Subcontractor Report

The S904 and S905 Airfoils

May 1998—January 1999

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Airfoils, Inc.
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NREL

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ABSTRACT

A family of natural-laminar-flow airfoils, the S904 and S905, for cooling-tower fans has been designed and analyzed theoretically. The two primary objectives of high maximum lift, relatively insensitive to roughness, and low profile drag have been achieved. The constraint on the lift at zero angle of attack has not been satisfied. The constraints on the pitching moment and the airfoil thicknesses have essentially been satisfied. The airfoils should exhibit docile stalls.

INTRODUCTION

Large ducted fans are used in industrial and electrical-utility cooling towers to remove heat from circulating-water systems. The fans usually employ 4 to 12 blades having lengths of 1 1/2 to 6 m (5 to 20 ft). The blades are frequently operated in a moist environment, which contributes to leading-edge contamination and erosion. The blades typically incorporate National Advisory Committee for Aeronautics (NACA) airfoils (ref. 1).

The two airfoils designed under the present study are intended for the root and tip regions of a cooling-tower fan. The specific tasks performed under this study are described in National Renewable Energy Laboratory (NREL) Subcontract Number AAM-8-18218-01. The specifications for the airfoils are outlined in the Statement of Work. These specifications were later refined during discussions with James L. Tangler of NREL.

Because of the limitations of the theoretical methods (refs. 2 and 3) employed in this study, the results presented are in no way guaranteed to be accurate—either in an absolute or in a relative sense. This statement applies to the entire study.

SYMBOLS

C_p	pressure coefficient
c	airfoil chord, m
c_d	section profile-drag coefficient
c_l	section lift coefficient
c_m	section pitching-moment coefficient about quarter-chord point
R	Reynolds number based on free-stream conditions and airfoil chord
t	airfoil thickness, m
x	airfoil abscissa, m

y	airfoil ordinate, m
α	angle of attack relative to x-axis, deg

Subscripts:

ll	lower limit of low-drag range
max	maximum
S	turbulent boundary-layer separation
T	boundary-layer transition
ul	upper limit of low-drag range
0	zero lift

Abbreviations:

L.	lower surface
S.	turbulent boundary-layer separation location, x_S/c
T.	boundary-layer transition location, x_T/c
U.	upper surface

AIRFOIL DESIGN

OBJECTIVES AND CONSTRAINTS

The design specifications for the family of airfoils are contained in table I. The family consists of two airfoils, root and tip. Two primary objectives are evident. The first objective is to achieve a high maximum lift coefficient. A requirement related to this objective is that the maximum lift coefficient not decrease significantly with transition fixed near the leading edge on both surfaces. In addition, the airfoils should exhibit docile stall characteristics. The second objective is to obtain low profile-drag coefficients over the range of lift coefficients from 0.20 to at least 1.10 for the root airfoil and from 0.65 to 1.20 for the tip airfoil.

Three major constraints were placed on the designs of these airfoils. First, the lift coefficient at zero angle of attack must equal 0.75. Second, the zero-lift pitching-moment coefficient must be no more negative than −0.15. Third, the airfoil thickness must equal 14-percent chord for the root airfoil and 10-percent chord for the tip airfoil.

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PHILOSOPHY

Given the above objectives and constraints, certain characteristics of the designs are apparent. The following sketch illustrates a drag polar that meets the goals for these designs. (The tip airfoil design specifications are used for the example.)
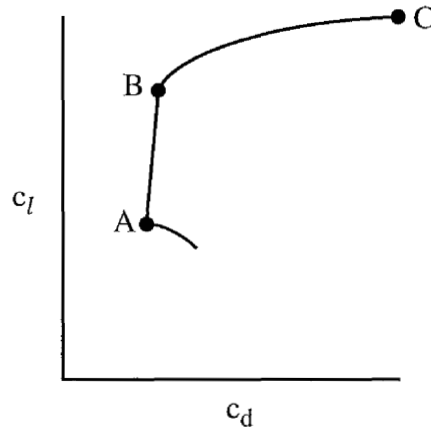
Sketch 1

The desired airfoil shape can be traced to the pressure distributions that occur at the various points in sketch 1. Point A is the lower limit of the low-drag, lift-coefficient range and point B, the upper limit. The drag increases rapidly outside the low-drag range because boundary-layer transition moves quickly toward the leading edge with increasing (or decreasing) lift coefficient. This feature results in a leading edge that produces a suction peak at higher lift coefficients, which ensures that transition on the upper surface will occur near the leading edge. Thus, the maximum lift coefficient, point C, occurs with turbulent flow along the entire upper surface and, therefore, should be relatively insensitive to roughness at the leading edge.

From the preceding discussion, the pressure distributions along the polar can be deduced. The pressure distribution at point A should look something like sketch 2, again using the tip airfoil as the example.
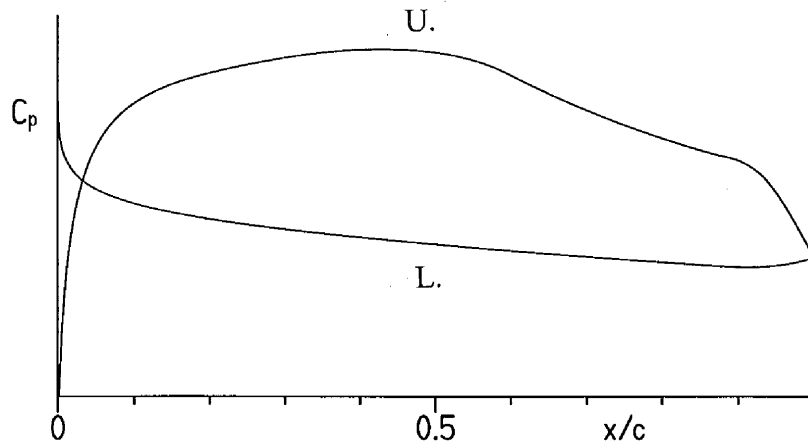
Sketch 2

To achieve low drag, a favorable pressure gradient is desirable along the upper surface to about 45-percent chord. Aft of this point, a region having a shallow, adverse pressure gradient ("transition ramp") promotes the efficient transition from laminar to turbulent flow (ref. 4). The curved transition ramp (ref. 5) is followed by a concave pressure recovery, which results in a boundary-layer development that exhibits lower drag and less tendency toward separation than the corresponding linear or convex pressure recovery (ref. 4). The specific pressure recovery employed represents a compromise between maximum lift, drag, pitching moment, and stall characteristics. The steep, adverse pressure gradient aft of about 90-percent chord is a "separation ramp," originally proposed by F. X. Wortmann,[1] which confines turbulent separation to a small region near the trailing edge. By constraining the movement of the separation point at high angles of attack, high lift coefficients can be achieved with little drag penalty. This feature also contributes to the docility of the stall characteristics. (See ref. 6.)

Along the lower surface, the pressure gradient is initially very adverse and then decreasingly so. Thus, transition is imminent over the entire forward portion of the lower surface. (See ref. 7.) This concept allows a wider low-drag range to be achieved and increases the amount of camber in the leading-edge region. The forward camber serves to balance, with respect to the pitching-moment constraint, the aft camber, both of which contribute to the achievement of a high maximum lift coefficient and low profile-drag coefficients. This region is followed by a nearly linear pressure recovery, which is an indistinguishable continuation of the forward pressure gradients.

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[1]Director, Institute for Aerodynamics and Gas Dynamics, University of Stuttgart, Germany.

The amounts of pressure recovery on the upper and lower surfaces are determined by the airfoil-thickness and pitching-moment constraints.

At point B, the pressure distribution should look like sketch 3.
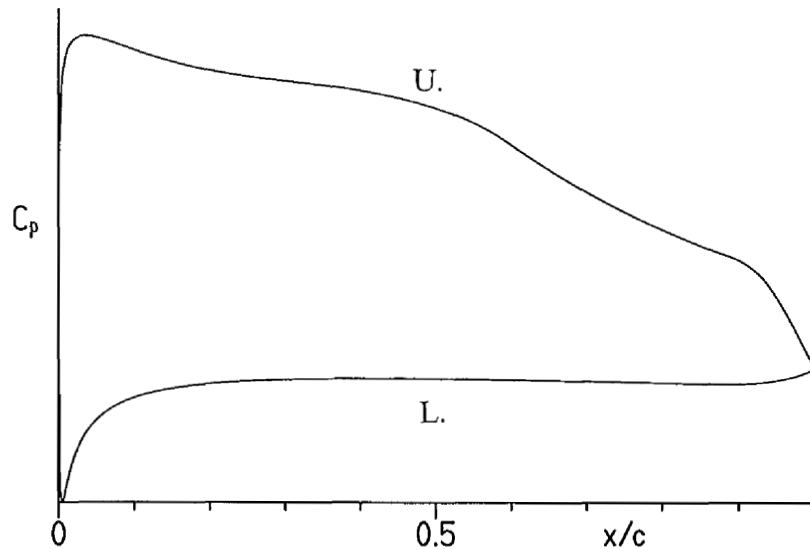
Sketch 3

No suction spike exists at the leading edge. Instead, a gently rounded peak occurs aft of the leading edge. This feature allows higher lift coefficients to be reached without significant separation. At higher angles of attack, the peak becomes sharper and moves rapidly forward to the leading edge. This feature causes transition to move quickly toward the leading edge with increasing lift coefficient, which leads to the roughness insensitivity of the maximum lift coefficient.

EXECUTION

Given the pressure distributions previously discussed, the design of the airfoils is reduced to the inverse problem of transforming the pressure distributions into airfoil shapes. The Eppler Airfoil Design and Analysis Code (refs. 2 and 3) was used because of its unique capability for multipoint design and because of confidence gained during the design, analysis, and experimental verification of many other airfoils. (See ref. 8, for example.)

The root airfoil is designated the S904. The tip airfoil, the S905, was derived from the S904 airfoil to increase the aerodynamic and geometric compatibilities of the two airfoils. The S904 and S905 airfoil shapes are shown in figure 1 and the coordinates are contained in

tables II and III, respectively. The S904 airfoil thickness is 14-percent chord and the S905, 10-percent chord, which satisfy the design constraints.

THEORETICAL PROCEDURE

The section characteristics are predicted for Reynolds numbers of 0.5×10^6 through 1.5×10^6, in increments of 0.1×10^6. The computations were performed with transition free using transition mode 3, with transition fixed at 2-percent chord on the upper surface and 5-percent chord on the lower surface using transition mode 1, and "rough" using transition mode 9, which simulates distributed roughness due to, for example, leading-edge contamination by water drops or insects. (See ref. 3.) Because the free-stream Mach number for all relevant operating conditions remains below 0.2, all results are incompressible.

DISCUSSION OF RESULTS

S904 AIRFOIL

Pressure Distributions

The inviscid pressure distributions for the S904 airfoil at various angles of attack are shown in figure 2 and tabulated in appendix A.

Transition and Separation Locations

The variation of boundary-layer transition location with lift coefficient for the S904 airfoil is shown in figure 3 and tabulated in appendix A. It should be remembered that the method of references 2 and 3 "defines" the transition location as the end of the laminar boundary layer whether due to natural transition or laminar separation. Thus, for conditions that result in relatively long laminar separation bubbles (low lift coefficients for the upper surface, high lift coefficients for the lower surface, and low Reynolds numbers), poor agreement between the predicted "transition" locations and the locations measured experimentally can be expected. This poor agreement is worsened by the fact that transition is normally confirmed in experiments only by the detection of attached turbulent flow. For conditions that result in shorter laminar separation bubbles (high lift coefficients for the upper surface, low lift coefficients for the lower surface, and high Reynolds numbers), the agreement between theory and experiment is generally good. (See refs. 8 and 9.)

The variation of turbulent boundary-layer separation location with lift coefficient for the S904 airfoil is shown in figure 3 and tabulated in appendix A. A small, trailing-edge separation is predicted on the upper surface at all lift coefficients. This separation, which is caused by the separation ramp (fig. 2), generally increases in length with transition fixed and rough. Separation is predicted on the lower surface at low lift coefficients. Such separation usually has little effect on the section characteristics. (See ref. 9.)

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Section Characteristics

Reynolds number effects.- The section characteristics of the S904 airfoil are shown in figure 3 and tabulated in appendix A. It should be noted that the maximum lift coefficient computed by the method of references 2 and 3 is not always realistic. Accordingly, an empirical criterion has been applied to the computed results. This criterion assumes that the maximum lift coefficient has been reached if the drag coefficient of the upper surface is greater than $0.0160 (2 \times 10^6/R)^{1/7}$ or if the length of turbulent separation on the upper surface is greater than $0.1000c$. Thus, the maximum lift coefficient for the design Reynolds number of 0.5×10^6 is estimated to be 1.50, which meets the design objective. Based on the variation of the upper-surface separation location with lift coefficient, the stall characteristics are expected to be docile, which meets the design goal. The lift coefficient at zero angle of attack is predicted to be 0.73. Because of boundary-layer displacement effects not accounted for in the present analysis, however, the actual lift coefficient at zero angle of attack will probably be about 0.6, which is below the design constraint of 0.75. Low profile-drag coefficients are predicted over the range of lift coefficients from 0.16 to 1.21, which exceeds the range specified (0.20 to 1.10). The drag coefficient at the specified lower limit of the low-drag, lift-coefficient range ($c_l = 0.20$) is predicted to be 0.0080, which meets the design objective. The zero-lift pitching-moment coefficient is predicted to be −0.19, which exceeds the design constraint ($c_{m,0} \geq -0.15$). Again because of boundary-layer displacement effects not accounted for in the present analysis, the pitching-moment coefficient is generally overpredicted by about 20 percent. Therefore, the actual zero-lift pitching-moment coefficient should be about −0.16, which still exceeds the design constraint. During the design process, it was determined that violating the constraints on the lift coefficient at zero angle of attack and the zero-lift pitching-moment coefficient was necessary to meet other, more important goals.

Effect of roughness.- The effect of roughness on the section characteristics of the S904 airfoil is shown in figure 3. The maximum lift coefficient for the design Reynolds number of 0.5×10^6 with transition fixed is estimated to be 1.41, a reduction of 6 percent from that with transition free. For the rough condition, the maximum lift coefficient is estimated to be 1.43, a reduction of 5 percent from that with transition free. Thus, the design requirement has been satisfied. The drag coefficients are, of course, adversely affected by the roughness.

S905 AIRFOIL

Pressure Distributions

The inviscid pressure distributions for the S905 airfoil at various angles of attack are shown in figure 4 and tabulated in appendix B.

Transition and Separation Locations

The variations of transition and separation locations with lift coefficient for the S905 airfoil are shown in figure 5 and tabulated in appendix B. A small, trailing-edge separation is

predicted on the upper surface at almost all lift coefficients. This separation, which is caused by the separation ramp (fig. 4), increases in length with transition fixed and rough.

Section Characteristics

Reynolds number effects.- The section characteristics of the S905 airfoil are shown in figure 5 and tabulated in appendix B. Using the previously described criterion, the maximum lift coefficient for the design Reynolds number of 1.0×10^6 is estimated to be 1.50, which meets the design objective. The stall characteristics are expected to be docile, which meets the design goal. The lift coefficient at zero angle of attack is predicted to be 0.75. Because of the previously mentioned effects, the actual lift coefficient at zero angle of attack will proba- bly be about 0.6, which is below the design constraint of 0.75. During the design process, it was determined that violating the constraint was necessary to meet other, more important goals. Low drag coefficients are predicted over the range of lift coefficients from 0.59 to 1.16. Thus, the lower limit of the low-drag range is below the design objective ($c_{l,ll} = 0.65$) although the upper limit is also below the design objective ($c_{l,ul} = 1.20$), primarily to meet other, more important goals. The drag coefficient at the specified lower limit of the low-drag range ($c_l = 0.65$) is predicted to be 0.0070, which meets the design objective. The zero-lift pitching-moment coefficient is predicted to be -0.17, which exceeds the design constraint ($c_{m,0} \geq -0.15$), although the actual zero-lift pitching-moment coefficient is expected to be about -0.15, which satisfies the constraint.

Effect of roughness.- The effect of roughness on the section characteristics of the S905 airfoil is shown in figure 5. The maximum lift coefficient for the design Reynolds number of 1.0×10^6 with transition fixed is estimated to be 1.49, a reduction of 1 percent from that with transition free. For the rough condition, the maximum lift coefficient is estimated to be 1.48, a reduction of about 1 percent from that with transition free. Thus, the design requirement has been satisfied. The drag coefficients are, of course, adversely affected by the roughness.

CONCLUDING REMARKS

A family of natural-laminar-flow airfoils, the S904 and S905, for cooling-tower fans has been designed and analyzed theoretically. The two primary objectives of high maximum lift coefficient, relatively insensitive to leading-edge roughness, and low profile-drag coeffi- cients have been achieved. The constraint on the lift coefficient at zero angle of attack has not been satisfied. The constraints on the pitching-moment coefficient and the airfoil thicknesses have essentially been satisfied. The airfoils should exhibit docile stall characteristics.

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TABLE I.– AIRFOIL DESIGN SPECIFICATIONS

Airfoil	Root	Tip
Parameter	Objective/Constraint	
Reynolds number R	0.5×10^6	1.0×10^6
Maximum lift coefficient $c_{l,max}$	1.50	
Lift coefficient at zero angle of attack	0.75	
Lower limit of low-drag, lift-coefficient range $c_{l,ll}$	0.20	0.65
Profile-drag coefficient at lower limit of low-drag range	≤ 0.0080	≤ 0.0070
Upper limit of low-drag, lift-coefficient range $c_{l,ul}$	≥ 1.10	1.20
Zero-lift pitching-moment coefficient $c_{m,0}$	≥ -0.15	
Airfoil thickness t/c	14%	10%

TABLE II.– S904 AIRFOIL COORDINATES

Upper Surface		Lower Surface	
x/c	y/c	x/c	y/c
0.00019	0.00179	0.00000	−0.00004
.00256	.00808	.00021	−.00165
.00968	.01758	.00093	−.00316
.02116	.02780	.00215	−.00470
.03685	.03828	.00374	−.00627
.05665	.04869	.01354	−.01266
.08040	.05875	.02846	−.01889
.10792	.06822	.04821	−.02465
.13897	.07691	.07252	−.02979
.17330	.08462	.10113	−.03414
.21061	.09119	.13371	−.03759
.25059	.09648	.16991	−.04003
.29293	.10039	.20931	−.04131
.33728	.10284	.25153	−.04120
.38330	.10381	.29632	−.03951
.43059	.10333	.34354	−.03619
.47876	.10147	.39294	−.03140
.52735	.09831	.44418	−.02524
.57590	.09397	.49710	−.01784
.62395	.08859	.55160	−.00978
.67101	.08232	.60714	−.00186
.71657	.07535	.66285	.00525
.76012	.06785	.71775	.01102
.80116	.05998	.77079	.01508
.83919	.05188	.82084	.01719
.87375	.04370	.86679	.01718
.90436	.03546	.90735	.01506
.93085	.02701	.94113	.01136
.95346	.01852	.96729	.00713
.97233	.01078	.98565	.00340
.98703	.00476	.99645	.00088
.99662	.00114	1.00000	.00000
1.00000	.00000		

TABLE III.– S905 AIRFOIL COORDINATES

Upper Surface		Lower Surface	
x/c	y/c	x/c	y/c
0.00003	0.00066	0.00004	–0.00070
.00047	.00297	.00037	–.00179
.00455	.01054	.00120	–.00266
.01280	.01937	.00254	–.00346
.02516	.02886	.00771	–.00536
.04163	.03863	.02065	–.00762
.06211	.04839	.03926	–.00898
.08648	.05789	.06332	–.00945
.11457	.06695	.09261	–.00909
.14614	.07541	.12682	–.00800
.18089	.08313	.16562	–.00627
.21849	.08997	.20860	–.00402
.25854	.09581	.25530	–.00138
.30064	.10051	.30519	.00152
.34435	.10391	.35772	.00455
.38928	.10586	.41227	.00755
.43504	.10625	.46821	.01041
.48128	.10496	.52486	.01296
.52766	.10192	.58152	.01510
.57397	.09708	.63745	.01667
.62009	.09058	.69190	.01759
.66582	.08287	.74412	.01779
.71067	.07440	.79336	.01725
.75405	.06552	.83888	.01593
.79539	.05651	.87997	.01390
.83410	.04761	.91590	.01120
.86962	.03901	.94594	.00809
.90137	.03076	.96955	.00501
.92905	.02278	.98647	.00240
.95269	.01521	.99662	.00063
.97222	.00863	1.00000	.00000
.98716	.00373		
.99670	.00088		
1.00000	.00000		
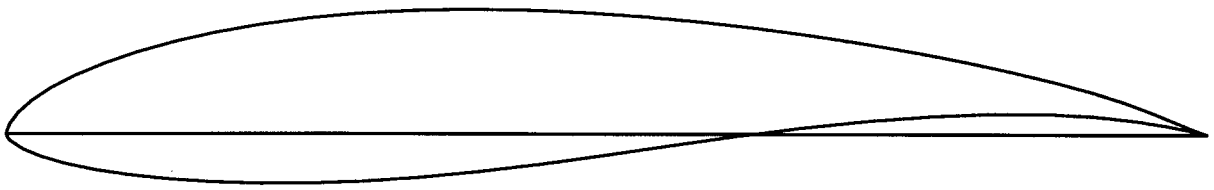
(a) S904.
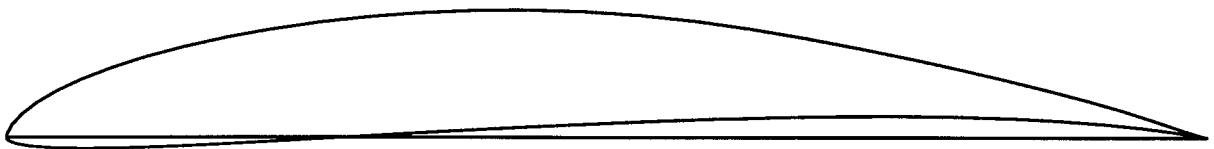
(b) S905.

Figure 1.- Airfoil shapes.
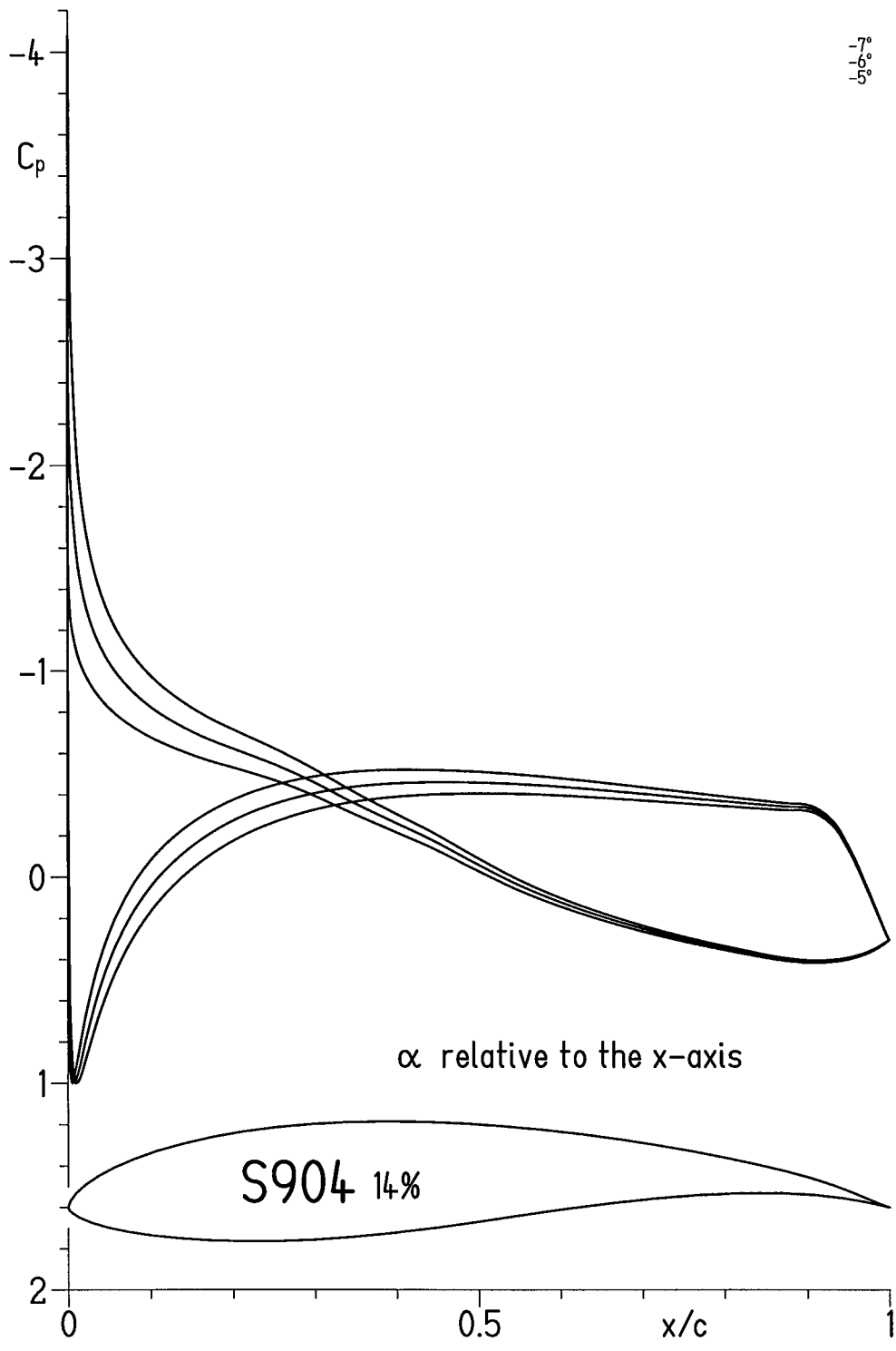
(a) $\alpha = -7°, -6°,$ and $-5°$.

Figure 2.- Inviscid pressure distributions for S904 airfoil.

α relative to the x-axis

S904 14%

−4°
−3°
−2°
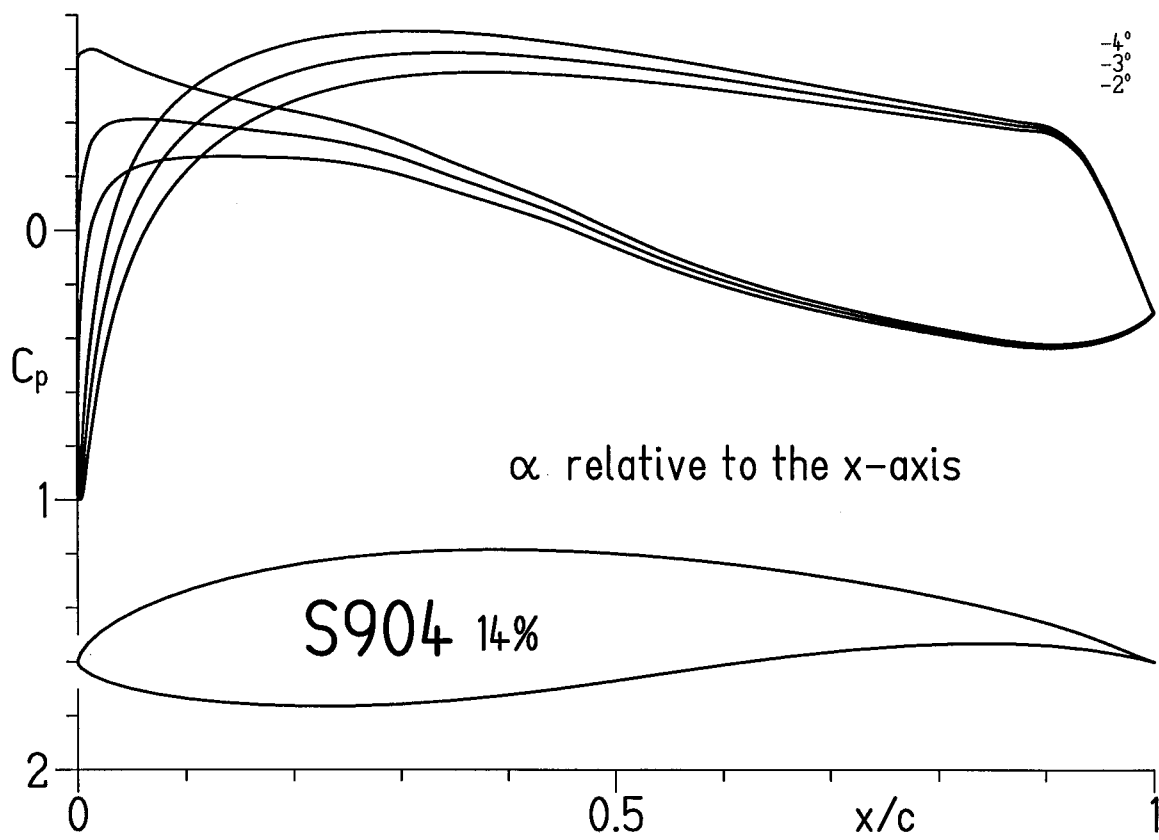
(b) α = −4°, −3°, and −2°.

Figure 2.- Continued.

−1

C_p

0

1

−1°
0°
1°

α relative to the x-axis

S904 14%

2

0   0.5   x/c   1
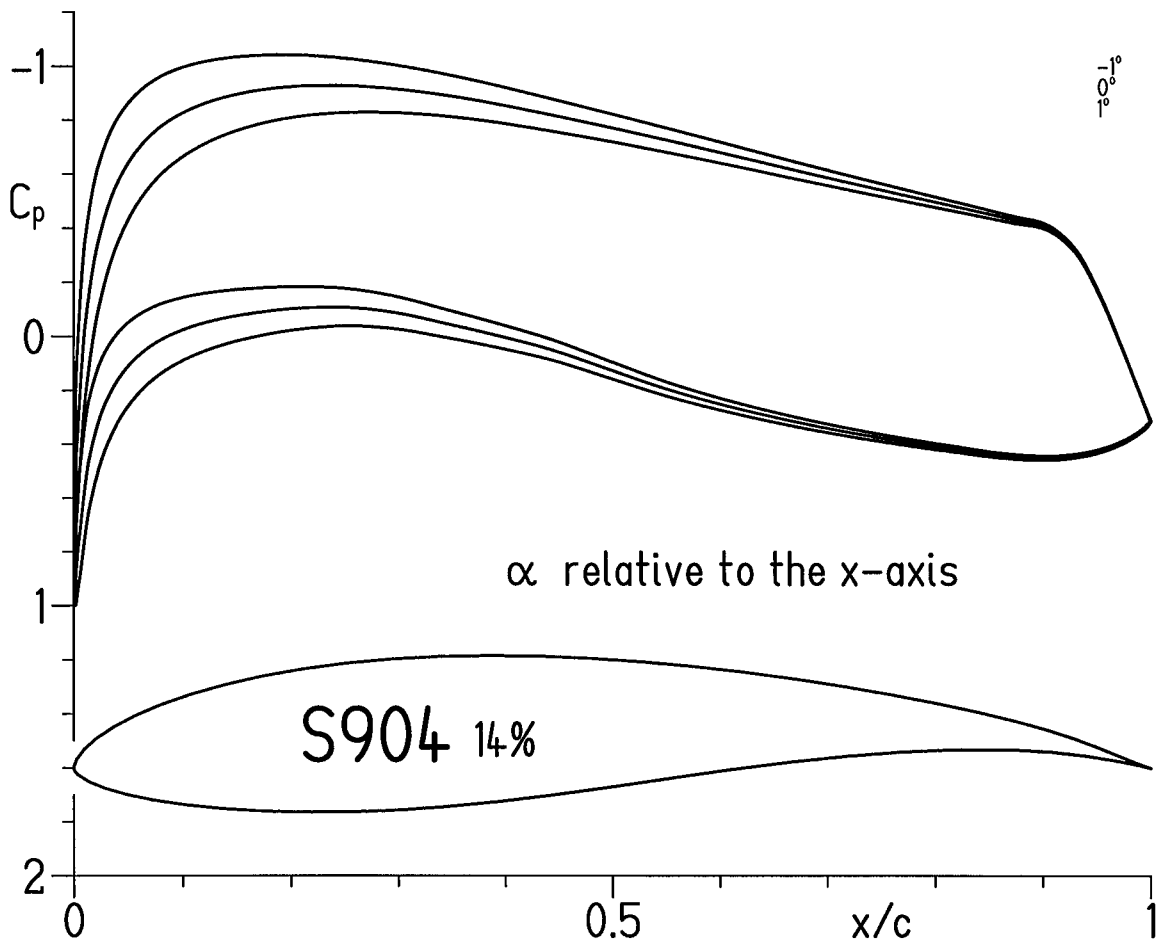
(c) α = −1°, 0°, and 1°.

Figure 2.- Continued.

α relative to the x-axis

S904 14%
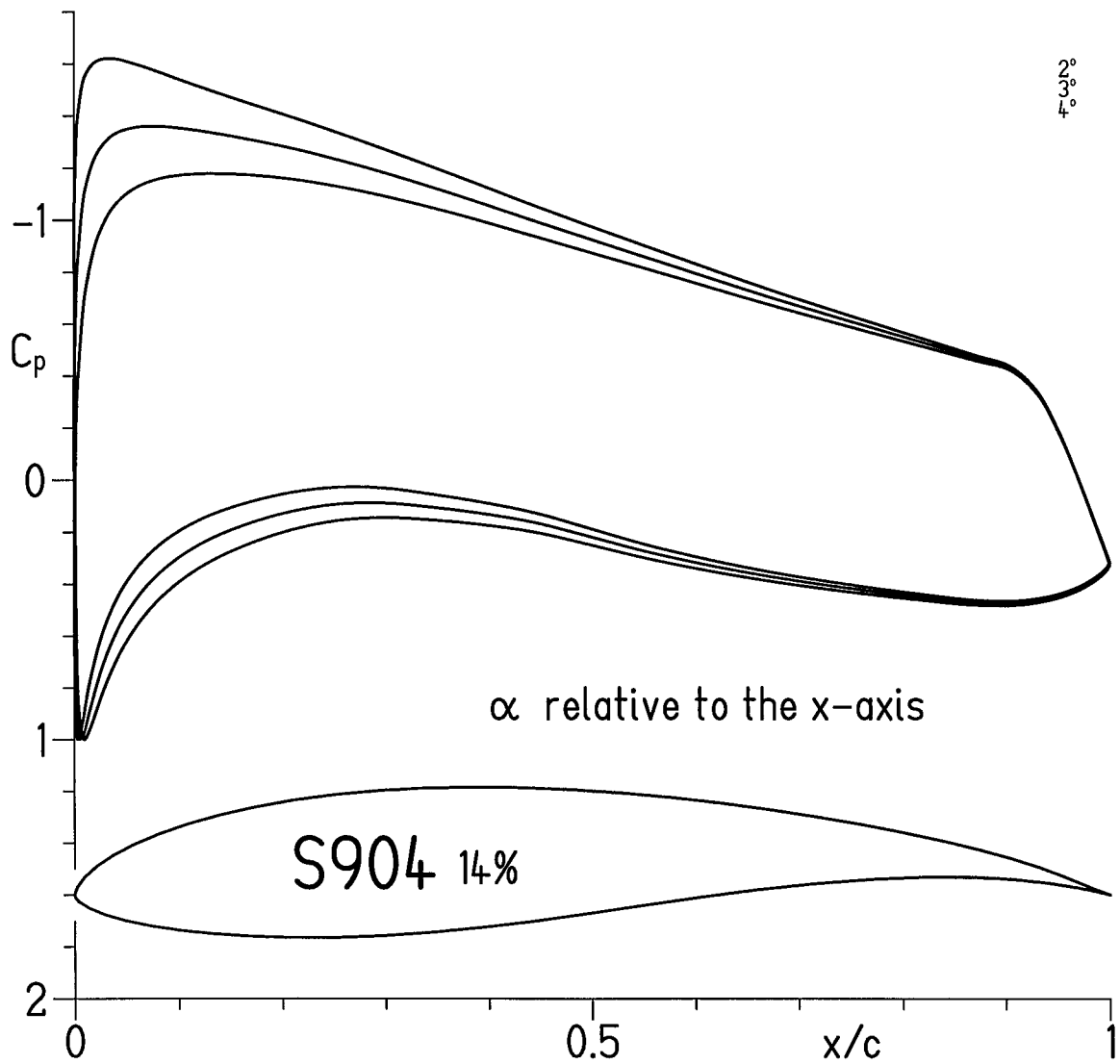
(d) $\alpha = 2°$, $3°$, and $4°$.

Figure 2.- Continued.

C_p

5°
6°
7°

α relative to the x-axis

S904 14%

x/c
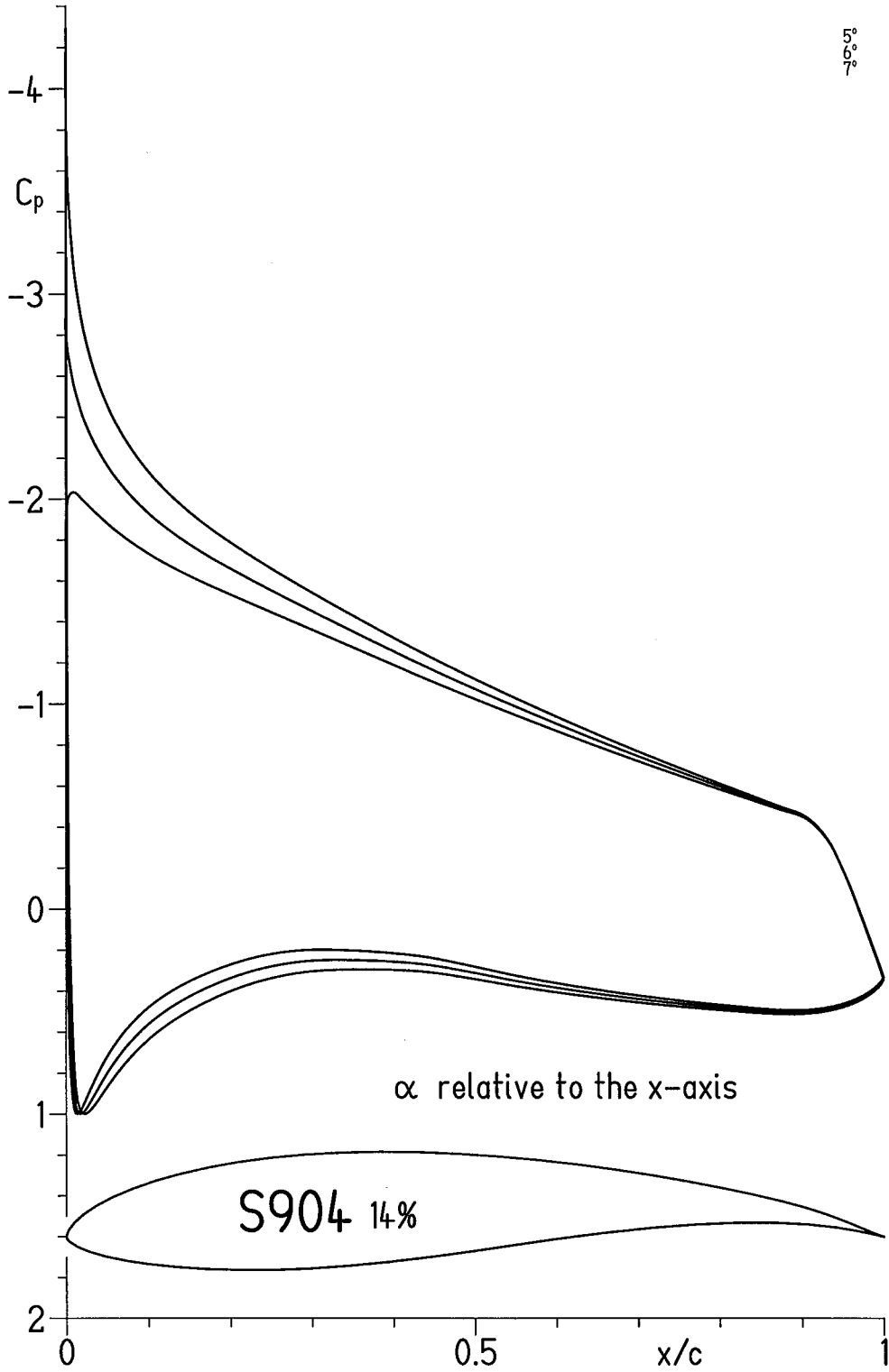
(e) α = 5°, 6°, and 7°.

