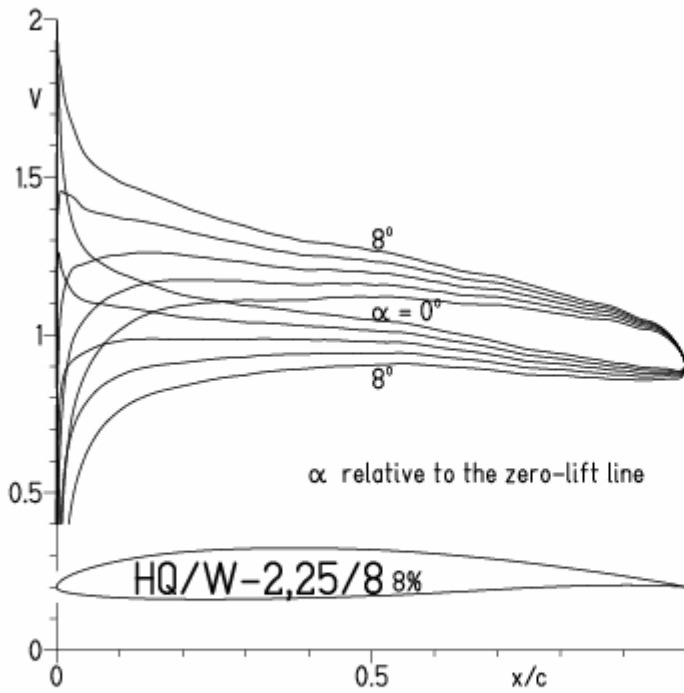


HQ/W-2,25/8, N=11

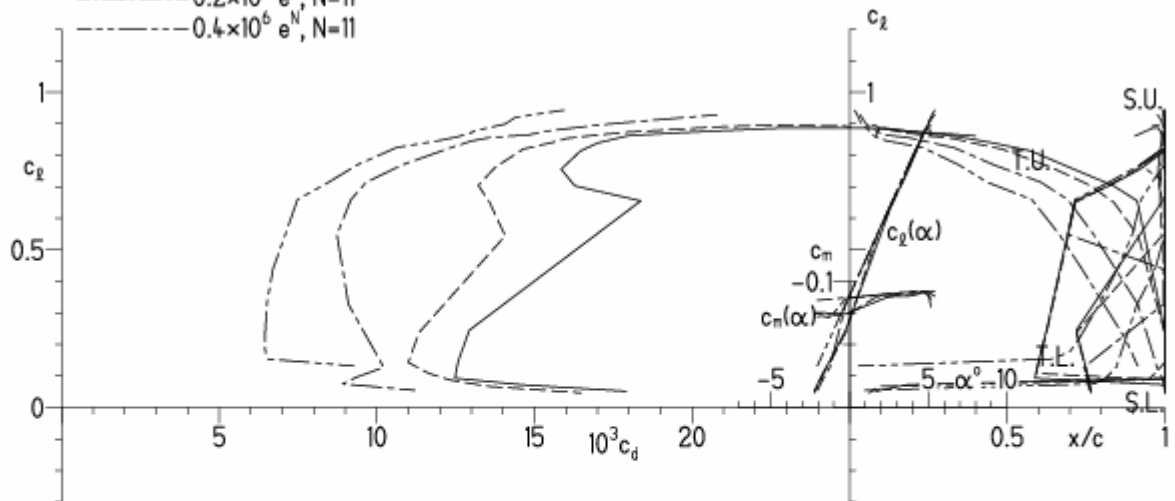
EPPLER 2005 V. 8.5.07 RUN 1.3.11 18:46



EPPLER 2005 V. 8.5.07 RUN 1.3.11 18

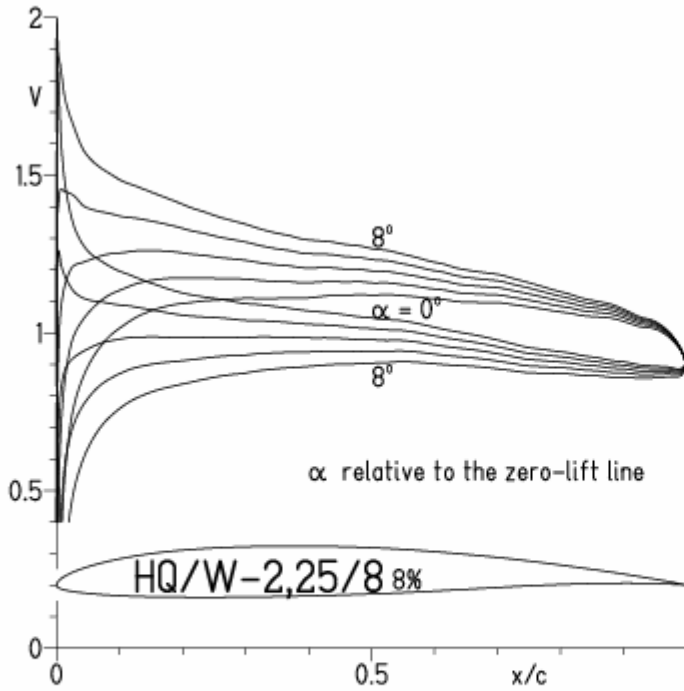
HQ/W-2,25/8 8%

- $Re = 75\,000 e^N, N=11$
- - -  $0.1 \times 10^6 e^N, N=11$
- · -  $0.2 \times 10^6 e^N, N=11$
- - -  $0.4 \times 10^6 e^N, N=11$



HQ/W-2,25/8, N=9

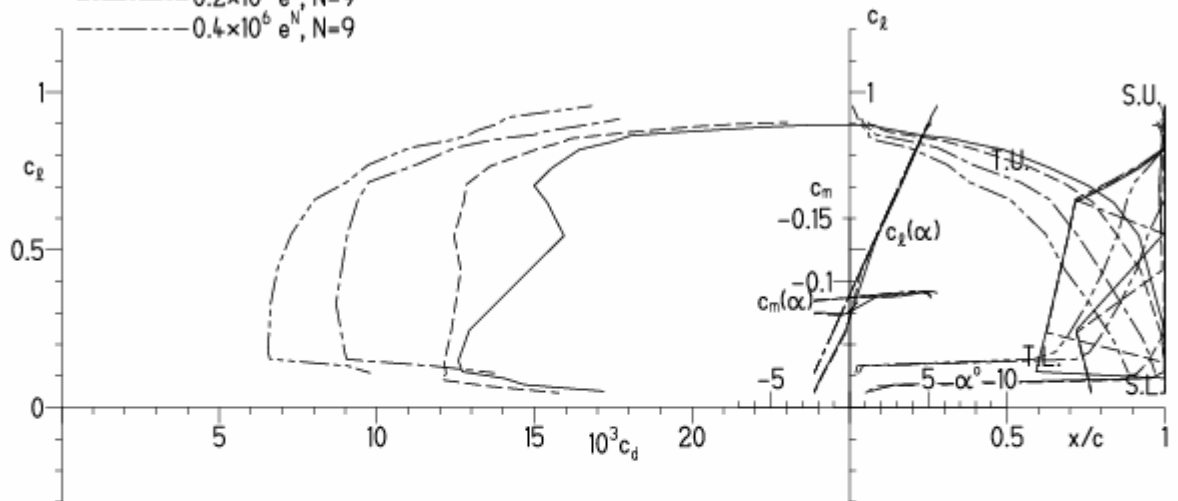
EPPLER 2005 V. 8.5.07 RUN 1.3.11 18:52



EPPLER 2005 V. 8.5.07 RUN 1.3.11 18:52

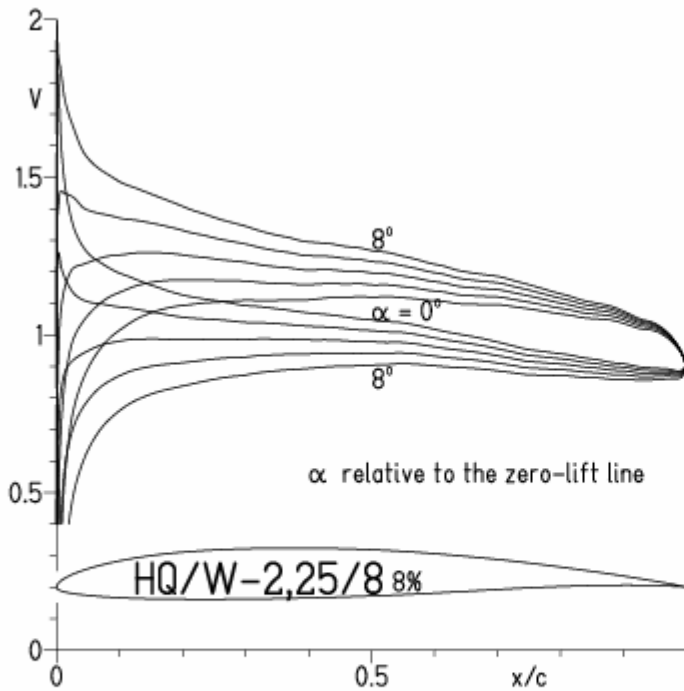
HQ/W-2,25/8 8%

- $Re = 75\,000 e^N, N=9$
- - -  $0.1 \times 10^6 e^N, N=9$
- · -  $0.2 \times 10^6 e^N, N=9$
- - -  $0.4 \times 10^6 e^N, N=9$



# HQ/W-2,25/8, N=9, Turbulatoreffekt (optimal beim Maximum der Wölbung)

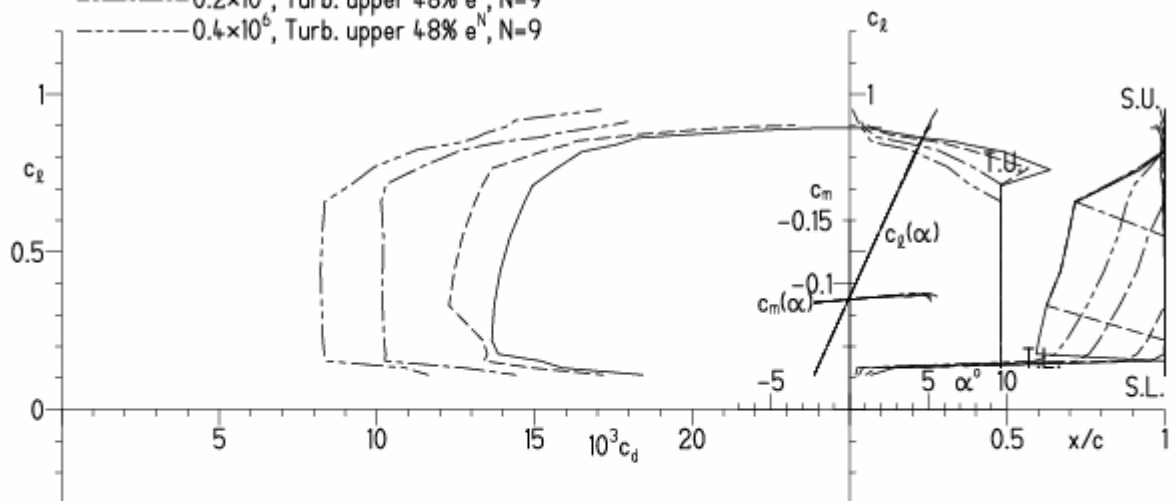
EPPLER 2005 V. 8.5.07 RUN 1.3.11 18:57



EPPLER 2005 V. 8.5.07 RUN 1.

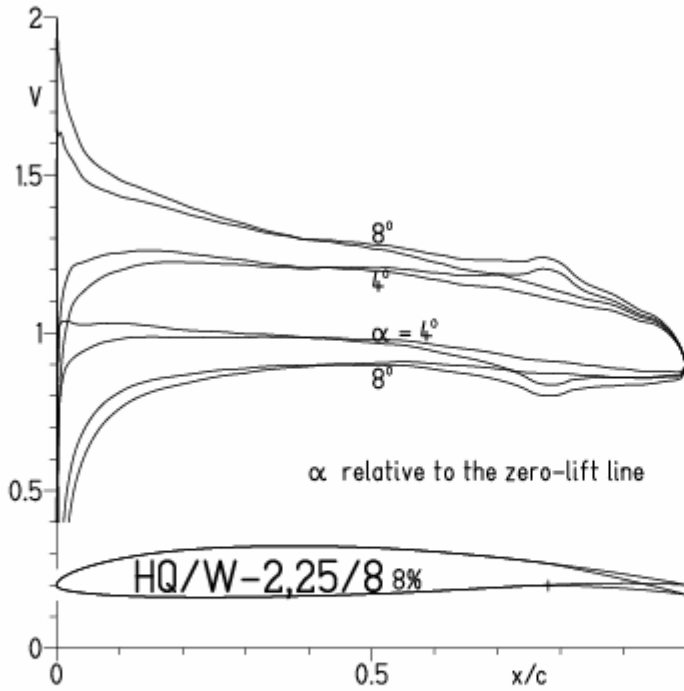
## HQ/W-2,25/8 8%

- $Re = 75\,000$ , Turb. upper 48%  $e^N$ ,  $N=9$
- - -  $0.1 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$
- · -  $0.2 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$
- - -  $0.4 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$



HQ/W-2,25/8, N=11, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 3.3.11 11:51

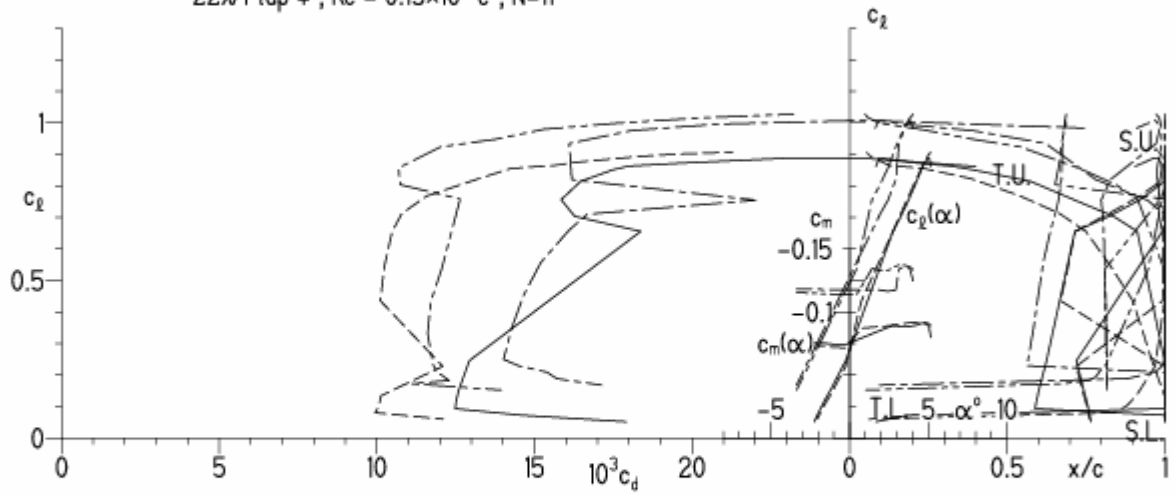


EPPLER 2005 V. 8.5.07 RUN 3.3.11 11:51

HQ/W-2,25/8 8%

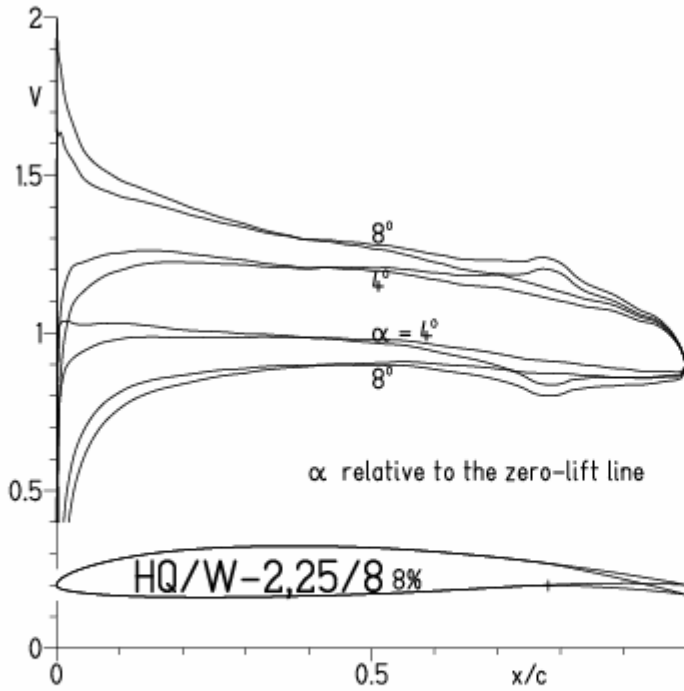
- Re = 75 000 e<sup>N</sup>, N=11
- - - 0.15 × 10<sup>6</sup> e<sup>N</sup>, N=11
- · - 22% Flap 4°, Re = 75 000 e<sup>N</sup>, N=11
- · - 22% Flap 4°, Re = 0.15 × 10<sup>6</sup> e<sup>N</sup>, N=11

