^6

CENTERLINE DISTANCE (IN)

PRESSURE COEFFICIENT
FIGURE 26
NASA FULL SPAN FLAP (VP-8)
PRESSURE COEFFICIENTS
FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 0 DEG
REYNOLDS NO.: 2.190e06
FIGURE 27

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 2 DEG
REYNOLDS NO.: 2.195e 06.
FIGURE 28

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 4 DEG
REYNOLDS NO.: 2.192e06
FIGURE 29

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 6 DEG
REYNOLDS NO.: 2.199e06
FIGURE 30

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 8 DEG
REYNOLDS NO.: 2.19e 06
FIGURE 31

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.211 x 10^6
FIGURE 32

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 11 DEG
REYNOLDS NO.: 2.184 × 10^6
FIGURE 33

NASA FULL SPAN FLAP (VPI-B)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG.
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 2,190,060
FIGURE 34

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 2.190e06
FIGURE 35

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 14 DEG
REYNOLDS NO.: 2.187e06
FIGURE 36

NASA FULL SPAN FLAP (VPI-8)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.179e06
FIGURE 37: SCHEMATIC OF FLAP WITH SMOOTHED HINGE LINE
FIGURE 38

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 8 DEG
REYNOLDS NO.: 1.310e06
FIGURE 39

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 1.338e06
FIGURE 40

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 11 DEG
REYNOLDS NO.: 1.343e06
FIGURE 41

NASA FULL SPAN FLAP (VPI-8) WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 1.342e06
FIGURE 42

NASA FULL SPAN FLAP (VPI-8) WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 1.332e06
FIGURE 43
NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLCTION:  30 DEG
ANGLE OF ATTACK:  14 DEG
REYNOLDS NO.: 1.332e06
FIGURE 44

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: $1.328 \times 10^6$
FIGURE 45

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 16 DEG
REYNOLDS NO.: 1.320e06
FIGURE 45

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS
FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 18 DEG.
REYNOLDS NO.: 1.314e 06
FIGURE 47

NASA FULL SPAN FLAP (VPI-8)
WITH ROUNDED HINGE LINE
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 20 DEG
REYNOLDS NO.: 1.295e06
Figure 48 Possible Effect From Thickness Variation on Vortex Reattachment Position

Chord line (Zero Thickness Case) and Predicted Vortex Flow

Effect of Thickness on Predicted Flow
FIGURE 49

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 0 DEG
REYNOLDS NO.: 2.236e06
FIGURE 50

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 2 DEG
REYNOLDS NO.: 2.284 x 10^6
FIGURE 51

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 4 DEG
REYNOLDS NO.: 2.285e06
FIGURE 52

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 6 DEG
REYNOLDS NO.: 2.280006
FIGURE 53.

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 8 DEG
REYNOLDS NO.: 2.270 x 06
FIGURE 54

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.262 x 10^6
FIGURE 55

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 11 DEG
REYNOLDS NO.: 2.263e06
FIGURE 56

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 2.258e06
FIGURE 57

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 2.257 x 10^06
FIGURE 58

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG.
ANGLE OF ATTACK: 14 DEG
REYNOLDS NO.: 2.255e+06
FIGURE 59

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.240e 06
FIGURE 60

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 0 DEG
REYNOLDS NO.: 1.943 x 10^6
FIGURE 61

NASA PART SPAN FLAP (VPI-10)

PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 2 DEG
REYNOLDS NO.: 1.952 x 10^6
FIGURE 62

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 4 DEG
REYNOLDS NO.: 2.244e06
FIGURE 63

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 6 DEG
REYNOLDS NO.: 1.956e06
FIGURE 64

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

- FLAP DEFLECTION: 30 DEG
- ANGLE OF ATTACK: 8 DEG
- REYNOLDS NO.: 2.251e06
FIGURE 65

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 1.967e 06
FIGURE 66

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 11 DEG
REYNOLDS NO.: 2.2586 06
FIGURE 67

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 2.269×10^6
FIGURE 68

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 2.272 x 06
FIGURE 69
NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS
FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 14 DEG
REYNOLDS NO.: 2.254e06
FIGURE 70

NASA PART SPAN FLAP (VPI-10)
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 30 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.248 x 10^6
FIGURE 71

NASA FULL SPAN FLAP (VPI-8) WITH HALF ANGLE EXTENSION
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 10 DEG
REYNOLDS NO.: 2.175E+05
FIGURE 72

NASA FULL SPAN FLAP (VPI-8) WITH HALF ANGLE EXTENSION
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 11 DEG
REYNOLDS NO.: 2.190e06
NASA FULL SPAN FLAP (VPI-8) WITH HALF ANGLE EXTENSION
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 12 DEG
REYNOLDS NO.: 2.181e 06
NASA FULL SPAN FLAP (VPI-8) WITH HALF ANGLE EXTENSION
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 13 DEG
REYNOLDS NO.: 2.180e 06
FIGURE 75

NASA FULL SPAN FLAP (VPI-8) WITH HALF ANGLE EXTENSION PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 14 DEG
REYNOLDS NO.: 2.184e06

Original Page is of Poor Quality
FIGURE 76

NASA FULL SPAN FLAP (VPI-8)
WITH HALF ANGLE EXTENSION
PRESSURE COEFFICIENTS

FLAP DEFLECTION: 15 DEG
ANGLE OF ATTACK: 15 DEG
REYNOLDS NO.: 2.190e06
APPENDIX A

TABULATED PRESSURE DATA
### NASA Full Span Flap VPI-8

#### Angle of Attack: 0 DEG

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
<td>$X = 7.125$</td>
</tr>
<tr>
<td>$Y$</td>
<td>$Cp$</td>
<td>$Y$</td>
<td>$Cp$</td>
</tr>
<tr>
<td>6.22</td>
<td>0.2035</td>
<td>12.76</td>
<td>0.1824</td>
</tr>
<tr>
<td>5.81</td>
<td>0.1464</td>
<td>12.26</td>
<td>0.1535</td>
</tr>
<tr>
<td>5.41</td>
<td>0.0969</td>
<td>11.76</td>
<td>0.0483</td>
</tr>
<tr>
<td>5.00</td>
<td>0.0316</td>
<td>11.26</td>
<td>0.0096</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.0189</td>
<td>10.76</td>
<td>-0.0498</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.0181</td>
<td>7.86</td>
<td>-0.0766</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.0199</td>
<td>6.75</td>
<td>-0.0427</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.0553</td>
<td>12.75</td>
<td>-0.0561</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.0588</td>
<td>11.63</td>
<td>-0.0630</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.0643</td>
<td>10.50</td>
<td>-0.0533</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.0502</td>
<td>9.38</td>
<td>-0.0553</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.0905</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### Angle of Attack: 2 DEG

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
<td>$X = 7.125$</td>
</tr>
<tr>
<td>$Y$</td>
<td>$Cp$</td>
<td>$Y$</td>
<td>$Cp$</td>
</tr>
<tr>
<td>6.22</td>
<td>0.0675</td>
<td>12.76</td>
<td>0.0843</td>
</tr>
<tr>
<td>5.81</td>
<td>0.0333</td>
<td>12.26</td>
<td>0.0447</td>
</tr>
<tr>
<td>2.41</td>
<td>-0.0051</td>
<td>11.76</td>
<td>-0.0416</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.0682</td>
<td>11.26</td>
<td>-0.0721</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.1058</td>
<td>10.76</td>
<td>-0.1486</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.1214</td>
<td>9.00</td>
<td>-0.2312</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.0746</td>
<td>7.88</td>
<td>-0.1254</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.0636</td>
<td>6.75</td>
<td>-0.1019</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.0987</td>
<td>12.75</td>
<td>-0.0955</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.0990</td>
<td>11.63</td>
<td>-0.1019</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.1019</td>
<td>10.50</td>
<td>-0.0849</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.0839</td>
<td>9.38</td>
<td>-0.0838</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.0905</td>
<td>8.25</td>
<td>-0.0852</td>
</tr>
</tbody>
</table>

#### Angle of Attack: 4 DEG

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
<td>$X = 7.125$</td>
</tr>
<tr>
<td>$Y$</td>
<td>$Cp$</td>
<td>$Y$</td>
<td>$Cp$</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.0778</td>
<td>12.76</td>
<td>-0.0513</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.0582</td>
<td>12.26</td>
<td>-0.0585</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.0971</td>
<td>11.76</td>
<td>-0.1648</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.1666</td>
<td>11.26</td>
<td>-0.1808</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.1943</td>
<td>10.76</td>
<td>-0.2567</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.1904</td>
<td>9.00</td>
<td>-0.3294</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.1459</td>
<td>7.88</td>
<td>-0.1843</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1069</td>
<td>6.75</td>
<td>-0.1979</td>
</tr>
<tr>
<td>5.50</td>
<td>-0.1399</td>
<td>11.63</td>
<td>-0.1403</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.1369</td>
<td>11.63</td>
<td>-0.1403</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.1407</td>
<td>10.50</td>
<td>-0.1281</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.1217</td>
<td>9.38</td>
<td>-0.1166</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.1419</td>
<td>8.25</td>
<td>-0.1160</td>
</tr>
</tbody>
</table>
### NASA Full Span Flap VPI-8
**Flap Deflection:** 15 DEG.  
**Angle of Attack:** 6 DEG  
**Reynold’s No.:** 2.202E 06

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.6215</td>
<td>12.76</td>
<td>-0.5613</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.4076</td>
<td>12.26</td>
<td>-0.2155</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.2467</td>
<td>11.76</td>
<td>-0.2494</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.2502</td>
<td>11.26</td>
<td>-0.2857</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.2651</td>
<td>10.76</td>
<td>-0.3568</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.2866</td>
<td>9.00</td>
<td>-0.4252</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2200</td>
<td>6.75</td>
<td>-0.1927</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1610</td>
<td>4.50</td>
<td>-0.1866</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.1982</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.1590</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NASA Full Span Flap VPI-8
**Flap Deflection:** 15 DEG.  
**Angle of Attack:** 8 DEG  
**Reynold’s No.:** 2.197E 06

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.7771</td>
<td>12.76</td>
<td>-0.8134</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.9371</td>
<td>12.26</td>
<td>-0.8592</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.7793</td>
<td>11.76</td>
<td>-0.6945</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.6951</td>
<td>11.26</td>
<td>-0.3030</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.3352</td>
<td>10.76</td>
<td>-0.3979</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.2364</td>
<td>9.00</td>
<td>-0.4369</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2026</td>
<td>7.88</td>
<td>-0.2970</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1610</td>
<td>6.65</td>
<td>-0.2427</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.2515</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.2482</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.2453</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.1883</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NASA Full Span Flap VPI-8
**Flap Deflection:** 15 DEG.  
**Angle of Attack:** 10 DEG  
**Reynold’s No.:** 2.197E 06

<table>
<thead>
<tr>
<th>Port Row 1</th>
<th>Port Row 2</th>
<th>Port Row 3</th>
<th>Port Row 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.7421</td>
<td>12.76</td>
<td>-1.1575</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.0483</td>
<td>12.26</td>
<td>-1.1972</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.0326</td>
<td>11.76</td>
<td>-1.0592</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.1311</td>
<td>11.26</td>
<td>-0.5619</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.8614</td>
<td>10.76</td>
<td>-0.5619</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.6264</td>
<td>9.00</td>
<td>-0.4247</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2273</td>
<td>7.88</td>
<td>-0.3575</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2590</td>
<td>6.75</td>
<td>-0.3823</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.3327</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.3266</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3947</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2294</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### NASA Full Span Flap VPI-8

#### Flap Deflection: 15 Deg

<table>
<thead>
<tr>
<th>ANGLE OF ATTACK = 11 Deg</th>
<th>REYNOLD'S NO. = 2.184E06</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT ROW 1</td>
<td>X = 42.750</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.0789</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.1265</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.1807</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.2358</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.0602</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.8327</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2303</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2937</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3886</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2499</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3961</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANGLE OF ATTACK = 12 Deg</th>
<th>REYNOLD'S NO. = 2.202E06</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT ROW 1</td>
<td>X = 42.750</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.0959</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.1661</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.2541</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.3286</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.3800</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.9541</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2391</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3130</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3886</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2499</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3961</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANGLE OF ATTACK = 13 Deg</th>
<th>REYNOLD'S NO. = 2.211E06</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT ROW 1</td>
<td>X = 42.750</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.2151</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.2914</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.3704</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.3800</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.3259</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.1555</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2552</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3582</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3954</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2888</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3016</td>
</tr>
</tbody>
</table>
### NASA FULL SPAN FLAP VPI-8

**FLAP DEFORMATION: 15 DEG.**

**ANGLE OF ATTACK = 14 DEG**

**REYNOLD'S NO. = 2.198E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.3419</td>
<td>12.76</td>
<td>-1.3983</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.5157</td>
<td>12.76</td>
<td>-1.3250</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.6912</td>
<td>11.76</td>
<td>-1.3714</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.5923</td>
<td>11.26</td>
<td>-1.4105</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.5091</td>
<td>10.76</td>
<td>-1.4439</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.2175</td>
<td>9.00</td>
<td>-1.1495</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3161</td>
<td>7.88</td>
<td>-0.8572</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4033</td>
<td>6.75</td>
<td>-0.5941</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.4279</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.3884</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3320</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.3149</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NASA FULL SPAN FLAP VPI-8