Figure 2.- Continued.

18
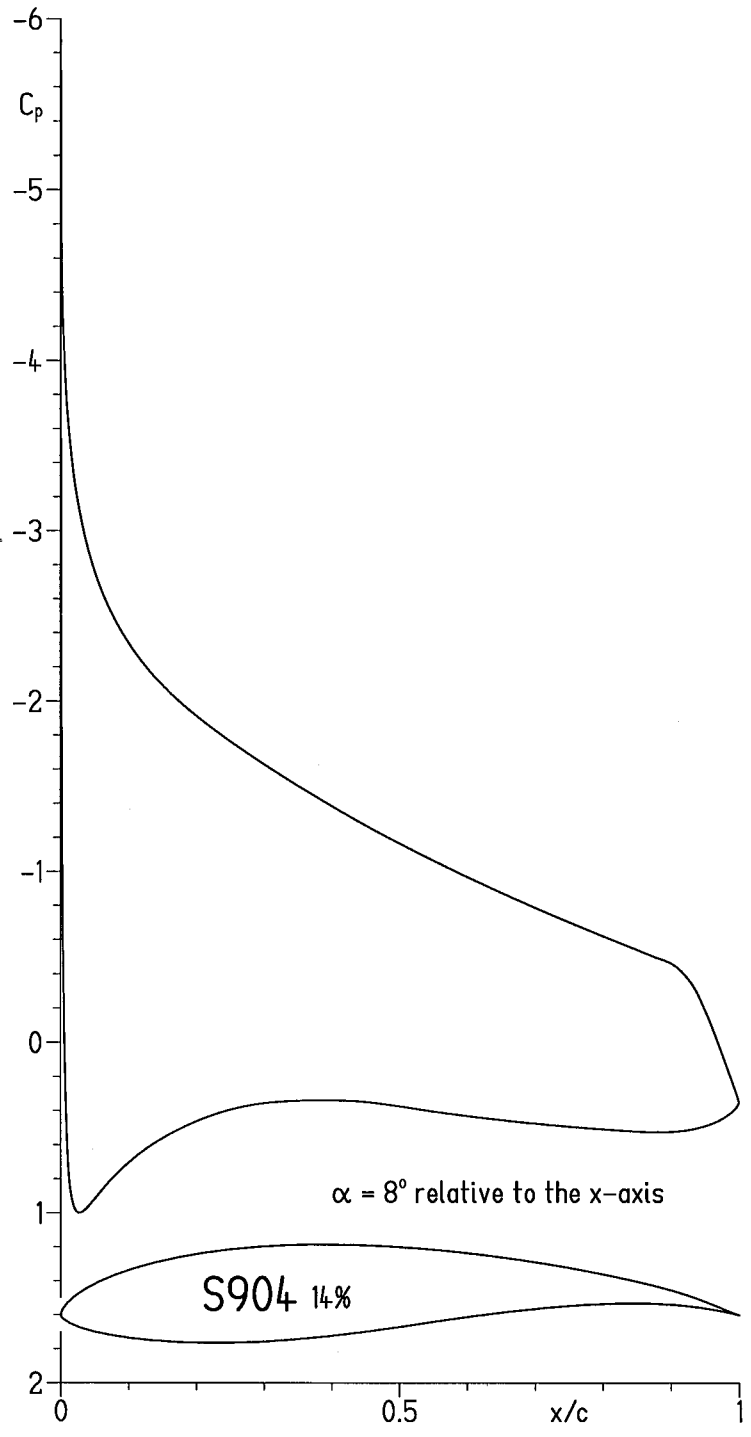
(f) $\alpha = 8°$.

Figure 2.- Concluded.

S904
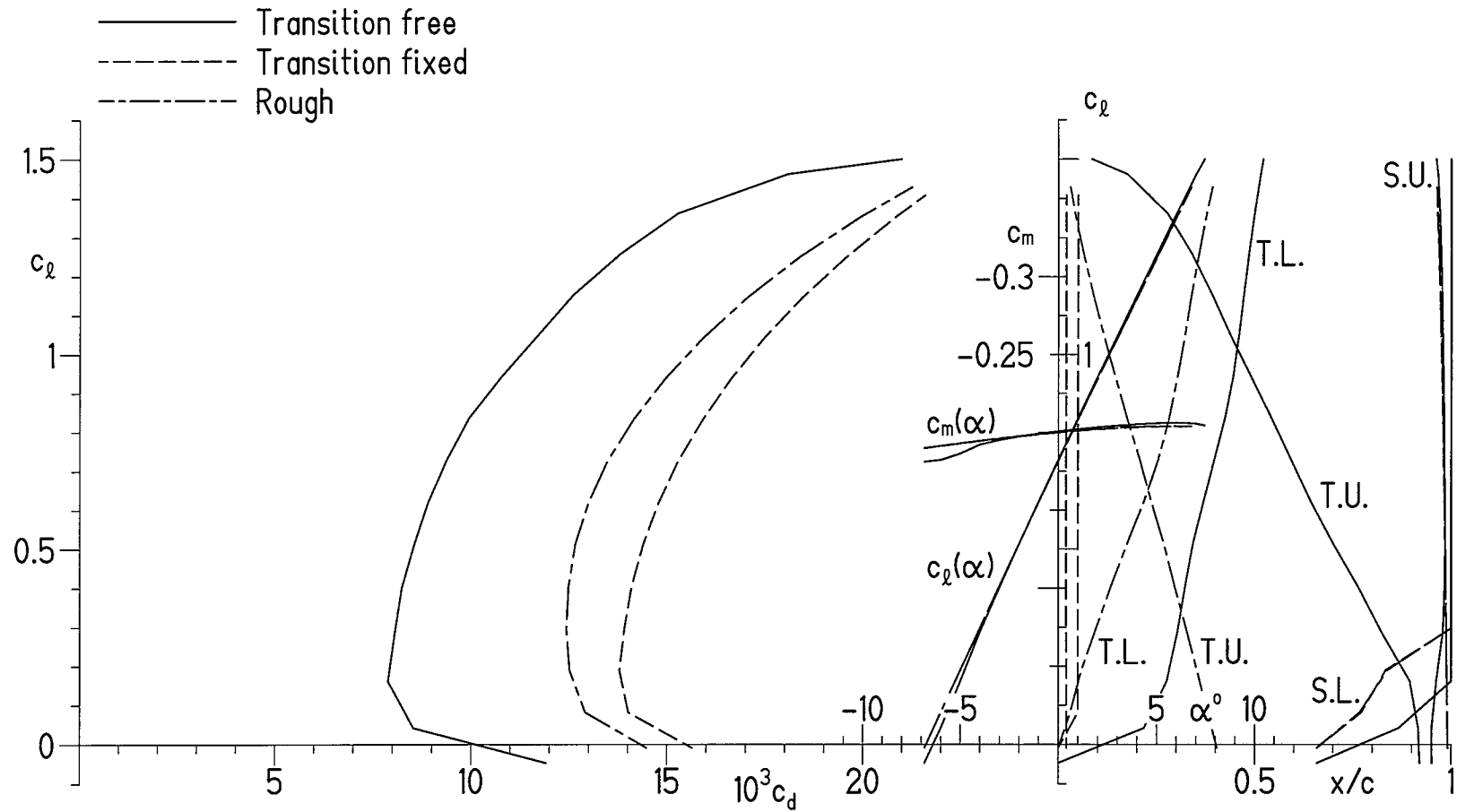
(a) R = 0.5 × 10^6.

Figure 3.- Section characteristics of S904 airfoil with transition free, transition fixed, and rough.

S904

Transition free
Transition fixed
Rough
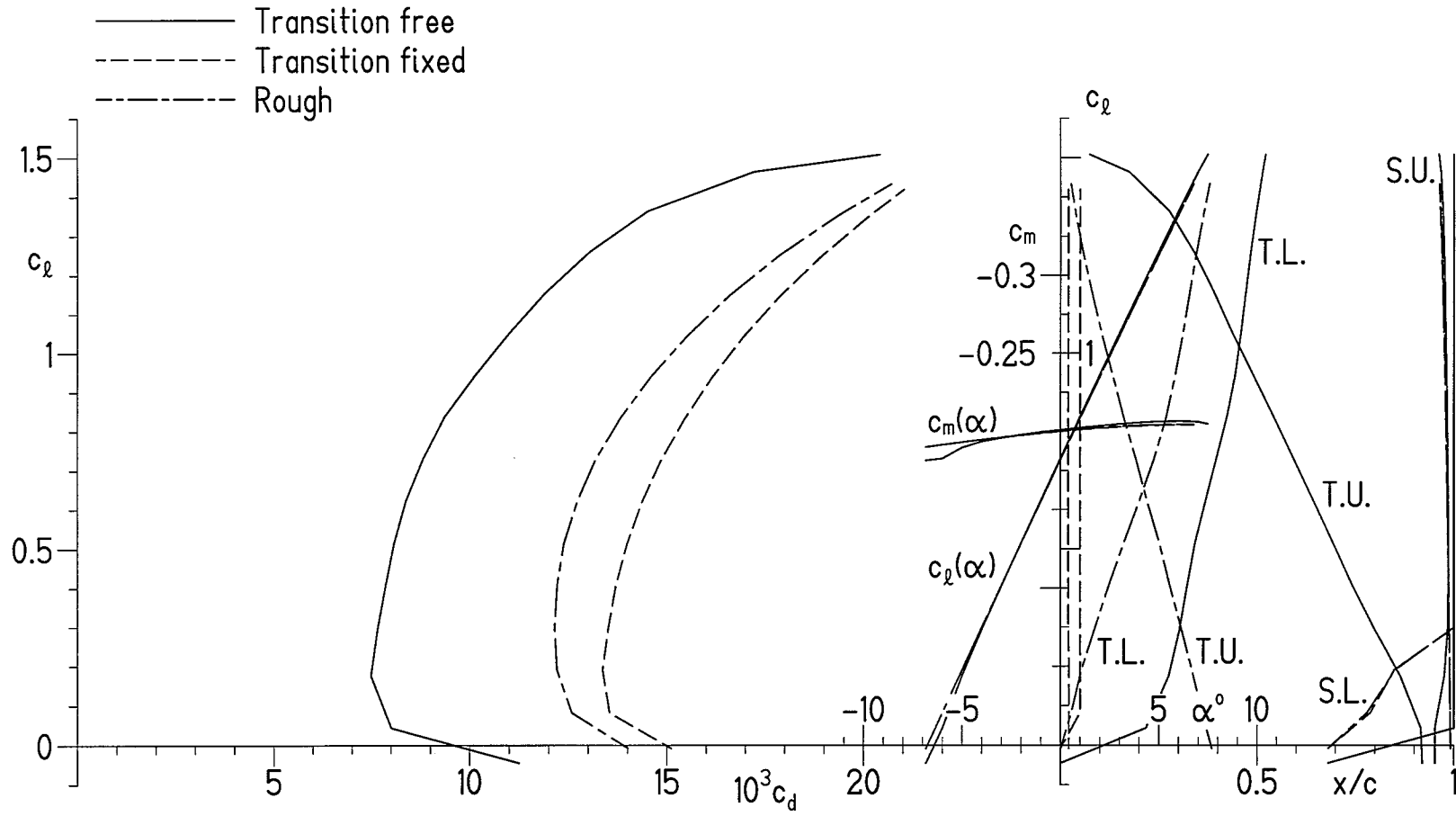
(b) $R = 0.6 \times 10^6$.

Figure 3.- Continued.

S904

——————— Transition free

— — — — — Transition fixed
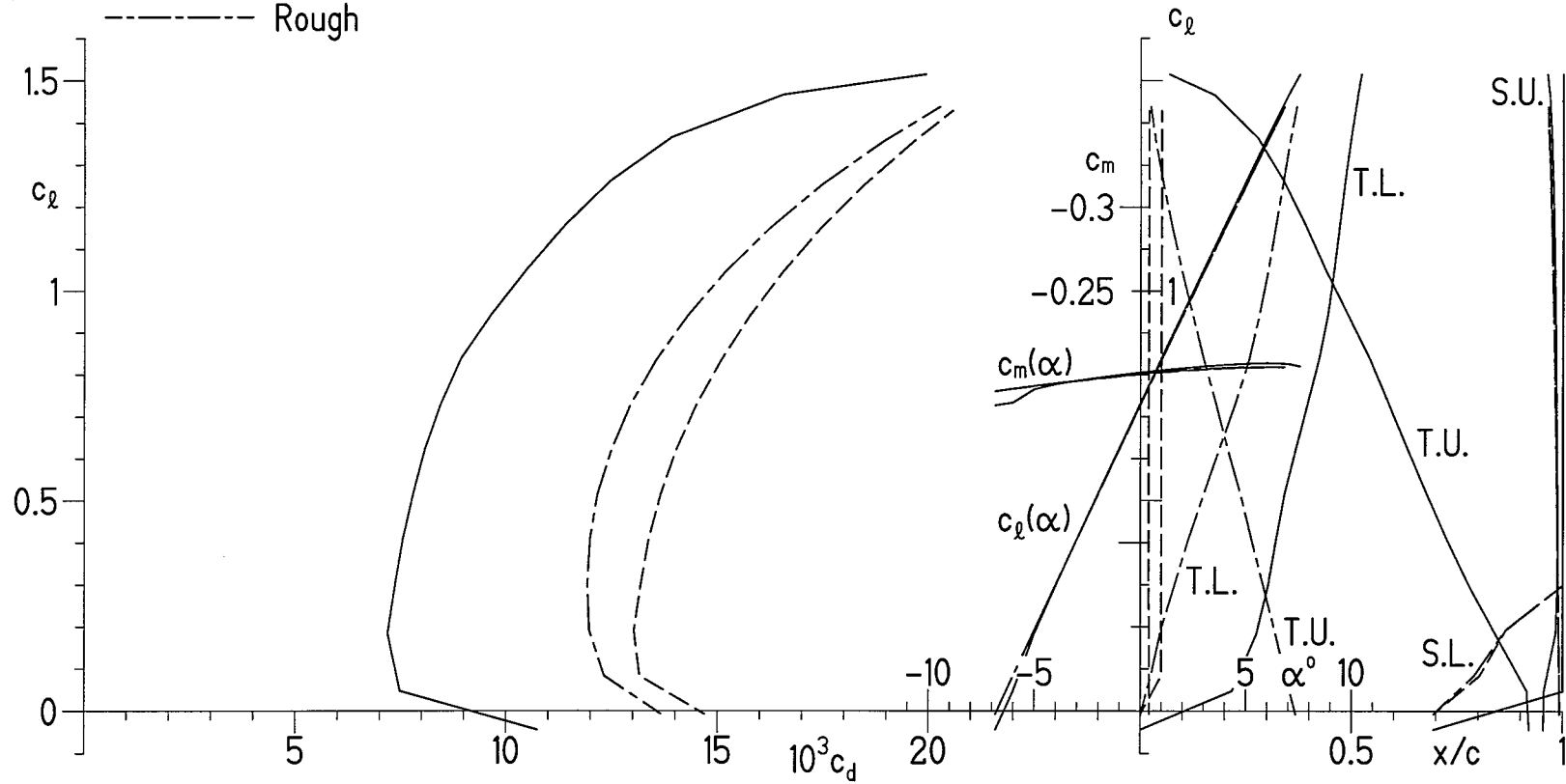
—·—·—·— Rough

(c) $R = 0.7 \times 10^6$.

Figure 3.- Continued.

S904

Transition free
------- Transition fixed
-----·----- Rough
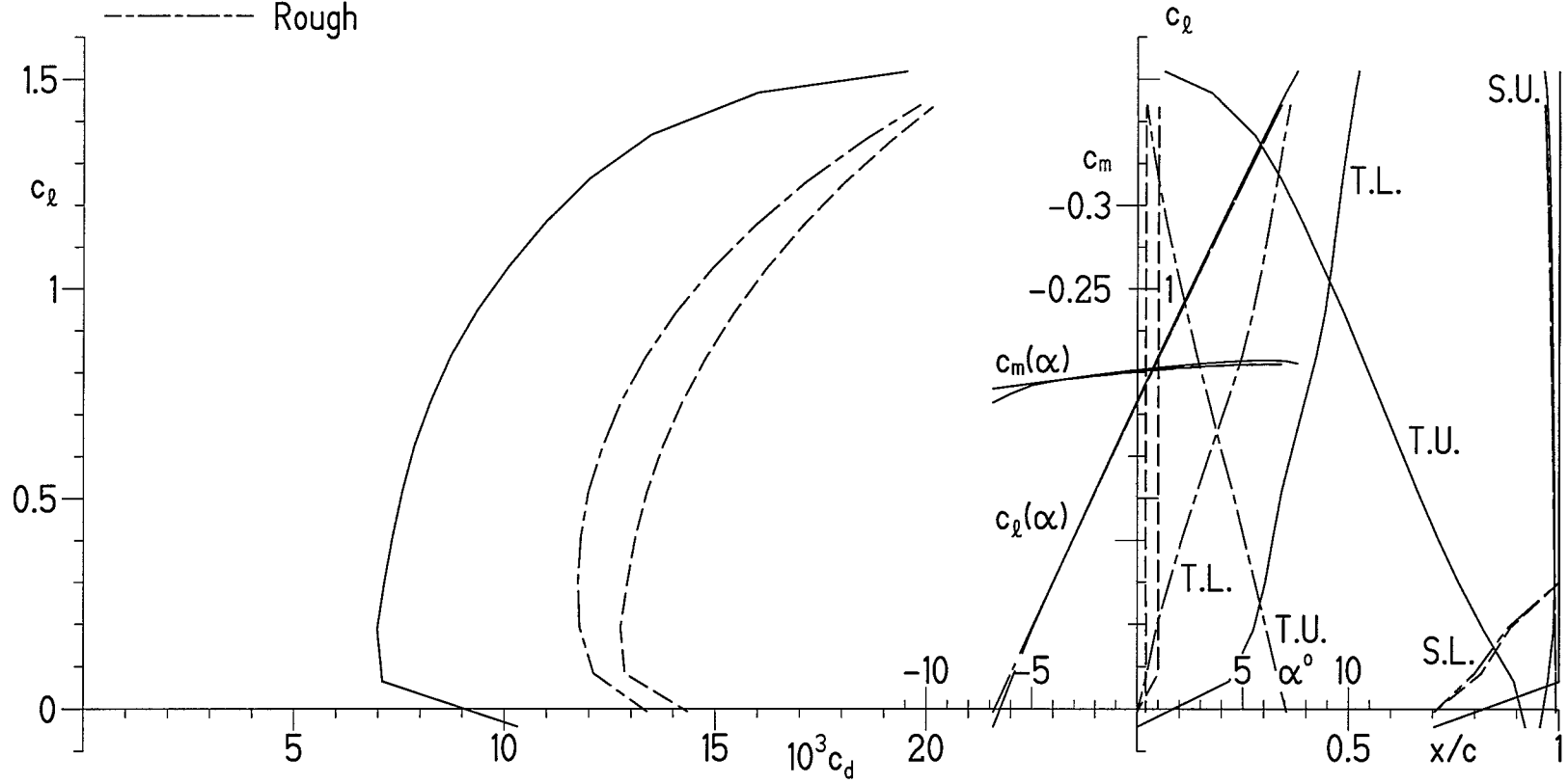
(d) $R = 0.8 \times 10^6$.

Figure 3.- Continued.

23

S904

Transition free
Transition fixed
Rough
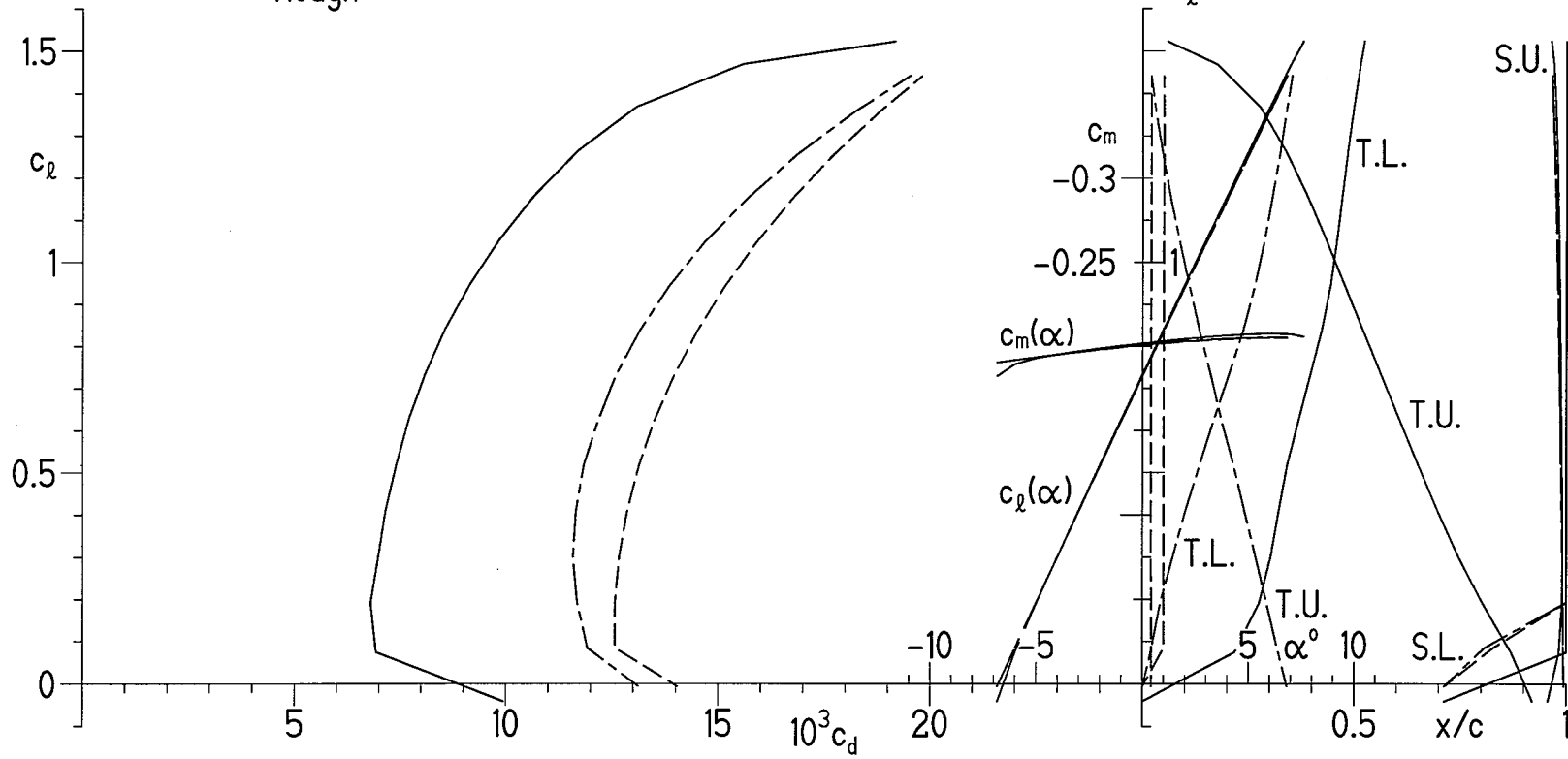
(e) $R = 0.9 \times 10^6$.

Figure 3.- Continued.
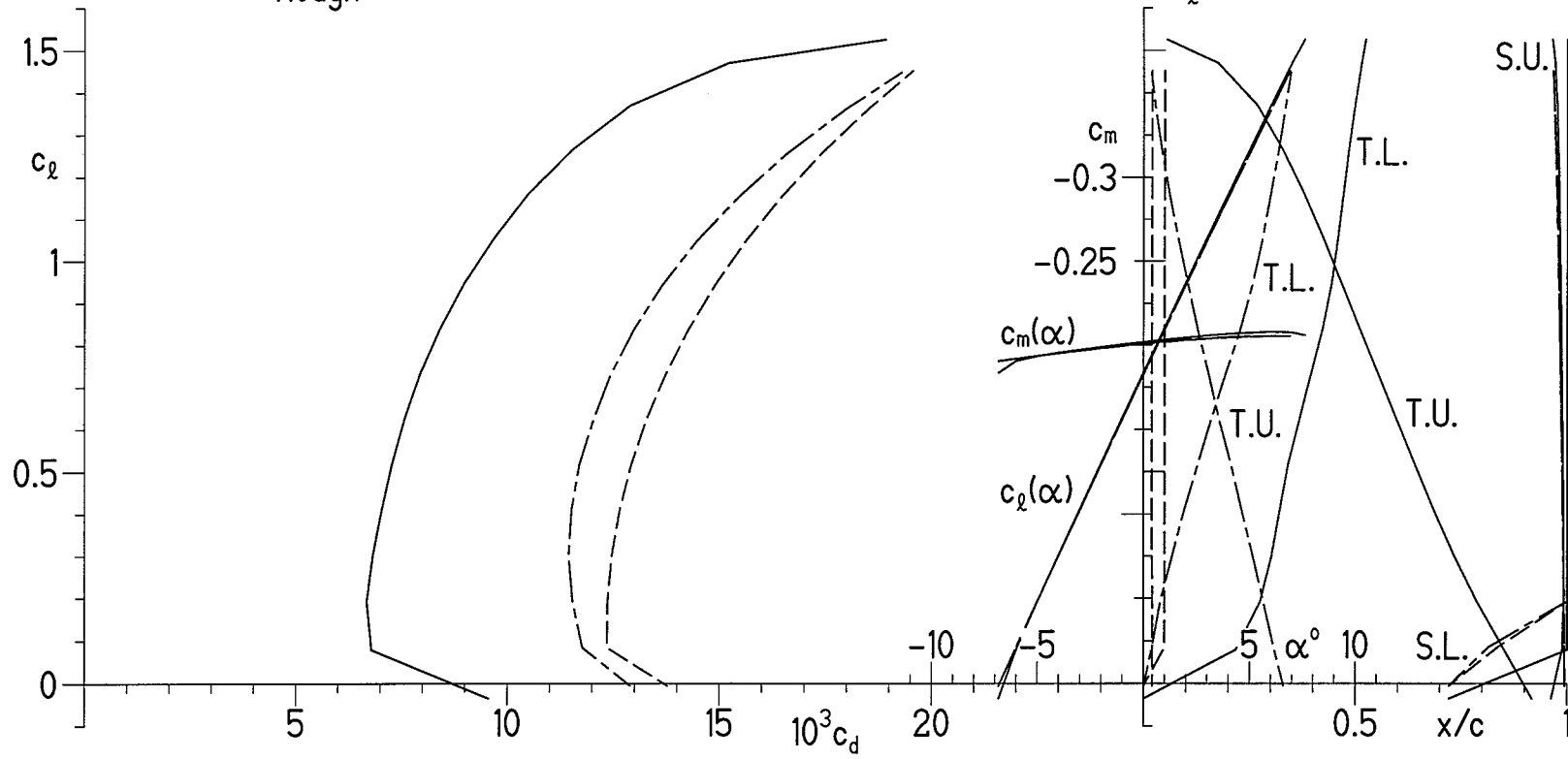
S904

(f) R = 1.0×10^6.

Figure 3.- Continued.
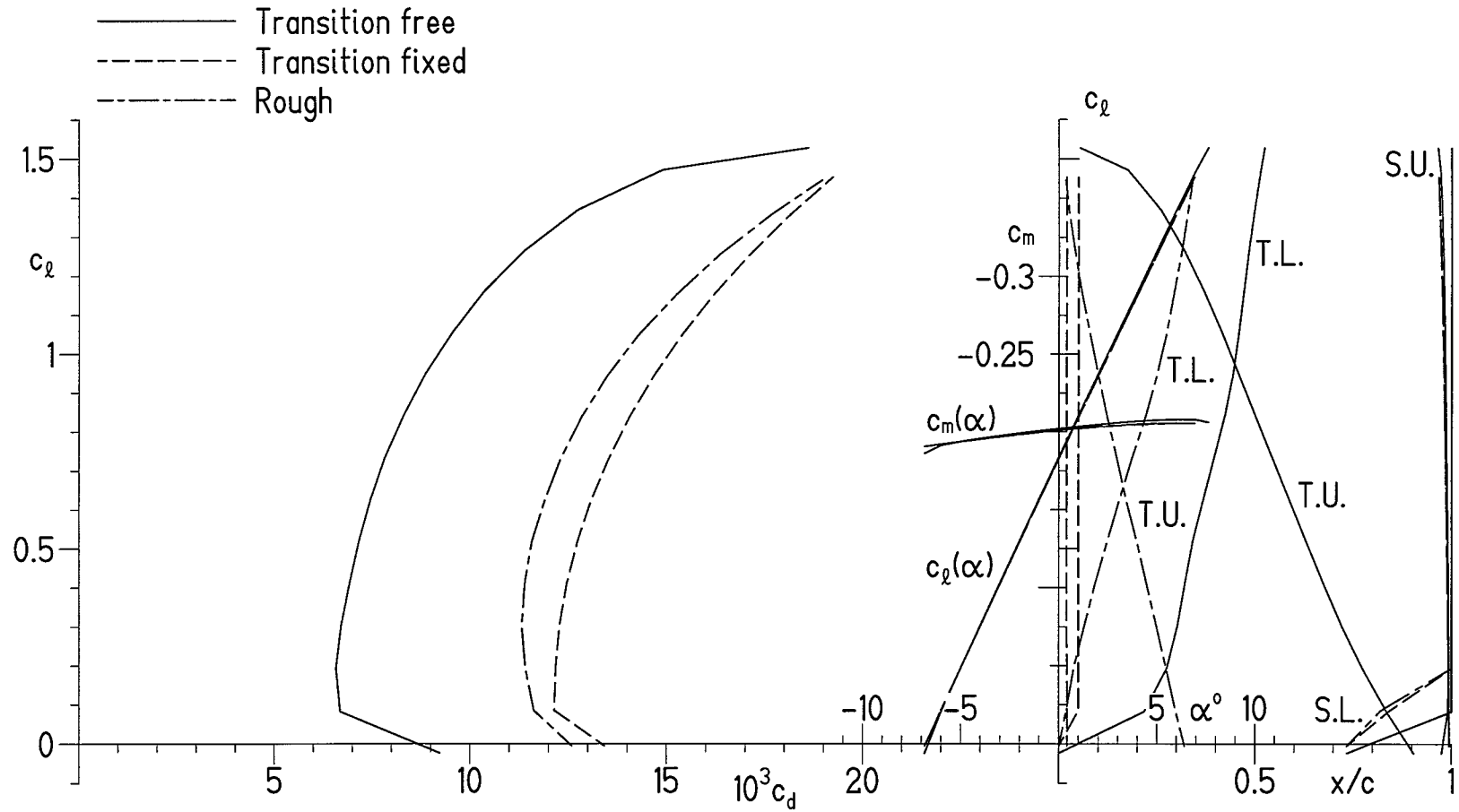
S904

(g) $R = 1.1 \times 10^6$.

Figure 3.- Continued.
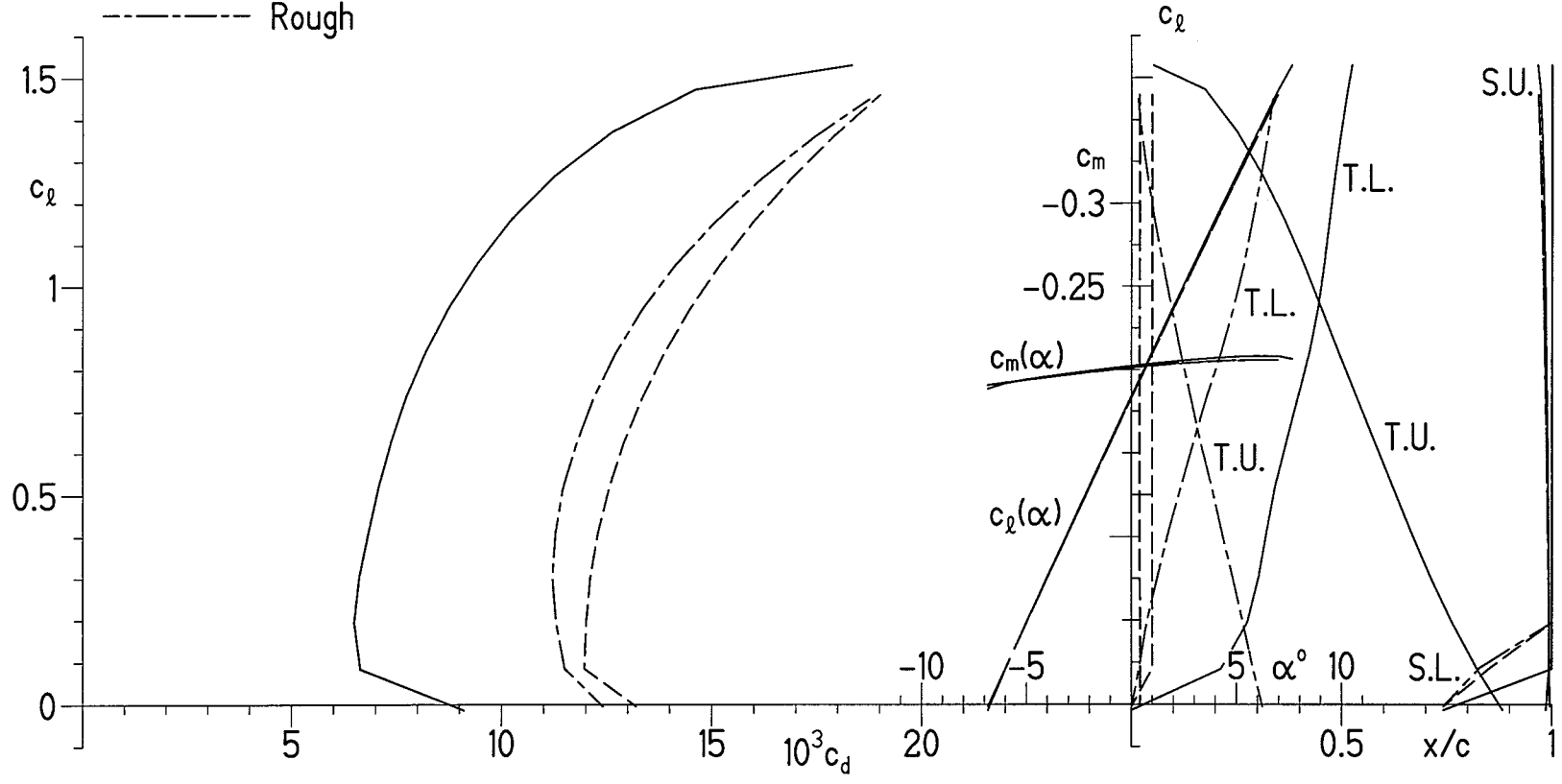
S904

(h) R = 1.2 × 10⁶.

Figure 3.- Continued.

S904

─────── Transition free

─ ─ ─ ─ ─ Transition fixed

─ · ─ · ─ · ─ Rough

(i) $R = 1.3 \times 10^6$.

Figure 3.- Continued.

S904

Transition free
Transition fixed
Rough

(j) $R = 1.4 \times 10^6$.

Figure 3.- Continued.