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



HQ/W-2,25/8, N=9, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 3.3.11 11:55

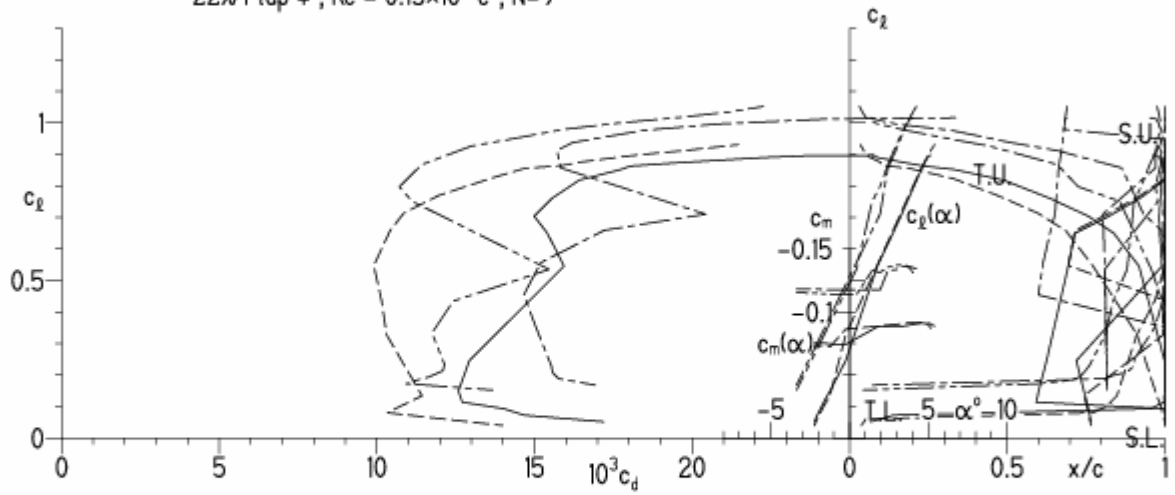


EPPLER 2005 V. 8.5.07 RUN 3.3.11 11

HQ/W-2,25/8 8%

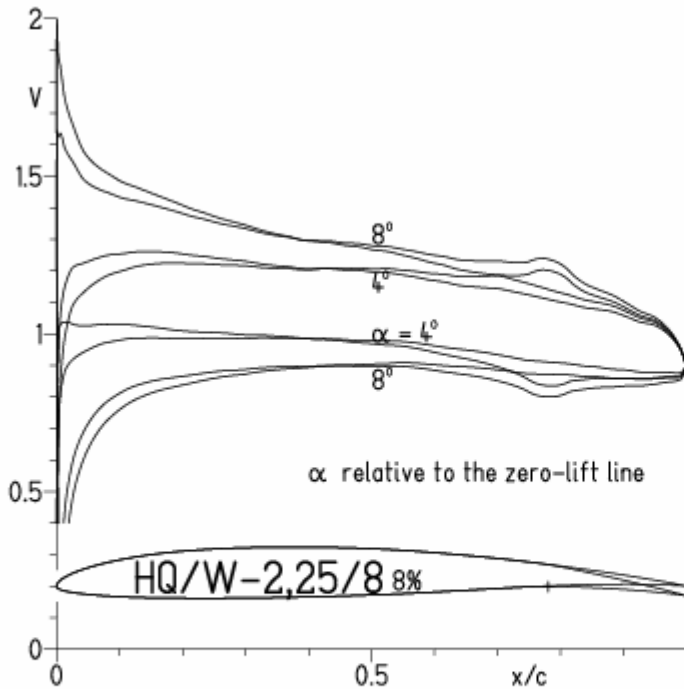
- $Re = 75\,000 e^N, N=9$
- - -  $0.15 \times 10^6 e^N, N=9$
- · - · - 22% Flap  $4^\circ, Re = 75\,000 e^N, N=9$
- · - · - 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=9$

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



**HQ/W-2,25/8, N=9 mit +4° Wölbklappenausschlag, Turbulatoreffekt**  
 (Verbesserungen für niedrige Geschwindigkeiten und Profiltiefen an Flügelenden)

EPPLER 2005 V. 8.5.07 RUN 3.3.11 11:59

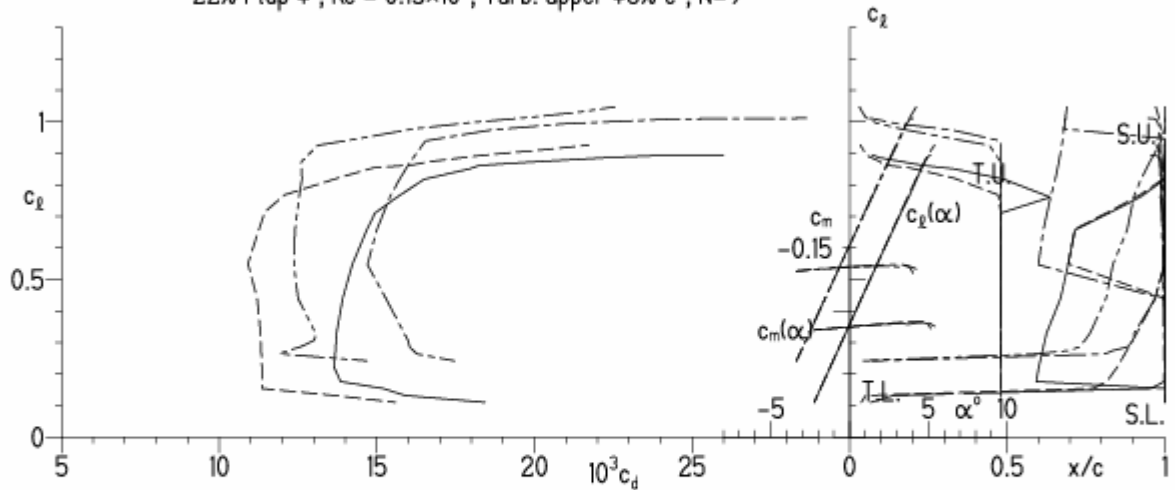


EPPLER 2005 V. 8.5.07 RUN 3.3.11 11:59

**HQ/W-2,25/8 8%**

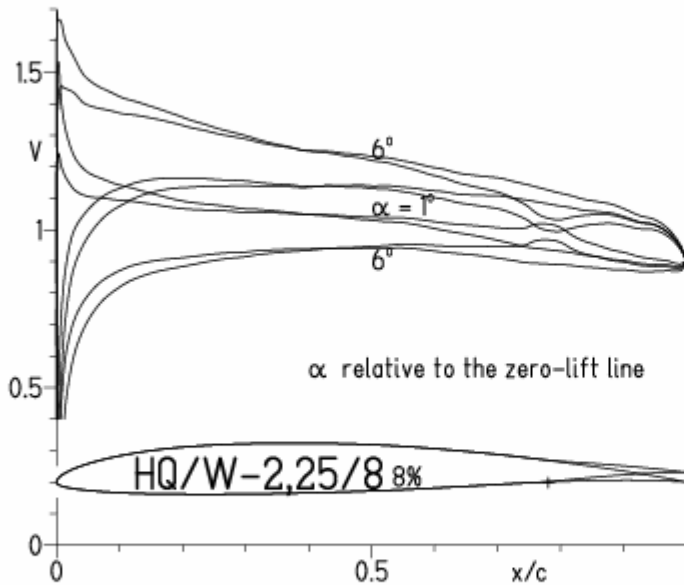
- $Re = 75\,000$ , Turb. upper 48%  $e^N$ ,  $N=9$
- - -  $0.15 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$
- · - · 22% Flap  $4^\circ$ ,  $Re = 75\,000$ , Turb. upper 48%  $e^N$ ,  $N=9$
- · - · 22% Flap  $4^\circ$ ,  $Re = 0.15 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$

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

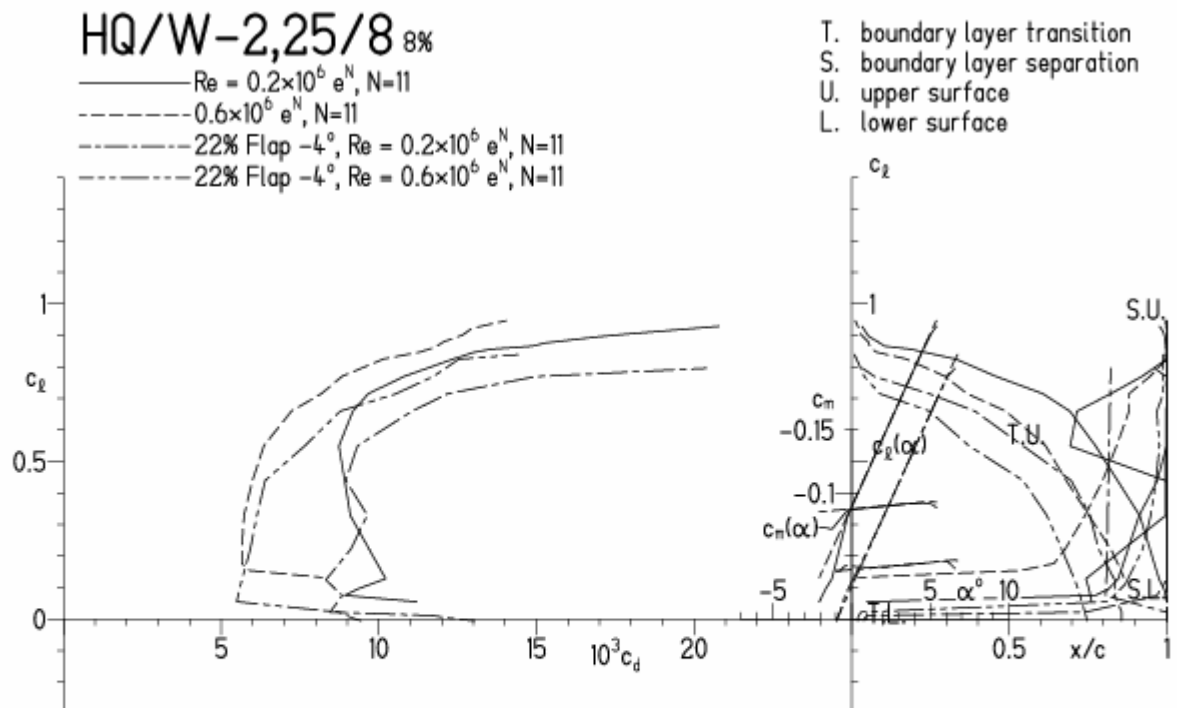


HQ/W-2,25/8, N=11 mit  $-4^\circ$  Wölbklappenausschlag  
 (F3J-Modelle mit  $30 \text{ g/dm}^2$  erreichen damit nur ca. 30 – 35 m/s Höchstgeschwindigkeit)

EPPLER 2005 V. 8.5.07 RUN 3.3.11 12:23

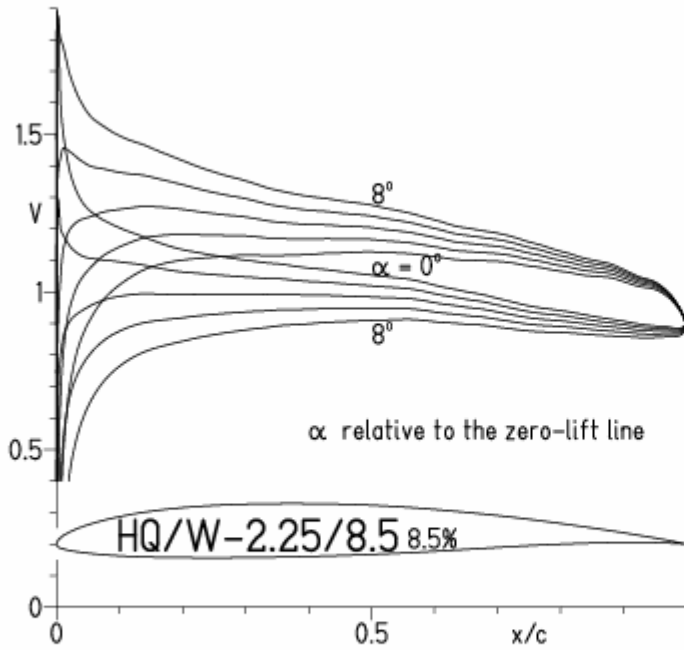


EPPLER 2005 V. 8.5.07 RUN 3.3.11 1



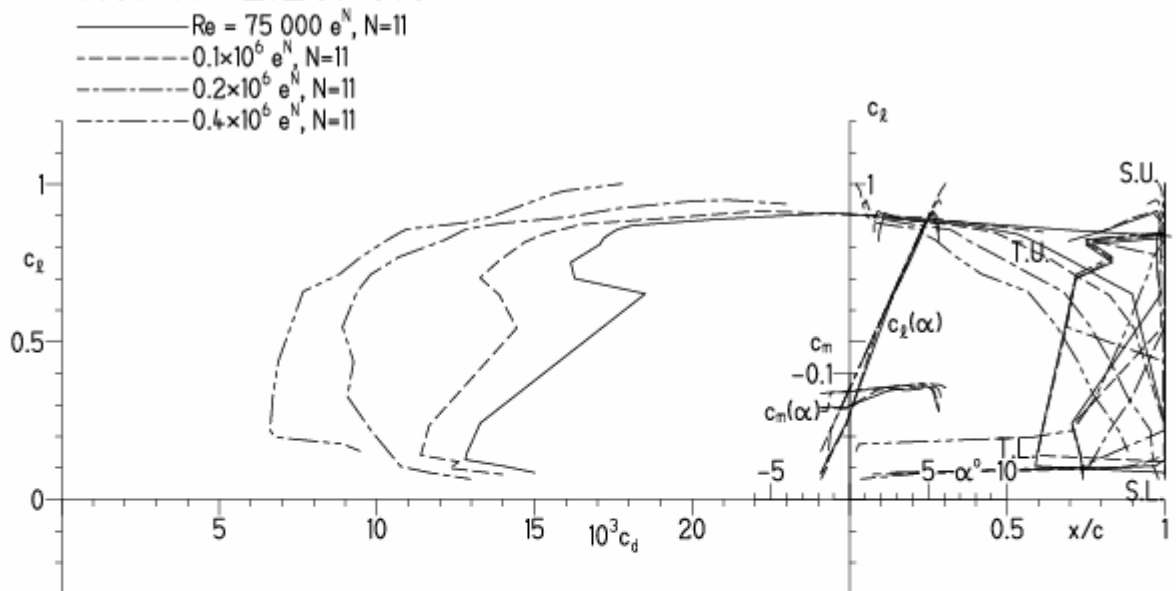
# HQ/W-2,25/8,5, N=11

EPPLER 2005 V. 8.5.07 RUN 24.3.11 13:07



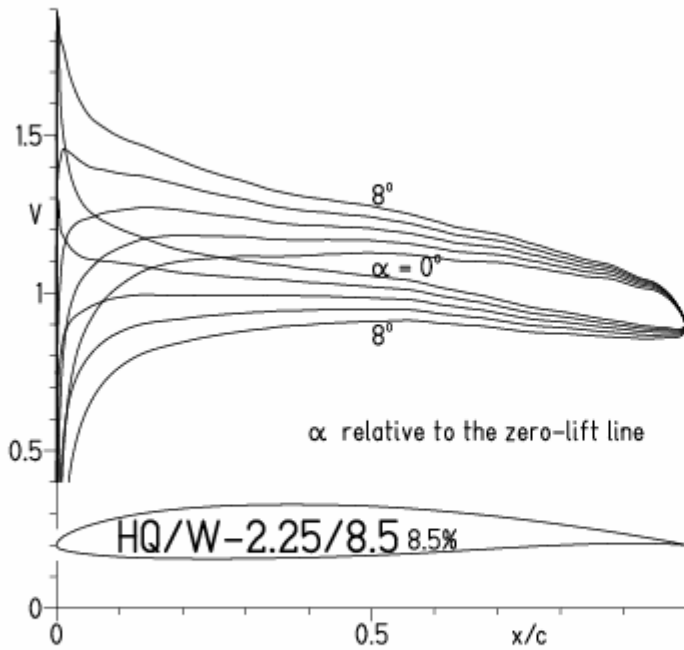
EPPLER 2005 V

## HQ/W-2.25/8.5 8.5%



HQ/W-2,25/8,5, N=9

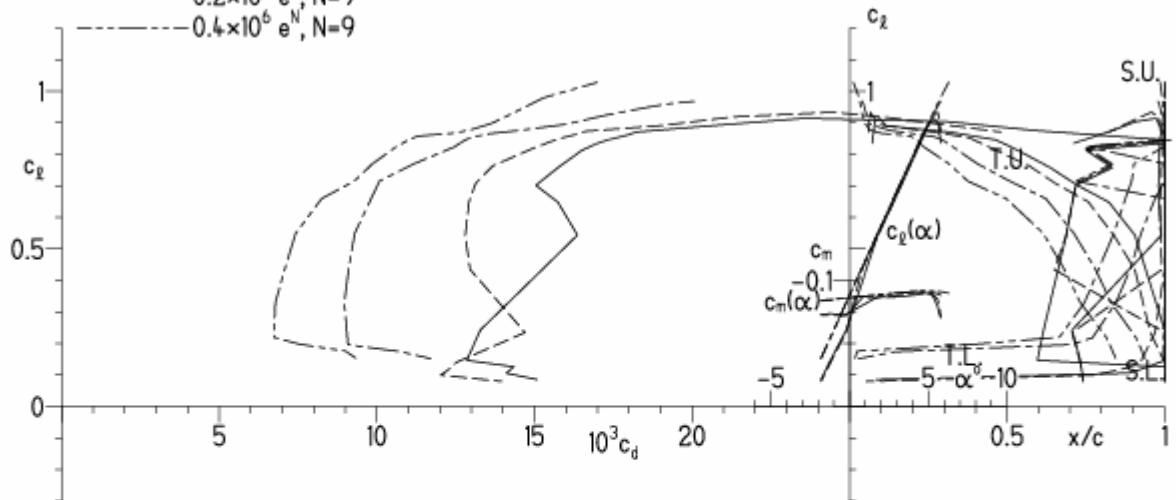
EPPLER 2005 V. 8.5.07 RUN 24.3.11 13:33



EPPLER 2005 V. 8.5.07 RUN 24.3.11 13:

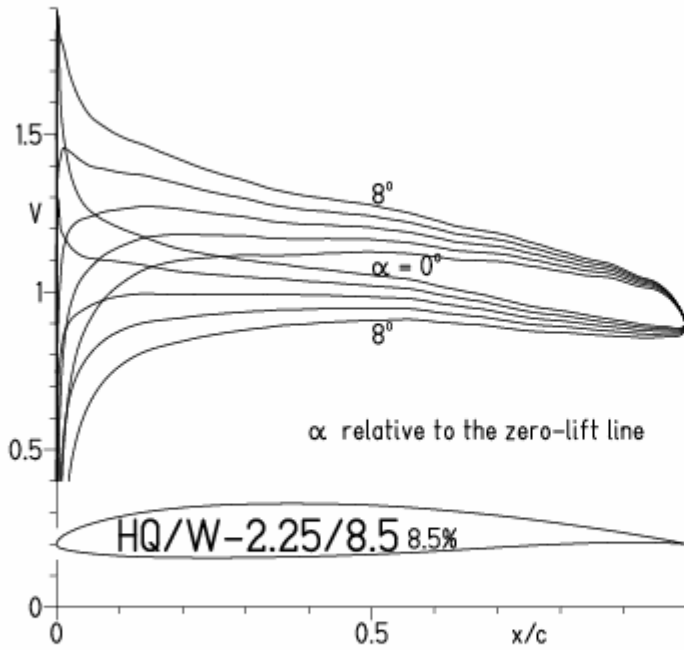
HQ/W-2.25/8.5 8.5%

- $Re = 75\,000 e^N, N=9$
- - -  $0.1 \times 10^6 e^N, N=9$
- · -  $0.2 \times 10^6 e^N, N=9$
- · - ·  $0.4 \times 10^6 e^N, N=9$



HQ/W-2,25/8,5, N=9, Turbulatoreffekt (optimal beim Maximum der Wölbung)

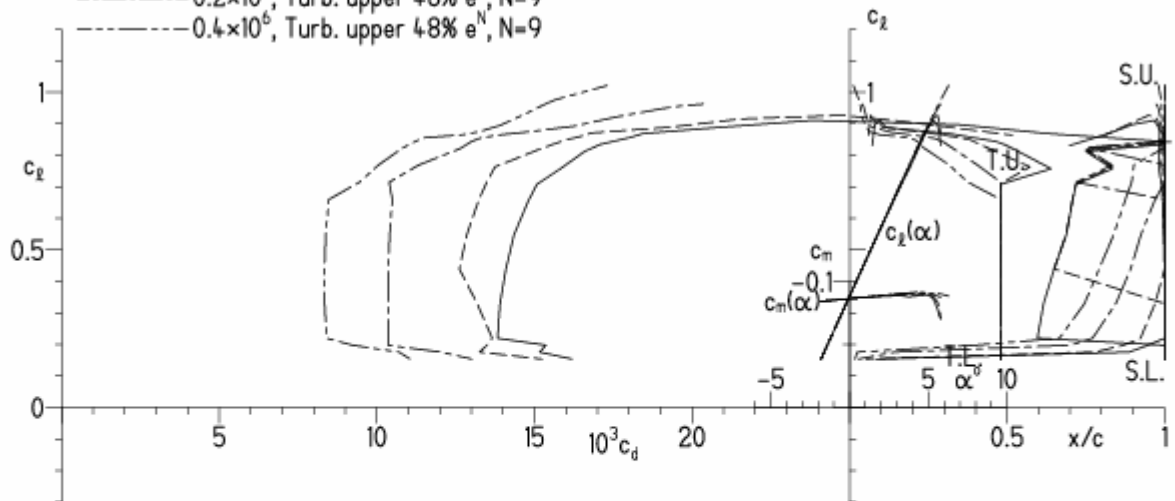
EPPLER 2005 V. 8.5.07 RUN 24.3.11 17:31



EPPLER 2005 V.

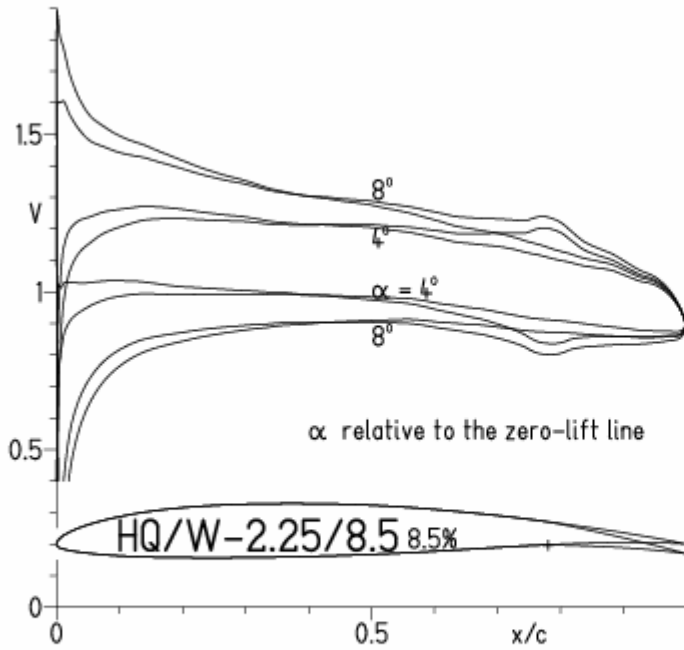
**HQ/W-2.25/8.5 8.5%**

- $Re = 75\,000$ , Turb. upper 48%  $e^N$ , N=9
- - -  $0.1 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9
- · -  $0.2 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9
- - -  $0.4 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9



HQ/W-2,25/8,5, N=11, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 24.3.11 18:08

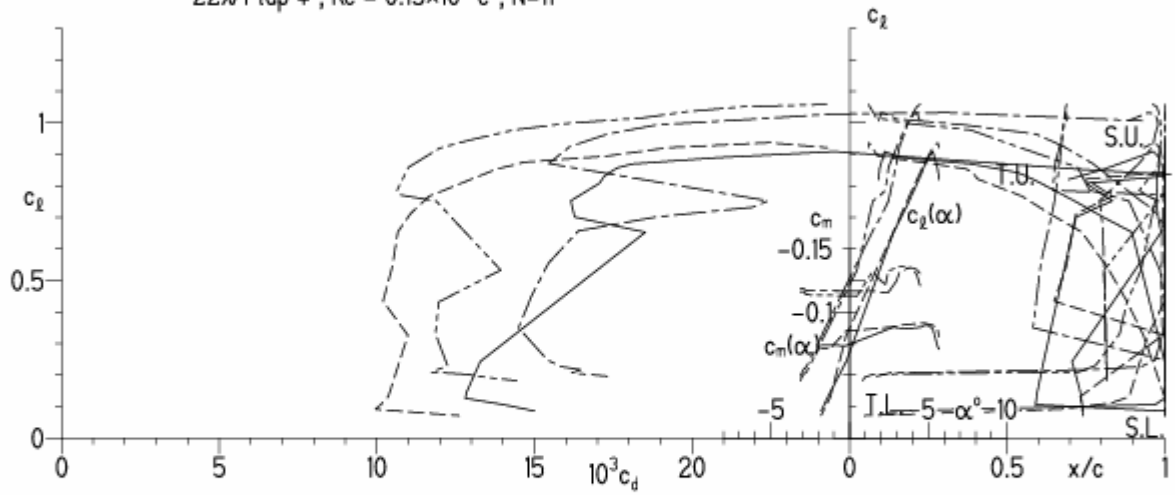


EPPLER 2005 V. 8.5.

HQ/W-2.25/8.5 8.5%

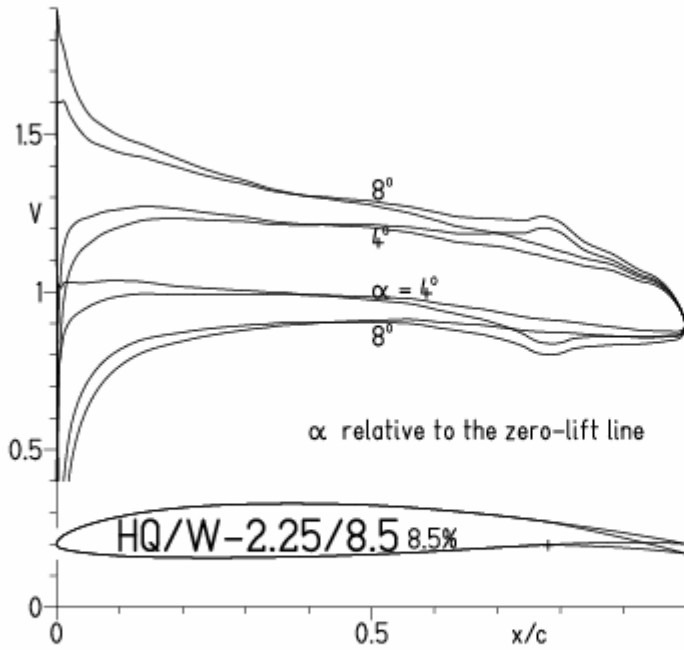
- $Re = 75\,000 e^N, N=11$
- - -  $0.15 \times 10^6 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 75\,000 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=11$

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



HQ/W-2,25/8,5, N=9, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 24.3.11 18:12

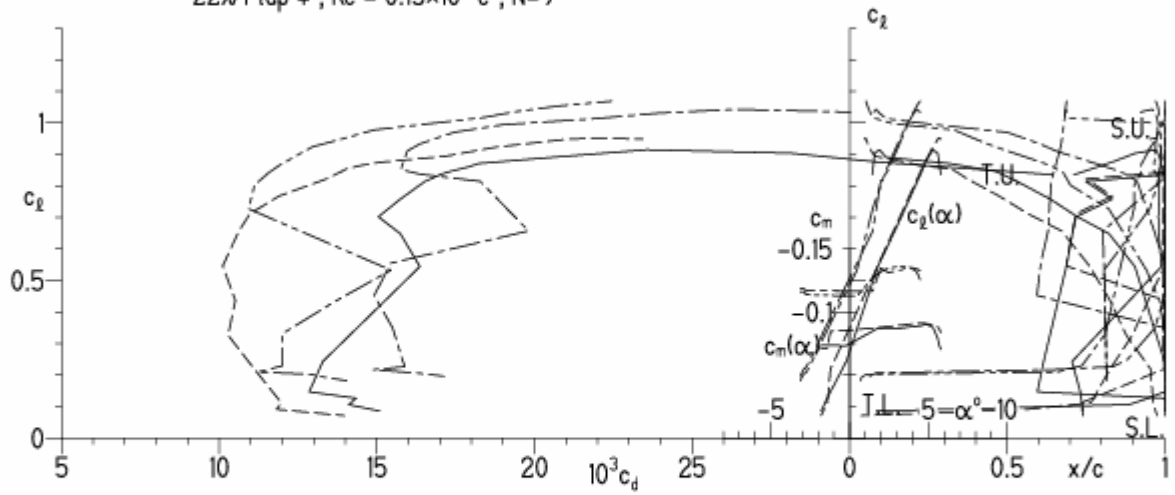


EPPLER 2005 V.

HQ/W-2.25/8.5 8.5%

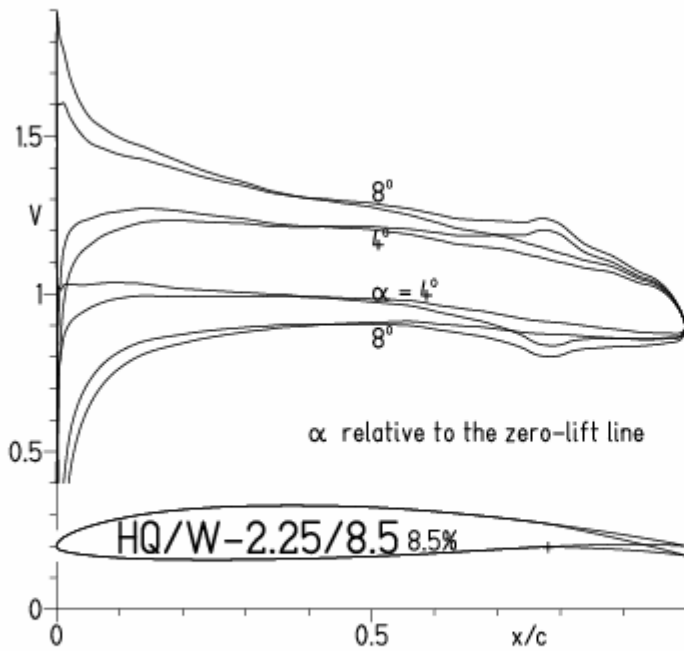
- $Re = 75\,000 e^N, N=9$
- - -  $0.15 \times 10^6 e^N, N=9$
- · - · 22% Flap  $4^\circ, Re = 75\,000 e^N, N=9$
- · - · 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=9$

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



HQ/W-2,25/8,5, N=9 mit +4° Wölbklappenausschlag, Turbulatoreffekt  
 (Verbesserungen für niedrige Geschwindigkeiten und Profiltiefen an Flügelenden)

