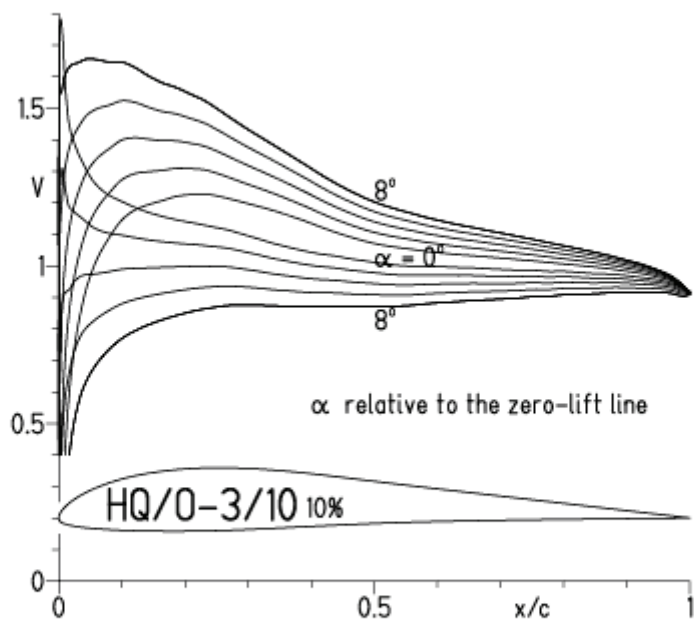


# HQ/OLDY-3/10, N=9

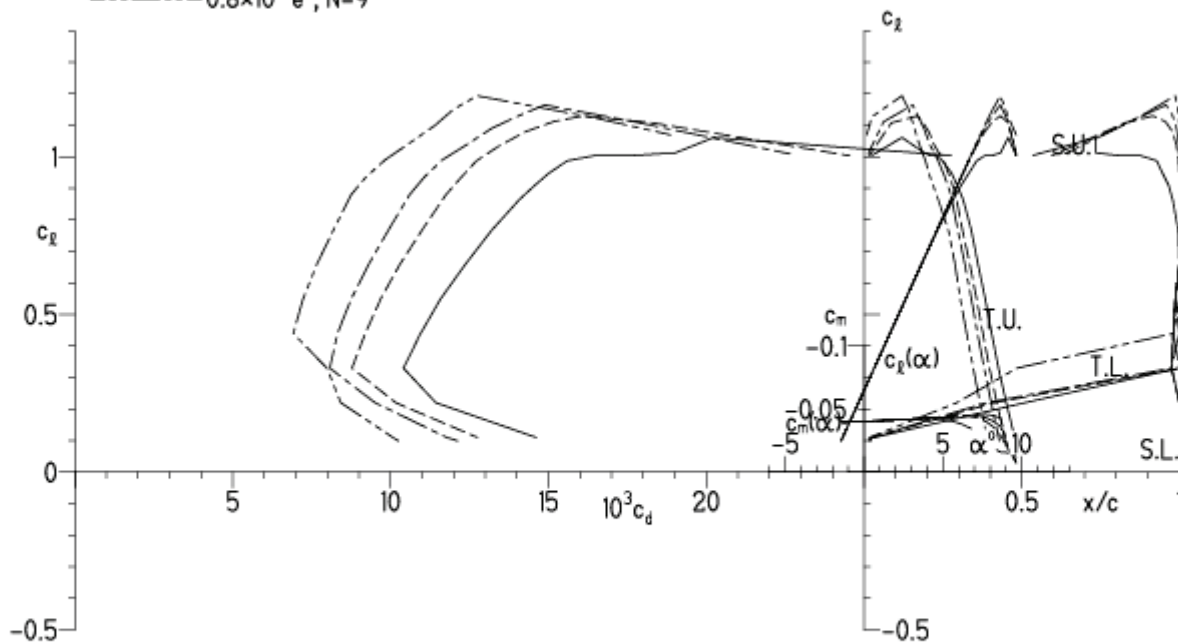
EPPLER 2005 V. 8.5.07 RUN 7.6.12 12:19



EPPLER 2005 V. 8.5.07 R

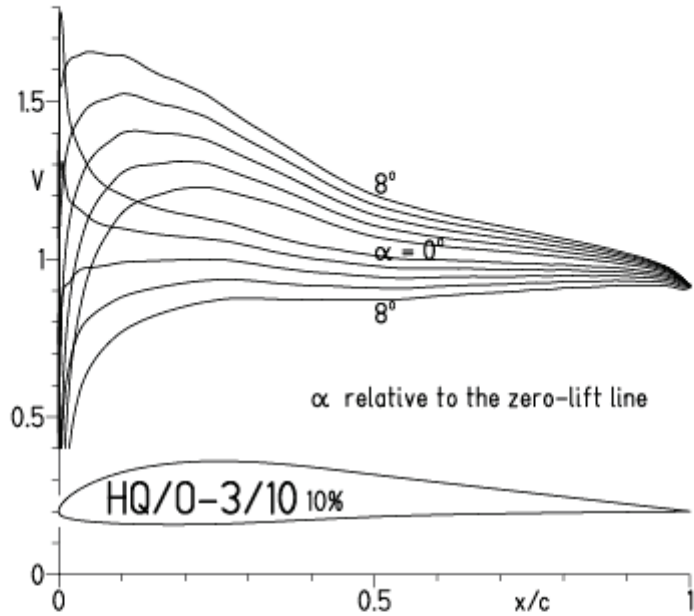
## HQ/O-3/10 10%

- $Re = 0.2 \times 10^6 e^N, N=9$
- - -  $0.3 \times 10^6 e^N, N=9$
- · -  $0.4 \times 10^6 e^N, N=9$
- · - ·  $0.8 \times 10^6 e^N, N=9$



HQ/OLDY-3/10, N=9, Turbulatoreffekt bei niedrigen Re-Zahlen  
 (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)

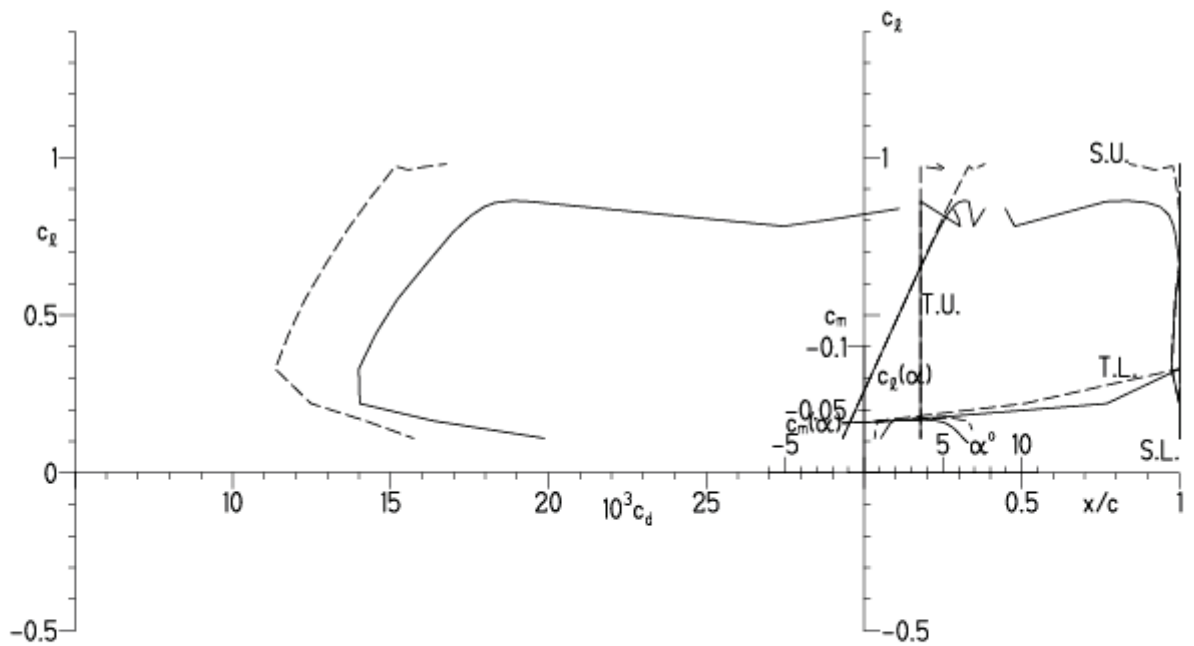
EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:13



EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:13

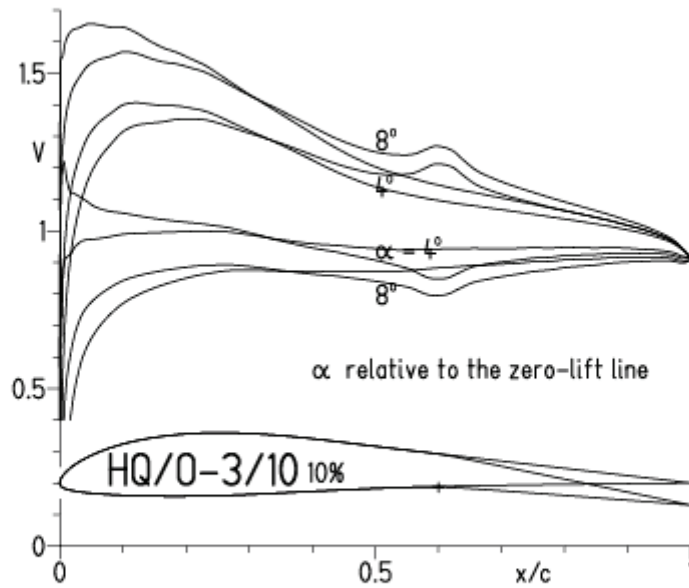
HQ/O-3/10 10%

- $Re = 0.1 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9
- - -  $0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9