S904

——————— Transition free
- - - - - - - Transition fixed
—·—·—·— Rough
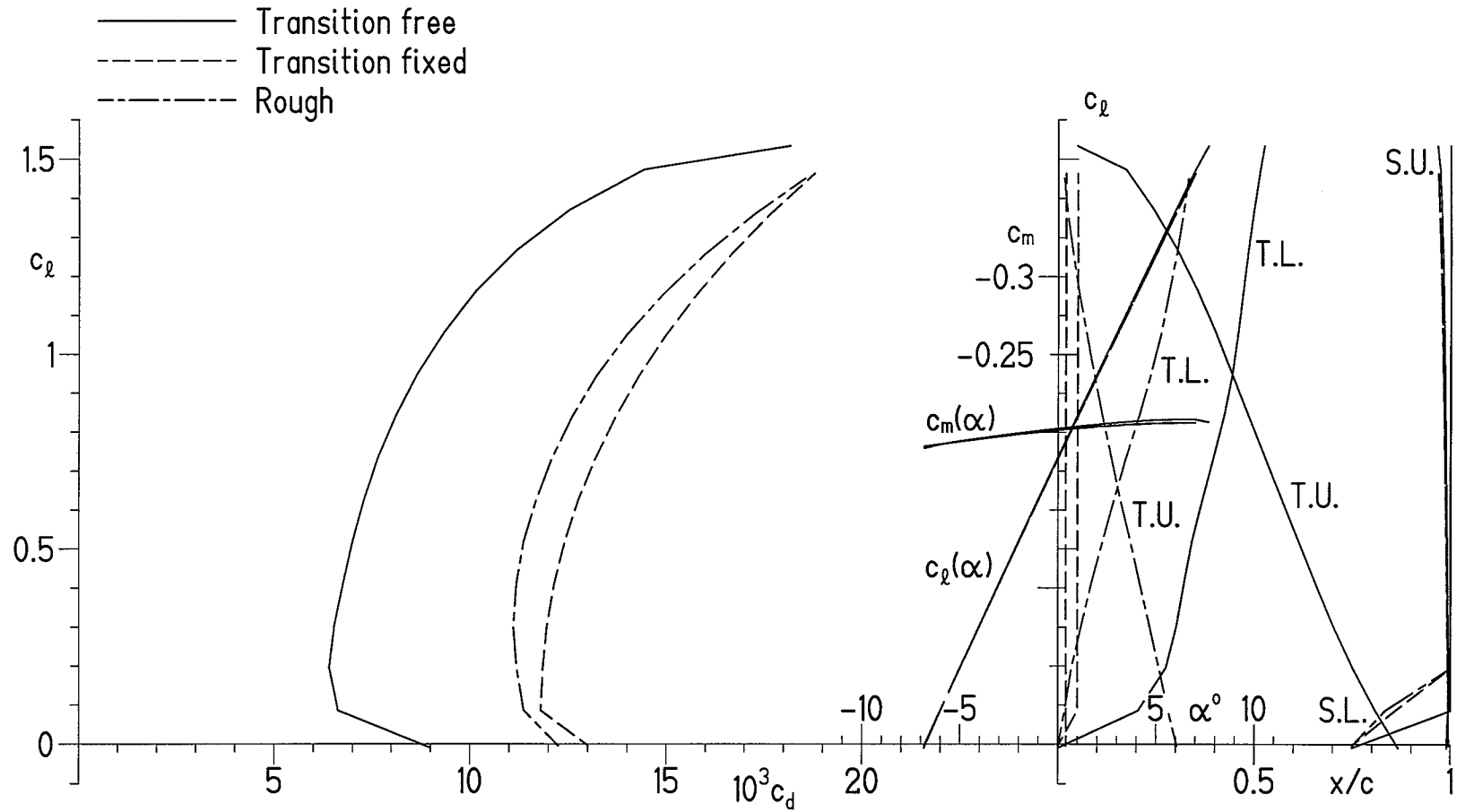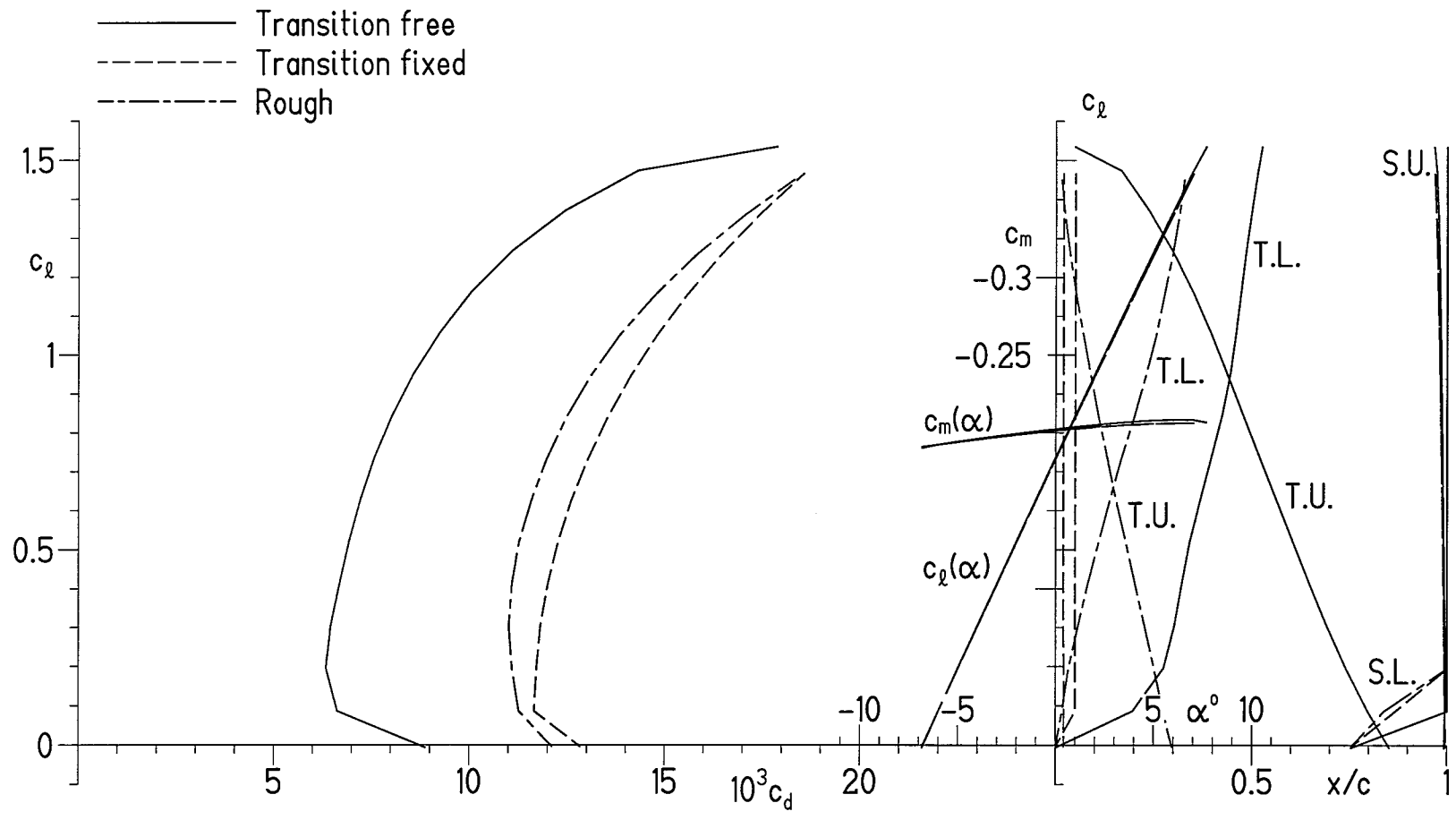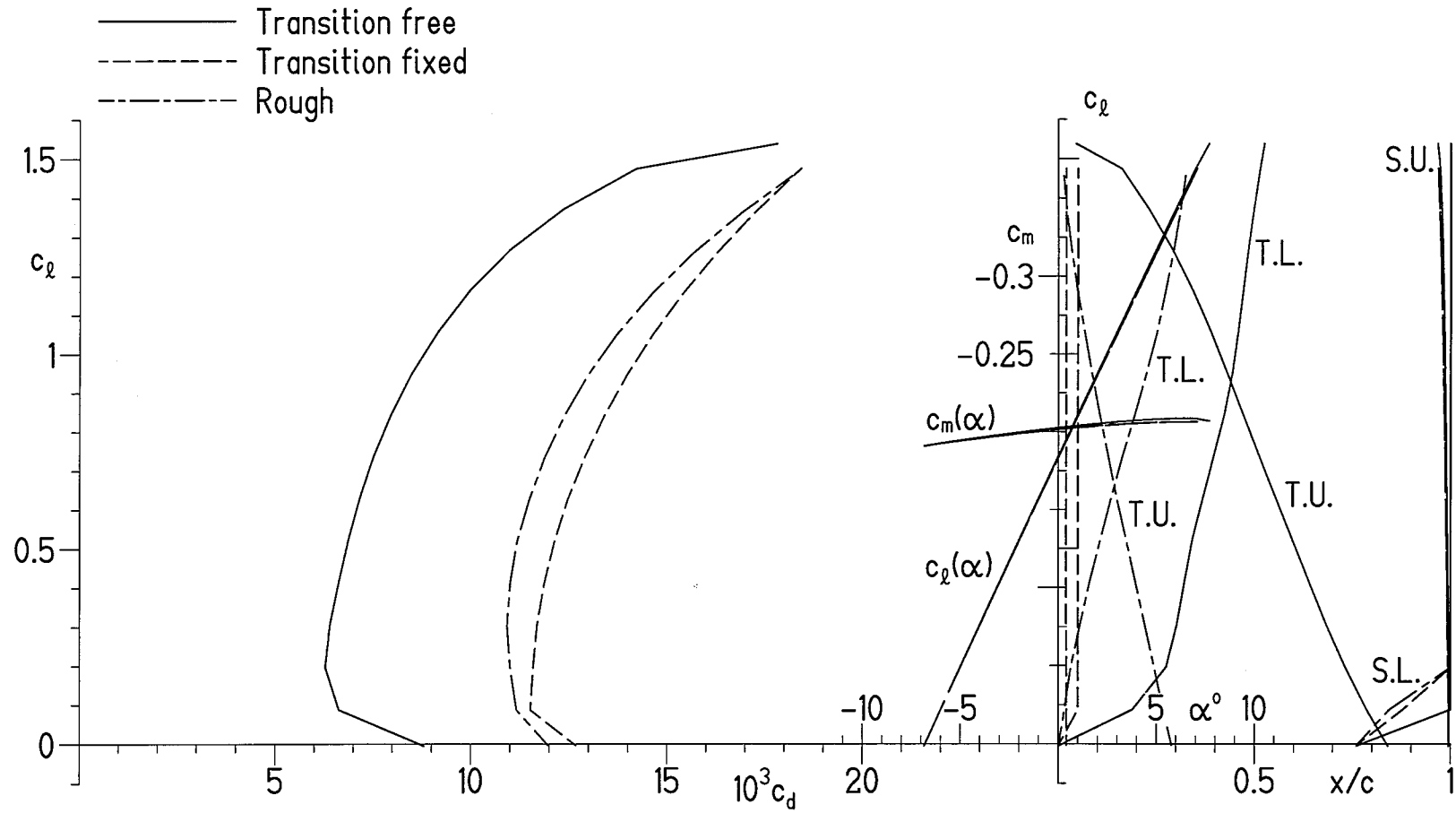
(k) R = 1.5 × 10^6.

Figure 3.- Concluded.
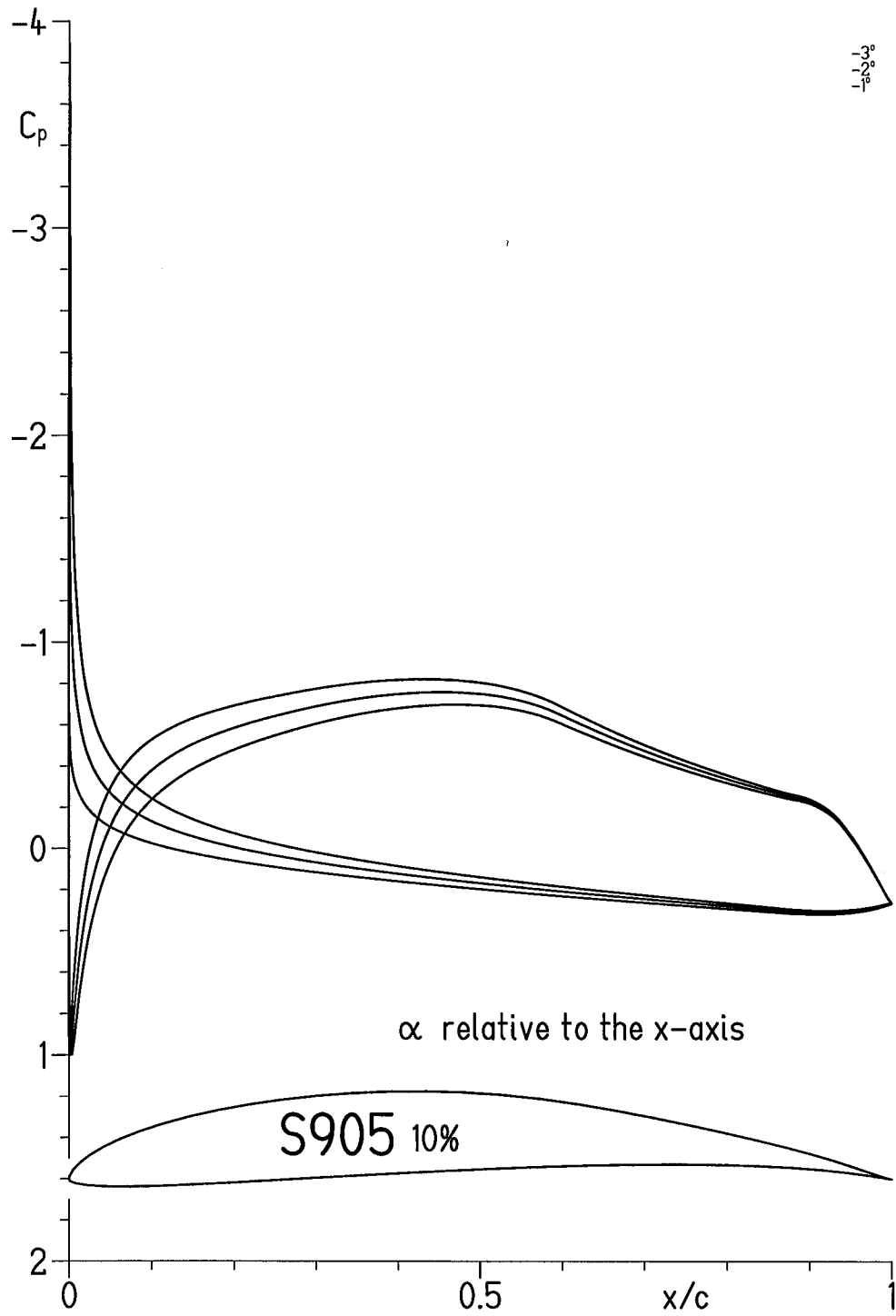
(a) $\alpha = -3°, -2°,$ and $-1°$.

Figure 4.- Inviscid pressure distributions for S905 airfoil.
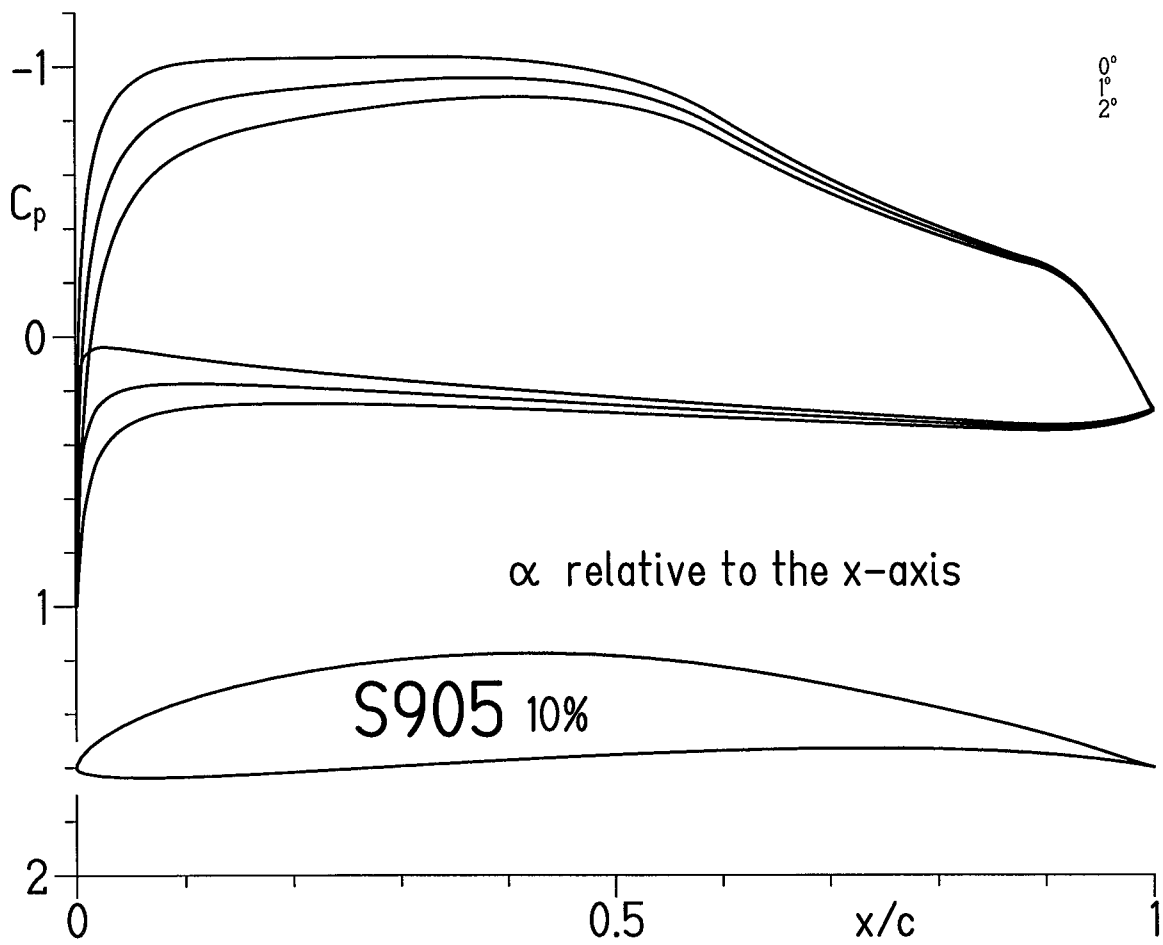
(b) $\alpha = 0°$, 1°, and 2°.

Figure 4.- Continued.
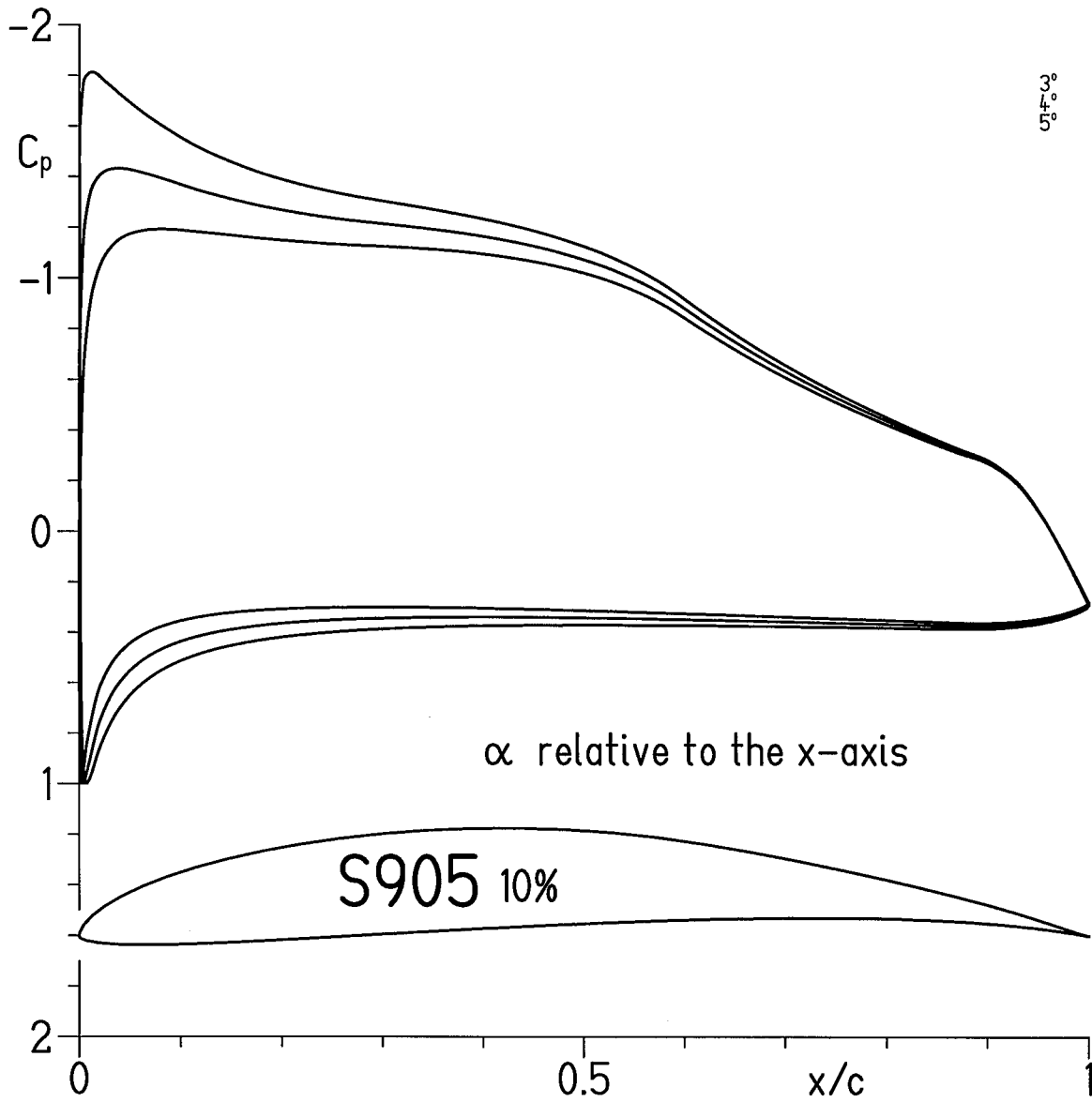
(c) $\alpha = 3°$, $4°$, and $5°$.

Figure 4.- Continued.
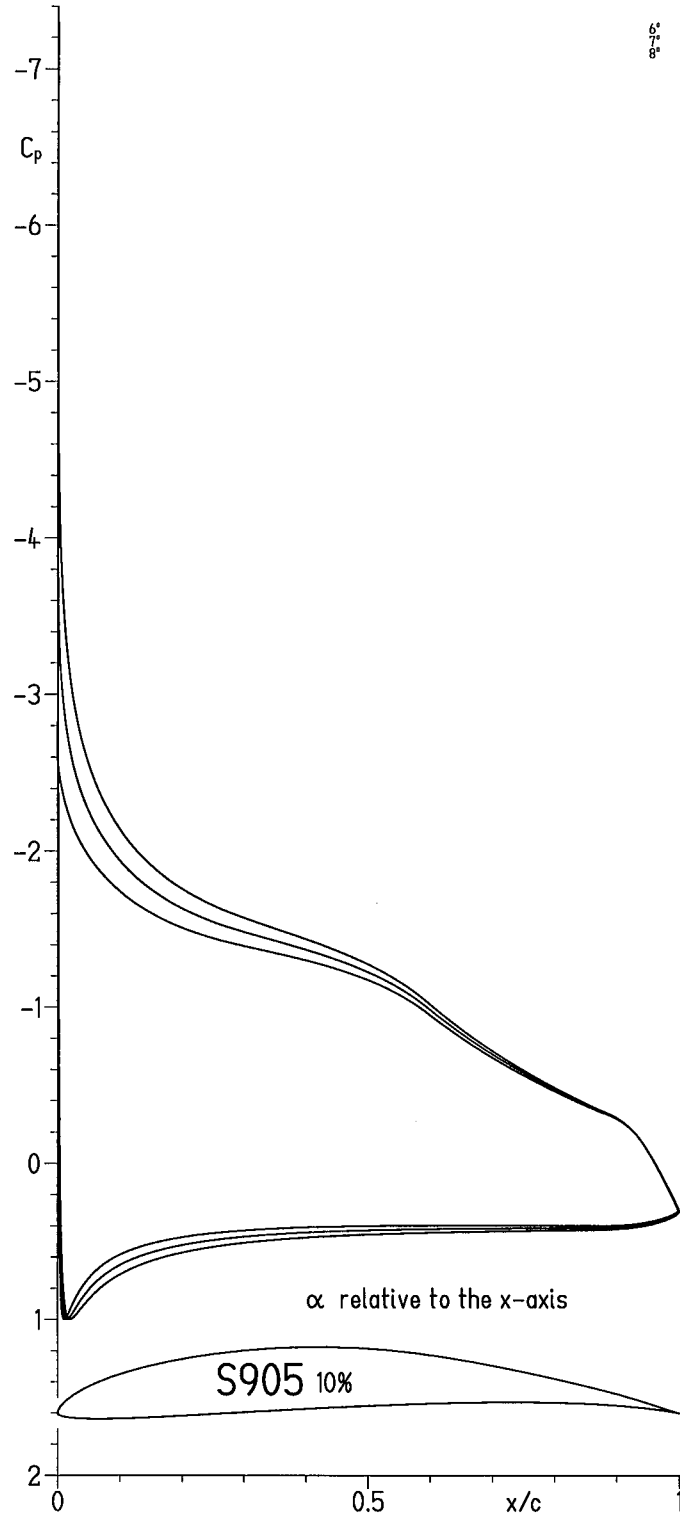
(d) $\alpha = 6°$, $7°$, and $8°$.

Figure 4.- Concluded.

S905
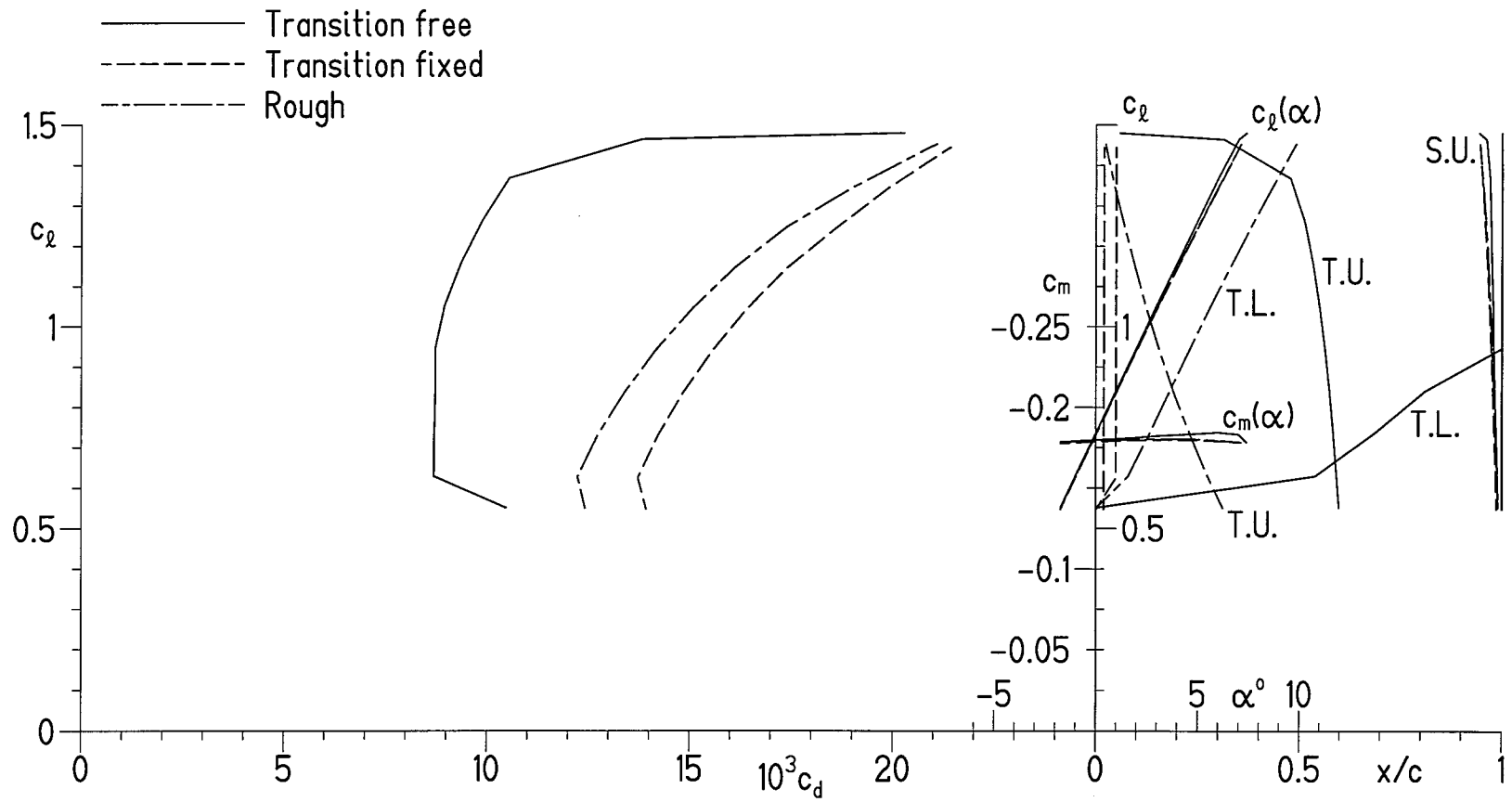
(a) $R = 0.5 \times 10^6$.

Figure 5.- Section characteristics of S905 airfoil with transition free, transition fixed, and rough.

S905
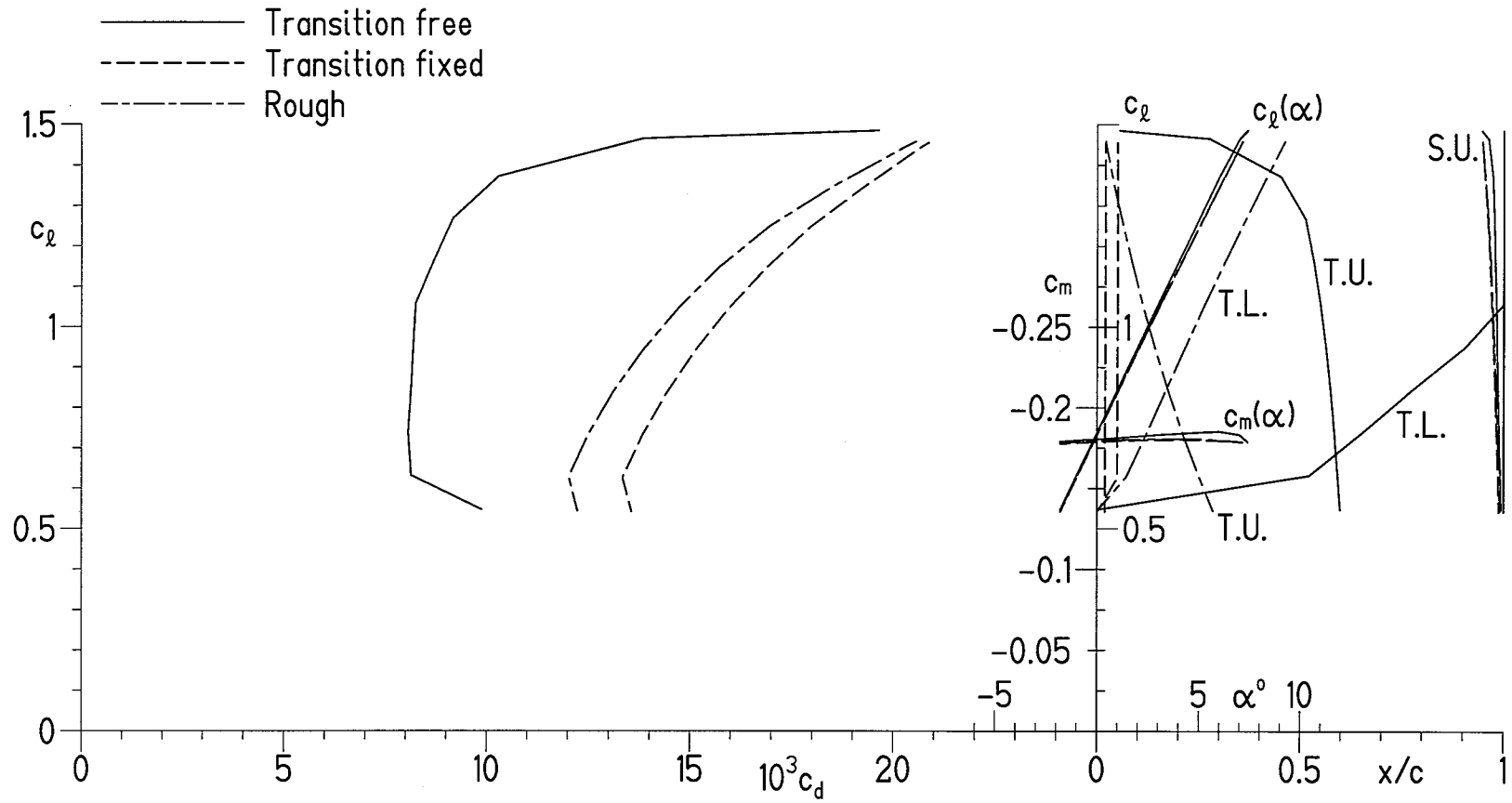
(b) $R = 0.6 \times 10^6$.

Figure 5.- Continued.
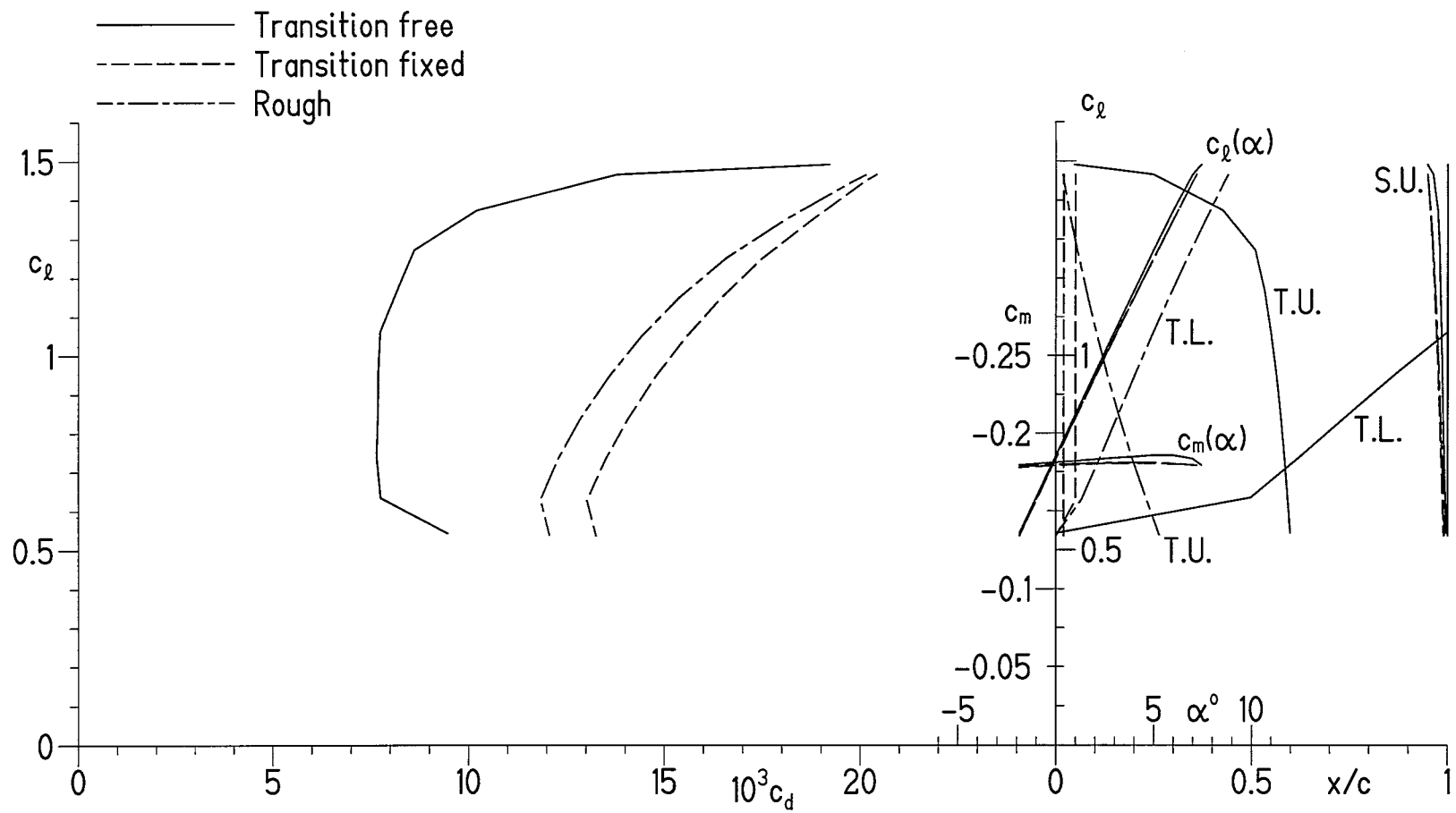
S905

(c) $R = 0.7 \times 10^6$.

Figure 5.- Continued.

S905

———————— Transition free
– – – – – – Transition fixed
–·–·–·– Rough

(d) $R = 0.8 \times 10^6$.

Figure 5.- Continued.

S905

- ———— Transition free
- – – – – – Transition fixed
- –·–·–·– Rough

(e) $R = 0.9 \times 10^6$.

Figure 5.- Continued.

