

Input and Output: Television Luminous System TLS00a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

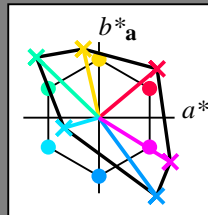
hue text for the colours

of this page:

$H^*_eR00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

H^*_e	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 158$

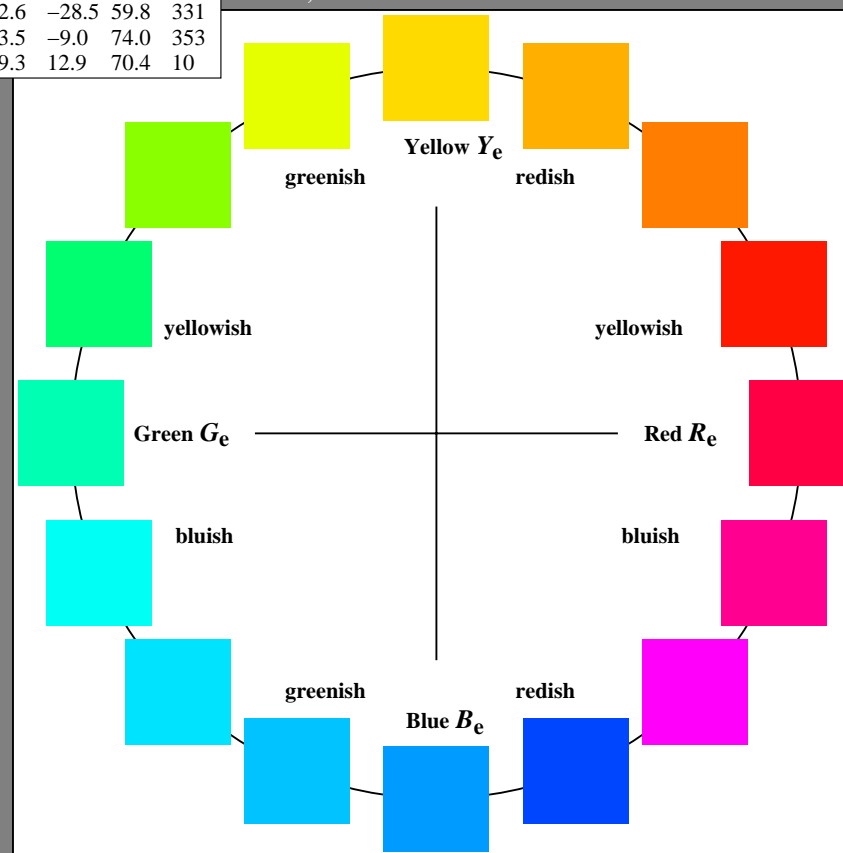
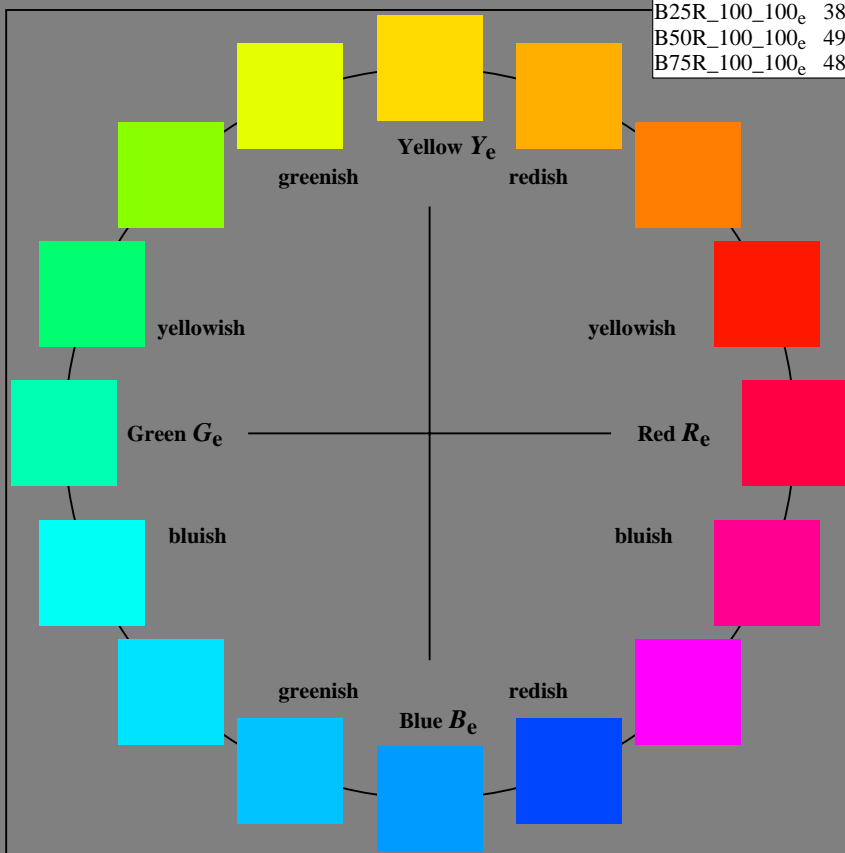
%Regularity

$g^*H_{rel} = 19$

$g^*C_{rel} = 37$

TLS00a; adapted (a) CIELAB data

name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_e, Ma	50.5	76.9	64.5	100.4	40
Y_e, Ma	92.6	-20.6	90.7	93.0	102
G_e, Ma	83.6	-82.7	79.9	115.0	136
C_e, Ma	86.8	-46.1	-13.5	48.0	196
B_e, Ma	30.3	76.0	-103.6	128.5	306
M_e, Ma	57.3	94.3	-58.4	110.9	328
N_e, Ma	0.0	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

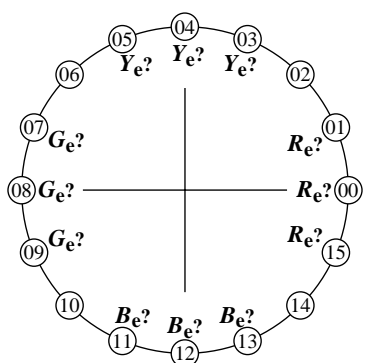
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .

No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)

Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)

Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)

Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11001

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY8_1.PDF

either PDF-file transfer "download, copy" to PDF device:.....

or with computer system interpretation by "Display-PDF":.....

or with software e. g. Adobe-Reader/-Acrobat and version:.....

or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY8_1.PS

either PS-file transfer "download, copy" to PS device:.....

or with computer system interpretation by "Display-PS":.....

or with software e. g. Ghostscript and version:.....

or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

.....

.....

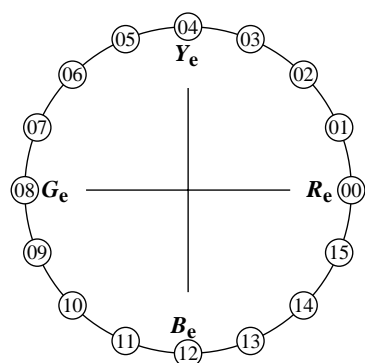
.....

part 3,

AE660-7de: 11001

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.

All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.

2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.

The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.

The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.

List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11001

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:

either according to DIN 6160:1996 with Anomaloskop of Nagel

or with test charts using colour points according to Ishihara

or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY8_3.PS

underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11001

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 3/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	0,00	0,00	0,00	0,00	0,01
2	6,36	0,00	0,06	0,00	0,01
3	12,72	0,00	0,13	0,00	0,01
4	19,08	0,00	0,20	0,00	0,01
5	25,44	0,00	0,26	0,00	0,01
6	31,80	0,00	0,33	0,00	0,01
7	38,16	0,00	0,40	0,00	0,01
8	44,52	0,00	0,46	0,00	0,01
9	50,88	0,00	0,53	0,00	0,01
10	57,24	0,00	0,60	0,00	0,01
11	63,60	0,00	0,66	0,00	0,01
12	69,96	0,00	0,73	0,00	0,01
13	76,32	0,00	0,80	0,00	0,01
14	82,68	0,00	0,86	0,00	0,01
15	89,04	0,00	0,93	0,00	0,01
16	95,41	0,00	1,00	0,00	0,01
17	0,00	0,00	0,00	0,00	0,01
18	23,85	0,00	0,25	0,00	0,01
19	47,70	0,00	0,50	0,00	0,01
20	71,55	0,00	0,75	0,00	0,01
21	95,41	0,00	1,00	0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

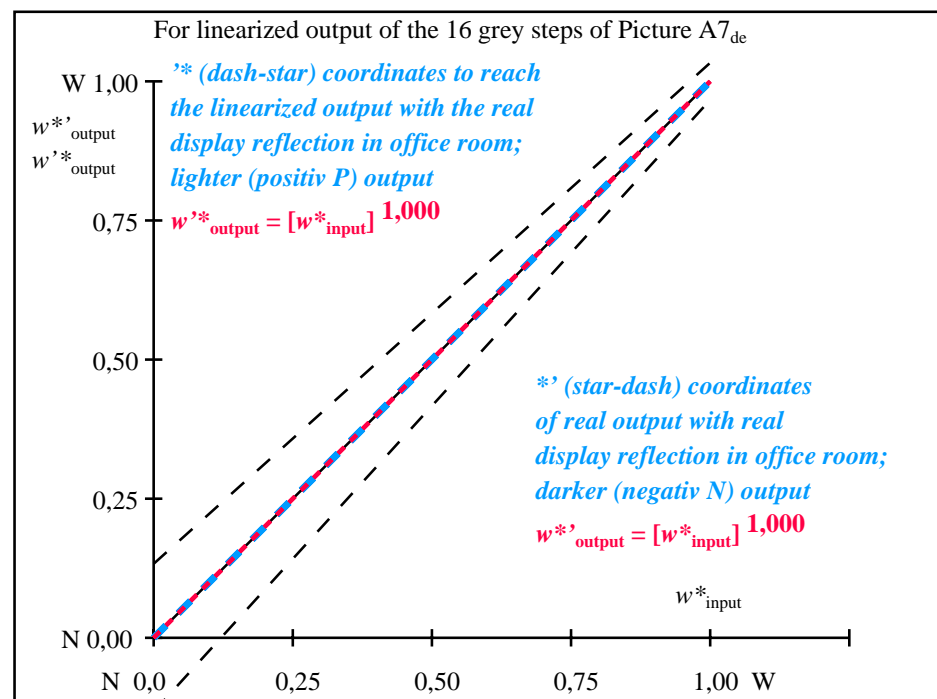
Mean lightness difference
(16 steps)
 $\Delta E^*_{\text{CIELAB}} = 0,0$

Mean lightness difference
(5 steps)
 $\Delta L^*_{\text{CIELAB}} = 0,0$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 99,9$

part 1,

AE660-3de: 11002



part 2,

AE661-3de: 11002

L^*/Y_{intended} (absolute)	0,0/0,0	6,3/0,7	12,7/1,5	19,0/2,7	25,4/4,5	31,8/6,9	38,1/10,1	44,5/14,2	50,8/19,1	57,2/25,1	63,6/32,3	69,9/40,7	76,3/50,4	82,6/61,5	89,0/74,2	95,4/88,5
0 0 0 n*																
setcmyk																
gp=1,000																
No. and																
Hex code																
$w^* = l^*_{\text{CIELAB}, r}$ (relative)																
w^*_{intended}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11002

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:0,31$; Y_N -range 0,0 to <0,46

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{\text{de}}$ setrgbcolor

Input and Output: Television Luminous System TLS06a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

hue text for the colours

of this page:

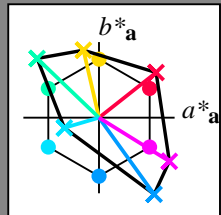
$H^*_eR00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

H^*_e	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10

TLS06a; adapted (a) CIELAB data

name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_e, Ma	51.0	75.5	59.6	96.2	38
Y_e, Ma	92.6	-20.5	89.2	91.5	102
G_e, Ma	83.7	-81.7	78.3	113.2	136
C_e, Ma	86.9	-45.7	-13.4	47.6	196
B_e, Ma	31.7	72.9	-101.3	124.8	305
M_e, Ma	57.7	93.0	-57.7	109.5	328
N_e, Ma	5.6	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