EPPLER 2005 V. 8.5.07 RUN 24.3.11 18:16

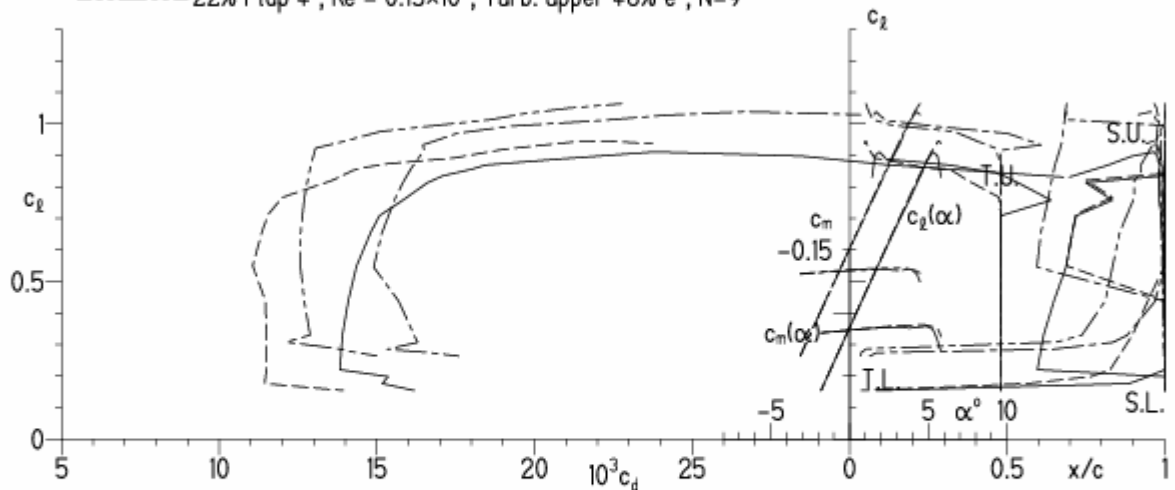


EPPLER 2005 V. 8.5.07 RUN 24.3.11 1

HQ/W-2.25/8.5 8.5%

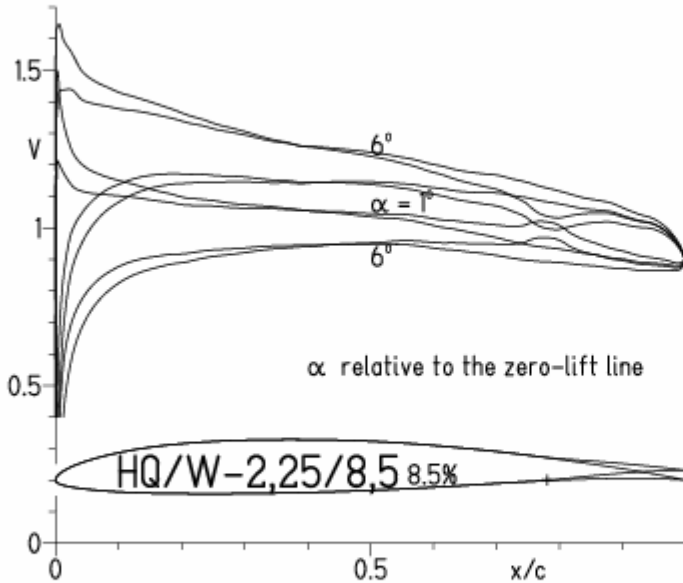
- Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- - - 0.15x10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 0.15x10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9

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

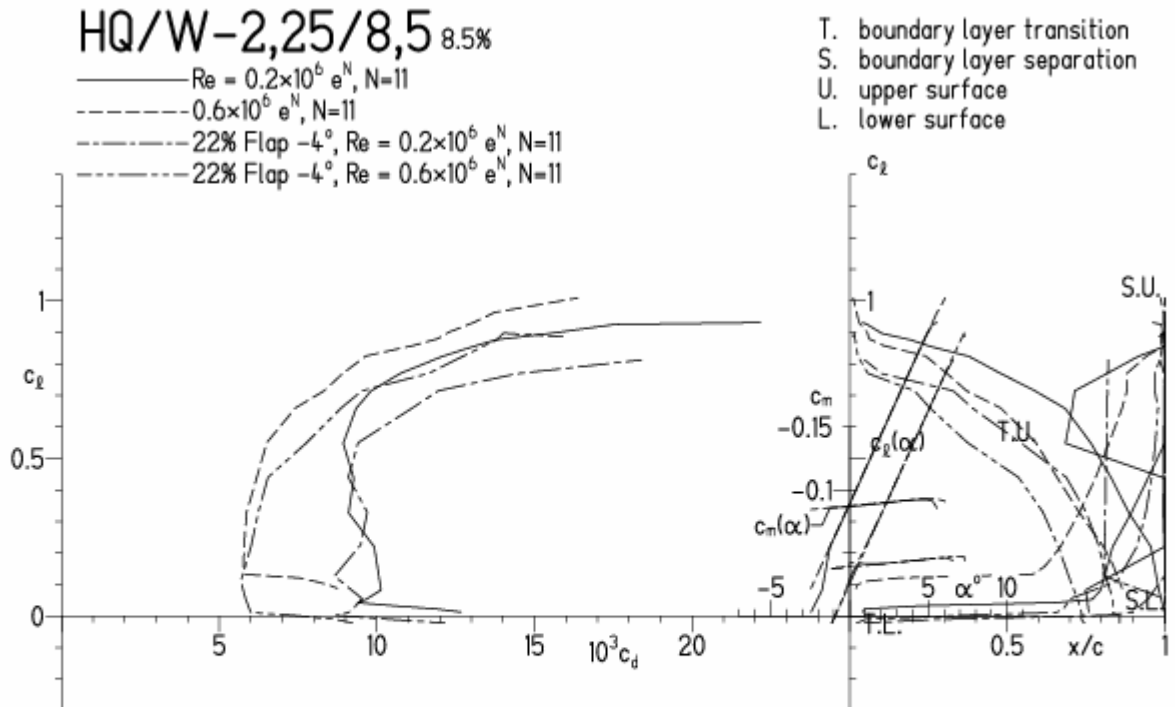


HQ/W-2,25/8,5, N=11 mit -4° Wölbklappenausschlag  
 (F3J-Modelle mit 30 g/dm<sup>2</sup> erreichen damit ca. 50 m/s Höchstgeschwindigkeit)

EPPLER 2005 V. 8.5.07 RUN 24.3.11 19:09

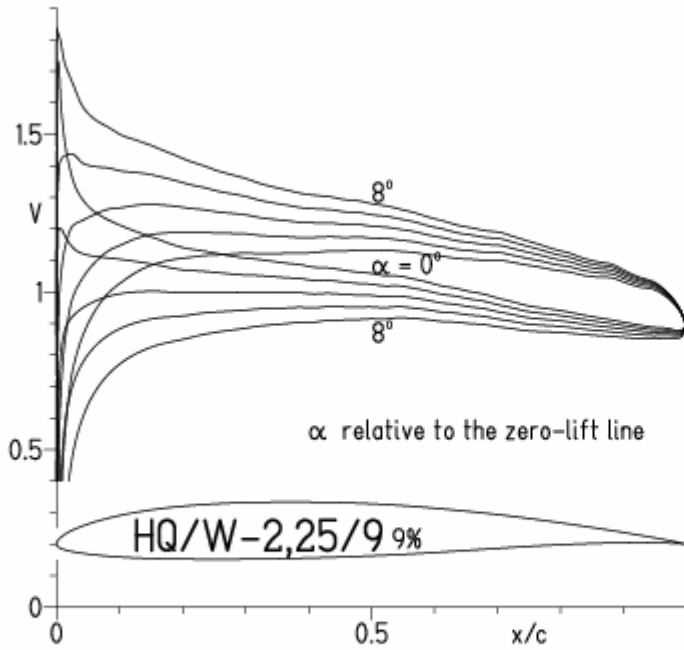


EPPLER 2005 V. 8.5.07 RUN 24.3.11 19:09

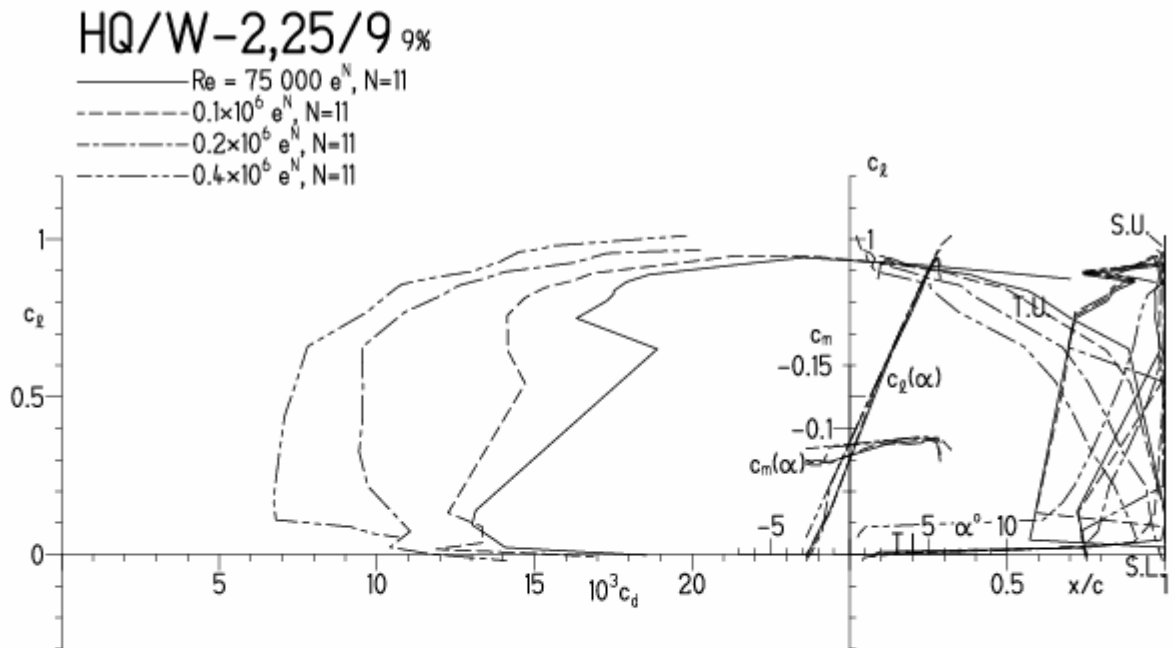


HQ/W-2,25/9, N=11

EPPLER 2005 V. 8.5.07 RUN 7.3.11 17:50

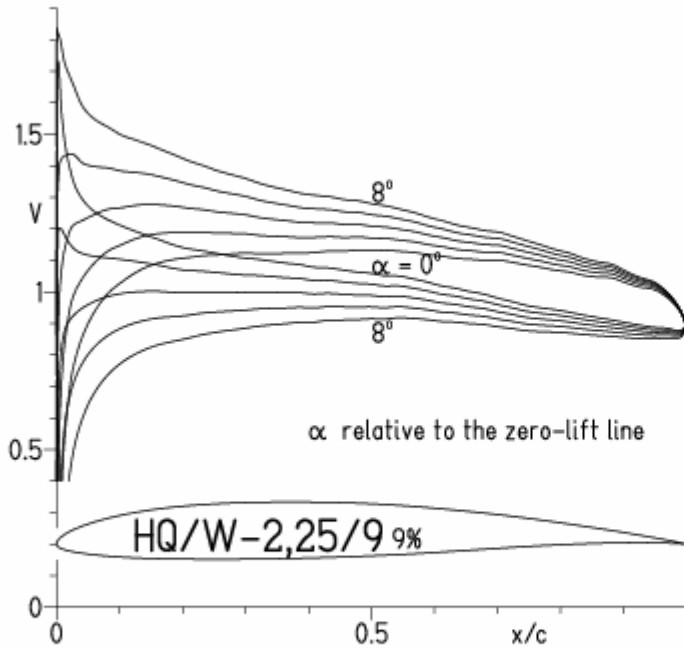


EPPLER 2005 V. 8.5.07 RUN 7.3.11 17:50

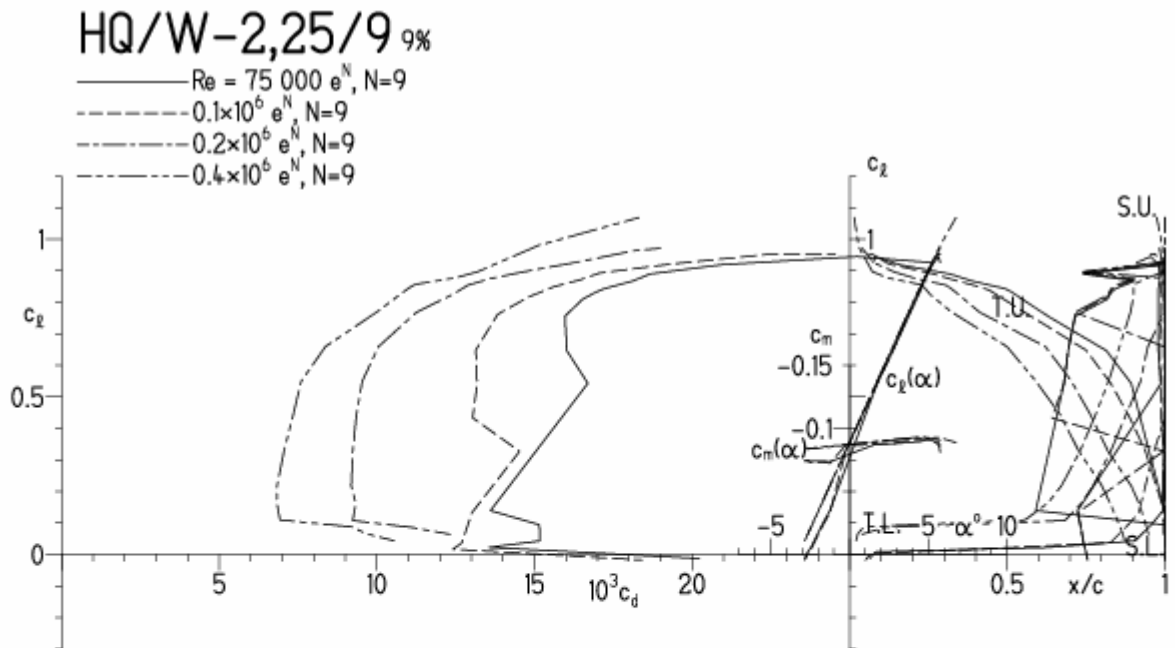


HQ/W-2,25/9, N=9

EPPLER 2005 V. 8.5.07 RUN 7.3.11 18:08

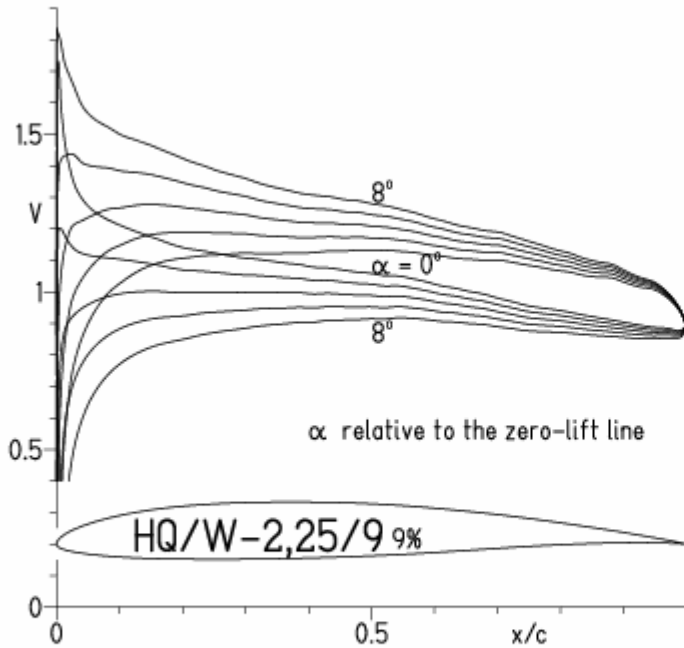


EPPLER 2005 V. 8.