**FLAP DEFORMATION: 15 DEG.**

**ANGLE OF ATTACK = 15 DEG**

**REYNOLD'S NO. = 2.189E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.4609</td>
<td>12.76</td>
<td>-1.3073</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.5293</td>
<td>12.26</td>
<td>-1.3420</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.6325</td>
<td>11.76</td>
<td>-1.3777</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.5025</td>
<td>11.26</td>
<td>-1.4339</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.7275</td>
<td>10.76</td>
<td>-1.4627</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.3800</td>
<td>9.90</td>
<td>-1.3925</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3466</td>
<td>7.88</td>
<td>-1.2542</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4650</td>
<td>6.75</td>
<td>-0.5967</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.3143</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.2923</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.4134</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.4071</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### CROPPED CONSTANT CHORD FLAP

**FLAP DEFORMATION: 26 DEG.**

**REYNOLD'S NO. = 2.235E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
<tr>
<td>Y</td>
<td>(C_p)</td>
<td>Y</td>
<td>(C_p)</td>
</tr>
<tr>
<td>-1.00</td>
<td>0.0277</td>
<td>-1.00</td>
<td>0.0520</td>
</tr>
<tr>
<td>1.00</td>
<td>0.0200</td>
<td>1.00</td>
<td>0.0110</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.0102</td>
<td>2.00</td>
<td>-0.0589</td>
</tr>
<tr>
<td>3.00</td>
<td>0.0859</td>
<td>3.00</td>
<td>-0.1193</td>
</tr>
<tr>
<td>4.00</td>
<td>0.2492</td>
<td>4.00</td>
<td>-0.1700</td>
</tr>
<tr>
<td>5.75</td>
<td>0.2051</td>
<td>5.75</td>
<td>-0.5504</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1834</td>
<td>6.75</td>
<td>-0.1931</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.1426</td>
<td>7.75</td>
<td>-0.2182</td>
</tr>
</tbody>
</table>

\[\text{Cp} = \frac{1}{\text{Y}}\]

### CROPPED CONSTANT CHORD FLAP

**FLAP DEFORMATION: 26 DEG.**

**REYNOLD'S NO. = 2.232E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
<tr>
<td>Y</td>
<td>(C_p)</td>
<td>Y</td>
<td>(C_p)</td>
</tr>
<tr>
<td>-1.00</td>
<td>0.2002</td>
<td>-1.00</td>
<td>0.2689</td>
</tr>
<tr>
<td>1.00</td>
<td>0.1658</td>
<td>1.00</td>
<td>-0.5620</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.1815</td>
<td>2.00</td>
<td>-0.2322</td>
</tr>
<tr>
<td>3.00</td>
<td>0.2645</td>
<td>3.00</td>
<td>-0.3104</td>
</tr>
<tr>
<td>4.00</td>
<td>0.4190</td>
<td>4.00</td>
<td>-0.4317</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.3663</td>
<td>5.75</td>
<td>-0.7919</td>
</tr>
<tr>
<td>6.75</td>
<td>0.3092</td>
<td>6.75</td>
<td>-0.2719</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.2669</td>
<td>7.75</td>
<td>-0.2542</td>
</tr>
</tbody>
</table>

\[\text{Cp} = \frac{1}{\text{Y}}\]

### CROPPED CONSTANT CHORD FLAP

**FLAP DEFORMATION: 26 DEG.**

**REYNOLD'S NO. = 2.229E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
<tr>
<td>Y</td>
<td>(C_p)</td>
<td>Y</td>
<td>(C_p)</td>
</tr>
<tr>
<td>-1.00</td>
<td>0.2930</td>
<td>-1.00</td>
<td>0.3179</td>
</tr>
<tr>
<td>1.00</td>
<td>-0.4734</td>
<td>1.00</td>
<td>-1.2909</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.4427</td>
<td>2.00</td>
<td>-1.5539</td>
</tr>
<tr>
<td>3.00</td>
<td>0.2865</td>
<td>3.00</td>
<td>-0.9669</td>
</tr>
<tr>
<td>4.00</td>
<td>0.5289</td>
<td>4.00</td>
<td>-0.4359</td>
</tr>
<tr>
<td>5.75</td>
<td>0.5605</td>
<td>5.75</td>
<td>-0.8977</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.5179</td>
<td>6.75</td>
<td>-0.3973</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.4132</td>
<td>7.75</td>
<td>-0.3494</td>
</tr>
</tbody>
</table>

\[\text{Cp} = \frac{1}{\text{Y}}\]

**NOTE:** \(Y\) VALUES ARE PERPENDICULAR TO THE FLAP LEADING EDGE
### Cropped Constant Chord Flap

**Flap Deflection:** 21 deg.  
**Angle of Attack:** 5 deg.  
**Reynold's No.:** 2.242E 06

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.300</td>
<td>-1.00</td>
<td>0.0682</td>
<td>0.0829</td>
<td>-1.00</td>
<td>0.0702</td>
<td>-1.00</td>
<td>0.0260</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.700</td>
<td>1.00</td>
<td>0.0564</td>
<td>0.0115</td>
<td>1.00</td>
<td>0.0249</td>
<td>1.00</td>
<td>0.0138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.200</td>
<td>3.00</td>
<td>-0.0396</td>
<td>0.00671</td>
<td>3.00</td>
<td>-0.0591</td>
<td>3.00</td>
<td>-0.1074</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.700</td>
<td>4.00</td>
<td>-0.0847</td>
<td>0.00699</td>
<td>3.00</td>
<td>-0.1450</td>
<td>3.00</td>
<td>-0.1890</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.75</td>
<td>5.75</td>
<td>-0.2037</td>
<td>0.00695</td>
<td>4.00</td>
<td>-0.2961</td>
<td>3.00</td>
<td>-0.3377</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.75</td>
<td>5.75</td>
<td>-0.2131</td>
<td>0.00747</td>
<td>5.75</td>
<td>-0.3785</td>
<td>5.75</td>
<td>-0.3031</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.75</td>
<td>5.75</td>
<td>-0.1597</td>
<td>0.00747</td>
<td>6.75</td>
<td>-0.2001</td>
<td>6.75</td>
<td>-0.1931</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.75</td>
<td>5.75</td>
<td>-0.1133</td>
<td>0.00747</td>
<td>7.75</td>
<td>-0.1792</td>
<td>7.75</td>
<td>-0.1790</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.75</td>
<td>5.75</td>
<td>-0.1252</td>
<td>0.00747</td>
<td>9.75</td>
<td>-0.1197</td>
<td>7.75</td>
<td>-0.1544</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.75</td>
<td>5.75</td>
<td>-0.1163</td>
<td>0.00747</td>
<td>11.75</td>
<td>-0.1388</td>
<td>10.75</td>
<td>-0.1436</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.75</td>
<td>5.75</td>
<td>-0.1168</td>
<td>0.00747</td>
<td>13.75</td>
<td>-0.1450</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cropped Constant Chord Flap

**Flap Deflection:** 21 deg.  
**Angle of Attack:** 10 deg.  
**Reynold's No.:** 2.231E 06

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.300</td>
<td>-1.00</td>
<td>0.1898</td>
<td>0.2499</td>
<td>-1.00</td>
<td>0.2309</td>
<td>-1.00</td>
<td>0.1815</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.700</td>
<td>1.00</td>
<td>-0.2465</td>
<td>0.0519</td>
<td>1.00</td>
<td>-0.8632</td>
<td>1.00</td>
<td>-0.8120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.200</td>
<td>3.00</td>
<td>-0.2763</td>
<td>0.3541</td>
<td>2.00</td>
<td>-0.7402</td>
<td>2.00</td>
<td>-0.8864</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.700</td>
<td>4.00</td>
<td>-0.2917</td>
<td>0.3110</td>
<td>3.00</td>
<td>-0.2874</td>
<td>3.00</td>
<td>-0.3677</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.75</td>
<td>5.75</td>
<td>-0.4235</td>
<td>0.4491</td>
<td>5.75</td>
<td>-0.7474</td>
<td>4.00</td>
<td>-0.5274</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.75</td>
<td>5.75</td>
<td>-0.2909</td>
<td>0.3916</td>
<td>6.75</td>
<td>-0.4828</td>
<td>5.75</td>
<td>-0.4403</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.75</td>
<td>5.75</td>
<td>-0.2618</td>
<td>0.3893</td>
<td>7.75</td>
<td>-0.2586</td>
<td>5.75</td>
<td>-0.9743</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.75</td>
<td>7.75</td>
<td>-0.3353</td>
<td>0.3085</td>
<td>8.75</td>
<td>-0.2385</td>
<td>7.75</td>
<td>-0.2947</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.75</td>
<td>7.75</td>
<td>-0.3254</td>
<td>0.2896</td>
<td>11.75</td>
<td>-0.2585</td>
<td>9.75</td>
<td>-0.2661</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.75</td>
<td>7.75</td>
<td>-0.2258</td>
<td>0.2233</td>
<td>13.75</td>
<td>-0.1849</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.75</td>
<td>7.75</td>
<td>-0.2258</td>
<td>0.2233</td>
<td>12.75</td>
<td>-0.2213</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.75</td>
<td>7.75</td>
<td>-0.2258</td>
<td>0.2233</td>
<td>13.75</td>
<td>-0.1849</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cropped Constant Chord Flap

**Flap Deflection:** 21 deg.  
**Angle of Attack:** 15 deg.  
**Reynold's No.:** 2.240E 06

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.300</td>
<td>-1.00</td>
<td>0.3893</td>
<td>0.3231</td>
<td>-1.00</td>
<td>0.3323</td>
<td>-1.00</td>
<td>0.2531</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.700</td>
<td>1.00</td>
<td>-1.3765</td>
<td>0.4197</td>
<td>1.00</td>
<td>-1.2324</td>
<td>1.00</td>
<td>-0.7348</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.200</td>
<td>3.00</td>
<td>-1.5656</td>
<td>0.4303</td>
<td>2.00</td>
<td>-1.3245</td>
<td>2.00</td>
<td>-0.7239</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50.700</td>
<td>4.00</td>
<td>-1.5544</td>
<td>0.3554</td>
<td>3.00</td>
<td>-1.3467</td>
<td>3.00</td>
<td>-0.7239</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.75</td>
<td>5.75</td>
<td>-0.5240</td>
<td>0.6010</td>
<td>5.75</td>
<td>-0.7544</td>
<td>5.75</td>
<td>-0.3566</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.75</td>
<td>5.75</td>
<td>-0.5240</td>
<td>0.6010</td>
<td>6.75</td>
<td>-0.4400</td>
<td>6.75</td>
<td>-0.9107</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.75</td>
<td>7.75</td>
<td>-0.3419</td>
<td>0.3190</td>
<td>7.75</td>
<td>-0.3015</td>
<td>7.75</td>
<td>-0.3597</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.75</td>
<td>7.75</td>
<td>-0.3725</td>
<td>0.2573</td>
<td>8.75</td>
<td>-0.2866</td>
<td>8.75</td>
<td>-0.6549</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.75</td>
<td>7.75</td>
<td>-0.3474</td>
<td>0.2573</td>
<td>9.75</td>
<td>-0.2767</td>
<td>8.75</td>
<td>-0.6549</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.75</td>
<td>7.75</td>
<td>-0.3284</td>
<td>0.2573</td>
<td>10.75</td>
<td>-0.2565</td>
<td>9.75</td>
<td>-0.1648</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.75</td>
<td>7.75</td>
<td>-0.3163</td>
<td>0.2332</td>
<td>11.75</td>
<td>-0.1356</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.75</td>
<td>7.75</td>
<td>-0.2521</td>
<td>0.2332</td>
<td>12.75</td>
<td>-0.1540</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.75</td>
<td>7.75</td>
<td>-0.2521</td>
<td>0.2332</td>
<td>13.75</td>
<td>-0.1540</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Y values are perpendicular to the flap leading edge.
### CROPPED CONSTANT CHORD FLAP

**FLAP DEFLECTION:** 31°

**ANGLE OF ATTACK:** 5°

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.00</td>
<td>-0.0746</td>
<td>-1.00</td>
<td>-0.1278</td>
<td>-1.00</td>
<td>0.0358</td>
<td>-1.00</td>
<td>-0.0331</td>
</tr>
<tr>
<td>1.00</td>
<td>-0.0475</td>
<td>1.00</td>
<td>-0.0940</td>
<td>1.00</td>
<td>0.0615</td>
<td>1.00</td>
<td>0.0748</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.0437</td>
<td>2.00</td>
<td>-0.0834</td>
<td>2.00</td>
<td>-0.0157</td>
<td>2.00</td>
<td>-0.0164</td>
</tr>
<tr>
<td>3.00</td>
<td>-0.0478</td>
<td>3.00</td>
<td>-0.0945</td>
<td>3.00</td>
<td>-0.0927</td>
<td>3.00</td>
<td>-0.1101</td>
</tr>
<tr>
<td>4.00</td>
<td>-0.0500</td>
<td>4.00</td>
<td>-0.0978</td>
<td>4.00</td>
<td>-0.2577</td>
<td>4.00</td>
<td>-0.2659</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.3490</td>
<td>5.75</td>
<td>-0.5602</td>
<td>5.75</td>
<td>-0.5541</td>
<td>5.75</td>
<td>-0.4556</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1630</td>
<td>6.75</td>
<td>-0.1611</td>
<td>6.75</td>
<td>-0.4535</td>
<td>6.75</td>
<td>-0.3775</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.1529</td>
<td>7.75</td>
<td>-0.1767</td>
<td>7.75</td>
<td>-0.3393</td>
<td>7.75</td>
<td>-0.4016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.75</td>
<td>-0.2354</td>
<td>8.75</td>
<td>-0.2559</td>
<td>8.75</td>
<td>-0.3019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.75</td>
<td>-0.1859</td>
<td>9.75</td>
<td>-0.1285</td>
<td>9.75</td>
<td>-0.2117</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.75</td>
<td>-0.1457</td>
<td>10.75</td>
<td>-0.1414</td>
<td>10.75</td>
<td>-0.1377</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.75</td>
<td>-0.1391</td>
<td>11.75</td>
<td>-0.1273</td>
<td>11.75</td>
<td>-0.1542</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CROPPED CONSTANT CHORD FLAP

