

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

Contrast step C_{Yi} 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 $Y_{N1} \dots Y_{N2}$	absolute Gamma G_{Pk} ($k=-3$ to 4) for display (P) with $G_{p0}=1,86^{2)}$ $G_{Pk}=1,86-0,18k$	relative Gamma g_{Pk} ($k=-3$ to 4) for display (P) with $G_{p0}=1,86^{2)}$ $g_{Pk}=G_{Pk}/1,86$	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	$G_{p,-3} = 2,40$	$g_{p,-3} = 1,29$	display, only 062 lux
C_{Y7} 144:1	88,9 : 0,62	0,46 ... <0,93	$G_{p,-2} = 2,22$	$g_{p,-2} = 1,20$	display, only 125 lux
C_{Y6} 72:1	88,9 : 1,25	0,93 ... <1,87	$G_{p,-1} = 2,04$	$g_{p,-1} = 1,10$	display, only 250 lux
C_{Y5} 36:1	88,9 : 2,50	1,87 ... <3,75	$G_{p0} = 1,86$	$g_{p0} = 1,00$	display & surface
C_{Y4} 18:1	88,9 : 5,00	3,75 ... <7,50	$G_{p1} = 1,68$	$g_{p1} = 0,90$	display & surface
C_{Y3} 9:1	88,9 : 10,0	7,50 ... <15,0	$G_{p2} = 1,50$	$g_{p2} = 0,81$	display & surface
C_{Y2} 4,5:1	88,9 : 20,0	15,0 ... <30,0	$G_{p3} = 1,32$	$g_{p3} = 0,71$	display & surface
C_{Y1} 2,25:1 ³⁾	88,9 : 40,0	30,0 ... <60,0	$G_{p4} = 1,14$	$g_{p4} = 0,61$	display & surface

- 1) The example is intended for data projectors (P) with $G_{p0}=1,86$. Compare NTSC television: $G_{p0}=1,8$.
- 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_{Y1} remains constant.
Then the luminance ratio of all colours at the screen and the paper has reduced to 9:1. This reduces visual fatigue.