# HQ/W-2,25/9, N=9, Turbulatoreffekt (optimal beim Maximum der Wölbung)

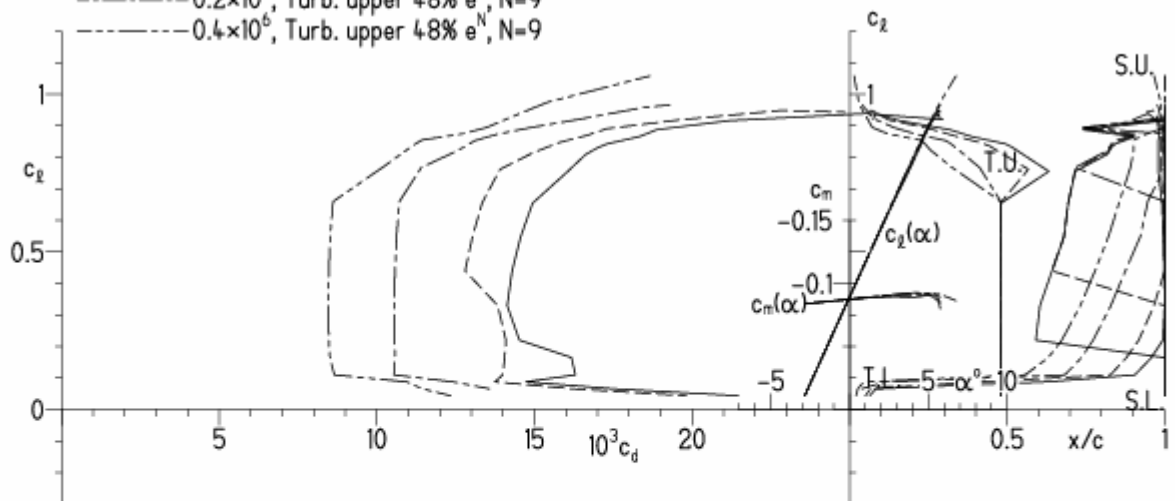
EPPLER 2005 V. 8.5.07 RUN 7.3.11 18:12



EPPLER 2005 V. 8.5.07 RUN 7

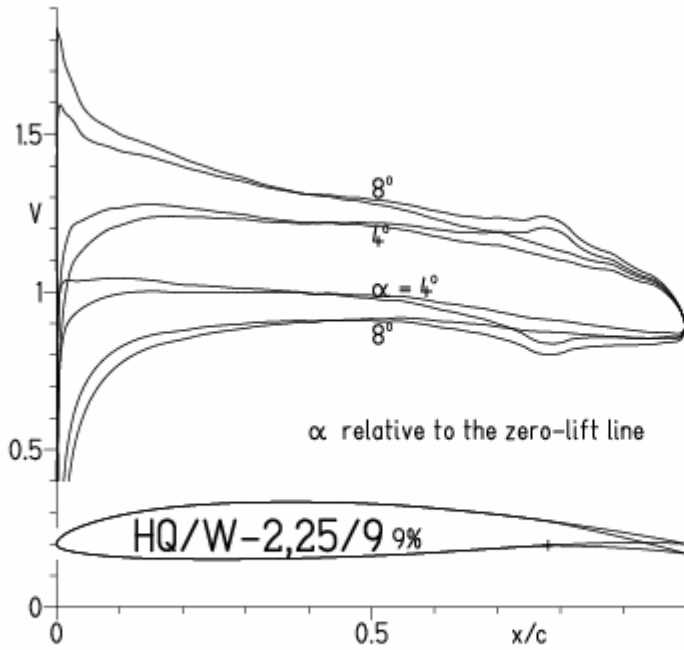
## HQ/W-2,25/9 9%

- $Re = 75\,000$ , Turb. upper 48%  $e^N$ ,  $N=9$
- - -  $0.1 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$
- · -  $0.2 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$
- - -  $0.4 \times 10^6$ , Turb. upper 48%  $e^N$ ,  $N=9$



HQ/W-2,25/9, N=11, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 15:38

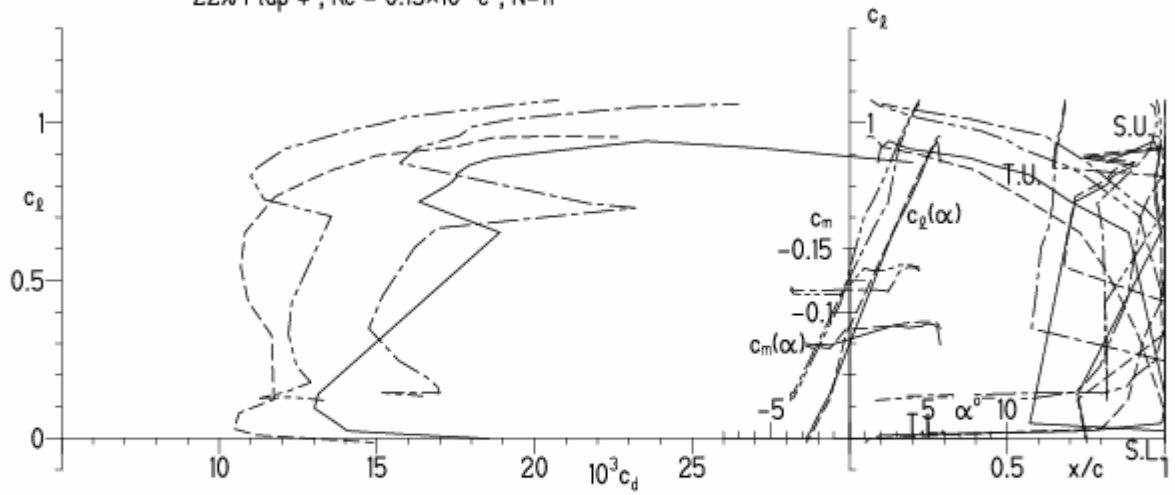


EPPLER 2005 V. 8.5.07 RUN 8.3.11 15:3

HQ/W-2,25/9 9%

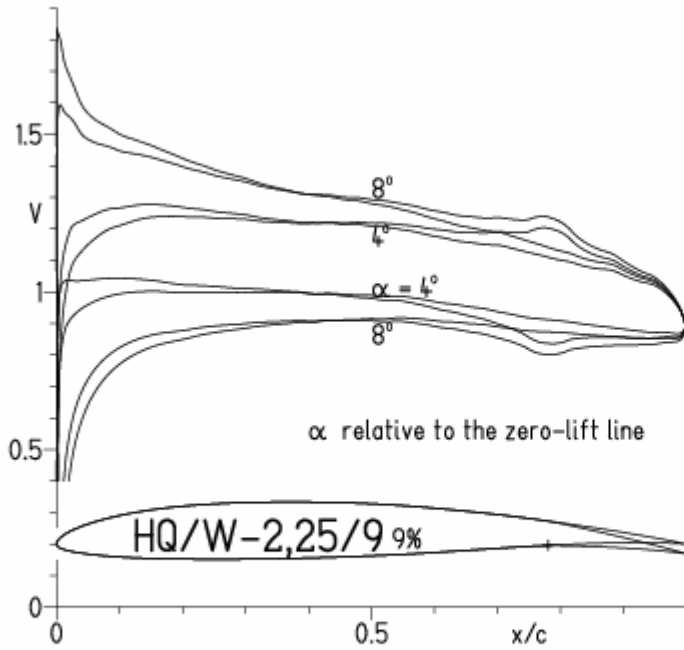
- $Re = 75\,000 e^N, N=11$
- - -  $0.15 \times 10^6 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 75\,000 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=11$

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



HQ/W-2,25/9, N=9, mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 15:48

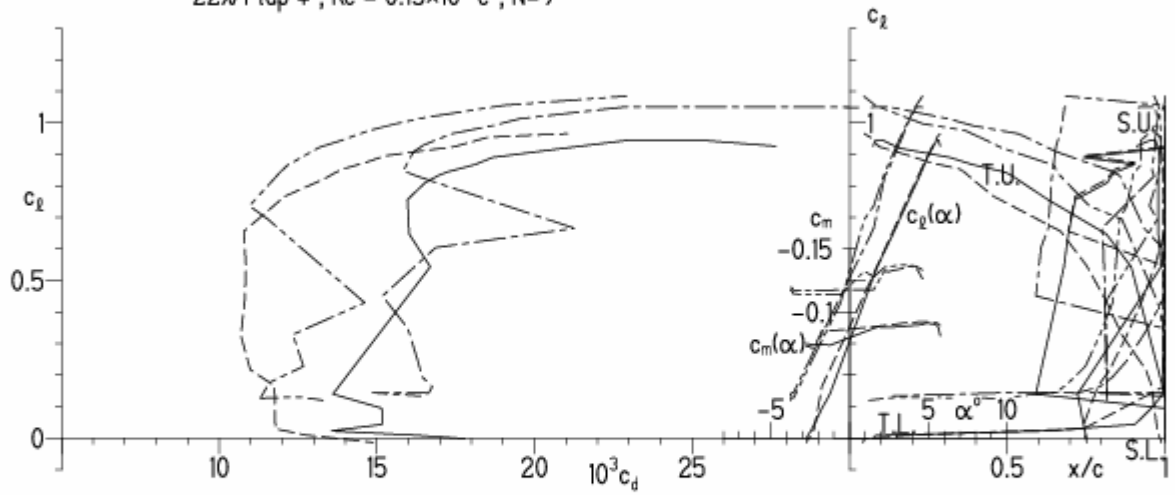


EPPLER 2005 V. 8.5.07 RUN 8.3.1

HQ/W-2,25/9 9%

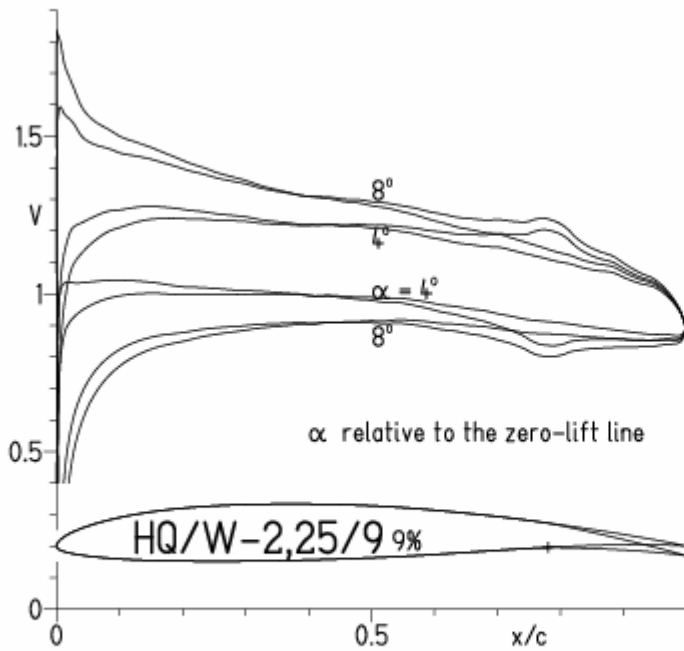
- $Re = 75\,000 e^N, N=9$
- - -  $0.15 \times 10^6 e^N, N=9$
- · - · - 22% Flap  $4^\circ, Re = 75\,000 e^N, N=9$
- · - · - 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=9$

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



**HQ/W-2,25/, N=9 mit +4° Wölbklappenausschlag, Turbulatoreffekt**  
 (Verbesserungen für niedrige Geschwindigkeiten und Profiltiefen an Flügelenden)

EPPLER 2005 V. 8.5.07 RUN 8.3.11 15:54

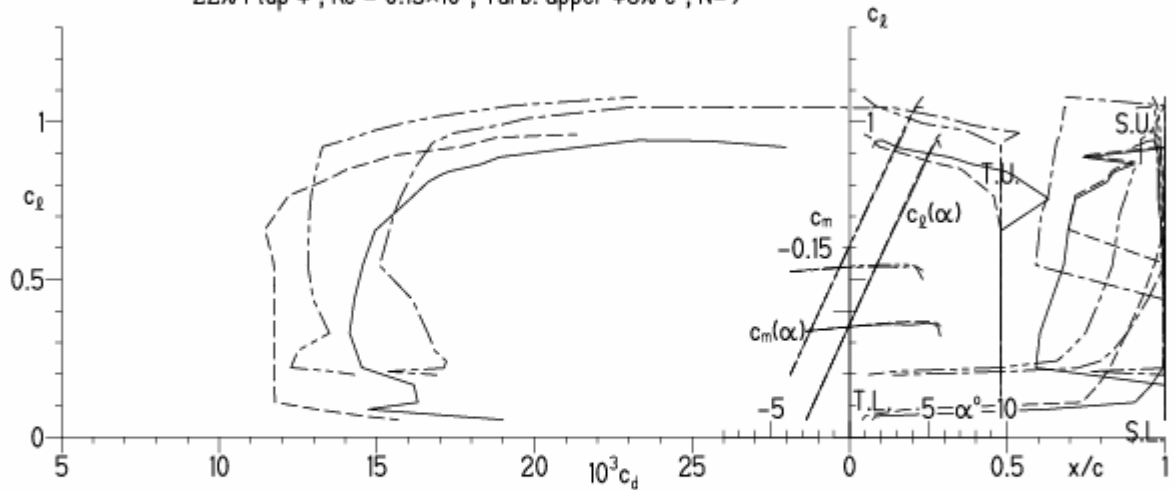


EPPLER 2005 V. 8.5.07 RUN 8.3.11 15:54

**HQ/W-2,25/9 9%**

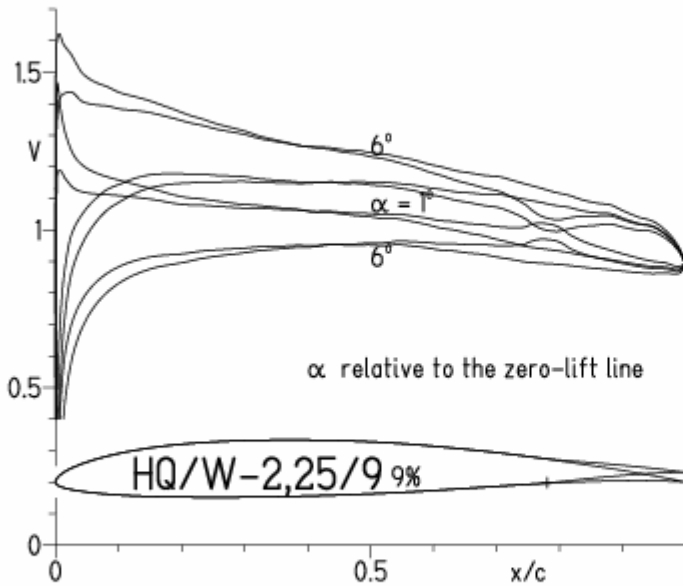
- Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- - - 0.15x10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 0.15x10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9

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



**HQ/W-2,25/9, N=11 mit -4° Wölbklappenausschlag**  
 (F3J-Modelle mit 30 g/dm<sup>2</sup> erreichen damit ca. 50 m/s Höchstgeschwindigkeit)

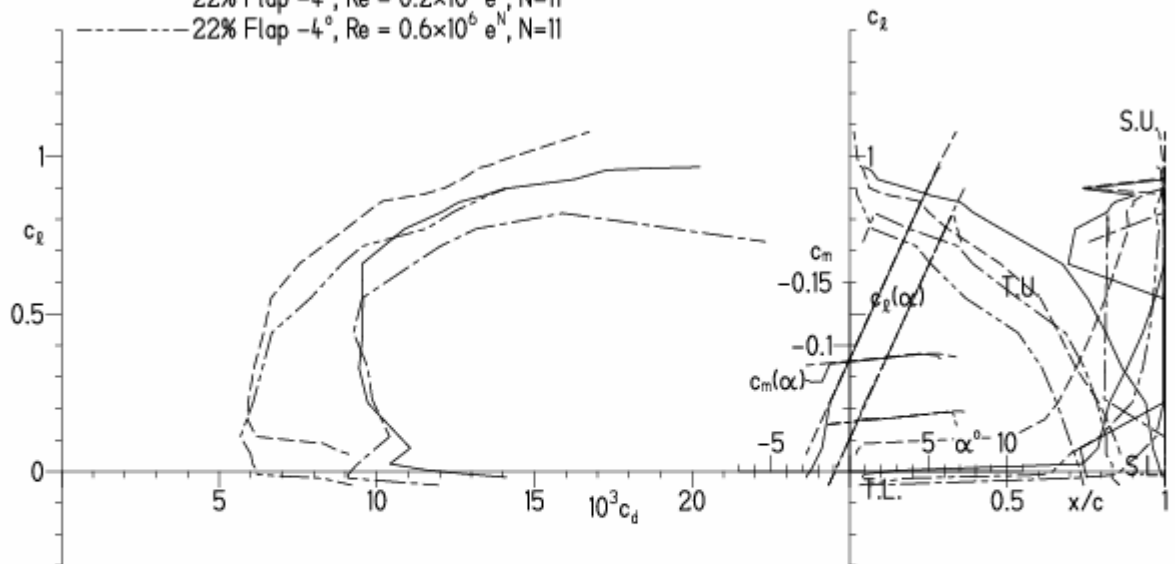
EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:17



EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:02

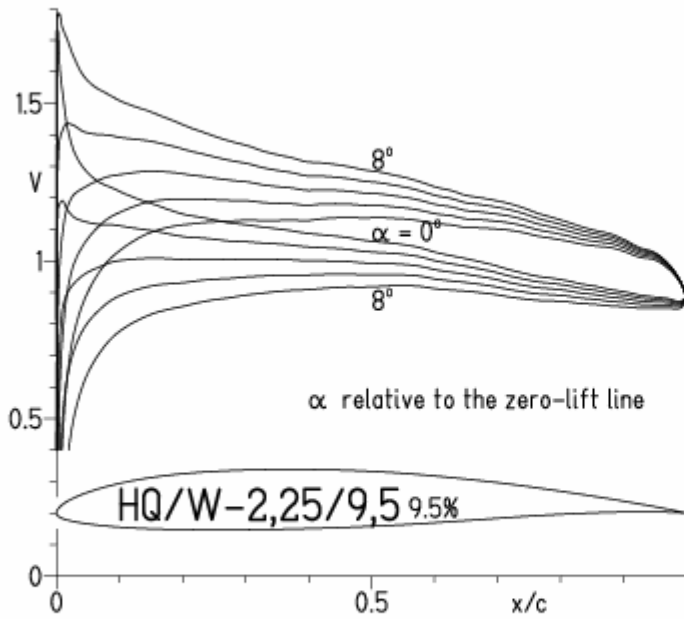
**HQ/W-2,25/9 9%**

- $Re = 0.2 \times 10^6 e^N, N=11$
- - -  $0.6 \times 10^6 e^N, N=11$
- · - · 22% Flap -4°,  $Re = 0.2 \times 10^6 e^N, N=11$
- · - · 22% Flap -4°,  $Re = 0.6 \times 10^6 e^N, N=11$