**FLAP DEFLECTION:** 31°

**ANGLE OF ATTACK:** 10°

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.00</td>
<td>-0.0746</td>
<td>-1.00</td>
<td>-0.1278</td>
<td>-1.00</td>
<td>0.0358</td>
<td>-1.00</td>
<td>-0.0331</td>
</tr>
<tr>
<td>1.00</td>
<td>-0.0475</td>
<td>1.00</td>
<td>-0.0940</td>
<td>1.00</td>
<td>0.0615</td>
<td>1.00</td>
<td>0.0748</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.0437</td>
<td>2.00</td>
<td>-0.0834</td>
<td>2.00</td>
<td>-0.0157</td>
<td>2.00</td>
<td>-0.0164</td>
</tr>
<tr>
<td>3.00</td>
<td>-0.0478</td>
<td>3.00</td>
<td>-0.0945</td>
<td>3.00</td>
<td>-0.0927</td>
<td>3.00</td>
<td>-0.1101</td>
</tr>
<tr>
<td>4.00</td>
<td>-0.0500</td>
<td>4.00</td>
<td>-0.0978</td>
<td>4.00</td>
<td>-0.2577</td>
<td>4.00</td>
<td>-0.2659</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.3490</td>
<td>5.75</td>
<td>-0.5602</td>
<td>5.75</td>
<td>-0.5541</td>
<td>5.75</td>
<td>-0.4556</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1630</td>
<td>6.75</td>
<td>-0.1611</td>
<td>6.75</td>
<td>-0.4535</td>
<td>6.75</td>
<td>-0.3775</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.1529</td>
<td>7.75</td>
<td>-0.1767</td>
<td>7.75</td>
<td>-0.3393</td>
<td>7.75</td>
<td>-0.4016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.75</td>
<td>-0.2354</td>
<td>8.75</td>
<td>-0.2559</td>
<td>8.75</td>
<td>-0.3019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.75</td>
<td>-0.1859</td>
<td>9.75</td>
<td>-0.1285</td>
<td>9.75</td>
<td>-0.2117</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.75</td>
<td>-0.1457</td>
<td>10.75</td>
<td>-0.1414</td>
<td>10.75</td>
<td>-0.1377</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.75</td>
<td>-0.1391</td>
<td>11.75</td>
<td>-0.1273</td>
<td>11.75</td>
<td>-0.1542</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CROPPED CONSTANT CHORD FLAP

**FLAP DEFLECTION:** 31°

**ANGLE OF ATTACK:** 15°

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 9.300</td>
<td>X = 21.700</td>
<td>X = 36.200</td>
<td>X = 50.700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.00</td>
<td>-0.0746</td>
<td>-1.00</td>
<td>-0.1278</td>
<td>-1.00</td>
<td>0.0358</td>
<td>-1.00</td>
<td>-0.0331</td>
</tr>
<tr>
<td>1.00</td>
<td>-0.0475</td>
<td>1.00</td>
<td>-0.0940</td>
<td>1.00</td>
<td>0.0615</td>
<td>1.00</td>
<td>0.0748</td>
</tr>
<tr>
<td>2.00</td>
<td>-0.0437</td>
<td>2.00</td>
<td>-0.0834</td>
<td>2.00</td>
<td>-0.0157</td>
<td>2.00</td>
<td>-0.0164</td>
</tr>
<tr>
<td>3.00</td>
<td>-0.0478</td>
<td>3.00</td>
<td>-0.0945</td>
<td>3.00</td>
<td>-0.0927</td>
<td>3.00</td>
<td>-0.1101</td>
</tr>
<tr>
<td>4.00</td>
<td>-0.0500</td>
<td>4.00</td>
<td>-0.0978</td>
<td>4.00</td>
<td>-0.2577</td>
<td>4.00</td>
<td>-0.2659</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.3490</td>
<td>5.75</td>
<td>-0.5602</td>
<td>5.75</td>
<td>-0.5541</td>
<td>5.75</td>
<td>-0.4556</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1630</td>
<td>6.75</td>
<td>-0.1611</td>
<td>6.75</td>
<td>-0.4535</td>
<td>6.75</td>
<td>-0.3775</td>
</tr>
<tr>
<td>7.75</td>
<td>-0.1529</td>
<td>7.75</td>
<td>-0.1767</td>
<td>7.75</td>
<td>-0.3393</td>
<td>7.75</td>
<td>-0.4016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.75</td>
<td>-0.2354</td>
<td>8.75</td>
<td>-0.2559</td>
<td>8.75</td>
<td>-0.3019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.75</td>
<td>-0.1859</td>
<td>9.75</td>
<td>-0.1285</td>
<td>9.75</td>
<td>-0.2117</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.75</td>
<td>-0.1457</td>
<td>10.75</td>
<td>-0.1414</td>
<td>10.75</td>
<td>-0.1377</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.75</td>
<td>-0.1391</td>
<td>11.75</td>
<td>-0.1273</td>
<td>11.75</td>
<td>-0.1542</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Y VALUES ARE PERPENDICULAR TO THE FLAP LEADING EDGE
### NASA Full Span Flap VPI-8

**Flap Deflection: 30 Deg.**

Reynold's No. = 2.190E 06

#### Angle of Attack = 0 Deg

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>0.9181</td>
<td>12.76</td>
<td>0.2565</td>
</tr>
<tr>
<td>6.81</td>
<td>0.2895</td>
<td>12.66</td>
<td>0.1437</td>
</tr>
<tr>
<td>5.41</td>
<td>0.2235</td>
<td>11.76</td>
<td>0.1551</td>
</tr>
<tr>
<td>5.00</td>
<td>0.1543</td>
<td>11.26</td>
<td>0.0820</td>
</tr>
<tr>
<td>4.59</td>
<td>0.0521</td>
<td>10.76</td>
<td>0.0311</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.0443</td>
<td>9.00</td>
<td>-0.2359</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.0040</td>
<td>7.88</td>
<td>-0.0682</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.0061</td>
<td>6.75</td>
<td>-0.0592</td>
</tr>
<tr>
<td>5.63</td>
<td>0.0483</td>
<td>12.75</td>
<td>-0.0439</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.0491</td>
<td>11.63</td>
<td>-0.0437</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.0556</td>
<td>10.50</td>
<td>0.0140</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.0378</td>
<td>9.38</td>
<td>-0.0401</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>0.0737</td>
</tr>
</tbody>
</table>

#### Angle of Attack = 2 Deg

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>0.2595</td>
<td>12.76</td>
<td>0.2183</td>
</tr>
<tr>
<td>5.81</td>
<td>0.2013</td>
<td>12.26</td>
<td>0.1120</td>
</tr>
<tr>
<td>5.41</td>
<td>0.1399</td>
<td>11.76</td>
<td>0.0897</td>
</tr>
<tr>
<td>5.00</td>
<td>0.0609</td>
<td>11.26</td>
<td>0.0355</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.0478</td>
<td>10.75</td>
<td>-0.0498</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.1172</td>
<td>9.00</td>
<td>-0.3986</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.0617</td>
<td>7.88</td>
<td>0.1487</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.0575</td>
<td>6.75</td>
<td>-0.0994</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.1962</td>
<td>12.75</td>
<td>-0.0915</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.0931</td>
<td>11.63</td>
<td>-0.1865</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.1011</td>
<td>10.50</td>
<td>-0.0719</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.1893</td>
<td>9.38</td>
<td>-0.0738</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.25</td>
<td>-0.0833</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.1072</td>
</tr>
</tbody>
</table>

#### Angle of Attack = 4 Deg

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6.22</td>
<td>0.1524</td>
<td>12.76</td>
<td>0.1475</td>
</tr>
<tr>
<td>5.81</td>
<td>0.1125</td>
<td>12.26</td>
<td>0.0745</td>
</tr>
<tr>
<td>5.41</td>
<td>0.0450</td>
<td>11.76</td>
<td>0.0087</td>
</tr>
<tr>
<td>5.00</td>
<td>0.0359</td>
<td>11.26</td>
<td>0.0237</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.1521</td>
<td>10.76</td>
<td>-0.1418</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.2335</td>
<td>9.00</td>
<td>-0.5459</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2135</td>
<td>7.88</td>
<td>-0.3201</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1033</td>
<td>6.75</td>
<td>-0.1430</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.1833</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.2036</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.2209</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.1215</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.29</td>
<td>-0.1115</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.1370</td>
</tr>
</tbody>
</table>
### NASA Full Span Flap VPI-8

**Angle of Attack = 6 Deg.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_F</td>
<td>Y</td>
<td>C_F</td>
</tr>
<tr>
<td>6.22</td>
<td>0.0446</td>
<td>12.76</td>
<td>0.0375</td>
</tr>
<tr>
<td>5.81</td>
<td>0.0055</td>
<td>12.26</td>
<td>0.0290</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.0554</td>
<td>11.76</td>
<td>-0.0897</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.1330</td>
<td>11.26</td>
<td>-0.1938</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.2546</td>
<td>10.76</td>
<td>-0.2591</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.3254</td>
<td>9.00</td>
<td>-0.6675</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2081</td>
<td>7.88</td>
<td>-0.3337</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1493</td>
<td>6.75</td>
<td>-0.1533</td>
</tr>
</tbody>
</table>

**Angle of Attack = 8 Deg.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_F</td>
<td>Y</td>
<td>C_F</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.3168</td>
<td>12.76</td>
<td>-0.0891</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.2002</td>
<td>12.26</td>
<td>-0.0329</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.1608</td>
<td>11.76</td>
<td>-0.1969</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.2689</td>
<td>11.26</td>
<td>-0.1771</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.3657</td>
<td>10.76</td>
<td>-0.3302</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.4375</td>
<td>9.00</td>
<td>-0.7865</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3075</td>
<td>7.88</td>
<td>-0.7576</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1987</td>
<td>6.75</td>
<td>-0.1993</td>
</tr>
</tbody>
</table>

**Angle of Attack = 10 Deg.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_F</td>
<td>Y</td>
<td>C_F</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.7286</td>
<td>12.76</td>
<td>-0.6710</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.5213</td>
<td>12.26</td>
<td>-0.4300</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.2739</td>
<td>11.76</td>
<td>-0.2554</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.3186</td>
<td>11.26</td>
<td>-0.2435</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.4582</td>
<td>10.76</td>
<td>-0.3538</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.5088</td>
<td>9.00</td>
<td>-0.8774</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3975</td>
<td>7.88</td>
<td>-0.9478</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2497</td>
<td>6.75</td>
<td>-0.2751</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2315</td>
<td>9.38</td>
<td>-0.1347</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2124</td>
<td>7.13</td>
<td>-0.1242</td>
</tr>
</tbody>
</table>
NASA FULL SPAN FLAP VPI-8
FLAP DEFLECTION: 30 DEG.

ANGLE OF ATTACK = 11 DEG
REYNOLD'S NO. = 2.184E06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>5.32</td>
<td>-0.8896</td>
<td>12.76</td>
<td>-0.7921</td>
</tr>
<tr>
<td>5.31</td>
<td>-0.8036</td>
<td>12.26</td>
<td>-0.5657</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.4339</td>
<td>11.76</td>
<td>-0.5024</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.3380</td>
<td>11.26</td>
<td>-0.4709</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.4872</td>
<td>10.76</td>
<td>-0.4144</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.5574</td>
<td>9.00</td>
<td>-0.8922</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4490</td>
<td>7.88</td>
<td>-1.0157</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2752</td>
<td>6.75</td>
<td>-0.3406</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.2592</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.2825</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2436</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NASA FULL SPAN FLAP VPI-8
FLAP DEFLECTION: 30 DEG.

ANGLE OF ATTACK = 12 DEG
REYNOLD'S NO. = 2.190E06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>5.32</td>
<td>-1.0332</td>
<td>12.76</td>
<td>-0.9537</td>
</tr>
<tr>
<td>5.31</td>
<td>-1.0317</td>
<td>12.26</td>
<td>-0.7190</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.7462</td>
<td>11.76</td>
<td>-0.8927</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.4788</td>
<td>11.26</td>
<td>-0.3146</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.4941</td>
<td>10.76</td>
<td>-0.4389</td>
</tr>
<tr>
<td>2.38</td>
<td>-0.6067</td>
<td>9.00</td>
<td>-0.8795</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4905</td>
<td>7.88</td>
<td>-1.0376</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2966</td>
<td>6.75</td>
<td>-0.4022</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.3002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.3157</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3306</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2560</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NASA FULL SPAN FLAP VPI-8
FLAP DEFLECTION: 30 DEG.