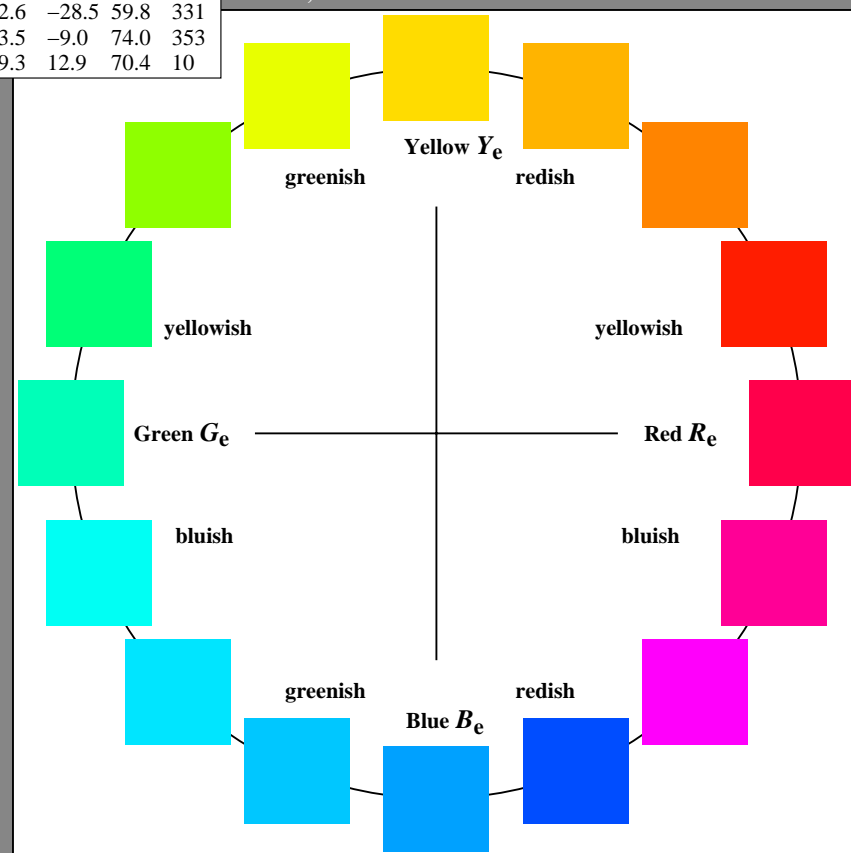
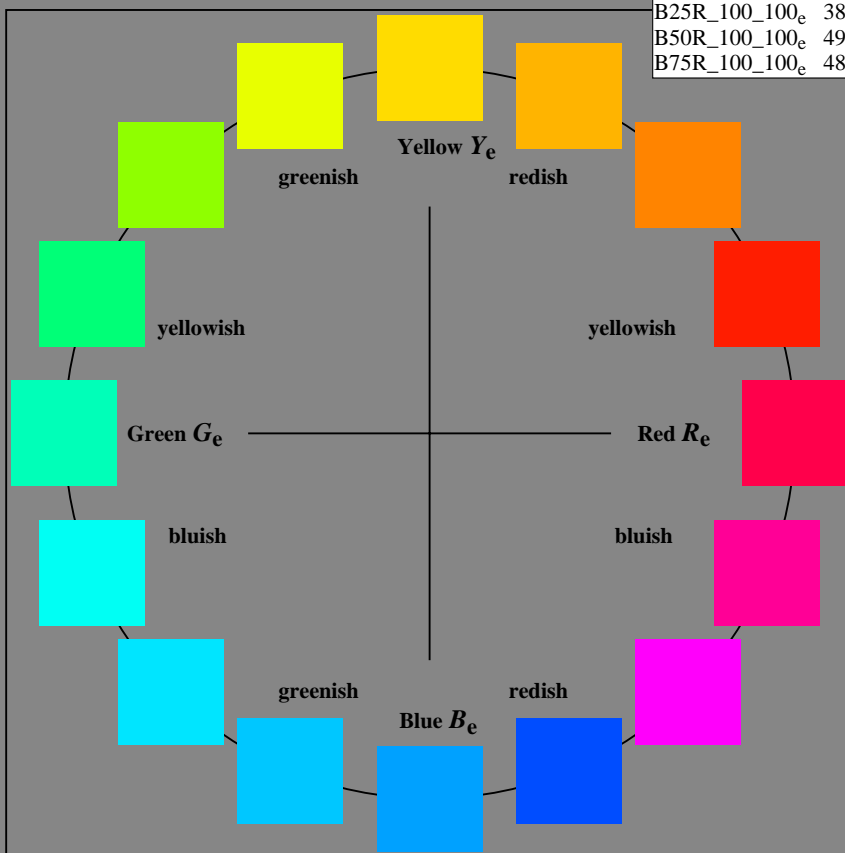
%Gamut

$u^*_{rel} = 145$

%Regularity

$g^*H_{rel} = 20$

$g^*C_{rel} = 38$



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

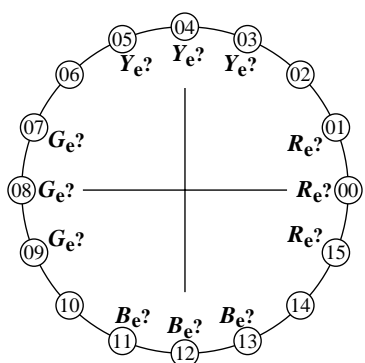
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11011

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY7_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY7_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

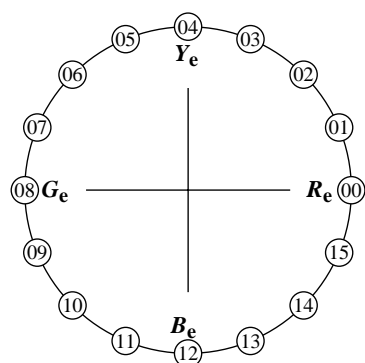
.....
.....
.....

part 3,

AE660-7de: 11011

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11011

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY7_3.PS

underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11011

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 6/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	5,69 0,00 0,00	0,00	5,69 0,00 0,00	0,00 0,00 0,00	0,01
2	11,67 0,00 0,00	0,10	14,73 0,00 0,00	3,05 0,00 0,00	3,05
3	17,65 0,00 0,00	0,18	21,95 0,00 0,00	4,30 0,00 0,00	4,30
4	23,63 0,00 0,00	0,25	28,62 0,00 0,00	4,99 0,00 0,00	4,99
5	29,61 0,00 0,00	0,32	34,96 0,00 0,00	5,34 0,00 0,00	5,34
6	35,59 0,00 0,00	0,39	41,05 0,00 0,00	5,45 0,00 0,00	5,45
7	41,57 0,00 0,00	0,46	46,96 0,00 0,00	5,38 0,00 0,00	5,38
8	47,55 0,00 0,00	0,52	52,72 0,00 0,00	5,16 0,00 0,00	5,16
9	53,54 0,00 0,00	0,58	58,35 0,00 0,00	4,81 0,00 0,00	4,81
10	59,52 0,00 0,00	0,64	63,88 0,00 0,00	4,36 0,00 0,00	4,36
11	65,50 0,00 0,00	0,70	69,31 0,00 0,00	3,81 0,00 0,00	3,81
12	71,48 0,00 0,00	0,76	74,67 0,00 0,00	3,18 0,00 0,00	3,18
13	77,46 0,00 0,00	0,82	79,95 0,00 0,00	2,48 0,00 0,00	2,48
14	83,44 0,00 0,00	0,88	85,16 0,00 0,00	1,71 0,00 0,00	1,71
15	89,42 0,00 0,00	0,94	90,31 0,00 0,00	0,88 0,00 0,00	0,88
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	5,69 0,00 0,00	0,00	5,69 0,00 0,00	0,00 0,00 0,00	0,01
18	28,12 0,00 0,00	0,30	33,40 0,00 0,00	5,28 0,00 0,00	5,28
19	50,55 0,00 0,00	0,55	55,55 0,00 0,00	5,00 0,00 0,00	5,00
20	72,98 0,00 0,00	0,78	75,99 0,00 0,00	3,01 0,00 0,00	3,01
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

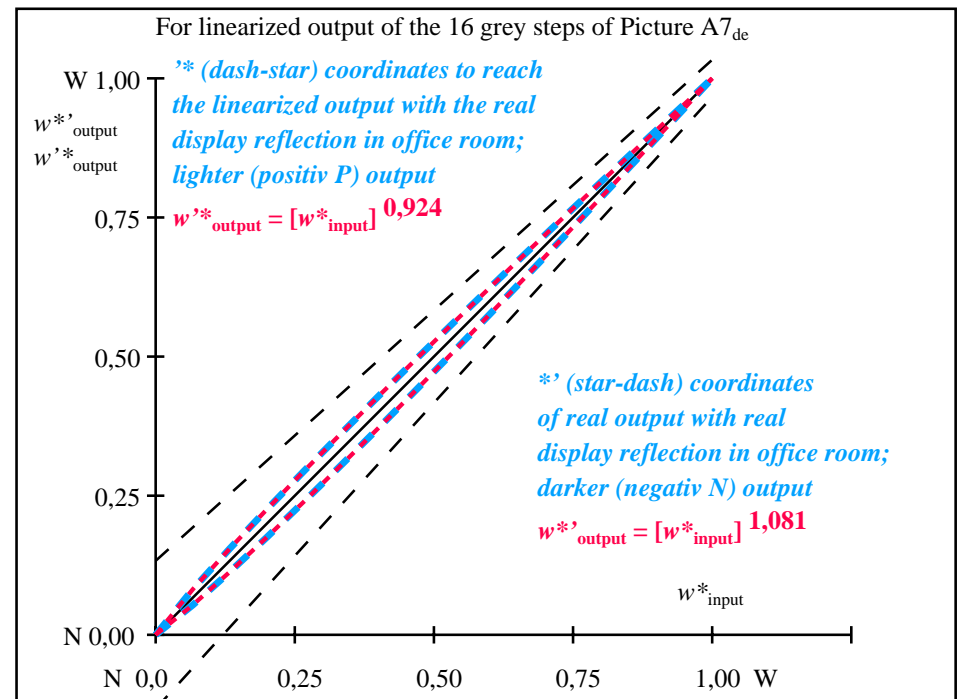
Mean lightness difference
(16 steps)
 $\Delta E^*_{\text{CIELAB}} = 3,4$

Mean lightness difference
(5 steps)
 $\Delta L^*_{\text{CIELAB}} = 2,6$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 85,0$

part 1,

AE660-3de: 11012



part 2,

AE661-3de: 11012

L^*/Y_{intended} (absolute)	5,6/0,6	11,6/1,3	17,6/2,4	23,6/3,9	29,6/6,0	35,5/8,8	41,5/12,2	47,5/16,4	53,5/21,5	59,5/27,5	65,5/34,6	71,4/42,8	77,4/52,3	83,4/63,0	89,4/75,0	95,4/88,5
0 0 0 n* setcmyk gp=0,924 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{\text{CIELAB}, r}$ (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{intended} w^*_{output}	0,000 0,000	0,067 0,082	0,133 0,154	0,200 0,225	0,267 0,294	0,333 0,361	0,400 0,428	0,467 0,494	0,533 0,558	0,600 0,623	0,667 0,687	0,733 0,750	0,800 0,813	0,867 0,876	0,933 0,937	1,000 1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11012

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:0,62$; Y_N -range 0,46 to <0,93

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{\text{de}}$ setrgbcolor

Input and Output: Television Luminous System TLS11a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

hue text for the colours

of this page:

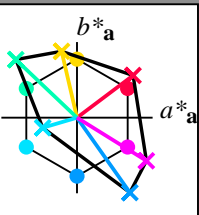
$H^*_eR00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

