81 PROFILI BOGART

A.S.A.
ABBIATEGRASSO

81
PROFILI
BOGART

Associazione Sportiva Aeromodellistica

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20081 ABBIATEGRASSO

PREMESSA

Bill Bogart, un ingegnere aeronautico laureatosi all'Università Statale dell'Ohio, oltre ad aver lavorato per parecchi anni presso industrie aeronautiche americane (Martin Marietta, North American Rockwell, Lockheed Burbank) è un aeromodellista attivo. Ha contribuito in maniera considerevole alla comprensione dei fenomeni relativi alla stabilità longitudinale e trasversale nei modelli volanti.

Sul 4° Symposium (1971) della NFFS, Bogart presenta una serie di nuovi profili da lui calcolati, che possono trovare utile impiego nel campo del volo libero.

Per tale motivo, li presentiamo qui ai nostri soci, dato che non tutti leggono il predetto Symposium.

A.S.A. ABBIATEGRASSO
Sezione Sperimentale

Settembre 1972

81 PROFILI BOGART

L'americano Bill Bogart presenta una serie di 81 profili per il volo libero da lui progettati usando - essenzialmente - il procedimento descritto nel Report NACA 824.

La linea di curvatura mediana da lui scelta è formata da due para-bole, entrambe con asse perpendicolare alla corda del profilo e si-tuato nel punto di massima curvatura.

Una parabola si estende sino al bordo di attacco e l'altra sino al bordo di uscita.

Le ordinate, in ciascun punto della corda, sono state determinate aggiungendo spessori alla linea mediana, su linee perpendicolari alla corda: tale sistema è leggermente diverso da quello NACA, nel quale gli spessori sono aggiunti su linee perpendicolari alla linea mediana.

Il codice dei profili Bogart è il seguente:

Bo   9 6 0 - 2 6

Spessore massimo % corda

Posizione dello spessore massimo, in decimi della corda.

Posizione della freccia massima in % della corda

Freccia massima in % della corda

Chi impiegasse qualcuno dei profili Bogart è invitato a comuni-carci i risultati ottenuti.

Grazie sin d'ora per la collaborazione.

A.S.A.
Sezione Sperimentale
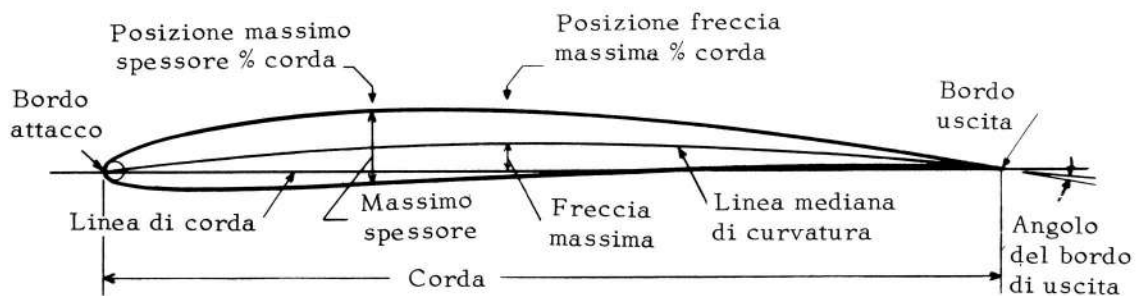
Elementi di un
profilo alare