ANGLE OF ATTACK = 13 DEG
REYNOLD'S NO. = 2.190E06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cp</td>
<td>Y</td>
<td>Cp</td>
</tr>
<tr>
<td>5.32</td>
<td>-1.1487</td>
<td>12.76</td>
<td>-1.1415</td>
</tr>
<tr>
<td>5.31</td>
<td>-1.1930</td>
<td>12.26</td>
<td>-0.3933</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.0797</td>
<td>11.76</td>
<td>-1.0764</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.7565</td>
<td>11.26</td>
<td>-0.5200</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.5729</td>
<td>10.76</td>
<td>-0.5298</td>
</tr>
<tr>
<td>2.38</td>
<td>-0.6612</td>
<td>9.00</td>
<td>-0.8473</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4944</td>
<td>7.88</td>
<td>-1.0700</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3169</td>
<td>6.75</td>
<td>-0.4390</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.3578</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.3658</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3574</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2666</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### NASA Full Span Flap VPI-8

**Flap Deflection:** 30 Deg.

**Angle of Attack** = 14 Deg.

**Reynold's No.** = 2.187E 06

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42.750</td>
<td>6.22</td>
<td>-1.2408</td>
<td>12.76</td>
<td>-1.3195</td>
<td>20.10</td>
<td>-1.3821</td>
<td>27.72</td>
<td>-0.7858</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>32.125</td>
<td>5.81</td>
<td>-1.2937</td>
<td>12.26</td>
<td>-1.0734</td>
<td>19.60</td>
<td>-1.4126</td>
<td>27.16</td>
<td>-0.7958</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>19.625</td>
<td>5.41</td>
<td>-1.3269</td>
<td>11.76</td>
<td>-1.3458</td>
<td>19.10</td>
<td>-1.5128</td>
<td>26.60</td>
<td>-0.8098</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7.125</td>
<td>5.00</td>
<td>-1.0993</td>
<td>11.26</td>
<td>-0.7713</td>
<td>18.60</td>
<td>-1.3323</td>
<td>26.04</td>
<td>-0.8103</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-0.7282</td>
<td>4.59</td>
<td>-0.7282</td>
<td>10.76</td>
<td>-0.6836</td>
<td>18.10</td>
<td>-0.7666</td>
<td>25.47</td>
<td>-0.7570</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-0.7788</td>
<td>2.88</td>
<td>-0.7788</td>
<td>9.00</td>
<td>-0.7972</td>
<td>16.13</td>
<td>-0.7736</td>
<td>23.56</td>
<td>-0.7276</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-0.4729</td>
<td>1.75</td>
<td>-0.4729</td>
<td>7.88</td>
<td>-1.0259</td>
<td>15.00</td>
<td>-0.7013</td>
<td>22.44</td>
<td>-0.7351</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-0.3419</td>
<td>0.63</td>
<td>-0.3419</td>
<td>6.75</td>
<td>-0.4983</td>
<td>13.88</td>
<td>-0.6192</td>
<td>21.31</td>
<td>-0.6321</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-0.4470</td>
<td>5.63</td>
<td>-0.4470</td>
<td>12.75</td>
<td>-0.6339</td>
<td>20.19</td>
<td>-0.6455</td>
<td>19.06</td>
<td>-0.5550</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-0.4372</td>
<td>4.50</td>
<td>-0.4372</td>
<td>11.63</td>
<td>-0.6581</td>
<td>19.06</td>
<td>-0.6550</td>
<td>17.94</td>
<td>-0.5302</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>-0.3638</td>
<td>3.38</td>
<td>-0.3638</td>
<td>10.50</td>
<td>-0.5287</td>
<td>17.94</td>
<td>-0.5302</td>
<td>16.81</td>
<td>-0.4602</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-0.2790</td>
<td>2.25</td>
<td>-0.2790</td>
<td>9.38</td>
<td>-0.3073</td>
<td>16.81</td>
<td>-0.4602</td>
<td>15.69</td>
<td>-0.4102</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NASA Full Span Flap VPI-8

**Flap Deflection:** 30 Deg.

**Angle of Attack** = 15 Deg.

**Reynold's No.** = 2.179E 06

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
<th>Port Row</th>
<th>X</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42.750</td>
<td>6.22</td>
<td>-1.3614</td>
<td>12.76</td>
<td>-1.5116</td>
<td>20.10</td>
<td>-1.4334</td>
<td>27.72</td>
<td>-0.7931</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>32.125</td>
<td>5.81</td>
<td>-1.4060</td>
<td>12.26</td>
<td>-1.2073</td>
<td>19.60</td>
<td>-1.4749</td>
<td>27.16</td>
<td>-0.7330</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>19.625</td>
<td>5.41</td>
<td>-1.4639</td>
<td>11.76</td>
<td>-1.6383</td>
<td>19.10</td>
<td>-1.5426</td>
<td>26.60</td>
<td>-0.7647</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7.125</td>
<td>5.00</td>
<td>-1.3610</td>
<td>11.26</td>
<td>-1.1696</td>
<td>18.60</td>
<td>-1.5976</td>
<td>26.04</td>
<td>-0.7948</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-0.9567</td>
<td>4.59</td>
<td>-0.9567</td>
<td>10.76</td>
<td>-0.9259</td>
<td>18.10</td>
<td>-1.6173</td>
<td>25.47</td>
<td>-0.7711</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-0.9915</td>
<td>2.88</td>
<td>-0.9915</td>
<td>9.00</td>
<td>-0.7973</td>
<td>16.13</td>
<td>-0.9044</td>
<td>23.56</td>
<td>-0.7829</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-0.4263</td>
<td>1.75</td>
<td>-0.4263</td>
<td>7.88</td>
<td>-0.8935</td>
<td>15.00</td>
<td>-0.7818</td>
<td>22.44</td>
<td>-0.9778</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>-0.3638</td>
<td>0.63</td>
<td>-0.3638</td>
<td>6.75</td>
<td>-0.5527</td>
<td>13.88</td>
<td>-0.6825</td>
<td>21.31</td>
<td>-1.0348</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-0.5822</td>
<td>5.63</td>
<td>-0.5822</td>
<td>12.75</td>
<td>-0.6479</td>
<td>20.19</td>
<td>-1.0336</td>
<td>19.06</td>
<td>-0.7058</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-0.5149</td>
<td>4.50</td>
<td>-0.5149</td>
<td>11.63</td>
<td>-0.6049</td>
<td>19.06</td>
<td>-0.7058</td>
<td>17.94</td>
<td>-0.4411</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>-0.3864</td>
<td>3.38</td>
<td>-0.3864</td>
<td>10.50</td>
<td>-0.5239</td>
<td>17.94</td>
<td>-0.4411</td>
<td>16.81</td>
<td>-0.3298</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-0.2991</td>
<td>2.25</td>
<td>-0.2991</td>
<td>9.38</td>
<td>-0.4088</td>
<td>16.81</td>
<td>-0.3298</td>
<td>15.69</td>
<td>-0.2864</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>-0.3990</td>
<td>7.13</td>
<td>-0.3990</td>
<td>7.13</td>
<td>-0.3990</td>
<td>7.13</td>
<td>-0.3990</td>
<td>7.13</td>
<td>-0.3990</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PORT ROW 1</td>
<td>PORT ROW 2</td>
<td>PORT ROW 3</td>
<td>PORT ROW 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.22</td>
<td>-0.1732</td>
<td>12.76</td>
<td>-0.4892</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.81</td>
<td>-0.0970</td>
<td>12.26</td>
<td>-0.1027</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.41</td>
<td>-0.1755</td>
<td>11.76</td>
<td>-0.1625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.00</td>
<td>-0.2571</td>
<td>11.76</td>
<td>-0.2655</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.89</td>
<td>-0.4137</td>
<td>10.76</td>
<td>-0.3793</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.38</td>
<td>-0.3597</td>
<td>9.00</td>
<td>-0.4526</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2395</td>
<td>7.88</td>
<td>-0.3132</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2119</td>
<td>6.75</td>
<td>-0.2540</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.63</td>
<td>-0.2761</td>
<td>12.75</td>
<td>-0.2675</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.50</td>
<td>-0.2307</td>
<td>11.63</td>
<td>-0.2633</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.38</td>
<td>-0.2252</td>
<td>10.50</td>
<td>-0.2427</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2029</td>
<td>9.38</td>
<td>-0.1888</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.25</td>
<td>-0.1954</td>
<td>16.89</td>
<td>-0.2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2064</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.6738</td>
<td>12.76</td>
<td>-0.5905</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.3904</td>
<td>12.26</td>
<td>-0.7745</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.2412</td>
<td>11.76</td>
<td>-0.4376</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.3527</td>
<td>11.26</td>
<td>-0.3517</td>
</tr>
<tr>
<td>4.89</td>
<td>-0.5269</td>
<td>10.76</td>
<td>-0.4968</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.4376</td>
<td>9.00</td>
<td>-0.4599</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3246</td>
<td>7.88</td>
<td>-0.4219</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2659</td>
<td>6.75</td>
<td>-0.3294</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.3407</td>
<td>12.98</td>
<td>-0.4021</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.2796</td>
<td>11.63</td>
<td>-0.3032</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.2693</td>
<td>10.50</td>
<td>-0.2767</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2360</td>
<td>9.38</td>
<td>-0.2456</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.2443</td>
<td>15.69</td>
<td>-0.2182</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2332</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.8764</td>
<td>12.76</td>
<td>-0.6163</td>
</tr>
<tr>
<td>5.81</td>
<td>-0.6608</td>
<td>12.26</td>
<td>-0.8929</td>
</tr>
<tr>
<td>5.41</td>
<td>-0.3380</td>
<td>11.76</td>
<td>-0.8995</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.3729</td>
<td>11.26</td>
<td>-0.4953</td>
</tr>
<tr>
<td>4.89</td>
<td>-0.5693</td>
<td>10.76</td>
<td>-0.5113</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.4960</td>
<td>9.00</td>
<td>-0.5048</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3636</td>
<td>7.88</td>
<td>-0.4701</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2949</td>
<td>6.75</td>
<td>-0.3716</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.3862</td>
<td>12.75</td>
<td>-0.3852</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.3096</td>
<td>11.63</td>
<td>-0.3586</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.2993</td>
<td>10.50</td>
<td>-0.3091</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2437</td>
<td>9.38</td>
<td>-0.2405</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.2443</td>
<td>15.69</td>
<td>-0.2182</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2481</td>
</tr>
</tbody>
</table>
### NASA Full Span Flap VPI-8 (Rounded Hingeline)

**FLAP DEFORMATION: 30 DEG.**

<table>
<thead>
<tr>
<th>Angle of Attack</th>
<th>Reynolds' No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 DEG.</td>
<td>1.342E+06</td>
</tr>
<tr>
<td>13 DEG.</td>
<td>1.332E+06</td>
</tr>
<tr>
<td>14 DEG.</td>
<td>1.332E+06</td>
</tr>
</tbody>
</table>

#### PORT ROW 1

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X (inches)</th>
<th>Y (Cp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42.750</td>
<td>6.22</td>
</tr>
<tr>
<td>2</td>
<td>42.76</td>
<td>5.81</td>
</tr>
<tr>
<td>3</td>
<td>5.41</td>
<td>5.00</td>
</tr>
<tr>
<td>4</td>
<td>2.88</td>
<td>2.68</td>
</tr>
</tbody>
</table>

#### PORT ROW 2

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X (inches)</th>
<th>Y (Cp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32.125</td>
<td>12.76</td>
</tr>
<tr>
<td>2</td>
<td>12.76</td>
<td>12.76</td>
</tr>
<tr>
<td>3</td>
<td>5.41</td>
<td>5.41</td>
</tr>
<tr>
<td>4</td>
<td>2.88</td>
<td>2.88</td>
</tr>
</tbody>
</table>

#### PORT ROW 3

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X (inches)</th>
<th>Y (Cp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.625</td>
<td>20.10</td>
</tr>
<tr>
<td>2</td>
<td>19.63</td>
<td>19.63</td>
</tr>
<tr>
<td>3</td>
<td>19.63</td>
<td>19.63</td>
</tr>
<tr>
<td>4</td>
<td>19.63</td>
<td>19.63</td>
</tr>
</tbody>
</table>

#### PORT ROW 4

<table>
<thead>
<tr>
<th>Port Row</th>
<th>X (inches)</th>
<th>Y (Cp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.125</td>
<td>7.125</td>
</tr>
<tr>
<td>2</td>
<td>7.125</td>
<td>7.125</td>
</tr>
<tr>
<td>3</td>
<td>7.125</td>
<td>7.125</td>
</tr>
<tr>
<td>4</td>
<td>7.125</td>
<td>7.125</td>
</tr>
<tr>
<td>PORT ROW 1</td>
<td>PORT ROW 2</td>
<td>PORT ROW 3</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
</tr>
</tbody>
</table>