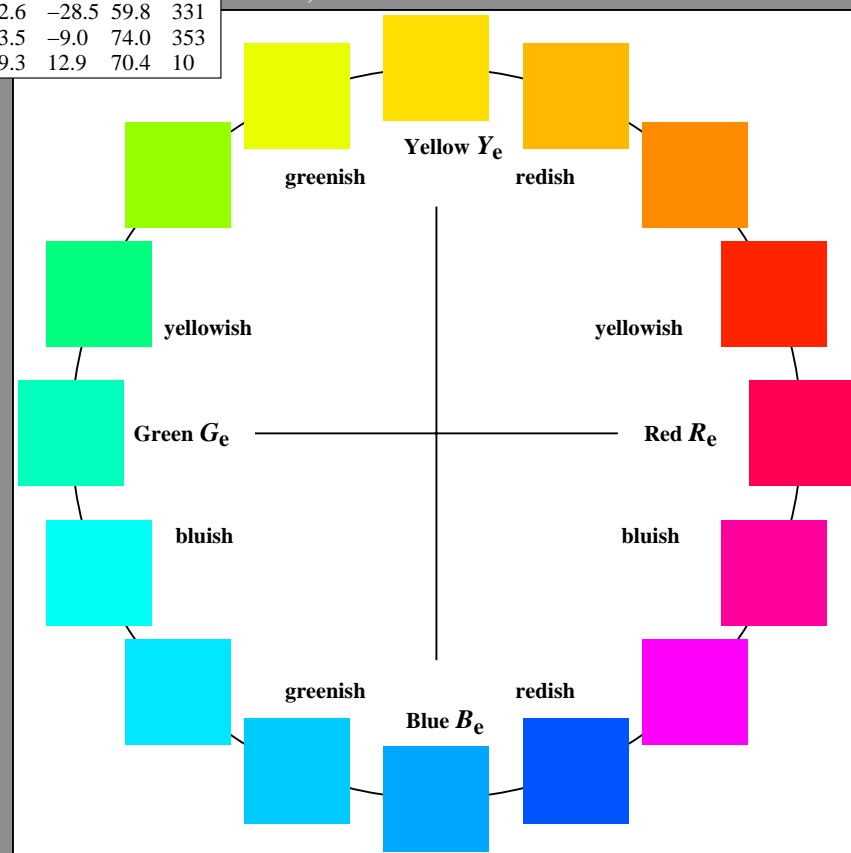
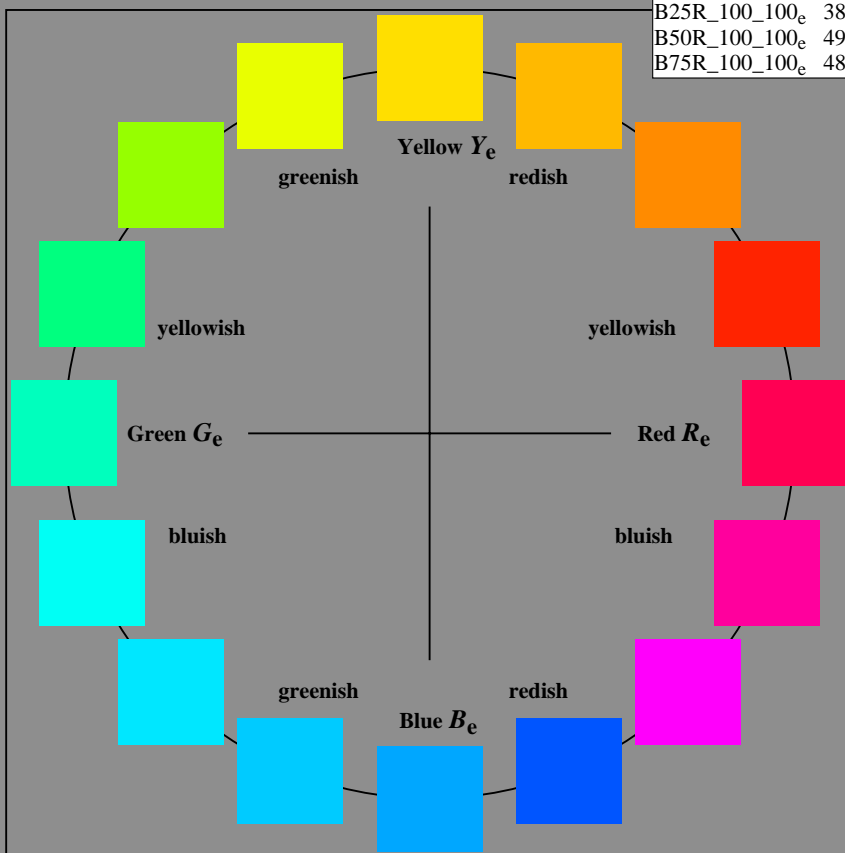
H^*_e	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10

TLS11a; adapted (a) CIELAB data

name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_e, Ma	51.6	74.2	55.8	92.8	36
Y_e, Ma	92.7	-20.3	87.7	90.0	103
G_e, Ma	83.8	-80.8	76.8	111.5	136
C_e, Ma	87.0	-45.2	-13.3	47.2	196
B_e, Ma	33.0	70.0	-99.0	121.3	305
M_e, Ma	58.1	91.8	-57.0	108.0	328
N_e, Ma	10.9	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



%Gamut
 $u^*_{rel} = 134$
%Regularity
 $g^*H_{rel} = 21$
 $g^*C_{rel} = 38$



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

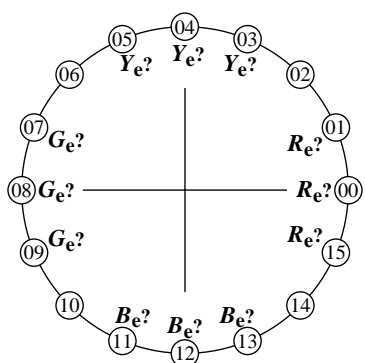
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11021

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY6_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY6_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

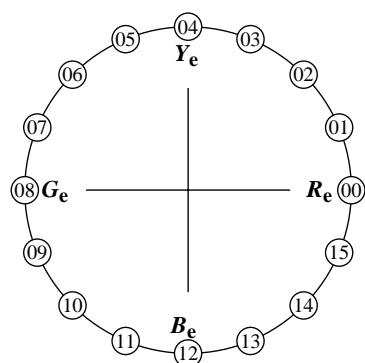
Special remarks: e. g. output of Landscape (L)

part 3,

AE660-7de: 11021

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11021

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY6_3.PS

or underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11021

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ setrgbcolor

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 9/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	10,99 0,00 0,00	0,00	10,99 0,00 0,00	0,00 0,00 0,00	0,01
2	16,62 0,00 0,00	0,13	22,51 0,00 0,00	5,89 0,00 0,00	5,89
3	22,24 0,00 0,00	0,22	30,17 0,00 0,00	7,93 0,00 0,00	7,93
4	27,87 0,00 0,00	0,30	36,84 0,00 0,00	8,96 0,00 0,00	8,96
5	33,50 0,00 0,00	0,37	42,93 0,00 0,00	9,42 0,00 0,00	9,42
6	39,13 0,00 0,00	0,44	48,62 0,00 0,00	9,49 0,00 0,00	9,49
7	44,75 0,00 0,00	0,50	54,02 0,00 0,00	9,26 0,00 0,00	9,26
8	50,38 0,00 0,00	0,57	59,19 0,00 0,00	8,80 0,00 0,00	8,80
9	56,01 0,00 0,00	0,62	64,16 0,00 0,00	8,15 0,00 0,00	8,15
10	61,64 0,00 0,00	0,68	68,97 0,00 0,00	7,33 0,00 0,00	7,33
11	67,27 0,00 0,00	0,74	73,64 0,00 0,00	6,37 0,00 0,00	6,37
12	72,89 0,00 0,00	0,79	78,19 0,00 0,00	5,29 0,00 0,00	5,29
13	78,52 0,00 0,00	0,84	82,63 0,00 0,00	4,10 0,00 0,00	4,10
14	84,15 0,00 0,00	0,90	86,97 0,00 0,00	2,82 0,00 0,00	2,82
15	89,78 0,00 0,00	0,95	91,23 0,00 0,00	1,45 0,00 0,00	1,45
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	10,99 0,00 0,00	0,00	10,99 0,00 0,00	0,00 0,00 0,00	0,01
18	32,09 0,00 0,00	0,36	41,45 0,00 0,00	9,35 0,00 0,00	9,35
19	53,20 0,00 0,00	0,60	61,70 0,00 0,00	8,50 0,00 0,00	8,50
20	74,30 0,00 0,00	0,80	79,31 0,00 0,00	5,00 0,00 0,00	5,00
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

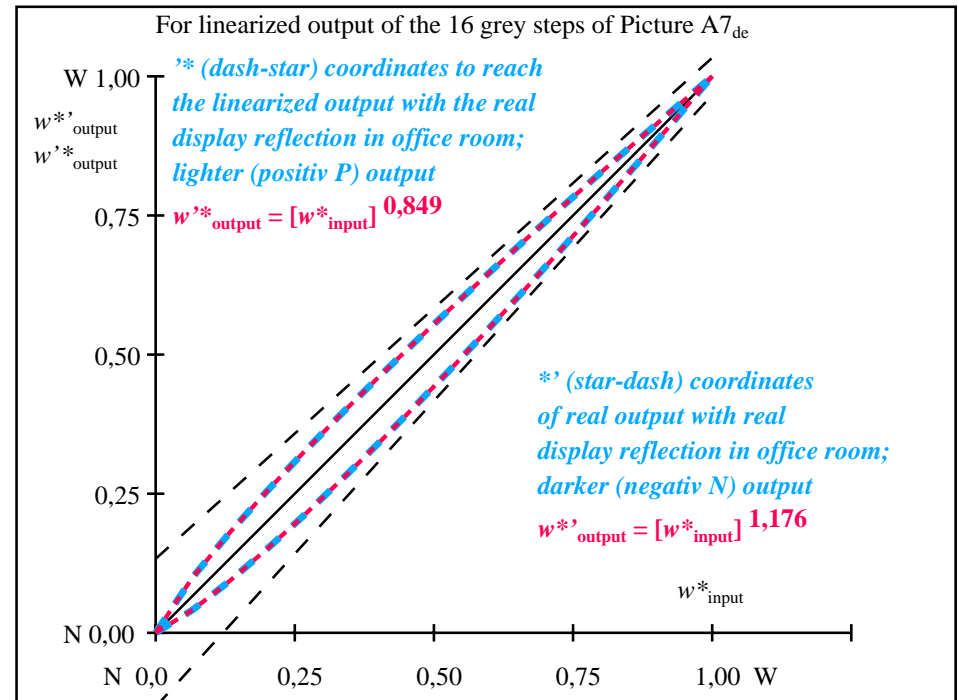
Mean lightness difference
(16 steps)
 $\Delta E^*_{CIELAB} = 5,9$

Mean lightness difference
(5 steps)
 $\Delta L^*_{CIELAB} = 4,5$

Mean colour reproduction index: $R^*_{ab,m} = 74,1$

part 1,

AE660-3de: 11022



AE661-3de: 11022

$L^*/Y_{intended}$ (absolute)	10,9/1,2	16,6/2,2	22,2/3,5	27,8/5,4	33,5/7,7	39,1/10,7	44,7/14,3	50,3/18,7	56,0/23,9	61,6/29,9	67,2/36,9	72,8/45,0	78,5/54,1	84,1/64,3	89,7/75,8	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,849																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,100	0,180	0,254	0,325	0,392	0,458	0,523	0,585	0,647	0,708	0,767	0,827	0,885	0,942	1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11022

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:1,25$; Y_N -range 0,93 to <1,87

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ setrgbcolor

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

Input and Output: Television Luminous System TLS18a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

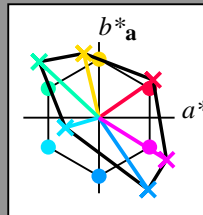
hue text for the colours

of this page:

$H^*_eR00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

H^*_e	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 118$

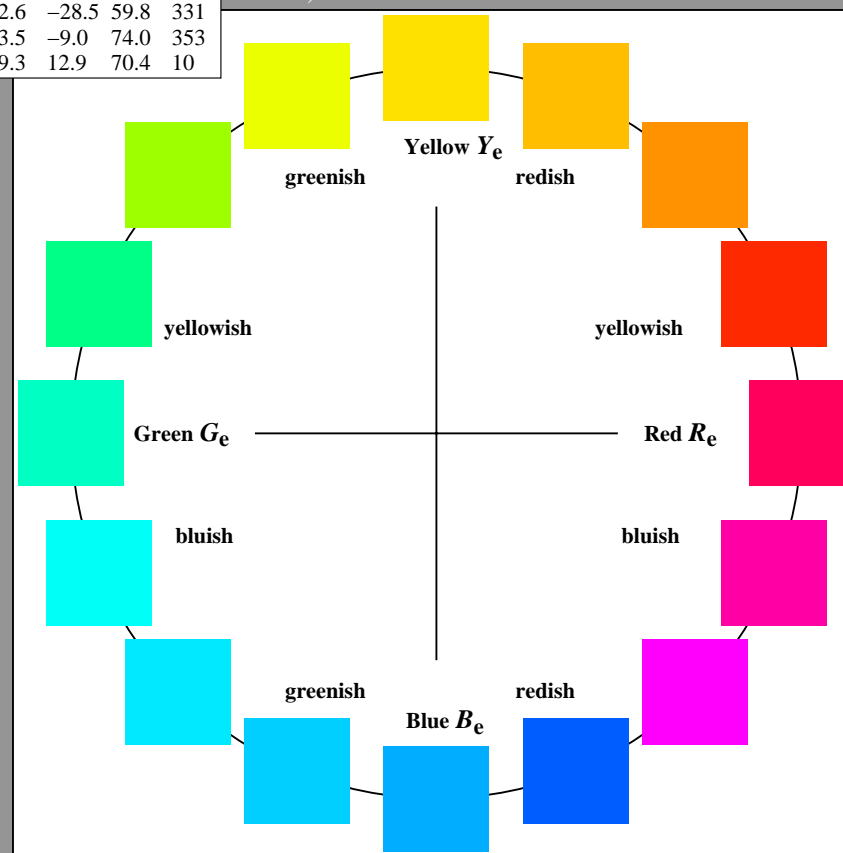
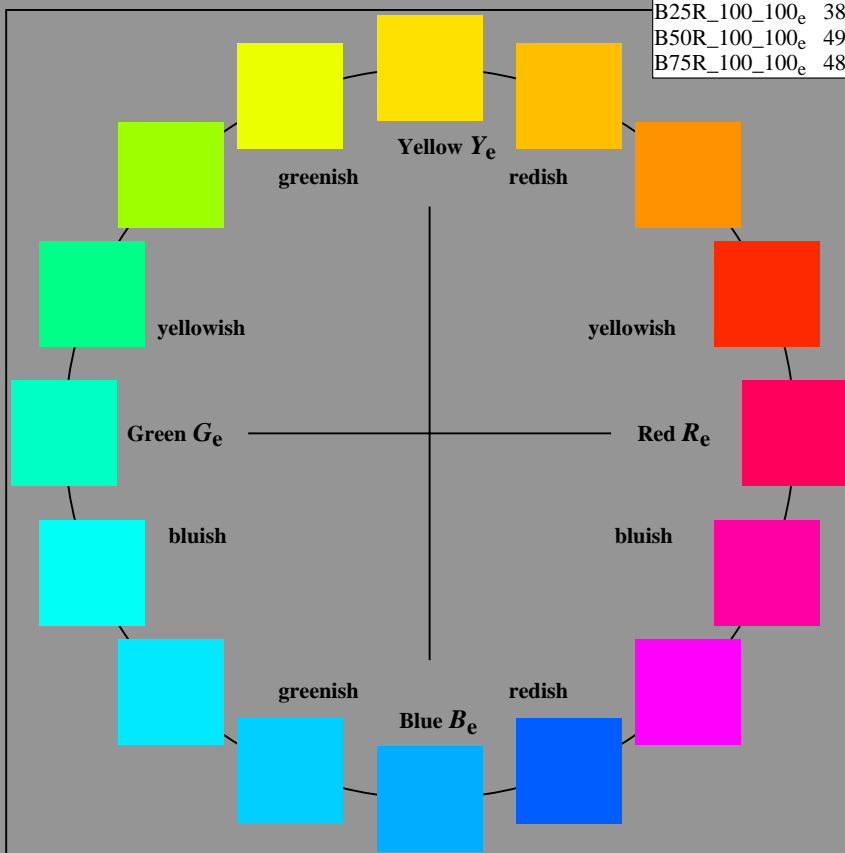
%Regularity

$g^*H_{rel} = 22$

$g^*C_{rel} = 40$

TLS18a; adapted (a) CIELAB data

name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_e, Ma	52.7	71.6	49.8	87.2	34
Y_e, Ma	92.7	-20.0	84.9	87.2	103
G_e, Ma	84.0	-78.9	73.9	108.1	136
C_e, Ma	87.1	-44.4	-13.1	46.3	196
B_e, Ma	35.4	64.9	-95.0	115.1	304
M_e, Ma	59.0	89.3	-55.6	105.2	328
N_e, Ma	18.0	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

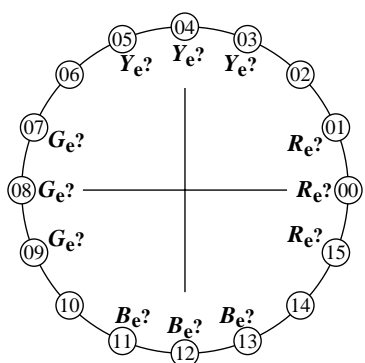
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11031

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY5_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY5_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

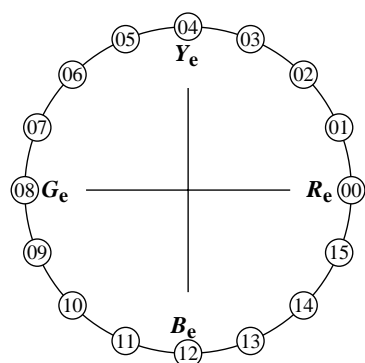
Special remarks: e. g. output of Landscape (L)

part 3,

AE660-7de: 11031

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11031

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY5_3.PS

or underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF

Exchange of CIELAB data in file http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11031

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

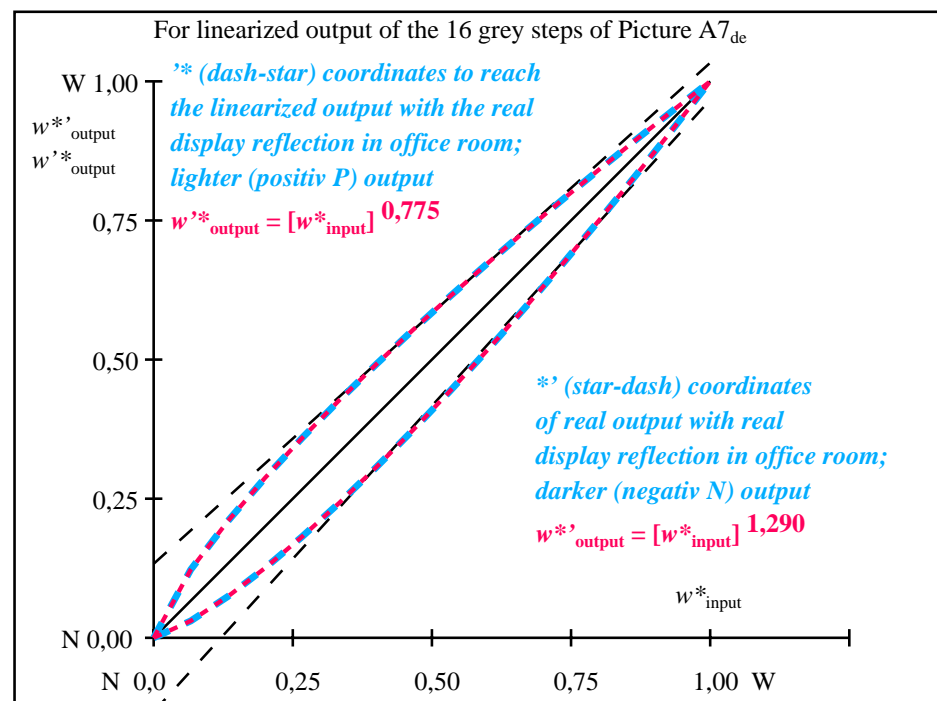
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 12/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

i	LAB [*] _{ref}	L [*] _{out}	LAB [*] _{out}	LAB [*] _{out-ref}	ΔE [*]	Start output S1
1	18,00 0,00 0,00	0,00	18,00 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	23,16 0,00 0,00	0,17	31,34 0,00 0,00	8,17 0,00 0,00	8,17	ISO/IEC 15775 Annex G
3	28,32 0,00 0,00	0,27	38,92 0,00 0,00	10,59 0,00 0,00	10,59	and DIN 33866-1 Annex G
4	33,48 0,00 0,00	0,35	45,22 0,00 0,00	11,73 0,00 0,00	11,73	
5	38,64 0,00 0,00	0,42	50,81 0,00 0,00	12,16 0,00 0,00	12,16	
6	43,80 0,00 0,00	0,48	55,93 0,00 0,00	12,12 0,00 0,00	12,12	
7	48,96 0,00 0,00	0,55	60,70 0,00 0,00	11,73 0,00 0,00	11,73	
8	54,12 0,00 0,00	0,60	65,19 0,00 0,00	11,06 0,00 0,00	11,06	
9	59,28 0,00 0,00	0,66	69,46 0,00 0,00	10,17 0,00 0,00	10,17	
10	64,44 0,00 0,00	0,71	73,55 0,00 0,00	9,11 0,00 0,00	9,11	
11	69,60 0,00 0,00	0,76	77,49 0,00 0,00	7,88 0,00 0,00	7,88	
12	74,76 0,00 0,00	0,81	81,29 0,00 0,00	6,52 0,00 0,00	6,52	
13	79,92 0,00 0,00	0,86	84,96 0,00 0,00	5,03 0,00 0,00	5,03	
14	85,08 0,00 0,00	0,91	88,54 0,00 0,00	3,45 0,00 0,00	3,45	Mean lightness difference
15	90,24 0,00 0,00	0,95	92,01 0,00 0,00	1,76 0,00 0,00	1,76	(16 steps)
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔE [*] _{CIELAB} = 7,5
17	18,00 0,00 0,00	0,00	18,00 0,00 0,00	0,00 0,00 0,00	0,01	
18	37,35 0,00 0,00	0,40	49,47 0,00 0,00	12,11 0,00 0,00	12,11	Mean lightness difference
19	56,70 0,00 0,00	0,63	67,35 0,00 0,00	10,64 0,00 0,00	10,64	(5 steps)
20	76,05 0,00 0,00	0,82	82,22 0,00 0,00	6,16 0,00 0,00	6,16	ΔL [*] _{CIELAB} = 5,7
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	Mean colour reproduction index: R [*] _{ab,m} = 67,0

part 1,

AE660-3de: 11032



part 2,

AE661-3de: 11032

L [*] /Y _{intended} (absolute)	18,0/2,5	23,1/3,8	28,3/5,5	33,4/7,7	38,6/10,4	43,8/13,7	48,9/17,5	54,1/22,0	59,2/27,3	64,4/33,3	69,6/40,1	74,7/47,9	79,9/56,5	85,0/66,1	90,2/76,8	95,4/88,5
0 0 0 n [*] setcmyk gp=0,775 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
w [*] = l [*] CIELAB, r (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w [*] _{intended} w [*] _{output}	0,000 0,000	0,067 0,123	0,133 0,209	0,200 0,287	0,267 0,359	0,333 0,426	0,400 0,491	0,467 0,554	0,533 0,614	0,600 0,673	0,667 0,730	0,733 0,786	0,800 0,841	0,867 0,895	0,933 0,947	1,000 1,000

part 3, picture A7_{de}: 16 visual equidistant L^{*}-grey steps; PS operator: 0 0 0 n^{*} setcmykcolor

AE660-7de: 11032

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast Y_W:Y_N=88,9:2,5; Y_N-range 1,87 to <3,75

input: rgb/cmy0/000n/w set...
output: ->rgb_{de} setrgbcolor

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

Input and Output: Television Luminous System TLS27a

Data for any device (d) or
elementary (e) colour:

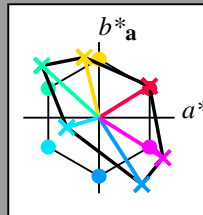
HIC^*_e

hue text for the colours

of this page:

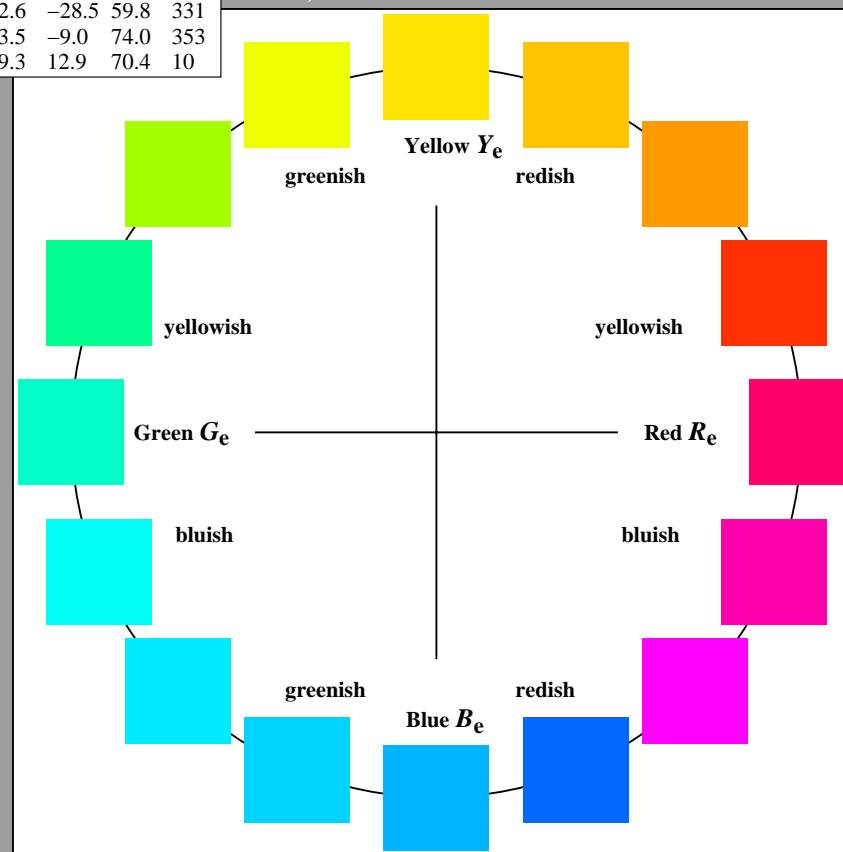
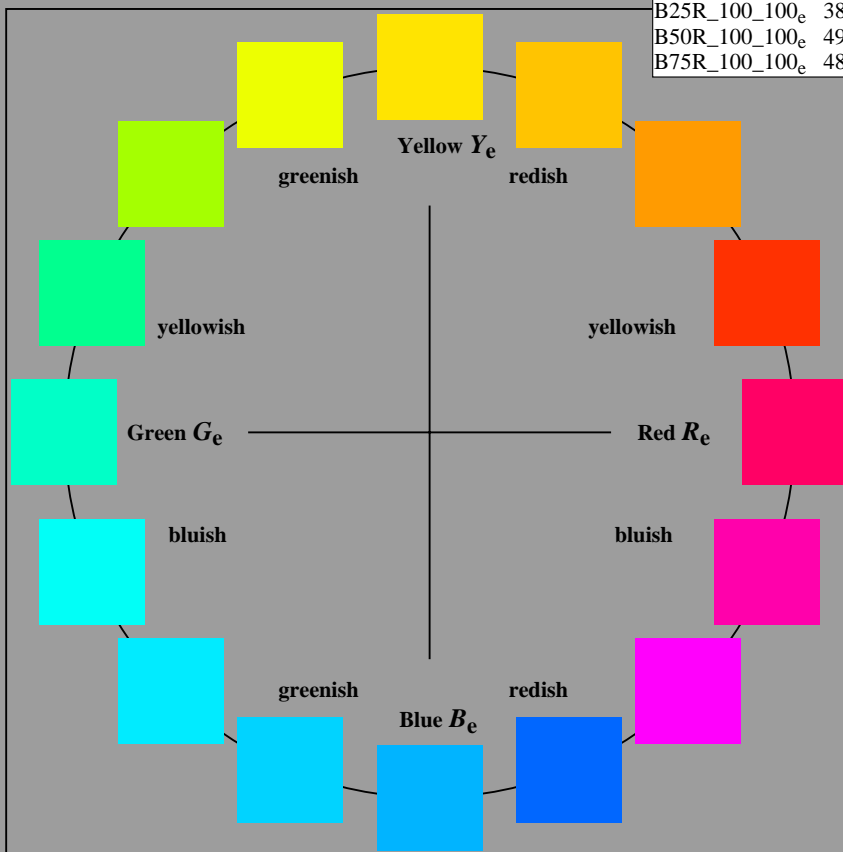
$H^*_e R00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data					
H^*_e	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$	
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10



%Gamut
 $u^*_{rel} = 97$
%Regularity
 $g^*H_{rel} = 23$
 $g^*C_{rel} = 42$

TLS27a; adapted (a) CIELAB data					
name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$	
R_e, Ma	54.8	66.8	41.6	78.7	31
Y_e, Ma	92.8	-19.3	79.8	82.1	103
G_e, Ma	84.3	-75.3	68.7	102.0	137
C_e, Ma	87.4	-42.7	-12.7	44.5	196
B_e, Ma	39.7	56.6	-88.0	104.6	302
M_e, Ma	60.6	84.6	-53.0	99.8	327
N_e, Ma	26.8	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

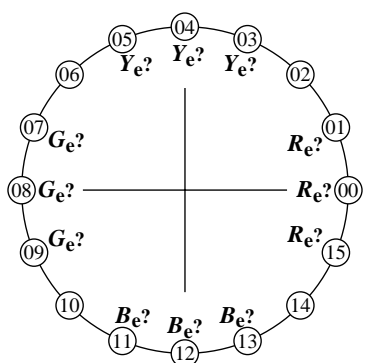
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ setrgbcolor

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11041

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY4_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY4_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

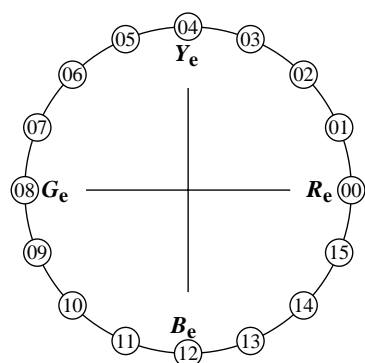
.....
.....
.....

part 3,

AE660-7de: 11041

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11041

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY4_3.PS

underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11041

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 15/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

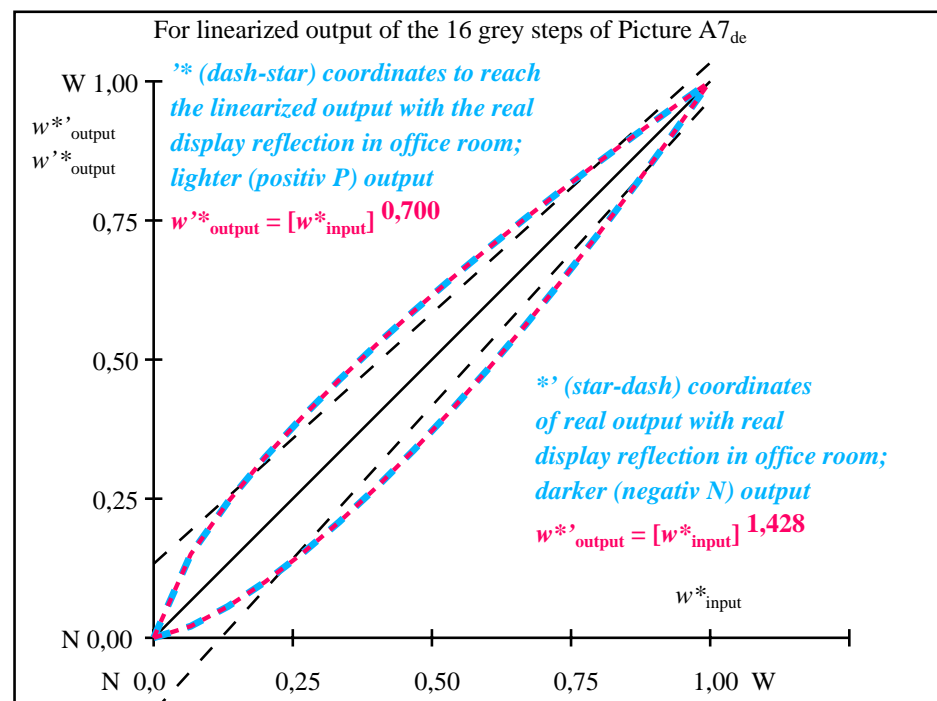
TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*	Start output S1
1	26,84 0,00 0,00	0,00	26,84 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	31,41 0,00 0,00	0,20	41,04 0,00 0,00	9,62 0,00 0,00	9,62	ISO/IEC 15775 Annex G
3	35,98 0,00 0,00	0,30	48,09 0,00 0,00	12,10 0,00 0,00	12,10	and DIN 33866-1 Annex G
4	40,56 0,00 0,00	0,39	53,74 0,00 0,00	13,18 0,00 0,00	13,18	
5	45,13 0,00 0,00	0,46	58,64 0,00 0,00	13,51 0,00 0,00	13,51	
6	49,70 0,00 0,00	0,52	63,04 0,00 0,00	13,34 0,00 0,00	13,34	
7	54,27 0,00 0,00	0,58	67,09 0,00 0,00	12,82 0,00 0,00	12,82	
8	58,84 0,00 0,00	0,64	70,86 0,00 0,00	12,02 0,00 0,00	12,02	
9	63,41 0,00 0,00	0,69	74,42 0,00 0,00	11,00 0,00 0,00	11,00	
10	67,98 0,00 0,00	0,74	77,79 0,00 0,00	9,80 0,00 0,00	9,80	
11	72,55 0,00 0,00	0,78	81,01 0,00 0,00	8,45 0,00 0,00	8,45	
12	77,12 0,00 0,00	0,83	84,09 0,00 0,00	6,97 0,00 0,00	6,97	
13	81,69 0,00 0,00	0,87	87,06 0,00 0,00	5,37 0,00 0,00	5,37	
14	86,26 0,00 0,00	0,92	89,93 0,00 0,00	3,66 0,00 0,00	3,66	Mean lightness difference
15	90,83 0,00 0,00	0,96	92,71 0,00 0,00	1,87 0,00 0,00	1,87	(16 steps)
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔE* _{CIELAB} = 8,3
17	26,84 0,00 0,00	0,00	26,84 0,00 0,00	0,00 0,00 0,00	0,01	
18	43,98 0,00 0,00	0,44	57,47 0,00 0,00	13,48 0,00 0,00	13,48	
19	61,12 0,00 0,00	0,66	72,66 0,00 0,00	11,54 0,00 0,00	11,54	Mean lightness difference
20	78,26 0,00 0,00	0,84	84,85 0,00 0,00	6,58 0,00 0,00	6,58	(5 steps)
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔL* _{CIELAB} = 6,3

Mean colour reproduction index: $R^*_{ab,m} = 63,7$

part 1,

AE660-3de: 11042



part 2,

AE661-3de: 11042

$L^*/Y_{intended}$ (absolute)	26,8/5,0	31,4/6,8	35,9/9,0	40,5/11,5	45,1/14,6	49,7/18,1	54,2/22,2	58,8/26,8	63,4/32,0	67,9/37,9	72,5/44,4	77,1/51,7	81,6/59,7	86,2/68,5	90,8/78,1	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,700																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,150	0,243	0,324	0,396	0,463	0,526	0,586	0,643	0,699	0,753	0,804	0,855	0,904	0,952	1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11042

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:5$; Y_N -range 3,75 to <7,5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ setrgbcolor

Input and Output: Television Luminous System TLS38a

Data for any device (d) or
elementary (e) colour:

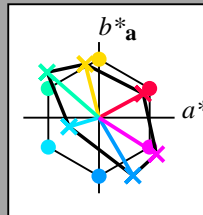
HIC^*_e

hue text for the colours

of this page:

$H^*_eR00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data					
H^*_e	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10