5

Bo545-2G

Bo545-3G

Bo545-4G

Bo745-2G

Bo745-3G

Bo745-4G

Bo945-2G

Bo945-3G

Bo945-4G

Bo560-2G

Bo560-3G

Bo560-4G

Bo760-26

Bo760-36

Bo760-46

Bo960-26

Bo960-36

Bo960-46
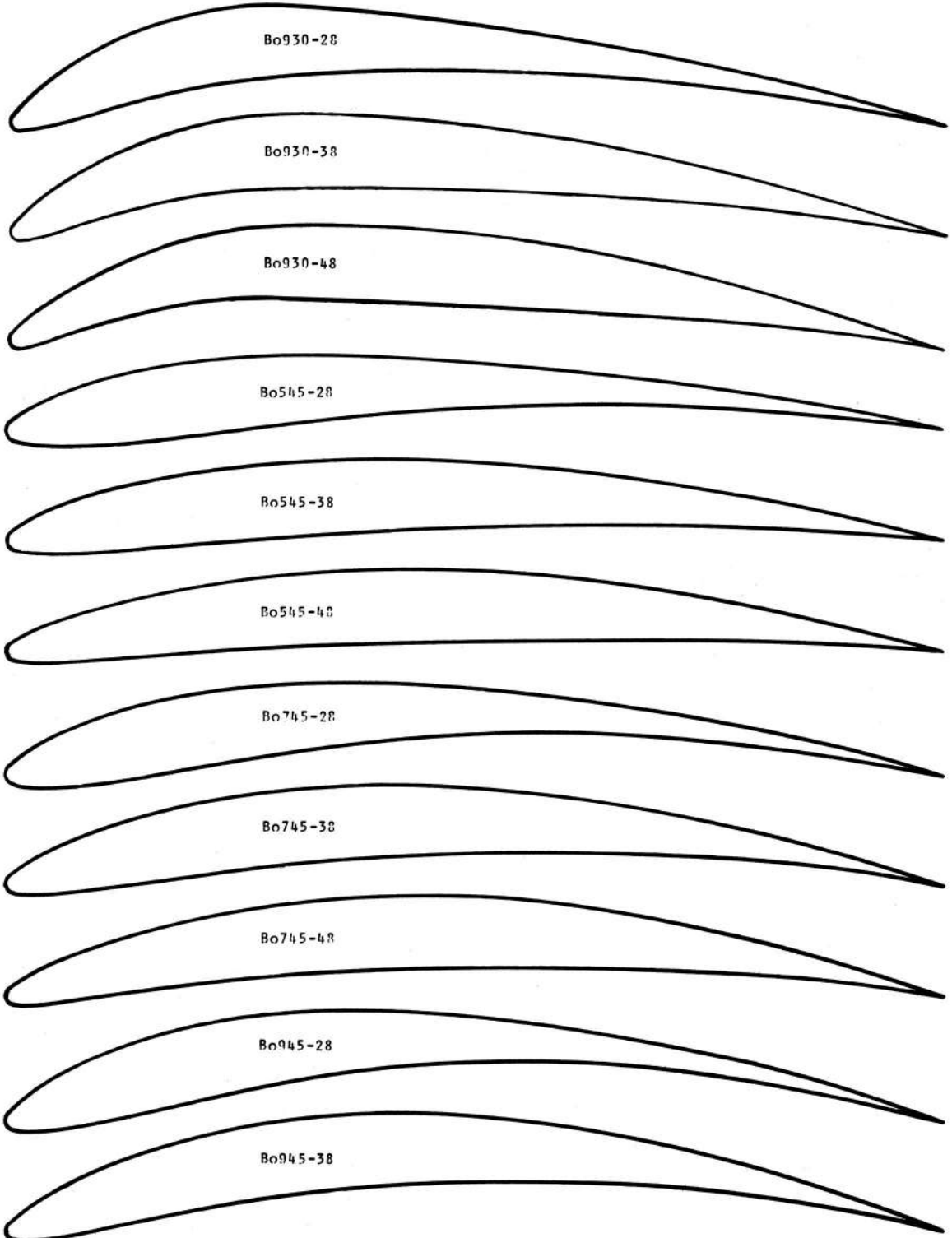
Bo530-28

Bo530-38

Bo530-48

Bo730-28

Bo730-38

Bo730-48

Bo930-28

Bo930-38

Bo930-48

Bo545-28

Bo545-38

Bo545-48
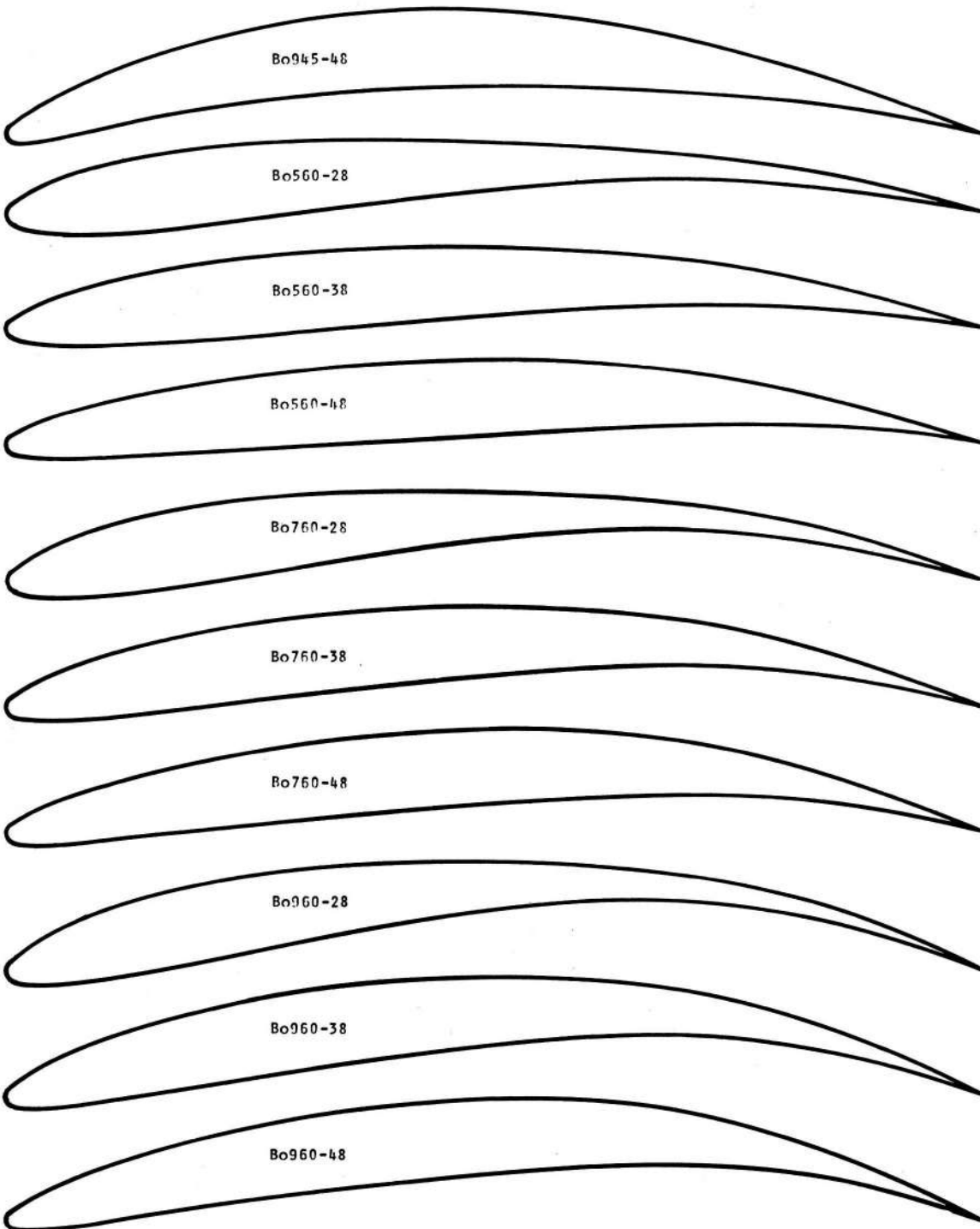
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Bo745-38