### NASA FULL SPAN FLAP VPI-8 (ROUNDED HINGELINE)

**ANGLE OF ATTACK = 15 DEG**

**FLAP DEFLECTION:** 30 DEG.

**REYNOLD'S NO.** = 1.328E 06

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.22</td>
<td>-1.5339</td>
<td>12.76</td>
<td>-0.8889</td>
<td>20.10</td>
<td>-1.6751</td>
<td>27.72</td>
<td>-1.0218</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.5642</td>
<td>12.26</td>
<td>-1.6624</td>
<td>19.60</td>
<td>-1.7196</td>
<td>27.16</td>
<td>-1.0268</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.2546</td>
<td>11.76</td>
<td>-1.3167</td>
<td>19.10</td>
<td>-1.8283</td>
<td>26.60</td>
<td>-1.0726</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.7847</td>
<td>10.76</td>
<td>-1.3528</td>
<td>18.60</td>
<td>-1.7126</td>
<td>26.04</td>
<td>-1.0307</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.7742</td>
<td>9.00</td>
<td>-0.6414</td>
<td>16.13</td>
<td>-0.7729</td>
<td>23.56</td>
<td>-0.6902</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4523</td>
<td>7.88</td>
<td>-0.6104</td>
<td>15.00</td>
<td>-0.6546</td>
<td>22.44</td>
<td>-0.9144</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4071</td>
<td>6.75</td>
<td>-0.4808</td>
<td>13.88</td>
<td>-0.5377</td>
<td>21.31</td>
<td>-0.7116</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.5550</td>
<td>12.75</td>
<td>-0.5702</td>
<td>20.19</td>
<td>-0.5924</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.4889</td>
<td>11.63</td>
<td>-0.5169</td>
<td>19.06</td>
<td>-0.5885</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3730</td>
<td>10.50</td>
<td>-0.4244</td>
<td>17.94</td>
<td>-0.4926</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.3110</td>
<td>9.38</td>
<td>-0.3334</td>
<td>16.81</td>
<td>-0.4000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.25</td>
<td>-0.3414</td>
<td>7.13</td>
<td>-0.3425</td>
<td>15.69</td>
<td>-0.3165</td>
</tr>
</tbody>
</table>

### NASA FULL SPAN FLAP VPI-8 (ROUNDED HINGELINE)

**ANGLE OF ATTACK = 16 DEG**

**FLAP DEFLECTION:** 30 DEG.

**REYNOLD'S NO.** = 1.320E 06

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.22</td>
<td>-1.4873</td>
<td>12.76</td>
<td>-1.1139</td>
<td>20.10</td>
<td>-1.7094</td>
<td>27.72</td>
<td>-0.8626</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.6939</td>
<td>12.26</td>
<td>-1.8445</td>
<td>19.60</td>
<td>-1.7874</td>
<td>27.16</td>
<td>-0.8699</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.7795</td>
<td>11.76</td>
<td>-2.0067</td>
<td>19.10</td>
<td>-1.8880</td>
<td>26.60</td>
<td>-1.0288</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.6803</td>
<td>11.26</td>
<td>-2.0509</td>
<td>18.60</td>
<td>-1.9209</td>
<td>26.04</td>
<td>-1.0053</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.1548</td>
<td>10.76</td>
<td>-1.7675</td>
<td>18.10</td>
<td>-1.6024</td>
<td>25.47</td>
<td>-0.9696</td>
</tr>
<tr>
<td>2.88</td>
<td>-0.8786</td>
<td>9.00</td>
<td>-0.5639</td>
<td>16.13</td>
<td>-0.8918</td>
<td>23.45</td>
<td>-0.9001</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4387</td>
<td>7.88</td>
<td>-0.6168</td>
<td>15.00</td>
<td>-0.7245</td>
<td>21.31</td>
<td>-1.0311</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4383</td>
<td>6.75</td>
<td>-0.5177</td>
<td>13.88</td>
<td>-0.6660</td>
<td>21.31</td>
<td>-1.0651</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.6073</td>
<td>12.75</td>
<td>-0.6236</td>
<td>20.19</td>
<td>-0.8224</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.5222</td>
<td>11.63</td>
<td>-0.5327</td>
<td>19.06</td>
<td>-0.6183</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.3945</td>
<td>10.50</td>
<td>-0.4334</td>
<td>17.94</td>
<td>-0.6831</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.3346</td>
<td>9.38</td>
<td>-0.3539</td>
<td>16.81</td>
<td>-0.3332</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.25</td>
<td>-0.3823</td>
<td>7.13</td>
<td>-0.3933</td>
<td>15.69</td>
<td>-0.2908</td>
</tr>
</tbody>
</table>

### NASA FULL SPAN FLAP VPI-8 (ROUNDED HINGELINE)

**ANGLE OF ATTACK = 18 DEG**

**FLAP DEFLECTION:** 30 DEG.

**REYNOLD'S NO.** = 1.314E 06

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.22</td>
<td>-1.8178</td>
<td>12.76</td>
<td>-1.8000</td>
<td>20.10</td>
<td>-1.5531</td>
<td>27.72</td>
<td>-0.6870</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.8456</td>
<td>12.26</td>
<td>-2.2417</td>
<td>19.60</td>
<td>-1.5651</td>
<td>27.16</td>
<td>-0.6681</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.9258</td>
<td>11.76</td>
<td>-2.5794</td>
<td>19.10</td>
<td>-1.5921</td>
<td>26.60</td>
<td>-0.7087</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.6298</td>
<td>11.26</td>
<td>-2.8006</td>
<td>18.60</td>
<td>-1.6205</td>
<td>26.04</td>
<td>-0.7376</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.8222</td>
<td>10.76</td>
<td>-2.4473</td>
<td>18.10</td>
<td>-1.6619</td>
<td>25.47</td>
<td>-0.7689</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.0801</td>
<td>9.00</td>
<td>-0.6960</td>
<td>16.13</td>
<td>-1.8488</td>
<td>23.56</td>
<td>-0.9052</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4642</td>
<td>7.88</td>
<td>-0.6590</td>
<td>15.00</td>
<td>-1.0248</td>
<td>22.44</td>
<td>-1.0017</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4998</td>
<td>6.75</td>
<td>-0.6408</td>
<td>13.88</td>
<td>-0.6358</td>
<td>21.31</td>
<td>-0.8997</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.7873</td>
<td>12.75</td>
<td>-0.5172</td>
<td>20.19</td>
<td>-0.9611</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.5493</td>
<td>11.63</td>
<td>-0.4374</td>
<td>19.06</td>
<td>-0.7846</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.4090</td>
<td>10.50</td>
<td>-0.3339</td>
<td>17.94</td>
<td>-0.4926</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.3794</td>
<td>9.38</td>
<td>-0.3769</td>
<td>16.81</td>
<td>-0.3029</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8.25</td>
<td>-0.4349</td>
<td>7.13</td>
<td>-0.4666</td>
<td>15.69</td>
<td>-0.3063</td>
</tr>
</tbody>
</table>
NASA FULL SPAN FLAP VPI-8 (ROUNDED HINGELINE)
ANGLE OF ATTACK = 20 DEG
FLAP DEFORMATION: 30 DEG
REYNOLDS NO. = 1.295E 06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.9474</td>
<td>12.76</td>
<td>-3.4920</td>
</tr>
<tr>
<td>5.41</td>
<td>-1.9704</td>
<td>11.76</td>
<td>-2.5519</td>
</tr>
<tr>
<td>5.00</td>
<td>-2.1078</td>
<td>11.26</td>
<td>-2.7179</td>
</tr>
<tr>
<td>4.59</td>
<td>-2.0688</td>
<td>10.76</td>
<td>-2.7497</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.0898</td>
<td>9.00</td>
<td>-0.7878</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.5362</td>
<td>7.88</td>
<td>-0.7716</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.5951</td>
<td>6.75</td>
<td>-0.8606</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.5065</td>
<td>5.63</td>
<td>-0.7994</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.4570</td>
<td>4.50</td>
<td>-0.4553</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.4397</td>
<td>3.38</td>
<td>-0.4526</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.4853</td>
<td>2.25</td>
<td>-0.5267</td>
</tr>
</tbody>
</table>
### NASA Part Span Flap VPI-10 (No FUSELAGE)

**Flap Deflection:** 30 deg.

**Angle of Attack:**
- Port Row 1: 0 deg.
- Port Row 2: 2 deg.
- Port Row 3: 4 deg.

**Reynold's No.:** 2.236E06

### Table 1: Port Row 1

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.88</td>
<td>-0.2686</td>
</tr>
<tr>
<td>1.75</td>
<td>0.0135</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.0224</td>
</tr>
</tbody>
</table>

### Table 2: Port Row 2

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>0.2591</td>
</tr>
<tr>
<td>12.26</td>
<td>0.2203</td>
</tr>
<tr>
<td>11.76</td>
<td>0.1778</td>
</tr>
<tr>
<td>11.26</td>
<td>0.1697</td>
</tr>
<tr>
<td>9.76</td>
<td>0.1800</td>
</tr>
<tr>
<td>8.88</td>
<td>0.0714</td>
</tr>
<tr>
<td>6.75</td>
<td>0.0651</td>
</tr>
<tr>
<td>5.63</td>
<td>0.0547</td>
</tr>
<tr>
<td>4.50</td>
<td>0.0444</td>
</tr>
<tr>
<td>3.38</td>
<td>0.0334</td>
</tr>
<tr>
<td>2.25</td>
<td>0.0265</td>
</tr>
</tbody>
</table>

### Table 3: Port Row 3

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.10</td>
<td>0.1820</td>
</tr>
<tr>
<td>18.60</td>
<td>0.0858</td>
</tr>
<tr>
<td>18.13</td>
<td>-0.0093</td>
</tr>
<tr>
<td>17.60</td>
<td>0.1465</td>
</tr>
<tr>
<td>17.14</td>
<td>0.0738</td>
</tr>
<tr>
<td>16.68</td>
<td>0.0659</td>
</tr>
<tr>
<td>16.21</td>
<td>0.0444</td>
</tr>
<tr>
<td>15.80</td>
<td>0.0530</td>
</tr>
<tr>
<td>15.39</td>
<td>0.0430</td>
</tr>
<tr>
<td>14.98</td>
<td>0.0315</td>
</tr>
<tr>
<td>14.63</td>
<td>-0.0139</td>
</tr>
<tr>
<td>14.23</td>
<td>0.0572</td>
</tr>
<tr>
<td>13.83</td>
<td>0.0984</td>
</tr>
<tr>
<td>13.43</td>
<td>0.0743</td>
</tr>
<tr>
<td>13.03</td>
<td>0.0215</td>
</tr>
<tr>
<td>12.63</td>
<td>0.0101</td>
</tr>
<tr>
<td>12.23</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

### Table 4: Port Row 4

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.72</td>
<td>0.2413</td>
</tr>
<tr>
<td>27.21</td>
<td>0.1702</td>
</tr>
<tr>
<td>26.80</td>
<td>0.1080</td>
</tr>
<tr>
<td>26.38</td>
<td>0.0438</td>
</tr>
<tr>
<td>25.97</td>
<td>-0.3336</td>
</tr>
<tr>
<td>25.56</td>
<td>0.0346</td>
</tr>
<tr>
<td>25.16</td>
<td>0.0085</td>
</tr>
<tr>
<td>24.76</td>
<td>0.0029</td>
</tr>
<tr>
<td>24.36</td>
<td>-0.0063</td>
</tr>
<tr>
<td>23.96</td>
<td>-0.0003</td>
</tr>
<tr>
<td>23.56</td>
<td>0.0438</td>
</tr>
<tr>
<td>23.16</td>
<td>-0.0013</td>
</tr>
<tr>
<td>22.76</td>
<td>-0.0050</td>
</tr>
<tr>
<td>22.36</td>
<td>-0.0003</td>
</tr>
<tr>
<td>21.96</td>
<td>0.0113</td>
</tr>
<tr>
<td>21.56</td>
<td>0.0029</td>
</tr>
<tr>
<td>21.16</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

### Table 5: Port Row 5

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.72</td>
<td>0.2178</td>
</tr>
<tr>
<td>27.21</td>
<td>0.1702</td>
</tr>
<tr>
<td>26.80</td>
<td>0.1080</td>
</tr>
<tr>
<td>26.38</td>
<td>0.0438</td>
</tr>
<tr>
<td>25.97</td>
<td>-0.3336</td>
</tr>
<tr>
<td>25.56</td>
<td>0.0346</td>
</tr>
<tr>
<td>25.16</td>
<td>0.0085</td>
</tr>
<tr>
<td>24.76</td>
<td>0.0029</td>
</tr>
<tr>
<td>24.36</td>
<td>-0.0063</td>
</tr>
<tr>
<td>23.96</td>
<td>-0.0003</td>
</tr>
<tr>
<td>23.56</td>
<td>0.0438</td>
</tr>
<tr>
<td>23.16</td>
<td>-0.0013</td>
</tr>
<tr>
<td>22.76</td>
<td>-0.0050</td>
</tr>
<tr>
<td>22.36</td>
<td>-0.0003</td>
</tr>
<tr>
<td>21.96</td>
<td>0.0113</td>
</tr>
<tr>
<td>21.56</td>
<td>0.0029</td>
</tr>
<tr>
<td>21.16</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

