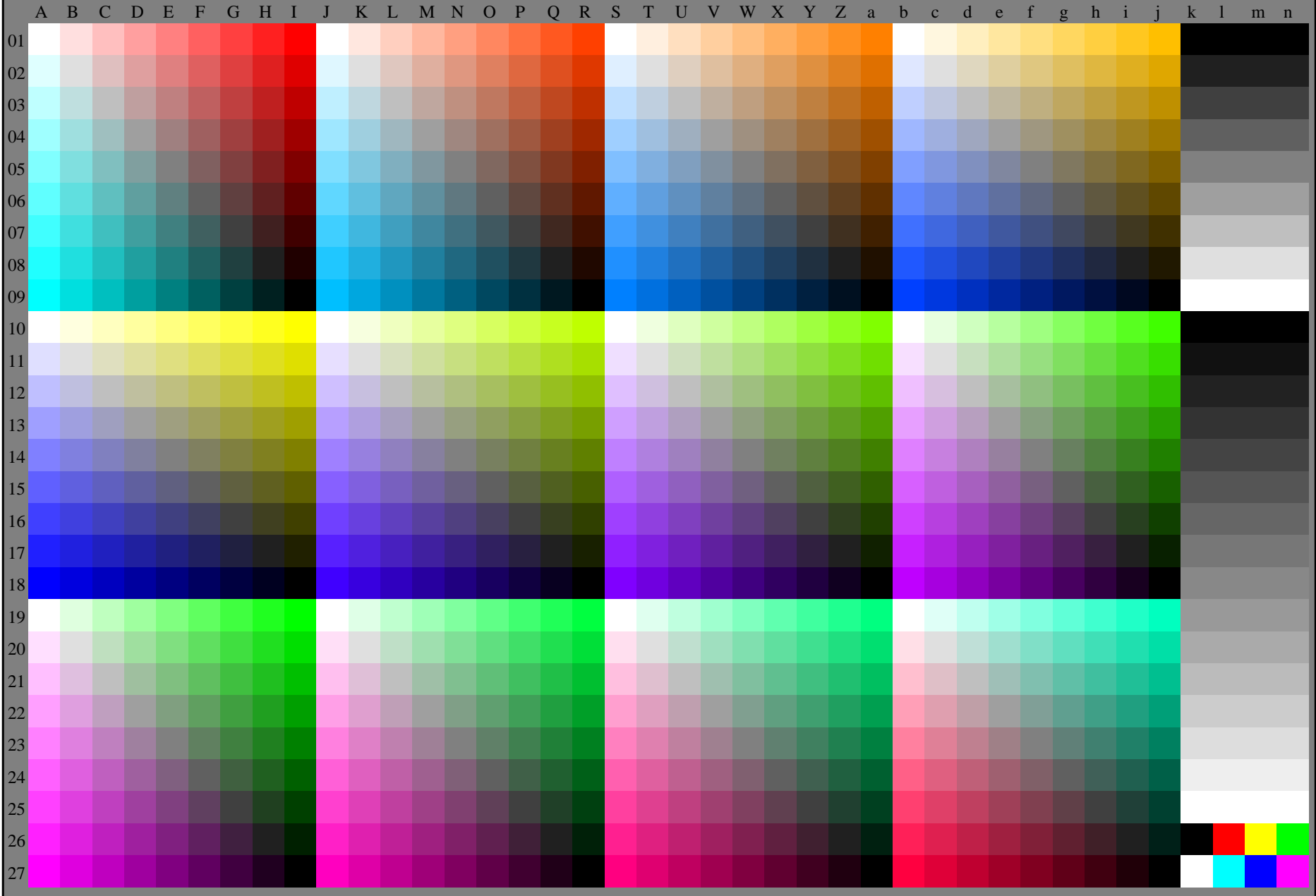


see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

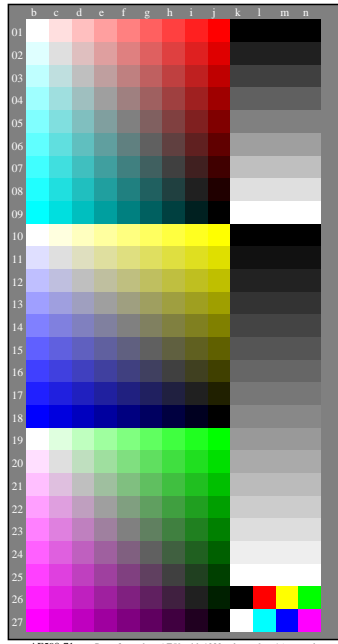
TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rhata4ta



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): **rgb + cmy0 (A-j + k26-n27), 000n (k), w (l), nnn0 (m), www (n)**
Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps
input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata4ta



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN8_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN8_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 AE59F0PX_CYN8_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 AE59F0PX_CYN8_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)
.....
.....

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN8_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN8_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN8_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN8_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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:

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

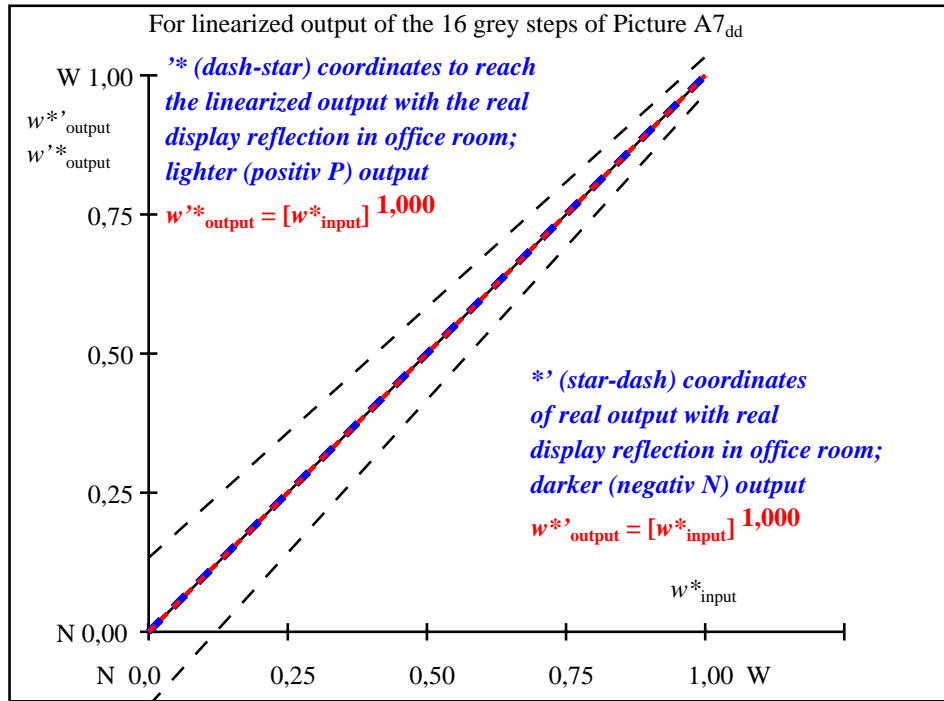
<i>i</i>	L^*_{ref}	L^*_{out}	L^*_{ref}	L^*_{out}	$L^*_{out-ref}$	ΔE^*	Start output S1
1	0,00	0,00	0,00	0,00	0,00	0,00	Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G
2	6,36	0,00	0,00	0,06	6,36	0,00	
3	12,72	0,00	0,00	0,13	12,72	0,00	
4	19,08	0,00	0,00	0,20	19,08	0,00	
5	25,44	0,00	0,00	0,26	25,44	0,00	
6	31,80	0,00	0,00	0,33	31,80	0,00	
7	38,16	0,00	0,00	0,40	38,16	0,00	
8	44,52	0,00	0,00	0,46	44,52	0,00	
9	50,88	0,00	0,00	0,53	50,88	0,00	
10	57,24	0,00	0,00	0,60	57,24	0,00	
11	63,60	0,00	0,00	0,66	63,60	0,00	
12	69,96	0,00	0,00	0,73	69,96	0,00	
13	76,32	0,00	0,00	0,80	76,32	0,00	
14	82,68	0,00	0,00	0,86	82,68	0,00	
15	89,04	0,00	0,00	0,93	89,04	0,00	
16	95,41	0,00	0,00	1,00	95,41	0,00	
17	0,00	0,00	0,00	0,00	0,00	0,00	
18	23,85	0,00	0,00	0,25	23,85	0,00	
19	47,70	0,00	0,00	0,50	47,70	0,00	
20	71,55	0,00	0,00	0,75	71,55	0,00	
21	95,41	0,00	0,00	1,00	95,41	0,00	

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

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

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

part 1, AE590-3dd: 01002



part 2, AE591-3dd: 01002

$L^*/Y_{intended}$ (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 n* setcmyk gp=1,000 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	0,067	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