S905

──────── Transition free

── ── ── Transition fixed

──·──·── Rough
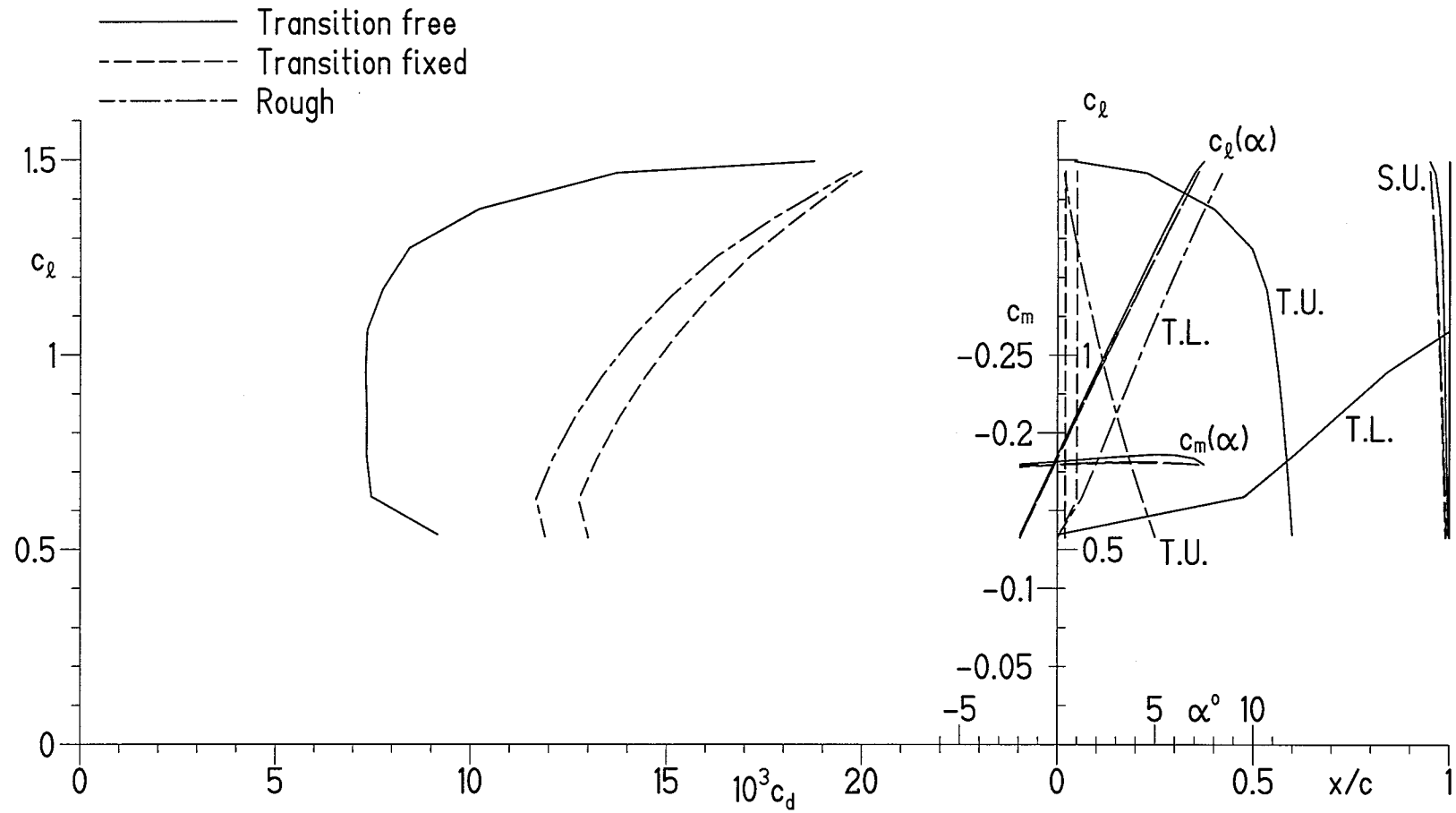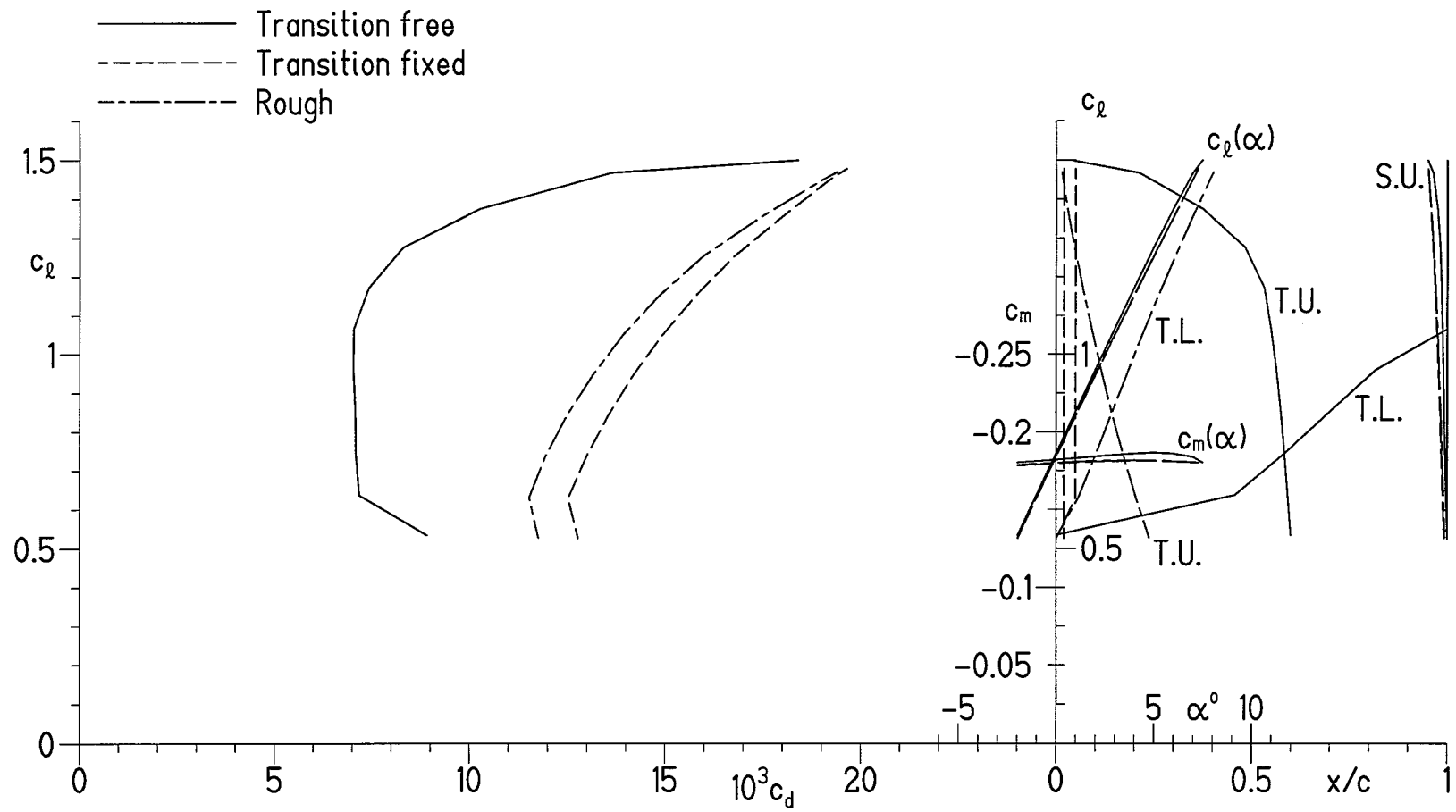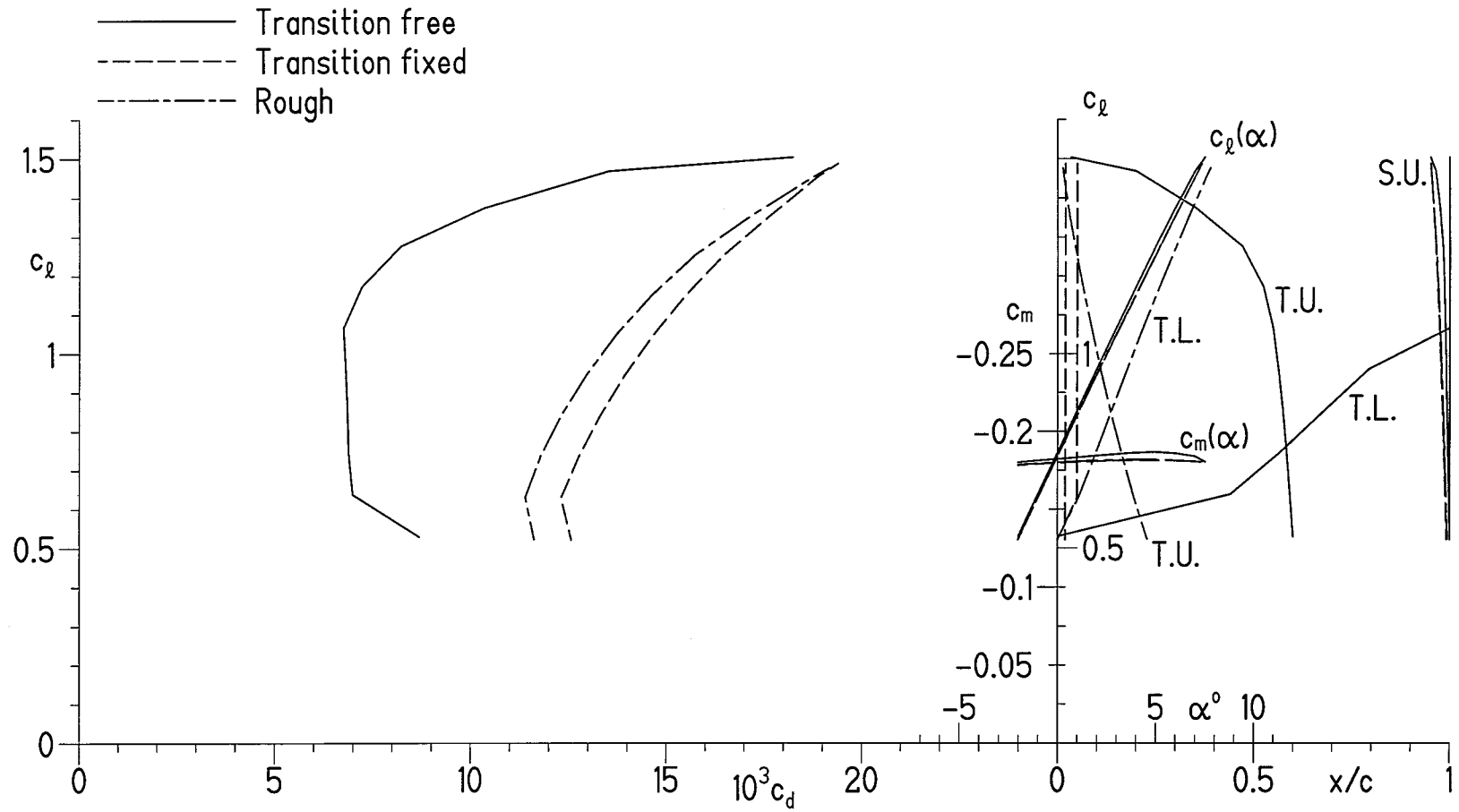
(f) $R = 1.0 \times 10^6$.

Figure 5.- Continued.
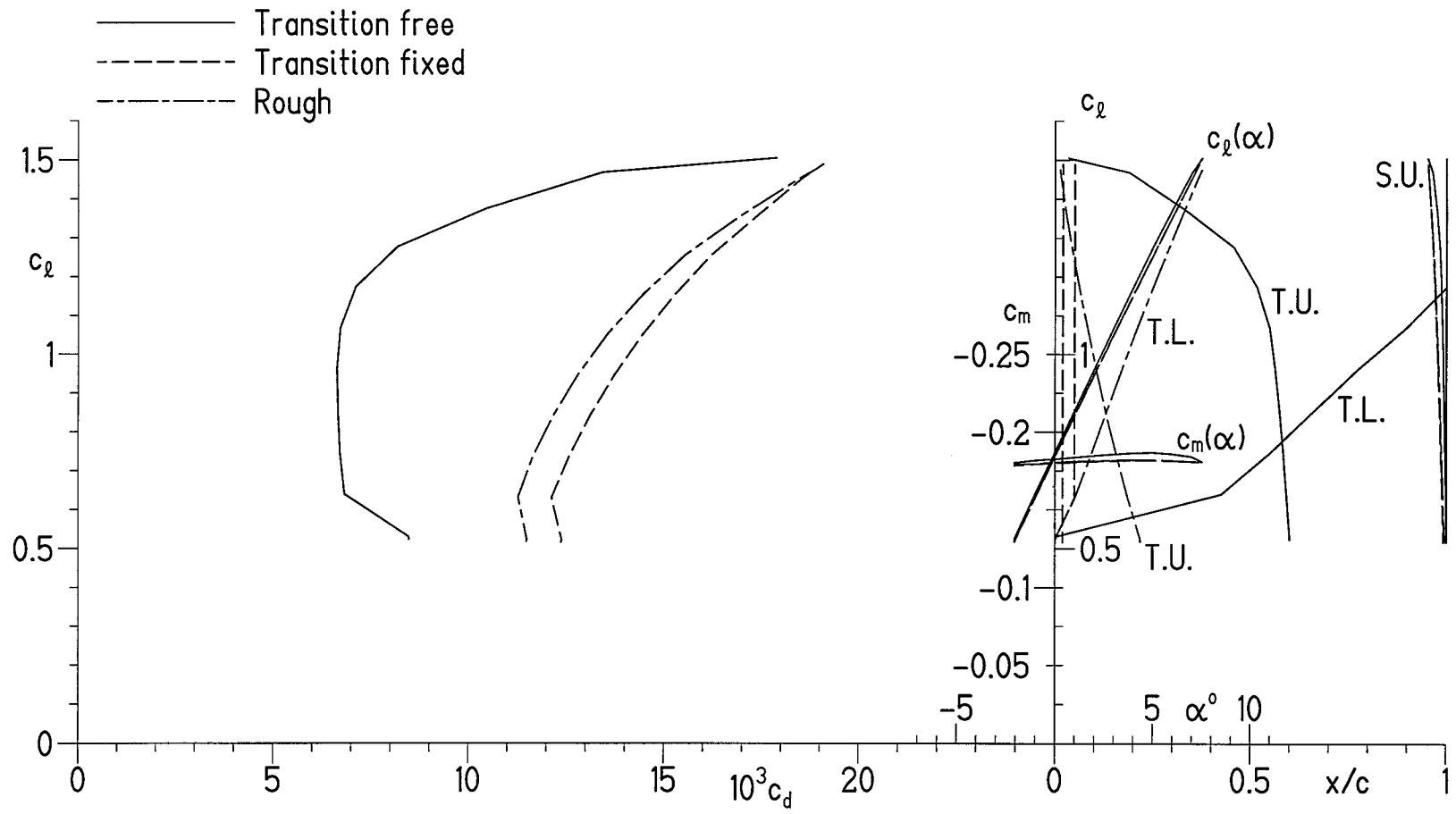
S905

(g) $R = 1.1 \times 10^6$.

Figure 5.- Continued.
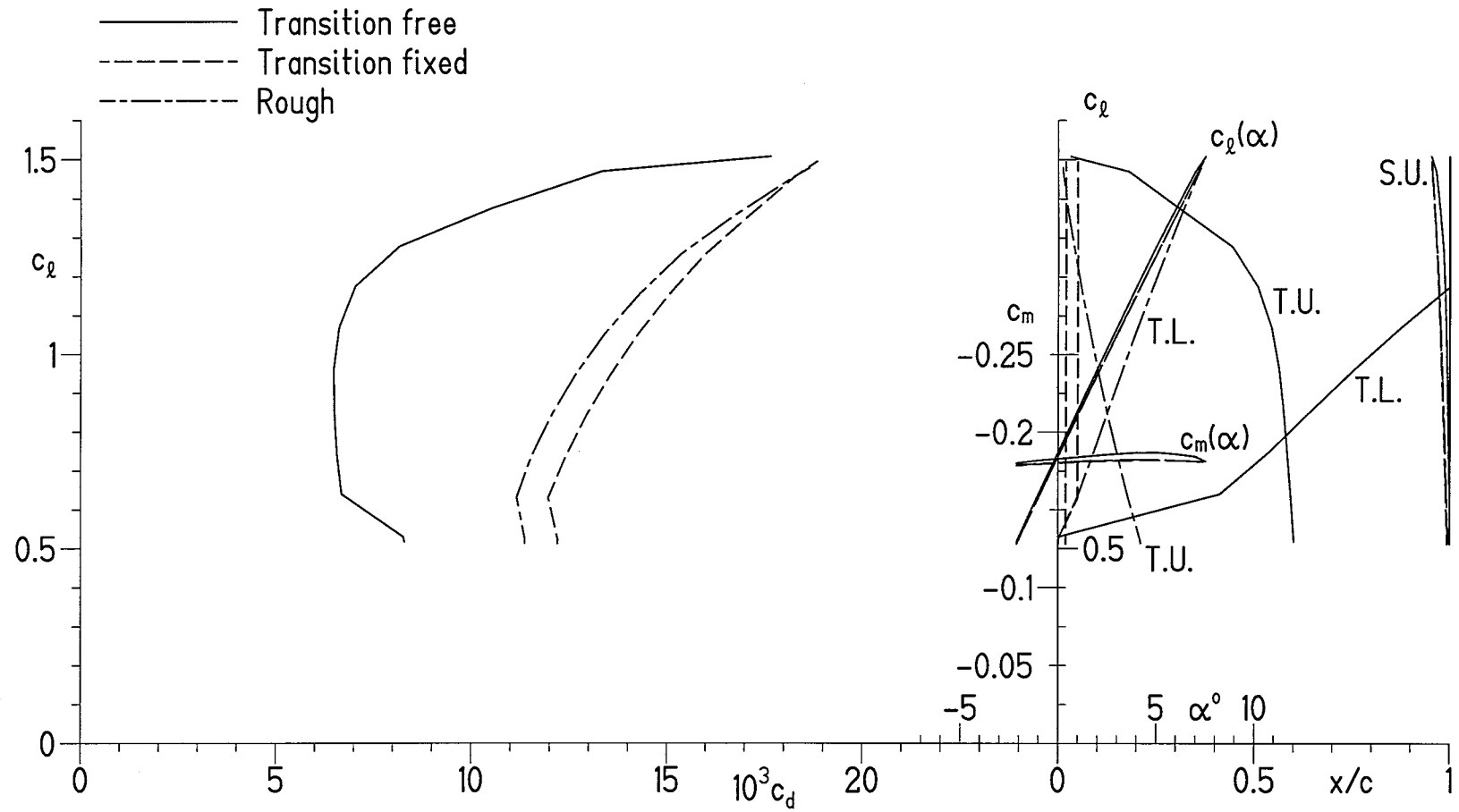
S905

(h) $R = 1.2 \times 10^6$.

Figure 5.- Continued.

S905

———— Transition free
– – – – – Transition fixed
–·–·–·– Rough

(i) R = 1.3 × 10⁶.

Figure 5.- Continued.

43

S905

---------- Transition free
---------- Transition fixed
---------- Rough
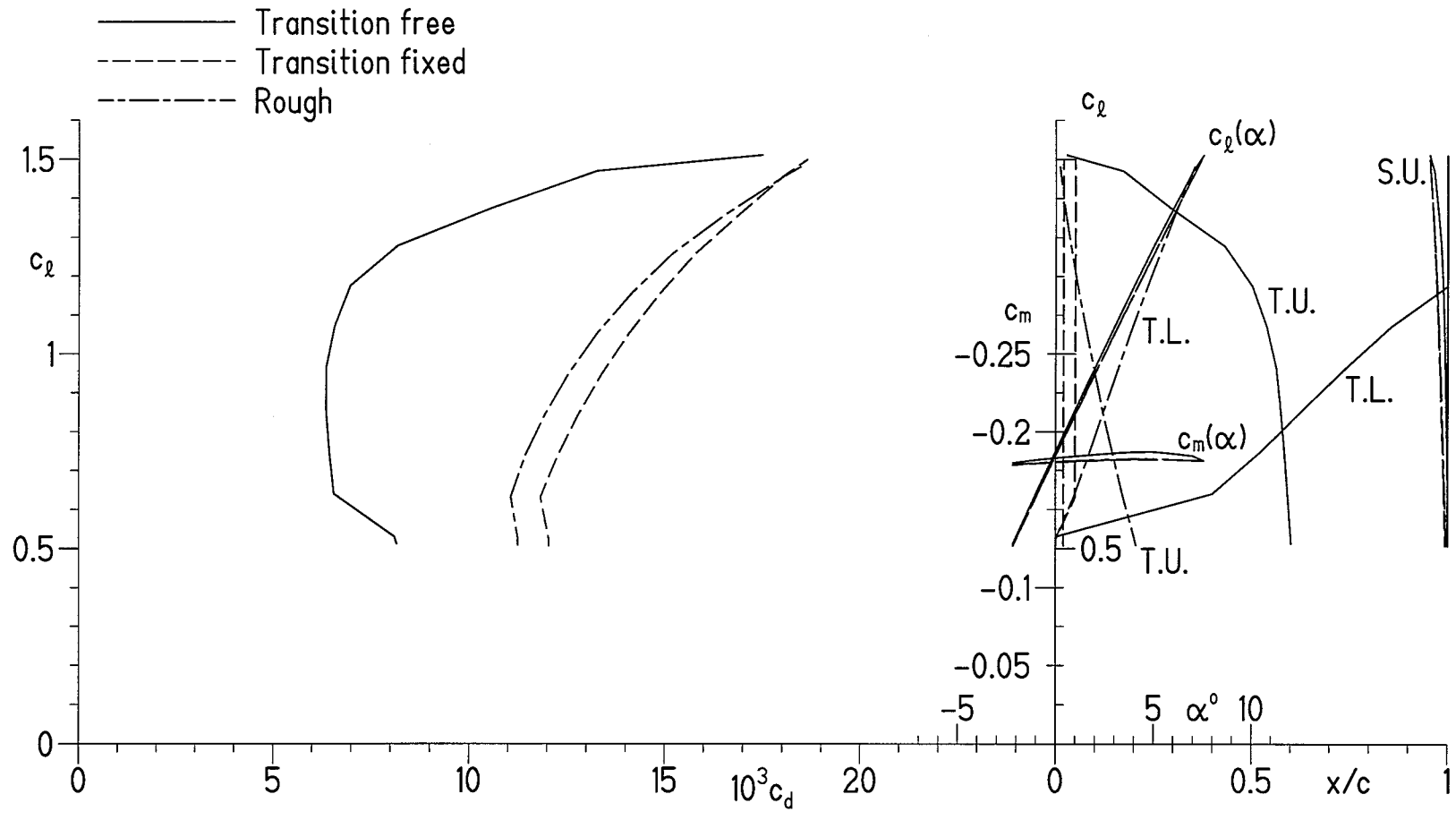
(j) $R = 1.4 \times 10^6$.

Figure 5.- Continued.
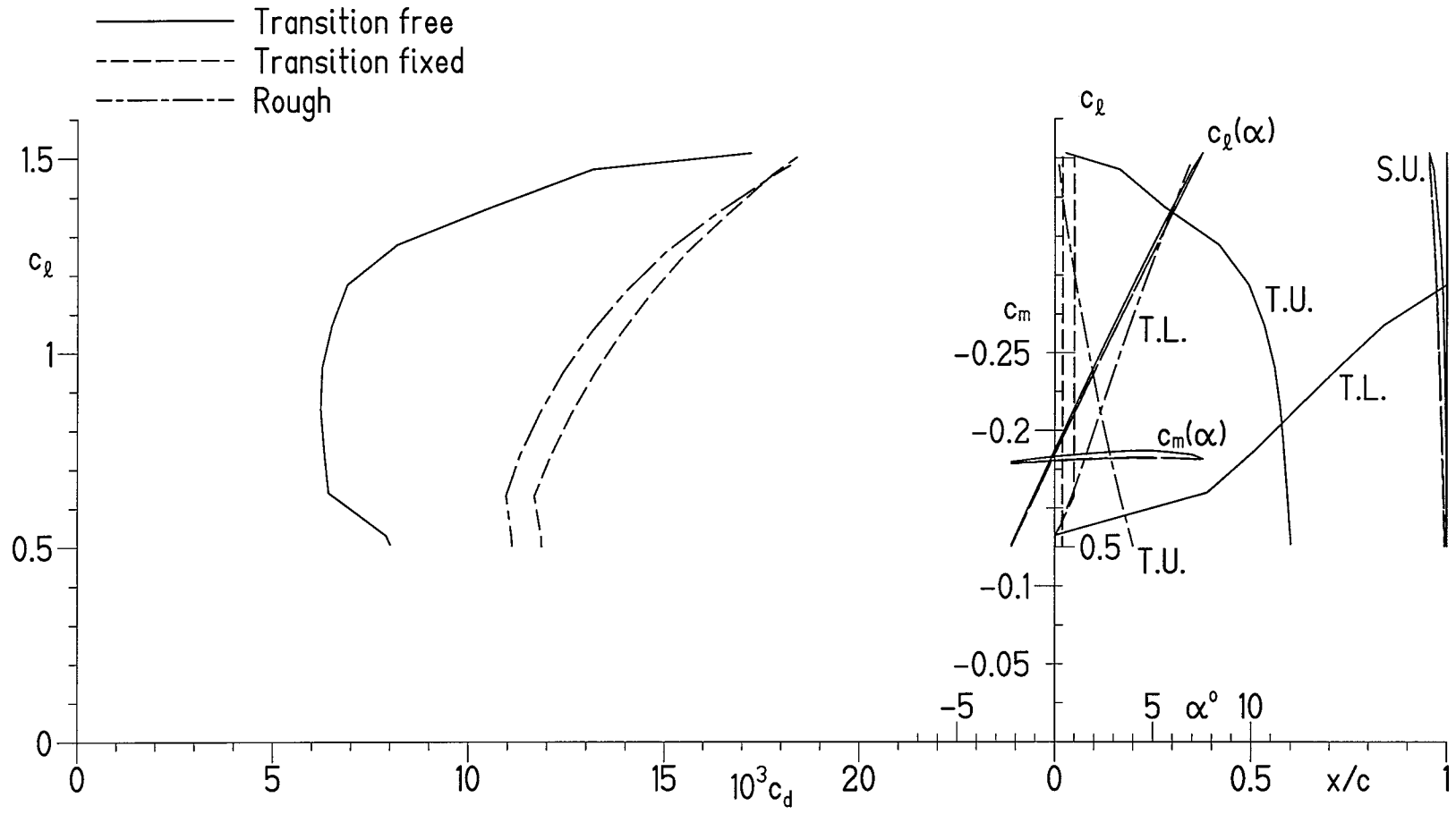
S905

Transition free ———
Transition fixed ———
Rough —·—·—
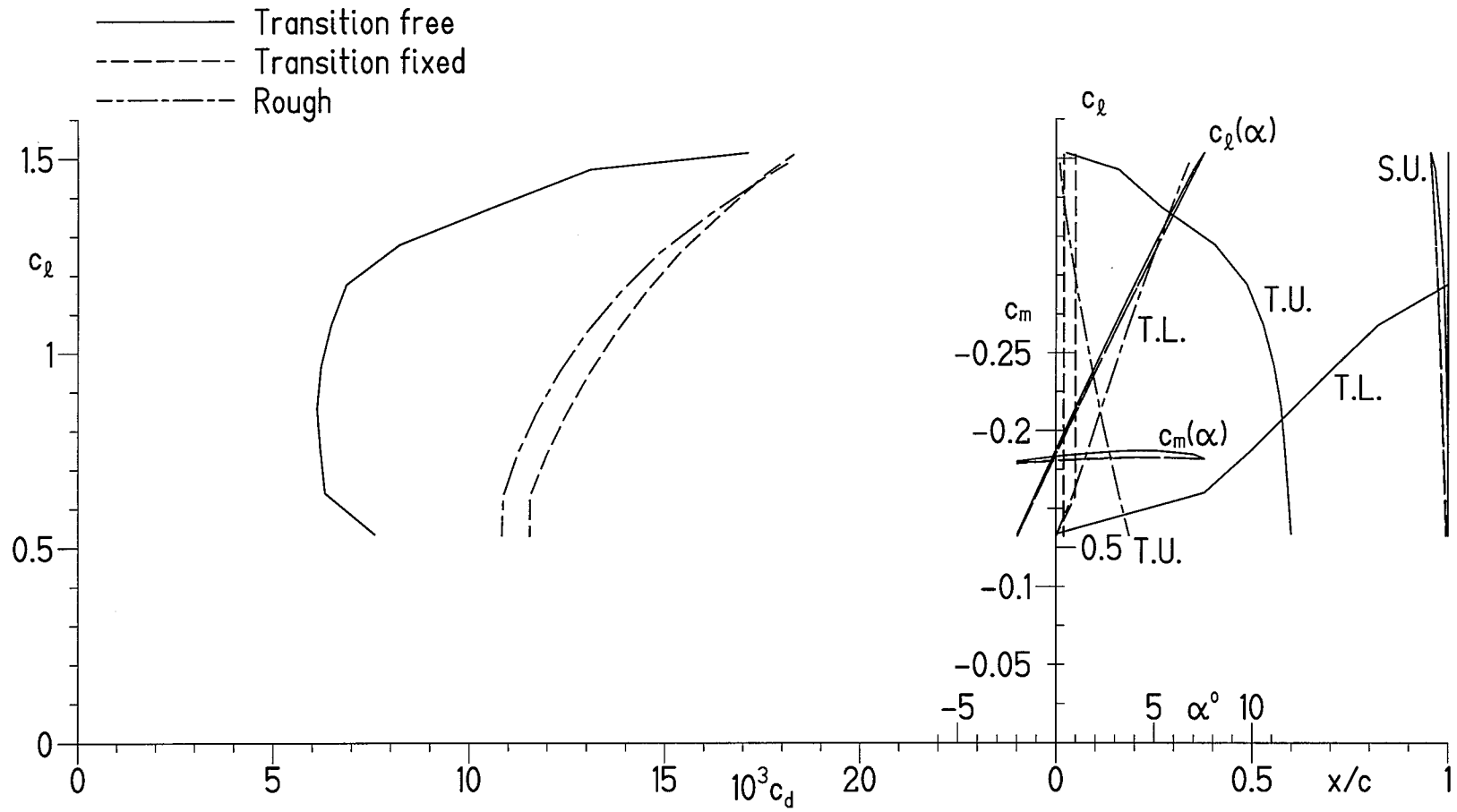
(k) R = 1.5 × 10⁶.

Figure 5.- Concluded.

APPENDIX A

PRESSURE DISTRIBUTIONS, TRANSITION AND SEPARATION LOCATIONS, AND
SECTION CHARACTERISTICS OF S904 AIRFOIL

AIRFOIL S904 14%

				-7.00	-6.00	-5.00	-4.00	-3.00	-2.00	-1.00	0.00
N	X	Y	NU	CP(X) FOR THE ABOVE ALPHA REL. CHORD LINE							
1	1.00000	0.00000	0.00	0.302	0.302	0.302	0.303	0.305	0.306	0.309	0.311
2	0.99662	0.00114	1.00	0.275	0.274	0.274	0.273	0.273	0.274	0.275	0.276
3	0.98703	0.00476	2.00	0.187	0.184	0.182	0.180	0.179	0.178	0.178	0.178
4	0.97233	0.01078	3.00	0.050	0.045	0.040	0.036	0.033	0.030	0.028	0.026
5	0.95346	0.01852	4.00	-0.111	-0.119	-0.127	-0.133	-0.139	-0.145	-0.149	-0.153
6	0.93085	0.02701	5.00	-0.253	-0.264	-0.275	-0.285	-0.294	-0.303	-0.311	-0.318
7	0.90436	0.03546	6.00	-0.318	-0.333	-0.347	-0.360	-0.373	-0.384	-0.395	-0.405
8	0.87375	0.04370	7.00	-0.325	-0.343	-0.359	-0.376	-0.391	-0.406	-0.419	-0.432
9	0.83919	0.05188	8.00	-0.334	-0.354	-0.374	-0.393	-0.412	-0.430	-0.447	-0.463
10	0.80116	0.05998	9.00	-0.344	-0.368	-0.391	-0.414	-0.435	-0.457	-0.477	-0.496
11	0.76012	0.06785	10.00	-0.356	-0.383	-0.410	-0.436	-0.461	-0.486	-0.510	-0.533
12	0.71657	0.07535	11.00	-0.368	-0.399	-0.429	-0.459	-0.488	-0.517	-0.545	-0.573
13	0.67101	0.08232	12.00	-0.380	-0.415	-0.450	-0.484	-0.517	-0.550	-0.583	-0.615
14	0.62395	0.08859	13.00	-0.392	-0.431	-0.470	-0.509	-0.547	-0.585	-0.622	-0.659
15	0.57590	0.09397	14.00	-0.401	-0.445	-0.489	-0.533	-0.576	-0.619	-0.662	-0.704
16	0.52735	0.09831	15.00	-0.406	-0.455	-0.504	-0.554	-0.603	-0.651	-0.700	-0.748
17	0.47876	0.10147	16.00	-0.405	-0.460	-0.515	-0.570	-0.625	-0.681	-0.735	-0.790
18	0.43059	0.10333	17.00	-0.398	-0.459	-0.520	-0.582	-0.644	-0.706	-0.768	-0.830
19	0.38330	0.10381	18.00	-0.384	-0.451	-0.519	-0.588	-0.657	-0.727	-0.797	-0.867
20	0.33728	0.10284	19.00	-0.358	-0.432	-0.508	-0.584	-0.661	-0.738	-0.817	-0.896
21	0.29293	0.10039	20.00	-0.320	-0.401	-0.484	-0.568	-0.653	-0.740	-0.828	-0.917
22	0.25059	0.09648	21.00	-0.267	-0.355	-0.446	-0.538	-0.633	-0.729	-0.827	-0.927
23	0.21061	0.09119	22.00	-0.197	-0.293	-0.392	-0.494	-0.599	-0.705	-0.815	-0.926
24	0.17330	0.08462	23.00	-0.110	-0.213	-0.321	-0.432	-0.547	-0.666	-0.787	-0.912
25	0.13897	0.07691	24.00	-0.002	-0.114	-0.230	-0.352	-0.478	-0.609	-0.745	-0.885
26	0.10792	0.06822	25.00	0.127	0.009	-0.117	-0.249	-0.388	-0.533	-0.685	-0.842
27	0.08040	0.05875	26.00	0.283	0.158	0.025	-0.118	-0.270	-0.431	-0.600	-0.778
28	0.05665	0.04869	27.00	0.467	0.341	0.202	0.050	-0.115	-0.292	-0.481	-0.682
29	0.03685	0.03828	28.00	0.678	0.558	0.420	0.264	0.089	-0.103	-0.314	-0.541
30	0.02116	0.02780	29.00	0.889	0.796	0.676	0.529	0.354	0.152	-0.076	-0.331
31	0.00968	0.01758	30.00	0.999	0.985	0.926	0.824	0.678	0.488	0.256	-0.021
32	0.00256	0.00808	31.00	0.610	0.817	0.947	0.999	0.973	0.870	0.689	0.431
33	0.00019	0.00179	31.75	-0.959	-0.305	0.218	0.607	0.864	0.988	0.978	0.835
34	0.00000	-0.00004	32.00	-2.157	-1.220	-0.446	0.163	0.607	0.885	0.997	0.944
35	0.00021	-0.00165	32.25	-4.076	-2.721	-1.574	-0.636	0.091	0.606	0.909	0.999
36	0.00093	-0.00316	32.50	-3.421	-2.349	-1.424	-0.647	-0.018	0.460	0.788	0.966
37	0.00215	-0.00470	32.75	-2.973	-2.091	-1.317	-0.654	-0.102	0.339	0.669	0.885
38	0.00374	-0.00627	33.00	-2.649	-1.902	-1.239	-0.660	-0.167	0.240	0.560	0.794
39	0.01354	-0.01266	34.00	-1.929	-1.473	-1.055	-0.674	-0.331	-0.027	0.239	0.465
40	0.02846	-0.01889	35.00	-1.543	-1.225	-0.928	-0.650	-0.394	-0.158	0.057	0.250
41	0.04821	-0.02465	36.00	-1.289	-1.052	-0.826	-0.612	-0.411	-0.222	-0.046	0.116
42	0.07252	-0.02979	37.00	-1.110	-0.924	-0.745	-0.574	-0.410	-0.255	-0.108	0.030
43	0.10113	-0.03414	38.00	-0.973	-0.822	-0.676	-0.535	-0.399	-0.269	-0.145	-0.026
44	0.13371	-0.03759	39.00	-0.864	-0.739	-0.617	-0.499	-0.384	-0.273	-0.166	-0.063
45	0.16991	-0.04003	40.00	-0.774	-0.669	-0.566	-0.465	-0.366	-0.271	-0.178	-0.088
46	0.20931	-0.04131	41.00	-0.698	-0.608	-0.520	-0.433	-0.348	-0.265	-0.183	-0.104
47	0.25153	-0.04120	42.00	-0.621	-0.544	-0.468	-0.393	-0.320	-0.247	-0.176	-0.106
48	0.29632	-0.03951	43.00	-0.530	-0.464	-0.400	-0.336	-0.272	-0.210	-0.148	-0.087
49	0.34354	-0.03619	44.00	-0.423	-0.368	-0.314	-0.259	-0.206	-0.152	-0.100	-0.047
50	0.39294	-0.03140	45.00	-0.320	-0.274	-0.228	-0.183	-0.137	-0.092	-0.047	-0.002
51	0.44418	-0.02524	46.00	-0.216	-0.178	-0.140	-0.102	-0.064	-0.025	0.013	0.051
52	0.49710	-0.01784	47.00	-0.097	-0.066	-0.035	-0.004	0.028	0.059	0.091	0.122
53	0.55160	-0.00978	48.00	0.017	0.042	0.067	0.092	0.118	0.144	0.170	0.196
54	0.60714	-0.00186	49.00	0.111	0.131	0.152	0.172	0.193	0.215	0.236	0.258
55	0.66285	0.00525	50.00	0.189	0.206	0.222	0.239	0.256	0.274	0.292	0.310
56	0.71775	0.01102	51.00	0.254	0.267	0.281	0.295	0.309	0.323	0.338	0.353
57	0.77079	0.01508	52.00	0.307	0.318	0.329	0.341	0.352	0.364	0.377	0.389
58	0.82084	0.01719	53.00	0.351	0.360	0.369	0.378	0.388	0.398	0.408	0.419
59	0.86679	0.01718	54.00	0.387	0.394	0.401	0.409	0.417	0.425	0.434	0.443
60	0.90735	0.01506	55.00	0.403	0.409	0.415	0.421	0.428	0.435	0.442	0.450
61	0.94113	0.01136	56.00	0.395	0.399	0.404	0.410	0.415	0.421	0.427	0.434
62	0.96729	0.00713	57.00	0.370	0.374	0.378	0.382	0.387	0.392	0.397	0.403
63	0.98565	0.00340	58.00	0.339	0.341	0.344	0.347	0.351	0.355	0.360	0.365
64	0.99645	0.00088	59.00	0.311	0.313	0.315	0.317	0.320	0.323	0.326	0.330
65	1.00000	0.00000	60.00	0.302	0.302	0.302	0.302	0.303	0.305	0.306	0.309	0.311