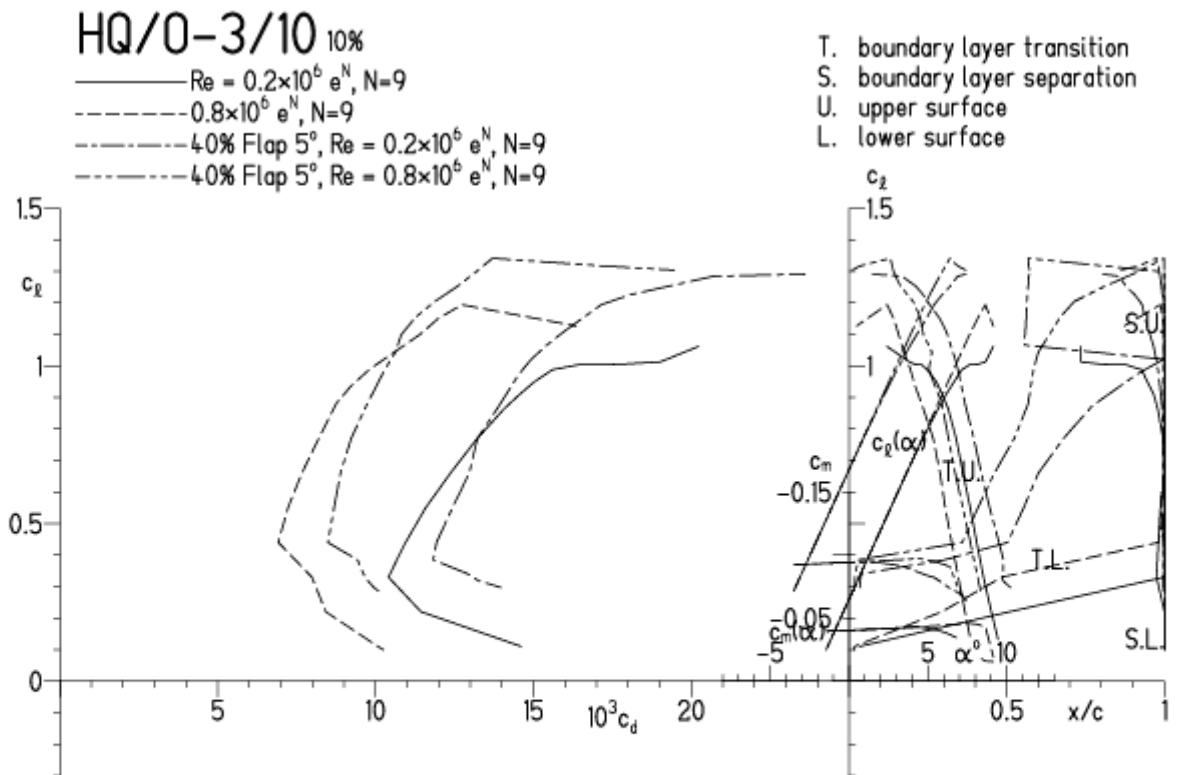


HQ/OLDY-3/10, N=9, mit 5° Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:36

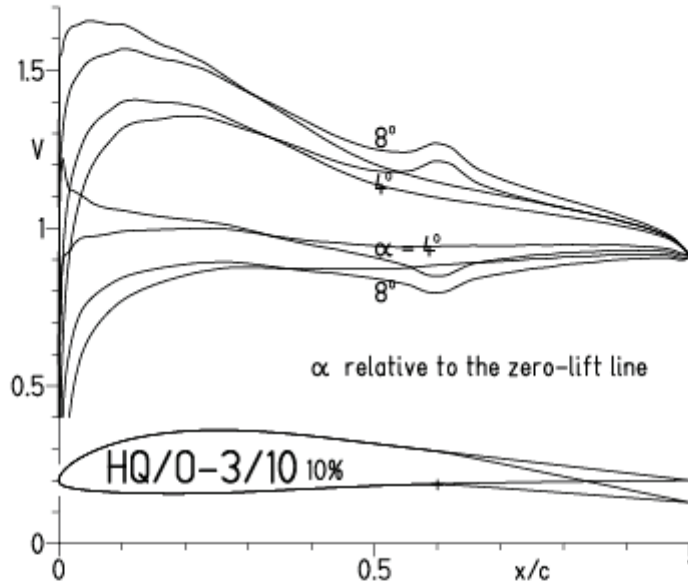


EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:36

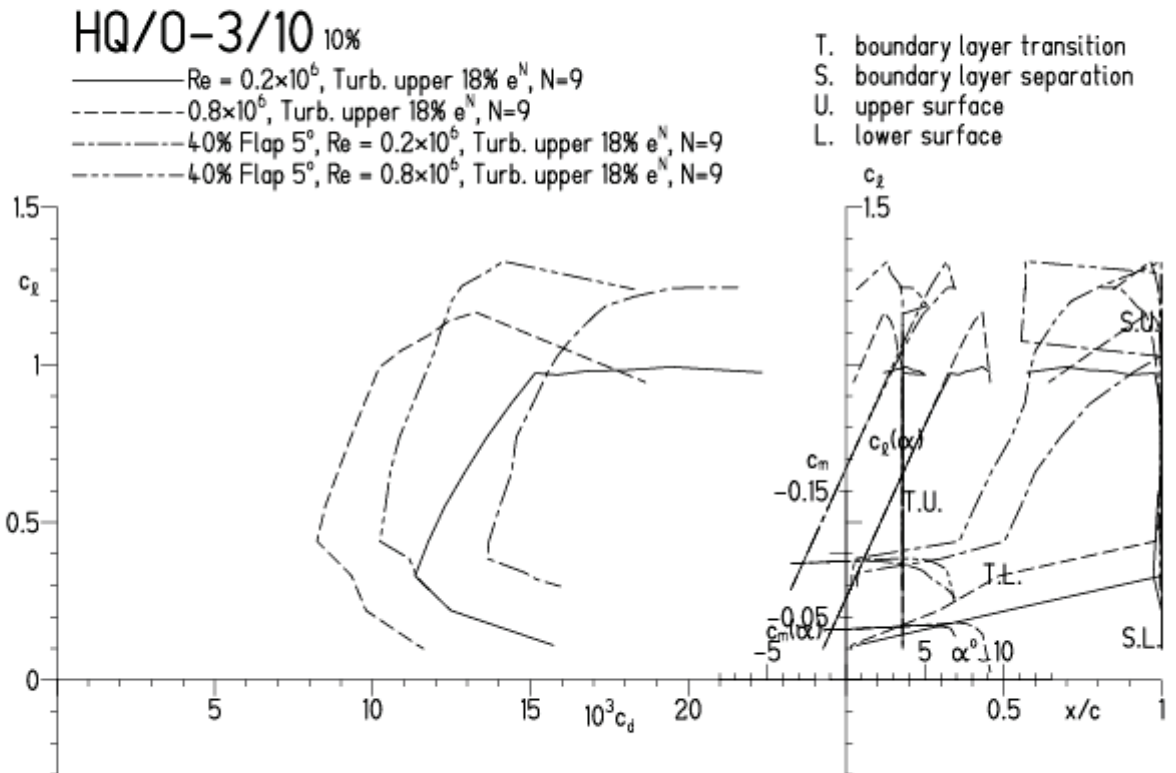


**HQ/OLDY-3/10, N=9, mit 5° Wölbklappenausschlag,  $l_k = 0,4 \cdot l$ , Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)**

EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:31

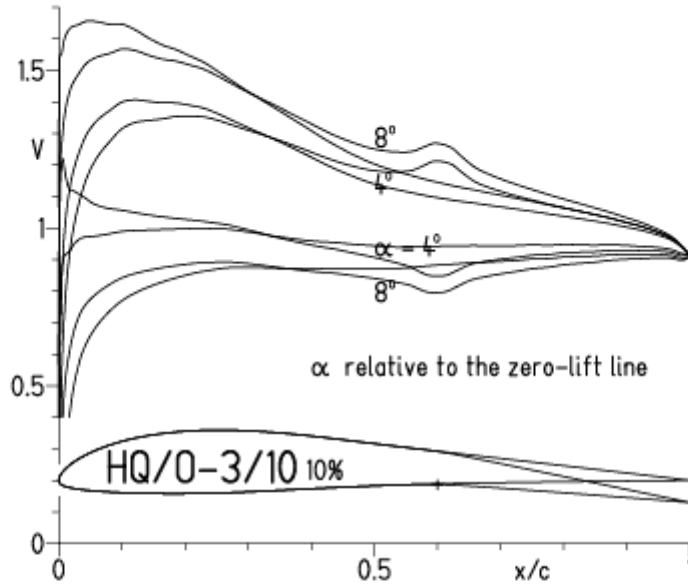


EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:31



**HQ/OLDY-3/10, N=7, mit 5° Wölbklappenausschlag, niedrige Re-Zahlen,  $l_k = 0,4 \cdot l$ ,  
Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)**

EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:51

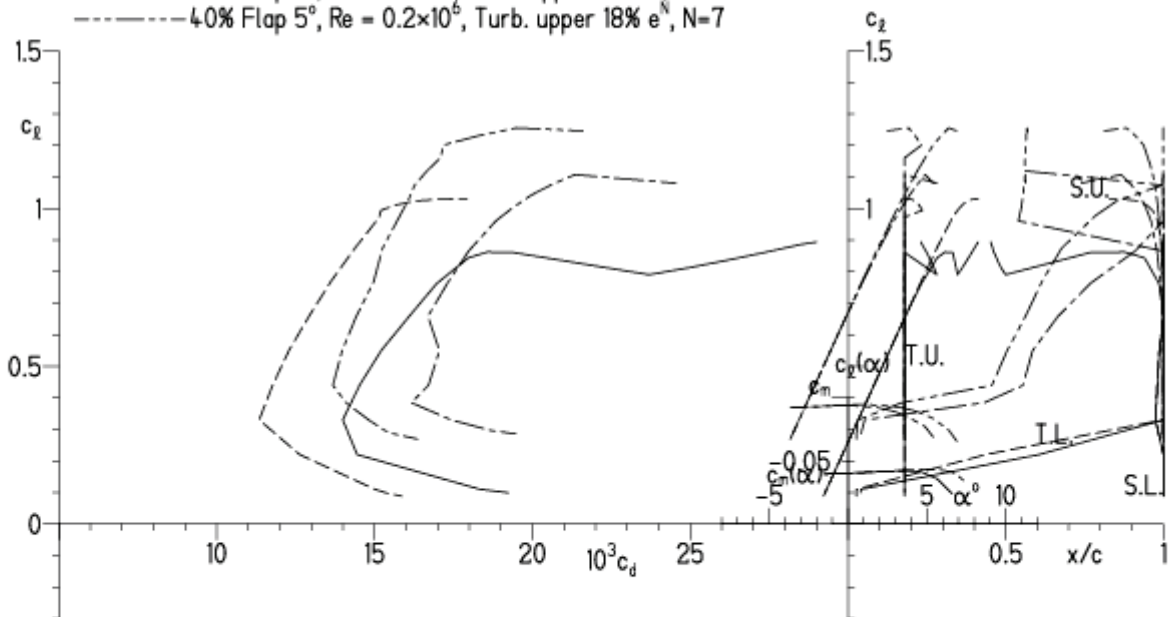


EPPLER 2005 V. 8.5.07 RUN 18.5.12 12:51

**HQ/O-3/10 10%**

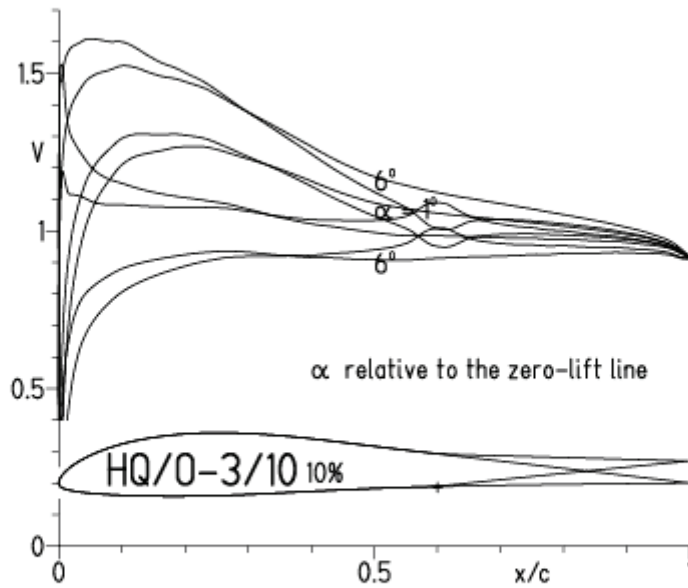
- $Re = 0.1 \times 10^6$ , Turb. upper 18%  $e^N$ , N=7
- - -  $0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=7
- · -  $40\%$  Flap  $5^\circ$ ,  $Re = 0.1 \times 10^6$ , Turb. upper 18%  $e^N$ , N=7
- · -  $40\%$  Flap  $5^\circ$ ,  $Re = 0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=7