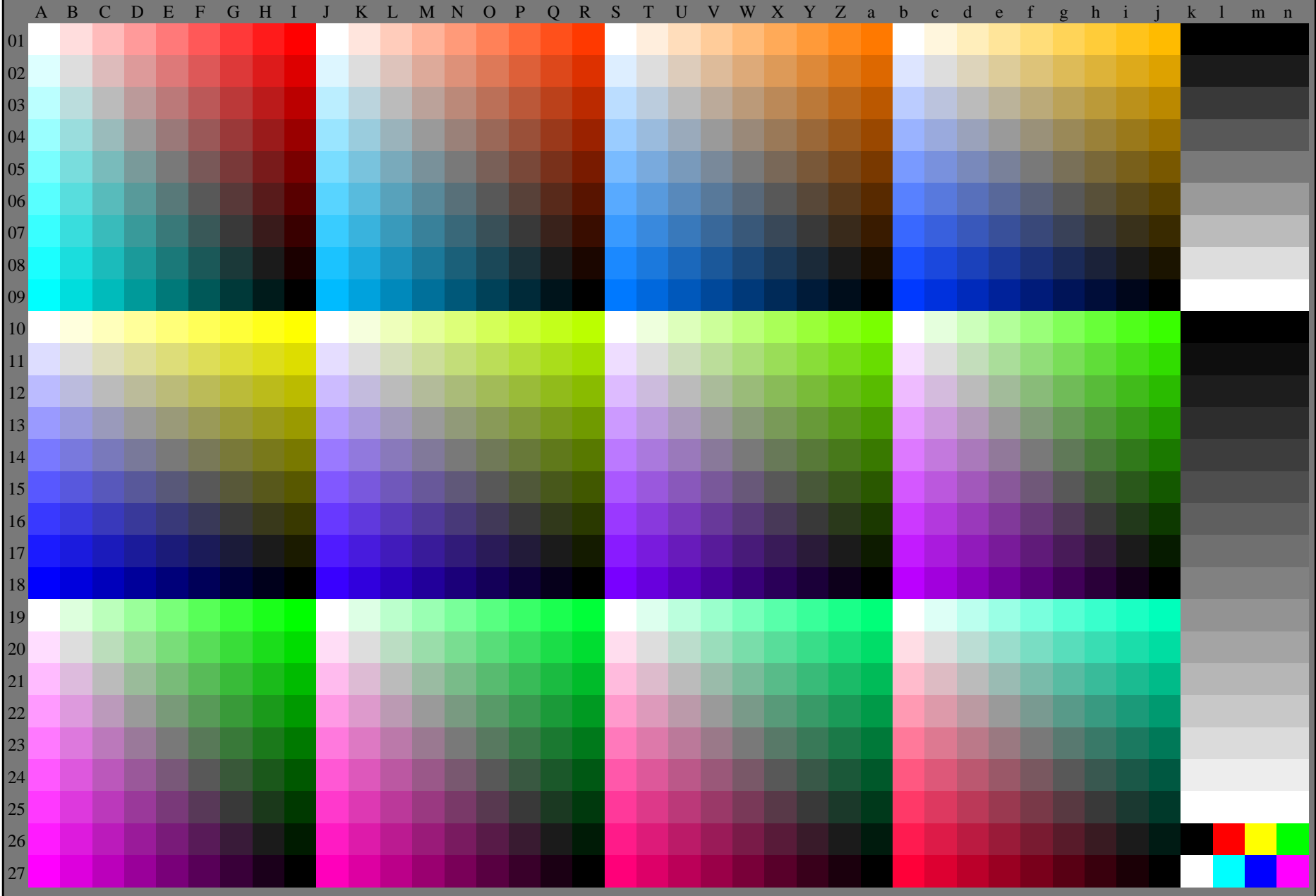
part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor AE590-7dd: 01002

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 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_{dd} setrgbcolor

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT/.PS>
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT/.PS
application for measurement or viewing of display and print output
TUB material: code=rhata4ta



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): **rgb + cmy0 (A-j + k26-n27), 000n (k), w (l), nnn0 (m), www (n)** 1-100000-L0 cmy_n6*

Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps
input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
 technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=thata4ta



Discriminability of chromatic colours
 Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:

Remarks about the creation and content of the PDF files:
 Sometimes "colour smoothing" is a default setting.
 In this case the 9 steps are often not visible and may be counted as one step.
 Sometimes "optimizing the PDF output for the web" is a default setting.
 For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
 Remarks: This test uses many colour scales of 9 steps
 Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
 Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
 Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
 Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
 Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
 Are the 9 steps distinguishable? **Yes/No**
 If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
 Are the 16 steps distinguishable? **Yes/No**
 If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:

Remarks about the creation and content of the PDF files:
 Sometimes "colour smoothing" is a default setting.
 In this case the 9 steps are often not visible and may be counted as one step.
 Sometimes "optimizing the PDF output for the web" is a default setting.
 For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN7_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN7_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 AE59F0PX_CYN7_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 AE59F0PX_CYN7_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,

AE590-7dd: 01081

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 **underline: Yes/No**
 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/AE59/AE59F0PX_CYN7_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN7_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN7_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN7_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 01081

Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
 9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps

input: `rgb/cmy0/000n/w set...`
 output: `->rgbdd setrgbcolor`

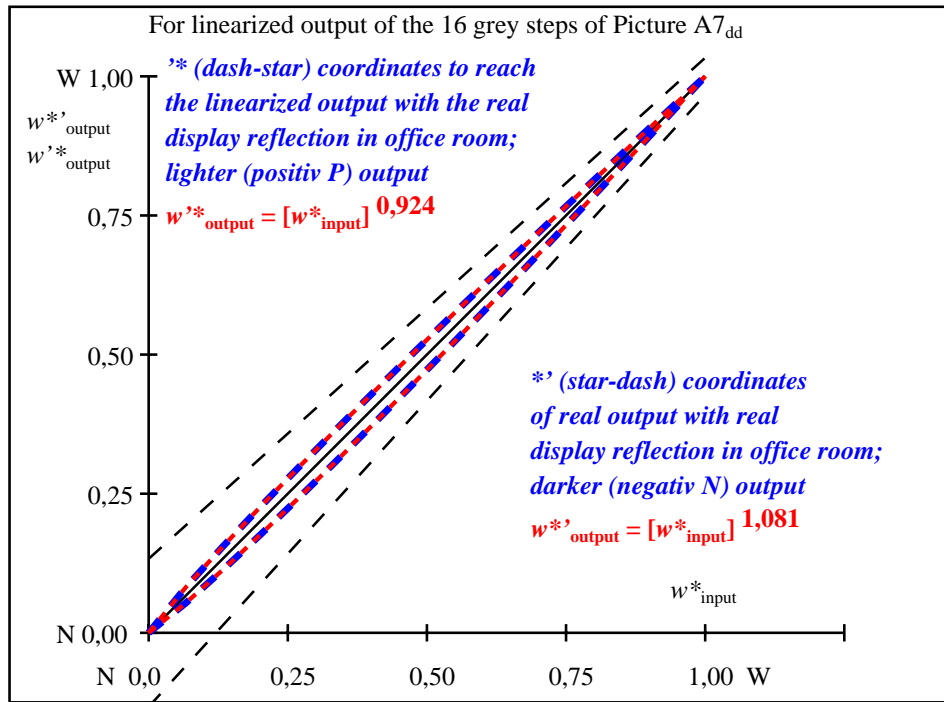
see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	L^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	5,69 0,00 0,00	0,00	5,69 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
2	11,67 0,00 0,00	0,04	9,36 0,00 0,00	-2, 0,00 0,00	2,30	
3	17,65 0,00 0,00	0,09	14,01 0,00 0,00	-3, 0,00 0,00	3,63	
4	23,63 0,00 0,00	0,14	19,12 0,00 0,00	-4, 0,00 0,00	4,51	
5	29,61 0,00 0,00	0,21	24,55 0,00 0,00	-5, 0,00 0,00	5,06	
6	35,59 0,00 0,00	0,27	30,23 0,00 0,00	-5, 0,00 0,00	5,36	
7	41,57 0,00 0,00	0,33	36,12 0,00 0,00	-5, 0,00 0,00	5,45	
8	47,55 0,00 0,00	0,40	42,19 0,00 0,00	-5, 0,00 0,00	5,36	
9	53,54 0,00 0,00	0,47	48,42 0,00 0,00	-5, 0,00 0,00	5,11	
10	59,52 0,00 0,00	0,54	54,79 0,00 0,00	-4, 0,00 0,00	4,72	
11	65,50 0,00 0,00	0,61	61,29 0,00 0,00	-4, 0,00 0,00	4,20	
12	71,48 0,00 0,00	0,69	67,91 0,00 0,00	-3, 0,00 0,00	3,57	
13	77,46 0,00 0,00	0,76	74,64 0,00 0,00	-2, 0,00 0,00	2,82	
14	83,44 0,00 0,00	0,84	81,47 0,00 0,00	-1, 0,00 0,00	1,97	
15	89,42 0,00 0,00	0,92	88,39 0,00 0,00	-1, 0,00 0,00	1,03	
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	0,19	23,16 0,00 0,00	-4, 0,00 0,00	4,95	
19	50,55 0,00 0,00	0,44	45,28 0,00 0,00	-5, 0,00 0,00	5,26	
20	72,98 0,00 0,00	0,71	69,58 0,00 0,00	-3, 0,00 0,00	3,39	
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) $\Delta E^*_{CIELAB} = 3,4$
 Mean lightness difference (5 steps) $\Delta L^*_{CIELAB} = 2,7$
 Mean colour reproduction index: $R^*_{ab,m} = 84,9$