Bo745-48

Bo945-28

Bo945-38

Bo945-48

Bo560-28

Bo560-38

Bo560-48

Bo760-28

Bo760-38

Bo760-48

Bo960-28

Bo960-38

Bo960-48

Bo530-210

Bo530-310

Bo530-410

Bo730-210

Bo730-310

Bo730-410

Bo930-210

Bo930-310

Bo930-410

Bo545-210

Bo545-310

Bo545-410

Bo745-210

Bo745-310

Bo745-410

Bo945-210

Bo945-310

Bo945-410

11
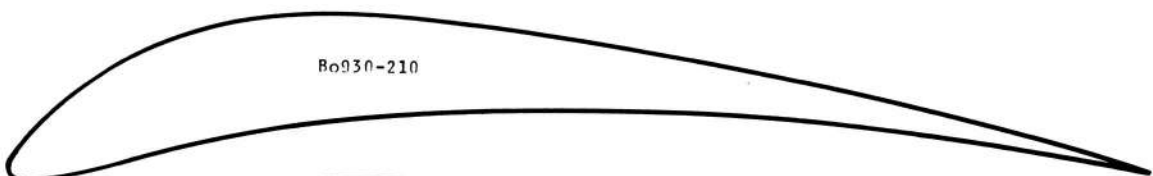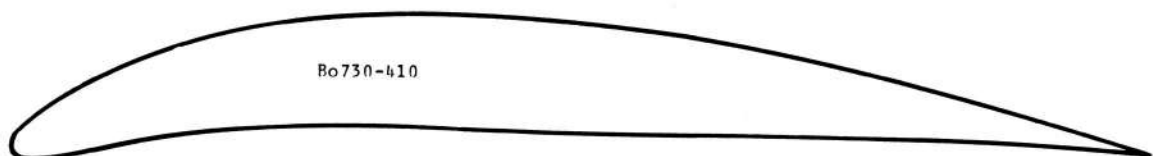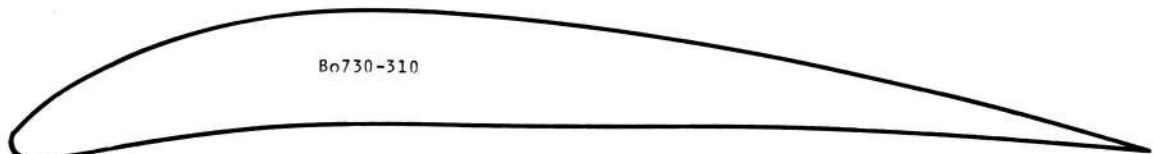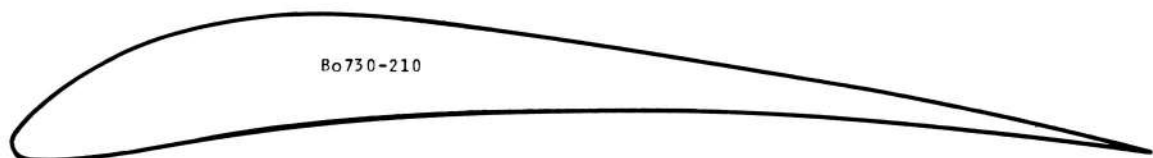
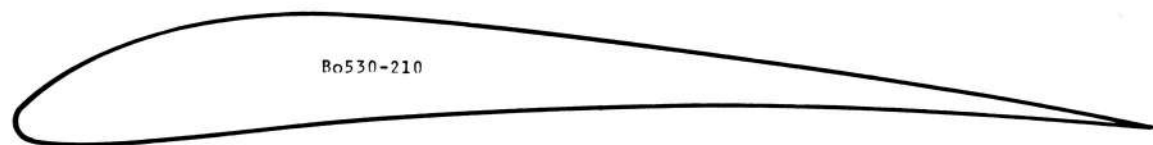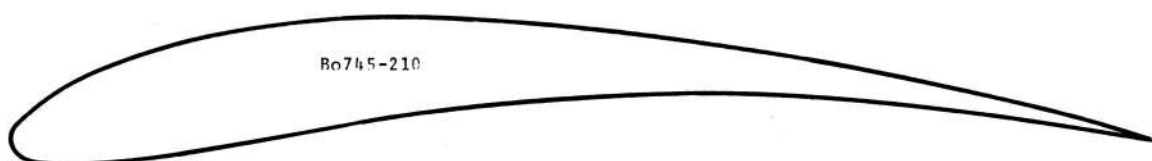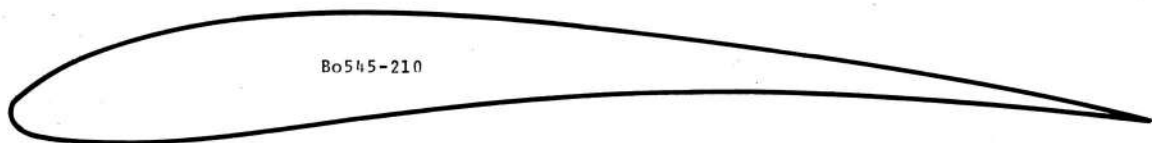Bo560-210

