

Contrast step C_{Y_i} ($i=1$ to 8) and absolute and relative Gamma according to ISO 9241-306¹⁾

Contrast step C_{Y_i} and Y -ratio ($i=1 \dots 8$)	CIE tristimulus value; ratio $Y_W : Y_N$ White W and Black N	CIE tristimulus value; range $Y_{N1} \dots Y_{N2}$	absolute Gamma $G_{P_k}(k=0 \text{ to } 7)$ for display (P) with $G_{P0}=2,4^{2)}$ $G_{P_k}=2,4 \cdot 0,18^k$	relative Gamma $g_{P_k}(k=0 \text{ to } 7)$ for display (P) with $G_{P0}=2,4^{2)}$ $g_{P_k}=G_{P_k}/2,4$	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	$G_{P0} = 2,40$	$g_{P0} = 1,000$	display, only 062 lux
C_{Y7} 144:1	88,9 : 0,62	0,46 ... <0,93	$G_{P1} = 2,22$	$g_{P1} = 0,925$	display, only 125 lux
C_{Y6} 72:1	88,9 : 1,25	0,93 ... <1,87	$G_{P2} = 2,04$	$g_{P2} = 0,850$	display, only 250 lux
C_{Y5} 36:1	88,9 : 2,50	1,87 ... <3,75	$G_{P3} = 1,86$	$g_{P3} = 0,775$	display and surface
C_{Y4} 18:1	88,9 : 5,00	3,75 ... <7,50	$G_{P4} = 1,68$	$g_{P4} = 0,700$	display and surface
C_{Y3} 9:1	88,9 : 10,0	7,50 ... <15,0	$G_{P5} = 1,50$	$g_{P5} = 0,625$	display and surface
C_{Y2} 4,5:1	88,9 : 20,0	15,0 ... <30,0	$G_{P6} = 1,32$	$g_{P6} = 0,550$	display and surface
C_{Y1} 2,25:1 ³⁾	88,9 : 40,0	30,0 ... <60,0	$G_{P7} = 1,14$	$g_{P7} = 0,475$	display and surface

1) The example is intended for data projectors (P) with $G_{P0}=2,4$. compare IEC 61966-2-1: $G_{P0}=2,4$.
 2) The computer operating system *Apple* has used the value 1,8 until 2010. The change to 2,4 (= *Windows*) is in the wrong direction.
 3) For the contrast $C_Y=2:1$ the viewing luminances of both the black in the projection and the white standard offset paper are equal (!).
 Visual fatigue caused by the adaptation luminance ratio 36:1 of the black at the screen and the black at the paper shall be reduced.
 If for example a grey screen with the CIE tristimulus value $Y_Z = 22,2$ ($=0,25 \cdot 88,9$) is used the contrast step C_{Y_i} remains constant.
 Then the luminance ratio of all colours at the screen and the paper has reduced to 9:1. This reduces visual fatigue.