part 1, AE590-3dd: 01082



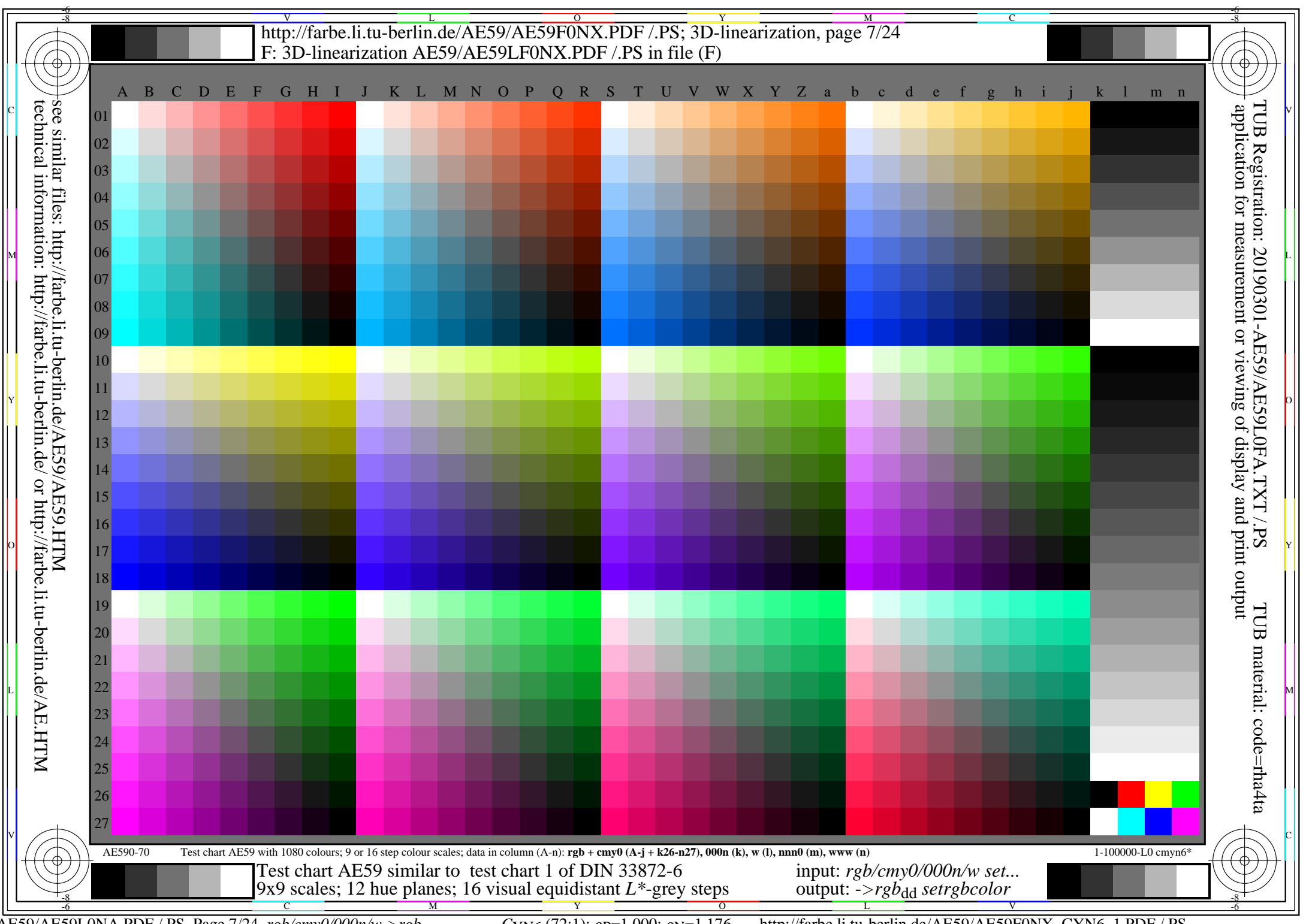
part 2, AE591-3dd: 01082

$L^*/Y_{intended}$ (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	[Visual Grey Steps]															
$g_N=1,081$	[Visual Grey Steps]															
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)	[Visual Grey Steps]															
$w^*_{intended}$	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	0,053	0,112	0,175	0,239	0,304	0,371	0,439	0,506	0,575	0,645	0,714	0,785	0,857	0,927	1,000

part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n^* setcmykcolor AE590-7dd: 01082

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 Viewing $Y_W: Y_N=88,9:0,62$; Y_N -range 0,46 to <0,93

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



see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

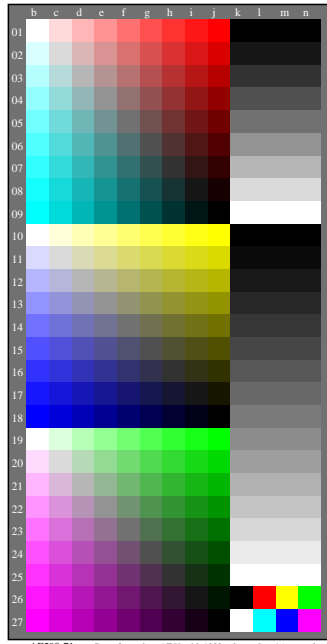
TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rhata4ta

AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): **rgb + cmy0 (A-j + k26-n27), 000n (k), w (l), nnn0 (m), www (n)** 1-100000-L0 cmy6*

Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps
input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata4ta



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN6_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN6_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 AE59F0PX_CYN6_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 AE59F0PX_CYN6_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,

AE590-7dd: 010161

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN6_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN6_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN6_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN6_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 010161

Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps

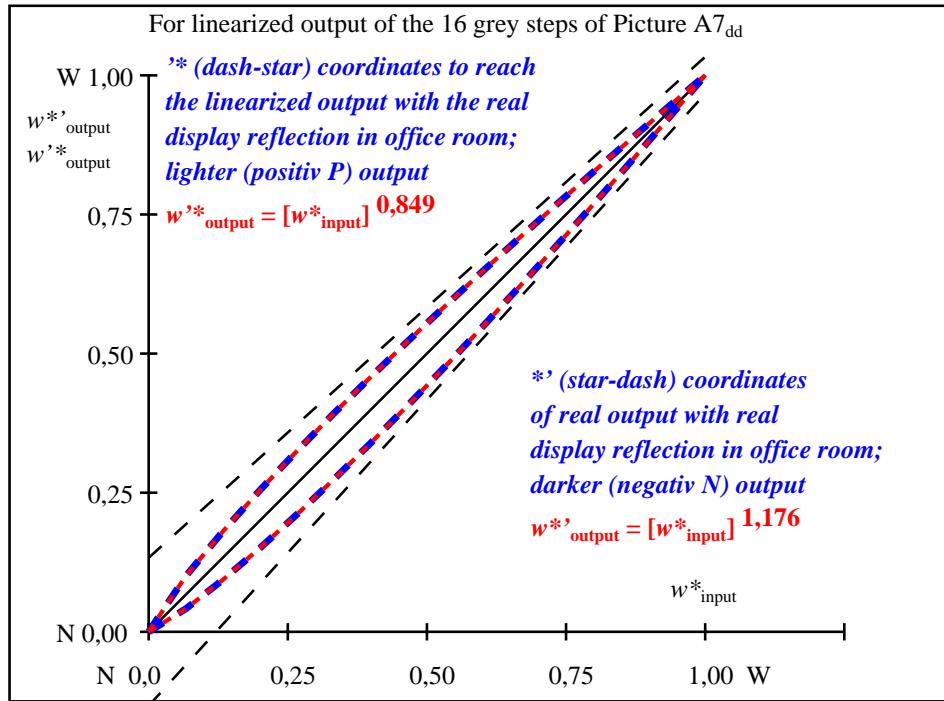
input: `rgb/cmy0/000n/w set...`
output: `->rgbdd setrgbcolor`

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	10,99 0,00 0,00	0,00	10,99 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
2	16,62 0,00 0,00	0,02	13,11 0,00 0,00	-3, 0,00 0,00	3,50	
3	22,24 0,00 0,00	0,06	16,44 0,00 0,00	-5, 0,00 0,00	5,80	
4	27,87 0,00 0,00	0,11	20,45 0,00 0,00	-7, 0,00 0,00	7,42	
5	33,50 0,00 0,00	0,16	24,98 0,00 0,00	-8, 0,00 0,00	8,52	
6	39,13 0,00 0,00	0,22	29,94 0,00 0,00	-9, 0,00 0,00	9,19	
7	44,75 0,00 0,00	0,28	35,27 0,00 0,00	-9, 0,00 0,00	9,48	
8	50,38 0,00 0,00	0,35	40,93 0,00 0,00	-9, 0,00 0,00	9,45	
9	56,01 0,00 0,00	0,42	46,89 0,00 0,00	-9, 0,00 0,00	9,11	
10	61,64 0,00 0,00	0,49	53,13 0,00 0,00	-8, 0,00 0,00	8,50	
11	67,27 0,00 0,00	0,57	59,62 0,00 0,00	-7, 0,00 0,00	7,64	
12	72,89 0,00 0,00	0,65	66,35 0,00 0,00	-6, 0,00 0,00	6,54	
13	78,52 0,00 0,00	0,73	73,31 0,00 0,00	-5, 0,00 0,00	5,21	
14	84,15 0,00 0,00	0,82	80,48 0,00 0,00	-3, 0,00 0,00	3,67	
15	89,78 0,00 0,00	0,91	87,84 0,00 0,00	-1, 0,00 0,00	1,93	
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	0,15	23,80 0,00 0,00	-8, 0,00 0,00	8,29	
19	53,20 0,00 0,00	0,38	43,88 0,00 0,00	-9, 0,00 0,00	9,32	
20	74,30 0,00 0,00	0,67	68,07 0,00 0,00	-6, 0,00 0,00	6,22	
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) $\Delta E^*_{CIELAB} = 6,0$
 Mean lightness difference (5 steps) $\Delta L^*_{CIELAB} = 4,7$
 Mean colour reproduction index: $R^*_{ab,m} = 73,7$



part 1, AE590-3dd: 010162

part 2, AE591-3dd: 010162

$L^*/Y_{intended}$ (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	[Color swatches]															
$g_N=1,176$	[Color swatches]															
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)	[Color swatches]															
$w^*_{intended}$	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	0,041	0,093	0,150	0,211	0,274	0,340	0,408	0,476	0,548	0,620	0,693	0,769	0,845	0,921	1,000