ALPHA0= 6.83 DEGREES CM0=-0.1927 ETA= 1.109

```
AIRFOIL S904  14%                  1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00
  N       X         Y      NU  CP(X) FOR THE ABOVE ALPHA REL. CHORD LINE
  1   1.00000   0.00000   0.00    0.315  0.318  0.322  0.326  0.331  0.336  0.341  0.347
  2   0.99662   0.00114   1.00    0.278  0.281  0.283  0.287  0.290  0.294  0.299  0.304
  3   0.98703   0.00476   2.00    0.178  0.180  0.181  0.183  0.186  0.189  0.193  0.197
  4   0.97233   0.01078   3.00    0.025  0.025  0.025  0.026  0.027  0.029  0.032  0.035
  5   0.95346   0.01852   4.00   -0.157 -0.159 -0.161 -0.162 -0.163 -0.163 -0.162 -0.160
  6   0.93085   0.02701   5.00   -0.324 -0.329 -0.334 -0.338 -0.341 -0.343 -0.344 -0.345
  7   0.90436   0.03546   6.00   -0.415 -0.423 -0.431 -0.437 -0.443 -0.448 -0.452 -0.456
  8   0.87375   0.04370   7.00   -0.445 -0.456 -0.467 -0.476 -0.485 -0.493 -0.500 -0.506
  9   0.83919   0.05188   8.00   -0.478 -0.493 -0.506 -0.519 -0.531 -0.542 -0.553 -0.562
 10   0.80116   0.05998   9.00   -0.515 -0.533 -0.550 -0.567 -0.582 -0.597 -0.610 -0.623
 11   0.76012   0.06785  10.00   -0.556 -0.577 -0.598 -0.618 -0.638 -0.656 -0.673 -0.690
 12   0.71657   0.07535  11.00   -0.599 -0.625 -0.650 -0.674 -0.698 -0.720 -0.742 -0.762
 13   0.67101   0.08232  12.00   -0.646 -0.676 -0.706 -0.735 -0.763 -0.790 -0.816 -0.841
 14   0.62395   0.08859  13.00   -0.695 -0.731 -0.765 -0.799 -0.833 -0.865 -0.897 -0.927
 15   0.57590   0.09397  14.00   -0.746 -0.787 -0.827 -0.867 -0.906 -0.944 -0.982 -1.018
 16   0.52735   0.09831  15.00   -0.796 -0.843 -0.890 -0.936 -0.982 -1.027 -1.071 -1.114
 17   0.47876   0.10147  16.00   -0.845 -0.899 -0.953 -1.006 -1.059 -1.111 -1.163 -1.214
 18   0.43059   0.10333  17.00   -0.892 -0.954 -1.016 -1.077 -1.138 -1.198 -1.259 -1.318
 19   0.38330   0.10381  18.00   -0.937 -1.008 -1.078 -1.148 -1.219 -1.289 -1.358 -1.428
 20   0.33728   0.10284  19.00   -0.976 -1.056 -1.136 -1.216 -1.297 -1.378 -1.458 -1.539
 21   0.29293   0.10039  20.00   -1.006 -1.097 -1.188 -1.280 -1.372 -1.465 -1.558 -1.651
 22   0.25059   0.09648  21.00   -1.028 -1.131 -1.234 -1.339 -1.444 -1.551 -1.658 -1.766
 23   0.21061   0.09119  22.00   -1.040 -1.156 -1.273 -1.393 -1.513 -1.636 -1.759 -1.884
 24   0.17330   0.08462  23.00   -1.040 -1.171 -1.305 -1.441 -1.579 -1.720 -1.862 -2.007
 25   0.13897   0.07691  24.00   -1.030 -1.178 -1.330 -1.486 -1.645 -1.808 -1.974 -2.142
 26   0.10792   0.06822  25.00   -1.006 -1.175 -1.350 -1.529 -1.714 -1.904 -2.098 -2.297
 27   0.08040   0.05875  26.00   -0.964 -1.158 -1.360 -1.569 -1.786 -2.010 -2.240 -2.477
 28   0.05665   0.04869  27.00   -0.895 -1.119 -1.355 -1.601 -1.859 -2.126 -2.403 -2.690
 29   0.03685   0.03828  28.00   -0.786 -1.048 -1.326 -1.620 -1.930 -2.256 -2.597 -2.952
 30   0.02116   0.02780  29.00   -0.612 -0.920 -1.252 -1.610 -1.992 -2.399 -2.829 -3.282
 31   0.00968   0.01758  30.00   -0.339 -0.700 -1.103 -1.548 -2.033 -2.559 -3.124 -3.728
 32   0.00256   0.00808  31.00    0.096 -0.315 -0.803 -1.366 -2.004 -2.716 -3.501 -4.358
 33   0.00019   0.00179  31.75    0.558  0.148 -0.394 -1.067 -1.872 -2.807 -3.871 -5.062
 34   0.00000  -0.00004  32.00    0.724  0.338 -0.214 -0.929 -1.809 -2.852 -4.056 -5.420
 35   0.00021  -0.00165  32.25    0.877  0.543 -0.004 -0.762 -1.731 -2.909 -4.294 -5.886
 36   0.00093  -0.00316  32.50    0.992  0.868  0.592  0.167 -0.409 -1.134 -2.007 -3.027
 37   0.00215  -0.00470  32.75    0.990  0.981  0.860  0.627  0.281 -0.177 -0.746 -1.425
 38   0.00374  -0.00627  33.00    0.940  0.999  0.970  0.854  0.650  0.359 -0.018 -0.482
 39   0.01354  -0.01266  34.00    0.651  0.798  0.905  0.972  0.999  0.986  0.933  0.839
 40   0.02846  -0.01889  35.00    0.421  0.571  0.698  0.804  0.886  0.947  0.984  1.000
 41   0.04821  -0.02465  36.00    0.266  0.402  0.524  0.633  0.728  0.809  0.875  0.928
 42   0.07252  -0.02979  37.00    0.160  0.281  0.393  0.495  0.589  0.673  0.748  0.813
 43   0.10113  -0.03414  38.00    0.087  0.194  0.295  0.389  0.477  0.558  0.633  0.701
 44   0.13371  -0.03759  39.00    0.036  0.130  0.221  0.307  0.388  0.464  0.536  0.603
 45   0.16991  -0.04003  40.00    0.000  0.084  0.165  0.242  0.317  0.388  0.455  0.519
 46   0.20931  -0.04131  41.00   -0.026  0.049  0.122  0.192  0.260  0.325  0.388  0.448
 47   0.25153  -0.04120  42.00   -0.037  0.029  0.095  0.158  0.220  0.279  0.337  0.393
 48   0.29632  -0.03951  43.00   -0.027  0.032  0.089  0.145  0.200  0.254  0.306  0.357
 49   0.34354  -0.03619  44.00    0.004  0.055  0.105  0.154  0.203  0.250  0.296  0.342
 50   0.39294  -0.03140  45.00    0.042  0.086  0.129  0.172  0.214  0.256  0.297  0.337
 51   0.44418  -0.02524  46.00    0.088  0.126  0.163  0.200  0.237  0.273  0.309  0.344
 52   0.49710  -0.01784  47.00    0.154  0.185  0.217  0.248  0.279  0.309  0.340  0.370
 53   0.55160  -0.00978  48.00    0.222  0.248  0.274  0.300  0.326  0.352  0.378  0.403
 54   0.60714  -0.00186  49.00    0.279  0.301  0.323  0.345  0.367  0.389  0.411  0.433
 55   0.66285   0.00525  50.00    0.328  0.346  0.365  0.383  0.402  0.420  0.439  0.458
 56   0.71775   0.01102  51.00    0.369  0.384  0.400  0.415  0.431  0.447  0.463  0.480
 57   0.77079   0.01508  52.00    0.402  0.415  0.429  0.442  0.456  0.469  0.483  0.497
 58   0.82084   0.01719  53.00    0.430  0.441  0.452  0.464  0.475  0.487  0.499  0.512
 59   0.86679   0.01718  54.00    0.452  0.461  0.471  0.481  0.491  0.501  0.512  0.522
 60   0.90735   0.01506  55.00    0.457  0.466  0.474  0.483  0.491  0.500  0.510  0.519
 61   0.94113   0.01136  56.00    0.441  0.448  0.456  0.463  0.471  0.480  0.488  0.497
 62   0.96729   0.00713  57.00    0.409  0.416  0.422  0.429  0.437  0.444  0.452  0.460
 63   0.98565   0.00340  58.00    0.370  0.375  0.381  0.388  0.394  0.401  0.409  0.416
 64   0.99645   0.00088  59.00    0.334  0.339  0.344  0.349  0.355  0.361  0.368  0.374
 65   1.00000   0.00000  60.00    0.315  0.318  0.322  0.326  0.331  0.336  0.341  0.347
ALPHA0= 6.83 DEGREES  CM0=-0.1927  ETA= 1.109
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  500000 MU=300       R=  500000 MU=100        R=  500000 MU=900
  -6.83   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.0853 0.0529 0.0035*   1.0037 0.0093 0.0072     0.6085 0.0091 0.0060
    LOWER 1.0110 0.0000 0.0084*   1.0110 0.0000 0.0084*    1.0110 0.0000 0.0084*
    TOTAL CL=-0.047 CD=0.01192    CL=-0.008 CD=0.01564     CL=-0.008 CD=0.01448
          CM=-0.1811              CM=-0.1898               CM=-0.1899
  -6.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.0891 0.0533 0.0036*   1.0037 0.0105 0.0076     0.6328 0.0102 0.0065
    LOWER 0.7872 0.0000 0.0049*   0.9560 0.0000 0.0064*    0.9760 0.0000 0.0065
    TOTAL CL= 0.042 CD=0.00853    CL= 0.082 CD=0.01402     CL= 0.082 CD=0.01291
          CM=-0.1822              CM=-0.1912               CM=-0.1913
  -5.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.1116 0.0407 0.0035    1.0037 0.0119 0.0082     0.6599 0.0115 0.0070
    LOWER 0.7293 0.0000 0.0044*   0.9560 0.0000 0.0056     0.9466 0.0000 0.0055
    TOTAL CL= 0.161 CD=0.00789    CL= 0.190 CD=0.01379     CL= 0.190 CD=0.01252
          CM=-0.1863              CM=-0.1928               CM=-0.1929
  -4.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.1856 0.0227 0.0040    1.0053 0.0134 0.0088     0.6876 0.0129 0.0075
    LOWER 0.7021 0.0000 0.0040*   0.9560 0.0000 0.0051     0.9087 0.0000 0.0049
    TOTAL CL= 0.288 CD=0.00807    CL= 0.297 CD=0.01392     CL= 0.298 CD=0.01243
          CM=-0.1921              CM=-0.1944               CM=-0.1945
  -3.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.2451 0.0184 0.0046    1.0053 0.0151 0.0094     0.7170 0.0144 0.0082
    LOWER 0.6831 0.0000 0.0037*   0.9560 0.0000 0.0047     0.8708 0.0000 0.0043
    TOTAL CL= 0.401 CD=0.00824    CL= 0.405 CD=0.01410     CL= 0.405 CD=0.01249
          CM=-0.1950              CM=-0.1959               CM=-0.1960
  -2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.3098 0.0165 0.0052*   1.0053 0.0168 0.0101     0.7441 0.0160 0.0088
    LOWER 0.6629 0.0000 0.0034*   0.9560 0.0000 0.0043     0.8303 0.0000 0.0038
    TOTAL CL= 0.512 CD=0.00856    CL= 0.512 CD=0.01440     CL= 0.513 CD=0.01266
          CM=-0.1973              CM=-0.1973               CM=-0.1975
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.3678 0.0168 0.0059*   1.0053 0.0186 0.0109     0.7761 0.0178 0.0096
    LOWER 0.6358 0.0000 0.0030*   0.9560 0.0000 0.0039     0.7881 0.0000 0.0034
    TOTAL CL= 0.621 CD=0.00891    CL= 0.619 CD=0.01479     CL= 0.620 CD=0.01300
          CM=-0.1991              CM=-0.1986               CM=-0.1988
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.4188 0.0178 0.0066*   1.0053 0.0206 0.0117     0.8052 0.0196 0.0104
    LOWER 0.6082 0.0000 0.0027*   0.9560 0.0000 0.0036     0.7521 0.0000 0.0031
    TOTAL CL= 0.729 CD=0.00938    CL= 0.725 CD=0.01528     CL= 0.727 CD=0.01349
          CM=-0.2006              CM=-0.1998               CM=-0.2001
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.4697 0.0192 0.0075*   1.0053 0.0228 0.0126     0.8380 0.0217 0.0114
    LOWER 0.5809 0.0000 0.0025*   0.9560 0.0000 0.0033     0.7243 0.0000 0.0028
    TOTAL CL= 0.836 CD=0.00994    CL= 0.831 CD=0.01591     CL= 0.833 CD=0.01415
          CM=-0.2020              CM=-0.2009               CM=-0.2012
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.5223 0.0208 0.0084*   1.0053 0.0251 0.0136     0.8683 0.0240 0.0124
    LOWER 0.5599 0.0000 0.0024*   0.9560 0.0000 0.0030     0.7031 0.0000 0.0025
    TOTAL CL= 0.943 CD=0.01078    CL= 0.937 CD=0.01663     CL= 0.938 CD=0.01496
          CM=-0.2032              CM=-0.2018               CM=-0.2022
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.5746 0.0228 0.0094*   1.0053 0.0277 0.0147     0.8985 0.0266 0.0136
    LOWER 0.5453 0.0000 0.0023*   0.9560 0.0000 0.0028     0.6843 0.0000 0.0023
    TOTAL CL= 1.049 CD=0.01170    CL= 1.042 CD=0.01747     CL= 1.043 CD=0.01593
          CM=-0.2042              CM=-0.2026               CM=-0.2030
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.6218 0.0251 0.0105*   1.0053 0.0307 0.0159     0.9262 0.0296 0.0149
    LOWER 0.5326 0.0000 0.0021*   0.9560 0.0000 0.0025     0.6679 0.0000 0.0022
    TOTAL CL= 1.154 CD=0.01261    CL= 1.146 CD=0.01844     CL= 1.148 CD=0.01705
          CM=-0.2051              CM=-0.2032               CM=-0.2036
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.6736 0.0278 0.0119*   1.0053 0.0340 0.0172     0.9527 0.0329 0.0164
    LOWER 0.5198 0.0000 0.0019*   0.9560 0.0000 0.0023     0.6495 0.0000 0.0020
    TOTAL CL= 1.259 CD=0.01381    CL= 1.249 CD=0.01956     CL= 1.251 CD=0.01838
          CM=-0.2058              CM=-0.2036               CM=-0.2040
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
    UPPER 0.7356 0.0311 0.0135*   1.0053 0.0376 0.0187     0.9768 0.0368 0.0181
    LOWER 0.5051 0.0000 0.0018*   0.9560 0.0000 0.0021     0.6296 0.0000 0.0018
    TOTAL CL= 1.362 CD=0.01528    CL= 1.352 CD=0.02082     CL= 1.353 CD=0.01994
          CM=-0.2061              CM=-0.2038               CM=-0.2041
   6.55                           S TURB  S SEP   CD
                                  1.0053 0.0398 0.0195
                                  0.9560 0.0000 0.0020
                                  CL= 1.408 CD=0.02159
                                  CM=-0.2038
   6.75                                                    S TURB  S SEP   CD
                                                           0.9921 0.0402 0.0195
                                                           0.6131 0.0000 0.0017
                                                           CL= 1.428 CD=0.02126
                                                           CM=-0.2039
   7.00   S TURB  S SEP   CD
    UPPER 0.8382 0.0364 0.0165*
    LOWER 0.4890 0.0000 0.0016*
    TOTAL CL= 1.462 CD=0.01808
          CM=-0.2056
   7.43   S TURB  S SEP   CD
    UPPER 0.9310 0.0413 0.0195*
    LOWER 0.4822 0.0000 0.0015*
    TOTAL CL= 1.500 CD=0.02099
          CM=-0.2044
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  600000 MU=300        R=  600000 MU=100        R=  600000 MU=900
  -6.83   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.0853 0.0511 0.0032*   1.0037 0.0085 0.0070     0.6277 0.0083 0.0059
   LOWER 1.0110 0.0000 0.0081*   1.0110 0.0000 0.0081*    1.0110 0.0000 0.0081*
   TOTAL CL=-0.045 CD=0.01125    CL=-0.008 CD=0.01510     CL=-0.007 CD=0.01401
         CM=-0.1815              CM=-0.1900               CM=-0.1900
  -6.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.0891 0.0514 0.0033*   1.0037 0.0096 0.0074     0.6522 0.0094 0.0063
   LOWER 0.7872 0.0000 0.0048*   0.9560 0.0000 0.0061*    0.9794 0.0000 0.0063
   TOTAL CL= 0.044 CD=0.00801    CL= 0.082 CD=0.01355     CL= 0.083 CD=0.01259
         CM=-0.1826              CM=-0.1914               CM=-0.1915
  -5.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.1440 0.0257 0.0034    1.0037 0.0111 0.0080     0.6784 0.0107 0.0068
   LOWER 0.7293 0.0000 0.0041*   0.9560 0.0000 0.0054     0.9525 0.0000 0.0054
   TOTAL CL= 0.176 CD=0.00748    CL= 0.190 CD=0.01337     CL= 0.191 CD=0.01221
         CM=-0.1896              CM=-0.1930               CM=-0.1931
  -4.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.2104 0.0170 0.0039    1.0053 0.0126 0.0085     0.7061 0.0121 0.0074
   LOWER 0.7021 0.0000 0.0038*   0.9560 0.0000 0.0050     0.9171 0.0000 0.0048
   TOTAL CL= 0.294 CD=0.00765    CL= 0.298 CD=0.01352     CL= 0.299 CD=0.01215
         CM=-0.1935              CM=-0.1946               CM=-0.1947
  -3.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.2668 0.0151 0.0044    1.0053 0.0142 0.0092     0.7345 0.0136 0.0080
   LOWER 0.6831 0.0000 0.0035*   0.9560 0.0000 0.0045     0.8820 0.0000 0.0042
   TOTAL CL= 0.405 CD=0.00785    CL= 0.406 CD=0.01370     CL= 0.406 CD=0.01222
         CM=-0.1958              CM=-0.1961               CM=-0.1962
  -2.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.3174 0.0147 0.0049    1.0053 0.0159 0.0098     0.7609 0.0152 0.0086
   LOWER 0.6629 0.0000 0.0031*   0.9560 0.0000 0.0042     0.8439 0.0000 0.0038
   TOTAL CL= 0.514 CD=0.00807    CL= 0.513 CD=0.01399     CL= 0.514 CD=0.01239
         CM=-0.1978              CM=-0.1975               CM=-0.1977
  -1.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.3678 0.0154 0.0056    1.0053 0.0177 0.0106     0.7923 0.0169 0.0094
   LOWER 0.6358 0.0000 0.0028*   0.9560 0.0000 0.0038     0.8045 0.0000 0.0033
   TOTAL CL= 0.623 CD=0.00837    CL= 0.620 CD=0.01437     CL= 0.621 CD=0.01273
         CM=-0.1995              CM=-0.1988               CM=-0.1990
   0.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.4188 0.0165 0.0063*   1.0053 0.0197 0.0114     0.8207 0.0188 0.0102
   LOWER 0.6082 0.0000 0.0026*   0.9560 0.0000 0.0035     0.7673 0.0000 0.0030
   TOTAL CL= 0.731 CD=0.00881    CL= 0.726 CD=0.01485     CL= 0.728 CD=0.01319
         CM=-0.2010              CM=-0.2000               CM=-0.2003
   1.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.4697 0.0179 0.0070*   1.0053 0.0218 0.0123     0.8519 0.0209 0.0111
   LOWER 0.5809 0.0000 0.0023*   0.9560 0.0000 0.0032     0.7365 0.0000 0.0027
   TOTAL CL= 0.838 CD=0.00936    CL= 0.833 CD=0.01545     CL= 0.834 CD=0.01382
         CM=-0.2024              CM=-0.2012               CM=-0.2015
   2.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.5223 0.0196 0.0079*   1.0053 0.0242 0.0132     0.8805 0.0231 0.0121
   LOWER 0.5599 0.0000 0.0022*   0.9560 0.0000 0.0029     0.7139 0.0000 0.0025
   TOTAL CL= 0.944 CD=0.01015    CL= 0.938 CD=0.01615     CL= 0.940 CD=0.01459
         CM=-0.2036              CM=-0.2021               CM=-0.2025
   3.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.5746 0.0216 0.0089*   1.0053 0.0267 0.0143     0.9087 0.0257 0.0132
   LOWER 0.5453 0.0000 0.0021*   0.9560 0.0000 0.0027     0.6941 0.0000 0.0023
   TOTAL CL= 1.051 CD=0.01099    CL= 1.043 CD=0.01696     CL= 1.045 CD=0.01552
         CM=-0.2047              CM=-0.2029               CM=-0.2033
   4.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.6218 0.0238 0.0100*   1.0053 0.0296 0.0154     0.9349 0.0286 0.0145
   LOWER 0.5326 0.0000 0.0019*   0.9560 0.0000 0.0025     0.6774 0.0000 0.0021
   TOTAL CL= 1.156 CD=0.01193    CL= 1.148 CD=0.01789     CL= 1.149 CD=0.01661
         CM=-0.2056              CM=-0.2036               CM=-0.2039
   5.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.6736 0.0264 0.0113*   1.0053 0.0328 0.0167     0.9596 0.0319 0.0160
   LOWER 0.5198 0.0000 0.0018*   0.9560 0.0000 0.0023     0.6600 0.0000 0.0019
   TOTAL CL= 1.261 CD=0.01305    CL= 1.251 CD=0.01896     CL= 1.252 CD=0.01788
         CM=-0.2062              CM=-0.2040               CM=-0.2043
   6.00   S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
   UPPER 0.7356 0.0297 0.0129*   1.0053 0.0364 0.0181     0.9820 0.0358 0.0176
   LOWER 0.5051 0.0000 0.0017*   0.9560 0.0000 0.0021     0.6414 0.0000 0.0018
   TOTAL CL= 1.364 CD=0.01452    CL= 1.354 CD=0.02017     CL= 1.355 CD=0.01938
         CM=-0.2066              CM=-0.2042               CM=-0.2044
   6.64                           S TURB  S SEP    CD
                                 1.0053 0.0389 0.0190
                                 0.9560 0.0000 0.0020
                                 CL= 1.419 CD=0.02102
                                 CM=-0.2042
   6.78                                                   S TURB  S SEP    CD
                                                          0.9967 0.0392 0.0190
                                                          0.6252 0.0000 0.0017
                                                          CL= 1.433 CD=0.02071
                                                          CM=-0.2043
   7.00   S TURB  S SEP    CD
   UPPER 0.8382 0.0350 0.0157*
   LOWER 0.4890 0.0000 0.0015*
   TOTAL CL= 1.464 CD=0.01722
         CM=-0.2061
   7.49   S TURB  S SEP    CD
   UPPER 0.9423 0.0404 0.0190*
   LOWER 0.4812 0.0000 0.0014*
   TOTAL CL= 1.508 CD=0.02041
         CM=-0.2048
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  700000 MU=300        R=  700000 MU=100        R=  700000 MU=900
 -6.83    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.0853 0.0494 0.0029*      1.0037 0.0078 0.0068      0.6446 0.0076 0.0058
    LOWER 1.0110 0.0000 0.0078*      1.0110 0.0000 0.0078*     1.0110 0.0000 0.0078*
    TOTAL CL=-0.044 CD=0.01074       CL=-0.007 CD=0.01469      CL=-0.007 CD=0.01367
          CM=-0.1818                 CM=-0.1902                CM=-0.1902
 -6.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.0906 0.0476 0.0029*      1.0037 0.0089 0.0073      0.6683 0.0087 0.0062
    LOWER 0.7872 0.0000 0.0046*      0.9560 0.0000 0.0059*     0.9820 0.0000 0.0061
    TOTAL CL= 0.047 CD=0.00748       CL= 0.083 CD=0.01316      CL= 0.083 CD=0.01233
          CM=-0.1834                 CM=-0.1916                CM=-0.1916
 -5.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.1685 0.0181 0.0033       1.0037 0.0103 0.0078      0.6943 0.0100 0.0067
    LOWER 0.7293 0.0000 0.0039*      0.9560 0.0000 0.0053      0.9570 0.0000 0.0053
    TOTAL CL= 0.183 CD=0.00719       CL= 0.191 CD=0.01303      CL= 0.191 CD=0.01197
          CM=-0.1914                 CM=-0.1932                CM=-0.1933
 -4.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.2311 0.0137 0.0038       1.0053 0.0118 0.0083      0.7213 0.0114 0.0072
    LOWER 0.7021 0.0000 0.0036*      0.9560 0.0000 0.0049      0.9238 0.0000 0.0047
    TOTAL CL= 0.297 CD=0.00736       CL= 0.299 CD=0.01319      CL= 0.299 CD=0.01193
          CM=-0.1943                 CM=-0.1948                CM=-0.1949
 -3.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.2850 0.0127 0.0043       1.0053 0.0134 0.0089      0.7489 0.0129 0.0078
    LOWER 0.6831 0.0000 0.0033*      0.9560 0.0000 0.0044      0.8908 0.0000 0.0041
    TOTAL CL= 0.407 CD=0.00755       CL= 0.407 CD=0.01337      CL= 0.407 CD=0.01199
          CM=-0.1965                 CM=-0.1963                CM=-0.1964
 -2.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.3336 0.0132 0.0048       1.0053 0.0152 0.0096      0.7750 0.0145 0.0085
    LOWER 0.6629 0.0000 0.0030*      0.9560 0.0000 0.0041      0.8545 0.0000 0.0037
    TOTAL CL= 0.516 CD=0.00780       CL= 0.514 CD=0.01366      CL= 0.515 CD=0.01217
          CM=-0.1982                 CM=-0.1977                CM=-0.1979
 -1.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.3796 0.0142 0.0054       1.0053 0.0170 0.0103      0.8054 0.0162 0.0092
    LOWER 0.6358 0.0000 0.0027*      0.9560 0.0000 0.0037      0.8178 0.0000 0.0033
    TOTAL CL= 0.624 CD=0.00808       CL= 0.621 CD=0.01403      CL= 0.622 CD=0.01251
          CM=-0.1998                 CM=-0.1990                CM=-0.1992
  0.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.4245 0.0155 0.0060       1.0053 0.0189 0.0111      0.8332 0.0181 0.0100
    LOWER 0.6082 0.0000 0.0024*      0.9560 0.0000 0.0034      0.7805 0.0000 0.0030
    TOTAL CL= 0.732 CD=0.00846       CL= 0.727 CD=0.01450      CL= 0.729 CD=0.01295
          CM=-0.2013                 CM=-0.2003                CM=-0.2005
  1.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.4697 0.0169 0.0067       1.0053 0.0210 0.0120      0.8631 0.0201 0.0109
    LOWER 0.5809 0.0000 0.0022*      0.9560 0.0000 0.0031      0.7476 0.0000 0.0027
    TOTAL CL= 0.839 CD=0.00894       CL= 0.834 CD=0.01508      CL= 0.835 CD=0.01355
          CM=-0.2027                 CM=-0.2014                CM=-0.2017
  2.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.5223 0.0186 0.0076       1.0053 0.0234 0.0129      0.8900 0.0224 0.0119
    LOWER 0.5599 0.0000 0.0021*      0.9560 0.0000 0.0029      0.7236 0.0000 0.0024
    TOTAL CL= 0.946 CD=0.00967       CL= 0.939 CD=0.01576      CL= 0.941 CD=0.01430
          CM=-0.2039                 CM=-0.2024                CM=-0.2027
  3.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.5746 0.0205 0.0085*      1.0053 0.0259 0.0139      0.9167 0.0249 0.0130
    LOWER 0.5453 0.0000 0.0019*      0.9560 0.0000 0.0026      0.7029 0.0000 0.0022
    TOTAL CL= 1.052 CD=0.01049       CL= 1.044 CD=0.01654      CL= 1.046 CD=0.01519
          CM=-0.2050                 CM=-0.2032                CM=-0.2035
  4.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.6218 0.0227 0.0096*      1.0053 0.0287 0.0150      0.9418 0.0278 0.0142
    LOWER 0.5326 0.0000 0.0018*      0.9560 0.0000 0.0024      0.6857 0.0000 0.0020
    TOTAL CL= 1.158 CD=0.01140       CL= 1.149 CD=0.01744      CL= 1.150 CD=0.01625
          CM=-0.2059                 CM=-0.2039                CM=-0.2042
  5.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.6736 0.0253 0.0108*      1.0053 0.0319 0.0162      0.9650 0.0311 0.0156
    LOWER 0.5198 0.0000 0.0017*      0.9560 0.0000 0.0022      0.6683 0.0000 0.0019
    TOTAL CL= 1.262 CD=0.01247       CL= 1.252 CD=0.01847      CL= 1.254 CD=0.01748
          CM=-0.2066                 CM=-0.2043                CM=-0.2046
  6.00    S TURB  S SEP    CD        S TURB  S SEP    CD       S TURB  S SEP    CD
    UPPER 0.7356 0.0285 0.0124*      1.0053 0.0354 0.0176      0.9860 0.0349 0.0172
    LOWER 0.5051 0.0000 0.0016*      0.9560 0.0000 0.0020      0.6510 0.0000 0.0017
    TOTAL CL= 1.366 CD=0.01392       CL= 1.355 CD=0.01964      CL= 1.356 CD=0.01893
          CM=-0.2070                 CM=-0.2046                CM=-0.2047
  6.72                               S TURB  S SEP    CD
                                     1.0053 0.0381 0.0186
                                     0.9560 0.0000 0.0019
                                     CL= 1.428 CD=0.02057
                                     CM=-0.2046
  6.81                                                         S TURB  S SEP    CD
                                                              1.0003 0.0383 0.0186
                                                              0.6350 0.0000 0.0016
                                                              CL= 1.438 CD=0.02027
                                                              CM=-0.2046
  7.00    S TURB  S SEP    CD
    UPPER 0.8382 0.0337 0.0151*
    LOWER 0.4890 0.0000 0.0014*
    TOTAL CL= 1.466 CD=0.01656
          CM=-0.2066
  7.54    S TURB  S SEP    CD
    UPPER 0.9491 0.0396 0.0186*
    LOWER 0.4804 0.0000 0.0014*
    TOTAL CL= 1.515 CD=0.01993
          CM=-0.2052
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  800000 MU=300       R=  800000 MU=100        R=  800000 MU=900
  -6.83   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.0853 0.0478 0.0027*  1.0037 0.0071 0.0067     0.6588 0.0070 0.0057
   LOWER 1.0110 0.0000 0.0076*  1.0110 0.0000 0.0076*    1.0110 0.0000 0.0076*
   TOTAL CL=-0.042 CD=0.01030   CL=-0.006 CD=0.01434     CL=-0.006 CD=0.01337
         CM=-0.1821             CM=-0.1903               CM=-0.1903
  -6.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.1134 0.0284 0.0027   1.0037 0.0083 0.0071     0.6820 0.0081 0.0061
   LOWER 0.7872 0.0000 0.0044*  0.9560 0.0000 0.0057*    0.9841 0.0000 0.0060
   TOTAL CL= 0.065 CD=0.00710   CL= 0.084 CD=0.01285     CL= 0.084 CD=0.01211
         CM=-0.1873             CM=-0.1917               CM=-0.1918
  -5.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.1890 0.0136 0.0032   1.0037 0.0097 0.0076     0.7079 0.0094 0.0066
   LOWER 0.7293 0.0000 0.0038*  0.9560 0.0000 0.0051     0.9606 0.0000 0.0052
   TOTAL CL= 0.188 CD=0.00698   CL= 0.192 CD=0.01275     CL= 0.192 CD=0.01178
         CM=-0.1924             CM=-0.1933               CM=-0.1934
  -4.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.2487 0.0115 0.0037   1.0053 0.0112 0.0082     0.7342 0.0108 0.0071
   LOWER 0.7021 0.0000 0.0034*  0.9560 0.0000 0.0047     0.9292 0.0000 0.0046
   TOTAL CL= 0.299 CD=0.00715   CL= 0.300 CD=0.01291     CL= 0.300 CD=0.01174
         CM=-0.1949             CM=-0.1949               CM=-0.1950
  -3.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.3006 0.0113 0.0042   1.0053 0.0128 0.0088     0.7609 0.0123 0.0077
   LOWER 0.6831 0.0000 0.0032*  0.9560 0.0000 0.0043     0.8980 0.0000 0.0041
   TOTAL CL= 0.409 CD=0.00734   CL= 0.407 CD=0.01310     CL= 0.408 CD=0.01181
         CM=-0.1968             CM=-0.1964               CM=-0.1966
  -2.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.3478 0.0122 0.0047   1.0053 0.0145 0.0094     0.7869 0.0139 0.0084
   LOWER 0.6629 0.0000 0.0029*  0.9560 0.0000 0.0040     0.8634 0.0000 0.0036
   TOTAL CL= 0.517 CD=0.00758   CL= 0.515 CD=0.01337     CL= 0.515 CD=0.01199
         CM=-0.1985             CM=-0.1979               CM=-0.1981
  -1.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.3930 0.0133 0.0053   1.0053 0.0163 0.0101     0.8169 0.0156 0.0091
   LOWER 0.6358 0.0000 0.0026*  0.9560 0.0000 0.0036     0.8285 0.0000 0.0032
   TOTAL CL= 0.625 CD=0.00786   CL= 0.622 CD=0.01374     CL= 0.622 CD=0.01232
         CM=-0.2001             CM=-0.1992               CM=-0.1994
   0.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4374 0.0146 0.0059   1.0053 0.0183 0.0109     0.8435 0.0175 0.0098
   LOWER 0.6082 0.0000 0.0023*  0.9560 0.0000 0.0033     0.7920 0.0000 0.0029
   TOTAL CL= 0.733 CD=0.00826   CL= 0.728 CD=0.01421     CL= 0.729 CD=0.01276
         CM=-0.2016             CM=-0.2005               CM=-0.2007
   1.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4819 0.0161 0.0066   1.0053 0.0204 0.0117     0.8723 0.0195 0.0107
   LOWER 0.5809 0.0000 0.0021*  0.9560 0.0000 0.0031     0.7581 0.0000 0.0026
   TOTAL CL= 0.840 CD=0.00873   CL= 0.835 CD=0.01477     CL= 0.836 CD=0.01334
         CM=-0.2029             CM=-0.2016               CM=-0.2019
   2.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5261 0.0178 0.0073   1.0053 0.0226 0.0126     0.8979 0.0217 0.0117
   LOWER 0.5599 0.0000 0.0020*  0.9560 0.0000 0.0028     0.7323 0.0000 0.0024
   TOTAL CL= 0.947 CD=0.00934   CL= 0.940 CD=0.01543     CL= 0.942 CD=0.01405
         CM=-0.2042             CM=-0.2026               CM=-0.2029
   3.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5746 0.0197 0.0082   1.0053 0.0251 0.0136     0.9232 0.0242 0.0127
   LOWER 0.5453 0.0000 0.0019*  0.9560 0.0000 0.0026     0.7109 0.0000 0.0022
   TOTAL CL= 1.053 CD=0.01010   CL= 1.046 CD=0.01619     CL= 1.047 CD=0.01491
         CM=-0.2053             CM=-0.2035               CM=-0.2038
   4.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.6218 0.0218 0.0092*  1.0053 0.0279 0.0147     0.9473 0.0271 0.0139
   LOWER 0.5326 0.0000 0.0017*  0.9560 0.0000 0.0024     0.6930 0.0000 0.0020
   TOTAL CL= 1.159 CD=0.01097   CL= 1.150 CD=0.01706     CL= 1.151 CD=0.01594
         CM=-0.2062             CM=-0.2041               CM=-0.2044
   5.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.6736 0.0244 0.0104   1.0053 0.0311 0.0159     0.9693 0.0303 0.0153
   LOWER 0.5198 0.0000 0.0016*  0.9560 0.0000 0.0022     0.6755 0.0000 0.0019
   TOTAL CL= 1.264 CD=0.01201   CL= 1.254 CD=0.01806     CL= 1.255 CD=0.01714
         CM=-0.2070             CM=-0.2046               CM=-0.2049
   6.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.7356 0.0276 0.0120   1.0053 0.0345 0.0172     0.9894 0.0341 0.0168
   LOWER 0.5051 0.0000 0.0015*  0.9560 0.0000 0.0020     0.6589 0.0000 0.0017
   TOTAL CL= 1.367 CD=0.01346   CL= 1.357 CD=0.01919     CL= 1.357 CD=0.01856
         CM=-0.2074             CM=-0.2049               CM=-0.2050
   6.75                          S TURB  S SEP   CD
                                1.0053 0.0373 0.0182
                                0.9558 0.0000 0.0019
                                CL= 1.433 CD=0.02013
                                CM=-0.2049
   6.80                                                  S TURB  S SEP   CD
                                                         1.0026 0.0374 0.0182
                                                         0.6442 0.0000 0.0016
                                                         CL= 1.438 CD=0.01984
                                                         CM=-0.2049
   7.00   S TURB  S SEP   CD
   UPPER 0.8382 0.0327 0.0146*
   LOWER 0.4890 0.0000 0.0014*
   TOTAL CL= 1.468 CD=0.01601
         CM=-0.2070
   7.56   S TURB  S SEP   CD
   UPPER 0.9533 0.0388 0.0182*
   LOWER 0.4800 0.0000 0.0013*
   TOTAL CL= 1.518 CD=0.01953
         CM=-0.2055
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  900000 MU=300      R=  900000 MU=100       R=  900000 MU=900
  -6.83   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.0853 0.0464 0.0025*  1.0037 0.0066 0.0066     0.6711 0.0064 0.0057
   LOWER 1.0110 0.0000 0.0075*  1.0110 0.0000 0.0075*    1.0110 0.0000 0.0075*
   TOTAL CL=-0.041 CD=0.00994   CL=-0.006 CD=0.01404     CL=-0.006 CD=0.01312
         CM=-0.1824             CM=-0.1904               CM=-0.1905
  -6.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.1375 0.0183 0.0027   1.0037 0.0077 0.0070     0.6944 0.0075 0.0061
   LOWER 0.7872 0.0000 0.0043*  0.9560 0.0000 0.0056*    0.9859 0.0000 0.0059
   TOTAL CL= 0.074 CD=0.00693   CL= 0.084 CD=0.01258     CL= 0.084 CD=0.01193
         CM=-0.1895             CM=-0.1918               CM=-0.1919
  -5.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.2066 0.0109 0.0031   1.0037 0.0091 0.0075     0.7196 0.0088 0.0065
   LOWER 0.7293 0.0000 0.0037*  0.9560 0.0000 0.0051     0.9636 0.0000 0.0052
   TOTAL CL= 0.191 CD=0.00681   CL= 0.192 CD=0.01258     CL= 0.193 CD=0.01168
         CM=-0.1931             CM=-0.1935               CM=-0.1936
  -4.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.2640 0.0101 0.0037   1.0053 0.0106 0.0080     0.7454 0.0102 0.0071
   LOWER 0.7021 0.0000 0.0033*  0.9560 0.0000 0.0047     0.9336 0.0000 0.0045
   TOTAL CL= 0.301 CD=0.00698   CL= 0.300 CD=0.01267     CL= 0.301 CD=0.01158
         CM=-0.1952             CM=-0.1951               CM=-0.1952
  -3.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.3141 0.0104 0.0041   1.0053 0.0122 0.0086     0.7716 0.0117 0.0076
   LOWER 0.6831 0.0000 0.0030*  0.9560 0.0000 0.0043     0.9039 0.0000 0.0040
   TOTAL CL= 0.410 CD=0.00715   CL= 0.408 CD=0.01286     CL= 0.408 CD=0.01165
         CM=-0.1971             CM=-0.1966               CM=-0.1967
  -2.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.3603 0.0114 0.0047   1.0053 0.0139 0.0092     0.7975 0.0133 0.0082
   LOWER 0.6629 0.0000 0.0027*  0.9560 0.0000 0.0039     0.8707 0.0000 0.0036
   TOTAL CL= 0.518 CD=0.00741   CL= 0.515 CD=0.01313     CL= 0.516 CD=0.01183
         CM=-0.1987             CM=-0.1980               CM=-0.1982
  -1.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4049 0.0126 0.0052   1.0053 0.0157 0.0099     0.8267 0.0151 0.0090
   LOWER 0.6358 0.0000 0.0025*  0.9560 0.0000 0.0036     0.8373 0.0000 0.0032
   TOTAL CL= 0.626 CD=0.00770   CL= 0.622 CD=0.01349     CL= 0.623 CD=0.01217
         CM=-0.2003             CM=-0.1994               CM=-0.1996
   0.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4490 0.0139 0.0058   1.0053 0.0177 0.0107     0.8522 0.0169 0.0097
   LOWER 0.6082 0.0000 0.0023*  0.9560 0.0000 0.0033     0.8022 0.0000 0.0029
   TOTAL CL= 0.734 CD=0.00809   CL= 0.729 CD=0.01396     CL= 0.730 CD=0.01259
         CM=-0.2018             CM=-0.2006               CM=-0.2009
   1.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4930 0.0155 0.0065   1.0053 0.0197 0.0115     0.8799 0.0189 0.0106