Bo560-310

Bo560-410

Bo760-210

Bo760-310

Bo760-410

Bo960-210

Bo960-310

Bo960-410

Bo530/Bo730 series

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo530-26		Bo530-36		Bo530-46		Bo730-26		Bo730-36		Bo730-46		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.013	-.006	.013	-.006	.012	-.005	.014	-.005	.014	-.005	.013	-.004	.01
.03	.026	-.007	.025	-.006	.023	-.004	.030	-.003	.028	-.002	.027	-.000	.03
.05	.036	-.005	.034	-.003	.032	-.001	.042	.001	.040	.003	.038	.005	.05
.07	.044	-.003	.042	-.000	.039	.002	.052	.005	.050	.008	.048	.010	.07
.10	.054	.001	.052	.004	.049	.007	.065	.012	.063	.015	.060	.012	.10
.15	.067	.008	.064	.011	.061	.014	.082	.023	.079	.026	.076	.029	.15
.20	.074	.014	.073	.016	.070	.018	.092	.032	.091	.033	.088	.036	.20
.25	.078	.019	.078	.019	.076	.021	.097	.039	.098	.038	.096	.040	.25
.30	.078	.022	.080	.020	.079	.021	.098	.042	.100	.040	.099	.041	.30
.40	.073	.025	.078	.020	.070	.019	.092	.045	.098	.040	.099	.039	.40
.50	.065	.027	.072	.020	.075	.017	.083	.046	.091	.038	.093	.035	.50
.60	.055	.027	.063	.019	.066	.015	.071	.043	.079	.035	.083	.032	.60
.70	.044	.023	.051	.017	.054	.013	.057	.037	.064	.030	.067	.027	.70
.80	.032	.017	.036	.013	.038	.011	.042	.027	.046	.023	.048	.021	.80
.90	.017	.009	.019	.008	.020	.007	.023	.014	.024	.013	.025	.012	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Bo930/Bo545 series

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo930-26		Bo930-36		Bo930-46		Bo545-26		Bo545-36		Bo545-46		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.016	-.004	.015	-.003	.015	-.003	.012	-.008	.011	-.007	.011	-.007	.01
.03	.034	.001	.032	.002	.031	.003	.023	-.010	.021	-.009	.020	-.007	.03
.05	.048	.007	.046	.009	.044	.011	.031	-.010	.029	-.008	.027	-.006	.05
.07	.061	.014	.058	.016	.056	.018	.038	-.009	.035	-.007	.033	-.004	.07
.10	.077	.023	.074	.026	.071	.029	.046	-.007	.044	-.004	.041	-.001	.10
.15	.097	.038	.094	.041	.091	.044	.057	-.001	.055	.001	.052	.004	.15
.20	.110	.050	.109	.051	.106	.054	.065	.005	.063	.006	.061	.009	.20
.25	.117	.058	.117	.058	.115	.060	.070	.011	.070	.010	.068	.012	.25
.30	.118	.062	.120	.060	.119	.061	.072	.016	.074	.014	.073	.015	.30
.40	.112	.065	.117	.059	.118	.058	.073	.026	.078	.020	.079	.019	.40
.50	.101	.064	.109	.056	.112	.054	.068	.031	.076	.023	.078	.021	.50
.60	.088	.059	.096	.051	.099	.048	.060	.032	.068	.024	.072	.021	.60
.70	.071	.050	.078	.043	.081	.040	.050	.029	.057	.023	.060	.019	.70
.80	.051	.037	.056	.033	.053	.031	.037	.023	.041	.018	.043	.016	.80
.90	.028	.020	.029	.018	.030	.018	.021	.012	.022	.011	.023	.010	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Bo745/Bo945 series

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo745-26		Bo745-36		Bo745-46		Bo945-26		Bo945-36		Bo945-46		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.013	-.007	.012	-.006	.012	-.006	.014	-.006	.013	-.005	.013	-.005	.01
.03	.025	-.007	.024	-.006	.023	-.005	.028	-.005	.027	-.003	.025	-.002	.03
.05	.035	-.006	.033	-.004	.031	-.002	.039	-.002	.037	.000	.035	.002	.05
.07	.044	-.003	.041	-.001	.039	.001	.049	.002	.047	.005	.044	.007	.07
.10	.054	.001	.051	.004	.049	.007	.062	.009	.059	.012	.057	.015	.10
.15	.068	.010	.066	.012	.063	.015	.079	.021	.077	.023	.074	.026	.15
.20	.078	.018	.077	.020	.074	.022	.092	.032	.091	.033	.088	.036	.20
.25	.086	.027	.086	.026	.084	.028	.102	.043	.102	.043	.100	.044	.25
.30	.090	.034	.092	.032	.091	.033	.108	.052	.110	.050	.109	.051	.30
.40	.093	.046	.098	.040	.099	.039	.112	.065	.118	.060	.119	.059	.40
.50	.088	.051	.096	.043	.098	.041	.108	.071	.116	.063	.118	.060	.50
.60	.079	.051	.087	.043	.090	.039	.097	.069	.106	.061	.109	.058	.60
.70	.066	.045	.073	.038	.076	.035	.082	.061	.089	.054	.092	.051	.70
.80	.049	.034	.053	.030	.055	.028	.061	.046	.065	.042	.067	.040	.80
.90	.027	.019	.029	.018	.029	.017	.034	.026	.035	.024	.036	.023	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Bo560/Bo760 series