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface

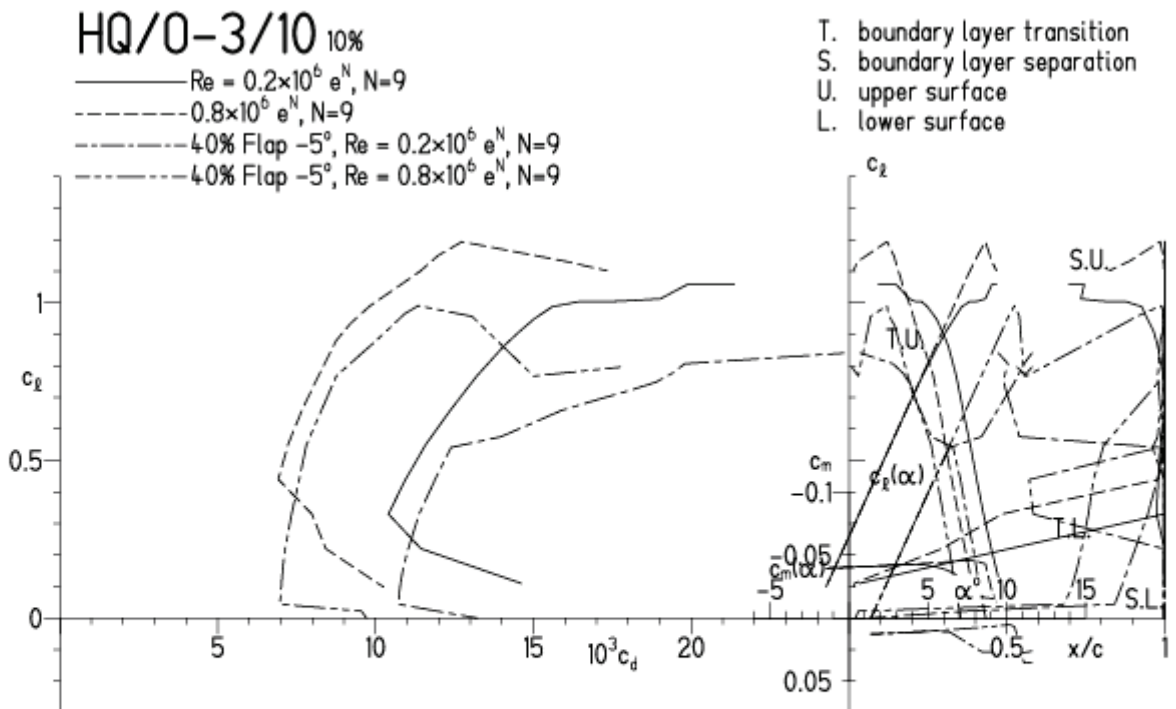


HQ/OLDY-3/10, N=9, mit  $-5^\circ$  Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 v. 8.5.07 RUN 18.5.12 13:11



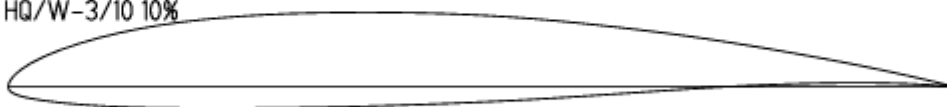
EPPLER 2005 v. 8.5.07 RUN 18.5.12 13:11



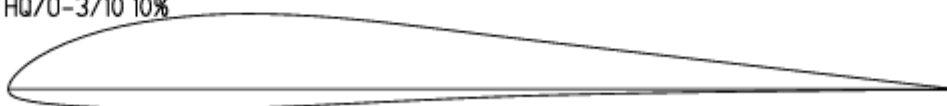
# HQ/OLDY-3/10 vs HQ/W-3/10, N=9

EPPLER 2005 V. 8.5.07 RUN 18.5.12 18:34

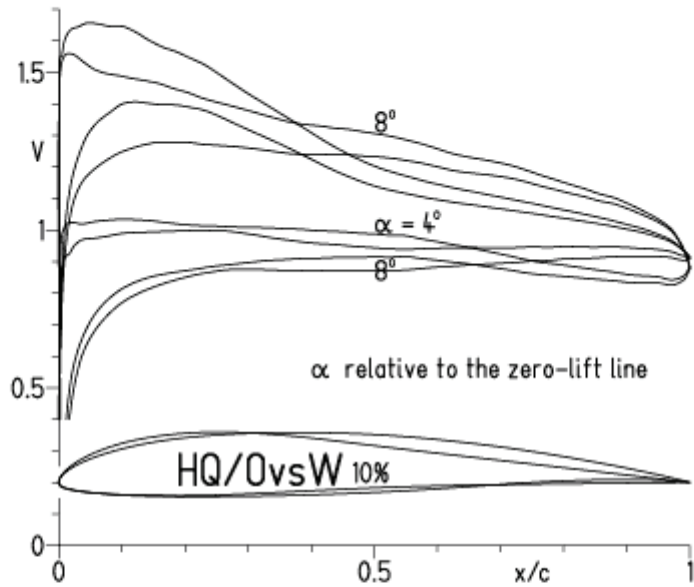
HQ/W-3/10 10%



HQ/O-3/10 10%



EPPLER 2005 V. 8.5.07 RUN 18.5.12 18:34

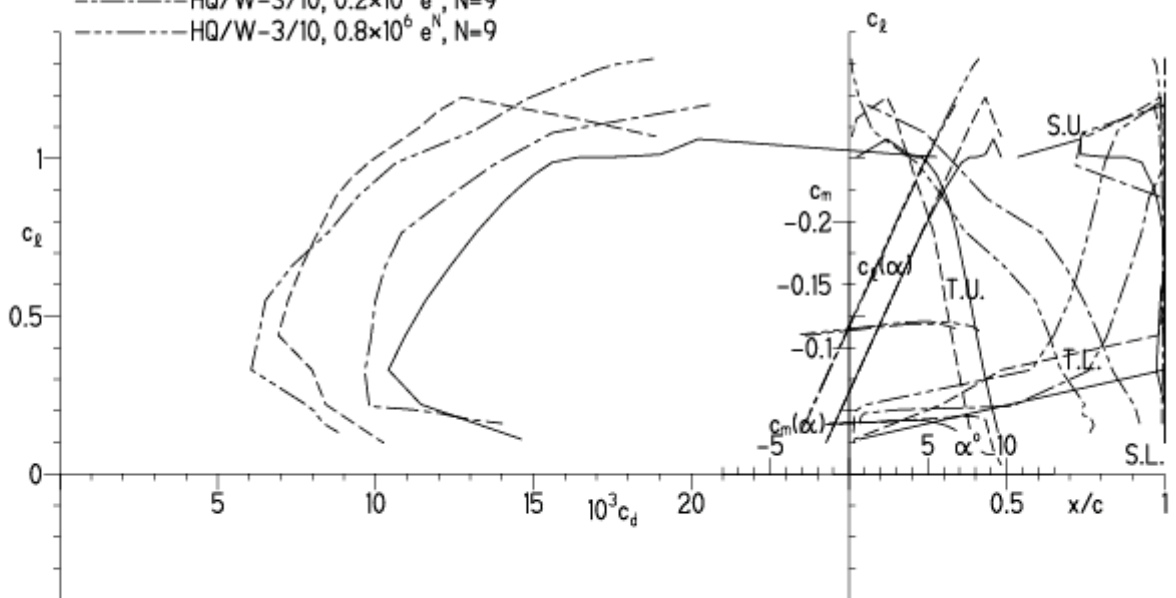


EPPLER 2005 V. 8.5.07 RUN 18.5.12 18:34

### HQ/O-HQ/W-Vergleich 10% ,10%

- HQ/O-3/10,  $Re = 0.2 \times 10^6 e^N$ ,  $N=9$
- - - HQ/O-3/10,  $0.8 \times 10^6 e^N$ ,  $N=9$
- · - HQ/W-3/10,  $0.2 \times 10^6 e^N$ ,  $N=9$
- · - HQ/W-3/10,  $0.8 \times 10^6 e^N$ ,  $N=9$

