

5 steps of grey series black – white ($N_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12							
Linear mixture between black and white in CIELAB colour space	<i>relative</i> CIELAB							
	<i>lab*</i> w _d <i>setgray</i>	<i>lab*</i> 000n _d =000n _a <i>000n_a setcmykcolor</i>	<i>lab*</i> cmy0 _d =cmy0 _a <i>cmy0_a setcmykcolor</i>	<i>lab*</i> rgb _d =rgb _a <i>rgb_a setrgbcolor</i>				
1,00N _d +0,00W _d (Black N _d)	0,00	0,00 0,00 0,00 1,00	1,00 1,00 1,00 0,00	0,00 0,00 0,00				
0,75N _d +0,25W _d	0,25	0,00 0,00 0,00 0,75	0,75 0,75 0,75 0,00	0,25 0,25 0,25				
0,50N _d +0,50W _d	0,50	0,00 0,00 0,00 0,50	0,50 0,50 0,50 0,00	0,50 0,50 0,50				
0,25N _d +0,75W _d	0,75	0,00 0,00 0,00 0,25	0,25 0,25 0,25 0,00	0,75 0,75 0,75				
0,00N _d +1,00W _d (white W _d)	1,00	0,00 0,00 0,00 0,00	0,00 0,00 0,00 0,00	1,00 1,00 1,00				

SS250-1

5 steps of grey series black – white ($N_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12						
Linear mixture between black and white in CIELAB colour space	<i>Standard CIELAB</i> $LAB^*LAB^*_d = LAB^*_d$ LAB^*_d <i>setcolor</i>			<i>adapted CIELAB</i> $LAB^*LAB^*_{a,d} = LAB^*_{a,d}$ $LAB^*_{a,d}$ <i>setcolor</i>			<i>relative CIELAB</i> $lab^*ncu^*_d = ncu^*_d$ ncu^*_d <i>setcolor</i>
1,00 N_d +0,00 W_d (Black N_d)	18,01	0,50	-0,40	18,01	0,00	0,00	1,00 0,00 R00Y _d
0,75 N_d +0,25 W_d	37,35	0,10	0,80	37,35	0,00	0,00	0,75 0,00 R00Y _d
0,50 N_d +0,50 W_d	56,70	-0,10	2,10	56,70	0,00	0,00	0,50 0,00 R00Y _d
0,25 N_d +0,75 W_d	76,05	-0,50	-3,40	76,05	0,00	0,00	0,25 0,00 R00Y _d
0,00 N_d +1,00 W_d (white W_d)	95,41	-0,98	4,76	95,41	0,00	0,00	0,00 0,00 R00Y _d

SS250-3

5 steps of colour series cyan blue – white ($C_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12		
Linear mixture between cyan blue and white in CIELAB colour space	<i>Standard CIELAB</i> $LAB^*LAB^*_d = LAB^*_d$ LAB^*_d <i>setcolor</i>	<i>relative CIELAB</i> $lab^*cmy0^*_d = cmy0^*_d$ $cmy0^*_d$ <i>setcmykcolor</i>	<i>relative CIELAB</i> $lab^*rgb^*_d = rgb^*_d$ rgb^*_d <i>setrgbcolor</i>
1,00 C_d + 0,00 W_d (cyan blue C_d)	58,62 -30,62 -42,74	1,00 0,00 0,00 0,00	0,00 1,00 1,00
0,75 C_d + 0,25 W_d	67,82 -23,21 -30,86	0,75 0,00 0,00 0,00	0,25 1,00 1,00
0,50 C_d + 0,50 W_d	77,02 -15,80 -18,98	0,50 0,00 0,00 0,00	0,50 1,00 1,00
0,25 C_d + 0,75 W_d	86,21 -8,39 -7,11	0,25 0,00 0,00 0,00	0,75 1,00 1,00
0,00 C_d + 1,00 W_d (white W_d)	95,41 -0,98 4,76	0,00 0,00 0,00 0,00	1,00 1,00 1,00