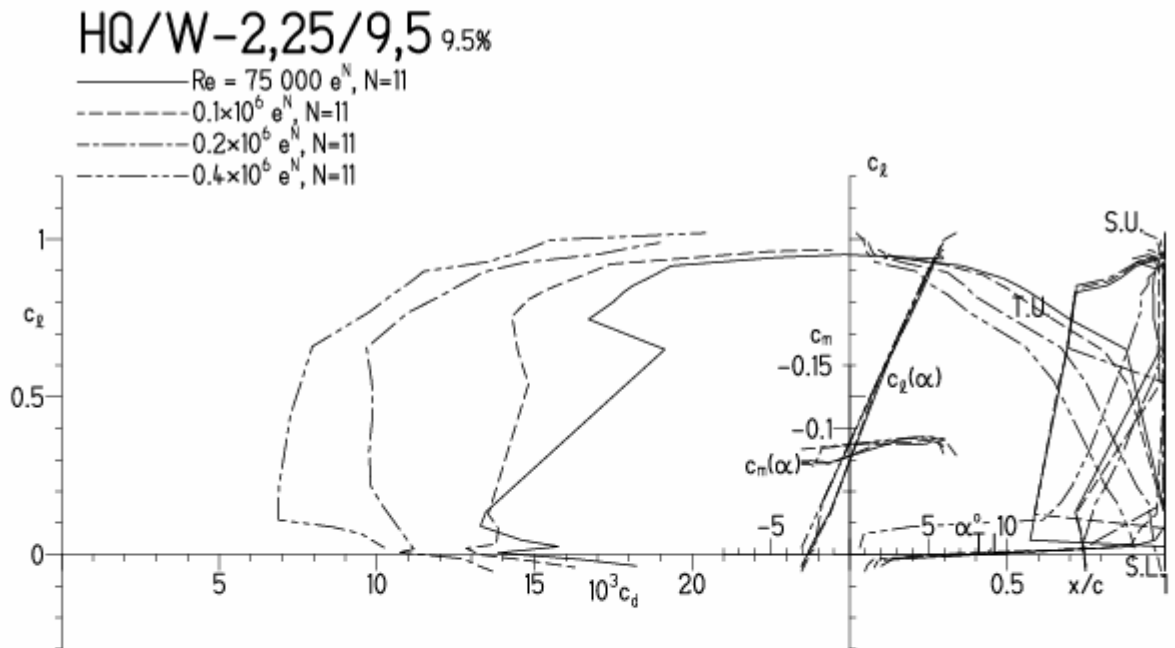


HQ/W-2,25/9,5, N=11

EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:33

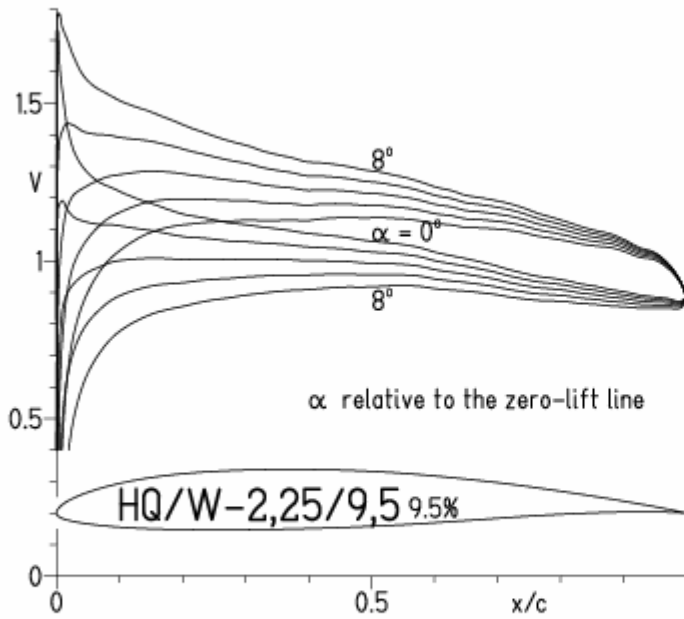


EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:33



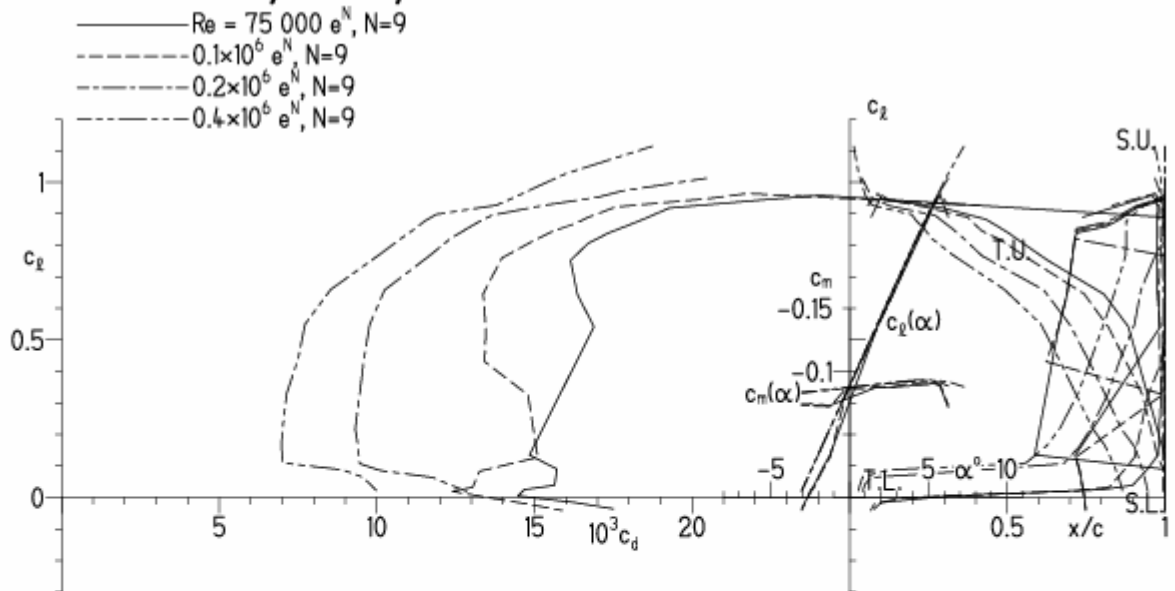
HQ/W-2,25/9,5, N=9

EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:43



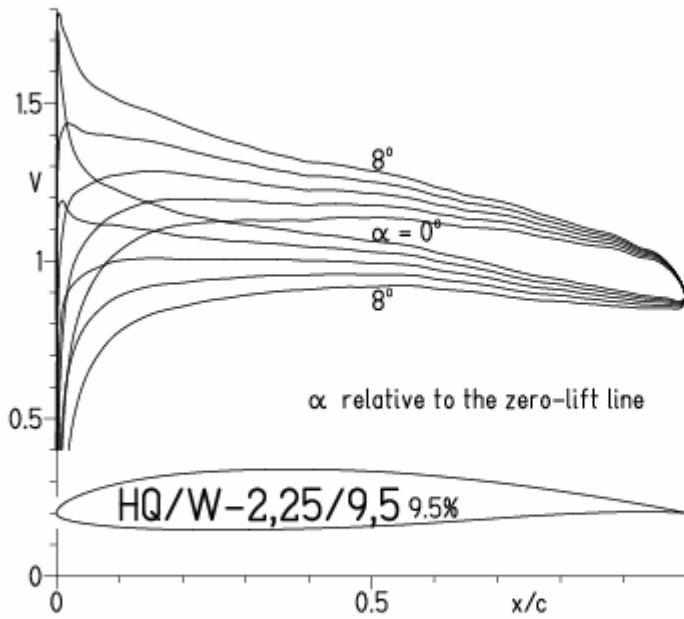
EPPLER 2005 V. 8.5.07 RUN 8.3.

HQ/W-2,25/9,5 9.5%

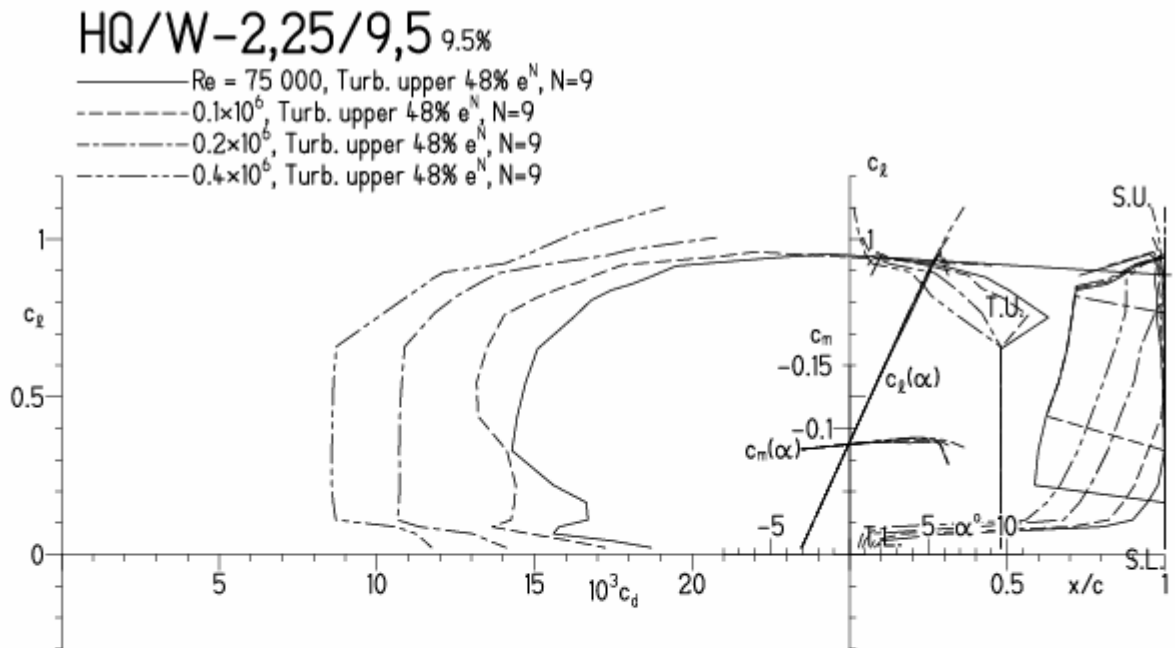


HQ/W-2,25/9,5, N=9, (Turbulatoreffekt (optimal beim Maximum der Wölbung))

EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:46

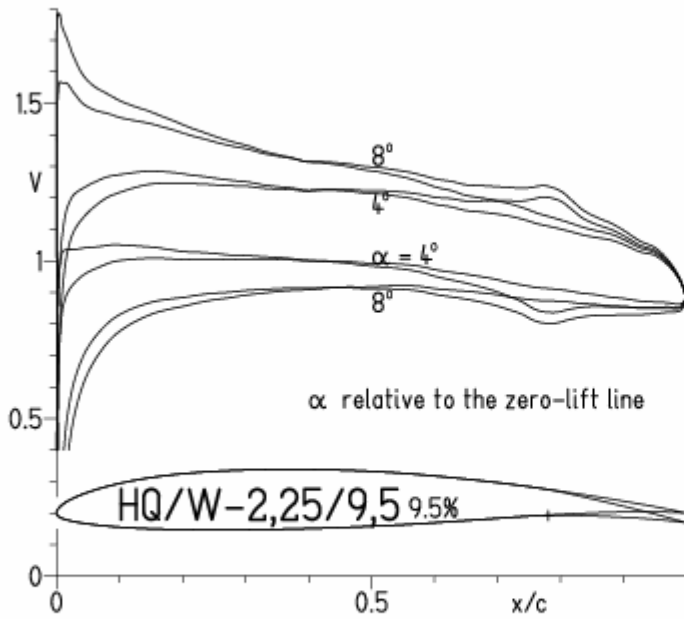


EPPLER 2005 V. 8.5.07 RUN 8.3.11 16:



HQ/W-2,25/9,5, N=11 mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:07

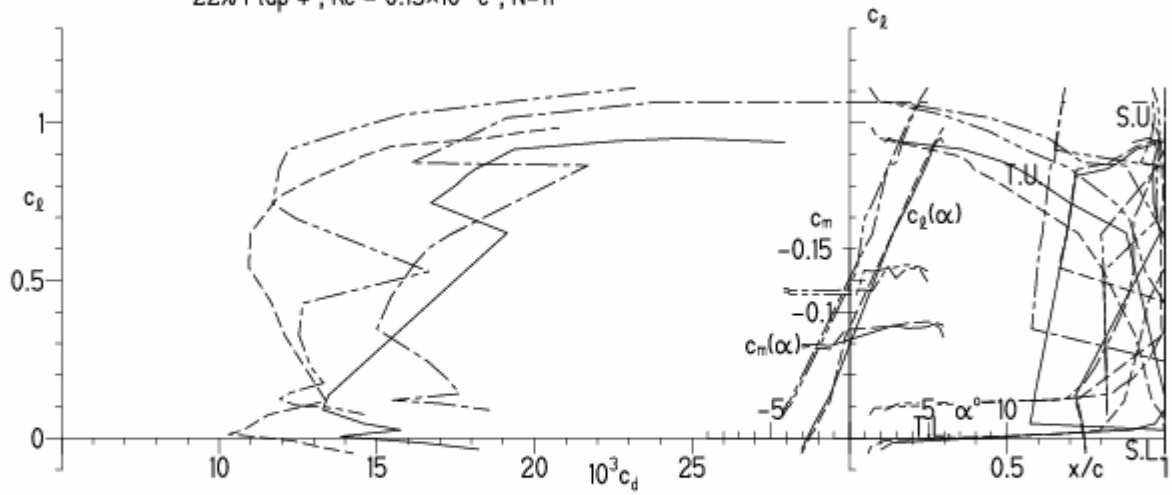


EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:07

HQ/W-2,25/9,5 9.5%

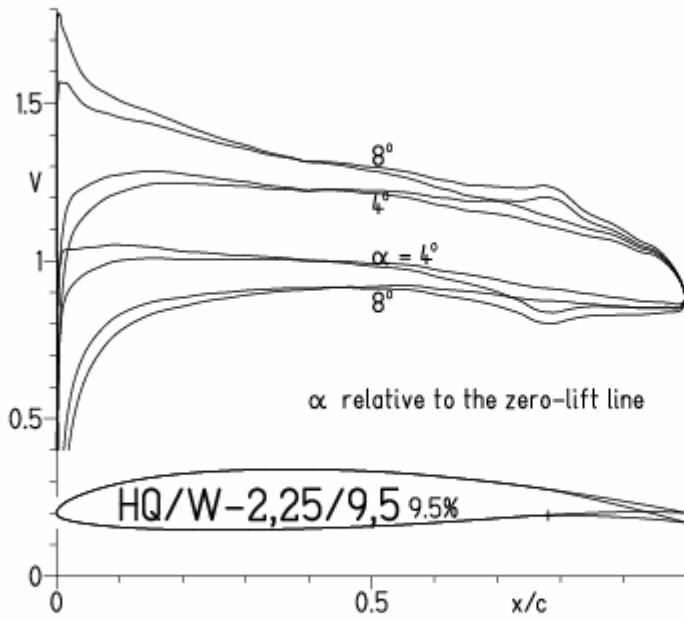
- $Re = 75\,000 e^N, N=11$
- - -  $0.15 \times 10^6 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 75\,000 e^N, N=11$
- · - · - 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=11$