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface

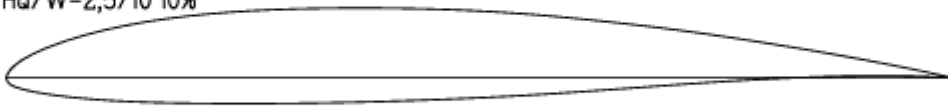




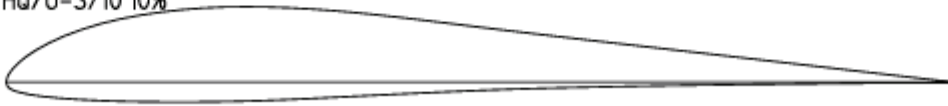
# HQ/OLDY-3/10 vs HQ/W-2,5/10, N=9

EPPLER 2005 v. 8.5.07 RUN 18.5.12 18:4

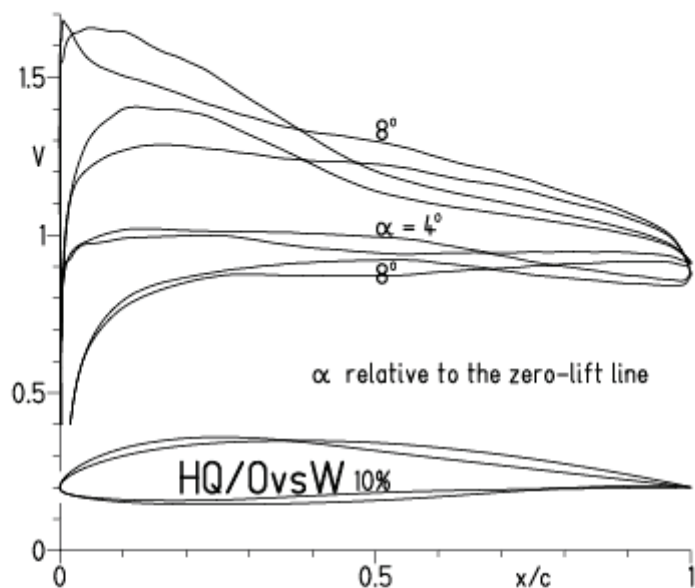
HQ/W-2,5/10 10%



HQ/O-3/10 10%



EPPLER 2005 V. 8.5.07 RUN 18.5.12 18:43

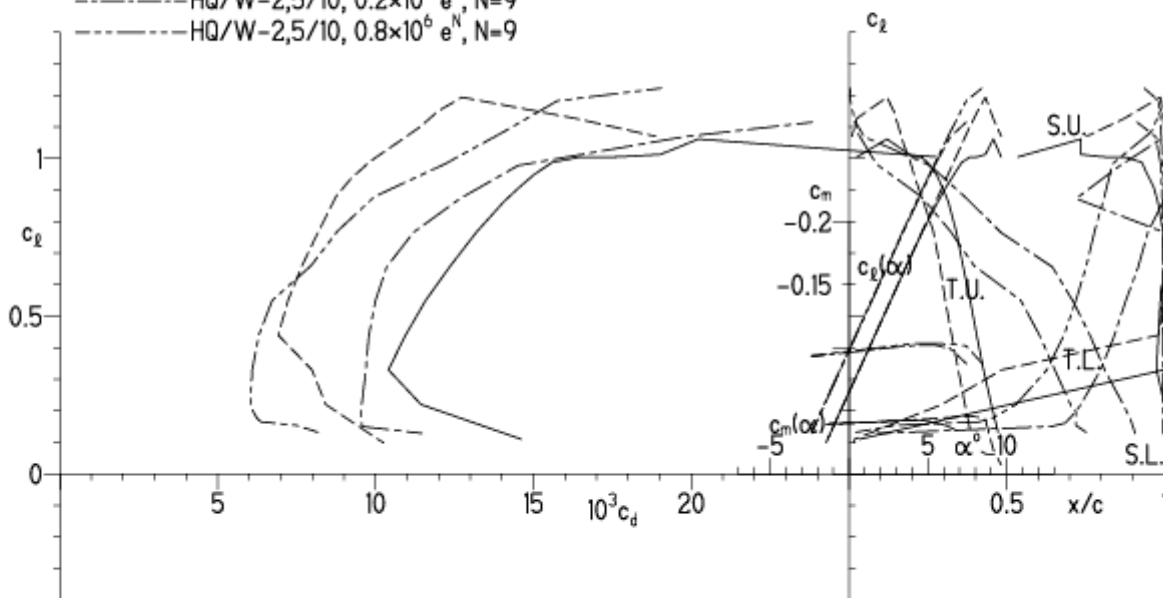


EPPLER 2005 V. 8.5.07 RU

### HQ/O-HQ/W-Vergleich 10% ,10%

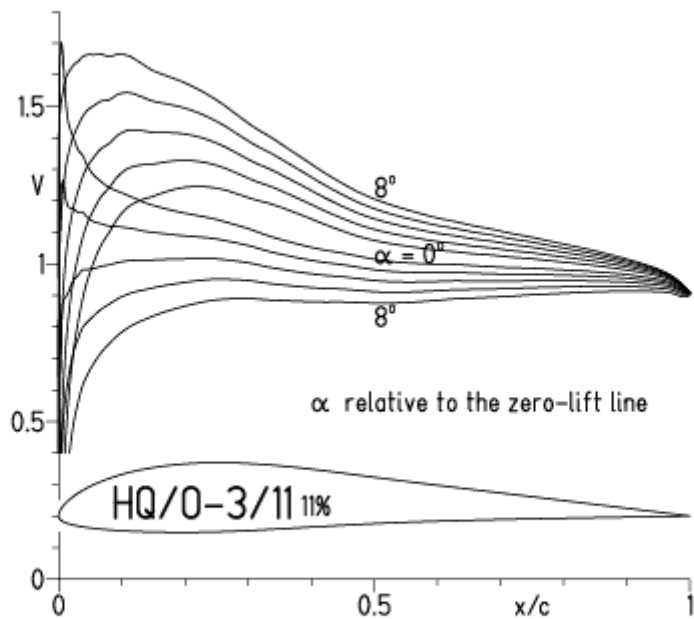
- HQ/O-3/10,  $Re = 0.2 \times 10^6$   $e^N$ ,  $N=9$
- - - HQ/O-3/10,  $0.8 \times 10^6$   $e^N$ ,  $N=9$
- · - HQ/W-2,5/10,  $0.2 \times 10^6$   $e^N$ ,  $N=9$
- · - HQ/W-2,5/10,  $0.8 \times 10^6$   $e^N$ ,  $N=9$

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface



HQ/OLDY-3/11, N=9

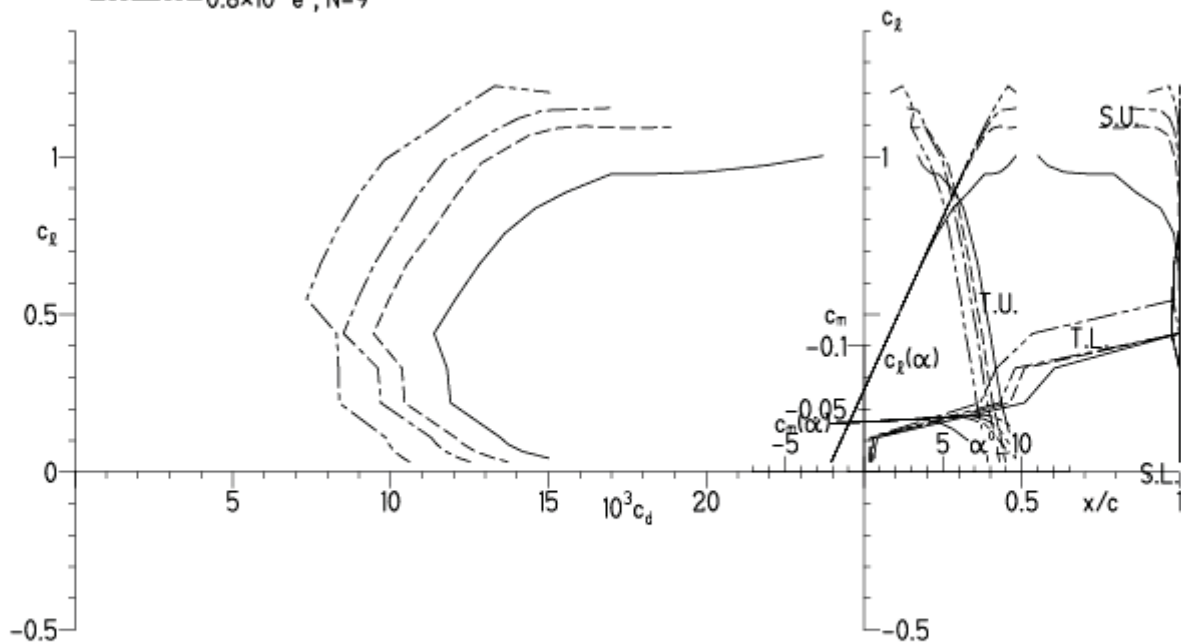
EPPLER 2005 V. 8.5.07 RUN 7.6.12 12:25



EPPLER 2005 V. 8.5.

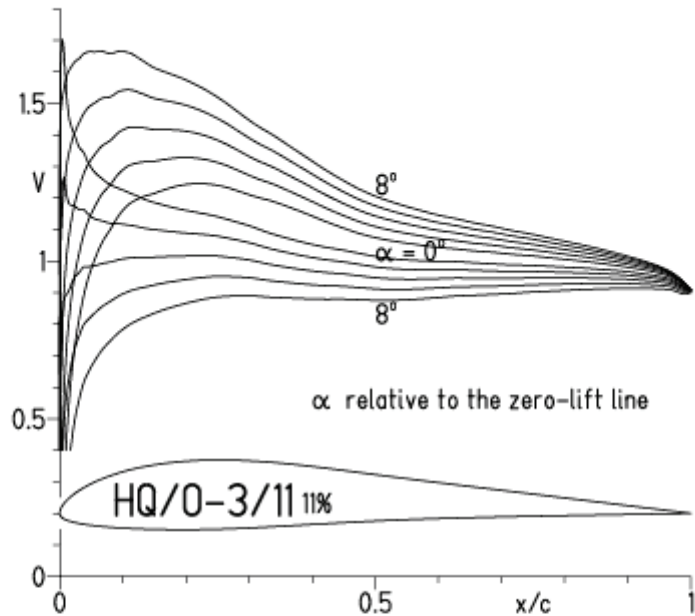
HQ/O-3/11 11%

- $Re = 0.2 \times 10^6 e^N, N=9$
- - -  $0.3 \times 10^6 e^N, N=9$
- · -  $0.4 \times 10^6 e^N, N=9$
- · - ·  $0.8 \times 10^6 e^N, N=9$



HQ/OLDY-3/11, N=9, Turbulatoreffekt bei niedrigen Re-Zahlen  
 (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)