%Gamut

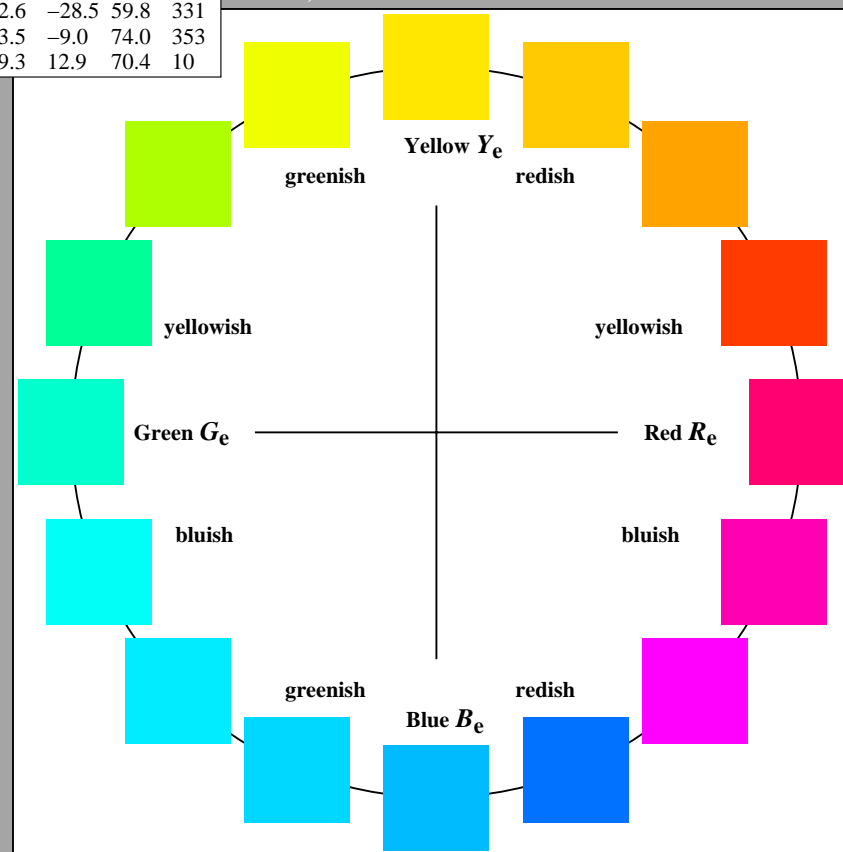
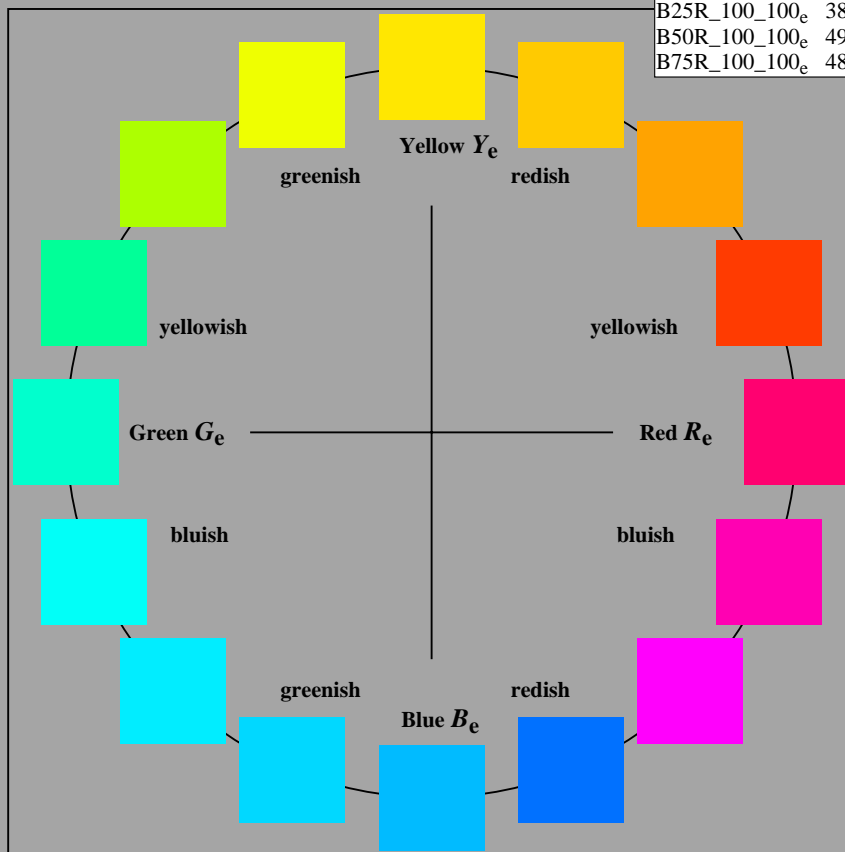
$u^*_{rel} = 71$

%Regularity

$g^*H_{rel} = 26$

$g^*C_{rel} = 45$

TLS38a; adapted (a) CIELAB data					
name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_e, Ma	58.7	58.4	31.7	66.5	28
Y_e, Ma	92.9	-18.1	70.8	73.0	104
G_e, Ma	85.1	-68.5	60.0	91.1	138
C_e, Ma	87.9	-39.4	-11.8	41.1	196
B_e, Ma	46.6	44.9	-76.5	88.7	300
M_e, Ma	63.7	75.9	-48.2	89.9	327
N_e, Ma	37.9	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

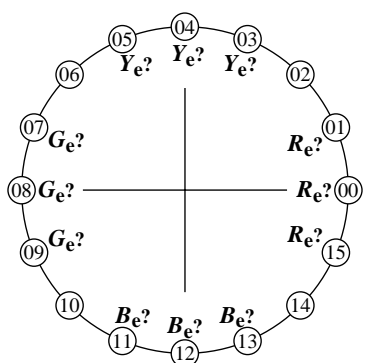
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .

No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)

Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)

Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)

Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11051

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY3_1.PDF

either PDF-file transfer "download, copy" to PDF device:.....

or with computer system interpretation by "Display-PDF":.....

or with software e. g. Adobe-Reader/-Acrobat and version:.....

or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY3_1.PS

either PS-file transfer "download, copy" to PS device:.....

or with computer system interpretation by "Display-PS":.....

or with software e. g. Ghostscript and version:.....

or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

.....

.....

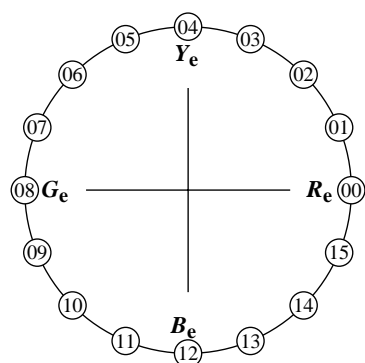
.....

part 3,

AE660-7de: 11051

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:

Red R_e and Yellow Y_e , Yellow Y_e and Green G_e .

Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.

All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.

2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.

The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.

The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.

List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11051

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:

either according to DIN 6160:1996 with Anomaloskop of Nagel

or with test charts using colour points according to Ishihara

or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY3_3.PS

underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11051

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 18/24
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE66.HTM>

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	37,98 0,00 0,00	0,00	37,98 0,00 0,00	0,00 0,00 0,00	0,01
2	41,81 0,00 0,00	0,24	51,79 0,00 0,00	9,97 0,00 0,00	9,97
3	45,64 0,00 0,00	0,34	57,87 0,00 0,00	12,22 0,00 0,00	12,22
4	49,47 0,00 0,00	0,42	62,60 0,00 0,00	13,13 0,00 0,00	13,13
5	53,29 0,00 0,00	0,49	66,62 0,00 0,00	13,32 0,00 0,00	13,32
6	57,12 0,00 0,00	0,56	70,19 0,00 0,00	13,06 0,00 0,00	13,06
7	60,95 0,00 0,00	0,61	73,43 0,00 0,00	12,48 0,00 0,00	12,48
8	64,78 0,00 0,00	0,66	76,43 0,00 0,00	11,65 0,00 0,00	11,65
9	68,61 0,00 0,00	0,71	79,23 0,00 0,00	10,62 0,00 0,00	10,62
10	72,44 0,00 0,00	0,76	81,87 0,00 0,00	9,43 0,00 0,00	9,43
11	76,26 0,00 0,00	0,80	84,37 0,00 0,00	8,10 0,00 0,00	8,10
12	80,09 0,00 0,00	0,84	86,76 0,00 0,00	6,66 0,00 0,00	6,66
13	83,92 0,00 0,00	0,88	89,04 0,00 0,00	5,12 0,00 0,00	5,12
14	87,75 0,00 0,00	0,92	91,24 0,00 0,00	3,49 0,00 0,00	3,49
15	91,58 0,00 0,00	0,96	93,36 0,00 0,00	1,78 0,00 0,00	1,78
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	37,98 0,00 0,00	0,00	37,98 0,00 0,00	0,00 0,00 0,00	0,01
18	52,34 0,00 0,00	0,48	65,66 0,00 0,00	13,32 0,00 0,00	13,32
19	66,69 0,00 0,00	0,69	77,85 0,00 0,00	11,15 0,00 0,00	11,15
20	81,05 0,00 0,00	0,85	87,34 0,00 0,00	6,28 0,00 0,00	6,28
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G

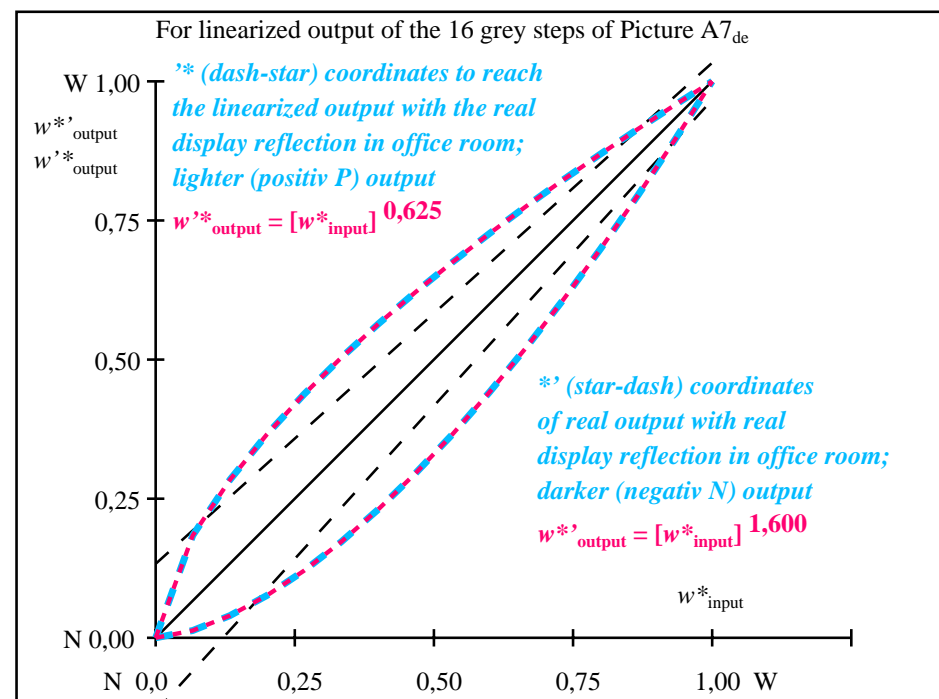
Mean lightness difference (16 steps)
 $\Delta E^*_{\text{CIELAB}} = 8,1$

Mean lightness difference (5 steps)
 $\Delta L^*_{\text{CIELAB}} = 6,1$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 64,5$

part 1,

AE660-3de: 11052



part 2,

AE661-3de: 11052

L*/Y _{intended} (absolute)	37,9/10,0	41,8/12,3	45,6/15,0	49,4/17,9	53,2/21,3	57,1/25,0	60,9/29,1	64,7/33,7	68,6/38,8	72,4/44,3	76,2/50,3	80,0/56,8	83,9/63,9	87,7/71,5	91,5/79,7	95,4/88,5
0 0 0 n* setcmyk gp=0,625 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
w* = l* CIELAB, r (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w* _{intended} w* _{output}	0,000 0,000	0,067 0,184	0,133 0,283	0,200 0,365	0,267 0,438	0,333 0,502	0,400 0,564	0,467 0,621	0,533 0,674	0,600 0,726	0,667 0,776	0,733 0,823	0,800 0,869	0,867 0,914	0,933 0,957	1,000 1,000

part 3, picture A7_{de}: 16 visual equidistant L*-grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11052

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:10$; Y_N -range 7,5 to <15

input: *rgb/cmy0/000n/w set...*
output: *->rgb_{de} setrgbcolor*

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

Input and Output: Television Luminous System TLS52a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

hue text for the colours

of this page:

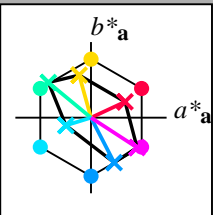
$H^*_e R00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

H^*_e	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10

TLS52a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R_e, Ma	65.5	45.0	20.9	49.7	24
Y_e, Ma	93.3	-15.6	56.2	58.3	105
G_e, Ma	86.5	-56.3	46.5	73.0	140
C_e, Ma	88.9	-33.1	-10.2	34.7	197
B_e, Ma	57.1	30.6	-59.4	66.8	297
M_e, Ma	69.2	60.9	-39.5	72.6	327
N_e, Ma	52.0	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