   LOWER 0.5809 0.0000 0.0021*  0.9560 0.0000 0.0030     0.7678 0.0000 0.0026
   TOTAL CL= 0.841 CD=0.00856   CL= 0.835 CD=0.01450     CL= 0.836 CD=0.01315
         CM=-0.2031             CM=-0.2018               CM=-0.2020
   2.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5365 0.0172 0.0072   1.0053 0.0220 0.0124     0.9046 0.0212 0.0115
   LOWER 0.5599 0.0000 0.0019*  0.9560 0.0000 0.0028     0.7406 0.0000 0.0024
   TOTAL CL= 0.948 CD=0.00915   CL= 0.941 CD=0.01514     CL= 0.942 CD=0.01384
         CM=-0.2044             CM=-0.2028               CM=-0.2031
   3.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5795 0.0190 0.0081   1.0053 0.0245 0.0133     0.9288 0.0236 0.0125
   LOWER 0.5453 0.0000 0.0018*  0.9560 0.0000 0.0025     0.7183 0.0000 0.0022
   TOTAL CL= 1.054 CD=0.00984   CL= 1.046 CD=0.01589     CL= 1.048 CD=0.01468
         CM=-0.2055             CM=-0.2037               CM=-0.2040
   4.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.6247 0.0211 0.0090   1.0053 0.0272 0.0144     0.9520 0.0264 0.0137
   LOWER 0.5326 0.0000 0.0017*  0.9560 0.0000 0.0023     0.6998 0.0000 0.0020
   TOTAL CL= 1.160 CD=0.01067   CL= 1.151 CD=0.01674     CL= 1.152 CD=0.01568
         CM=-0.2065             CM=-0.2044               CM=-0.2046
   5.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.6754 0.0237 0.0102   1.0053 0.0303 0.0156     0.9730 0.0297 0.0150
   LOWER 0.5198 0.0000 0.0015*  0.9560 0.0000 0.0022     0.6818 0.0000 0.0018
   TOTAL CL= 1.265 CD=0.01169   CL= 1.255 CD=0.01771     CL= 1.256 CD=0.01685
         CM=-0.2072             CM=-0.2049               CM=-0.2051
   6.00   S TURB  S SEP   CD     S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.7356 0.0268 0.0116   1.0053 0.0337 0.0168     0.9922 0.0334 0.0166
   LOWER 0.5051 0.0000 0.0014*  0.9560 0.0000 0.0020     0.6656 0.0000 0.0017
   TOTAL CL= 1.369 CD=0.01308   CL= 1.358 CD=0.01881     CL= 1.358 CD=0.01823
         CM=-0.2076             CM=-0.2051               CM=-0.2053
   6.81                          S TURB  S SEP   CD
                                1.0053 0.0368 0.0179
                                0.9559 0.0000 0.0019
                                CL= 1.440 CD=0.01979
                                CM=-0.2052
   6.82                                                  S TURB  S SEP   CD
                                                        1.0050 0.0368 0.0179
                                                        0.6519 0.0000 0.0016
                                                        CL= 1.441 CD=0.01952
                                                        CM=-0.2052
   7.00   S TURB  S SEP   CD
   UPPER 0.8382 0.0318 0.0143
   LOWER 0.4890 0.0000 0.0013*
   TOTAL CL= 1.469 CD=0.01558
         CM=-0.2073
   7.59   S TURB  S SEP   CD
   UPPER 0.9591 0.0382 0.0179*
   LOWER 0.4795 0.0000 0.0012*
   TOTAL CL= 1.522 CD=0.01917
         CM=-0.2057
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1000000 MU=300         R= 1000000 MU=100          R= 1000000 MU=900
  -6.83    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.0888 0.0401 0.0023*    1.0037 0.0060 0.0065      0.6819 0.0059 0.0056
   LOWER 1.0110 0.0000 0.0073*    1.0110 0.0000 0.0073*     1.0110 0.0000 0.0073*
   TOTAL CL=-0.035 CD=0.00956     CL=-0.005 CD=0.01377      CL=-0.005 CD=0.01290
         CM=-0.1836               CM=-0.1905                CM=-0.1906
  -6.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.1563 0.0129 0.0026     1.0037 0.0072 0.0069      0.7052 0.0070 0.0060
   LOWER 0.7872 0.0000 0.0042*    0.9560 0.0000 0.0055*     0.9873 0.0000 0.0058
   TOTAL CL= 0.079 CD=0.00680     CL= 0.085 CD=0.01235      CL= 0.085 CD=0.01177
         CM=-0.1907               CM=-0.1919                CM=-0.1920
  -5.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2221 0.0091 0.0031     1.0037 0.0086 0.0074      0.7299 0.0083 0.0065
   LOWER 0.7293 0.0000 0.0036*    0.9560 0.0000 0.0050      0.9662 0.0000 0.0051
   TOTAL CL= 0.192 CD=0.00668     CL= 0.193 CD=0.01237      CL= 0.193 CD=0.01154
         CM=-0.1935               CM=-0.1936                CM=-0.1937
  -4.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2775 0.0088 0.0036     1.0053 0.0101 0.0079      0.7552 0.0097 0.0070
   LOWER 0.7021 0.0000 0.0032*    0.9560 0.0000 0.0046      0.9374 0.0000 0.0045
   TOTAL CL= 0.302 CD=0.00683     CL= 0.301 CD=0.01246      CL= 0.301 CD=0.01144
         CM=-0.1955               CM=-0.1952                CM=-0.1953
  -3.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3261 0.0096 0.0041     1.0053 0.0117 0.0085      0.7811 0.0112 0.0075
   LOWER 0.6831 0.0000 0.0029*    0.9560 0.0000 0.0042      0.9089 0.0000 0.0040
   TOTAL CL= 0.411 CD=0.00704     CL= 0.408 CD=0.01265      CL= 0.409 CD=0.01151
         CM=-0.1973               CM=-0.1967                CM=-0.1969
  -2.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3715 0.0107 0.0046     1.0053 0.0134 0.0091      0.8066 0.0128 0.0081
   LOWER 0.6629 0.0000 0.0027*    0.9560 0.0000 0.0038      0.8770 0.0000 0.0035
   TOTAL CL= 0.519 CD=0.00728     CL= 0.516 CD=0.01292      CL= 0.517 CD=0.01170
         CM=-0.1989               CM=-0.1982                CM=-0.1983
  -1.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4156 0.0120 0.0052     1.0053 0.0152 0.0098      0.8351 0.0146 0.0088
   LOWER 0.6358 0.0000 0.0024*    0.9560 0.0000 0.0035      0.8447 0.0000 0.0032
   TOTAL CL= 0.627 CD=0.00758     CL= 0.623 CD=0.01328      CL= 0.624 CD=0.01203
         CM=-0.2005               CM=-0.1995                CM=-0.1997
   0.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4593 0.0134 0.0058     1.0053 0.0171 0.0105      0.8598 0.0164 0.0096
   LOWER 0.6082 0.0000 0.0022*    0.9560 0.0000 0.0032      0.8113 0.0000 0.0029
   TOTAL CL= 0.734 CD=0.00795     CL= 0.730 CD=0.01373      CL= 0.731 CD=0.01244
         CM=-0.2019               CM=-0.2008                CM=-0.2010
   1.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5029 0.0149 0.0064     1.0053 0.0192 0.0113      0.8864 0.0184 0.0104
   LOWER 0.5809 0.0000 0.0020*    0.9560 0.0000 0.0030      0.7766 0.0000 0.0026
   TOTAL CL= 0.842 CD=0.00842     CL= 0.836 CD=0.01427      CL= 0.837 CD=0.01298
         CM=-0.2033               CM=-0.2020                CM=-0.2022
   2.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5459 0.0166 0.0071     1.0053 0.0214 0.0122      0.9102 0.0206 0.0113
   LOWER 0.5599 0.0000 0.0018*    0.9560 0.0000 0.0027      0.7483 0.0000 0.0023
   TOTAL CL= 0.949 CD=0.00899     CL= 0.942 CD=0.01489      CL= 0.943 CD=0.01365
         CM=-0.2045               CM=-0.2030                CM=-0.2032
   3.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5883 0.0185 0.0080     1.0053 0.0239 0.0131      0.9335 0.0231 0.0123
   LOWER 0.5453 0.0000 0.0017*    0.9560 0.0000 0.0025      0.7250 0.0000 0.0021
   TOTAL CL= 1.055 CD=0.00968     CL= 1.047 CD=0.01562      CL= 1.048 CD=0.01447
         CM=-0.2057               CM=-0.2039                CM=-0.2041
   4.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6336 0.0206 0.0089     1.0053 0.0266 0.0141      0.9561 0.0259 0.0135
   LOWER 0.5326 0.0000 0.0016*    0.9560 0.0000 0.0023      0.7062 0.0000 0.0020
   TOTAL CL= 1.161 CD=0.01049     CL= 1.152 CD=0.01645      CL= 1.153 CD=0.01546
         CM=-0.2066               CM=-0.2046                CM=-0.2048
   5.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6847 0.0232 0.0100     1.0053 0.0297 0.0153      0.9762 0.0291 0.0148
   LOWER 0.5198 0.0000 0.0015*    0.9560 0.0000 0.0021      0.6875 0.0000 0.0018
   TOTAL CL= 1.266 CD=0.01153     CL= 1.256 CD=0.01740      CL= 1.257 CD=0.01660
         CM=-0.2074               CM=-0.2051                CM=-0.2053
   6.00    S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7441 0.0263 0.0115     1.0053 0.0331 0.0165      0.9946 0.0327 0.0163
   LOWER 0.5051 0.0000 0.0014*    0.9560 0.0000 0.0020      0.6713 0.0000 0.0017
   TOTAL CL= 1.370 CD=0.01289     CL= 1.359 CD=0.01847      CL= 1.359 CD=0.01795
         CM=-0.2078               CM=-0.2054                CM=-0.2055
   6.87                                                       S TURB  S SEP   CD
                                                            1.0073 0.0364 0.0177
                                                            0.6575 0.0000 0.0015
                                                            CL= 1.448 CD=0.01929
                                                            CM=-0.2054
   6.91                            S TURB  S SEP   CD
                                  1.0053 0.0364 0.0177
                                  0.9559 0.0000 0.0018
                                  CL= 1.452 CD=0.01956
                                  CM=-0.2055
   7.00    S TURB  S SEP   CD
   UPPER 0.8382 0.0311 0.0139
   LOWER 0.4890 0.0000 0.0013*
   TOTAL CL= 1.470 CD=0.01522
         CM=-0.2076
   7.61    S TURB  S SEP   CD
   UPPER 0.9628 0.0377 0.0177*
   LOWER 0.4792 0.0000 0.0012*
   TOTAL CL= 1.525 CD=0.01891
         CM=-0.2060
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1100000 MU=300       R= 1100000 MU=100        R= 1100000 MU=900
  -6.83   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.1019 0.0265 0.0022    1.0037 0.0056 0.0064      0.6918 0.0054 0.0056
  LOWER 1.0110 0.0000 0.0070*   1.0110 0.0000 0.0070*     1.0110 0.0000 0.0070*
  TOTAL CL=-0.023 CD=0.00923    CL=-0.005 CD=0.01342      CL=-0.005 CD=0.01259
        CM=-0.1863               CM=-0.1906                CM=-0.1907
  -6.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.1727 0.0097 0.0026    1.0037 0.0067 0.0068      0.7149 0.0065 0.0059
  LOWER 0.7872 0.0000 0.0041    0.9560 0.0000 0.0054*     0.9886 0.0000 0.0057
  TOTAL CL= 0.082 CD=0.00669    CL= 0.085 CD=0.01215      CL= 0.085 CD=0.01163
        CM=-0.1914               CM=-0.1921                CM=-0.1921
  -5.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.2359 0.0078 0.0031    1.0037 0.0082 0.0073      0.7390 0.0079 0.0064
  LOWER 0.7293 0.0000 0.0035*   0.9560 0.0000 0.0049      0.9684 0.0000 0.0050
  TOTAL CL= 0.194 CD=0.00658    CL= 0.193 CD=0.01218      CL= 0.193 CD=0.01141
        CM=-0.1938               CM=-0.1937                CM=-0.1938
  -4.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.2895 0.0080 0.0036    1.0053 0.0096 0.0078      0.7639 0.0093 0.0069
  LOWER 0.7021 0.0000 0.0031*   0.9560 0.0000 0.0045      0.9408 0.0000 0.0044
  TOTAL CL= 0.303 CD=0.00671    CL= 0.301 CD=0.01228      CL= 0.302 CD=0.01132
        CM=-0.1957               CM=-0.1953                CM=-0.1954
  -3.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.3369 0.0090 0.0041    1.0053 0.0112 0.0083      0.7895 0.0108 0.0075
  LOWER 0.6831 0.0000 0.0029*   0.9560 0.0000 0.0041      0.9132 0.0000 0.0039
  TOTAL CL= 0.411 CD=0.00693    CL= 0.409 CD=0.01246      CL= 0.409 CD=0.01139
        CM=-0.1975               CM=-0.1969                CM=-0.1970
  -2.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.3816 0.0101 0.0046    1.0053 0.0129 0.0090      0.8146 0.0124 0.0081
  LOWER 0.6629 0.0000 0.0026*   0.9560 0.0000 0.0038      0.8823 0.0000 0.0035
  TOTAL CL= 0.520 CD=0.00717    CL= 0.516 CD=0.01273      CL= 0.517 CD=0.01157
        CM=-0.1991               CM=-0.1983                CM=-0.1985
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.4254 0.0114 0.0051    1.0053 0.0147 0.0096      0.8424 0.0141 0.0087
  LOWER 0.6358 0.0000 0.0024*   0.9560 0.0000 0.0035      0.8512 0.0000 0.0032
  TOTAL CL= 0.627 CD=0.00747    CL= 0.624 CD=0.01308      CL= 0.624 CD=0.01190
        CM=-0.2006               CM=-0.1997                CM=-0.1999
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.4688 0.0129 0.0057    1.0053 0.0166 0.0103      0.8664 0.0160 0.0095
  LOWER 0.6082 0.0000 0.0021*   0.9560 0.0000 0.0032      0.8192 0.0000 0.0028
  TOTAL CL= 0.735 CD=0.00783    CL= 0.730 CD=0.01353      CL= 0.731 CD=0.01231
        CM=-0.2021               CM=-0.2010                CM=-0.2012
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.5119 0.0145 0.0064    1.0053 0.0187 0.0111      0.8920 0.0180 0.0103
  LOWER 0.5809 0.0000 0.0019*   0.9560 0.0000 0.0029      0.7846 0.0000 0.0025
  TOTAL CL= 0.842 CD=0.00831    CL= 0.837 CD=0.01405      CL= 0.838 CD=0.01284
        CM=-0.2034               CM=-0.2021                CM=-0.2023
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.5543 0.0162 0.0071    1.0053 0.0209 0.0120      0.9151 0.0202 0.0112
  LOWER 0.5599 0.0000 0.0018*   0.9560 0.0000 0.0027      0.7556 0.0000 0.0023
  TOTAL CL= 0.949 CD=0.00886    CL= 0.943 CD=0.01467      CL= 0.944 CD=0.01349
        CM=-0.2047               CM=-0.2032                CM=-0.2034
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.5964 0.0180 0.0079    1.0053 0.0234 0.0129      0.9374 0.0226 0.0122
  LOWER 0.5453 0.0000 0.0017*   0.9560 0.0000 0.0025      0.7313 0.0000 0.0021
  TOTAL CL= 1.056 CD=0.00955    CL= 1.048 CD=0.01538      CL= 1.049 CD=0.01429
        CM=-0.2058               CM=-0.2040                CM=-0.2043
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.6419 0.0202 0.0088    1.0053 0.0261 0.0139      0.9596 0.0254 0.0133
  LOWER 0.5326 0.0000 0.0016*   0.9560 0.0000 0.0023      0.7122 0.0000 0.0019
  TOTAL CL= 1.161 CD=0.01036    CL= 1.153 CD=0.01620      CL= 1.154 CD=0.01526
        CM=-0.2068               CM=-0.2048                CM=-0.2050
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.6930 0.0227 0.0099    1.0053 0.0291 0.0150      0.9790 0.0285 0.0146
  LOWER 0.5198 0.0000 0.0015*   0.9560 0.0000 0.0021      0.6929 0.0000 0.0018
  TOTAL CL= 1.266 CD=0.01139    CL= 1.257 CD=0.01713      CL= 1.258 CD=0.01638
        CM=-0.2076               CM=-0.2053                CM=-0.2055
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP    CD
  UPPER 0.7528 0.0259 0.0114    1.0053 0.0324 0.0162      0.9966 0.0322 0.0161
  LOWER 0.5051 0.0000 0.0013*   0.9560 0.0000 0.0019      0.6765 0.0000 0.0016
  TOTAL CL= 1.370 CD=0.01275    CL= 1.360 CD=0.01817      CL= 1.360 CD=0.01770
        CM=-0.2080               CM=-0.2056                CM=-0.2057
   6.84                                                     S TURB  S SEP    CD
                                                           1.0084 0.0356 0.0174
                                                           0.6638 0.0000 0.0015
                                                           CL= 1.446 CD=0.01896
                                                           CM=-0.2057
   6.91                            S TURB  S SEP   CD
                                 1.0053 0.0358 0.0174
                                 0.9559 0.0000 0.0018
                                 CL= 1.453 CD=0.01924
                                 CM=-0.2057
   7.00   S TURB  S SEP   CD
  UPPER 0.8382 0.0304 0.0137
  LOWER 0.4890 0.0000 0.0012*
  TOTAL CL= 1.471 CD=0.01491
        CM=-0.2078
   7.62   S TURB  S SEP   CD
  UPPER 0.9644 0.0370 0.0174*
  LOWER 0.4789 0.0000 0.0012*
  TOTAL CL= 1.527 CD=0.01861
        CM=-0.2062
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1200000 MU=300        R= 1200000 MU=100        R= 1200000 MU=900
  -6.83   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.1244 0.0152 0.0022    1.0037 0.0051 0.0063     0.7006 0.0050 0.0055
  LOWER 1.0110 0.0000 0.0069*   1.0110 0.0000 0.0069*    1.0110 0.0000 0.0069*
  TOTAL CL=-0.013 CD=0.00910    CL=-0.005 CD=0.01321     CL=-0.004 CD=0.01241
        CM=-0.1886                CM=-0.1907               CM=-0.1908
  -6.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.1874 0.0077 0.0026    1.0037 0.0063 0.0067     0.7235 0.0061 0.0059
  LOWER 0.7915 0.0000 0.0040    0.9560 0.0000 0.0053*    0.9896 0.0000 0.0056
  TOTAL CL= 0.084 CD=0.00664    CL= 0.085 CD=0.01197     CL= 0.086 CD=0.01150
        CM=-0.1918                CM=-0.1922               CM=-0.1922
  -5.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.2481 0.0069 0.0031    1.0037 0.0077 0.0072     0.7472 0.0075 0.0063
  LOWER 0.7293 0.0000 0.0034*   0.9560 0.0000 0.0049     0.9703 0.0000 0.0050
  TOTAL CL= 0.194 CD=0.00650    CL= 0.194 CD=0.01201     CL= 0.194 CD=0.01130
        CM=-0.1940                CM=-0.1938               CM=-0.1939
  -4.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.3004 0.0074 0.0036    1.0053 0.0092 0.0077     0.7718 0.0089 0.0068
  LOWER 0.7021 0.0000 0.0031*   0.9560 0.0000 0.0044     0.9437 0.0000 0.0044
  TOTAL CL= 0.304 CD=0.00661    CL= 0.302 CD=0.01211     CL= 0.302 CD=0.01121
        CM=-0.1959                CM=-0.1954               CM=-0.1955
  -3.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.3467 0.0085 0.0040    1.0053 0.0108 0.0082     0.7970 0.0104 0.0074
  LOWER 0.6831 0.0000 0.0028*   0.9560 0.0000 0.0041     0.9170 0.0000 0.0039
  TOTAL CL= 0.412 CD=0.00684    CL= 0.409 CD=0.01229     CL= 0.410 CD=0.01128
        CM=-0.1976                CM=-0.1970               CM=-0.1971
  -2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.3909 0.0097 0.0045    1.0053 0.0125 0.0088     0.8217 0.0119 0.0080
  LOWER 0.6629 0.0000 0.0026*   0.9560 0.0000 0.0037     0.8870 0.0000 0.0035
  TOTAL CL= 0.520 CD=0.00708    CL= 0.517 CD=0.01256     CL= 0.518 CD=0.01146
        CM=-0.1992                CM=-0.1984               CM=-0.1986
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.4343 0.0110 0.0051    1.0053 0.0143 0.0095     0.8488 0.0137 0.0087
  LOWER 0.6358 0.0000 0.0023*   0.9560 0.0000 0.0034     0.8570 0.0000 0.0031
  TOTAL CL= 0.628 CD=0.00738    CL= 0.624 CD=0.01291     CL= 0.625 CD=0.01179
        CM=-0.2008                CM=-0.1998               CM=-0.2000
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.4774 0.0124 0.0057    1.0053 0.0162 0.0102     0.8724 0.0155 0.0094
  LOWER 0.6082 0.0000 0.0021*   0.9560 0.0000 0.0031     0.8261 0.0000 0.0028
  TOTAL CL= 0.736 CD=0.00774    CL= 0.731 CD=0.01335     CL= 0.732 CD=0.01219
        CM=-0.2022                CM=-0.2011               CM=-0.2013
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.5201 0.0140 0.0063    1.0053 0.0182 0.0110     0.8970 0.0175 0.0102
  LOWER 0.5809 0.0000 0.0019*   0.9560 0.0000 0.0029     0.7918 0.0000 0.0025
  TOTAL CL= 0.843 CD=0.00820    CL= 0.837 CD=0.01386     CL= 0.838 CD=0.01271
        CM=-0.2036                CM=-0.2023               CM=-0.2025
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.5620 0.0157 0.0070    1.0053 0.0205 0.0118     0.9194 0.0197 0.0111
  LOWER 0.5599 0.0000 0.0017*   0.9560 0.0000 0.0027     0.7627 0.0000 0.0023
  TOTAL CL= 0.950 CD=0.00875    CL= 0.943 CD=0.01447     CL= 0.944 CD=0.01335
        CM=-0.2048                CM=-0.2033               CM=-0.2035
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.6037 0.0176 0.0078    1.0053 0.0229 0.0127     0.9411 0.0221 0.0120
  LOWER 0.5453 0.0000 0.0016*   0.9560 0.0000 0.0024     0.7374 0.0000 0.0021
  TOTAL CL= 1.056 CD=0.00943    CL= 1.049 CD=0.01517     CL= 1.050 CD=0.01413
        CM=-0.2060                CM=-0.2042               CM=-0.2045
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.6494 0.0198 0.0087    1.0053 0.0256 0.0137     0.9626 0.0249 0.0132
  LOWER 0.5326 0.0000 0.0015*   0.9560 0.0000 0.0022     0.7178 0.0000 0.0019
  TOTAL CL= 1.162 CD=0.01024    CL= 1.154 CD=0.01597     CL= 1.154 CD=0.01508
        CM=-0.2069                CM=-0.2050               CM=-0.2052
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.7009 0.0223 0.0099    1.0053 0.0285 0.0148     0.9814 0.0280 0.0144
  LOWER 0.5198 0.0000 0.0014*   0.9560 0.0000 0.0021     0.6979 0.0000 0.0018
  TOTAL CL= 1.267 CD=0.01128    CL= 1.258 CD=0.01688     CL= 1.258 CD=0.01618
        CM=-0.2077                CM=-0.2055               CM=-0.2057
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
  UPPER 0.7608 0.0255 0.0113    1.0053 0.0318 0.0160     0.9984 0.0316 0.0159
  LOWER 0.5051 0.0000 0.0013*   0.9560 0.0000 0.0019     0.6812 0.0000 0.0016
  TOTAL CL= 1.371 CD=0.01263    CL= 1.361 CD=0.01791     CL= 1.361 CD=0.01748
        CM=-0.2081                CM=-0.2058               CM=-0.2059
   6.86                                                    S TURB  S SEP   CD
                                                          1.0100 0.0352 0.0172
                                                          0.6685 0.0000 0.0015
                                                          CL= 1.448 CD=0.01875
                                                          CM=-0.2059
   6.96                           S TURB  S SEP   CD
                                 1.0053 0.0354 0.0172
                                 0.9559 0.0000 0.0018
                                 CL= 1.459 CD=0.01901
                                 CM=-0.2059
   7.00   S TURB  S SEP   CD
  UPPER 0.8382 0.0298 0.0134
  LOWER 0.4890 0.0000 0.0012*
  TOTAL CL= 1.472 CD=0.01463
        CM=-0.2080
   7.63   S TURB  S SEP   CD
  UPPER 0.9660 0.0365 0.0172*
  LOWER 0.4787 0.0000 0.0011*
  TOTAL CL= 1.529 CD=0.01834
        CM=-0.2064
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
 *-WARNING 1996    ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1300000 MU=300      R= 1300000 MU=100        R= 1300000 MU=900
  -6.83   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.1409 0.0103 0.0022     1.0037 0.0047 0.0062     0.7087 0.0046 0.0055
    LOWER 1.0110 0.0000 0.0068*    1.0110 0.0000 0.0068*    1.0110 0.0000 0.0068*
    TOTAL CL=-0.009 CD=0.00899     CL=-0.004 CD=0.01301     CL=-0.004 CD=0.01225
          CM=-0.1896               CM=-0.1908               CM=-0.1908
  -6.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.2005 0.0062 0.0026     1.0037 0.0059 0.0066     0.7313 0.0057 0.0058
    LOWER 0.8002 0.0000 0.0040     0.9560 0.0000 0.0052*    0.9906 0.0000 0.0055
    TOTAL CL= 0.085 CD=0.00663     CL= 0.086 CD=0.01180     CL= 0.086 CD=0.01137
          CM=-0.1922               CM=-0.1922               CM=-0.1923
  -5.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.2593 0.0059 0.0031     1.0037 0.0073 0.0071     0.7547 0.0071 0.0063
    LOWER 0.7293 0.0000 0.0033*    0.9560 0.0000 0.0048     0.9720 0.0000 0.0049
    TOTAL CL= 0.195 CD=0.00640     CL= 0.194 CD=0.01186     CL= 0.194 CD=0.01119
          CM=-0.1942               CM=-0.1939               CM=-0.1940
  -4.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.3102 0.0069 0.0035     1.0053 0.0088 0.0076     0.7789 0.0085 0.0068
    LOWER 0.7021 0.0000 0.0030*    0.9560 0.0000 0.0044     0.9463 0.0000 0.0043
    TOTAL CL= 0.304 CD=0.00653     CL= 0.302 CD=0.01196     CL= 0.302 CD=0.01111
          CM=-0.1960               CM=-0.1955               CM=-0.1956
  -3.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.3558 0.0080 0.0040     1.0053 0.0104 0.0081     0.8038 0.0100 0.0073
    LOWER 0.6831 0.0000 0.0028*    0.9560 0.0000 0.0040     0.9204 0.0000 0.0039
    TOTAL CL= 0.412 CD=0.00676     CL= 0.410 CD=0.01214     CL= 0.410 CD=0.01118
          CM=-0.1977               CM=-0.1971               CM=-0.1972
  -2.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.3996 0.0093 0.0045     1.0053 0.0121 0.0087     0.8282 0.0116 0.0079
    LOWER 0.6629 0.0000 0.0025*    0.9560 0.0000 0.0037     0.8913 0.0000 0.0034
    TOTAL CL= 0.521 CD=0.00700     CL= 0.517 CD=0.01241     CL= 0.518 CD=0.01136
          CM=-0.1993               CM=-0.1985               CM=-0.1987
  -1.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4427 0.0106 0.0050     1.0053 0.0138 0.0094     0.8545 0.0133 0.0086
    LOWER 0.6358 0.0000 0.0023*    0.9560 0.0000 0.0034     0.8621 0.0000 0.0031
    TOTAL CL= 0.628 CD=0.00730     CL= 0.625 CD=0.01275     CL= 0.625 CD=0.01168
          CM=-0.2009               CM=-0.1999               CM=-0.2001
   0.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4853 0.0120 0.0056     1.0053 0.0158 0.0101     0.8776 0.0151 0.0093
    LOWER 0.6082 0.0000 0.0020*    0.9560 0.0000 0.0031     0.8321 0.0000 0.0028
    TOTAL CL= 0.736 CD=0.00765     CL= 0.731 CD=0.01318     CL= 0.732 CD=0.01208
          CM=-0.2023               CM=-0.2012               CM=-0.2014
   1.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.5276 0.0136 0.0063     1.0053 0.0178 0.0108     0.9015 0.0172 0.0101
    LOWER 0.5809 0.0000 0.0019*    0.9560 0.0000 0.0029     0.7986 0.0000 0.0025
    TOTAL CL= 0.843 CD=0.00811     CL= 0.838 CD=0.01369     CL= 0.839 CD=0.01259
          CM=-0.2037               CM=-0.2024               CM=-0.2026
   2.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.5691 0.0154 0.0069     1.0053 0.0200 0.0117     0.9232 0.0193 0.0109
    LOWER 0.5599 0.0000 0.0017*    0.9560 0.0000 0.0026     0.7693 0.0000 0.0023
    TOTAL CL= 0.950 CD=0.00866     CL= 0.944 CD=0.01429     CL= 0.945 CD=0.01321
          CM=-0.2050               CM=-0.2034               CM=-0.2037
   3.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.6107 0.0172 0.0077     1.0053 0.0224 0.0126     0.9443 0.0217 0.0119
    LOWER 0.5453 0.0000 0.0016*    0.9560 0.0000 0.0024     0.7431 0.0000 0.0021
    TOTAL CL= 1.057 CD=0.00933     CL= 1.049 CD=0.01498     CL= 1.050 CD=0.01398
          CM=-0.2061               CM=-0.2044               CM=-0.2046
   4.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.6565 0.0194 0.0087     1.0053 0.0251 0.0135     0.9653 0.0245 0.0130
    LOWER 0.5326 0.0000 0.0015*    0.9560 0.0000 0.0022     0.7230 0.0000 0.0019
    TOTAL CL= 1.163 CD=0.01014     CL= 1.154 CD=0.01577     CL= 1.155 CD=0.01491
          CM=-0.2071               CM=-0.2051               CM=-0.2053
   5.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.7081 0.0219 0.0098     1.0053 0.0280 0.0146     0.9836 0.0276 0.0143
    LOWER 0.5198 0.0000 0.0014*    0.9560 0.0000 0.0020     0.7027 0.0000 0.0017
    TOTAL CL= 1.268 CD=0.01118     CL= 1.258 CD=0.01666     CL= 1.259 CD=0.01600
          CM=-0.2078               CM=-0.2057               CM=-0.2058
   6.00   S TURB  S SEP    CD      S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.7684 0.0251 0.0113     1.0053 0.0313 0.0158     1.0001 0.0312 0.0157
    LOWER 0.5051 0.0000 0.0013*    0.9560 0.0000 0.0019     0.6855 0.0000 0.0016
    TOTAL CL= 1.371 CD=0.01253     CL= 1.362 CD=0.01767     CL= 1.362 CD=0.01727
          CM=-0.2083               CM=-0.2060               CM=-0.2061
   6.87                                                     S TURB  S SEP    CD
                                                            1.0112 0.0347 0.0170
                                                            0.6729 0.0000 0.0015
                                                            CL= 1.450 CD=0.01854
                                                            CM=-0.2060
   6.99                            S TURB  S SEP    CD
                                   1.0053 0.0349 0.0170
                                   0.9559 0.0000 0.0017
                                   CL= 1.463 CD=0.01878
                                   CM=-0.2061
   7.00   S TURB  S SEP    CD
    UPPER 0.8405 0.0293 0.0132
    LOWER 0.4890 0.0000 0.0012*
    TOTAL CL= 1.473 CD=0.01442
          CM=-0.2082
   7.66   S TURB  S SEP    CD
    UPPER 0.9705 0.0361 0.0170*
    LOWER 0.4783 0.0000 0.0011*
    TOTAL CL= 1.533 CD=0.01816
          CM=-0.2066
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1400000 MU=300        R= 1400000 MU=100        R= 1400000 MU=900
  -6.83    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.1553 0.0073 0.0022     1.0037 0.0043 0.0062      0.7162 0.0042 0.0054
   LOWER 1.0110 0.0000 0.0067*    1.0110 0.0000 0.0067*     1.0110 0.0000 0.0067*
   TOTAL CL=-0.007 CD=0.00889     CL=-0.004 CD=0.01283      CL=-0.004 CD=0.01211
         CM=-0.1903               CM=-0.1909                CM=-0.1909
  -6.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2124 0.0052 0.0026     1.0037 0.0055 0.0065      0.7383 0.0054 0.0058
   LOWER 0.8083 0.0000 0.0040     0.9560 0.0000 0.0051*     0.9914 0.0000 0.0055
   TOTAL CL= 0.086 CD=0.00663     CL= 0.086 CD=0.01166      CL= 0.086 CD=0.01127
         CM=-0.1924               CM=-0.1923                CM=-0.1924
  -5.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2695 0.0054 0.0031     1.0037 0.0070 0.0070      0.7614 0.0067 0.0062
   LOWER 0.7293 0.0000 0.0033*    0.9560 0.0000 0.0047      0.9735 0.0000 0.0049
   TOTAL CL= 0.196 CD=0.00634     CL= 0.194 CD=0.01172      CL= 0.195 CD=0.01109
         CM=-0.1944               CM=-0.1940                CM=-0.1941
  -4.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3192 0.0064 0.0035     1.0053 0.0084 0.0075      0.7855 0.0081 0.0067
   LOWER 0.7021 0.0000 0.0029*    0.9560 0.0000 0.0043      0.9486 0.0000 0.0043
   TOTAL CL= 0.305 CD=0.00646     CL= 0.302 CD=0.01182      CL= 0.303 CD=0.01101
         CM=-0.1961               CM=-0.1956                CM=-0.1957
  -3.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3641 0.0076 0.0040     1.0053 0.0100 0.0080      0.8101 0.0096 0.0073
   LOWER 0.6831 0.0000 0.0027*    0.9560 0.0000 0.0040      0.9235 0.0000 0.0038
   TOTAL CL= 0.413 CD=0.00669     CL= 0.410 CD=0.01200      CL= 0.411 CD=0.01109
         CM=-0.1978               CM=-0.1972                CM=-0.1973
  -2.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4076 0.0089 0.0045     1.0053 0.0117 0.0086      0.8342 0.0112 0.0079
   LOWER 0.6629 0.0000 0.0025*    0.9560 0.0000 0.0036      0.8952 0.0000 0.0034
   TOTAL CL= 0.521 CD=0.00693     CL= 0.518 CD=0.01226      CL= 0.518 CD=0.01127
         CM=-0.1994               CM=-0.1987                CM=-0.1988
  -1.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4505 0.0102 0.0050     1.0053 0.0135 0.0093      0.8596 0.0129 0.0085
   LOWER 0.6358 0.0000 0.0022*    0.9560 0.0000 0.0033      0.8668 0.0000 0.0031
   TOTAL CL= 0.629 CD=0.00723     CL= 0.625 CD=0.01260      CL= 0.626 CD=0.01159
         CM=-0.2010               CM=-0.2000                CM=-0.2002
   0.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4928 0.0117 0.0056     1.0053 0.0154 0.0100      0.8822 0.0148 0.0092
   LOWER 0.6082 0.0000 0.0020*    0.9560 0.0000 0.0031      0.8375 0.0000 0.0028
   TOTAL CL= 0.737 CD=0.00758     CL= 0.732 CD=0.01303      CL= 0.733 CD=0.01198
         CM=-0.2024               CM=-0.2013                CM=-0.2015
   1.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5346 0.0133 0.0062     1.0053 0.0174 0.0107      0.9054 0.0168 0.0100
   LOWER 0.5809 0.0000 0.0018*    0.9560 0.0000 0.0028      0.8048 0.0000 0.0025
   TOTAL CL= 0.844 CD=0.00803     CL= 0.838 CD=0.01353      CL= 0.839 CD=0.01248
         CM=-0.2038               CM=-0.2025                CM=-0.2027
   2.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5756 0.0150 0.0069     1.0053 0.0196 0.0115      0.9267 0.0190 0.0108
   LOWER 0.5599 0.0000 0.0017*    0.9560 0.0000 0.0026      0.7754 0.0000 0.0023
   TOTAL CL= 0.951 CD=0.00857     CL= 0.944 CD=0.01412      CL= 0.945 CD=0.01309
         CM=-0.2051               CM=-0.2036                CM=-0.2038
   3.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6172 0.0169 0.0077     1.0053 0.0220 0.0124      0.9472 0.0213 0.0118
   LOWER 0.5453 0.0000 0.0016*    0.9560 0.0000 0.0024      0.7485 0.0000 0.0021
   TOTAL CL= 1.057 CD=0.00924     CL= 1.050 CD=0.01480      CL= 1.051 CD=0.01385
         CM=-0.2062               CM=-0.2045                CM=-0.2047
   4.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6630 0.0191 0.0086     1.0053 0.0246 0.0134      0.9677 0.0241 0.0129
   LOWER 0.5326 0.0000 0.0015*    0.9560 0.0000 0.0022      0.7279 0.0000 0.0019
   TOTAL CL= 1.163 CD=0.01005     CL= 1.155 CD=0.01558      CL= 1.156 CD=0.01477
         CM=-0.2072               CM=-0.2053                CM=-0.2055
   5.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7148 0.0216 0.0097     1.0053 0.0276 0.0144      0.9855 0.0271 0.0141
   LOWER 0.5198 0.0000 0.0014*    0.9560 0.0000 0.0020      0.7073 0.0000 0.0017
   TOTAL CL= 1.268 CD=0.01109     CL= 1.259 CD=0.01646      CL= 1.260 CD=0.01583
         CM=-0.2079               CM=-0.2058                CM=-0.2060
   6.00    S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7754 0.0248 0.0112     1.0053 0.0308 0.0156      1.0015 0.0307 0.0155
   LOWER 0.5051 0.0000 0.0013*    0.9560 0.0000 0.0019      0.6899 0.0000 0.0016
   TOTAL CL= 1.372 CD=0.01245     CL= 1.362 CD=0.01745      CL= 1.363 CD=0.01709
         CM=-0.2084               CM=-0.2062                CM=-0.2062
   6.86                                                      S TURB  S SEP   CD
                                                            1.0121 0.0342 0.0168
                                                            0.6773 0.0000 0.0015
                                                            CL= 1.450 CD=0.01832
                                                            CM=-0.2062
   7.00    S TURB  S SEP   CD      S TURB  S SEP   CD
   UPPER 0.8465 0.0290 0.0132     1.0053 0.0344 0.0168
   LOWER 0.4890 0.0000 0.0012*    0.9560 0.0000 0.0017
   TOTAL CL= 1.474 CD=0.01432     CL= 1.465 CD=0.01855
         CM=-0.2083               CM=-0.2063
   7.01                            S TURB  S SEP   CD
                                  1.0053 0.0345 0.0168
                                  0.9560 0.0000 0.0017
                                  CL= 1.466 CD=0.01857