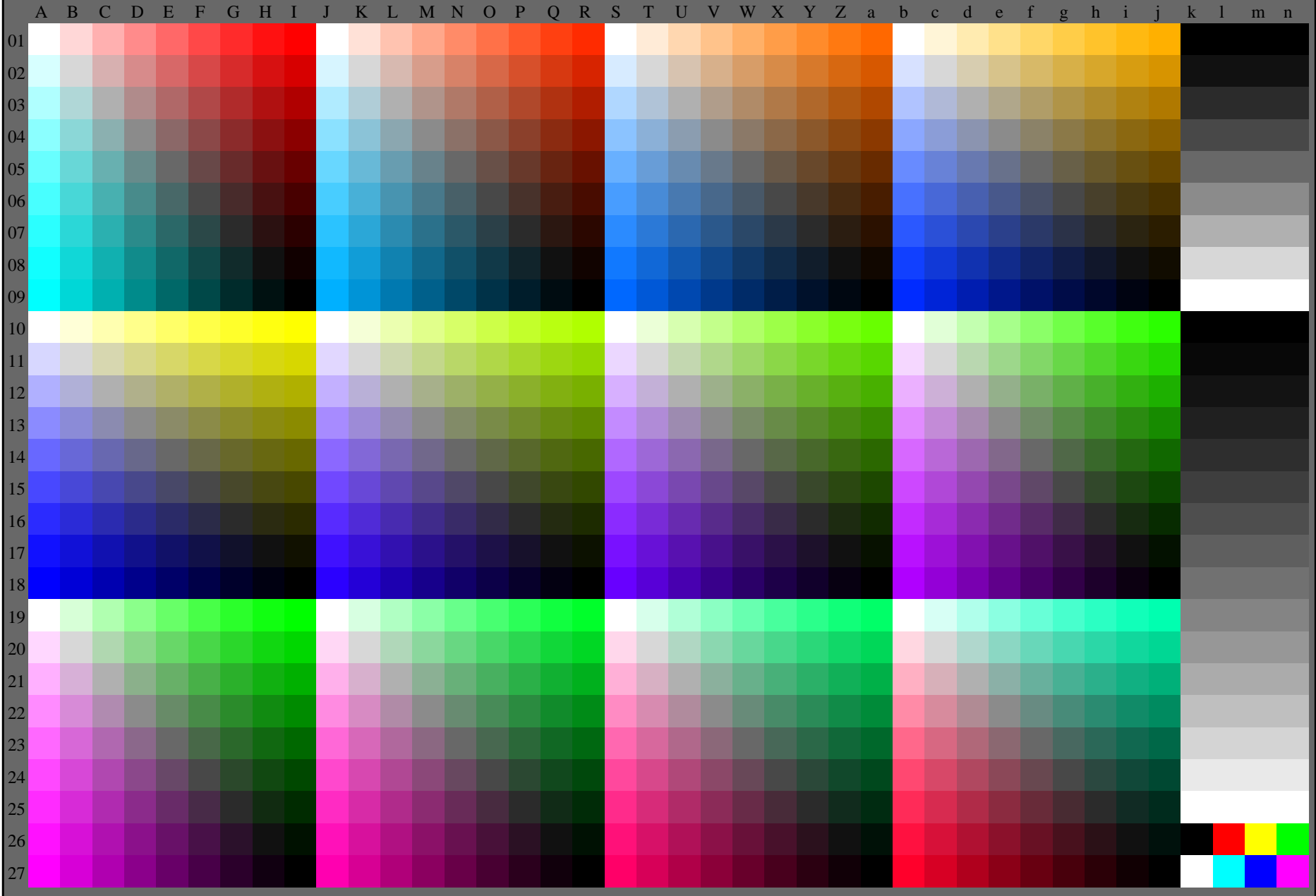
part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: $0\ 0\ 0\ n^*$ setcmykcolor AE590-7dd: 010162

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 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: $->rgb_{dd}\ setrgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rhata



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): **rgb + cmy0 (A-j + k26-n27), 000n (k), w (l), nnn0 (m), www (n)** 1-100000-L0 cmy_n6*

Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps

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

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN5_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN5_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 AE59F0PX_CYN5_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 AE59F0PX_CYN5_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,

AE590-7dd: 010241

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN5_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN5_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN5_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN5_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 010241



Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps

input: `rgb/cmy0/000n/w set...`
output: `->rgbdd setrgbcolor`



TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata

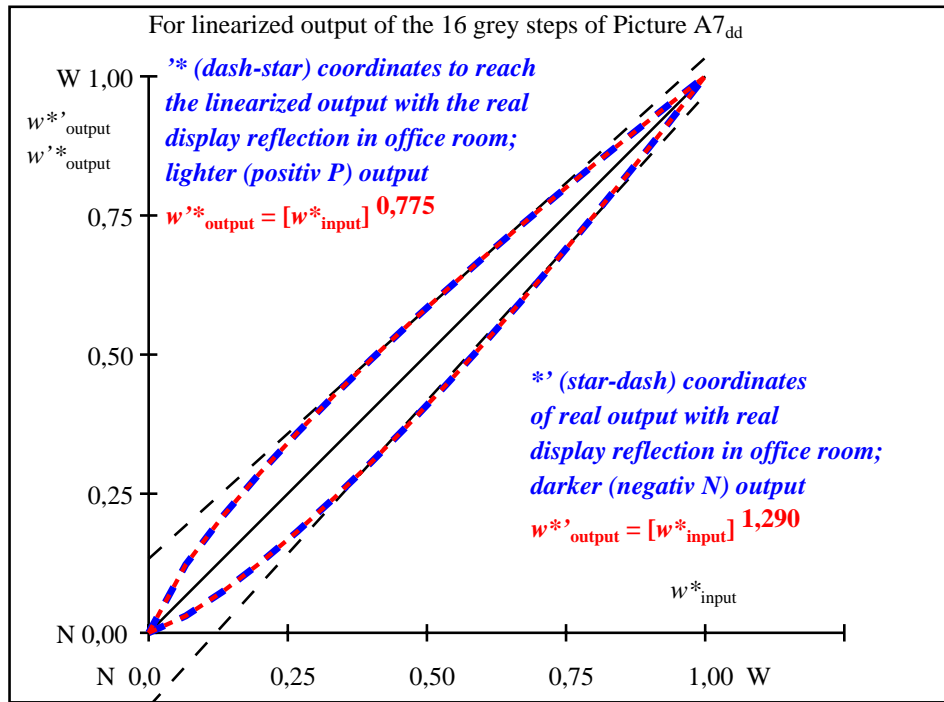
see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	18,00	0,00	18,00	0,00	0,01	Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G
2	23,16	0,00	19,20	-3,	3,96	
3	28,32	0,00	21,48	-6,	6,84	
4	33,48	0,00	24,50	-8,	8,98	
5	38,64	0,00	28,11	-10,	10,53	
6	43,80	0,00	32,26	-11,	11,54	
7	48,96	0,00	36,88	-12,	12,08	
8	54,12	0,00	41,94	-12,	12,18	
9	59,28	0,00	47,40	-11,	11,88	
10	64,44	0,00	53,25	-11,	11,19	
11	69,60	0,00	59,46	-10,	10,14	
12	74,76	0,00	66,01	-8,	8,75	
13	79,92	0,00	72,90	-7,	7,02	
14	85,08	0,00	80,10	-4,	4,98	Mean lightness difference (16 steps)
15	90,24	0,00	87,60	-2,	2,64	$\Delta E^*_{CIELAB} = 7,6$
16	95,41	0,00	95,41	0,00	0,01	
17	18,00	0,00	18,00	0,00	0,01	
18	37,35	0,00	27,16	-10,	10,19	
19	56,70	0,00	44,62	-12,	12,08	Mean lightness difference (5 steps)
20	76,05	0,00	67,70	-8,	8,35	$\Delta L^*_{CIELAB} = 6,1$
21	95,41	0,00	95,41	0,00	0,01	

Mean colour reproduction index: $R^*_{ab,m} = 66,3$

part 1, AE590-3dd: 010242



part 2, AE591-3dd: 010242

$L^*/Y_{intended}$ (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	[Color swatches]															
$g_N=1,290$ 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)	[Color swatches]															
$w^*_{intended}$	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	0,030	0,074	0,125	0,181	0,241	0,306	0,374	0,444	0,517	0,593	0,669	0,749	0,831	0,914	1,000

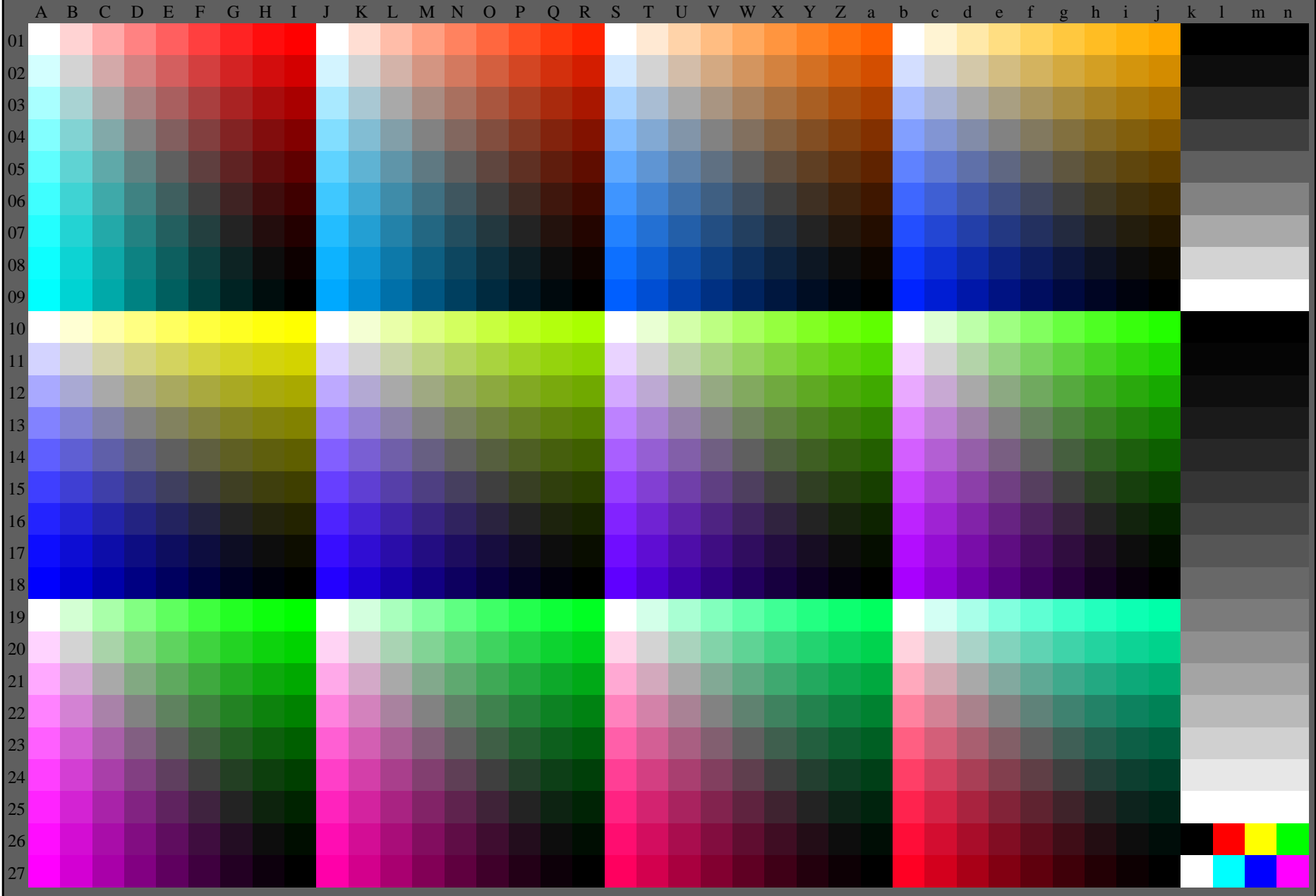
part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor AE590-7dd: 010242