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



HQ/W-2,25/9,5, N=9 mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:12

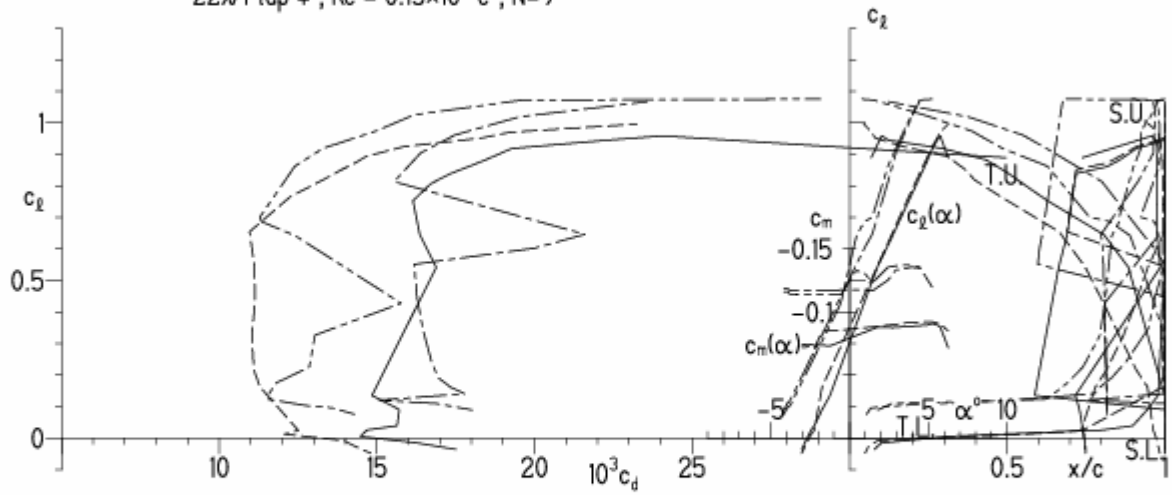


EPPLER 2005 V. 8.5.07 R

HQ/W-2,25/9,5 9.5%

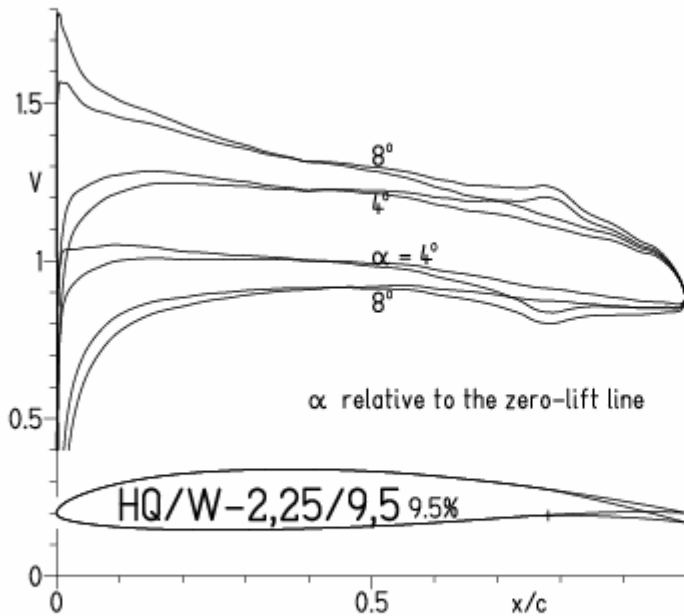
- $Re = 75\,000 e^N, N=9$
- - -  $0.15 \times 10^6 e^N, N=9$
- · - · 22% Flap  $4^\circ, Re = 75\,000 e^N, N=9$
- · - · 22% Flap  $4^\circ, Re = 0.15 \times 10^6 e^N, N=9$

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



**HQ/W-2,25/9,5, N=9 mit +4° Wölbklappenausschlag, Turbulatoreffekt**  
 (Verbesserungen für niedrige Geschwindigkeiten und Profiltiefen an Flügelenden)

EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:14

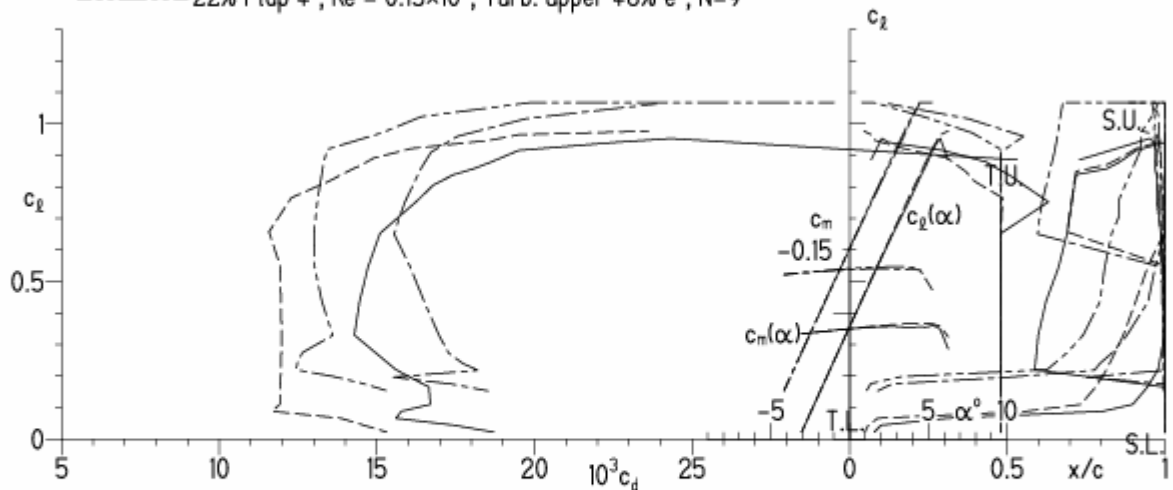


EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:14

**HQ/W-2,25/9,5 9.5%**

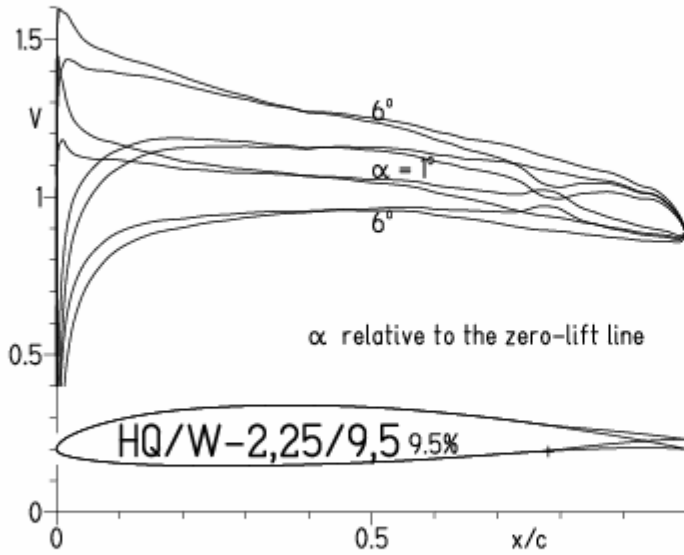
- Re = 75 000, Turb. upper 48%  $e^N$ , N=9
- - -  $0.15 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9
- · - 22% Flap 4°, Re = 75 000, Turb. upper 48%  $e^N$ , N=9
- · - 22% Flap 4°, Re =  $0.15 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9

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



HQ/W-2,25/9,5, N=11 mit -4° Wölbklappenausschlag

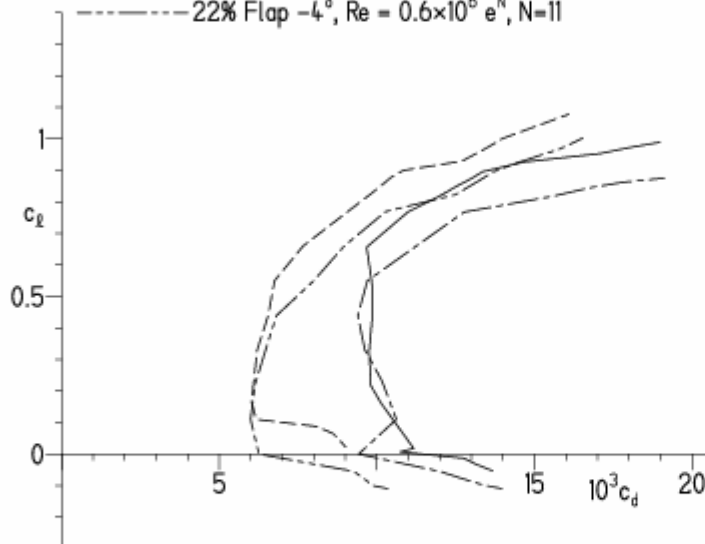
EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:31



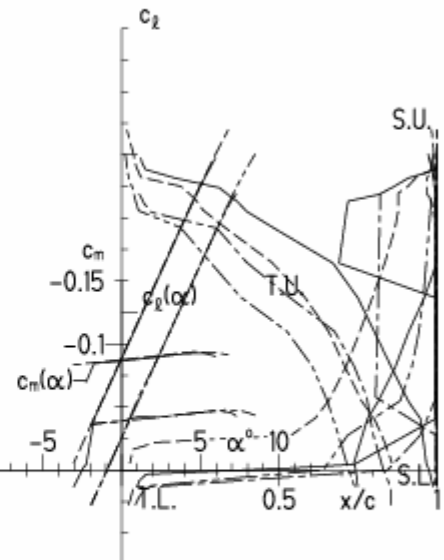
EPPLER 2005 V.

HQ/W-2,25/9,5 9.5%

- $Re = 0.2 \times 10^6 e^N, N=11$
- - -  $0.6 \times 10^6 e^N, N=11$
- · - · - 22% Flap -4°,  $Re = 0.2 \times 10^6 e^N, N=11$
- · - · - 22% Flap -4°,  $Re = 0.6 \times 10^6 e^N, N=11$

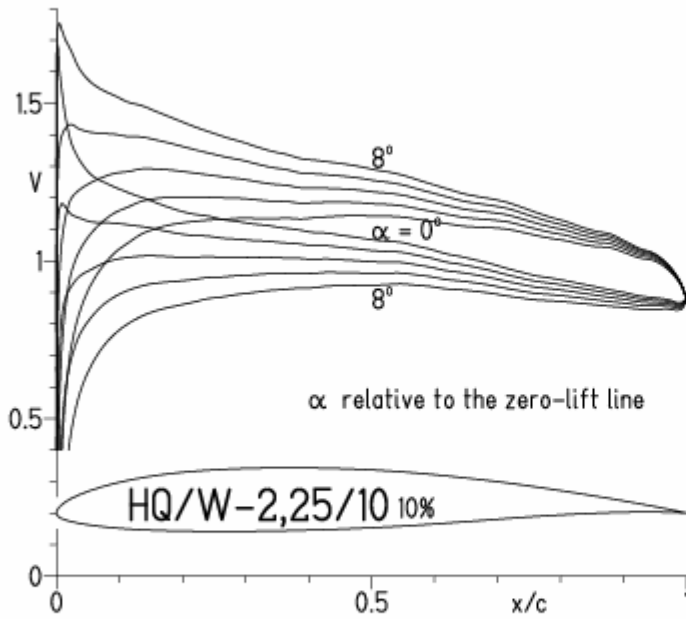


- T. boundary layer transition
- S. boundary layer separation
- U. upper surface
- L. lower surface

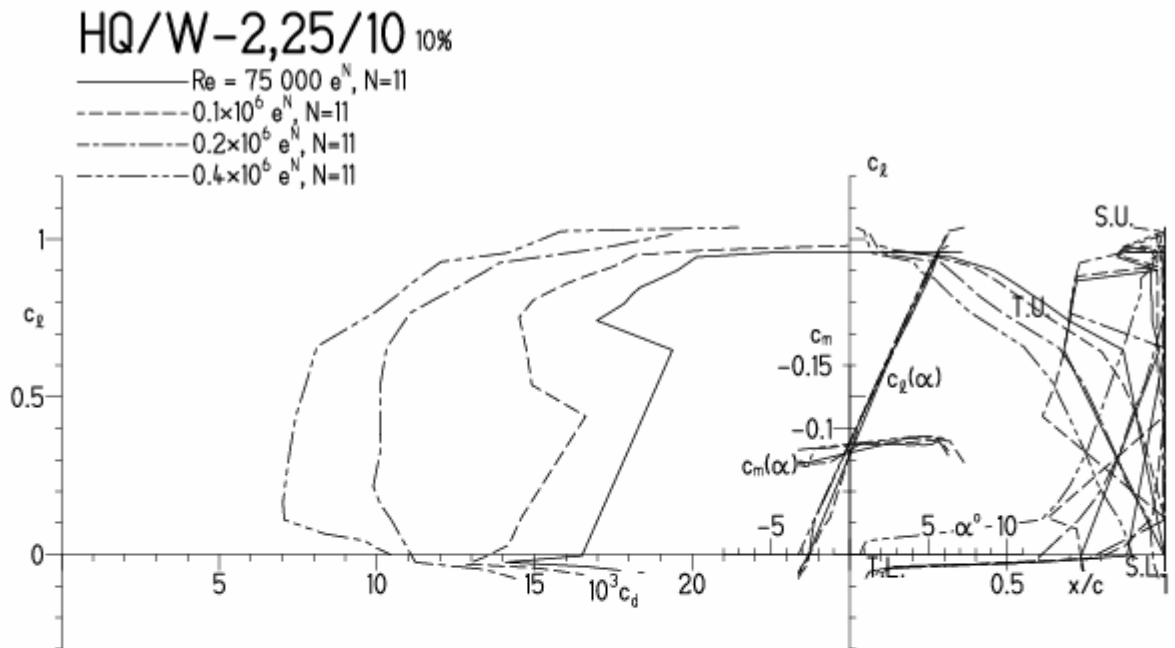


HQ/W-2,25/10, N=11

EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:47

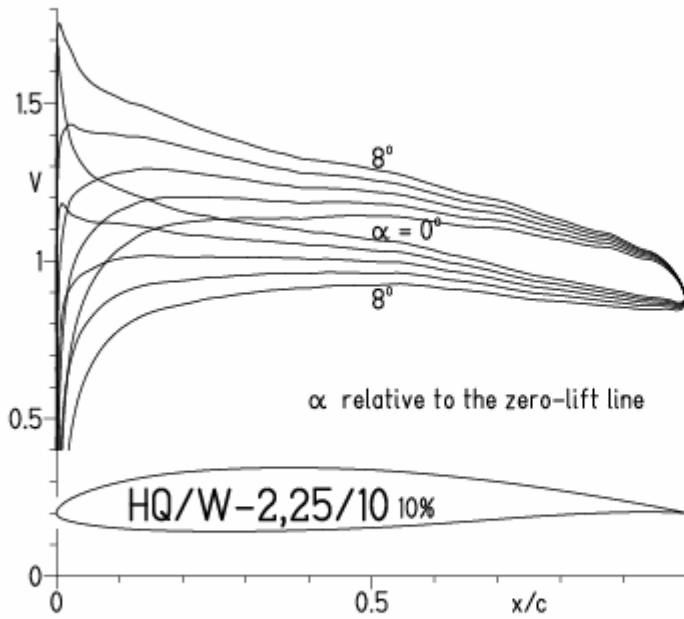


EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:47

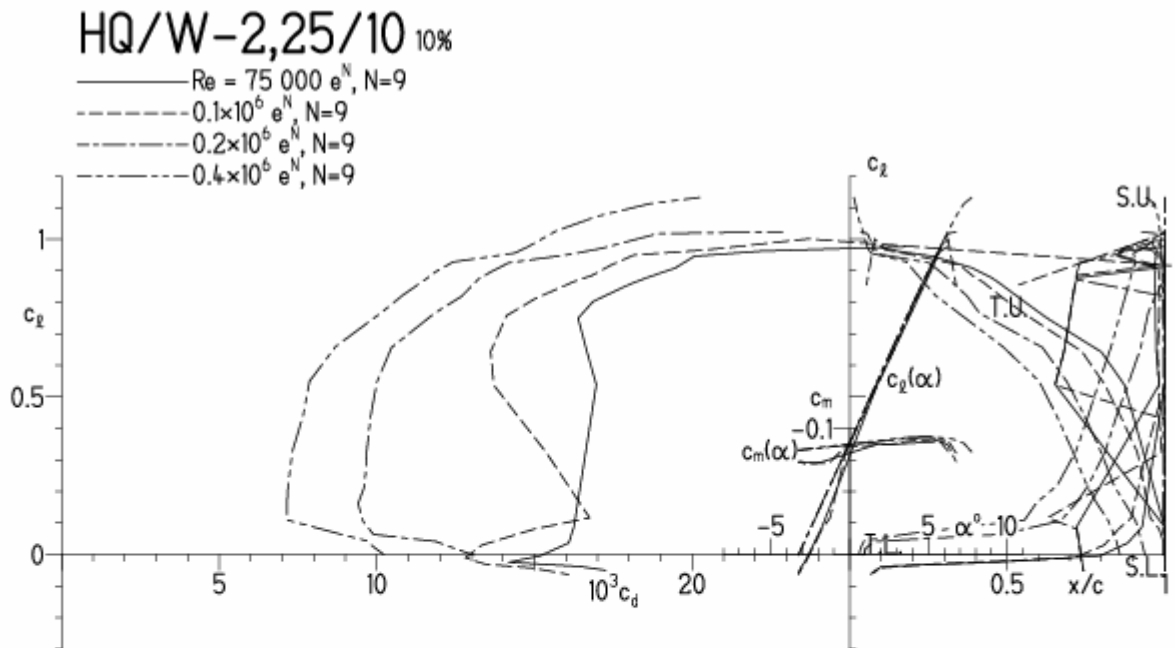


HQ/W-2,25/10, N=9

EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:53

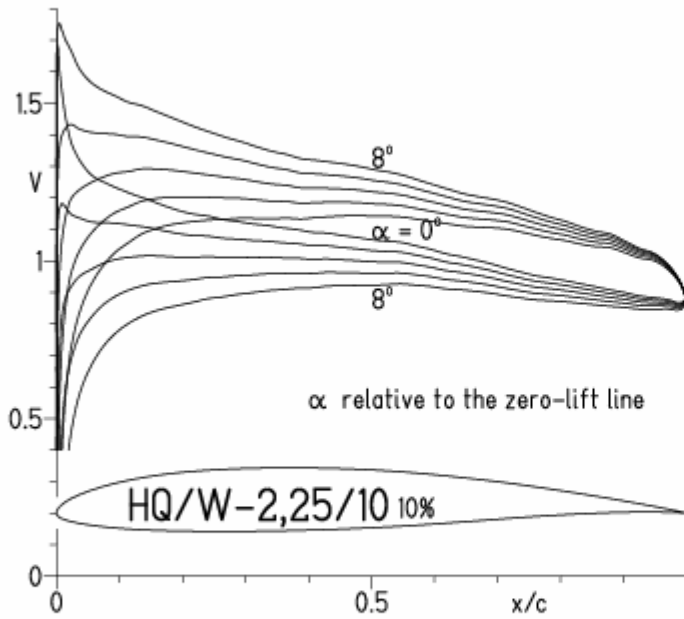


EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:53



HQ/W-2,25/10, N=9, (Turbulatoreffekt (optimal beim Maximum der Wölbung))