                                  CM=-0.2063
   7.66    S TURB  S SEP   CD
   UPPER 0.9705 0.0355 0.0168*
   LOWER 0.4783 0.0000 0.0011*
   TOTAL CL= 1.534 CD=0.01789
         CM=-0.2068
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B.L.SUMMARY AIRFOIL S904  14%  ALPHA0=  6.829 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1500000 MU=300        R= 1500000 MU=100        R= 1500000 MU=900
  -6.83   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.1683 0.0053 0.0022    1.0037 0.0039 0.0061     0.7231 0.0038 0.0054
   LOWER 1.0110 0.0000 0.0066*   1.0110 0.0000 0.0066*    1.0110 0.0000 0.0066*
   TOTAL CL=-0.005 CD=0.00880    CL=-0.004 CD=0.01267     CL=-0.003 CD=0.01197
         CM=-0.1907              CM=-0.1910               CM=-0.1910
  -6.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2234 0.0043 0.0026    1.0037 0.0051 0.0065     0.7448 0.0050 0.0058
   LOWER 0.8155 0.0000 0.0040    0.9560 0.0000 0.0051*    0.9922 0.0000 0.0054
   TOTAL CL= 0.087 CD=0.00663    CL= 0.086 CD=0.01152     CL= 0.087 CD=0.01117
         CM=-0.1926              CM=-0.1924               CM=-0.1924
  -5.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.2790 0.0049 0.0031    1.0037 0.0066 0.0069     0.7676 0.0064 0.0062
   LOWER 0.7293 0.0000 0.0032*   0.9560 0.0000 0.0047     0.9749 0.0000 0.0048
   TOTAL CL= 0.196 CD=0.00629    CL= 0.195 CD=0.01159     CL= 0.195 CD=0.01100
         CM=-0.1945              CM=-0.1941               CM=-0.1941
  -4.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3276 0.0060 0.0035    1.0053 0.0081 0.0074     0.7915 0.0078 0.0067
   LOWER 0.7021 0.0000 0.0029*   0.9560 0.0000 0.0043     0.9507 0.0000 0.0042
   TOTAL CL= 0.305 CD=0.00640    CL= 0.303 CD=0.01169     CL= 0.303 CD=0.01093
         CM=-0.1962              CM=-0.1958               CM=-0.1958
  -3.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.3718 0.0073 0.0040    1.0053 0.0097 0.0080     0.8158 0.0093 0.0072
   LOWER 0.6831 0.0000 0.0027*   0.9560 0.0000 0.0039     0.9263 0.0000 0.0038
   TOTAL CL= 0.413 CD=0.00663    CL= 0.411 CD=0.01188     CL= 0.411 CD=0.01101
         CM=-0.1979              CM=-0.1973               CM=-0.1974
  -2.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4150 0.0085 0.0045    1.0053 0.0113 0.0085     0.8397 0.0109 0.0078
   LOWER 0.6629 0.0000 0.0024*   0.9560 0.0000 0.0036     0.8986 0.0000 0.0034
   TOTAL CL= 0.521 CD=0.00687    CL= 0.518 CD=0.01213     CL= 0.519 CD=0.01119
         CM=-0.1995              CM=-0.1988               CM=-0.1989
  -1.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4577 0.0099 0.0050    1.0053 0.0131 0.0092     0.8643 0.0126 0.0084
   LOWER 0.6358 0.0000 0.0022*   0.9560 0.0000 0.0033     0.8710 0.0000 0.0031
   TOTAL CL= 0.629 CD=0.00717    CL= 0.625 CD=0.01247     CL= 0.626 CD=0.01150
         CM=-0.2011              CM=-0.2001               CM=-0.2003
   0.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4997 0.0114 0.0056    1.0053 0.0150 0.0098     0.8864 0.0144 0.0091
   LOWER 0.6082 0.0000 0.0020*   0.9560 0.0000 0.0030     0.8422 0.0000 0.0028
   TOTAL CL= 0.737 CD=0.00752    CL= 0.732 CD=0.01289     CL= 0.733 CD=0.01188
         CM=-0.2025              CM=-0.2014               CM=-0.2016
   1.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5411 0.0130 0.0062    1.0053 0.0170 0.0106     0.9090 0.0164 0.0099
   LOWER 0.5809 0.0000 0.0018*   0.9560 0.0000 0.0028     0.8105 0.0000 0.0025
   TOTAL CL= 0.844 CD=0.00797    CL= 0.839 CD=0.01339     CL= 0.840 CD=0.01238
         CM=-0.2039              CM=-0.2026               CM=-0.2028
   2.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5817 0.0147 0.0069    1.0053 0.0192 0.0114     0.9299 0.0186 0.0107
   LOWER 0.5599 0.0000 0.0016*   0.9560 0.0000 0.0026     0.7811 0.0000 0.0022
   TOTAL CL= 0.951 CD=0.00850    CL= 0.945 CD=0.01397     CL= 0.946 CD=0.01299
         CM=-0.2052              CM=-0.2037               CM=-0.2039
   3.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6233 0.0166 0.0076    1.0053 0.0216 0.0123     0.9499 0.0210 0.0117
   LOWER 0.5453 0.0000 0.0015*   0.9560 0.0000 0.0024     0.7538 0.0000 0.0020
   TOTAL CL= 1.058 CD=0.00917    CL= 1.051 CD=0.01464     CL= 1.051 CD=0.01373
         CM=-0.2063              CM=-0.2046               CM=-0.2048
   4.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6692 0.0187 0.0085    1.0053 0.0242 0.0132     0.9699 0.0237 0.0128
   LOWER 0.5326 0.0000 0.0014*   0.9560 0.0000 0.0022     0.7325 0.0000 0.0019
   TOTAL CL= 1.164 CD=0.00998    CL= 1.155 CD=0.01541     CL= 1.156 CD=0.01463
         CM=-0.2073              CM=-0.2054               CM=-0.2056
   5.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7211 0.0213 0.0097    1.0053 0.0271 0.0143     0.9873 0.0267 0.0140
   LOWER 0.5198 0.0000 0.0013*   0.9560 0.0000 0.0020     0.7116 0.0000 0.0017
   TOTAL CL= 1.269 CD=0.01101    CL= 1.260 CD=0.01627     CL= 1.260 CD=0.01568
         CM=-0.2081              CM=-0.2060               CM=-0.2061
   6.00   S TURB  S SEP   CD       S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7819 0.0245 0.0111    1.0053 0.0304 0.0154     1.0028 0.0303 0.0153
   LOWER 0.5051 0.0000 0.0012*   0.9560 0.0000 0.0019     0.6940 0.0000 0.0016
   TOTAL CL= 1.372 CD=0.01237    CL= 1.363 CD=0.01724     CL= 1.363 CD=0.01692
         CM=-0.2085              CM=-0.2064               CM=-0.2064
   6.91                                                     S TURB  S SEP   CD
                                                          1.0136 0.0340 0.0167
                                                          0.6801 0.0000 0.0015
                                                          CL= 1.456 CD=0.01821
                                                          CM=-0.2064
   7.00   S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.8520 0.0286 0.0131    1.0053 0.0340 0.0166
   LOWER 0.4890 0.0000 0.0011*   0.9560 0.0000 0.0017
   TOTAL CL= 1.474 CD=0.01422    CL= 1.466 CD=0.01834
         CM=-0.2085              CM=-0.2065
   7.09                            S TURB  S SEP   CD
                                 1.0053 0.0343 0.0167
                                 0.9560 0.0000 0.0017
                                 CL= 1.475 CD=0.01844
                                 CM=-0.2065
   7.69   S TURB  S SEP   CD
   UPPER 0.9745 0.0354 0.0167*
   LOWER 0.4778 0.0000 0.0011*
   TOTAL CL= 1.538 CD=0.01782
         CM=-0.2069
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APPENDIX B

PRESSURE DISTRIBUTIONS, TRANSITION AND SEPARATION LOCATIONS, AND SECTION CHARACTERISTICS OF S905 AIRFOIL

AIRFOIL S905 10%

				-3.00	-2.00	-1.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
N	X	Y	NU	CP(X) FOR THE ABOVE ALPHA REL. CHORD LINE											
1	1.00000	0.00000	0.00	0.262	0.263	0.266	0.269	0.272	0.276	0.280	0.284	0.289	0.295	0.301	0.307
2	0.99670	0.00088	1.00	0.244	0.245	0.246	0.247	0.249	0.252	0.254	0.258	0.262	0.266	0.270	0.275
3	0.98716	0.00373	2.00	0.177	0.176	0.176	0.176	0.177	0.178	0.180	0.182	0.184	0.187	0.191	0.195
4	0.97222	0.00863	3.00	0.073	0.071	0.069	0.067	0.066	0.066	0.066	0.067	0.068	0.070	0.072	0.075
5	0.95269	0.01521	4.00	-0.047	-0.052	-0.056	-0.060	-0.063	-0.066	-0.067	-0.068	-0.069	-0.069	-0.068	-0.066
6	0.92905	0.02278	5.00	-0.157	-0.164	-0.171	-0.178	-0.183	-0.188	-0.192	-0.196	-0.198	-0.200	-0.201	-0.202
7	0.90137	0.03076	6.00	-0.219	-0.230	-0.239	-0.248	-0.257	-0.264	-0.271	-0.277	-0.282	-0.287	-0.290	-0.293
8	0.86962	0.03901	7.00	-0.248	-0.261	-0.273	-0.285	-0.296	-0.306	-0.315	-0.324	-0.332	-0.339	-0.345	-0.351
9	0.83410	0.04761	8.00	-0.283	-0.299	-0.314	-0.329	-0.343	-0.356	-0.369	-0.380	-0.391	-0.401	-0.411	-0.419
10	0.79539	0.05651	9.00	-0.325	-0.345	-0.363	-0.381	-0.399	-0.415	-0.431	-0.446	-0.461	-0.474	-0.487	-0.498
11	0.75405	0.06552	10.00	-0.375	-0.398	-0.421	-0.443	-0.464	-0.484	-0.504	-0.523	-0.541	-0.558	-0.575	-0.590
12	0.71067	0.07440	11.00	-0.432	-0.460	-0.487	-0.513	-0.539	-0.564	-0.588	-0.611	-0.634	-0.655	-0.676	-0.696
13	0.66582	0.08287	12.00	-0.498	-0.530	-0.562	-0.594	-0.624	-0.654	-0.684	-0.712	-0.740	-0.767	-0.793	-0.818
14	0.62009	0.09058	13.00	-0.571	-0.609	-0.647	-0.684	-0.721	-0.757	-0.792	-0.827	-0.861	-0.894	-0.926	-0.957
15	0.57397	0.09708	14.00	-0.645	-0.689	-0.734	-0.778	-0.821	-0.864	-0.907	-0.948	-0.989	-1.029	-1.068	-1.106
16	0.52766	0.10192	15.00	-0.685	-0.736	-0.787	-0.838	-0.888	-0.938	-0.987	-1.035	-1.083	-1.131	-1.177	-1.222
17	0.48128	0.10496	16.00	-0.698	-0.756	-0.813	-0.870	-0.927	-0.984	-1.040	-1.096	-1.151	-1.206	-1.260	-1.313
18	0.43504	0.10625	17.00	-0.694	-0.757	-0.821	-0.885	-0.949	-1.013	-1.077	-1.140	-1.203	-1.265	-1.327	-1.388
19	0.38928	0.10586	18.00	-0.675	-0.745	-0.816	-0.887	-0.958	-1.029	-1.100	-1.171	-1.242	-1.313	-1.384	-1.454
20	0.34435	0.10391	19.00	-0.644	-0.721	-0.799	-0.878	-0.956	-1.036	-1.115	-1.195	-1.275	-1.355	-1.435	-1.514
21	0.30064	0.10051	20.00	-0.605	-0.689	-0.774	-0.861	-0.948	-1.036	-1.124	-1.214	-1.303	-1.393	-1.484	-1.574
22	0.25854	0.09581	21.00	-0.558	-0.650	-0.743	-0.839	-0.935	-1.033	-1.132	-1.231	-1.332	-1.434	-1.536	-1.639
23	0.21849	0.08997	22.00	-0.506	-0.607	-0.710	-0.815	-0.922	-1.031	-1.142	-1.254	-1.368	-1.483	-1.600	-1.717
24	0.18089	0.08313	23.00	-0.446	-0.557	-0.671	-0.787	-0.907	-1.029	-1.154	-1.281	-1.411	-1.542	-1.676	-1.811
25	0.14614	0.07541	24.00	-0.376	-0.498	-0.624	-0.755	-0.889	-1.027	-1.169	-1.314	-1.463	-1.614	-1.768	-1.925
26	0.11457	0.06695	25.00	-0.288	-0.423	-0.564	-0.710	-0.862	-1.019	-1.182	-1.349	-1.520	-1.697	-1.877	-2.062
27	0.08648	0.05789	26.00	-0.179	-0.328	-0.485	-0.650	-0.823	-1.004	-1.191	-1.386	-1.587	-1.795	-2.009	-2.229
28	0.06211	0.04839	27.00	-0.034	-0.198	-0.374	-0.561	-0.759	-0.967	-1.186	-1.415	-1.654	-1.902	-2.160	-2.426
29	0.04163	0.03863	28.00	0.155	-0.023	-0.218	-0.430	-0.657	-0.900	-1.158	-1.432	-1.720	-2.022	-2.339	-2.669
30	0.02516	0.02886	29.00	0.402	0.215	0.002	-0.234	-0.495	-0.780	-1.089	-1.421	-1.776	-2.154	-2.553	-2.975
31	0.01280	0.01937	30.00	0.703	0.527	0.311	0.055	-0.241	-0.576	-0.950	-1.363	-1.813	-2.301	-2.826	-3.387
32	0.00455	0.01054	31.00	0.976	0.881	0.714	0.475	0.164	-0.218	-0.670	-1.193	-1.785	-2.445	-3.174	-3.970
33	0.00047	0.00297	32.00	0.633	0.892	0.997	0.948	0.745	0.388	-0.122	-0.786	-1.601	-2.567	-3.684	-4.948
34	0.00003	0.00066	32.36	-0.196	0.422	0.818	0.992	0.941	0.668	0.172	-0.547	-1.487	-2.647	-4.026	-5.622
35	0.00004	-0.00070	32.61	-1.440	-0.379	0.381	0.841	1.000	0.857	0.412	-0.334	-1.379	-2.724	-4.365	-6.302
36	0.00037	-0.00179	32.86	-3.893	-2.061	-0.655	0.322	0.871	0.989	0.677	-0.064	-1.234	-2.832	-4.855	-7.301
37	0.00120	-0.00266	33.11	-2.703	-1.486	-0.510	0.225	0.717	0.966	0.973	0.736	0.255	-0.467	-1.431	-2.635
38	0.00254	-0.00346	33.36	-2.065	-1.168	-0.426	0.163	0.596	0.873	0.994	0.959	0.768	0.420	-0.082	-0.740
39	0.00771	-0.00536	34.00	-1.297	-0.773	-0.315	0.075	0.397	0.651	0.836	0.952	0.999	0.977	0.886	0.726
40	0.02065	-0.00762	35.00	-0.783	-0.481	-0.207	0.040	0.259	0.450	0.613	0.748	0.854	0.931	0.980	1.000
41	0.03926	-0.00898	36.00	-0.527	-0.323	-0.133	0.043	0.205	0.352	0.485	0.602	0.705	0.792	0.865	0.922
42	0.06332	-0.00945	37.00	-0.372	-0.221	-0.078	0.056	0.182	0.300	0.409	0.509	0.600	0.682	0.754	0.818
43	0.09261	-0.00909	38.00	-0.264	-0.146	-0.034	0.074	0.176	0.272	0.363	0.448	0.527	0.601	0.668	0.730
44	0.12682	-0.00800	39.00	-0.182	-0.087	0.004	0.092	0.176	0.257	0.334	0.407	0.477	0.542	0.603	0.660
45	0.16562	-0.00627	40.00	-0.117	-0.039	0.037	0.111	0.182	0.251	0.317	0.380	0.441	0.499	0.554	0.606
46	0.20860	-0.00402	41.00	-0.063	0.002	0.067	0.129	0.190	0.249	0.307	0.362	0.416	0.468	0.517	0.564
47	0.25530	-0.00138	42.00	-0.017	0.039	0.094	0.147	0.200	0.252	0.302	0.351	0.398	0.444	0.489	0.532
48	0.30519	0.00152	43.00	0.023	0.071	0.119	0.165	0.211	0.256	0.300	0.344	0.386	0.427	0.467	0.506
49	0.35772	0.00455	44.00	0.059	0.101	0.142	0.183	0.223	0.263	0.302	0.340	0.378	0.415	0.451	0.486
50	0.41227	0.00755	45.00	0.092	0.128	0.164	0.200	0.235	0.270	0.305	0.339	0.373	0.406	0.439	0.471
51	0.46821	0.01041	46.00	0.123	0.154	0.186	0.217	0.248	0.279	0.310	0.340	0.370	0.400	0.430	0.459
52	0.52486	0.01296	47.00	0.151	0.178	0.206	0.233	0.261	0.288	0.316	0.343	0.370	0.397	0.424	0.450
53	0.58152	0.01510	48.00	0.177	0.201	0.226	0.250	0.274	0.298	0.323	0.347	0.371	0.395	0.419	0.443
54	0.63745	0.01667	49.00	0.201	0.222	0.243	0.265	0.286	0.308	0.329	0.351	0.373	0.395	0.416	0.438
55	0.69190	0.01759	50.00	0.223	0.242	0.260	0.279	0.298	0.317	0.336	0.356	0.375	0.395	0.414	0.434
56	0.74412	0.01779	51.00	0.244	0.260	0.276	0.292	0.309	0.326	0.343	0.360	0.378	0.395	0.413	0.431
57	0.79336	0.01725	52.00	0.263	0.276	0.290	0.305	0.319	0.334	0.349	0.365	0.380	0.396	0.412	0.428
58	0.83888	0.01593	53.00	0.280	0.291	0.303	0.316	0.329	0.342	0.355	0.369	0.382	0.396	0.411	0.425
59	0.87997	0.01390	54.00	0.295	0.305	0.315	0.326	0.337	0.348	0.360	0.372	0.384	0.396	0.409	0.422
60	0.91590	0.01120	55.00	0.302	0.310	0.319	0.328	0.338	0.348	0.358	0.368	0.379	0.390	0.402	0.413
61	0.94594	0.00809	56.00	0.298	0.305	0.313	0.321	0.329	0.337	0.346	0.356	0.365	0.375	0.385	0.396
62	0.96955	0.00501	57.00	0.287	0.293	0.300	0.306	0.313	0.321	0.329	0.337	0.345	0.354	0.363	0.373
63	0.98647	0.00240	58.00	0.274	0.279	0.284	0.289	0.295	0.302	0.308	0.315	0.323	0.330	0.339	0.347
64	0.99662	0.00063	59.00	0.264	0.267	0.271	0.275	0.280	0.285	0.290	0.296	0.302	0.309	0.316	0.323
65	1.00000	0.00000	60.00	0.262	0.263	0.266	0.269	0.272	0.276	0.280	0.284	0.289	0.295	0.301	0.307

ALPHA0= 6.82 DEGREES CM0=-0.1740 ETA= 1.084

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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  500000 MU=300        R=  500000 MU=100        R=  500000 MU=900
  -1.73   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4135 0.0098 0.0061*   1.0049 0.0136 0.0096      0.7005 0.0106 0.0081
   LOWER 1.0017 0.0000 0.0043*   1.0017 0.0000 0.0043*     1.0017 0.0000 0.0043*
   TOTAL CL= 0.551 CD=0.01047    CL= 0.547 CD=0.01393      CL= 0.550 CD=0.01242
         CM=-0.1784              CM=-0.1775                CM=-0.1782
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4193 0.0117 0.0064*   1.0049 0.0161 0.0101      0.7372 0.0132 0.0087
   LOWER 0.4619 0.0000 0.0023    0.9516 0.0000 0.0036      0.9224 0.0000 0.0035
   TOTAL CL= 0.629 CD=0.00870    CL= 0.625 CD=0.01373      CL= 0.627 CD=0.01224
         CM=-0.1790              CM=-0.1780                CM=-0.1786
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4276 0.0149 0.0069*   1.0049 0.0196 0.0109      0.7814 0.0169 0.0096
   LOWER 0.3161 0.0000 0.0018    0.9516 0.0000 0.0033      0.8699 0.0000 0.0031
   TOTAL CL= 0.735 CD=0.00871    CL= 0.730 CD=0.01423      CL= 0.733 CD=0.01275
         CM=-0.1797              CM=-0.1786                CM=-0.1792
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4372 0.0186 0.0073*   1.0049 0.0233 0.0118      0.8221 0.0209 0.0106
   LOWER 0.1902 0.0000 0.0015    0.9516 0.0000 0.0030      0.8208 0.0000 0.0028
   TOTAL CL= 0.840 CD=0.00873    CL= 0.835 CD=0.01484      CL= 0.838 CD=0.01341
         CM=-0.1803              CM=-0.1791                CM=-0.1797
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4487 0.0212 0.0077*   1.0049 0.0274 0.0128      0.8578 0.0251 0.0116
   LOWER 0.0000 0.0000 0.0010    0.9516 0.0000 0.0028      0.7717 0.0000 0.0025
   TOTAL CL= 0.946 CD=0.00873    CL= 0.939 CD=0.01556      CL= 0.942 CD=0.01417
         CM=-0.1811              CM=-0.1795                CM=-0.1801
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4625 0.0228 0.0080*   1.0049 0.0319 0.0138      0.8906 0.0297 0.0128
   LOWER 0.0000 0.0000 0.0010    0.9516 0.0000 0.0026      0.7226 0.0000 0.0023
   TOTAL CL= 1.053 CD=0.00896    CL= 1.042 CD=0.01641      CL= 1.045 CD=0.01508
         CM=-0.1821              CM=-0.1797               ·CM=-0.1803
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4788 0.0259 0.0084*   1.0049 0.0369 0.0150      0.9193 0.0348 0.0140
   LOWER 0.0000 0.0000 0.0009    0.9516 0.0000 0.0024      0.6720 0.0000 0.0021
   TOTAL CL= 1.158 CD=0.00937    CL= 1.144 CD=0.01739      CL= 1.147 CD=0.01613
         CM=-0.1828              CM=-0.1797                CM=-0.1803
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4997 0.0285 0.0090*   1.0049 0.0428 0.0164      0.9474 0.0406 0.0155
   LOWER 0.0000 0.0000 0.0009    0.9516 0.0000 0.0022      0.6212 0.0000 0.0019
   TOTAL CL= 1.263 CD=0.00989    CL= 1.245 CD=0.01861      CL= 1.248 CD=0.01740
         CM=-0.1835              CM=-0.1794                CM=-0.1801
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5345 0.0310 0.0097*   1.0049 0.0491 0.0179      0.9739 0.0478 0.0173
   LOWER 0.0000 0.0000 0.0008    0.9516 0.0000 0.0020      0.5687 0.0000 0.0017
   TOTAL CL= 1.368 CD=0.01055    CL= 1.344 CD=0.01989      CL= 1.346 CD=0.01902
         CM=-0.1843              CM=-0.1790                CM=-0.1793
   7.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6976 0.0398 0.0131    1.0049 0.0564 0.0195*     0.9978 0.0559 0.0193
   LOWER 0.0000 0.0000 0.0008    0.9516 0.0000 0.0019      0.5160 0.0000 0.0016
   TOTAL CL= 1.464 CD=0.01383    CL= 1.441 CD=0.02137      CL= 1.442 CD=0.02086
         CM=-0.1831              CM=-0.1781                CM=-0.1783
   7.03                           S TURB  S SEP   CD
                                 1.0049 0.0566 0.0195*
                                 0.9516 0.0000 0.0019
                                 CL= 1.444 CD=0.02142
                                 CM=-0.1781
   7.11                                                    S TURB  S SEP   CD
                                                          1.0000 0.0569 0.0195
                                                          0.5097 0.0000 0.0015
                                                          CL= 1.452 CD=0.02108
                                                          CM=-0.1781
   7.38   S TURB  S SEP   CD
   UPPER 0.9594 0.0578 0.0195*
   LOWER 0.0000 0.0000 0.0008
   TOTAL CL= 1.480 CD=0.02028
         CM=-0.1782
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
 *-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  600000 MU=300      R=  600000 MU=100        R=  600000 MU=900
  -1.79   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4130 0.0066 0.0056*    1.0049 0.0122 0.0093      0.7278 0.0096 0.0080
   LOWER 1.0017 0.0000 0.0043*    1.0017 0.0000 0.0043*     1.0017 0.0000 0.0043*
   TOTAL CL= 0.547 CD=0.00987     CL= 0.542 CD=0.01356      CL= 0.544 CD=0.01223
         CM=-0.1790               CM=-0.1777                CM=-0.1783
  -1.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4193 0.0088 0.0059*    1.0049 0.0149 0.0099      0.7620 0.0123 0.0086
   LOWER 0.4789 0.0000 0.0022     0.9516 0.0000 0.0035      0.9299 0.0000 0.0034
   TOTAL CL= 0.632 CD=0.00813     CL= 0.626 CD=0.01334      CL= 0.628 CD=0.01202
         CM=-0.1797               CM=-0.1783                CM=-0.1788
   0.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4276 0.0118 0.0063*    1.0049 0.0183 0.0106      0.8021 0.0160 0.0095
   LOWER 0.3485 0.0000 0.0018     0.9516 0.0000 0.0032      0.8806 0.0000 0.0030
   TOTAL CL= 0.738 CD=0.00806     CL= 0.731 CD=0.01383      CL= 0.734 CD=0.01250
         CM=-0.1804               CM=-0.1789                CM=-0.1794
   1.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4372 0.0147 0.0067*    1.0049 0.0221 0.0115      0.8382 0.0198 0.0104
   LOWER 0.2252 0.0000 0.0014     0.9516 0.0000 0.0029      0.8346 0.0000 0.0027
   TOTAL CL= 0.844 CD=0.00812     CL= 0.836 CD=0.01442      CL= 0.839 CD=0.01311
         CM=-0.1813               CM=-0.1794                CM=-0.1800
   2.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4487 0.0170 0.0070*    1.0049 0.0260 0.0124      0.8710 0.0239 0.0114
   LOWER 0.0948 0.0000 0.0011     0.9516 0.0000 0.0027      0.7883 0.0000 0.0025
   TOTAL CL= 0.951 CD=0.00818     CL= 0.941 CD=0.01512      CL= 0.943 CD=0.01384
         CM=-0.1822               CM=-0.1798                CM=-0.1804
   3.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4625 0.0189 0.0073*    1.0049 0.0304 0.0134      0.9013 0.0284 0.0125
   LOWER 0.0000 0.0000 0.0009     0.9516 0.0000 0.0025      0.7421 0.0000 0.0023
   TOTAL CL= 1.058 CD=0.00823     CL= 1.044 CD=0.01593      CL= 1.047 CD=0.01471
         CM=-0.1832               CM=-0.1801                CM=-0.1806
   4.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4788 0.0220 0.0078*    1.0049 0.0353 0.0146      0.9281 0.0334 0.0137
   LOWER 0.0000 0.0000 0.0008     0.9516 0.0000 0.0023      0.6943 0.0000 0.0020
   TOTAL CL= 1.163 CD=0.00868     CL= 1.146 CD=0.01687      CL= 1.149 CD=0.01572
         CM=-0.1839               CM=-0.1802                CM=-0.1807
   5.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4997 0.0246 0.0084*    1.0049 0.0405 0.0158      0.9544 0.0390 0.0151
   LOWER 0.0000 0.0000 0.0008     0.9516 0.0000 0.0021      0.6453 0.0000 0.0019
   TOTAL CL= 1.268 CD=0.00915     CL= 1.248 CD=0.01795      CL= 1.250 CD=0.01695
         CM=-0.1847               CM=-0.1801                CM=-0.1805
   6.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.5599 0.0280 0.0095     1.0049 0.0471 0.0173      0.9791 0.0460 0.0168
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0020      0.5959 0.0000 0.0017
   TOTAL CL= 1.372 CD=0.01028     CL= 1.347 CD=0.01927      CL= 1.348 CD=0.01851
         CM=-0.1852               CM=-0.1796                CM=-0.1799
   7.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.7365 0.0393 0.0131     1.0049 0.0541 0.0188*     1.0012 0.0539 0.0187
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0018      0.5465 0.0000 0.0015
   TOTAL CL= 1.465 CD=0.01385     CL= 1.444 CD=0.02067      CL= 1.445 CD=0.02028
         CM=-0.1833               CM=-0.1788                CM=-0.1789
   7.11                            S TURB  S SEP    CD
                                  1.0049 0.0550 0.0190*
                                  0.9516 0.0000 0.0018
                                  CL= 1.455 CD=0.02085
                                  CM=-0.1787
   7.14                                                     S TURB  S SEP    CD
                                                            1.0038 0.0550 0.0190
                                                            0.5390 0.0000 0.0015
                                                            CL= 1.458 CD=0.02054
                                                            CM=-0.1787

   7.40   S TURB  S SEP    CD
   UPPER 0.9641 0.0557 0.0189*
   LOWER 0.0000 0.0000 0.0007
   TOTAL CL= 1.485 CD=0.01962
         CM=-0.1788
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B.L.SUMMARY AIRFOIL S905 10% ALPHA0= 6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

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ALPHA(DEG.) R=  700000 MU=300      R=  700000 MU=100          R=  700000 MU=900
 -1.85   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4126 0.0043 0.0052*  1.0049 0.0111 0.0090      0.7484 0.0087 0.0078
   LOWER 1.0018 0.0000 0.0042*  1.0018 0.0000 0.0042*     1.0018 0.0000 0.0042*
   TOTAL CL= 0.543 CD=0.00947   CL= 0.536 CD=0.01326      CL= 0.539 CD=0.01206
         CM=-0.1794             CM=-0.1779                CM=-0.1784
 -1.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4193 0.0066 0.0056*  1.0049 0.0138 0.0096      0.7811 0.0115 0.0085
   LOWER 0.5037 0.0000 0.0022   0.9516 0.0000 0.0034      0.9358 0.0000 0.0034
   TOTAL CL= 0.634 CD=0.00776   CL= 0.627 CD=0.01302      CL= 0.629 CD=0.01184
         CM=-0.1802             CM=-0.1785                CM=-0.1790
  0.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4276 0.0094 0.0059*  1.0049 0.0173 0.0104      0.8180 0.0151 0.0093
   LOWER 0.3753 0.0000 0.0018   0.9516 0.0000 0.0031      0.8891 0.0000 0.0030
   TOTAL CL= 0.740 CD=0.00765   CL= 0.732 CD=0.01350      CL= 0.735 CD=0.01229
         CM=-0.1811             CM=-0.1791                CM=-0.1797
  1.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4372 0.0120 0.0063*  1.0049 0.0210 0.0112      0.8509 0.0189 0.0102
   LOWER 0.2545 0.0000 0.0014   0.9516 0.0000 0.0029      0.8454 0.0000 0.0027
   TOTAL CL= 0.847 CD=0.00768   CL= 0.838 CD=0.01408      CL= 0.840 CD=0.01287
         CM=-0.1820             CM=-0.1797                CM=-0.1802
  2.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4487 0.0141 0.0066*  1.0049 0.0249 0.0121      0.8816 0.0229 0.0111
   LOWER 0.1314 0.0000 0.0011   0.9516 0.0000 0.0026      0.8014 0.0000 0.0024
   TOTAL CL= 0.954 CD=0.00769   CL= 0.942 CD=0.01475      CL= 0.944 CD=0.01358
         CM=-0.1830             CM=-0.1801                CM=-0.1806
  3.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4625 0.0163 0.0069*  1.0049 0.0292 0.0131      0.9094 0.0273 0.0122
   LOWER 0.0000 0.0000 0.0008   0.9516 0.0000 0.0024      0.7575 0.0000 0.0022
   TOTAL CL= 1.061 CD=0.00774   CL= 1.046 CD=0.01554      CL= 1.048 CD=0.01440
         CM=-0.1840             CM=-0.1804                CM=-0.1809
  4.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4788 0.0193 0.0074*  1.0049 0.0339 0.0142      0.9351 0.0322 0.0134
   LOWER 0.0000 0.0000 0.0008   0.9516 0.0000 0.0023      0.7120 0.0000 0.0020
   TOTAL CL= 1.166 CD=0.00816   CL= 1.148 CD=0.01644      CL= 1.150 CD=0.01539
         CM=-0.1847             CM=-0.1805                CM=-0.1810
  5.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5033 0.0215 0.0079*  1.0049 0.0391 0.0154      0.9599 0.0377 0.0147
   LOWER 0.0000 0.0000 0.0007   0.9516 0.0000 0.0021      0.6654 0.0000 0.0018
   TOTAL CL= 1.272 CD=0.00861   CL= 1.250 CD=0.01749      CL= 1.251 CD=0.01658
         CM=-0.1856             CM=-0.1805                CM=-0.1809
  6.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5858 0.0267 0.0095   1.0049 0.0454 0.0168      0.9832 0.0445 0.0164
   LOWER 0.0000 0.0000 0.0007   0.9516 0.0000 0.0019      0.6184 0.0000 0.0017
   TOTAL CL= 1.374 CD=0.01021   CL= 1.349 CD=0.01876      CL= 1.350 CD=0.01809
         CM=-0.1856             CM=-0.1800                CM=-0.1803
  7.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.7635 0.0387 0.0131   1.0049 0.0522 0.0183*     1.0039 0.0521 0.0183
   LOWER 0.0000 0.0000 0.0007   0.9516 0.0000 0.0018      0.5707 0.0000 0.0015
   TOTAL CL= 1.466 CD=0.01379   CL= 1.447 CD=0.02011      CL= 1.447 CD=0.01980
         CM=-0.1834             CM=-0.1794                CM=-0.1794
  7.18                                                    S TURB  S SEP   CD
                                                          1.0070 0.0536 0.0186
                                                          0.5615 0.0000 0.0015
                                                          CL= 1.464 CD=0.02013
                                                          CM=-0.1792
  7.19                          S TURB  S SEP   CD
                                1.0049 0.0536 0.0186*
                                0.9516 0.0000 0.0018
                                CL= 1.465 CD=0.02041
                                CM=-0.1792
  7.44   S TURB  S SEP   CD
   UPPER 0.9718 0.0543 0.0186*
   LOWER 0.0000 0.0000 0.0006
   TOTAL CL= 1.491 CD=0.01921
         CM=-0.1793
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B.L.SUMMARY AIRFOIL S905  10% ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  800000 MU=300      R=  800000 MU=100       R=  800000 MU=900
  -1.91  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4121 0.0022 0.0050*   1.0049 0.0101 0.0088     0.7628 0.0079 0.0077
    LOWER 1.0018 0.0000 0.0042*   1.0018 0.0000 0.0042*    1.0018 0.0000 0.0042*
    TOTAL CL= 0.538 CD=0.00916    CL= 0.531 CD=0.01300     CL= 0.533 CD=0.01190
          CM=-0.1798                 CM=-0.1780                CM=-0.1785
  -1.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4193 0.0049 0.0053*   1.0049 0.0130 0.0094     0.7960 0.0108 0.0084
    LOWER 0.5251 0.0000 0.0022    0.9516 0.0000 0.0033     0.9405 0.0000 0.0033
    TOTAL CL= 0.635 CD=0.00747    CL= 0.628 CD=0.01275     CL= 0.630 CD=0.01167
          CM=-0.1806                 CM=-0.1787                CM=-0.1792
   0.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4276 0.0075 0.0056*   1.0049 0.0164 0.0102     0.8304 0.0143 0.0092
    LOWER 0.3979 0.0000 0.0018    0.9516 0.0000 0.0031     0.8960 0.0000 0.0029
    TOTAL CL= 0.742 CD=0.00734    CL= 0.733 CD=0.01322     CL= 0.735 CD=0.01210
          CM=-0.1815                 CM=-0.1793                CM=-0.1798
   1.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4372 0.0099 0.0059*   1.0049 0.0200 0.0110     0.8613 0.0181 0.0100
    LOWER 0.2798 0.0000 0.0014    0.9516 0.0000 0.0028     0.8541 0.0000 0.0026
    TOTAL CL= 0.849 CD=0.00735    CL= 0.839 CD=0.01378     CL= 0.841 CD=0.01266
          CM=-0.1825                 CM=-0.1799                CM=-0.1804
   2.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4487 0.0118 0.0062*   1.0049 0.0239 0.0118     0.8900 0.0220 0.0109
    LOWER 0.1602 0.0000 0.0011    0.9516 0.0000 0.0026     0.8120 0.0000 0.0024
    TOTAL CL= 0.957 CD=0.00731    CL= 0.943 CD=0.01444     CL= 0.945 CD=0.01335
          CM=-0.1836                 CM=-0.1804                CM=-0.1809
   3.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4625 0.0143 0.0066*   1.0049 0.0281 0.0128     0.9159 0.0263 0.0120
    LOWER 0.0000 0.0000 0.0008    0.9516 0.0000 0.0024     0.7700 0.0000 0.0022
    TOTAL CL= 1.063 CD=0.00735    CL= 1.047 CD=0.01521     CL= 1.049 CD=0.01415
          CM=-0.1845                 CM=-0.1807                CM=-0.1812
   4.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.4788 0.0171 0.0070*   1.0049 0.0328 0.0139     0.9408 0.0312 0.0131
    LOWER 0.0000 0.0000 0.0007    0.9516 0.0000 0.0022     0.7265 0.0000 0.0020
    TOTAL CL= 1.169 CD=0.00775    CL= 1.150 CD=0.01609     CL= 1.152 CD=0.01511
          CM=-0.1853                 CM=-0.1809                CM=-0.1813
   5.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.5162 0.0199 0.0077    1.0049 0.0379 0.0151     0.9643 0.0366 0.0145
    LOWER 0.0000 0.0000 0.0007    0.9516 0.0000 0.0020     0.6821 0.0000 0.0018
    TOTAL CL= 1.274 CD=0.00843    CL= 1.251 CD=0.01710     CL= 1.253 CD=0.01627
          CM=-0.1861                 CM=-0.1808                CM=-0.1812
   6.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.6117 0.0262 0.0096    1.0049 0.0440 0.0164     0.9866 0.0432 0.0161
    LOWER 0.0000 0.0000 0.0006    0.9516 0.0000 0.0019     0.6371 0.0000 0.0016
    TOTAL CL= 1.375 CD=0.01022    CL= 1.351 CD=0.01834     CL= 1.352 CD=0.01774
          CM=-0.1858                 CM=-0.1804                CM=-0.1807
   7.00  S TURB  S SEP    CD     S TURB  S SEP    CD      S TURB  S SEP    CD
    UPPER 0.7840 0.0382 0.0131    1.0049 0.0505 0.0179*    1.0061 0.0506 0.0179
    LOWER 0.0000 0.0000 0.0006    0.9516 0.0000 0.0018     0.5902 0.0000 0.0015
    TOTAL CL= 1.467 CD=0.01372    CL= 1.449 CD=0.01963     CL= 1.449 CD=0.01940
          CM=-0.1836                 CM=-0.1799                CM=-0.1798
   7.17                                                    S TURB  S SEP    CD
                                                           1.0089 0.0520 0.0182
                                                           0.5822 0.0000 0.0015
                                                           CL= 1.465 CD=0.01971
                                                               CM=-0.1796
   7.22                           S TURB  S SEP    CD
                                  1.0049 0.0522 0.0182*
                                  0.9516 0.0000 0.0017
                                  CL= 1.471 CD=0.01997
                                      CM=-0.1797
   7.47  S TURB  S SEP    CD
    UPPER 0.9773 0.0529 0.0182*
    LOWER 0.0000 0.0000 0.0006
    TOTAL CL= 1.496 CD=0.01877
          CM=-0.1798
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R=  900000 MU=300        R=   900000 MU=100          R=  900000 MU=900
  -1.96   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4117 0.0003 0.0048*    1.0049 0.0092 0.0086      0.7750 0.0071 0.0076
   LOWER 1.0018 0.0000 0.0041*    1.0018 0.0000 0.0041*     1.0018 0.0000 0.0041*
   TOTAL CL= 0.534 CD=0.00891     CL= 0.526 CD=0.01277      CL= 0.528 CD=0.01176
         CM=-0.1801                CM=-0.1781                CM=-0.1786
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4193 0.0034 0.0050*    1.0049 0.0122 0.0093      0.8085 0.0102 0.0083
   LOWER 0.5440 0.0000 0.0022     0.9516 0.0000 0.0033      0.9443 0.0000 0.0032
   TOTAL CL= 0.637 CD=0.00718     CL= 0.628 CD=0.01252      CL= 0.630 CD=0.01153
         CM=-0.1809                CM=-0.1789                CM=-0.1793
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4276 0.0060 0.0053*    1.0049 0.0156 0.0100      0.8404 0.0137 0.0090
   LOWER 0.4172 0.0000 0.0017     0.9516 0.0000 0.0030      0.9017 0.0000 0.0029
   TOTAL CL= 0.744 CD=0.00709     CL= 0.734 CD=0.01298      CL= 0.736 CD=0.01194
         CM=-0.1819                CM=-0.1795                CM=-0.1800
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4372 0.0083 0.0057*    1.0049 0.0192 0.0108      0.8698 0.0173 0.0099
   LOWER 0.3020 0.0000 0.0014     0.9516 0.0000 0.0028      0.8616 0.0000 0.0026
   TOTAL CL= 0.851 CD=0.00708     CL= 0.840 CD=0.01353      CL= 0.841 CD=0.01248
         CM=-0.1829                CM=-0.1801                CM=-0.1806