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 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: $->rgb_{dd}\ setrgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

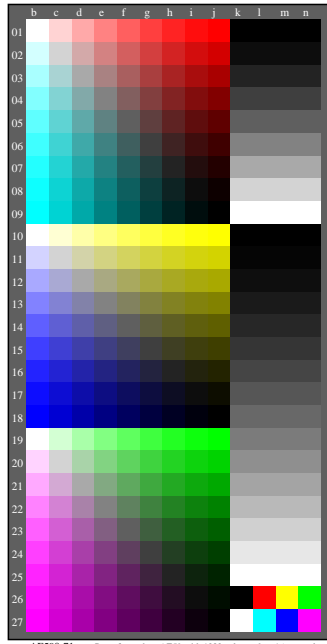
TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rhata



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): **rgb + cmy0 (A-j + k26-n27), 000n (k), w (l), nnn0 (m), www (n)** 1-100000-L0 cmy_n6*

Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps
input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN4_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN4_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 AE59F0PX_CYN4_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 AE59F0PX_CYN4_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,

AE590-7dd: 010321

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN4_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN4_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN4_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN4_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 010321



Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps

input: `rgb/cmy0/000n/w set...`
output: `->rgbdd setrgbcolor`



TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	26,84	0,00	0,00	0,00	0,00	0,01
2	31,41	0,00	0,00	27,49	0,00	3,92
3	35,98	0,00	0,03	28,99	0,00	6,99
4	40,56	0,00	0,06	31,15	0,00	9,40
5	45,13	0,00	0,10	33,90	0,00	11,22
6	49,70	0,00	0,15	37,21	0,00	12,49
7	54,27	0,00	0,20	41,02	0,00	13,24
8	58,84	0,00	0,26	45,33	0,00	13,51
9	63,41	0,00	0,33	50,10	0,00	13,31
10	67,98	0,00	0,41	55,32	0,00	12,65
11	72,55	0,00	0,49	60,98	0,00	11,57
12	77,12	0,00	0,58	67,06	0,00	10,06
13	81,69	0,00	0,68	73,55	0,00	8,14
14	86,26	0,00	0,78	80,45	0,00	5,81
15	90,83	0,00	0,88	87,73	0,00	3,10
16	95,41	0,00	1,00	95,41	0,00	0,01
17	26,84	0,00	0,00	26,84	0,00	0,01
18	43,98	0,00	0,09	33,16	0,00	10,82
19	61,12	0,00	0,30	47,66	0,00	13,46
20	78,26	0,00	0,60	68,64	0,00	9,62
21	95,41	0,00	1,00	95,41	0,00	0,01

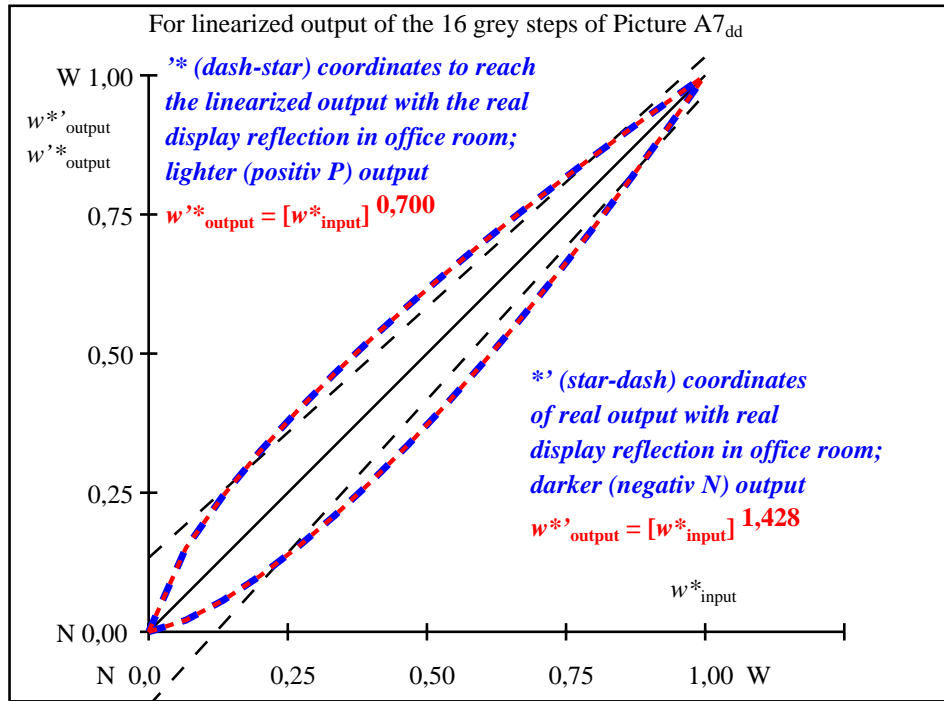
Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G

Mean lightness difference (16 steps)
 $\Delta E^*_{CIELAB} = 8,4$

Mean lightness difference (5 steps)
 $\Delta L^*_{CIELAB} = 6,7$

Mean colour reproduction index: $R^*_{ab,m} = 62,8$

part 1, AE590-3dd: 010322



part 2, AE591-3dd: 010322

$L^*/Y_{intended}$ (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																
$g_N=1,428$ 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	0,021	0,056	0,100	0,151	0,207	0,270	0,336	0,407	0,482	0,560	0,641	0,727	0,815	0,905	1,000

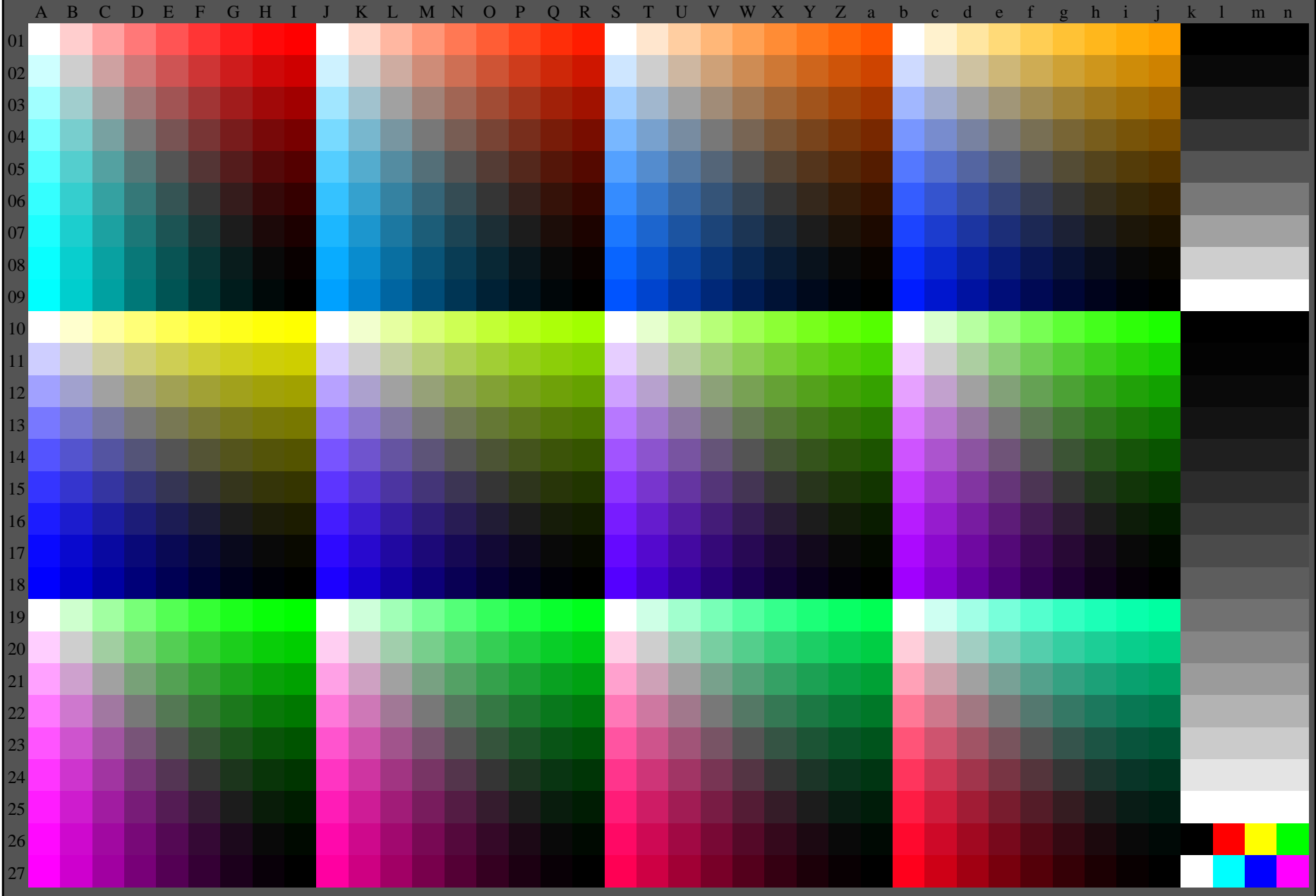
part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor
 AE590-7dd: 010322

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 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: $->rgb_{dd}\ setrgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rh4d4a



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): $rgb + cmy0(A-j + k26-n27), 000n(k), w(l), nnn0(m), www(n)$ 1-100000-L0 cmy_n6*