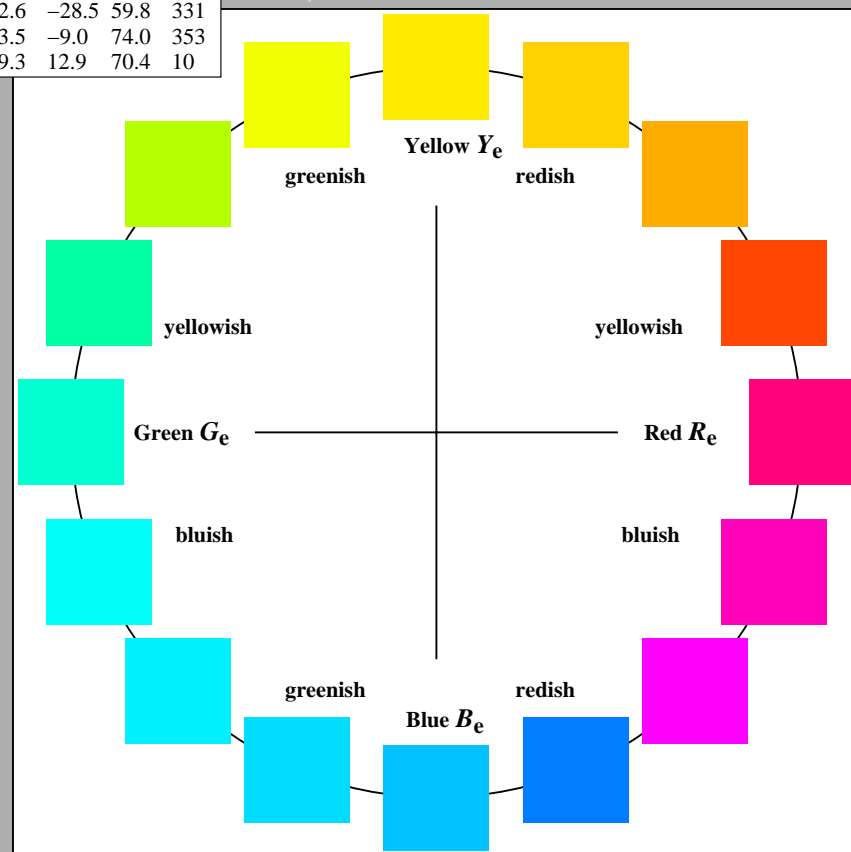
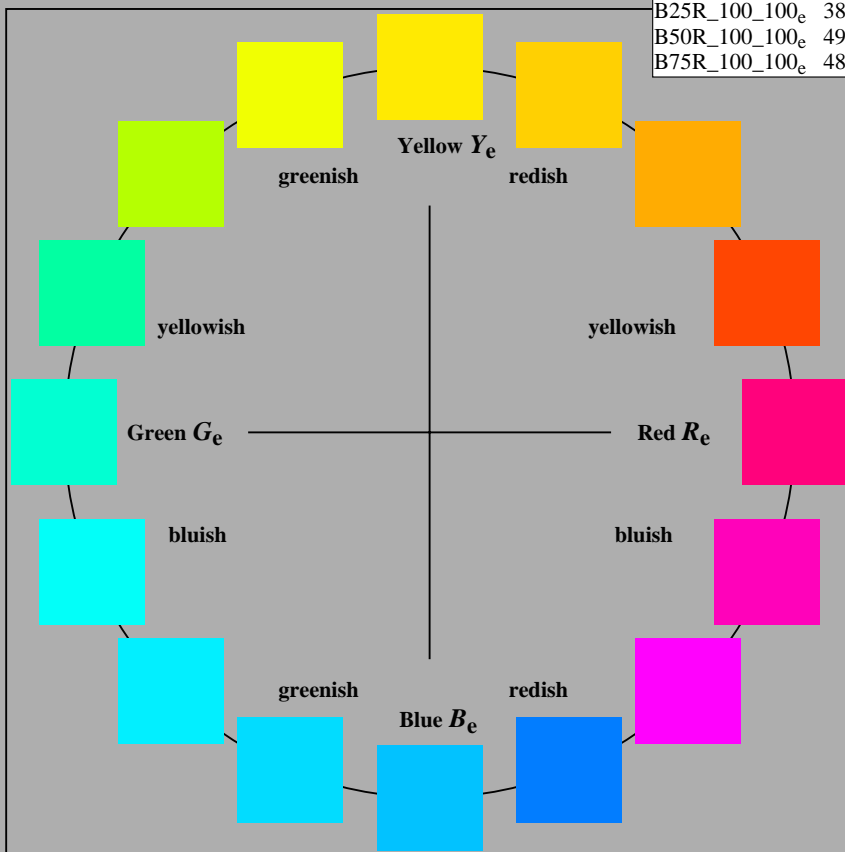
%Gamut

$u^*_{rel} = 42$

%Regularity

$g^*H_{rel} = 29$

$g^*C_{rel} = 47$



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

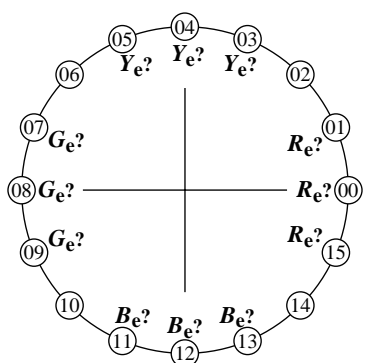
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11061

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY2_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY2_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

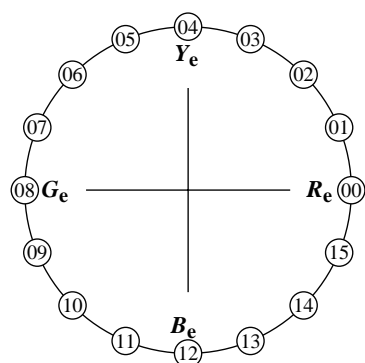
Special remarks: e. g. output of Landscape (L)

part 3,

AE660-7de: 11061

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11061

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY2_3.PS

or underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11061

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 21/24
technical information: <http://farbe.li.tu-berlin.de/AE66/AE66LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	52,01 0,00 0,00	0,00	52,01 0,00 0,00	0,00 0,00 0,00	0,01
2	54,91 0,00 0,00	0,27	63,82 0,00 0,00	8,90 0,00 0,00	8,90
3	57,80 0,00 0,00	0,37	68,48 0,00 0,00	10,68 0,00 0,00	10,68
4	60,69 0,00 0,00	0,46	72,03 0,00 0,00	11,33 0,00 0,00	11,33
5	63,58 0,00 0,00	0,52	75,00 0,00 0,00	11,41 0,00 0,00	11,41
6	66,48 0,00 0,00	0,58	77,60 0,00 0,00	11,12 0,00 0,00	11,12
7	69,37 0,00 0,00	0,64	79,94 0,00 0,00	10,57 0,00 0,00	10,57
8	72,26 0,00 0,00	0,69	82,09 0,00 0,00	9,83 0,00 0,00	9,83
9	75,16 0,00 0,00	0,73	84,09 0,00 0,00	8,93 0,00 0,00	8,93
10	78,05 0,00 0,00	0,78	85,96 0,00 0,00	7,90 0,00 0,00	7,90
11	80,94 0,00 0,00	0,82	87,72 0,00 0,00	6,77 0,00 0,00	6,77
12	83,83 0,00 0,00	0,86	89,39 0,00 0,00	5,56 0,00 0,00	5,56
13	86,73 0,00 0,00	0,89	90,99 0,00 0,00	4,26 0,00 0,00	4,26
14	89,62 0,00 0,00	0,93	92,52 0,00 0,00	2,90 0,00 0,00	2,90
15	92,51 0,00 0,00	0,96	93,99 0,00 0,00	1,47 0,00 0,00	1,47
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	52,01 0,00 0,00	0,00	52,01 0,00 0,00	0,00 0,00 0,00	0,01
18	62,86 0,00 0,00	0,51	74,30 0,00 0,00	11,43 0,00 0,00	11,43
19	73,71 0,00 0,00	0,71	83,11 0,00 0,00	9,39 0,00 0,00	9,39
20	84,56 0,00 0,00	0,87	89,80 0,00 0,00	5,24 0,00 0,00	5,24
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

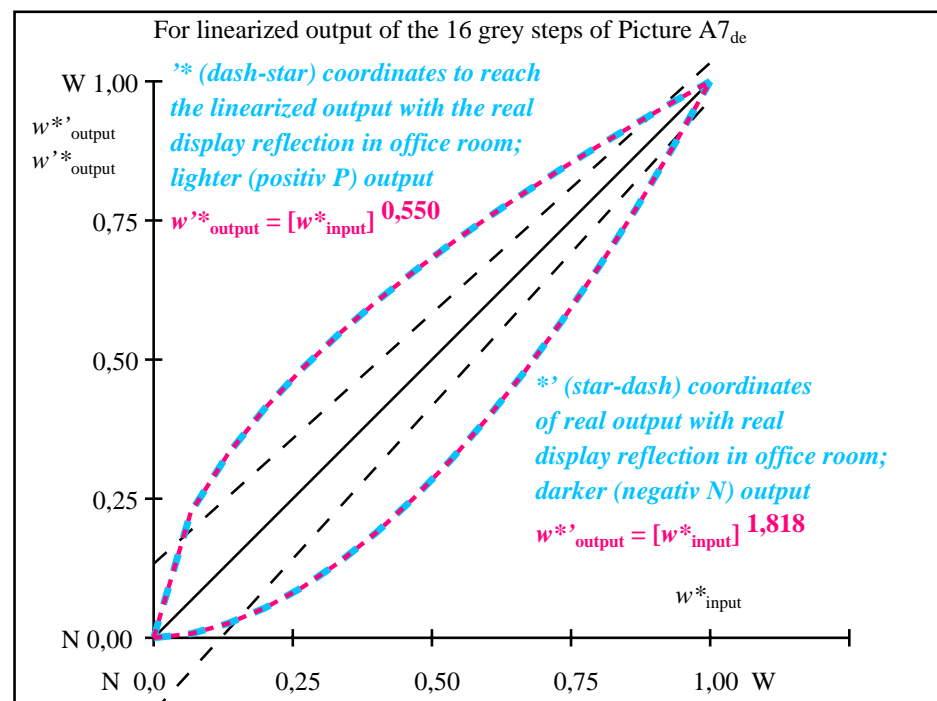
Mean lightness difference
(16 steps)
 $\Delta E^*_{\text{CIELAB}} = 6,9$

Mean lightness difference
(5 steps)
 $\Delta L^*_{\text{CIELAB}} = 5,2$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 69,8$

part 1,

AE660-3de: 11062



part 2,

AE661-3de: 11062

L^*/Y_{intended} (absolute)	52,0/20,1	54,9/22,8	57,8/25,7	60,6/28,9	63,5/32,2	66,4/35,9	69,3/39,8	72,2/44,0	75,1/48,5	78,0/53,3	80,9/58,3	83,8/63,7	86,7/69,4	89,6/75,4	92,5/81,8	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,550																
No. and																
Hex code																
$w^* = l^*_{\text{CIELAB}, r}$ (relative)																
w^*_{intended}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,226	0,329	0,412	0,483	0,546	0,604	0,657	0,707	0,755	0,800	0,842	0,884	0,924	0,962	1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11062

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:20$; Y_N -range 15 to <30

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{\text{de}}$ setrgbcolor

Input and Output: Television Luminous System TLS70a

Data for any device (d) or
elementary (e) colour:

HIC^*_e

hue text for the colours

of this page:

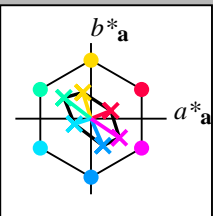
$H^*_e R00Y_e, R25Y_e, \dots, B75R_e$

ORS20a; adapted (a) CIELAB data

H^*_e	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_e	48.4	66.1	40.2	77.3	31
R25Y_100_100_e	56.8	48.0	50.5	69.6	46
R50Y_100_100_e	68.6	25.0	63.9	68.6	68
R75Y_100_100_e	80.6	4.8	77.2	77.3	86
Y00G_100_100_e	90.2	-9.6	88.2	88.7	96
Y25G_100_100_e	83.2	-18.4	79.9	81.9	102
Y50G_100_100_e	73.3	-31.7	62.7	70.2	116
Y75G_100_100_e	62.0	-49.7	43.2	65.8	139
G00B_100_100_e	55.8	-65.2	33.8	73.4	152
G25B_100_100_e	59.3	-50.3	-9.0	51.0	190
G50B_100_100_e	63.0	-30.5	-42.0	51.9	234
G75B_100_100_e	45.7	-5.7	-44.6	44.9	262
B00R_100_100_e	27.5	25.9	-47.3	53.9	298
B25R_100_100_e	38.3	52.6	-28.5	59.8	331
B50R_100_100_e	49.5	73.5	-9.0	74.0	353
B75R_100_100_e	48.9	69.3	12.9	70.4	10

