

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

Contrast step C_{Yi} and Y -ratio ($i=1 \dots 8$)	CIE tristimulus value; ratio $Y_W : Y_N$ White W and Black N	CIE tristimulus value; range $Y_{N1} \dots Y_{N2}$	Paper (S) luminance ²⁾ ; ratio [cd/m ²] $L_{WS} : L_{NS}$	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_{Y8} 288:1	88,9 : 0,31	0,00 ... <0,46	142 : 0,50	142 : 0,50	display, only 062 lux
C_{Y7} 144:1	88,9 : 0,62	0,46 ... <0,93	142 : 1,00	142 : 1,00	display, only 125 lux
C_{Y6} 72:1	88,9 : 1,25	0,93 ... <1,87	142 : 2,00	142 : 2,00	display, only 250 lux
C_{Y5} 36:1	88,9 : 2,50	1,87 ... <3,75	142 : 4,00	142 : 4,00	display and surface
C_{Y4} 18:1	88,9 : 5,00	3,75 ... <7,50	142 : 8,00	142 : 8,00	display and surface
C_{Y3} 9:1	88,9 : 10,0	7,50 ... <15,0	142 : 16,0	142 : 16,0	display and surface
C_{Y2} 4,5:1	88,9 : 20,0	15,0 ... <30,0	142 : 32,0	142 : 32,0	display and surface
C_{Y1} 2,25:1 ³⁾	88,9 : 40,0	30,0 ... <60,0	142 : 64,0	142 : 64,0	display and 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) 500 lux corresponds to the viewing luminance $L_v = 142 \text{ cd/m}^2$ for the standard offset paper (S) with the tristimulus value $Y_W = 88,9$.
- 3) 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).
- 4) 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.
- For all black surfaces it is valid $Y_N > 2,5$. Therefore high contrast steps are only possible at the displays by reduced reflection.