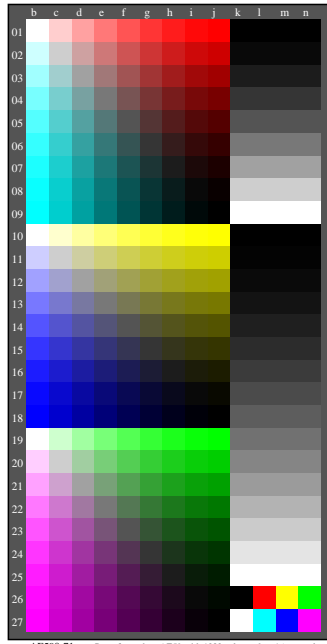


Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L*-grey steps

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



see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

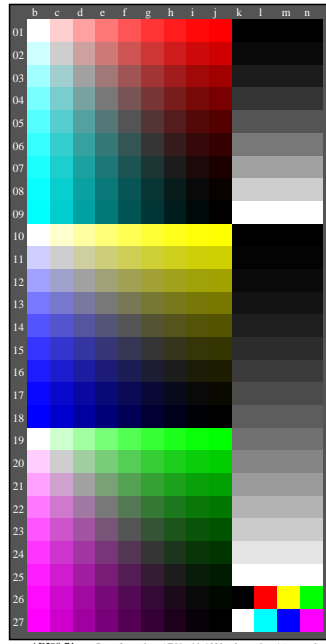
Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN3_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN3_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 AE59F0PX_CYN3_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 AE59F0PX_CYN3_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,

AE590-7dd: 010401

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN3_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN3_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN3_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN3_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 010401



Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps

input: `rgb/cmy0/000n/w set...`
output: `->rgbdd setrgbcolor`



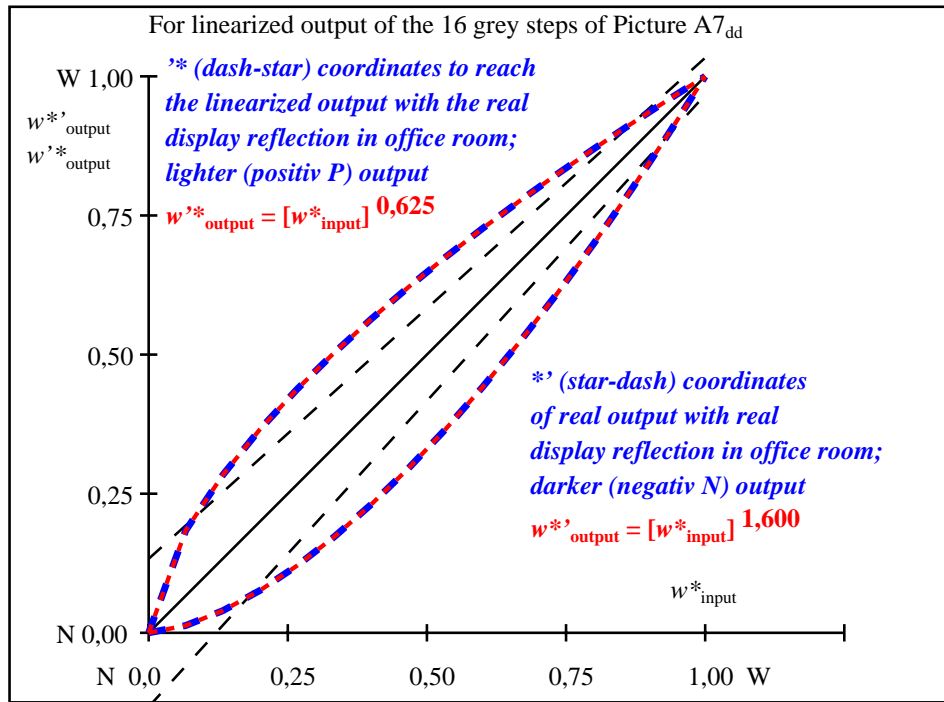
TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
 technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	37,98 0,00 0,00	0,00 0,00	37,98 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
2	41,81 0,00 0,00	0,00 0,00	38,32 0,00 0,00	-3, 0,00 0,00	3,49	
3	45,64 0,00 0,00	0,02 0,00	39,23 0,00 0,00	-6, 0,00 0,00	6,40	
4	49,47 0,00 0,00	0,04 0,00	40,68 0,00 0,00	-8, 0,00 0,00	8,78	
5	53,29 0,00 0,00	0,08 0,00	42,64 0,00 0,00	-10, 0,00 0,00	10,65	
6	57,12 0,00 0,00	0,12 0,00	45,10 0,00 0,00	-12, 0,00 0,00	12,02	
7	60,95 0,00 0,00	0,17 0,00	48,05 0,00 0,00	-12, 0,00 0,00	12,90	
8	64,78 0,00 0,00	0,23 0,00	51,48 0,00 0,00	-13, 0,00 0,00	13,30	
9	68,61 0,00 0,00	0,30 0,00	55,37 0,00 0,00	-13, 0,00 0,00	13,23	
10	72,44 0,00 0,00	0,37 0,00	59,74 0,00 0,00	-12, 0,00 0,00	12,69	
11	76,26 0,00 0,00	0,46 0,00	64,56 0,00 0,00	-11, 0,00 0,00	11,70	
12	80,09 0,00 0,00	0,55 0,00	69,83 0,00 0,00	-10, 0,00 0,00	10,25	
13	83,92 0,00 0,00	0,65 0,00	75,56 0,00 0,00	-8, 0,00 0,00	8,35	
14	87,75 0,00 0,00	0,76 0,00	81,73 0,00 0,00	-6, 0,00 0,00	6,01	Mean lightness difference (16 steps)
15	91,58 0,00 0,00	0,87 0,00	88,35 0,00 0,00	-3, 0,00 0,00	3,22	$\Delta E^*_{CIELAB} = 8,3$
16	95,41 0,00 0,00	1,00 0,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	
17	37,98 0,00 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	0,07 0,00	42,10 0,00 0,00	-10, 0,00 0,00	10,23	
19	66,69 0,00 0,00	0,26 0,00	53,37 0,00 0,00	-13, 0,00 0,00	13,32	Mean lightness difference (5 steps)
20	81,05 0,00 0,00	0,57 0,00	71,22 0,00 0,00	-9, 0,00 0,00	9,82	$\Delta L^*_{CIELAB} = 6,6$
21	95,41 0,00 0,00	1,00 0,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	Mean colour reproduction index: $R^*_{ab,m} = 63,5$

part 1, AE590-3dd: 010402



part 2, AE591-3dd: 010402

$L^*/Y_{intended}$ (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	[Visual representation of 16 grey steps]															
$g_N=1,600$ 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)	[Visual representation of 16 grey steps]															
$w^*_{intended}$	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	0,013	0,039	0,076	0,120	0,172	0,230	0,295	0,365	0,441	0,523	0,608	0,699	0,795	0,894	1,000

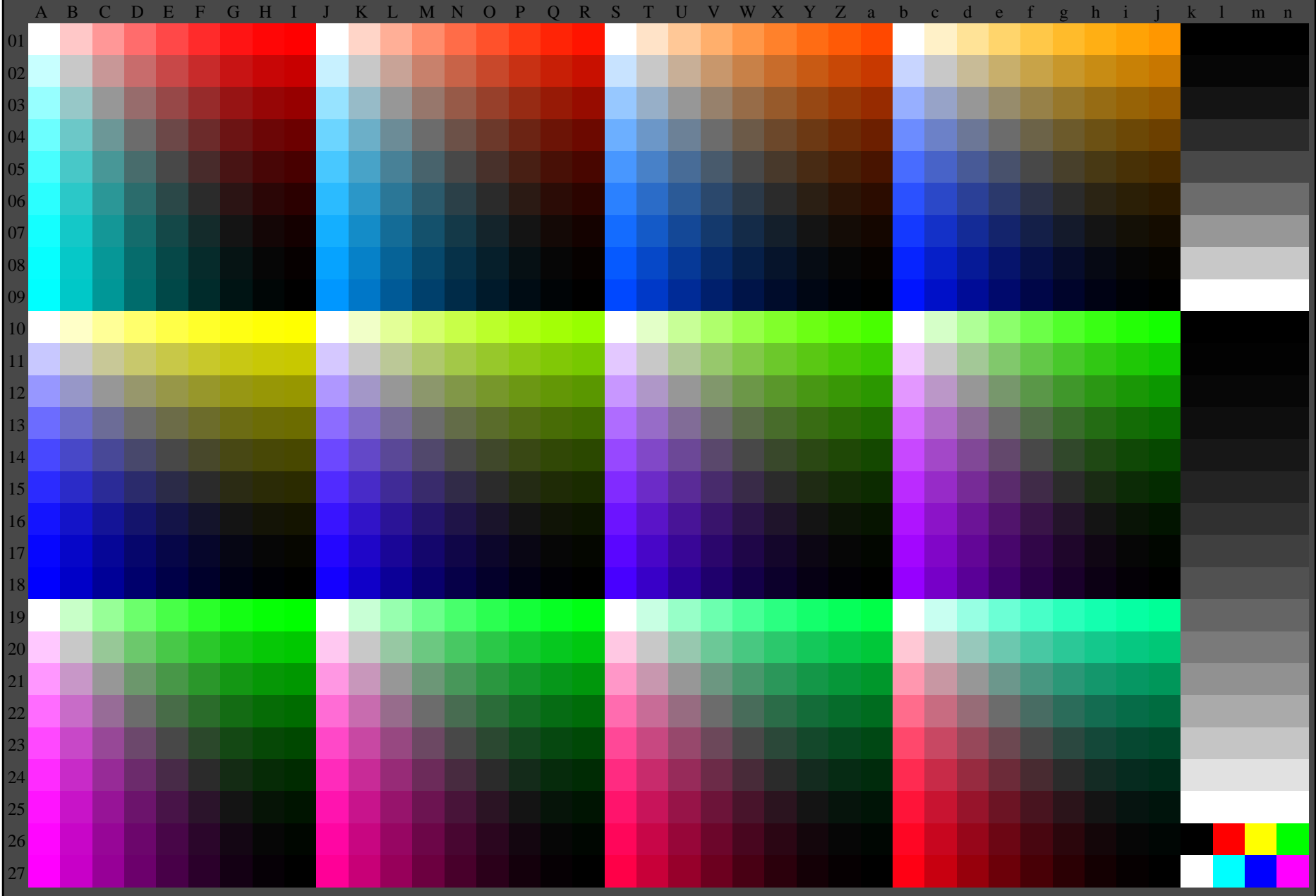
part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor AE590-7dd: 010402