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo560-26		Bo560-36		Bo560-46		Bo760-26		Bo760-36		Bo760-46		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.011	-.008	.011	-.008	.010	-.007	.012	-.007	.012	-.007	.011	-.006	.01
.03	.021	-.012	.020	-.010	.019	-.009	.023	-.010	.022	-.008	.021	-.007	.03
.05	.029	-.013	.026	-.011	.025	-.009	.032	-.009	.030	-.007	.028	-.005	.05
.07	.034	-.013	.032	-.010	.030	-.008	.039	-.008	.036	-.006	.034	-.003	.07
.10	.042	-.011	.039	-.009	.036	-.006	.048	-.005	.045	-.002	.042	.000	.10
.15	.051	-.007	.049	-.005	.046	-.002	.060	.001	.058	.004	.054	.007	.15
.20	.058	-.002	.057	-.001	.054	.002	.069	.009	.068	.010	.065	.013	.20
.25	.062	.004	.063	.003	.061	.005	.076	.017	.076	.016	.074	.018	.25
.30	.065	.010	.068	.008	.066	.009	.080	.025	.083	.023	.081	.024	.30
.40	.068	.021	.073	.015	.074	.014	.086	.039	.091	.033	.092	.032	.40
.50	.067	.030	.075	.022	.078	.020	.087	.049	.094	.042	.097	.039	.50
.60	.064	.036	.072	.028	.076	.024	.084	.056	.092	.048	.096	.044	.60
.70	.057	.037	.064	.030	.067	.027	.076	.055	.083	.048	.086	.045	.70
.80	.045	.030	.049	.026	.051	.024	.060	.045	.064	.041	.066	.039	.80
.90	.026	.018	.027	.016	.028	.016	.035	.026	.036	.025	.037	.024	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Block 1 — airfoil coordinates

x	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	x
	Bo960-26		Bo960-36		Bo960-46		Bo530-28		Bo530-38		Bo530-48		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.013	-.007	.012	-.006	.012	-.006	.016	-.009	.015	-.009	.014	-.008	.01
.03	.025	-.008	.024	-.006	.023	-.005	.031	-.012	.029	-.010	.027	-.008	.03
.05	.035	-.006	.033	-.004	.031	-.002	.042	-.012	.039	-.009	.037	-.006	.05
.07	.043	-.004	.041	-.001	.038	.001	.052	-.010	.048	-.007	.045	-.004	.07
.10	.054	.001	.051	.004	.048	.007	.063	-.007	.059	-.004	.055	.000	.10
.15	.069	.010	.066	.012	.063	.016	.076	-.001	.073	.002	.069	.006	.15
.20	.080	.020	.079	.021	.076	.024	.084	-.004	.083	.006	.079	.010	.20
.25	.089	.030	.089	.030	.087	.032	.088	.009	.088	.009	.085	.012	.25
.30	.095	.040	.098	.038	.096	.039	.087	.013	.090	.010	.089	.011	.30
.40	.104	.056	.109	.051	.110	.050	.080	.018	.088	.010	.089	.009	.40
.50	.106	.069	.114	.061	.116	.059	.070	.022	.081	.011	.084	.007	.50
.60	.104	.076	.112	.068	.116	.064	.059	.023	.070	.011	.075	.007	.60
.70	.095	.074	.102	.067	.105	.064	.047	.021	.056	.011	.061	.007	.70
.80	.075	.060	.079	.056	.081	.054	.034	.015	.040	.009	.042	.007	.80
.90	.044	.035	.045	.034	.046	.033	.019	.008	.021	.006	.022	.005	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Block 2 — airfoil coordinates

x	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	x
	Bo730-28		Bo730-38		Bo730-48		Bo930-28		Bo930-38		Bo930-48		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.017	-.008	.016	-.007	.016	-.007	.018	-.007	.018	-.006	.017	-.005	.01
.03	.035	-.008	.033	-.006	.031	-.004	.039	-.004	.037	-.002	.035	-.001	.03
.05	.048	-.006	.046	-.003	.043	-.000	.054	.001	.052	.003	.049	.006	.05
.07	.060	-.002	.056	.001	.053	.005	.068	.006	.065	.010	.061	.013	.07
.10	.074	.004	.070	.007	.066	.011	.085	.015	.081	.019	.078	.022	.10
.15	.091	.014	.088	.017	.084	.021	.106	.029	.103	.032	.099	.036	.15
.20	.102	.022	.100	.024	.097	.028	.120	.040	.118	.042	.115	.045	.20
.25	.107	.029	.108	.028	.105	.031	.127	.048	.127	.048	.124	.051	.25
.30	.107	.033	.110	.030	.109	.031	.127	.053	.130	.050	.129	.051	.30
.40	.100	.038	.107	.030	.109	.029	.119	.057	.127	.050	.128	.048	.40
.50	.088	.040	.099	.029	.103	.026	.107	.058	.118	.048	.121	.044	.50
.60	.075	.039	.087	.028	.091	.023	.091	.055	.103	.044	.108	.039	.60
.70	.060	.034	.070	.025	.074	.020	.074	.048	.083	.038	.088	.034	.70
.80	.044	.025	.049	.019	.052	.016	.053	.035	.059	.029	.062	.026	.80
.90	.024	.013	.026	.011	.027	.010	.029	.018	.031	.016	.032	.016	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Block 3 — airfoil coordinates