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4487 0.0101 0.0059*    1.0049 0.0230 0.0116      0.8970 0.0213 0.0108
   LOWER 0.1853 0.0000 0.0011     0.9516 0.0000 0.0026      0.8211 0.0000 0.0024
   TOTAL CL= 0.959 CD=0.00703     CL= 0.944 CD=0.01418      CL= 0.946 CD=0.01315
         CM=-0.1840                CM=-0.1806                CM=-0.1811
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4625 0.0127 0.0063*    1.0049 0.0271 0.0126      0.9216 0.0255 0.0118
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0024      0.7809 0.0000 0.0022
   TOTAL CL= 1.065 CD=0.00704     CL= 1.048 CD=0.01492      CL= 1.050 CD=0.01393
         CM=-0.1850                CM=-0.1810                CM=-0.1814
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.4798 0.0153 0.0067*    1.0049 0.0318 0.0136      0.9456 0.0303 0.0129
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0022      0.7389 0.0000 0.0020
   TOTAL CL= 1.171 CD=0.00742     CL= 1.151 CD=0.01578      CL= 1.153 CD=0.01487
         CM=-0.1859                CM=-0.1811                CM=-0.1816
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.5290 0.0188 0.0077     1.0049 0.0368 0.0148      0.9680 0.0356 0.0142
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0020      0.6961 0.0000 0.0018
   TOTAL CL= 1.276 CD=0.00830     CL= 1.253 CD=0.01677      CL= 1.254 CD=0.01599
         CM=-0.1865                CM=-0.1812                CM=-0.1815
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.6370 0.0260 0.0097     1.0049 0.0428 0.0161      0.9894 0.0421 0.0158
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0019      0.6528 0.0000 0.0016
   TOTAL CL= 1.375 CD=0.01028     CL= 1.353 CD=0.01797      CL= 1.353 CD=0.01744
         CM=-0.1859                CM=-0.1808                CM=-0.1810
   7.00   S TURB  S SEP   CD      S TURB  S SEP   CD        S TURB  S SEP   CD
   UPPER 0.8001 0.0377 0.0131     1.0049 0.0491 0.0175*     1.0079 0.0493 0.0176
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0017      0.6078 0.0000 0.0015
   TOTAL CL= 1.467 CD=0.01363     CL= 1.451 CD=0.01923      CL= 1.451 CD=0.01906
         CM=-0.1838                CM=-0.1803                CM=-0.1802
   7.19                                                     S TURB  S SEP   CD
                                                            1.0109 0.0508 0.0179
                                                            0.5990 0.0000 0.0015
                                                            CL= 1.469 CD=0.01940
                                                            CM=-0.1800
   7.27                           S TURB  S SEP   CD
                                  1.0049 0.0511 0.0179*
                                  0.9516 0.0000 0.0017
                                  CL= 1.477 CD=0.01964
                                  CM=-0.1800
   7.48   S TURB  S SEP   CD
   UPPER 0.9795 0.0516 0.0178*
   LOWER 0.0000 0.0000 0.0006
   TOTAL CL= 1.499 CD=0.01840
         CM=-0.1802
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996  ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1000000 MU=300       R= 1000000 MU=100         R= 1000000 MU=900
  -2.01   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4113 0.0000 0.0046*    1.0049 0.0083 0.0085     0.7845 0.0064 0.0075
   LOWER 1.0018 0.0000 0.0041*    1.0018 0.0000 0.0041*    1.0018 0.0000 0.0041*
   TOTAL CL= 0.529 CD=0.00868     CL= 0.521 CD=0.01257     CL= 0.523 CD=0.01162
         CM=-0.1801               CM=-0.1783               CM=-0.1787
  -2.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4114 0.0000 0.0046*    1.0049 0.0084 0.0085     0.7850 0.0064 0.0075
   LOWER 1.0018 0.0000 0.0041*    1.0018 0.0000 0.0041*    1.0018 0.0000 0.0041*
   TOTAL CL= 0.530 CD=0.00868     CL= 0.522 CD=0.01257     CL= 0.524 CD=0.01162
         CM=-0.1801               CM=-0.1783               CM=-0.1787
  -1.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4193 0.0020 0.0048*    1.0049 0.0115 0.0091     0.8189 0.0097 0.0082
   LOWER 0.5607 0.0000 0.0021     0.9516 0.0000 0.0032     0.9475 0.0000 0.0032
   TOTAL CL= 0.638 CD=0.00699     CL= 0.629 CD=0.01231     CL= 0.631 CD=0.01140
         CM=-0.1813               CM=-0.1790               CM=-0.1795
   0.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4276 0.0047 0.0051*    1.0049 0.0149 0.0098     0.8487 0.0130 0.0089
   LOWER 0.4347 0.0000 0.0017     0.9516 0.0000 0.0029     0.9066 0.0000 0.0029
   TOTAL CL= 0.745 CD=0.00689     CL= 0.735 CD=0.01277     CL= 0.737 CD=0.01179
         CM=-0.1822               CM=-0.1797               CM=-0.1802
   1.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4372 0.0069 0.0054*    1.0049 0.0184 0.0106     0.8770 0.0167 0.0097
   LOWER 0.3219 0.0000 0.0014     0.9516 0.0000 0.0027     0.8679 0.0000 0.0026
   TOTAL CL= 0.853 CD=0.00686     CL= 0.840 CD=0.01331     CL= 0.842 CD=0.01232
         CM=-0.1833               CM=-0.1803               CM=-0.1808
   2.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4487 0.0088 0.0057*    1.0049 0.0222 0.0114     0.9028 0.0206 0.0106
   LOWER 0.2073 0.0000 0.0011     0.9516 0.0000 0.0025     0.8289 0.0000 0.0023
   TOTAL CL= 0.960 CD=0.00681     CL= 0.945 CD=0.01394     CL= 0.947 CD=0.01297
         CM=-0.1844               CM=-0.1808               CM=-0.1812
   3.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4625 0.0113 0.0061*    1.0049 0.0263 0.0124     0.9263 0.0247 0.0116
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0023     0.7900 0.0000 0.0021
   TOTAL CL= 1.067 CD=0.00676     CL= 1.049 CD=0.01467     CL= 1.051 CD=0.01373
         CM=-0.1854               CM=-0.1812               CM=-0.1816
   4.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4876 0.0139 0.0066     1.0049 0.0308 0.0134     0.9497 0.0294 0.0127
   LOWER 0.0000 0.0000 0.0007     0.9516 0.0000 0.0021     0.7495 0.0000 0.0019
   TOTAL CL= 1.173 CD=0.00723     CL= 1.152 CD=0.01551     CL= 1.154 CD=0.01466
         CM=-0.1863               CM=-0.1814               CM=-0.1818
   5.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.5421 0.0181 0.0076     1.0049 0.0358 0.0145     0.9712 0.0347 0.0140
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0020     0.7080 0.0000 0.0018
   TOTAL CL= 1.277 CD=0.00822     CL= 1.254 CD=0.01648     CL= 1.255 CD=0.01576
         CM=-0.1867               CM=-0.1814               CM=-0.1817
   6.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.6608 0.0259 0.0098     1.0049 0.0417 0.0158     0.9919 0.0412 0.0156
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0018     0.6661 0.0000 0.0016
   TOTAL CL= 1.375 CD=0.01037     CL= 1.354 CD=0.01765     CL= 1.355 CD=0.01718
         CM=-0.1859               CM=-0.1811               CM=-0.1813
   7.00   S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.8129 0.0372 0.0130     1.0049 0.0479 0.0172     1.0095 0.0481 0.0173
   LOWER 0.0000 0.0000 0.0005     0.9516 0.0000 0.0017     0.6229 0.0000 0.0015
   TOTAL CL= 1.468 CD=0.01354     CL= 1.453 CD=0.01887     CL= 1.453 CD=0.01876
         CM=-0.1839               CM=-0.1807               CM=-0.1806
   7.24                                                     S TURB  S SEP    CD
                                                            1.0131 0.0500 0.0177
                                                            0.6117 0.0000 0.0014
                                                            CL= 1.476 CD=0.01918
                                                            CM=-0.1803
   7.35                            S TURB  S SEP    CD
                                  1.0049 0.0504 0.0177*
                                  0.9516 0.0000 0.0017
                                  CL= 1.487 CD=0.01940
                                  CM=-0.1804
   7.51   S TURB  S SEP    CD
   UPPER 0.9875 0.0509 0.0177*
   LOWER 0.0000 0.0000 0.0005
   TOTAL CL= 1.503 CD=0.01824
         CM=-0.1804
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ALPHA(DEG.) R= 1100000 MU=300        R= 1100000 MU=100        R= 1100000 MU=900
  -2.06   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4109 0.0000 0.0044*       1.0049 0.0076 0.0083      0.7948 0.0058 0.0074
  LOWER 1.0018 0.0000 0.0041*       1.0018 0.0000 0.0041*     1.0018 0.0000 0.0041*
  TOTAL CL= 0.523 CD=0.00848        CL= 0.517 CD=0.01238      CL= 0.518 CD=0.01150
        CM=-0.1800                  CM=-0.1784                CM=-0.1788
  -2.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4114 0.0000 0.0044*       1.0049 0.0078 0.0083      0.7953 0.0059 0.0074
  LOWER 1.0018 0.0000 0.0041*       1.0018 0.0000 0.0041*     1.0018 0.0000 0.0041*
  TOTAL CL= 0.530 CD=0.00847        CL= 0.523 CD=0.01239      CL= 0.525 CD=0.01150
        CM=-0.1801                  CM=-0.1784                CM=-0.1788
  -1.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4193 0.0007 0.0047*       1.0049 0.0108 0.0090      0.8277 0.0091 0.0081
  LOWER 0.5756 0.0000 0.0021        0.9516 0.0000 0.0032      0.9503 0.0000 0.0032
  TOTAL CL= 0.639 CD=0.00683        CL= 0.630 CD=0.01213      CL= 0.631 CD=0.01128
        CM=-0.1816                  CM=-0.1792                CM=-0.1796
   0.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4276 0.0035 0.0050*       1.0049 0.0142 0.0097      0.8560 0.0125 0.0088
  LOWER 0.4504 0.0000 0.0017        0.9516 0.0000 0.0029      0.9108 0.0000 0.0028
  TOTAL CL= 0.746 CD=0.00672        CL= 0.736 CD=0.01258      CL= 0.737 CD=0.01166
        CM=-0.1825                  CM=-0.1799                CM=-0.1803
   1.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4372 0.0058 0.0053*       1.0049 0.0177 0.0104      0.8832 0.0161 0.0096
  LOWER 0.3397 0.0000 0.0014        0.9516 0.0000 0.0027      0.8734 0.0000 0.0025
  TOTAL CL= 0.854 CD=0.00667        CL= 0.841 CD=0.01311      CL= 0.843 CD=0.01218
        CM=-0.1836                  CM=-0.1805                CM=-0.1809
   2.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4487 0.0078 0.0055*       1.0049 0.0215 0.0113      0.9077 0.0199 0.0105
  LOWER 0.2270 0.0000 0.0011        0.9516 0.0000 0.0025      0.8355 0.0000 0.0023
  TOTAL CL= 0.961 CD=0.00664        CL= 0.946 CD=0.01374      CL= 0.948 CD=0.01281
        CM=-0.1847                  CM=-0.1810                CM=-0.1814
   3.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4626 0.0102 0.0059*       1.0049 0.0255 0.0122      0.9304 0.0240 0.0115
  LOWER 0.1037 0.0000 0.0009        0.9516 0.0000 0.0023      0.7980 0.0000 0.0021
  TOTAL CL= 1.068 CD=0.00673        CL= 1.050 CD=0.01445      CL= 1.052 CD=0.01356
        CM=-0.1857                  CM=-0.1814                CM=-0.1818
   4.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.4953 0.0131 0.0065        1.0049 0.0300 0.0132      0.9533 0.0287 0.0125
  LOWER 0.0000 0.0000 0.0006        0.9516 0.0000 0.0021      0.7586 0.0000 0.0019
  TOTAL CL= 1.174 CD=0.00712        CL= 1.153 CD=0.01527      CL= 1.155 CD=0.01447
        CM=-0.1865                  CM=-0.1816                CM=-0.1820
   5.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.5551 0.0176 0.0076        1.0049 0.0349 0.0142      0.9740 0.0339 0.0138
  LOWER 0.0000 0.0000 0.0006        0.9516 0.0000 0.0020      0.7183 0.0000 0.0018
  TOTAL CL= 1.277 CD=0.00818        CL= 1.255 CD=0.01621      CL= 1.256 CD=0.01555
        CM=-0.1868                  CM=-0.1817                CM=-0.1820
   6.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.6826 0.0260 0.0099        1.0049 0.0407 0.0156      0.9939 0.0403 0.0153
  LOWER 0.0000 0.0000 0.0006        0.9516 0.0000 0.0018      0.6780 0.0000 0.0016
  TOTAL CL= 1.375 CD=0.01045        CL= 1.355 CD=0.01737      CL= 1.356 CD=0.01695
        CM=-0.1859                  CM=-0.1814                CM=-0.1815
   7.00   S TURB  S SEP   CD        S TURB  S SEP   CD        S TURB  S SEP   CD
  UPPER 0.8237 0.0367 0.0129        1.0049 0.0467 0.0169      1.0109 0.0471 0.0170
  LOWER 0.0000 0.0000 0.0005        0.9516 0.0000 0.0017      0.6361 0.0000 0.0015
  TOTAL CL= 1.469 CD=0.01344        CL= 1.455 CD=0.01856      CL= 1.454 CD=0.01850
        CM=-0.1841                  CM=-0.1810                CM=-0.1809
   7.22                                                        S TURB  S SEP   CD
                                                               1.0141 0.0488 0.0174
                                                               0.6263 0.0000 0.0014
                                                               CL= 1.475 CD=0.01887
                                                               CM=-0.1807
   7.36                             S TURB  S SEP   CD
                                    1.0049 0.0493 0.0174*
                                    0.9516 0.0000 0.0016
                                    CL= 1.490 CD=0.01909
                                    CM=-0.1807
   7.51   S TURB  S SEP   CD
  UPPER 0.9875 0.0497 0.0174*
  LOWER 0.0000 0.0000 0.0005
  TOTAL CL= 1.505 CD=0.01788
        CM=-0.1808
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1200000 MU=300        R= 1200000 MU=100         R= 1200000 MU=900
  -2.11   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4105 0.0000 0.0043*   1.0049 0.0068 0.0082     0.8021 0.0051 0.0073
   LOWER 1.0018 0.0000 0.0040*   1.0018 0.0000 0.0040*    1.0018 0.0000 0.0040*
   TOTAL CL= 0.518 CD=0.00830    CL= 0.512 CD=0.01220     CL= 0.513 CD=0.01137
         CM=-0.1800              CM=-0.1784               CM=-0.1788
  -2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4114 0.0000 0.0043*   1.0049 0.0072 0.0082     0.8043 0.0054 0.0074
   LOWER 1.0018 0.0000 0.0040*   1.0018 0.0000 0.0040*    1.0018 0.0000 0.0040*
   TOTAL CL= 0.530 CD=0.00827    CL= 0.523 CD=0.01221     CL= 0.525 CD=0.01137
         CM=-0.1801              CM=-0.1785               CM=-0.1789
  -1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4193 0.0000 0.0046*   1.0049 0.0103 0.0089     0.8353 0.0087 0.0080
   LOWER 0.5891 0.0000 0.0021    0.9516 0.0000 0.0031     0.9527 0.0000 0.0031
   TOTAL CL= 0.640 CD=0.00669    CL= 0.630 CD=0.01197     CL= 0.632 CD=0.01116
         CM=-0.1817              CM=-0.1793               CM=-0.1797
   0.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4276 0.0025 0.0048*   1.0049 0.0136 0.0095     0.8624 0.0119 0.0088
   LOWER 0.4648 0.0000 0.0017    0.9516 0.0000 0.0029     0.9144 0.0000 0.0028
   TOTAL CL= 0.747 CD=0.00657    CL= 0.736 CD=0.01241     CL= 0.738 CD=0.01154
         CM=-0.1828              CM=-0.1800               CM=-0.1804
   1.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4372 0.0047 0.0051*   1.0049 0.0171 0.0103     0.8887 0.0155 0.0095
   LOWER 0.3560 0.0000 0.0014    0.9516 0.0000 0.0026     0.8782 0.0000 0.0025
   TOTAL CL= 0.855 CD=0.00650    CL= 0.842 CD=0.01294     CL= 0.843 CD=0.01205
         CM=-0.1839              CM=-0.1807               CM=-0.1810
   2.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4487 0.0068 0.0054*   1.0049 0.0208 0.0111     0.9121 0.0193 0.0104
   LOWER 0.2446 0.0000 0.0011    0.9516 0.0000 0.0024     0.8414 0.0000 0.0023
   TOTAL CL= 0.962 CD=0.00648    CL= 0.947 CD=0.01355     CL= 0.948 CD=0.01267
         CM=-0.1850              CM=-0.1812               CM=-0.1816
   3.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4679 0.0092 0.0058    1.0049 0.0248 0.0120     0.9341 0.0234 0.0113
   LOWER 0.1261 0.0000 0.0009    0.9516 0.0000 0.0023     0.8049 0.0000 0.0021
   TOTAL CL= 1.069 CD=0.00662    CL= 1.051 CD=0.01425     CL= 1.052 CD=0.01341
         CM=-0.1860              CM=-0.1816               CM=-0.1820
   4.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5031 0.0124 0.0064    1.0049 0.0292 0.0130     0.9564 0.0280 0.0124
   LOWER 0.0000 0.0000 0.0006    0.9516 0.0000 0.0021     0.7665 0.0000 0.0019
   TOTAL CL= 1.175 CD=0.00703    CL= 1.154 CD=0.01506     CL= 1.155 CD=0.01430
         CM=-0.1867              CM=-0.1819               CM=-0.1822
   5.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5681 0.0172 0.0076    1.0049 0.0341 0.0140     0.9765 0.0332 0.0136
   LOWER 0.0000 0.0000 0.0006    0.9516 0.0000 0.0019     0.7276 0.0000 0.0017
   TOTAL CL= 1.278 CD=0.00817    CL= 1.256 CD=0.01598     CL= 1.257 CD=0.01536
         CM=-0.1869              CM=-0.1819               CM=-0.1822
   6.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.7020 0.0260 0.0100    1.0049 0.0399 0.0153     0.9958 0.0395 0.0151
   LOWER 0.0000 0.0000 0.0005    0.9516 0.0000 0.0018     0.6886 0.0000 0.0016
   TOTAL CL= 1.375 CD=0.01052    CL= 1.356 CD=0.01711     CL= 1.357 CD=0.01674
         CM=-0.1859              CM=-0.1817               CM=-0.1818
   7.00   S TURB  S SEP   CD      S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.8329 0.0361 0.0128    1.0049 0.0457 0.0166     1.0121 0.0462 0.0168
   LOWER 0.0000 0.0000 0.0005    0.9516 0.0000 0.0017     0.6477 0.0000 0.0015
   TOTAL CL= 1.469 CD=0.01334    CL= 1.456 CD=0.01828     CL= 1.455 CD=0.01826
         CM=-0.1842              CM=-0.1813               CM=-0.1812
   7.24                                                    S TURB  S SEP   CD
                                                          1.0154 0.0480 0.0172
                                                          0.6372 0.0000 0.0014
                                                          CL= 1.479 CD=0.01867
                                                          CM=-0.1809
   7.40                          S TURB  S SEP   CD
                                1.0049 0.0485 0.0172*
                                0.9516 0.0000 0.0016
                                CL= 1.495 CD=0.01885
                                CM=-0.1810
   7.52   S TURB  S SEP   CD
   UPPER 0.9897 0.0488 0.0172*
   LOWER 0.0000 0.0000 0.0005
   TOTAL CL= 1.508 CD=0.01767
         CM=-0.1811
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1300000 MU=300        R= 1300000 MU=100         R= 1300000 MU=900
  -2.16    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4101 0.0000 0.0041*    1.0048 0.0061 0.0080      0.8083 0.0044 0.0072
   LOWER 1.0018 0.0000 0.0040*    1.0018 0.0000 0.0040*     1.0018 0.0000 0.0040*
   TOTAL CL= 0.512 CD=0.00815     CL= 0.507 CD=0.01203      CL= 0.508 CD=0.01124
         CM=-0.1799                CM=-0.1785                CM=-0.1789
  -2.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4114 0.0000 0.0042*    1.0049 0.0066 0.0081      0.8123 0.0050 0.0073
   LOWER 1.0018 0.0000 0.0039*    1.0018 0.0000 0.0039*     1.0018 0.0000 0.0039*
   TOTAL CL= 0.530 CD=0.00809     CL= 0.524 CD=0.01204      CL= 0.525 CD=0.01124
         CM=-0.1801                CM=-0.1786                CM=-0.1790
  -1.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4193 0.0000 0.0044*    1.0049 0.0097 0.0087      0.8418 0.0082 0.0080
   LOWER 0.6014 0.0000 0.0021     0.9516 0.0000 0.0031      0.9548 0.0000 0.0031
   TOTAL CL= 0.640 CD=0.00655     CL= 0.631 CD=0.01182      CL= 0.632 CD=0.01106
         CM=-0.1817                CM=-0.1794                CM=-0.1798
   0.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4276 0.0015 0.0047*    1.0049 0.0130 0.0094      0.8680 0.0115 0.0087
   LOWER 0.4779 0.0000 0.0017     0.9516 0.0000 0.0028      0.9177 0.0000 0.0028
   TOTAL CL= 0.748 CD=0.00644     CL= 0.737 CD=0.01226      CL= 0.738 CD=0.01143
         CM=-0.1830                CM=-0.1802                CM=-0.1805
   1.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4372 0.0038 0.0049*    1.0049 0.0165 0.0102      0.8935 0.0150 0.0094
   LOWER 0.3706 0.0000 0.0014     0.9516 0.0000 0.0026      0.8824 0.0000 0.0025
   TOTAL CL= 0.856 CD=0.00635     CL= 0.842 CD=0.01277      CL= 0.844 CD=0.01193
         CM=-0.1841                CM=-0.1808                CM=-0.1812
   2.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4487 0.0060 0.0052*    1.0049 0.0202 0.0110      0.9159 0.0188 0.0103
   LOWER 0.2607 0.0000 0.0011     0.9516 0.0000 0.0024      0.8466 0.0000 0.0023
   TOTAL CL= 0.963 CD=0.00635     CL= 0.947 CD=0.01338      CL= 0.949 CD=0.01254
         CM=-0.1852                CM=-0.1813                CM=-0.1817
   3.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.4730 0.0086 0.0057     1.0049 0.0242 0.0118      0.9374 0.0228 0.0112
   LOWER 0.1454 0.0000 0.0009     0.9516 0.0000 0.0022      0.8110 0.0000 0.0021
   TOTAL CL= 1.070 CD=0.00656     CL= 1.052 CD=0.01407      CL= 1.053 CD=0.01326
         CM=-0.1862                CM=-0.1818                CM=-0.1821
   4.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.5107 0.0118 0.0064     1.0049 0.0285 0.0128      0.9591 0.0274 0.0123
   LOWER 0.0000 0.0000 0.0006     0.9516 0.0000 0.0021      0.7738 0.0000 0.0019
   TOTAL CL= 1.175 CD=0.00696     CL= 1.155 CD=0.01486      CL= 1.156 CD=0.01415
         CM=-0.1869                CM=-0.1821                CM=-0.1824
   5.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.5812 0.0170 0.0076     1.0049 0.0333 0.0138      0.9787 0.0325 0.0135
   LOWER 0.0000 0.0000 0.0005     0.9516 0.0000 0.0019      0.7359 0.0000 0.0017
   TOTAL CL= 1.278 CD=0.00817     CL= 1.257 CD=0.01576      CL= 1.258 CD=0.01519
         CM=-0.1870                CM=-0.1821                CM=-0.1824
   6.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.7187 0.0259 0.0101     1.0049 0.0391 0.0151      0.9974 0.0387 0.0150
   LOWER 0.0000 0.0000 0.0005     0.9516 0.0000 0.0018      0.6979 0.0000 0.0016
   TOTAL CL= 1.375 CD=0.01058     CL= 1.358 CD=0.01688      CL= 1.358 CD=0.01653
         CM=-0.1859                CM=-0.1819                CM=-0.1820
   7.00    S TURB  S SEP    CD      S TURB  S SEP    CD       S TURB  S SEP    CD
   UPPER 0.8408 0.0357 0.0128     1.0049 0.0448 0.0164      1.0131 0.0453 0.0166
   LOWER 0.0000 0.0000 0.0005     0.9516 0.0000 0.0016      0.6579 0.0000 0.0014
   TOTAL CL= 1.470 CD=0.01326     CL= 1.457 CD=0.01803      CL= 1.457 CD=0.01804
         CM=-0.1844                CM=-0.1816                CM=-0.1814
   7.25                                                      S TURB  S SEP    CD
                                                             1.0165 0.0472 0.0170
                                                             0.6474 0.0000 0.0014
                                                             CL= 1.481 CD=0.01846
                                                             CM=-0.1812
   7.43                             S TURB  S SEP    CD
                                  1.0049 0.0478 0.0170*
                                  0.9516 0.0000 0.0016
                                  CL= 1.499 CD=0.01864
                                  CM=-0.1813
   7.54    S TURB  S SEP    CD
   UPPER 0.9938 0.0481 0.0170*
   LOWER 0.0000 0.0000 0.0005
   TOTAL CL= 1.511 CD=0.01749
         CM=-0.1813
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B.L.SUMMARY AIRFOIL S905  10%  ALPHA0=  6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

ALPHA(DEG.) R= 1400000 MU=300        R= 1400000 MU=100        R= 1400000 MU=900
  -2.21   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4096 0.0000 0.0040*     1.0049 0.0055 0.0079     0.8136 0.0038 0.0072
   LOWER 1.0019 0.0000 0.0040*     1.0019 0.0000 0.0040*    1.0019 0.0000 0.0040*
   TOTAL CL= 0.507 CD=0.00801      CL= 0.502 CD=0.01187     CL= 0.503 CD=0.01112
         CM=-0.1798                CM=-0.1786               CM=-0.1790
  -2.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4114 0.0000 0.0041*     1.0049 0.0061 0.0080     0.8193 0.0045 0.0073
   LOWER 1.0018 0.0000 0.0038*     1.0018 0.0000 0.0038*    1.0018 0.0000 0.0038*
   TOTAL CL= 0.530 CD=0.00790      CL= 0.524 CD=0.01186     CL= 0.526 CD=0.01111
         CM=-0.1801                CM=-0.1788               CM=-0.1791
  -1.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4193 0.0000 0.0043*     1.0049 0.0092 0.0086     0.8476 0.0078 0.0079
   LOWER 0.6126 0.0000 0.0021      0.9516 0.0000 0.0030     0.9567 0.0000 0.0031
   TOTAL CL= 0.640 CD=0.00643      CL= 0.631 CD=0.01168     CL= 0.633 CD=0.01097
         CM=-0.1817                CM=-0.1796               CM=-0.1799
   0.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4276 0.0006 0.0046*     1.0049 0.0125 0.0093     0.8730 0.0110 0.0086
   LOWER 0.4902 0.0000 0.0017      0.9516 0.0000 0.0028     0.9206 0.0000 0.0027
   TOTAL CL= 0.749 CD=0.00632      CL= 0.737 CD=0.01211     CL= 0.739 CD=0.01133
         CM=-0.1832                CM=-0.1803               CM=-0.1807
   1.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4372 0.0029 0.0048*     1.0049 0.0160 0.0100     0.8977 0.0146 0.0094
   LOWER 0.3839 0.0000 0.0014      0.9516 0.0000 0.0026     0.8862 0.0000 0.0025
   TOTAL CL= 0.857 CD=0.00623      CL= 0.843 CD=0.01263     CL= 0.844 CD=0.01182
         CM=-0.1843                CM=-0.1809               CM=-0.1813
   2.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4521 0.0053 0.0051      1.0049 0.0196 0.0108     0.9194 0.0183 0.0102
   LOWER 0.2757 0.0000 0.0011      0.9516 0.0000 0.0024     0.8512 0.0000 0.0022
   TOTAL CL= 0.964 CD=0.00627      CL= 0.948 CD=0.01322     CL= 0.949 CD=0.01242
         CM=-0.1854                CM=-0.1815               CM=-0.1819
   3.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.4782 0.0080 0.0056      1.0049 0.0236 0.0117     0.9404 0.0223 0.0111
   LOWER 0.1630 0.0000 0.0009      0.9516 0.0000 0.0022     0.8166 0.0000 0.0021
   TOTAL CL= 1.071 CD=0.00652      CL= 1.052 CD=0.01391     CL= 1.054 CD=0.01314
         CM=-0.1863                CM=-0.1819               CM=-0.1823
   4.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5182 0.0114 0.0064      1.0049 0.0279 0.0126     0.9615 0.0268 0.0121
   LOWER 0.0000 0.0000 0.0006      0.9516 0.0000 0.0020     0.7804 0.0000 0.0019
   TOTAL CL= 1.176 CD=0.00691      CL= 1.156 CD=0.01469     CL= 1.157 CD=0.01401
         CM=-0.1870                CM=-0.1822               CM=-0.1825
   5.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.5944 0.0168 0.0077      1.0049 0.0327 0.0137     0.9806 0.0319 0.0133
   LOWER 0.0000 0.0000 0.0005      0.9516 0.0000 0.0019     0.7434 0.0000 0.0017
   TOTAL CL= 1.278 CD=0.00819      CL= 1.258 CD=0.01557     CL= 1.259 CD=0.01504
         CM=-0.1871                CM=-0.1823               CM=-0.1826
   6.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.7329 0.0258 0.0101      1.0049 0.0382 0.0149     0.9988 0.0380 0.0148
   LOWER 0.0000 0.0000 0.0005      0.9516 0.0000 0.0018     0.7061 0.0000 0.0016
   TOTAL CL= 1.375 CD=0.01061      CL= 1.359 CD=0.01666     CL= 1.359 CD=0.01636
         CM=-0.1859                CM=-0.1821               CM=-0.1822
   7.00   S TURB  S SEP   CD       S TURB  S SEP   CD       S TURB  S SEP   CD
   UPPER 0.8479 0.0352 0.0127      1.0049 0.0440 0.0162     1.0141 0.0446 0.0164
   LOWER 0.0000 0.0000 0.0005      0.9516 0.0000 0.0016     0.6671 0.0000 0.0014
   TOTAL CL= 1.471 CD=0.01318      CL= 1.458 CD=0.01780     CL= 1.458 CD=0.01785
         CM=-0.1845                CM=-0.1818               CM=-0.1817
   7.24                                                     S TURB  S SEP   CD
                                                            1.0173 0.0463 0.0168
                                                            0.6572 0.0000 0.0014
                                                            CL= 1.481 CD=0.01824
                                                            CM=-0.1815
   7.44                            S TURB  S SEP   CD
                                   1.0049 0.0469 0.0168*
                                   0.9516 0.0000 0.0016
                                   CL= 1.502 CD=0.01841
                                   CM=-0.1815
   7.54   S TURB  S SEP   CD
   UPPER 0.9938 0.0471 0.0168*
   LOWER 0.0000 0.0000 0.0004
   TOTAL CL= 1.512 CD=0.01723
         CM=-0.1816
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B.L.SUMMARY AIRFOIL S905 10% ALPHA0= 6.818 DEG.
*-WARNING 1996   ALPHA REL. CHORD LINE

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ALPHA(DEG.) R= 1500000 MU=300      R= 1500000 MU=100         R= 1500000 MU=900
  -1.96   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4117 0.0000 0.0040*  1.0049 0.0058 0.0080      0.8273 0.0042 0.0073
    LOWER 1.0018 0.0000 0.0036*  1.0018 0.0000 0.0036*     1.0018 0.0000 0.0036*
    TOTAL CL= 0.534 CD=0.00759   CL= 0.529 CD=0.01155      CL= 0.531 CD=0.01083
          CM=-0.1802             CM=-0.1789                CM=-0.1792
  -1.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4193 0.0000 0.0042*  1.0049 0.0088 0.0086      0.8528 0.0074 0.0079
    LOWER 0.6229 0.0000 0.0021   0.9584 0.0000 0.0030      0.9584 0.0000 0.0030
    TOTAL CL= 0.640 CD=0.00633   CL= 0.632 CD=0.01156      CL= 0.633 CD=0.01088
          CM=-0.1817             CM=-0.1797                CM=-0.1800
   0.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4276 0.0000 0.0045*  1.0049 0.0120 0.0092      0.8775 0.0106 0.0085
    LOWER 0.5014 0.0000 0.0017   0.9516 0.0000 0.0028      0.9231 0.0000 0.0027
    TOTAL CL= 0.750 CD=0.00621   CL= 0.738 CD=0.01199      CL= 0.739 CD=0.01124
          CM=-0.1834             CM=-0.1804                CM=-0.1808
   1.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4372 0.0022 0.0047*  1.0049 0.0155 0.0099      0.9015 0.0141 0.0093
    LOWER 0.3959 0.0000 0.0014   0.9516 0.0000 0.0026      0.8896 0.0000 0.0025
    TOTAL CL= 0.858 CD=0.00612   CL= 0.843 CD=0.01249      CL= 0.845 CD=0.01172
          CM=-0.1845             CM=-0.1811                CM=-0.1814
   2.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4559 0.0047 0.0051   1.0049 0.0191 0.0107      0.9227 0.0178 0.0101
    LOWER 0.2894 0.0000 0.0011   0.9516 0.0000 0.0024      0.8553 0.0000 0.0022
    TOTAL CL= 0.965 CD=0.00622   CL= 0.948 CD=0.01308      CL= 0.950 CD=0.01231
          CM=-0.1855             CM=-0.1816                CM=-0.1820
   3.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.4832 0.0075 0.0056   1.0049 0.0230 0.0116      0.9431 0.0218 0.0110
    LOWER 0.1791 0.0000 0.0009   0.9516 0.0000 0.0022      0.8218 0.0000 0.0020
    TOTAL CL= 1.071 CD=0.00648   CL= 1.053 CD=0.01376      CL= 1.054 CD=0.01302
          CM=-0.1865             CM=-0.1821                CM=-0.1824
   4.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.5255 0.0110 0.0063   1.0049 0.0273 0.0125      0.9638 0.0262 0.0120
    LOWER 0.0000 0.0000 0.0005   0.9516 0.0000 0.0020      0.7863 0.0000 0.0019
    TOTAL CL= 1.176 CD=0.00687   CL= 1.156 CD=0.01452      CL= 1.158 CD=0.01388
          CM=-0.1871             CM=-0.1824                CM=-0.1827
   5.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.6073 0.0167 0.0077   1.0049 0.0320 0.0135      0.9824 0.0313 0.0132
    LOWER 0.0000 0.0000 0.0005   0.9516 0.0000 0.0019      0.7500 0.0000 0.0017
    TOTAL CL= 1.278 CD=0.00822   CL= 1.259 CD=0.01540      CL= 1.260 CD=0.01489
          CM=-0.1871             CM=-0.1825                CM=-0.1827
   6.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.7452 0.0257 0.0102   1.0049 0.0376 0.0147      1.0001 0.0374 0.0146
    LOWER 0.0000 0.0000 0.0005   0.9516 0.0000 0.0017      0.7136 0.0000 0.0016
    TOTAL CL= 1.375 CD=0.01063   CL= 1.360 CD=0.01647      CL= 1.360 CD=0.01620
          CM=-0.1860             CM=-0.1824                CM=-0.1824
   7.00   S TURB  S SEP   CD     S TURB  S SEP   CD        S TURB  S SEP    CD
    UPPER 0.8542 0.0348 0.0126   1.0049 0.0432 0.0160      1.0150 0.0438 0.0162
    LOWER 0.0000 0.0000 0.0004   0.9516 0.0000 0.0016      0.6756 0.0000 0.0014
    TOTAL CL= 1.471 CD=0.01310   CL= 1.460 CD=0.01759      CL= 1.459 CD=0.01767
          CM=-0.1847             CM=-0.1821                CM=-0.1819
   7.29                                                    S TURB  S SEP    CD
                                                           1.0186 0.0459 0.0167
                                                           0.6638 0.0000 0.0014
                                                           CL= 1.487 CD=0.01814
                                                           CM=-0.1816
   7.51                          S TURB  S SEP   CD
                                 1.0049 0.0466 0.0167*
                                 0.9516 0.0000 0.0016
                                 CL= 1.510 CD=0.01830
                                 CM=-0.1817
   7.55   S TURB  S SEP   CD
    UPPER 0.9962 0.0466 0.0167*
    LOWER 0.0000 0.0000 0.0004
    TOTAL CL= 1.514 CD=0.01712
          CM=-0.1818
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REPORT DOCUMENTATION PAGE

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	5c. PROGRAM ELEMENT NUMBER
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14. ABSTRACT *(Maximum 200 Words)*
A family of natural-laminar-flow airfoils, the S904 and S905, for cooling-tower fans has been designed and analyzed theoretically. The two primary objectives of high maximum lift, relatively insensitive to roughness, and low profile drag have been achieved. The constraint on the lift a zero angle of attack has not been satisfied. The constraints on the pitching moment and the airfoil thicknesses have essentially been satisfied. The airfoils should exhibit docile stalls.

15. SUBJECT TERMS
airfoils; wind turbine; airfoil design; Pennsylvania State University; wind energy

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
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