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 Viewing Y contrast $Y_W:Y_N=88,9:10$; Y_N -range 7,5 to <15

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

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59L0FA.TXT> / .PS
technical information: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT / .PS
application for measurement or viewing of display and print output
TUB material: code=rhata



AE590-70 Test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (A-n): $rgb + cmy0(A-j + k26-n27), 000n(k), w(l), nnn0(m), www(n)$
Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd} setrgbcolor$
1-100000-L0 cmy_n6^*

see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



Discriminability of chromatic colours
Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Discriminability of 81 chromatic colours
Are all the 81 colours different? **Yes/No**
Only in case of "No": How many are different? Of the 81 are different

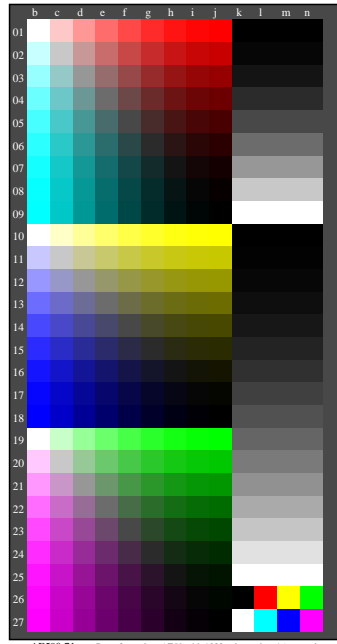
Result: Of the 243 (=3x81) colours are different

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours
Remarks: This test uses many colour scales of 9 steps
Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)
Agreement with elementary colours
Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue (rows 10 to 18, column b to j)
Agreement with elementary colours
Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**
Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)
Agreement with elementary colours
Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps
Discriminability of 9 steps (rows 01 to 09, column k to n)
Are the 9 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n)
Are the 16 steps distinguishable? **Yes/No**
If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:
.....
.....

Remarks about the creation and content of the PDF files:
Sometimes "colour smoothing" is a default setting.
In this case the 9 steps are often not visible and may be counted as one step.
Sometimes "optimizing the PDF output for the web" is a default setting.
For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN2_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN2_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 AE59F0PX_CYN2_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 AE59F0PX_CYN2_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,

AE590-7dd: 010481

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 **underline: Yes/No**
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/AE59/AE59F0PX_CYN2_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN2_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN2_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN2_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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,

AE591-7dd: 010481



Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps

input: `rgb/cmy0/000n/w set...`
output: `->rgbdd setrgbcolor`



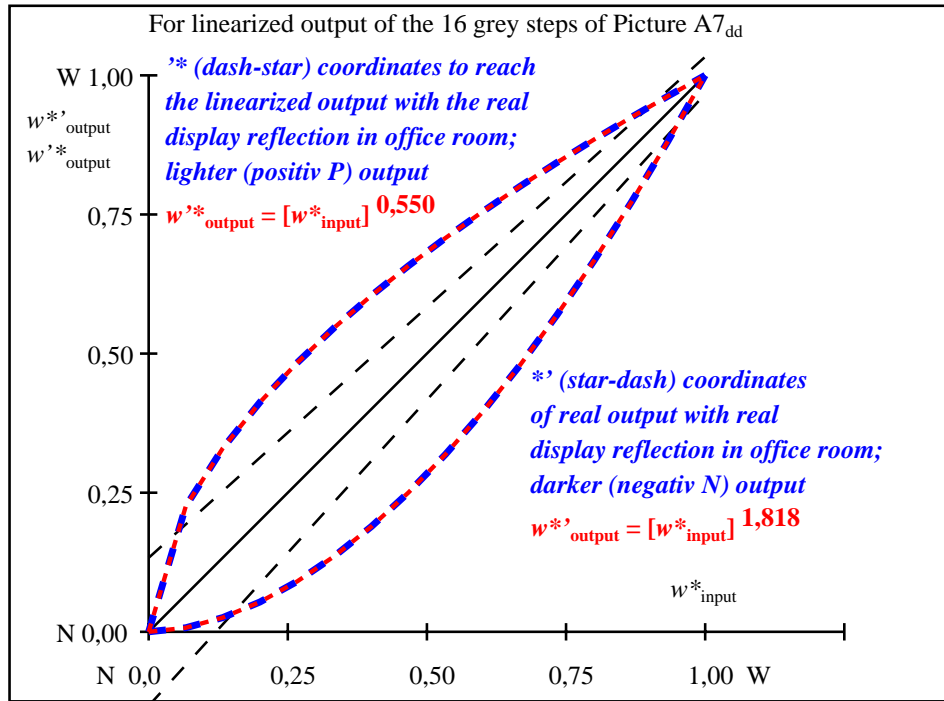
TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=thata

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	52,01 0,00 0,00	0,00	52,01 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
2	54,91 0,00 0,00	0,00	52,17 0,00 0,00	-2, 0,00 0,00	2,73	
3	57,80 0,00 0,00	0,01	52,67 0,00 0,00	-5, 0,00 0,00	5,12	
4	60,69 0,00 0,00	0,03	53,54 0,00 0,00	-7, 0,00 0,00	7,15	
5	63,58 0,00 0,00	0,06	54,79 0,00 0,00	-8, 0,00 0,00	8,79	
6	66,48 0,00 0,00	0,10	56,43 0,00 0,00	-10, 0,00 0,00	10,04	
7	69,37 0,00 0,00	0,14	58,46 0,00 0,00	-10, 0,00 0,00	10,90	
8	72,26 0,00 0,00	0,20	60,90 0,00 0,00	-11, 0,00 0,00	11,35	
9	75,16 0,00 0,00	0,27	63,75 0,00 0,00	-11, 0,00 0,00	11,40	
10	78,05 0,00 0,00	0,34	67,01 0,00 0,00	-11, 0,00 0,00	11,03	
11	80,94 0,00 0,00	0,43	70,68 0,00 0,00	-10, 0,00 0,00	10,25	
12	83,83 0,00 0,00	0,52	74,78 0,00 0,00	-9, 0,00 0,00	9,05	
13	86,73 0,00 0,00	0,62	79,29 0,00 0,00	-7, 0,00 0,00	7,43	
14	89,62 0,00 0,00	0,74	84,23 0,00 0,00	-5, 0,00 0,00	5,38	Mean lightness difference (16 steps)
15	92,51 0,00 0,00	0,86	89,60 0,00 0,00	-2, 0,00 0,00	2,90	$\Delta E^*_{CIELAB} = 7,1$
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	0,05	54,44 0,00 0,00	-8, 0,00 0,00	8,42	
19	73,71 0,00 0,00	0,23	62,28 0,00 0,00	-11, 0,00 0,00	11,43	Mean lightness difference (5 steps)
20	84,56 0,00 0,00	0,54	75,87 0,00 0,00	-8, 0,00 0,00	8,69	$\Delta L^*_{CIELAB} = 5,7$
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: $R^*_{ab,m} = 68,8$

part 1, AE590-3dd: 010482



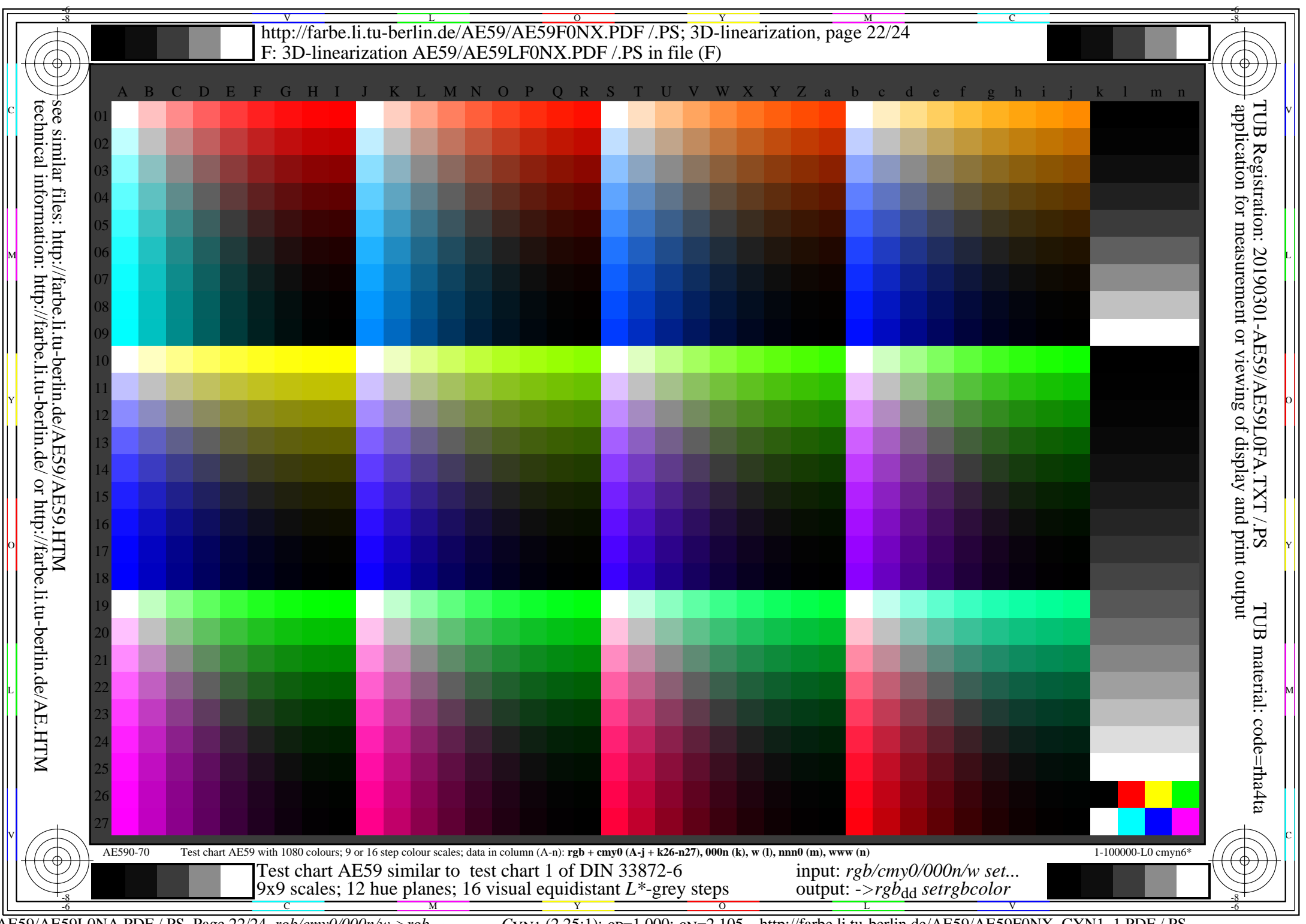
part 2, AE591-3dd: 010482

$L^*/Y^*_{intended}$ (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	[Visual representation of 16 grey steps]															
$g_N=1,818$ 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)	[Visual representation of 16 grey steps]															
$w^*_{intended}$	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	0,007	0,025	0,053	0,090	0,135	0,189	0,250	0,318	0,395	0,478	0,568	0,666	0,771	0,881	1,000

part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor AE590-7dd: 010482

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 Viewing Y contrast $Y_W:Y_N=88,9:20$; Y_N -range 15 to <30