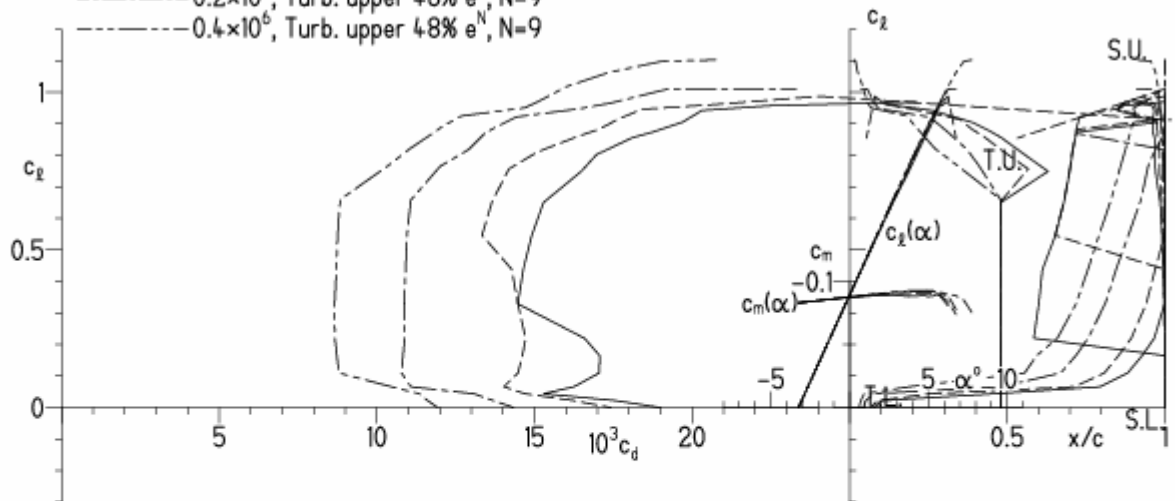
EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:56



EPPLER 2005 V. 8.5.07 RUN 8.3.11 17:56

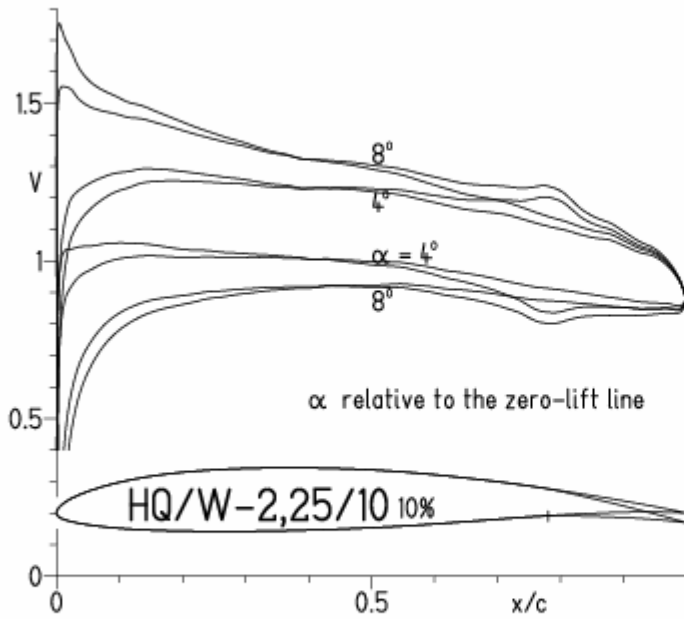
**HQ/W-2,25/10 10%**

- $Re = 75\ 000$ , Turb. upper 48%  $e^N$ , N=9
- - -  $0.1 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9
- · -  $0.2 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9
- - -  $0.4 \times 10^6$ , Turb. upper 48%  $e^N$ , N=9



HQ/W-2,25/10, N=11 mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:08

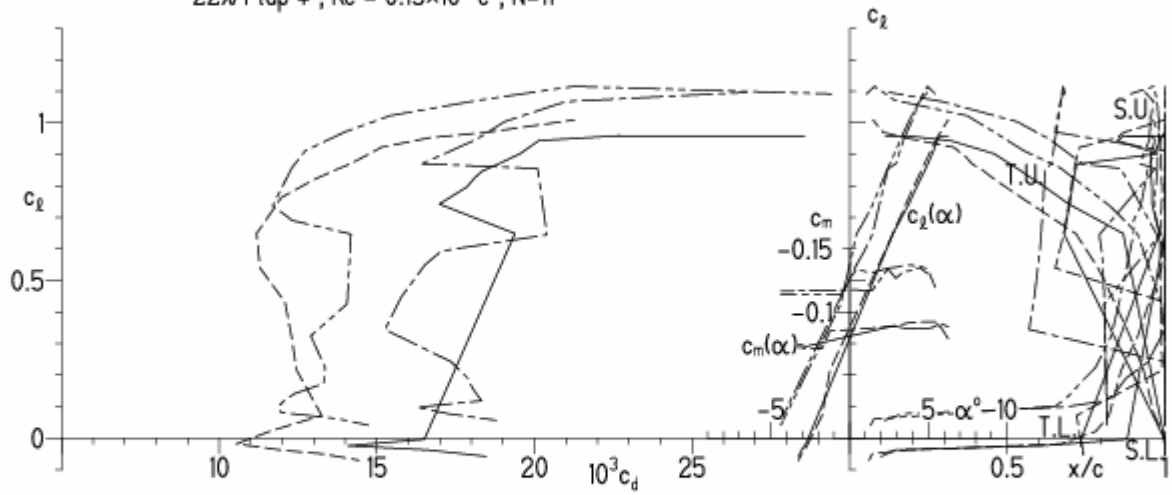


EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:08

**HQ/W-2,25/10** 10%

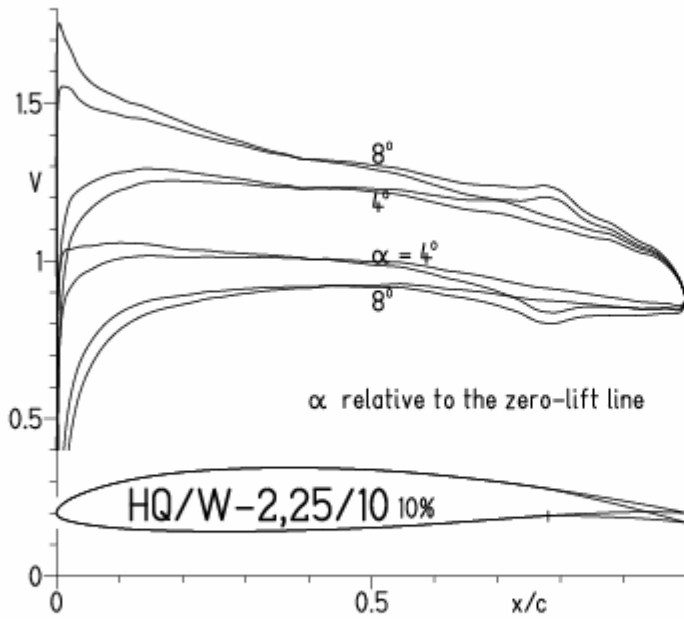
- $Re = 75\,000 e^N, N=11$
- - -  $0.15 \times 10^6 e^N, N=11$
- · - · 22% Flap 4°,  $Re = 75\,000 e^N, N=11$
- · - · 22% Flap 4°,  $Re = 0.15 \times 10^6 e^N, N=11$

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



HQ/W-2,25/10, N=9 mit +4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:16

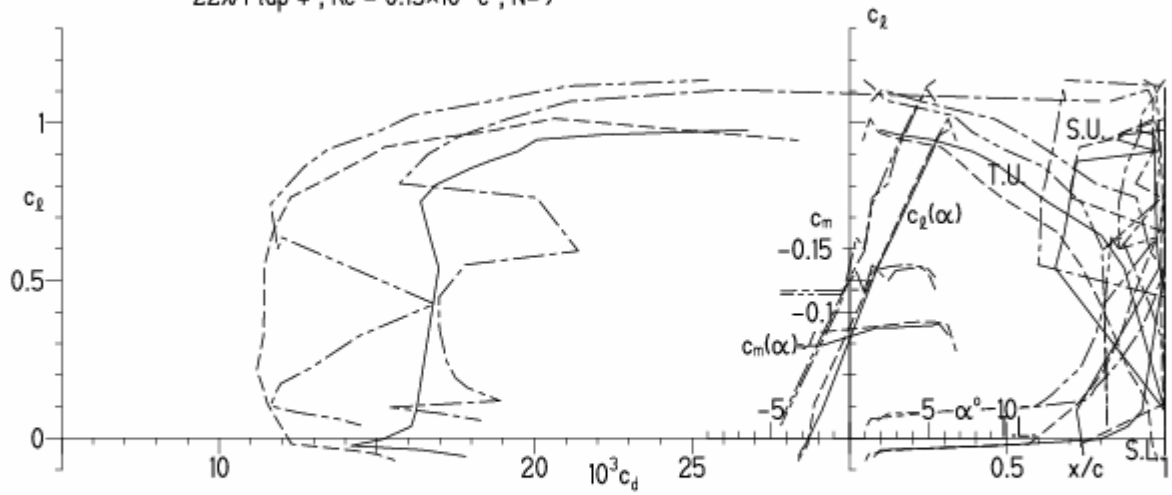


EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:16

HQ/W-2,25/10 10%

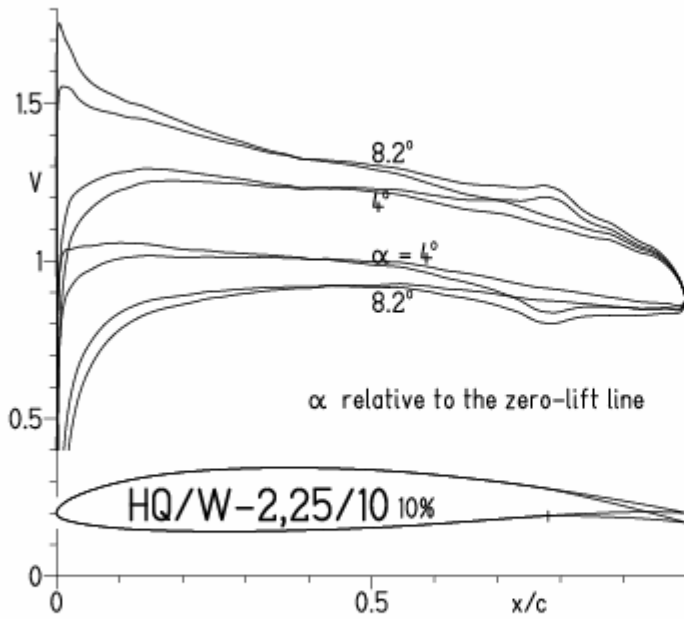
- $Re = 75\,000 e^N, N=9$
- - -  $0.15 \times 10^6 e^N, N=9$
- · - · 22% Flap 4°,  $Re = 75\,000 e^N, N=9$
- · - · 22% Flap 4°,  $Re = 0.15 \times 10^6 e^N, N=9$

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



HQ/W-2,25/10, N=9 mit +4° Wölbklappenausschlag, Turbulatoreffekt

EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:32

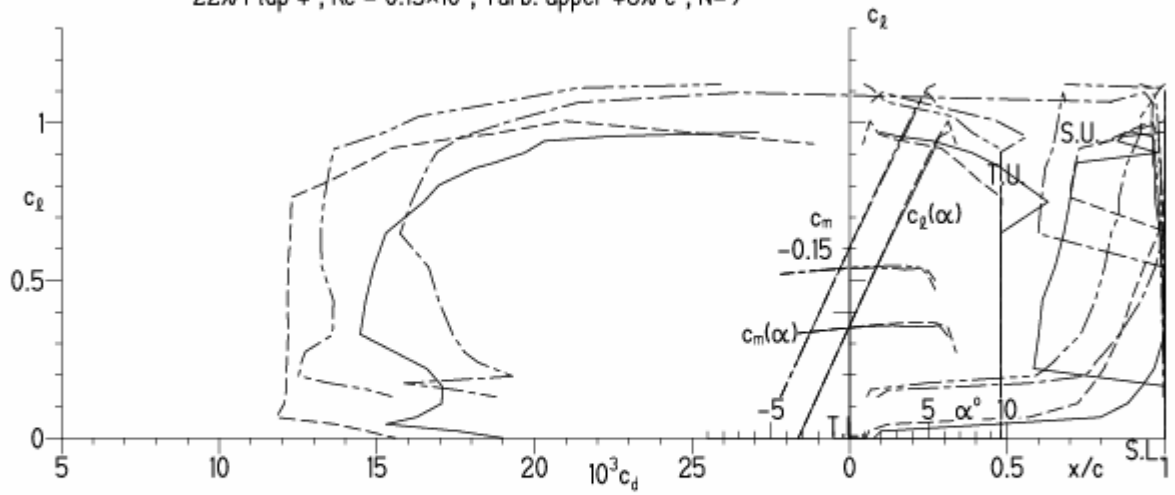


EPPLER 2005 V. 8.5.07 RUN 8.3

**HQ/W-2,25/10** 10%

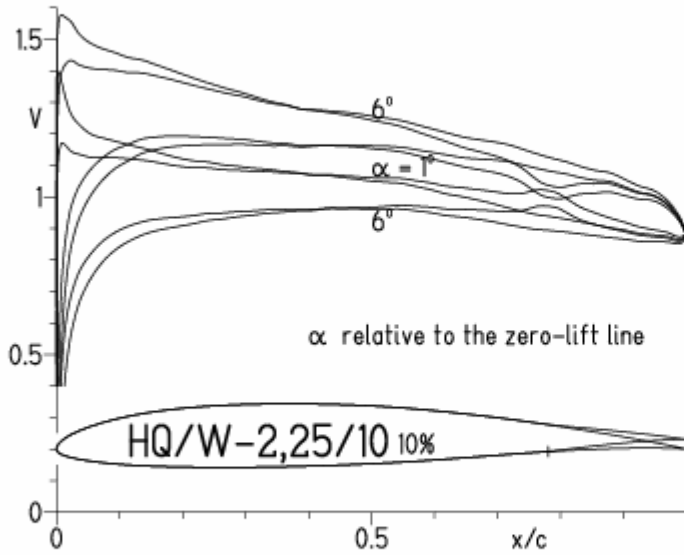
- Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- - - 0.15×10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 75 000, Turb. upper 48% e<sup>N</sup>, N=9
- · - 22% Flap 4°, Re = 0.15×10<sup>6</sup>, Turb. upper 48% e<sup>N</sup>, N=9

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



HQ/W-2,25/10, N=11 mit -4° Wölbklappenausschlag

EPPLER 2005 V. 8.5.07 RUN 8.3.11 18:23



EPPLER 2005 V. 8.5.07 RUN

