

Contrast steps C_{Y_i} ($i=1$ to 8), CIE tristimulus values Y_W and Y_N according to ISO 9241-306¹⁾

Contrast step C_{Y_i} and Y -ratio ($i=1 \dots 8$)	CIE tristimulus values; Ratio $Y_W : Y_N$ of White W and Black N	CIE tristimulus values; Range $Y_{N1} \dots Y_{N2}$	Display (E) illuminance ²⁾ ; Ratio [lux] $E_{WE} : E_{NE}$	Display (E) luminance ²⁾ ; Ratio [cd/m^2] $L_{WE} : L_{NE}$	application and colour mode at work place; illuminance on display 500 lux or 250/125/62 lux
C_{Y_8} 288:1	88,9 : 0,31	0,00 ... <0,46	445 : 1,55	142 : 0,50	display, only 062 lux
C_{Y_7} 144:1	88,9 : 0,62	0,46 ... <0,93	445 : 3,1	142 : 1,00	display, only 125 lux
C_{Y_6} 72:1	88,9 : 1,25	0,93 ... <1,87	445 : 6,2	142 : 2,00	display, only 250 lux
C_{Y_5} 36:1	88,9 : 2,50	1,87 ... <3,75	445 : 12,4	142 : 4,00	display & surface
C_{Y_4} 18:1	88,9 : 5,00	3,75 ... <7,50	445 : 24,8	142 : 8,00	display & surface
C_{Y_3} 9:1	88,9 : 10,0	7,50 ... <15,0	445 : 49,6	142 : 16,0	display & surface
C_{Y_2} 4,5:1	88,9 : 20,0	15,0 ... <30,0	445 : 99,2	142 : 32,0	display & surface
C_{Y_1} 2,2:1³⁾	88,9 : 40,0	30,0 ... <60,0	445 : 198	142 : 64,0	display & surface

1) The example shows data for emissive displays (E). The standard contrast step (bold) with $L_{NE} = 4 \text{ cd/m}^2$ may be reached.

2) Measurement of 445 (= $500 \cdot 0,889$) lux corresponds to the viewing luminance $L_v = 142 \text{ cd/m}^2$ for an emissive display (E).

3) For the contrast $C_Y = 36:1$ the viewing luminances of both the black paper and the black on the screen are equal.

Also the viewing luminances of all colours at the screen and the paper are equal, for example for a 16 step grey scale.

A visual fatigue based on an adaptation changes between paper and display is impossible

For all black surfaces it is valid $Y_N > 2,5$. Therefore high contrast steps are only possible at the displays by reduced reflection.