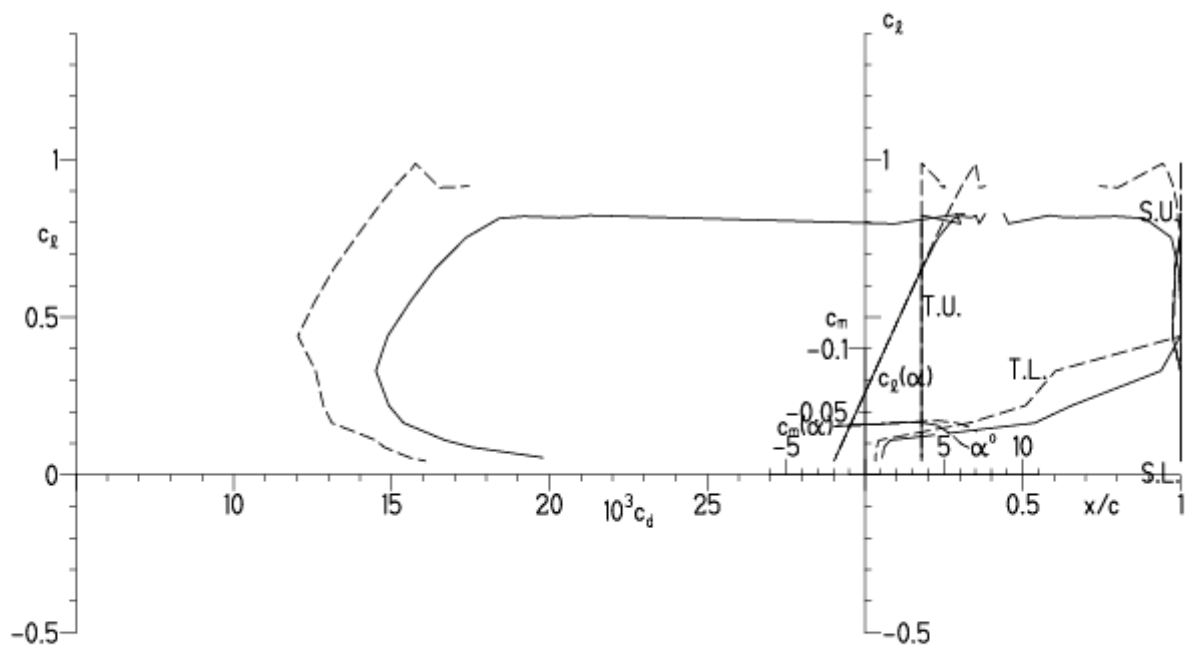
EPPLER 2005 V. 8.5.07 RUN 19.5.12 11:40



EPPLER 2005 V. 8.5.07 RUN 19.5.12 11:40

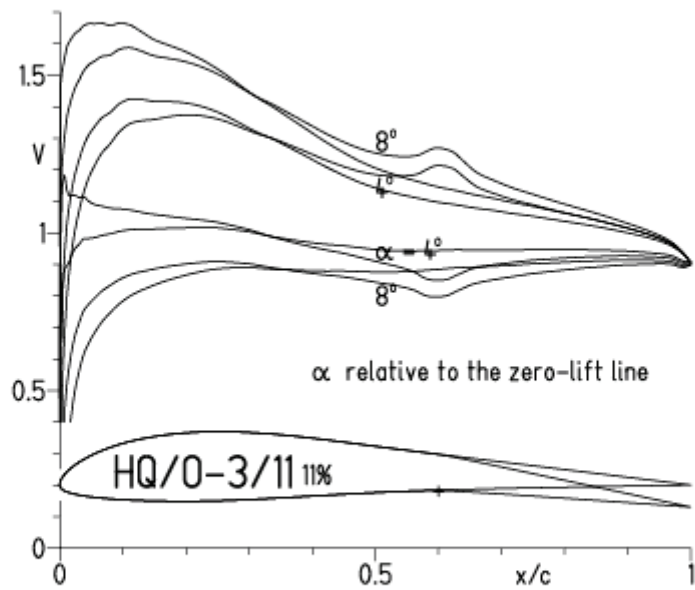
HQ/O-3/11 11%

- $Re = 0.1 \times 10^6$ , Turb. upper 18%  $e^N$ ,  $N=9$
- - -  $0.2 \times 10^6$ , Turb. upper 18%  $e^N$ ,  $N=9$

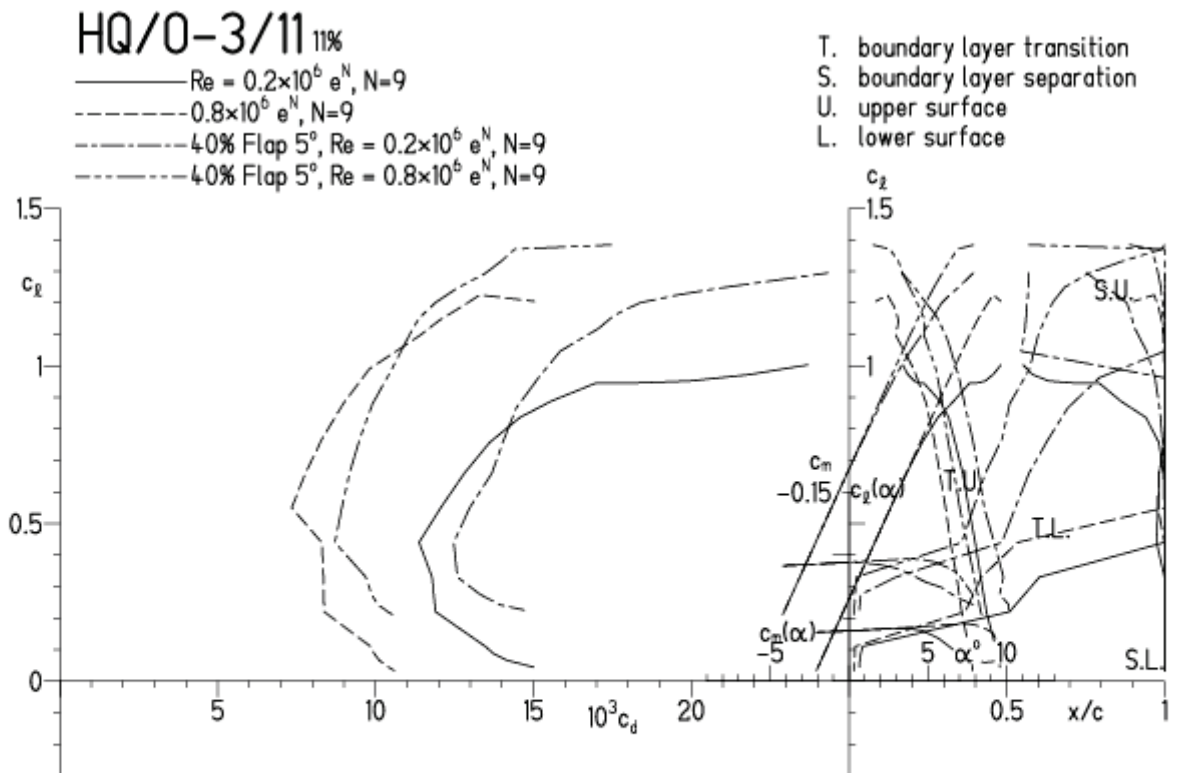


HQ/OLDY-3/11, N=9, mit 5° Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 V. 8.5.07 RUN 7.6.12 12:28

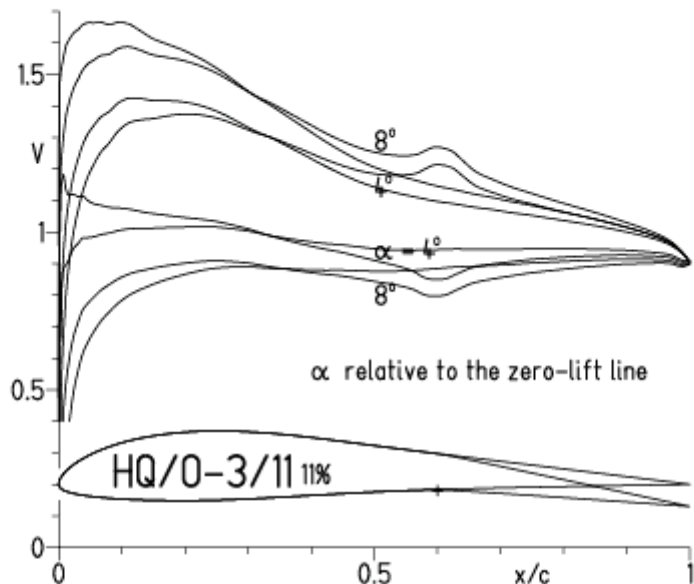


EPPLER 2005 V. 8.5.07 RUN 7.6.12 12:28



HQ/OLDY-2,5/11, N=9, mit 5° Wölbklappenausschlag,  $l_k = 0,4 \cdot l$ , Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)

EPPLER 2005 V. 8.5.07 RUN 19.5.12 13:10

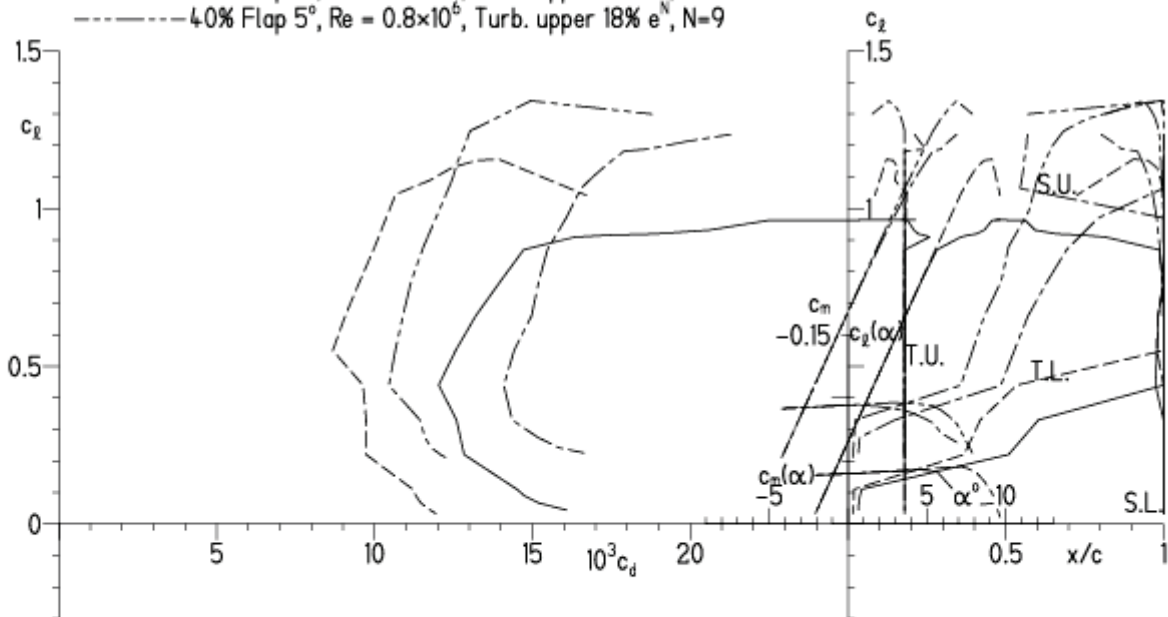


EPPLER 2005 V. 8.5.07 RUN 19.5.12 13:10

HQ/O-3/11 11%

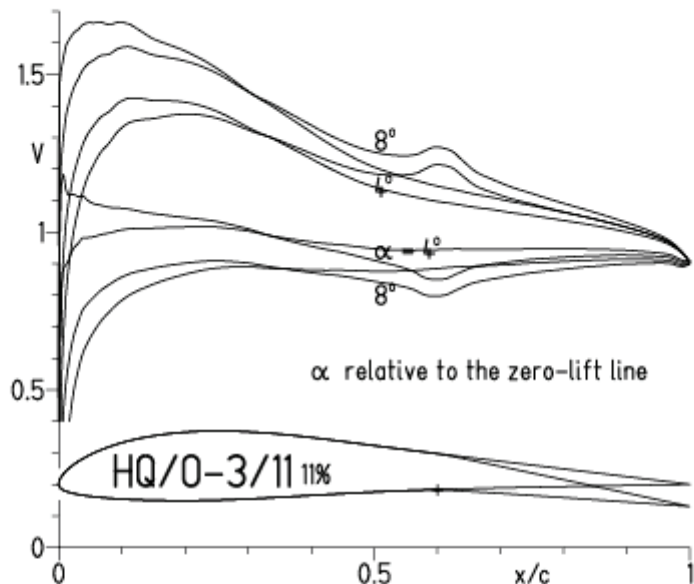
- $Re = 0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9
- - -  $0.8 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9
- · -  $40\%$  Flap  $5^\circ$ ,  $Re = 0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9
- · -  $40\%$  Flap  $5^\circ$ ,  $Re = 0.8 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface



**HQ/OLDY-3/11, N=7, mit 5° Wölbklappenausschlag, niedrige Re-Zahlen,  $l_k = 0,4 \cdot l$ ,  
Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)**

EPPLER 2005 V. 8.5.07 RUN 19.5.12 13:27

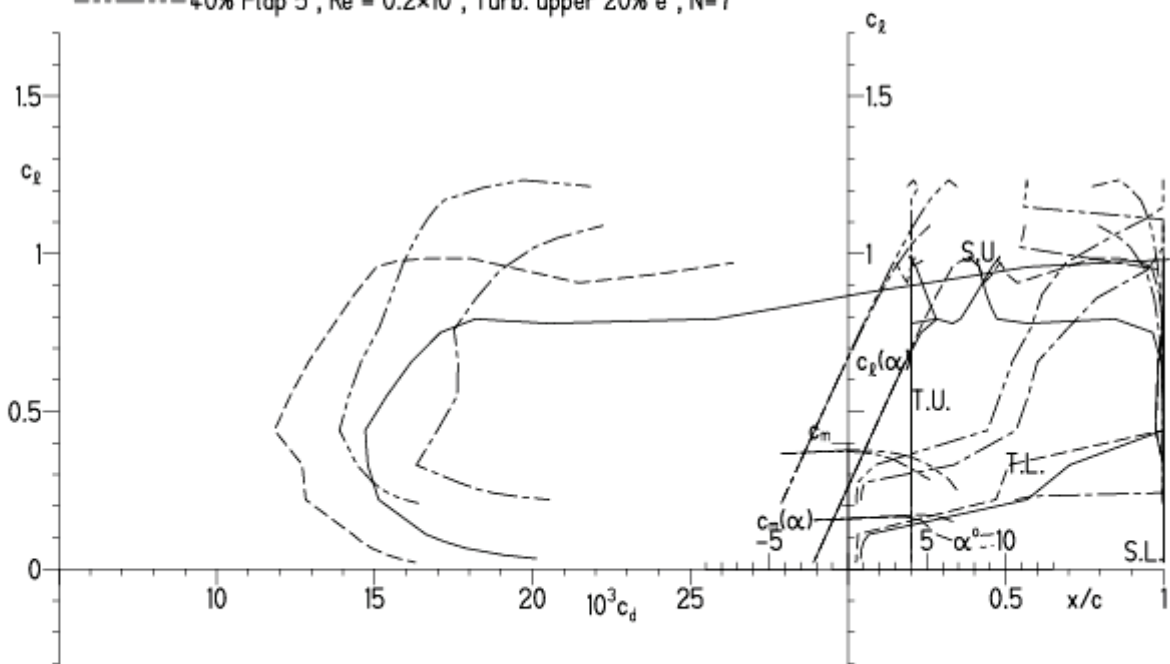


EPPLER 2005 V

**HQ/O-3/11 11%**

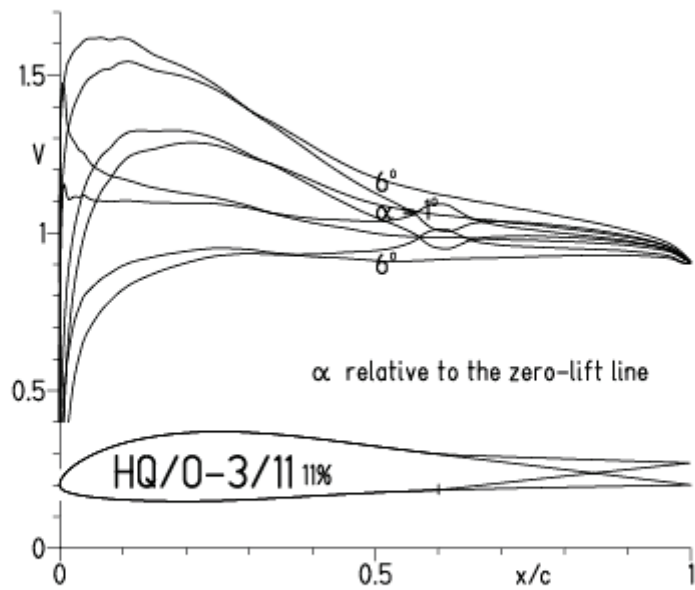
- $Re = 0.1 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- - -  $0.2 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- · - · 40% Flap 5°,  $Re = 0.1 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- · - · 40% Flap 5°,  $Re = 0.2 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface

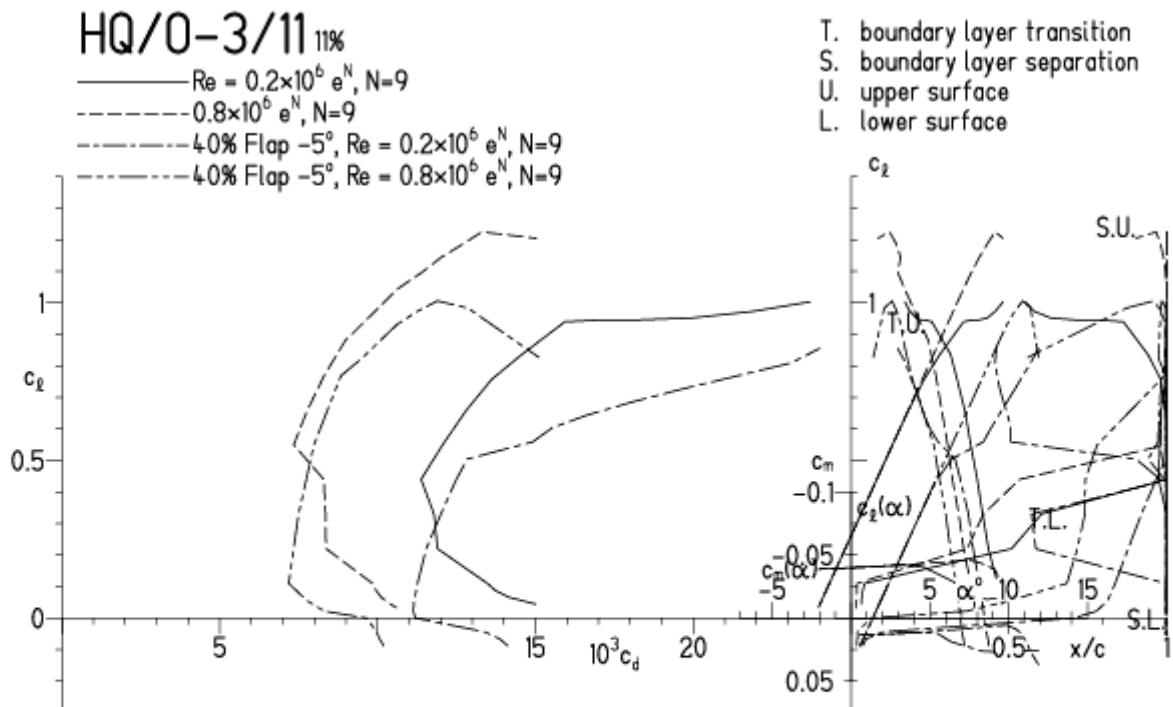


HQ/OLDY-3/11, N=9, mit  $-5^\circ$  Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 v. 8.5.07 RUN 19.5.12 16:14