x	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	x
	Bo545-28		Bo545-38		Bo545-48		Bo745-28		Bo745-38		Bo745-48		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.015	-.010	.014	-.010	.013	-.009	.016	-.010	.015	-.009	.014	-.008	.01
.03	.028	-.015	.026	-.013	.024	-.011	.030	-.012	.028	-.010	.027	-.009	.03
.05	.037	-.016	.035	-.014	.032	-.011	.042	-.012	.039	-.009	.036	-.007	.05
.07	.045	-.017	.042	-.013	.039	-.010	.051	-.011	.048	-.007	.044	-.004	.07
.10	.055	-.015	.051	-.012	.047	-.008	.063	-.008	.059	-.004	.055	.000	.10
.15	.067	-.011	.063	-.008	.059	-.004	.078	-.000	.075	.003	.070	.007	.15
.20	.075	-.005	.073	-.004	.069	.000	.088	.008	.087	.010	.083	.014	.20
.25	.079	-.001	.080	.001	.077	.003	.095	.017	.096	.017	.093	.019	.25
.30	.082	.007	.084	.004	.083	.006	.099	.025	.102	.022	.101	.024	.30
.40	.080	.018	.088	.011	.089	.009	.100	.038	.108	.031	.109	.029	.40
.50	.074	.025	.084	.015	.088	.011	.094	.045	.104	.035	.108	.031	.50
.60	.064	.028	.076	.017	.080	.012	.083	.047	.094	.035	.099	.031	.60
.70	.053	.027	.062	.017	.067	.013	.069	.042	.078	.033	.082	.029	.70
.80	.039	.021	.045	.015	.048	.012	.051	.032	.057	.027	.060	.024	.80
.90	.022	.011	.024	.009	.025	.008	.029	.018	.031	.016	.031	.015	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