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



see similar files: <http://farbe.li.tu-berlin.de/AE59/AE59.HTM>
 technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=thata4ta



Discriminability of chromatic colours

Remarks: This test uses many colour scales of 9 steps

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)

Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Hue plane Yellow - Blue (rows 10 to 18, column b to j)

Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Hue plane Green - Magenta red (rows 19 to 27, column b to j)

Discriminability of 81 chromatic colours
 Are all the 81 colours different? **Yes/No**
 Only in case of "No": How many are different? Of the 81 are different

Result: Of the 243 (=3x81) colours are different

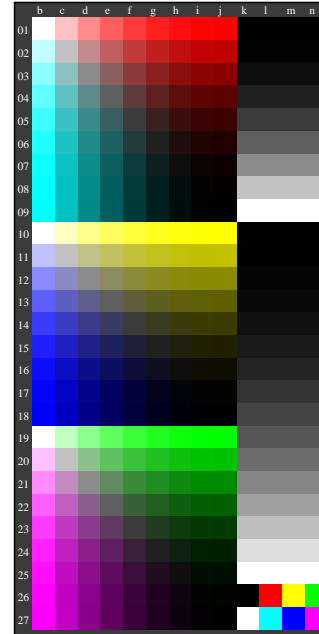
Artifacts, please describe if visible:

Remarks about the creation and content of the PDF files:

Sometimes "colour smoothing" is a default setting.
 In this case the 9 steps are often not visible and may be counted as one step.
 Sometimes "optimizing the PDF output for the web" is a default setting.
 For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*



Agreement with elementary colours

Remarks: This test uses many colour scales of 9 steps
 Red R_e and Green G_e are defined by the visual criteria: *neither yellowish nor bluish*.
 Yellow Y_e and Blue B_e are defined by the visual criteria: *neither reddish nor greenish*.

Hue plane Red - Cyan blue (rows 01 to 09, column b to j)

Agreement with elementary colours
 Is the colour at the position (j,01) the elementary colour Red R_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: yellowish/bluish

Hue plane Yellow - Blue B_e (rows 10 to 18, column b to j)

Agreement with elementary colours
 Is the colour at the position (j,10) the elementary colour Yellow Y_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: reddish/greenish

Is the colour at the position (b,18) the elementary colour Blue B_e ? **Yes/No**

Only in case of "No": The colour at this position appears: reddish/greenish

Hue plane Green - Magenta red (rows 19 to 27, column b to j)

Agreement with elementary colours
 Is the colour at the position (j,19) the elementary colour Green G_e ? **Yes/No**
 Only in case of "No": The colour at this position appears: yellowish/bluish

Result: Of the 4 elementary colours (e. g. 3) are acceptable as elementary colours.

Discriminability of 9 and 16 grey steps

Discriminability of 9 steps (rows 01 to 09, column k to n) **Yes/No**
 Are the 9 steps distinguishable? **Yes/No**
 If No: How many can be distinguished? of 9 greys are distinguishable.

Discriminability of 16 steps (rows 10 to 27, column k to n) **Yes/No**
 Are the 16 steps distinguishable? **Yes/No**
 If No: How many can be distinguished? of 16 greys are distinguishable.

Artifacts, please describe if visible:

Remarks about the creation and content of the PDF files:

Sometimes "colour smoothing" is a default setting.
 In this case the 9 steps are often not visible and may be counted as one step.
 Sometimes "optimizing the PDF output for the web" is a default setting.
 For example this setting may reduce the 1080 colours on a page to 256 colours.

AE590-71 Part of test chart AE59 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6*

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

PDF file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN1_1.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN1_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 AE59F0PX_CYN1_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 AE59F0PX_CYN1_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, AE590-7dd: 010561

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/AE59/AE59F0PX_CYN1_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN1_3.PS **underline: Yes/No**

picture A7dd 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/AE59/AE59F0PX_CYN1_3.PDF **underline: Yes/No**

PS file: http://farbe.li.tu-berlin.de/AE59/AE59F0PX_CYN1_3.PS **underline: Yes/No**

picture A7dd **underline: Yes/No**

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, AE591-7dd: 010561

Form A: Test chart AE59 similar to test chart 1 of DIN 33872-6
 9x9 scales; 12 hue planes; 16 visual equidistant L^* -grey steps
 input: `rgb/cmy0/000n/w set...`
 output: `->rgbdd setrgbcolor`

see similar files: http://farbe.li.tu-berlin.de/AE59/AE59.HTM
 technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE59/AE59L0FA.TXT /.PS
 application for measurement or viewing of display and print output
 TUB material: code=rhata4ta

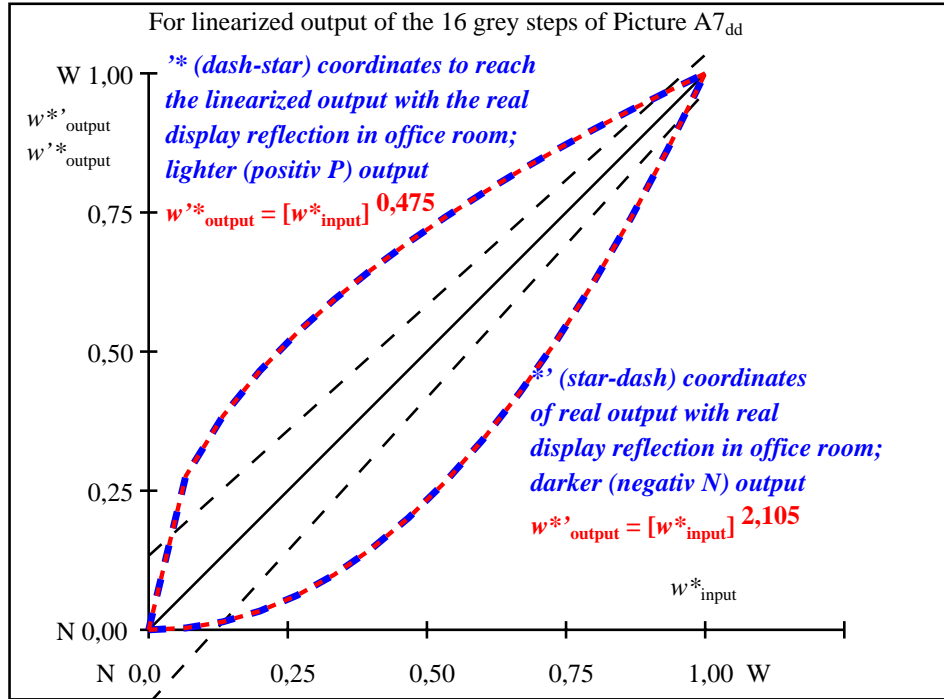
<i>i</i>	LAB^*_{ref}	l^*_{out}	LAB^*_{out}	$LAB^*_{out-ref}$	ΔE^*	Start output S1
1	69,69	0,00	0,00	69,69	0,00	0,00
2	71,41	0,00	0,00	69,75	0,00	-1,
3	73,12	0,00	0,01	69,96	0,00	-3,
4	74,83	0,00	0,02	70,37	0,00	-4,
5	76,55	0,00	0,05	70,99	0,00	-5,
6	78,26	0,00	0,08	71,84	0,00	-6,
7	79,98	0,00	0,12	72,93	0,00	-7,
8	81,69	0,00	0,17	74,28	0,00	-7,
9	83,41	0,00	0,24	75,90	0,00	-7,
10	85,12	0,00	0,31	77,80	0,00	-7,
11	86,83	0,00	0,39	79,98	0,00	-6,
12	88,55	0,00	0,49	82,45	0,00	-6,
13	90,26	0,00	0,60	85,22	0,00	-5,
14	91,98	0,00	0,72	88,30	0,00	-3,
15	93,69	0,00	0,85	91,69	0,00	-1,
16	95,41	0,00	1,00	95,41	0,00	0,00
17	69,69	0,00	0,00	69,69	0,00	0,00
18	76,12	0,00	0,04	70,81	0,00	-5,
19	82,55	0,00	0,20	75,06	0,00	-7,
20	88,98	0,00	0,52	83,11	0,00	-5,
21	95,41	0,00	1,00	95,41	0,00	0,00

Mean lightness difference (16 steps)
 $\Delta E^*_{CIELAB} = 4,6$

Mean lightness difference (5 steps)
 $\Delta L^*_{CIELAB} = 3,7$

Mean colour reproduction index: $R^*_{ab,m} = 79,6$

part 1, AE590-3dd: 010562



part 2, AE591-3dd: 010562

$L^*/Y^*_{intended}$ (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	[Color bars]															
$g_N=2,105$ 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)	[Color bars]															
$w^*_{intended}$	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	0,003	0,014	0,033	0,062	0,098	0,145	0,201	0,265	0,341	0,426	0,520	0,625	0,740	0,864	1,000

part 3, picture A7dd: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n^* setcmykcolor AE590-7dd: 010562

In-out: Test chart AE59 similar to test chart 1 of DIN 33872-6
 Viewing Y contrast $Y_W:Y_N=88,9:40$; Y_N -range 30 to <60

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