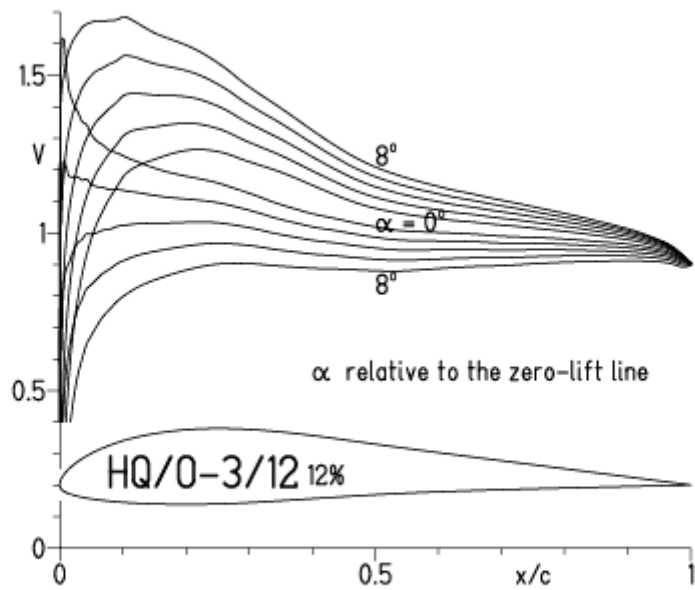
EPPLER 2005 v. 8.5.07 RUN 19.5.12 16:14





# HQ/OLDY-3/12, N=9

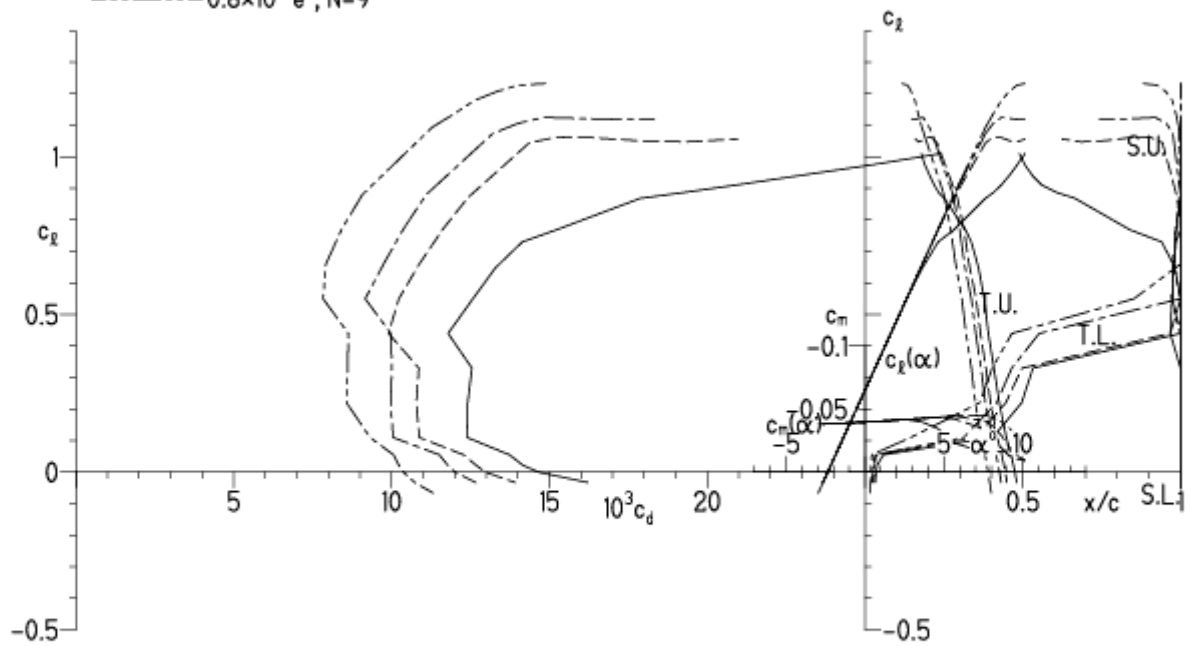
EPPLER 2005 V. 8.5.07 RUN 8.6.12 16:33



EPPLER 2005 V. 8.5.07 RUN 8.6.12 16:33

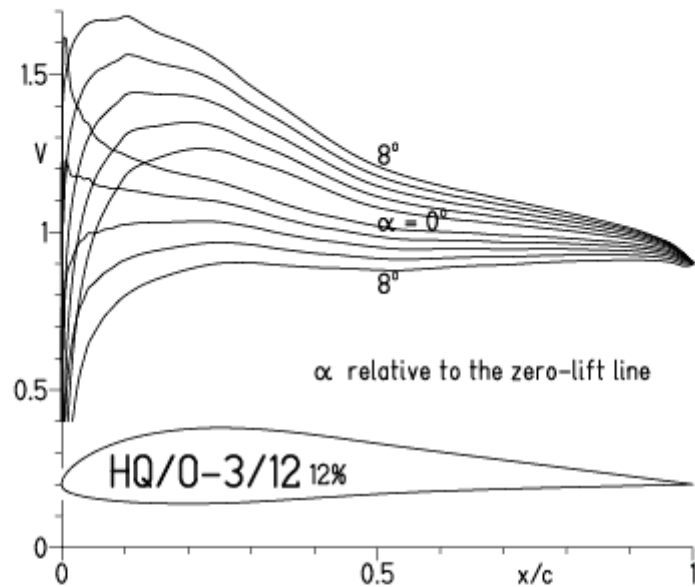
## HQ/O-3/12 12%

- $Re = 0.2 \times 10^6 e^N, N=9$
- - -  $0.3 \times 10^6 e^N, N=9$
- · -  $0.4 \times 10^6 e^N, N=9$
- - -  $0.8 \times 10^6 e^N, N=9$



HQ/OLDY-3/12, N=9, Turbulatoreffekt bei niedrigen Re-Zahlen  
(optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)

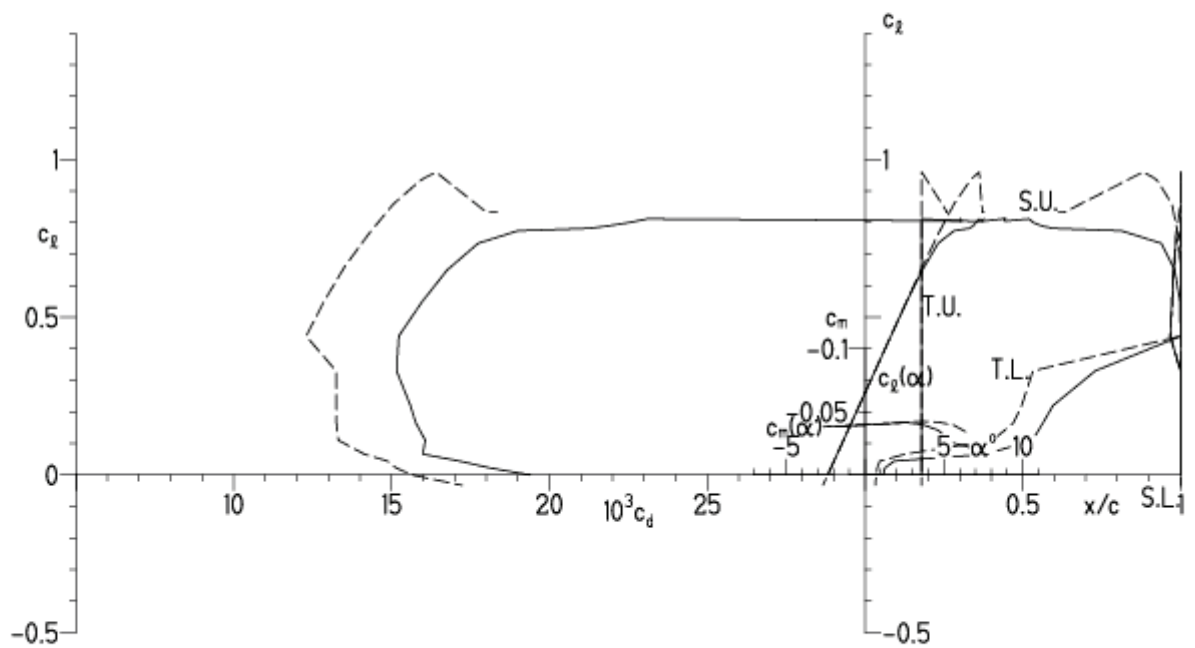
EPPLER 2005 V. 8.5.07 RUN 20.5.12 13:10



EPPLER 2005 V. 8.5.07 RUN 20.5.12 13:10

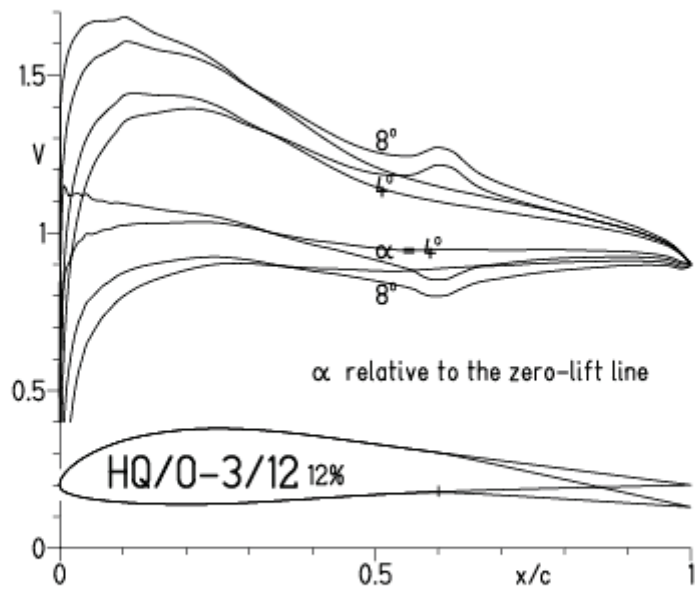
HQ/O-3/12 12%

—  $Re = 0.1 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9  
- - -  $0.2 \times 10^6$ , Turb. upper 18%  $e^N$ , N=9

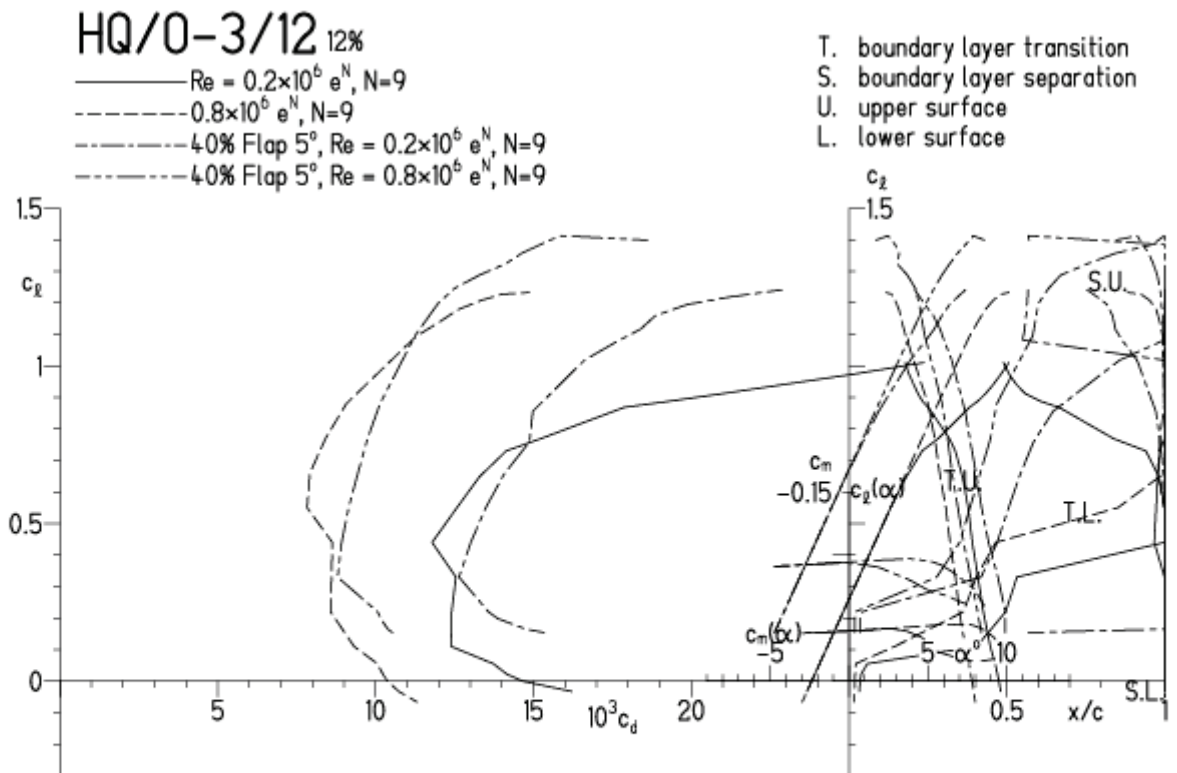


HQ/OLDY-3/12, N=9, mit 5° Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 V. 8.5.07 RUN 20.5.12 13:26