SS250-5

5 steps of colour series cyan blue – white ($C_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12						
Linear mixture between cyan blue and white in CIELAB colour space	<i>adapted CIELAB</i> $LAB^*LAB^*_{a,d}=LAB^*_{a,d}$ $LAB^*_{a,d}$ setcolor	<i>relative CIELAB</i> $lab^*tch^*_d = tch^*_d$ tch^*_d setcolor			<i>relative CIELAB</i> $lab^*ncu^*_d = ncu^*_d$ ncu^*_d setcolor		
1,00 C_d +0,00 W_d (cyan blue C_d)	58,62 -30,34 -45,01	0,500	1,000	0,656	0,000	1,000	G42 C_d
0,75 C_d +0,25 W_d	67,82 -22,75 -33,75	0,625	0,750	0,656	0,000	0,750	G42 C_d
0,50 C_d +0,50 W_d	77,02 -15,17 -22,50	0,750	0,500	0,656	0,000	0,500	G42 C_d
0,25 C_d +0,75 W_d	86,21 -7,58 -11,25	0,875	0,250	0,656	0,000	0,250	G42 C_d
0,00 C_d +1,00 W_d (white W_d)	95,41 0,00 0,00	1,000	0,000	0,000	0,000	0,000	R00 Y_d

SS250-7

gráfico TUB-SS25; colour space and coordinates
5 step colour scales and user friendly coordinates

Application of colour in daily life or in Colour Information Technology (IT)

Design, architecture, art, industrial products Measured for CIE standard illuminant D65	Colour Information Technology Measured for CIE illuminants D65 and D50
colour order system; name and coordinates: <i>RAL Design System (CIELAB)</i> $L^*C^*_{ab}h^*_{ab}$, lightness, chroma, hue angle <i>Munsell Colour System</i> <i>VCH</i> , lightness (Value), Chroma, Hue text <i>Natural Colour System (NCS)</i> ncu^*_c : relative blackness, relative chroma relative elementary hue text	Device system name and coordinates: Printer system (illuminants D50 or D65): $cm y_d$, content of "cyan, magenta, yellow" Display system (standard illuminant D65): $rgb_d/sRGB_d$, content of "red, green, blue" <i>No user friendly colour coordinates</i> <i>Nearly no connection to colour order systems</i>

Aim: define user friendly connection

New: Interpretation of the *rgb* colour data in the range 0 to 1 as elementary colour data *rgb**_e

Linear relations between *relative* and *absolute* coordinates $lab^*_d - LAB^*_d$ and $lab^*_e - LAB^*_e$
 $rgb^*_d - (L^*a^*b^*C^*_{ab}h_{ab})_d$ and $rgb^*_e - (L^*a^*b^*C^*_{ab}h_{ab})_e$ (CIELAB)
 $rgb_d - cmy_d$, $rgb^*_d - cmy^*_d$ and $rgb_e - cmy_e$, $rgb^*_e - cmy^*_e$ ("1-minus"-relation)
 $rgb^*_d - nce^*_d$, $rgb^*_d - ncu^*_d$ and $rgb^*_e - nce^*_e$, $rgb^*_e - ncu^*_e$
relative coordinates lab^*_e : elementary redness r^*_e , greenness g^*_e , blueness b^*_e , blackness n^*_e
chroma c^*_d , elementary hue e^*_e , elementary hue text u^*_e

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User friendly colorimetric CIE colour notation ncu_e^* or uic_e^* or nce_e^* and linear relation to rgb_e^* data

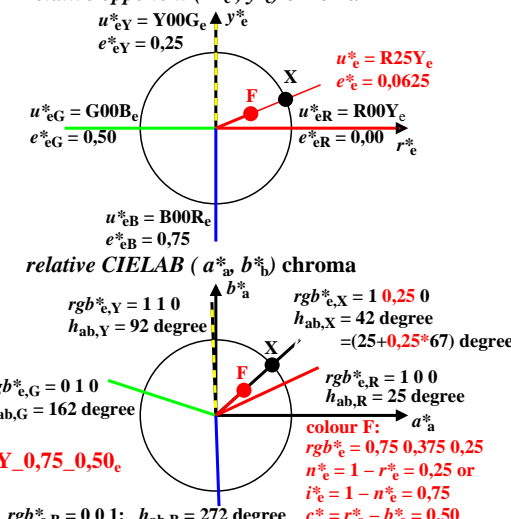
n^*_e relative blackness
 $i^*_e = 1 - n^*_e$ relative brilliance
 c^*_e relative chroma
 u^*_e elementary (unique) hue text
 e^* elementary hue number

[illegible]

examples for user colour notation:

$ncu^*_e = 0,25 \ 0,50 \ R25Y_e$ or $uic^*_e = R25Y_0,75_0,50_e$
or
 $nce^*_e = 0,25 \ 0,50 \ 0,0625 (=0,25/4)$ $rob^*_e = 0,01$

entrada: w/rgb/cmyk \rightarrow w/rgb/cmyk_d
salida: ningún cambio

relative opponent (r_c^* , y_c^*) **chroma**

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