

**CIELAB 1976  $L^*a^*b^*$ -espacio-color**  
 Definición y cambio

$$L^* = 116 (Y/Y_n)^{1/3} - 16$$

$$a^* = 500 [ (X/X_n)^{1/3} - (Y/Y_n)^{1/3} ]$$

$$b^* = 200 [ (Y/Y_n)^{1/3} - (Z/Z_n)^{1/3} ]$$

$$X = X_n [ (L^* + 16) / 116 + a^*/500 ]^3$$

$$Y = Y_n [ (L^* + 16) / 116 ]^3$$

$$Z = Z_n [ (L^* + 16) / 116 - b^*/200 ]^3$$

AF870-1N

$Q$ -function changes; transition from light- to color metrics

scaling function of **light metrics**:  
 $Q [k(x - u)] = Q[k(\log L - \log L_u)]$   
 log  $L \rightarrow$  log  $P$  for **color metrics**:  
 $Q[k(\log P - \log L_u)] = Q[k(\log L - \log L_u + \log P - \log L)]$   
 with saturation  $p = \log P - \log L$   
**for color metrics:  $Q [k(x - u + p)]$**

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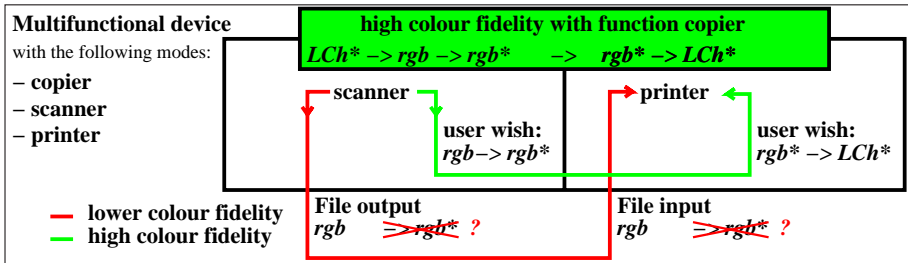
**Agreement (Y/N) of CIELAB  $h_{ab}$  with IEC 61966-2-1 and CIE R1-47**

	reference: device colours				NOTES visual standard deviation $v_{SD}$
	$R_{d,sRGB}$	$Y_{d,sRGB}$	$G_{d,sRGB}$	$B_{d,sRGB}$	
<b>definition for display output in IEC 61966-2-1</b>	40 +/- 4 40 +/- 8	103 +/- 4 103 +/- 8	136 +/- 4 136 +/- 8	306 +/- 8 306 +/- 16	1 x $v_{SD}$ 2 x $v_{SD}$ data see [1], Tab. B.2
<b>measurement of printer output <math>rgb</math> in file</b>	34 N(-2) 34 Y	100 Y 100 Y	146 N(+8) 146 N(+2)	264 N(-34) 264 N(-26)	1 x $v_{SD}$ ; 1 x Y 2 x $v_{SD}$ ; 2 x Y data see [1], Fig. 32
<b>measurement of printer output <math>cmY0</math> in file</b>	34 N(-2) 34 Y	100 Y 100 Y	153 N(+15) 153 N(+9)	300 Y 300 Y	1 x $v_{SD}$ ; 2 x Y 2 x $v_{SD}$ ; 3 x Y data see [1], Fig. 33

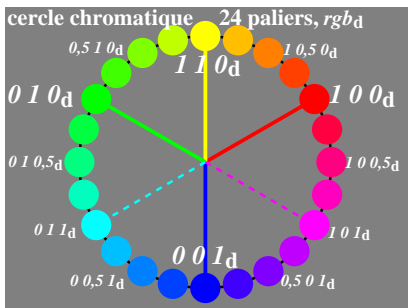
  

	reference: elementary colours				NOTES visual standard deviation $v_{SD}$
	$R_e$	$Y_e$	$G_e$	$B_e$	
<b>definition for any output in CIE R1-47</b>	26 +/- 4 26 +/- 8	92 +/- 4 92 +/- 8	162 +/- 4 162 +/- 8	272 +/- 8 272 +/- 16	1 x $v_{SD}$ 2 x $v_{SD}$ data see CIE R1-47
<b>measurement of printer output <math>rgb</math> in file</b>	34 N(+4) 34 Y	100 N(+4) 100 Y	146 N(-12) 146 N(-8)	264 N(-4) 264 Y	1 x $v_{SD}$ ; 0 x Y 2 x $v_{SD}$ ; 3 x Y data see [1], Fig. 32
<b>measurement of printer output <math>cmY0</math> in file</b>	34 N(+4) 34 Y	100 N(+4) 100 Y	153 N(-5) 153 N(-1)	300 N(+20) 300 N(+12)	1 x $v_{SD}$ ; 0 x Y 2 x $v_{SD}$ ; 2 x Y data see [1], Fig. 33

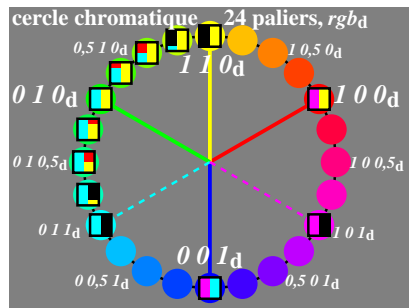
AF871-3N



AF870-3N



AF870-5N



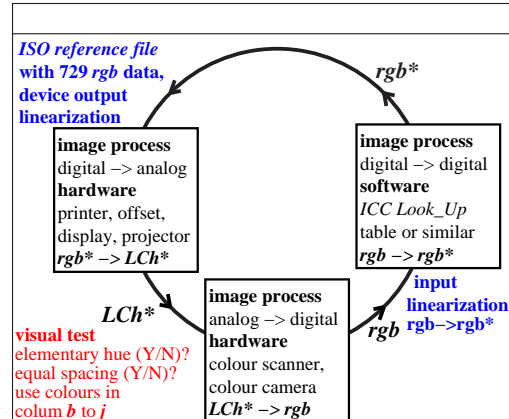
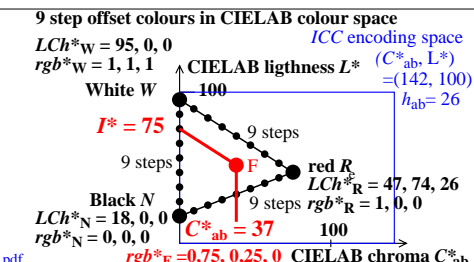
AF870-6N

**Offset  $rgb^*$  input data and  $LCh^*$  output data**

Color	$rgb^*$	$LCh^*$
$R_e$ elementary red	1 0 0	47, 74, 26
$Y_e$ elementary yellow	1 1 0	86, 88, 92
$G_e$ elementary green	0 1 0	53, 57, 164
$B_e$ elementary blue	0 0 1	42, 45, 271
N black	0 0 0	18, 0, 0
W white	1 1 1	95, 0, 0

Data according to test chart DIN 33872-2, p.9-12  
<http://farbe.li.tu-berlin.de/A/33872E.html>  
 Elementary-hue angles of CIE R1-47, see  
<http://web.archive.org/web/20160304130704/http://files.cie.co.at/526.pdf>

AF870-7N



AF871-7N