### Table 6: Port Row 6

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.15</td>
<td>-0.0980</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.0646</td>
</tr>
<tr>
<td>6.35</td>
<td>-0.0135</td>
</tr>
<tr>
<td>6.05</td>
<td>-0.0860</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.1001</td>
</tr>
<tr>
<td>5.45</td>
<td>-0.1252</td>
</tr>
<tr>
<td>5.15</td>
<td>-0.1503</td>
</tr>
<tr>
<td>4.85</td>
<td>-0.1754</td>
</tr>
<tr>
<td>4.55</td>
<td>-0.2006</td>
</tr>
<tr>
<td>4.25</td>
<td>-0.2257</td>
</tr>
<tr>
<td>3.95</td>
<td>-0.2509</td>
</tr>
<tr>
<td>3.65</td>
<td>-0.2761</td>
</tr>
<tr>
<td>3.35</td>
<td>-0.3012</td>
</tr>
<tr>
<td>3.05</td>
<td>-0.3264</td>
</tr>
<tr>
<td>2.75</td>
<td>-0.3516</td>
</tr>
<tr>
<td>2.45</td>
<td>-0.3768</td>
</tr>
<tr>
<td>2.15</td>
<td>-0.4020</td>
</tr>
<tr>
<td>1.85</td>
<td>-0.4272</td>
</tr>
<tr>
<td>1.55</td>
<td>-0.4524</td>
</tr>
<tr>
<td>1.25</td>
<td>-0.4776</td>
</tr>
<tr>
<td>0.95</td>
<td>-0.5028</td>
</tr>
<tr>
<td>0.65</td>
<td>-0.5280</td>
</tr>
<tr>
<td>0.35</td>
<td>-0.5532</td>
</tr>
<tr>
<td>0.05</td>
<td>-0.5784</td>
</tr>
</tbody>
</table>

### Table 7: Port Row 7

<table>
<thead>
<tr>
<th>Y</th>
<th>C_p</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.15</td>
<td>-0.0980</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.0646</td>
</tr>
<tr>
<td>6.35</td>
<td>-0.0135</td>
</tr>
<tr>
<td>6.05</td>
<td>-0.0860</td>
</tr>
<tr>
<td>5.75</td>
<td>-0.1001</td>
</tr>
<tr>
<td>5.45</td>
<td>-0.1252</td>
</tr>
<tr>
<td>5.15</td>
<td>-0.1503</td>
</tr>
<tr>
<td>4.85</td>
<td>-0.1754</td>
</tr>
<tr>
<td>4.55</td>
<td>-0.2006</td>
</tr>
<tr>
<td>4.25</td>
<td>-0.2257</td>
</tr>
<tr>
<td>3.95</td>
<td>-0.2509</td>
</tr>
<tr>
<td>3.65</td>
<td>-0.2761</td>
</tr>
<tr>
<td>3.35</td>
<td>-0.3012</td>
</tr>
<tr>
<td>3.05</td>
<td>-0.3264</td>
</tr>
<tr>
<td>2.75</td>
<td>-0.3516</td>
</tr>
<tr>
<td>2.45</td>
<td>-0.3768</td>
</tr>
<tr>
<td>2.15</td>
<td>-0.4020</td>
</tr>
<tr>
<td>1.85</td>
<td>-0.4272</td>
</tr>
<tr>
<td>1.55</td>
<td>-0.4524</td>
</tr>
<tr>
<td>1.25</td>
<td>-0.4776</td>
</tr>
<tr>
<td>0.95</td>
<td>-0.5028</td>
</tr>
<tr>
<td>0.65</td>
<td>-0.5280</td>
</tr>
<tr>
<td>0.35</td>
<td>-0.5532</td>
</tr>
<tr>
<td>0.05</td>
<td>-0.5784</td>
</tr>
<tr>
<td>PORT ROW 1</td>
<td>PORT ROW 2</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_P</td>
</tr>
<tr>
<td>2.38</td>
<td>-1.1742</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.0981</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.1957</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_P</td>
<td>Y</td>
<td>C_P</td>
</tr>
<tr>
<td>2.98</td>
<td>-1.4499</td>
<td>12.76</td>
<td>0.0956</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.1594</td>
<td>12.26</td>
<td>-0.1526</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2500</td>
<td>11.76</td>
<td>-0.1918</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.26</td>
<td>-0.2628</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.76</td>
<td>-0.3469</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.00</td>
<td>-0.4708</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.88</td>
<td>-0.4577</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.4338</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.3033</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.1861</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.2092</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.1945</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_P</td>
<td>Y</td>
<td>C_P</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.6976</td>
<td>12.76</td>
<td>0.6410</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2389</td>
<td>12.26</td>
<td>-0.3208</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3154</td>
<td>11.76</td>
<td>-0.3800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.26</td>
<td>-0.3983</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.76</td>
<td>-0.4900</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.00</td>
<td>-0.5708</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.88</td>
<td>-0.7908</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.7878</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.2677</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.2050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.38</td>
<td>-0.2677</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.13</td>
<td>-0.2012</td>
</tr>
</tbody>
</table>

NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)
FLAP DEFORMATION: 30 DEG
REYNOLDS NO. = 2.280E 06
ANGLE OF ATTACK = 6 DEG

NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)
FLAP DEFORMATION: 30 DEG
REYNOLDS NO. = 2.270E 06
ANGLE OF ATTACK = 8 DEG

NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)
FLAP DEFORMATION: 30 DEG
REYNOLDS NO. = 2.262E 06
ANGLE OF ATTACK = 10 DEG

108
NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)

**FLAP DEFLECTION:** 30 DEG.

**ANGLE OF ATTACK:** 11 DEG

**REYNOLD’S NO.:** 2.263E 06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cρ</td>
<td>Y</td>
<td>Cρ</td>
</tr>
<tr>
<td>2.88</td>
<td>-2.0060</td>
<td>12.76</td>
<td>-0.9381</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3346</td>
<td>12.76</td>
<td>-0.5855</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3619</td>
<td>11.76</td>
<td>-0.6527</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.76</td>
<td>-0.6793</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.7312</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.88</td>
<td>-1.2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.8329</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.2362</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.1971</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.35</td>
<td>-0.2348</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2546</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2331</td>
</tr>
</tbody>
</table>

---

NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)

**FLAP DEFLECTION:** 30 DEG.

**ANGLE OF ATTACK:** 12 DEG

**REYNOLD’S NO.:** 2.258E 06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cρ</td>
<td>Y</td>
<td>Cρ</td>
</tr>
<tr>
<td>2.88</td>
<td>-2.1638</td>
<td>12.76</td>
<td>-0.9983</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3979</td>
<td>12.76</td>
<td>-0.6708</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4252</td>
<td>11.76</td>
<td>-0.6650</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.76</td>
<td>-0.7598</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.76</td>
<td>-0.7353</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.00</td>
<td>-0.7246</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.88</td>
<td>-1.4741</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.8414</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.4174</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.5702</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.35</td>
<td>-0.2704</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2707</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2691</td>
</tr>
</tbody>
</table>

---

NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)

**FLAP DEFLECTION:** 30 DEG.

**ANGLE OF ATTACK:** 13 DEG

**REYNOLD’S NO.:** 2.257E 06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>Cρ</td>
<td>Y</td>
<td>Cρ</td>
</tr>
<tr>
<td>2.88</td>
<td>-2.1638</td>
<td>12.76</td>
<td>-0.9983</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3979</td>
<td>12.76</td>
<td>-0.6708</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4252</td>
<td>11.76</td>
<td>-0.6650</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.76</td>
<td>-0.7598</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.76</td>
<td>-0.7353</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.00</td>
<td>-0.7246</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.88</td>
<td>-1.4741</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.75</td>
<td>-0.8414</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.63</td>
<td>-0.4174</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.50</td>
<td>-0.5702</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.35</td>
<td>-0.2704</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.25</td>
<td>-0.2707</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.13</td>
<td>-0.2691</td>
</tr>
</tbody>
</table>
### NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)

**FLAP DEFORMATION: 30 DEG.**

**ANGLER OF ATTACK = 14 DEG**

**REYNOLDS NO. = 2.255E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.88</td>
<td>-2.2975</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.4407</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3983</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>-0.8860</td>
</tr>
<tr>
<td>19.60</td>
<td>-1.3898</td>
</tr>
<tr>
<td>27.16</td>
<td>-0.8732</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.76</td>
<td>-0.7789</td>
</tr>
<tr>
<td>19.10</td>
<td>-1.4474</td>
</tr>
<tr>
<td>26.60</td>
<td>-0.8944</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.26</td>
<td>-0.8273</td>
</tr>
<tr>
<td>18.60</td>
<td>-1.2180</td>
</tr>
<tr>
<td>26.04</td>
<td>-0.9211</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.76</td>
<td>-0.8254</td>
</tr>
<tr>
<td>18.10</td>
<td>-0.7873</td>
</tr>
<tr>
<td>25.47</td>
<td>-0.8682</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.88</td>
<td>-1.5810</td>
</tr>
<tr>
<td>15.00</td>
<td>-0.5001</td>
</tr>
<tr>
<td>22.44</td>
<td>-0.7031</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.78</td>
<td>-0.7783</td>
</tr>
<tr>
<td>13.88</td>
<td>-0.3652</td>
</tr>
<tr>
<td>21.31</td>
<td>-0.5101</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.63</td>
<td>-0.2431</td>
</tr>
<tr>
<td>12.75</td>
<td>-0.3847</td>
</tr>
<tr>
<td>20.19</td>
<td>-0.5820</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.50</td>
<td>-0.2278</td>
</tr>
<tr>
<td>11.63</td>
<td>-0.5483</td>
</tr>
<tr>
<td>19.06</td>
<td>-0.4495</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.38</td>
<td>-0.2883</td>
</tr>
<tr>
<td>10.50</td>
<td>-0.6768</td>
</tr>
<tr>
<td>17.94</td>
<td>-0.2491</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>-0.2983</td>
</tr>
<tr>
<td>9.38</td>
<td>-0.5311</td>
</tr>
<tr>
<td>16.31</td>
<td>-0.2404</td>
</tr>
</tbody>
</table>

### NASA PART SPAN FLAP VPI-10 (NO FUSELAGE)

**FLAP DEFORMATION: 30 DEG.**

**ANGLER OF ATTACK = 15 DEG**

**REYNOLDS NO. = 2.249E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.88</td>
<td>-2.4535</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.5268</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4209</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>-0.8860</td>
</tr>
<tr>
<td>19.60</td>
<td>-1.4473</td>
</tr>
<tr>
<td>26.60</td>
<td>-0.8944</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.76</td>
<td>-0.8119</td>
</tr>
<tr>
<td>19.10</td>
<td>-1.4709</td>
</tr>
<tr>
<td>26.60</td>
<td>-0.9052</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.76</td>
<td>-0.9916</td>
</tr>
<tr>
<td>18.10</td>
<td>-1.0695</td>
</tr>
<tr>
<td>25.47</td>
<td>-0.8023</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.88</td>
<td>-1.5761</td>
</tr>
<tr>
<td>15.00</td>
<td>-0.4584</td>
</tr>
<tr>
<td>22.44</td>
<td>-1.0492</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.78</td>
<td>-0.8240</td>
</tr>
<tr>
<td>13.88</td>
<td>-0.4581</td>
</tr>
<tr>
<td>21.31</td>
<td>-0.8040</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.63</td>
<td>-0.3418</td>
</tr>
<tr>
<td>12.75</td>
<td>-0.4795</td>
</tr>
<tr>
<td>20.19</td>
<td>-0.6219</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.50</td>
<td>-0.2901</td>
</tr>
<tr>
<td>11.76</td>
<td>-0.4948</td>
</tr>
<tr>
<td>19.06</td>
<td>-0.5628</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.38</td>
<td>-0.3411</td>
</tr>
<tr>
<td>10.50</td>
<td>-0.7477</td>
</tr>
<tr>
<td>17.94</td>
<td>-0.2445</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>-0.3343</td>
</tr>
<tr>
<td>9.38</td>
<td>-0.5571</td>
</tr>
<tr>
<td>16.81</td>
<td>-0.3033</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>Cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.13</td>
<td>-0.3230</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3230</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3230</td>
</tr>
<tr>
<td>PORT ROW 1</td>
<td>PORT ROW 2</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>0.5361</td>
<td>20.10</td>
<td>0.1569</td>
<td>27.72</td>
<td>0.4754</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.26</td>
<td>0.4884</td>
<td>19.60</td>
<td>0.4320</td>
<td>27.16</td>
<td>0.1107</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.76</td>
<td>0.4345</td>
<td>19.10</td>
<td>0.3862</td>
<td>26.60</td>
<td>0.3349</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.26</td>
<td>0.3412</td>
<td>18.60</td>
<td>0.3064</td>
<td>26.04</td>
<td>0.2535</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.76</td>
<td>0.2234</td>
<td>18.10</td>
<td>0.1961</td>
<td>25.54</td>
<td>0.1709</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td>0.1012</td>
<td>16.13</td>
<td>-0.2452</td>
<td>23.56</td>
<td>-0.1294</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.68</td>
<td>0.1106</td>
<td>15.00</td>
<td>0.1120</td>
<td>22.44</td>
<td>-0.2098</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.75</td>
<td>0.1540</td>
<td>13.88</td>
<td>0.1089</td>
<td>21.31</td>
<td>-0.0557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.75</td>
<td>0.1306</td>
<td>20.19</td>
<td>-0.0645</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.63</td>
<td>0.1225</td>
<td>19.06</td>
<td>-0.0580</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.50</td>
<td>0.1344</td>
<td>17.94</td>
<td>-0.0456</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.38</td>
<td>0.1299</td>
<td>16.81</td>
<td>-0.0507</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.13</td>
<td>0.0864</td>
<td>15.69</td>
<td>-0.0414</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
<td>$X = 7.125$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>0.4568</td>
<td>20.10</td>
<td>0.4481</td>
<td>27.72</td>
<td>0.4776</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.26</td>
<td>0.3765</td>
<td>19.60</td>
<td>0.3856</td>
<td>27.16</td>
<td>0.3568</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.76</td>
<td>0.2214</td>
<td>18.60</td>
<td>0.2086</td>
<td>26.04</td>
<td>0.1779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.26</td>
<td>0.0929</td>
<td>18.10</td>
<td>0.0894</td>
<td>25.47</td>
<td>0.0964</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.76</td>
<td>-0.2151</td>
<td>16.13</td>
<td>-0.3806</td>
<td>23.56</td>
<td>-0.2674</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td>0.0893</td>
<td>13.98</td>
<td>-0.0697</td>
<td>22.44</td>
<td>-0.2068</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.76</td>
<td>-0.0660</td>
<td>12.75</td>
<td>-0.0600</td>
<td>20.19</td>
<td>-0.0016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.63</td>
<td>0.0747</td>
<td>19.06</td>
<td>-0.0657</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.50</td>
<td>0.0915</td>
<td>17.94</td>
<td>0.0852</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.38</td>
<td>-0.0542</td>
<td>16.81</td>
<td>-0.0593</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.23</td>
<td>-0.0625</td>
<td>15.69</td>
<td>0.0894</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.13</td>
<td>0.0459</td>
<td>15.69</td>
<td>0.0894</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X = 42.750$</td>
<td>$X = 32.125$</td>
<td>$X = 19.625$</td>
<td>$X = 7.125$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
<th>$Y$</th>
<th>$C_{p}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.76</td>
<td>0.1132</td>
<td>20.10</td>
<td>0.1141</td>
<td>27.72</td>
<td>-0.0391</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.26</td>
<td>0.0425</td>
<td>19.60</td>
<td>0.0353</td>
<td>27.16</td>
<td>0.0548</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.76</td>
<td>-0.0091</td>
<td>19.10</td>
<td>-0.0129</td>
<td>26.90</td>
<td>-0.0141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.26</td>
<td>-0.0915</td>
<td>18.60</td>
<td>-0.0806</td>
<td>26.04</td>
<td>-0.0805</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.76</td>
<td>-0.2463</td>
<td>18.10</td>
<td>-0.2354</td>
<td>25.47</td>
<td>0.1398</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.00</td>
<td>-0.4474</td>
<td>16.13</td>
<td>-0.4082</td>
<td>23.56</td>
<td>-0.4717</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.88</td>
<td>-0.2432</td>
<td>15.90</td>
<td>-0.3924</td>
<td>22.44</td>
<td>-0.3849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1330</td>
<td>13.38</td>
<td>-0.2219</td>
<td>21.31</td>
<td>-0.3883</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.75</td>
<td>-0.1569</td>
<td>20.19</td>
<td>-0.3096</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.63</td>
<td>-0.2031</td>
<td>12.94</td>
<td>-0.1922</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.50</td>
<td>-0.1103</td>
<td>17.94</td>
<td>-0.1997</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.38</td>
<td>-0.2055</td>
<td>16.81</td>
<td>-0.1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.25</td>
<td>-0.1286</td>
<td>15.69</td>
<td>-0.1053</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.13</td>
<td>-0.1521</td>
<td>15.69</td>
<td>-0.1053</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)