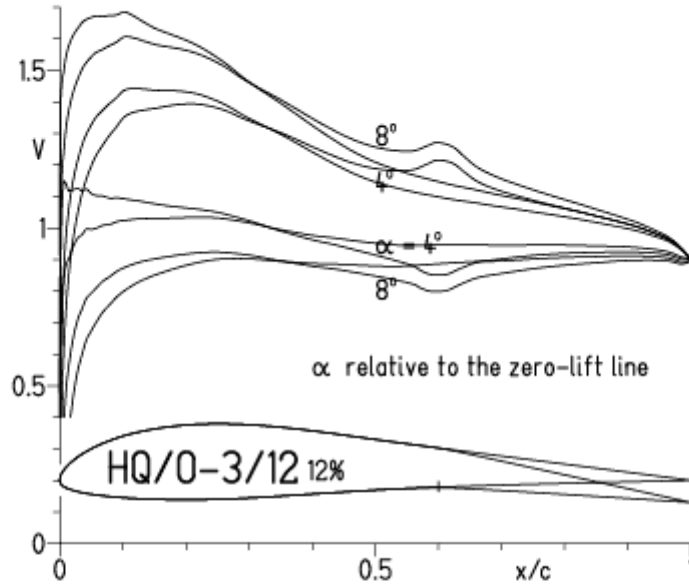


EPPLER 2005 V. 8.5.07 RUN 20.5.12

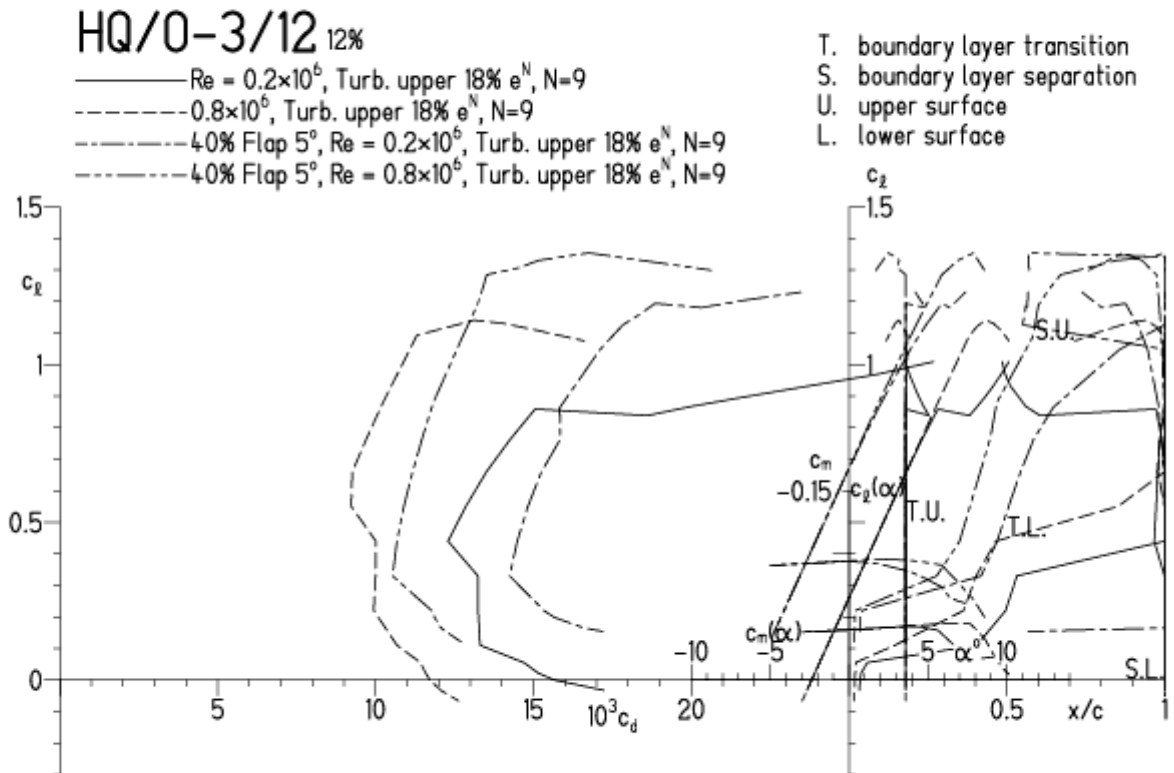


**HQ/OLDY-3/12, N=9, mit 5° Wölbklappenausschlag,  $l_k = 0,4 \cdot l$ , Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)**

EPPLER 2005 V. 8.5.07 RUN 20.5.12 13:38

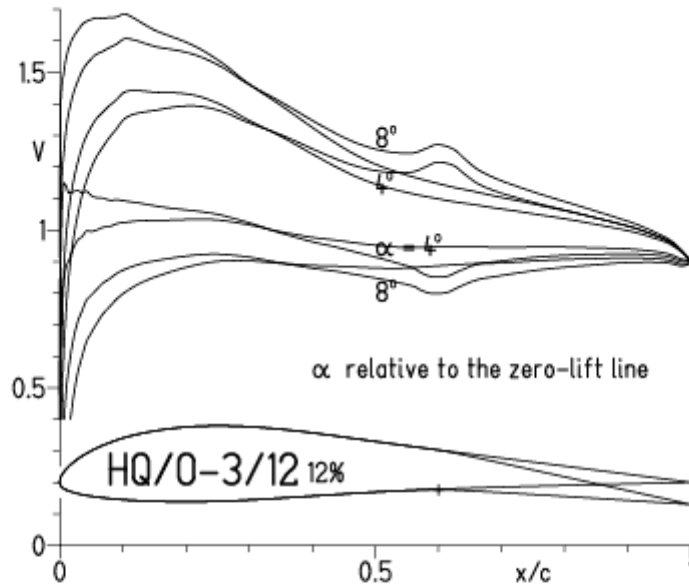


EPPLER 2005 V. 8.5.07 RUN 20.5.12 13:38



**HQ/OLDY-3/12, N=7, mit 5° Wölbklappenausschlag, niedrige Re-Zahlen,  $l_k = 0,4 \cdot l$ ,  
Turbulatoreffekt (optimale Turbulatorposition bei 15 – 20 % der Profiltiefe)**

EPPLER 2005 V. 8.5.07 RUN 26.5.12 17:26

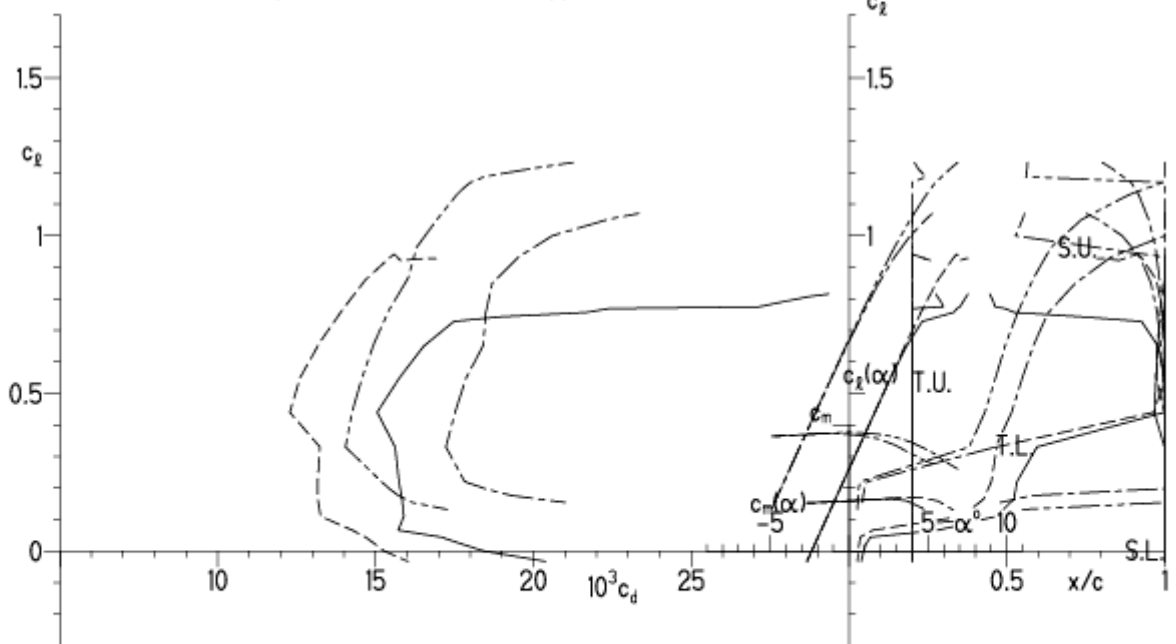


EPPLER 2005 V. 8.5.07 RUN 26.5.12 17:

**HQ/0-3/12 12%**

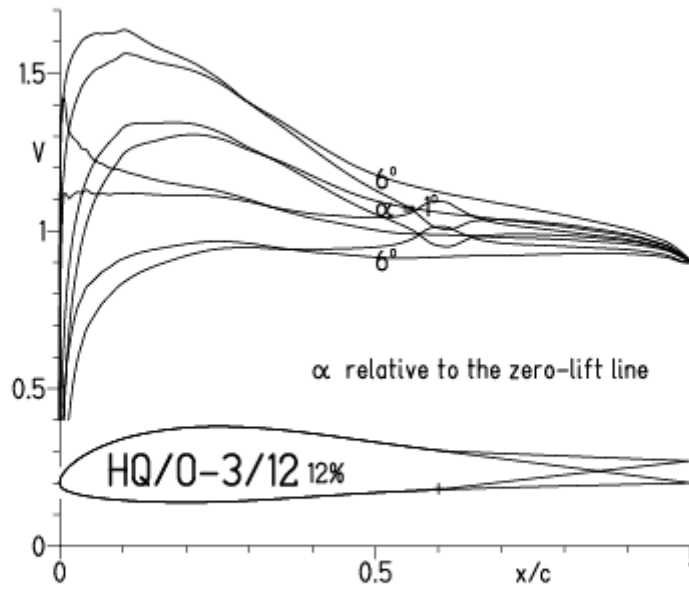
- $Re = 0.1 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- - -  $0.2 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- · - · 40% Flap 5°,  $Re = 0.1 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7
- · - · 40% Flap 5°,  $Re = 0.2 \times 10^6$ , Turb. upper 20%  $e^N$ , N=7

- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface



HQ/OLDY-3/12, N=9, mit  $-5^\circ$  Wölbklappenausschlag, Wölbklappentiefe 40 % von l

EPPLER 2005 V. 8.5.07 RUN 26.5.12 17:40



EPPLER 2