TLS70a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R_e, Ma	76.4	26.2	10.5	28.3	21
Y_e, Ma	93.9	-10.7	34.6	36.2	107
G_e, Ma	89.3	-35.8	27.6	45.2	142
C_e, Ma	90.9	-21.9	-7.0	23.0	197
B_e, Ma	72.1	15.7	-35.6	38.9	293
M_e, Ma	78.5	37.5	-25.2	45.2	326
N_e, Ma	69.7	0.0	0.0	0.0	0
W_e, Ma	95.4	0.0	0.0	0.0	0
R_e, CIE	39.9	58.7	27.9	65.0	25
Y_e, CIE	81.2	-2.8	71.5	71.6	92
G_e, CIE	52.2	-42.4	13.6	44.5	162
B_e, CIE	30.5	1.4	-46.4	46.4	271



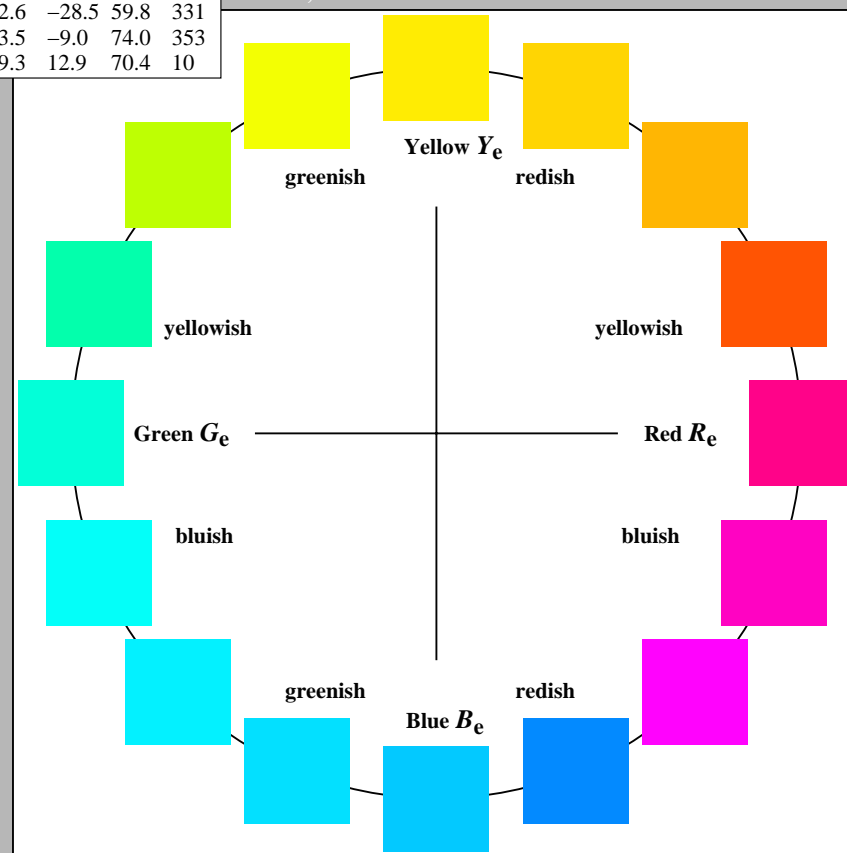
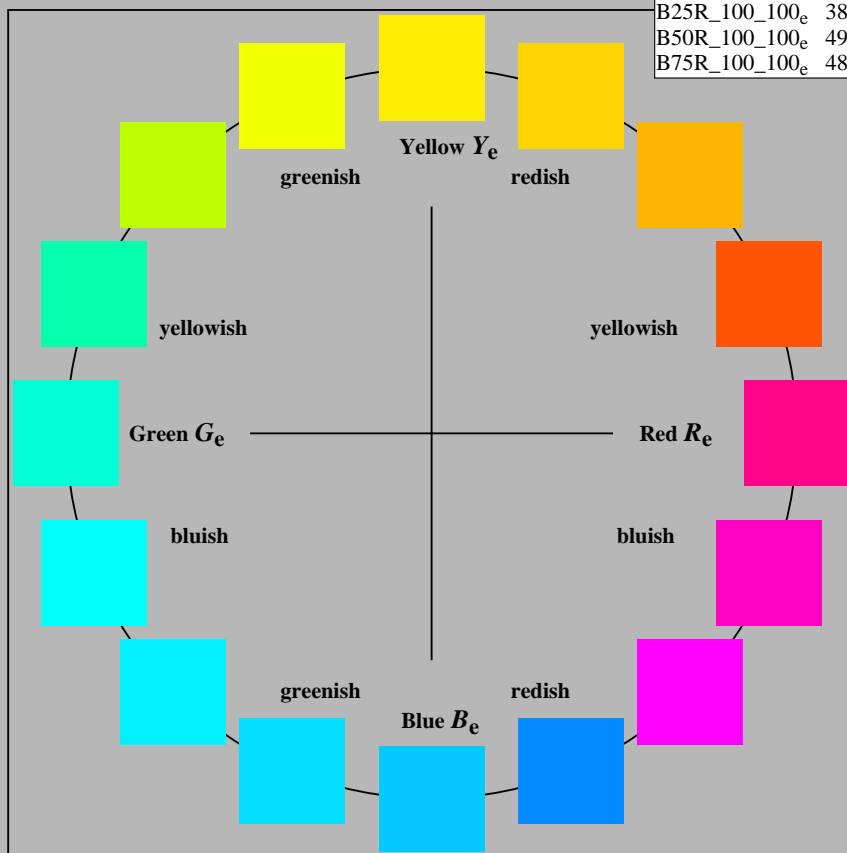
%Gamut

$u^*_{rel} = 15$

%Regularity

$g^*H_{rel} = 33$

$g^*C_{rel} = 51$



1-110000-L0 cmyn6*

AE660-70

Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

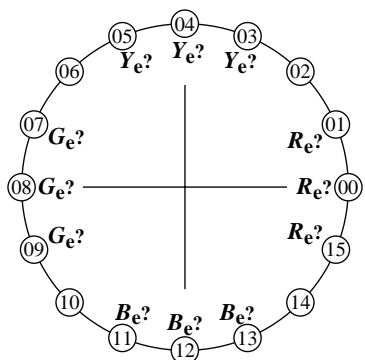
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{de}$ set $rgbcolor$

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE660-3de: 11071

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE66F0PX_CY1_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE66F0PX_CY1_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

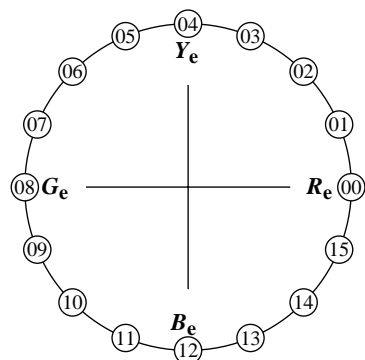
.....
.....
.....

part 3,

AE660-7de: 11071

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE661-3de: 11071

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:

underline: Yes/No

either according to DIN 6160:1996 with Anomaloskop of Nagel

underline: Yes/unknown

or with test charts using colour points according to Ishihara

underline: Yes/unknown

or tested with, please specify:

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_3.PS

underline: Yes/No

picture A7de contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_3.PDF

underline: Yes/No

picture A7de

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE66/AE66F0PX_CY1_3.PS

or underline: Yes/No

picture A7de

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE661-7de: 11071

Form A: Test chart AE66 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE66/AE66F0PX.PDF> / .PS; 3D-linearization, page 24/24
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE66.HTM>

TUB Registration: 20190301-AE66/AE66L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

<i>i</i>	LAB^*_{ref}	L^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	71,41 0,00 0,00	0,30	77,45 0,00 0,00	6,04 0,00 0,00	6,04	ISO/IEC 15775 Annex G
3	73,12 0,00 0,00	0,41	80,23 0,00 0,00	7,11 0,00 0,00	7,11	and DIN 33866-1 Annex G
4	74,83 0,00 0,00	0,49	82,31 0,00 0,00	7,47 0,00 0,00	7,47	
5	76,55 0,00 0,00	0,55	84,02 0,00 0,00	7,47 0,00 0,00	7,47	
6	78,26 0,00 0,00	0,61	85,51 0,00 0,00	7,24 0,00 0,00	7,24	
7	79,98 0,00 0,00	0,66	86,83 0,00 0,00	6,85 0,00 0,00	6,85	
8	81,69 0,00 0,00	0,71	88,04 0,00 0,00	6,35 0,00 0,00	6,35	
9	83,41 0,00 0,00	0,75	89,16 0,00 0,00	5,75 0,00 0,00	5,75	
10	85,12 0,00 0,00	0,79	90,20 0,00 0,00	5,08 0,00 0,00	5,08	
11	86,83 0,00 0,00	0,83	91,18 0,00 0,00	4,34 0,00 0,00	4,34	
12	88,55 0,00 0,00	0,87	92,11 0,00 0,00	3,55 0,00 0,00	3,55	
13	90,26 0,00 0,00	0,90	92,99 0,00 0,00	2,72 0,00 0,00	2,72	
14	91,98 0,00 0,00	0,93	93,83 0,00 0,00	1,85 0,00 0,00	1,85	
15	93,69 0,00 0,00	0,96	94,63 0,00 0,00	0,94 0,00 0,00	0,94	
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	
17	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01	
18	76,12 0,00 0,00	0,54	83,62 0,00 0,00	7,49 0,00 0,00	7,49	
19	82,55 0,00 0,00	0,73	88,61 0,00 0,00	6,06 0,00 0,00	6,06	
20	88,98 0,00 0,00	0,88	92,33 0,00 0,00	3,35 0,00 0,00	3,35	
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	

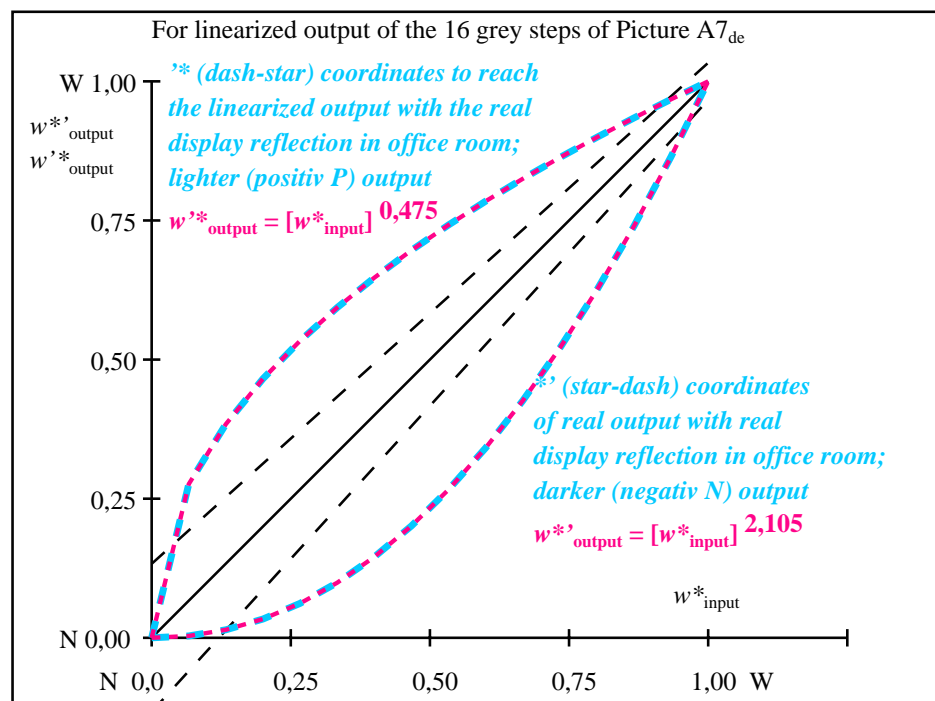
Mean lightness difference (16 steps)
 $\Delta E^*_{CIELAB} = 4,5$

Mean lightness difference (5 steps)
 $\Delta L^*_{CIELAB} = 3,3$

Mean colour reproduction index: $R^*_{ab,m} = 80,3$

part 1,

AE660-3de: 11072



part 2,

AE661-3de: 11072

$L^*/Y_{intended}$ (absolute)	69,6/40,3	71,4/42,7	73,1/45,3	74,8/48,0	76,5/50,7	78,2/53,6	79,9/56,6	81,6/59,7	83,4/62,9	85,1/66,2	86,8/69,6	88,5/73,2	90,2/76,8	91,9/80,6	93,6/84,5	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,475																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{CIELAB, r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,276	0,383	0,465	0,534	0,593	0,647	0,696	0,741	0,784	0,825	0,862	0,899	0,934	0,967	1,000

part 3, picture A7_{de}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE660-7de: 11072

In-out: Test chart AE66 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:40$; Y_N -range 30 to <60

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{de}$ setrgbcolor