**FLAP DEFLECTION**: 30 DEG

**REYNOLD'S NO.** = 1.956E+06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>( Y )</td>
<td>( C_P )</td>
<td>( Y )</td>
<td>( C_P )</td>
</tr>
<tr>
<td>12.76</td>
<td>0.1759</td>
<td>20.10</td>
<td>0.1693</td>
</tr>
<tr>
<td>12.26</td>
<td>0.0966</td>
<td>19.60</td>
<td>0.0856</td>
</tr>
<tr>
<td>11.76</td>
<td>0.0370</td>
<td>19.10</td>
<td>0.0493</td>
</tr>
<tr>
<td>11.26</td>
<td>-0.1408</td>
<td>18.60</td>
<td>-0.1129</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.2071</td>
<td>18.10</td>
<td>-0.1754</td>
</tr>
<tr>
<td>9.00</td>
<td>-0.6090</td>
<td>16.13</td>
<td>-0.4211</td>
</tr>
<tr>
<td>7.88</td>
<td>-0.2134</td>
<td>15.00</td>
<td>-0.6137</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.0416</td>
<td>13.88</td>
<td>-0.3253</td>
</tr>
<tr>
<td>5.94</td>
<td>-0.0774</td>
<td>12.75</td>
<td>-0.0745</td>
</tr>
<tr>
<td>5.13</td>
<td>-0.0075</td>
<td>11.63</td>
<td>-0.0045</td>
</tr>
<tr>
<td>4.33</td>
<td>0.0022</td>
<td>10.50</td>
<td>-0.0045</td>
</tr>
<tr>
<td>3.53</td>
<td>0.0124</td>
<td>9.43</td>
<td>-0.0022</td>
</tr>
<tr>
<td>2.73</td>
<td>-0.0408</td>
<td>8.25</td>
<td>-0.1124</td>
</tr>
<tr>
<td>1.93</td>
<td>-0.2285</td>
<td>7.13</td>
<td>-0.0325</td>
</tr>
</tbody>
</table>

NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)

**FLAP DEFLECTION**: 30 DEG

**REYNOLD'S NO.** = 2.251E+06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>( Y )</td>
<td>( C_P )</td>
<td>( Y )</td>
<td>( C_P )</td>
</tr>
<tr>
<td>12.76</td>
<td>-0.1168</td>
<td>20.10</td>
<td>-0.4128</td>
</tr>
<tr>
<td>12.26</td>
<td>-0.2113</td>
<td>19.60</td>
<td>-0.2641</td>
</tr>
<tr>
<td>11.76</td>
<td>-0.2442</td>
<td>19.10</td>
<td>-0.2501</td>
</tr>
<tr>
<td>11.26</td>
<td>-0.3223</td>
<td>18.60</td>
<td>-0.2706</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.4337</td>
<td>18.10</td>
<td>-0.3402</td>
</tr>
<tr>
<td>9.00</td>
<td>-0.5333</td>
<td>16.13</td>
<td>-0.5153</td>
</tr>
<tr>
<td>7.88</td>
<td>-0.4298</td>
<td>15.00</td>
<td>-0.7775</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.2607</td>
<td>13.88</td>
<td>-0.6199</td>
</tr>
<tr>
<td>5.94</td>
<td>-0.2285</td>
<td>12.75</td>
<td>-0.2285</td>
</tr>
<tr>
<td>5.13</td>
<td>-0.1832</td>
<td>11.63</td>
<td>-0.1832</td>
</tr>
<tr>
<td>4.33</td>
<td>0.0124</td>
<td>10.50</td>
<td>0.0124</td>
</tr>
<tr>
<td>3.53</td>
<td>-0.0325</td>
<td>9.43</td>
<td>-0.0325</td>
</tr>
<tr>
<td>2.73</td>
<td>-0.0500</td>
<td>8.25</td>
<td>-0.1124</td>
</tr>
<tr>
<td>1.93</td>
<td>-0.2285</td>
<td>7.13</td>
<td>-0.2285</td>
</tr>
</tbody>
</table>

NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)

**FLAP DEFLECTION**: 30 DEG

**REYNOLD'S NO.** = 1.967E+06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>( Y )</td>
<td>( C_P )</td>
<td>( Y )</td>
<td>( C_P )</td>
</tr>
<tr>
<td>12.76</td>
<td>-1.2536</td>
<td>20.10</td>
<td>-0.7939</td>
</tr>
<tr>
<td>12.26</td>
<td>-1.7600</td>
<td>19.60</td>
<td>-0.8298</td>
</tr>
<tr>
<td>11.76</td>
<td>-0.2344</td>
<td>19.10</td>
<td>-0.3426</td>
</tr>
<tr>
<td>11.26</td>
<td>-0.3544</td>
<td>18.60</td>
<td>-0.2920</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.3542</td>
<td>18.10</td>
<td>-0.3426</td>
</tr>
<tr>
<td>9.00</td>
<td>-0.6159</td>
<td>16.13</td>
<td>-0.8308</td>
</tr>
<tr>
<td>7.88</td>
<td>-0.7297</td>
<td>15.00</td>
<td>-0.8987</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.1760</td>
<td>13.88</td>
<td>-0.6779</td>
</tr>
<tr>
<td>5.94</td>
<td>-0.1748</td>
<td>12.75</td>
<td>-0.1748</td>
</tr>
<tr>
<td>5.13</td>
<td>-0.1748</td>
<td>11.63</td>
<td>-0.1748</td>
</tr>
<tr>
<td>4.33</td>
<td>-0.1748</td>
<td>10.50</td>
<td>-0.1748</td>
</tr>
<tr>
<td>3.53</td>
<td>-0.1748</td>
<td>9.43</td>
<td>-0.1748</td>
</tr>
<tr>
<td>2.73</td>
<td>-0.1748</td>
<td>8.25</td>
<td>-0.1748</td>
</tr>
<tr>
<td>1.93</td>
<td>-0.1748</td>
<td>7.13</td>
<td>-0.1748</td>
</tr>
</tbody>
</table>
NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)
FLAP DEFLECTION: 30 DEG.

**ANGLE OF ATTACK** = **11 DEG**
**REYNOLD'S NO.** = **2.258E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>12.76</td>
<td>-1.3605</td>
<td>20.10</td>
<td>-0.9323</td>
</tr>
<tr>
<td>12.26</td>
<td>-0.4219</td>
<td>19.60</td>
<td>-0.9777</td>
</tr>
<tr>
<td>11.76</td>
<td>-0.4845</td>
<td>19.10</td>
<td>-0.9137</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.5417</td>
<td>18.10</td>
<td>-0.4638</td>
</tr>
<tr>
<td>9.00</td>
<td>-0.6842</td>
<td>16.13</td>
<td>-0.7893</td>
</tr>
<tr>
<td>7.88</td>
<td>-0.7590</td>
<td>15.00</td>
<td>-0.7935</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.2896</td>
<td>13.88</td>
<td>-0.6033</td>
</tr>
</tbody>
</table>

**PORT ROW 1**
**X = 42.750**
**PORT ROW 2**
**X = 32.125**
**PORT ROW 3**
**X = 19.625**
**PORT ROW 4**
**X = 7.125**

**Y**

| 12.76      | -1.4362    | 20.10      | -0.7111    |
| 12.26      | -0.8421    | 19.60      | -1.1623    |
| 11.76      | -0.7485    | 19.10      | -1.1723    |
| 11.26      | -0.6876    | 18.66      | -0.8875    |
| 10.76      | -0.8402    | 18.10      | -0.5830    |
| 9.00       | -0.8223    | 17.13      | -0.7285    |
| 7.98       | -0.7780    | 15.00      | -0.7710    |
| 6.75       | -0.2991    | 13.88      | -0.5784    |

**NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)**
**FLAP DEFLECTION: 30 DEG.**

**ANGLE OF ATTACK** = **12 DEG**
**REYNOLD'S NO.** = **2.269E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>12.76</td>
<td>-1.4362</td>
<td>20.10</td>
<td>-0.7111</td>
</tr>
<tr>
<td>12.26</td>
<td>-0.8421</td>
<td>19.60</td>
<td>-1.1623</td>
</tr>
<tr>
<td>11.76</td>
<td>-0.7485</td>
<td>19.10</td>
<td>-1.1723</td>
</tr>
<tr>
<td>11.26</td>
<td>-0.6876</td>
<td>18.66</td>
<td>-0.8875</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.8402</td>
<td>18.10</td>
<td>-0.5830</td>
</tr>
<tr>
<td>9.00</td>
<td>-0.8223</td>
<td>17.13</td>
<td>-0.7285</td>
</tr>
<tr>
<td>7.98</td>
<td>-0.7780</td>
<td>15.00</td>
<td>-0.7710</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.2991</td>
<td>13.88</td>
<td>-0.5784</td>
</tr>
</tbody>
</table>

**NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)**
**FLAP DEFLECTION: 30 DEG.**

**ANGLE OF ATTACK** = **13 DEG**
**REYNOLD'S NO.** = **2.272E 06**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>C_p</td>
<td>Y</td>
<td>C_p</td>
</tr>
<tr>
<td>12.76</td>
<td>-1.4360</td>
<td>20.10</td>
<td>-1.3174</td>
</tr>
<tr>
<td>12.26</td>
<td>-1.2980</td>
<td>19.60</td>
<td>-1.3565</td>
</tr>
<tr>
<td>11.76</td>
<td>-1.0038</td>
<td>19.10</td>
<td>-1.4014</td>
</tr>
<tr>
<td>11.26</td>
<td>-0.9040</td>
<td>18.60</td>
<td>-1.1966</td>
</tr>
<tr>
<td>10.76</td>
<td>-0.8160</td>
<td>18.10</td>
<td>-0.7529</td>
</tr>
<tr>
<td>9.00</td>
<td>-1.0462</td>
<td>16.13</td>
<td>-0.7392</td>
</tr>
<tr>
<td>7.98</td>
<td>-0.7782</td>
<td>15.00</td>
<td>-0.6881</td>
</tr>
<tr>
<td>6.75</td>
<td>-0.3123</td>
<td>13.88</td>
<td>-0.5176</td>
</tr>
<tr>
<td>12.75</td>
<td>-0.4154</td>
<td>20.13</td>
<td>-0.5863</td>
</tr>
<tr>
<td>11.63</td>
<td>-0.4484</td>
<td>19.06</td>
<td>-0.4984</td>
</tr>
<tr>
<td>10.50</td>
<td>-0.4854</td>
<td>17.94</td>
<td>-0.3597</td>
</tr>
<tr>
<td>9.38</td>
<td>-0.3142</td>
<td>16.81</td>
<td>-0.3202</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.2601</td>
<td>15.69</td>
<td>-0.2691</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.2582</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)