Block 4 — airfoil coordinates

x	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	y_u	y_1	x
	Bo945-28		Bo945-38		Bo945-48		Bo560-28		Bo560-38		Bo560-48		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.017	-.009	.016	-.008	.015	-.007	.014	-.011	.013	-.010	.013	-.010	.01
.03	.033	-.010	.031	-.008	.029	-.006	.026	-.017	.024	-.015	.023	-.013	.03
.05	.046	-.008	.043	-.005	.040	-.003	.035	-.019	.032	-.016	.030	-.014	.05
.07	.057	-.005	.053	-.002	.050	.002	.042	-.020	.039	-.017	.035	-.013	.07
.10	.071	.000	.067	.004	.063	.008	.050	-.020	.047	-.016	.043	-.012	.10
.15	.089	.011	.086	.014	.081	.019	.061	-.017	.058	-.014	.053	-.010	.15
.20	.102	.022	.100	.024	.097	.028	.068	-.012	.066	-.010	.062	-.007	.20
.25	.111	.033	.112	.033	.109	.035	.072	-.006	.073	-.007	.070	-.004	.25
.30	.117	.043	.120	.040	.119	.041	.075	.000	.078	-.002	.076	-.001	.30
.40	.120	.058	.127	.050	.129	.049	.075	.013	.083	.006	.084	.004	.40
.50	.113	.065	.124	.054	.128	.051	.073	.024	.083	.014	.087	.010	.50
.60	.101	.065	.113	.054	.117	.049	.068	.032	.079	.021	.084	.016	.60
.70	.084	.058	.094	.049	.098	.044	.060	.034	.070	.024	.074	.020	.70
.80	.063	.044	.069	.038	.071	.036	.047	.028	.053	.022	.055	.020	.80
.90	.035	.024	.037	.022	.038	.021	.027	.016	.029	.014	.030	.014	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo760-28		Bo760-38		Bo760-48		Ro960-28		Ro960-38		Bo960-48		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.015	-.010	.014	-.010	.014	-.009	.016	-.010	.015	-.009	.014	-.008	.01
.03	.028	-.015	.026	-.013	.025	-.011	.030	-.013	.028	-.011	.026	-.009	.03
.05	.038	-.016	.035	-.013	.033	-.010	.041	-.013	.039	-.010	.036	-.007	.05
.07	.046	-.016	.043	-.012	.040	-.009	.051	-.011	.047	-.008	.044	-.005	.07
.10	.057	-.014	.053	-.010	.049	-.006	.063	-.008	.059	-.004	.055	-.000	.10
.15	.070	-.008	.066	-.005	.062	-.001	.078	.000	.075	.004	.071	.008	.15
.20	.079	-.001	.077	.001	.073	.004	.090	.010	.088	.012	.085	.015	.20
.25	.085	.007	.086	.007	.083	.009	.099	.020	.099	.020	.096	.022	.25
.30	.090	.015	.093	.013	.091	.014	.105	.030	.108	.028	.106	.029	.30
.40	.093	.031	.101	.024	.102	.022	.111	.049	.119	.041	.120	.040	.40
.50	.092	.044	.103	.033	.107	.030	.112	.063	.122	.053	.126	.049	.50
.60	.088	.052	.099	.041	.104	.036	.108	.072	.119	.061	.124	.056	.60
.70	.079	.053	.088	.043	.093	.039	.097	.071	.107	.062	.111	.057	.70
.80	.062	.043	.068	.037	.070	.035	.077	.058	.083	.052	.085	.050	.80
.90	.036	.025	.038	.023	.039	.022	.045	.034	.047	.032	.048	.031	.90
1.00	.000	.000	.000	.000	.000	.000	.000	-.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo530-210		Bo530-310		Bo530-410		Bo730-210		Bo730-310		Bo730-410		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.019	-.012	.018	-.011	.017	-.010	.020	-.011	.019	-.010	.018	-.009	.01
.03	.036	-.017	.034	-.015	.031	-.012	.040	-.013	.037	-.011	.035	-.009	.03
.05	.049	-.018	.045	-.015	.042	-.011	.055	-.012	.051	-.009	.048	-.005	.05
.07	.059	-.018	.055	-.014	.051	-.009	.067	-.010	.063	-.005	.059	-.001	.07
.10	.072	-.016	.067	-.011	.062	-.006	.083	-.005	.078	-.000	.073	.005	.10
.15	.086	-.011	.082	-.007	.077	-.002	.101	.004	.097	.008	.092	.013	.15
.20	.094	-.006	.092	-.003	.088	.001	.112	.012	.110	.014	.105	.019	.20
.25	.098	-.000	.098	-.001	.095	.003	.117	.019	.118	.019	.114	.022	.25
.30	.096	.004	.100	.000	.098	.002	.116	.024	.120	.020	.118	.022	.30
.40	.088	.010	.097	.001	.099	-.001	.107	.030	.117	.020	.119	.019	.40
.50	.076	.016	.089	.002	.094	-.002	.094	.034	.108	.021	.112	.016	.50
.60	.063	.019	.077	.004	.083	-.002	.079	.035	.094	.021	.100	.015	.60
.70	.050	.018	.062	.005	.067	.000	.063	.031	.075	.019	.081	.014	.70
.80	.036	.013	.043	.006	.047	.002	.046	.023	.053	.015	.057	.012	.80
.90	.020	.007	.022	.004	.024	.003	.025	.012	.028	.009	.029	.008	.90
1.00	.000	.000	.000	.000	.000	.000	.000	-.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo930-210		Bo930-310		Bo930-410		Bo545-210		Bo545-310		Bo545-410		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.021	-.010	.020	-.009	.020	-.008	.018	-.013	.017	-.012	.016	-.012	.01
.03	.044	-.009	.041	-.007	.039	-.005	.033	-.020	.030	-.018	.028	-.015	.03
.05	.061	-.006	.057	-.002	.054	.001	.044	-.023	.040	-.019	.037	-.016	.05
.07	.076	-.002	.071	.003	.067	.007	.053	-.024	.049	-.020	.044	-.016	.07
.10	.094	.006	.089	.011	.084	.016	.064	-.024	.059	-.019	.054	-.014	.10
.15	.116	.019	.112	.023	.107	.028	.076	-.021	.072	-.017	.067	-.011	.15
.20	.130	.030	.128	.032	.123	.037	.085	-.015	.082	-.013	.078	-.009	.20
.25	.136	.039	.137	.038	.134	.041	.089	-.009	.090	-.009	.086	-.006	.25
.30	.136	.044	.140	.040	.138	.042	.091	-.002	.094	-.006	.093	-.004	.30
.40	.127	.050	.136	.040	.138	.038	.088	.011	.098	.001	.099	-.001	.40
.50	.113	.053	.126	.039	.131	.035	.080	.020	.093	.006	.098	.001	.50
.60	.096	.051	.110	.037	.116	.031	.068	.024	.083	.010	.089	.004	.60
.70	.077	.045	.089	.032	.094	.027	.056	.024	.068	.011	.073	.006	.70
.80	.055	.033	.063	.025	.066	.022	.041	.018	.049	.011	.052	.007	.80
.90	.031	.017	.033	.015	.034	.013	.023	.010	.026	.007	.027	.006	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo745-210		Bo745-310		Bo745-410		Bo945-210		Bo945-310		Bo945-410		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.019	-.012	.018	-.012	.017	-.011	.019	-.012	.019	-.011	.018	-.010	.01
.03	.036	-.018	.033	-.015	.031	-.013	.038	-.015	.036	-.012	.033	-.010	.03
.05	.048	-.019	.045	-.015	.041	-.012	.052	-.015	.049	-.011	.045	-.008	.05
.07	.059	-.019	.054	-.014	.050	-.010	.064	-.013	.060	-.008	.056	-.004	.07
.10	.072	-.016	.067	-.011	.062	-.006	.079	-.008	.075	-.004	.070	.001	.10
.15	.088	-.010	.083	-.006	.078	-.000	.099	.001	.095	.005	.089	.011	.15
.20	.098	-.002	.096	.001	.091	.005	.112	.012	.110	.014	.105	.019	.20
.25	.105	.007	.106	.007	.102	.010	.121	.023	.122	.023	.118	.026	.25
.30	.109	.016	.112	.012	.110	.014	.126	.034	.130	.030	.128	.032	.30
.40	.108	.031	.117	.021	.119	.019	.128	.050	.137	.041	.139	.039	.40
.50	.099	.039	.113	.026	.118	.021	.119	.059	.133	.046	.137	.041	.50
.60	.087	.043	.101	.028	.107	.022	.105	.061	.120	.047	.126	.041	.60
.70	.072	.039	.084	.027	.089	.022	.087	.055	.100	.043	.105	.038	.70
.80	.053	.030	.060	.023	.064	.019	.065	.042	.072	.035	.076	.031	.80
.90	.030	.016	.032	.014	.034	.013	.036	.023	.039	.021	.040	.019	.90
1.00	.000	.000	.000	.000	.000	.000	.000	-.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo560-210		Bo560-310		Bo560-410		Bo760-210		Bo760-310		Bo760-410		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.017	-.014	.016	-.013	.015	-.012	.018	-.013	.017	-.012	.016	-.011	.01
.03	.031	-.022	.029	-.019	.027	-.017	.033	-.020	.031	-.017	.029	-.015	.03
.05	.042	-.026	.038	-.022	.035	-.019	.045	-.022	.041	-.019	.038	-.015	.05
.07	.050	-.028	.045	-.023	.041	-.019	.054	-.023	.050	-.019	.045	-.015	.07
.10	.059	-.029	.054	-.024	.049	-.019	.065	-.023	.060	-.018	.056	-.013	.10
.15	.071	-.027	.066	-.023	.061	-.017	.079	-.018	.075	-.014	.070	-.009	.15
.20	.078	-.022	.076	-.020	.071	-.015	.089	-.011	.087	-.009	.082	-.004	.20
.25	.082	-.016	.082	-.016	.079	-.013	.095	-.003	.096	-.003	.092	.000	.25
.30	.084	-.009	.088	-.013	.086	-.011	.099	.006	.103	.003	.101	.004	.30
.40	.083	.006	.093	-.004	.094	-.006	.101	.024	.110	.014	.112	.012	.40
.50	.079	.019	.092	.005	.097	.000	.098	.038	.112	.025	.116	.020	.50
.60	.072	.028	.087	.013	.093	.007	.092	.048	.107	.033	.113	.027	.60
.70	.063	.031	.075	.019	.080	.013	.082	.050	.094	.037	.099	.032	.70
.80	.049	.026	.056	.019	.060	.015	.064	.041	.071	.034	.075	.030	.80
.90	.029	.015	.031	.013	.032	.011	.037	.024	.040	.021	.041	.020	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo960-210		Bo960-310		Bo960-410		Bo000-26		Bo000-36		Bo000-46		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.019	-.013	.018	-.012	.017	-.011	.010	-.010	.009	-.009	.009	-.009	.01
.03	.035	-.018	.033	-.015	.031	-.013	.016	-.016	.015	-.015	.014	-.014	.03
.05	.048	-.019	.044	-.016	.041	-.012	.021	-.021	.019	-.019	.017	-.017	.05
.07	.058	-.019	.054	-.014	.050	-.010	.023	-.023	.021	-.021	.019	-.019	.07
.10	.071	-.016	.067	-.012	.062	-.007	.027	-.027	.024	-.024	.021	-.021	.10
.15	.088	-.009	.084	-.005	.079	.000	.029	-.029	.027	-.027	.024	-.024	.15
.20	.100	.000	.098	.002	.093	.007	.030	-.030	.029	-.029	.026	-.026	.20
.25	.108	.010	.109	.010	.105	.013	.029	-.029	.030	-.030	.028	-.028	.25
.30	.114	.021	.118	.017	.116	.019	.028	-.028	.030	-.030	.029	-.029	.30
.40	.119	.041	.128	.032	.130	.030	.024	-.024	.029	-.029	.030	-.030	.40
.50	.117	.058	.131	.044	.136	.039	.019	-.019	.026	-.026	.029	-.029	.50
.60	.112	.068	.127	.053	.133	.047	.014	-.014	.022	-.022	.026	-.026	.60
.70	.100	.068	.113	.056	.118	.051	.010	-.010	.017	-.017	.020	-.020	.70
.80	.079	.056	.086	.049	.090	.045	.007	-.007	.011	-.011	.013	-.013	.80
.90	.046	.033	.049	.030	.050	.029	.004	-.004	.006	-.006	.006	-.006	.90
1.00	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.00

