

CIE LAB 1976 $L^*a^*b^*$ -color space definition and reversal

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

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

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

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

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

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

AN870-1N

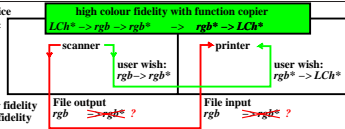
Q -function changes; transition
 from light- to color metrics
 scaling function of light metrics:
 $Q[k(x - u)] = Q[k(\log L - \log L_u)]$
 $\log L \rightarrow \log P$ for color metrics:
 $Q[k(\log L - \log L_u)]$
 $= Q[k(\log L - \log L_u + \log P - \log L)]$
 with saturation $p = \log P - \log L$
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

AN870-2N

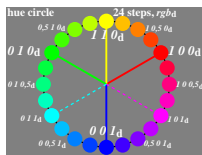
Multifunctional device

with the following modes:

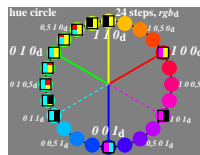
- copier
- scanner
- printer



AN870-3N



AN870-5N



AN870-6N

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

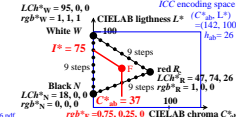
http://farbe.li.tu-berlin.de/A33872.html

Elementary-hue angles of CIE R1-47, see

http://web.archive.org/web/20160304130704/http://files.cie.co.at/524.pdf

AN870-7N

9 step offset colours in CIE LAB colour space



ICC encoding space

$LCh^*_W = 95, 0, 0$

$rgb^*_W = 1, 1, 1$

$C^*_{ab} = 142, 100$

$h^*_{ab} = 26$

$I^* = 75$

9 steps

$Red R_e$ $LCh^*_R = 47, 74, 26$

$LCh^*_N = 18, 0, 0$

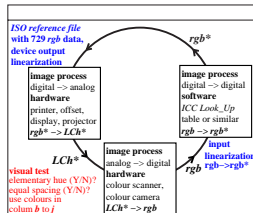
$rgb^*_N = 0, 0, 0$

$rgb^*_B = 0, 75, 0, 25, 0$ CIE LAB chroma C^*_{ab}

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

	reference: device colours		reference: elementary colours	
	$R_{d,sRGB}$	$Y_{d,sRGB}$	$G_{d,sRGB}$	$B_{d,sRGB}$
NOTES				
visual standard deviation v_{SD}				
definition for display output in IEC 61966-2-1	40 +/- 4 40 +/- 8	103 +/- 4 103 +/- 8	136 +/- 4 136 +/- 8	306 +/- 8 306 +/- 16
measurement of printer output rgb in file	34 N(-2) 34 Y	100 Y 100 Y	146 N(+8) 146 N(+2)	264 N(-34) 264 N(-26)
measurement of printer output cmy in file	34 N(-2) 34 Y	100 Y 100 Y	153 N(+15) 153 N(+9)	300 Y 300 Y
NOTES				
visual standard deviation v_{SD}				
definition for any output in CIE R1-47	26 +/- 4 26 +/- 8	92 +/- 4 92 +/- 8	162 +/- 4 162 +/- 8	272 +/- 8 272 +/- 16
measurement of printer output rgb in file	34 N(+4) 34 Y	100 N(+4) 100 Y	146 N(-12) 146 N(-8)	264 N(-4) 264 Y
measurement of printer output cmy in file	34 N(+4) 34 Y	100 N(+4) 100 Y	153 N(-5) 153 N(-1)	300 N(+20) 300 N(+12)

AN871-5N



AN871-7N

TUB-test chart AN87; Examples of colour metric
 User coordinates and device calibration

input: w/rgb/cmyk -> w/rgb/cmyk
 output: no change compared