**FLAP DEFLECTION:** 30 DEG.

**ANGLE OF ATTACK = 14 DEG**

REYNOLD'S NO. = 2.254E06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>12.76 -1.4351</td>
<td>20.10 -1.5127</td>
<td>27.72 -0.8475</td>
<td></td>
</tr>
<tr>
<td>11.76 -1.4351</td>
<td>19.60 -1.5576</td>
<td>27.16 -0.8776</td>
<td></td>
</tr>
<tr>
<td>10.76 -1.4351</td>
<td>19.10 -1.6130</td>
<td>26.60 -0.9028</td>
<td></td>
</tr>
<tr>
<td>10.76 -1.4351</td>
<td>18.60 -1.5668</td>
<td>26.04 -0.9286</td>
<td></td>
</tr>
<tr>
<td>10.76 -1.4351</td>
<td>18.10 -1.0842</td>
<td>25.47 -0.8693</td>
<td></td>
</tr>
<tr>
<td>9.00 -1.2728</td>
<td>16.13 -0.7943</td>
<td>23.56 -0.9267</td>
<td></td>
</tr>
<tr>
<td>7.68 -0.8336</td>
<td>15.00 -0.6741</td>
<td>23.44 -0.9504</td>
<td></td>
</tr>
<tr>
<td>6.75 -0.3346</td>
<td>13.88 -0.4685</td>
<td>21.31 -0.7047</td>
<td></td>
</tr>
<tr>
<td>5.50 -0.5472</td>
<td>12.75 -0.4415</td>
<td>20.19 -0.6199</td>
<td></td>
</tr>
<tr>
<td>4.38 -0.3475</td>
<td>11.63 -0.4244</td>
<td>19.06 -0.5053</td>
<td></td>
</tr>
<tr>
<td>3.25 -0.2544</td>
<td>10.50 -0.5472</td>
<td>17.94 -0.3737</td>
<td></td>
</tr>
<tr>
<td>7.13 -0.2763</td>
<td>9.38 -0.3475</td>
<td>16.81 -0.2872</td>
<td></td>
</tr>
</tbody>
</table>

### NASA PART SPAN FLAP VPI-10 (WITH FUSELAGE)

**FLAP DEFLECTION:** 30 DEG.

**ANGLE OF ATTACK = 15 DEG**

REYNOLD'S NO. = 2.24E06

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>12.76 -1.4406</td>
<td>20.10 -1.5906</td>
<td>27.72 -0.7864</td>
<td></td>
</tr>
<tr>
<td>12.26 -1.5264</td>
<td>19.60 -1.6416</td>
<td>27.16 -0.8142</td>
<td></td>
</tr>
<tr>
<td>11.76 -1.3258</td>
<td>19.10 -1.6950</td>
<td>26.60 -0.8576</td>
<td></td>
</tr>
<tr>
<td>11.26 -1.2702</td>
<td>18.60 -1.7077</td>
<td>26.04 -0.8975</td>
<td></td>
</tr>
<tr>
<td>10.76 -1.0831</td>
<td>18.10 -0.8429</td>
<td>25.47 -0.8357</td>
<td></td>
</tr>
<tr>
<td>9.00 -1.4878</td>
<td>16.13 -0.8956</td>
<td>23.56 -0.9821</td>
<td></td>
</tr>
<tr>
<td>7.88 -0.9067</td>
<td>15.00 -0.6664</td>
<td>22.44 -1.2602</td>
<td></td>
</tr>
<tr>
<td>6.75 -0.9326</td>
<td>13.88 -0.4522</td>
<td>21.31 -0.9896</td>
<td></td>
</tr>
<tr>
<td>5.65 -0.3850</td>
<td>12.75 -0.3850</td>
<td>20.19 -0.6667</td>
<td></td>
</tr>
<tr>
<td>4.38 -0.4335</td>
<td>11.63 -0.4335</td>
<td>19.06 -0.3940</td>
<td></td>
</tr>
<tr>
<td>3.25 -0.5615</td>
<td>10.50 -0.5615</td>
<td>17.94 -0.2594</td>
<td></td>
</tr>
<tr>
<td>7.13 -0.2763</td>
<td>9.38 -0.3656</td>
<td>16.81 -0.2872</td>
<td></td>
</tr>
<tr>
<td>6.75 -0.3951</td>
<td>8.25 -0.3951</td>
<td>15.69 -0.2277</td>
<td></td>
</tr>
</tbody>
</table>

114
NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)
FLAP DEFLECTION: 15 DEG.
REYNOLD'S NO. = 2.175E 06

<table>
<thead>
<tr>
<th>X = 42.750</th>
<th>X = 32.125</th>
<th>X = 19.625</th>
<th>X = 7.125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Cₚ</td>
<td>Y</td>
<td>Cₚ</td>
</tr>
<tr>
<td>6.22</td>
<td>-0.9641</td>
<td>12.76</td>
<td>-1.1647</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.0630</td>
<td>12.26</td>
<td>-1.2329</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.1291</td>
<td>11.26</td>
<td>-1.0475</td>
</tr>
<tr>
<td>4.59</td>
<td>-0.8602</td>
<td>10.76</td>
<td>-0.5903</td>
</tr>
<tr>
<td>2.98</td>
<td>-0.6491</td>
<td>9.00</td>
<td>-0.4265</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2244</td>
<td>7.88</td>
<td>-0.3538</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2591</td>
<td>6.75</td>
<td>-0.3162</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.2792</td>
<td>10.50</td>
<td>-0.2937</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2309</td>
<td>9.38</td>
<td>-0.2259</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.2350</td>
<td>15.69</td>
<td>-0.1908</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.2597</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)
FLAP DEFLECTION: 15 DEG.
REYNOLD'S NO. = 2.190E 06

<table>
<thead>
<tr>
<th>X = 42.750</th>
<th>X = 32.125</th>
<th>X = 19.625</th>
<th>X = 7.125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Cₚ</td>
<td>Y</td>
<td>Cₚ</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.0281</td>
<td>12.76</td>
<td>-1.2705</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.0999</td>
<td>11.76</td>
<td>-1.3484</td>
</tr>
<tr>
<td>5.00</td>
<td>-0.8273</td>
<td>11.26</td>
<td>-1.3220</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.0288</td>
<td>10.76</td>
<td>-0.8279</td>
</tr>
<tr>
<td>2.98</td>
<td>-0.9052</td>
<td>9.00</td>
<td>-0.4300</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2275</td>
<td>7.88</td>
<td>-0.4458</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.2821</td>
<td>7.88</td>
<td>-0.3583</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.3858</td>
<td>12.75</td>
<td>-0.2837</td>
</tr>
<tr>
<td>4.38</td>
<td>-0.3042</td>
<td>11.63</td>
<td>-0.2800</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3070</td>
<td>10.50</td>
<td>-0.2459</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.3761</td>
<td>9.38</td>
<td>-0.2472</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.2545</td>
<td>15.69</td>
<td>-0.1952</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.2852</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)
FLAP DEFLECTION: 15 DEG.
REYNOLD'S NO. = 2.181E 06

<table>
<thead>
<tr>
<th>X = 42.750</th>
<th>X = 32.125</th>
<th>X = 19.625</th>
<th>X = 7.125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Cₚ</td>
<td>Y</td>
<td>Cₚ</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.0910</td>
<td>12.76</td>
<td>-1.3476</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.1714</td>
<td>12.26</td>
<td>-1.4008</td>
</tr>
<tr>
<td>5.00</td>
<td>-1.3384</td>
<td>11.76</td>
<td>-1.4978</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.1605</td>
<td>10.76</td>
<td>-1.2477</td>
</tr>
<tr>
<td>2.98</td>
<td>-0.9539</td>
<td>9.00</td>
<td>-0.4488</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.2417</td>
<td>7.98</td>
<td>-0.4287</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.3150</td>
<td>6.75</td>
<td>-0.4675</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.3774</td>
<td>12.75</td>
<td>-0.2575</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.2843</td>
<td>10.50</td>
<td>-0.2446</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.2602</td>
<td>9.38</td>
<td>-0.2612</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3059</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)

**FLAP DEFLECTION:** 15 DEG.

**ANGLE OF ATTACK = 13 DEG.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>CP</td>
<td>Y</td>
<td>CP</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.2086</td>
<td>12.76</td>
<td>-1.3183</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.2675</td>
<td>12.26</td>
<td>-1.3385</td>
</tr>
<tr>
<td>4.41</td>
<td>-1.3723</td>
<td>11.76</td>
<td>-1.4062</td>
</tr>
<tr>
<td>3.99</td>
<td>-1.4273</td>
<td>11.26</td>
<td>-1.4908</td>
</tr>
<tr>
<td>4.39</td>
<td>-1.5272</td>
<td>10.76</td>
<td>-1.4379</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.0856</td>
<td>9.00</td>
<td>-1.6048</td>
</tr>
<tr>
<td>1.75</td>
<td>-1.2724</td>
<td>7.88</td>
<td>-1.5438</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4315</td>
<td>6.75</td>
<td>-0.5041</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.4785</td>
<td>12.75</td>
<td>-0.3633</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.4089</td>
<td>11.63</td>
<td>-0.3721</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3032</td>
<td>10.50</td>
<td>-0.2606</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.3956</td>
<td>9.38</td>
<td>-0.2674</td>
</tr>
</tbody>
</table>

**REYNOLD'S NO. = 2.190E06**

### NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)

**FLAP DEFLECTION:** 15 DEG.

**ANGLE OF ATTACK = 14 DEG.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>CP</td>
<td>Y</td>
<td>CP</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.3534</td>
<td>12.76</td>
<td>-1.3158</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.4130</td>
<td>12.26</td>
<td>-1.3398</td>
</tr>
<tr>
<td>4.41</td>
<td>-1.5254</td>
<td>11.76</td>
<td>-1.3665</td>
</tr>
<tr>
<td>3.99</td>
<td>-1.5713</td>
<td>11.26</td>
<td>-1.3947</td>
</tr>
<tr>
<td>4.39</td>
<td>-1.5385</td>
<td>10.76</td>
<td>-1.4630</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.2078</td>
<td>9.00</td>
<td>-1.1793</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3247</td>
<td>7.88</td>
<td>-0.8966</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4562</td>
<td>6.75</td>
<td>-0.5430</td>
</tr>
<tr>
<td>5.63</td>
<td>-0.4785</td>
<td>12.75</td>
<td>-0.3633</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.4089</td>
<td>11.63</td>
<td>-0.3721</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.3032</td>
<td>10.50</td>
<td>-0.2606</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.3956</td>
<td>9.38</td>
<td>-0.2674</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.3038</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REYNOLD'S NO. = 2.184E06**

### NASA FULL SPAN FLAP VPI-8 (WITH HALF ANGLE EXT.)

**FLAP DEFLECTION:** 15 DEG.

**ANGLE OF ATTACK = 15 DEG.**

<table>
<thead>
<tr>
<th>PORT ROW 1</th>
<th>PORT ROW 2</th>
<th>PORT ROW 3</th>
<th>PORT ROW 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 42.750</td>
<td>X = 32.125</td>
<td>X = 19.625</td>
<td>X = 7.125</td>
</tr>
<tr>
<td>Y</td>
<td>CP</td>
<td>Y</td>
<td>CP</td>
</tr>
<tr>
<td>6.22</td>
<td>-1.4775</td>
<td>12.76</td>
<td>-1.3439</td>
</tr>
<tr>
<td>5.81</td>
<td>-1.5630</td>
<td>12.26</td>
<td>-1.3621</td>
</tr>
<tr>
<td>4.41</td>
<td>-1.6459</td>
<td>11.76</td>
<td>-1.4484</td>
</tr>
<tr>
<td>3.99</td>
<td>-1.5316</td>
<td>11.26</td>
<td>-1.4284</td>
</tr>
<tr>
<td>4.59</td>
<td>-1.7494</td>
<td>10.76</td>
<td>-1.5226</td>
</tr>
<tr>
<td>2.88</td>
<td>-1.3184</td>
<td>9.00</td>
<td>-1.6546</td>
</tr>
<tr>
<td>1.75</td>
<td>-0.3692</td>
<td>7.88</td>
<td>-1.2647</td>
</tr>
<tr>
<td>0.63</td>
<td>-0.4771</td>
<td>6.75</td>
<td>-0.5725</td>
</tr>
<tr>
<td>4.50</td>
<td>-0.3247</td>
<td>12.75</td>
<td>-1.6546</td>
</tr>
<tr>
<td>3.38</td>
<td>-0.4225</td>
<td>10.50</td>
<td>-0.1437</td>
</tr>
<tr>
<td>2.25</td>
<td>-0.4170</td>
<td>9.38</td>
<td>-0.1592</td>
</tr>
<tr>
<td>8.25</td>
<td>-0.1923</td>
<td>15.69</td>
<td>-0.3672</td>
</tr>
<tr>
<td>7.13</td>
<td>-0.2583</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>