x	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	y_u	y_l	x
	Bo000-28		Bo000-38		Bo000-48		Bo000-210		Bo000-310		Bo000-410		
.00	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.000	-.000	.00
.01	.013	-.013	.012	-.012	.011	-.011	.016	-.016	.015	-.015	.014	-.014	.01
.03	.021	-.021	.019	-.019	.018	-.018	.027	-.027	.024	-.024	.022	-.022	.03
.05	.027	-.027	.024	-.024	.022	-.022	.034	-.034	.030	-.030	.027	-.027	.05
.07	.031	-.031	.028	-.028	.024	-.024	.039	-.039	.034	-.034	.030	-.030	.07
.10	.035	-.035	.031	-.031	.028	-.028	.044	-.044	.039	-.039	.034	-.034	.10
.15	.039	-.039	.036	-.036	.031	-.031	.049	-.049	.045	-.045	.039	-.039	.15
.20	.040	-.040	.038	-.038	.035	-.035	.050	-.050	.048	-.048	.043	-.043	.20
.25	.039	-.039	.040	-.040	.037	-.037	.049	-.049	.049	-.049	.046	-.046	.25
.30	.037	-.037	.040	-.040	.039	-.039	.046	-.046	.050	-.050	.048	-.048	.30
.40	.031	-.031	.039	-.039	.040	-.040	.039	-.039	.048	-.048	.050	-.050	.40
.50	.024	-.024	.035	-.035	.039	-.039	.030	-.030	.044	-.044	.048	-.048	.50
.60	.018	-.018	.029	-.029	.034	-.034	.022	-.022	.037	-.037	.043	-.043	.60
.70	.013	-.013	.023	-.023	.027	-.027	.016	-.016	.028	-.028	.034	-.034	.70
.80	.009	-.009	.015	-.015	.018	-.018	.011	-.011	.019	-.019	.022	-.022	.80
.90	.005	-.005	.007	-.007	.008	-.008	.007	-.007	.009	-.009	.010	-.010	.90
1.00	.000	.000	.000	.000	.000	.000	.000	-.000	.000	-.000	.000	.000	1.00