

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

see similar files: <http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 3/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

i	LAB* <sub>ref</sub>	L* <sub>out</sub>	LAB* <sub>out</sub>	LAB* <sub>out-ref</sub>	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**

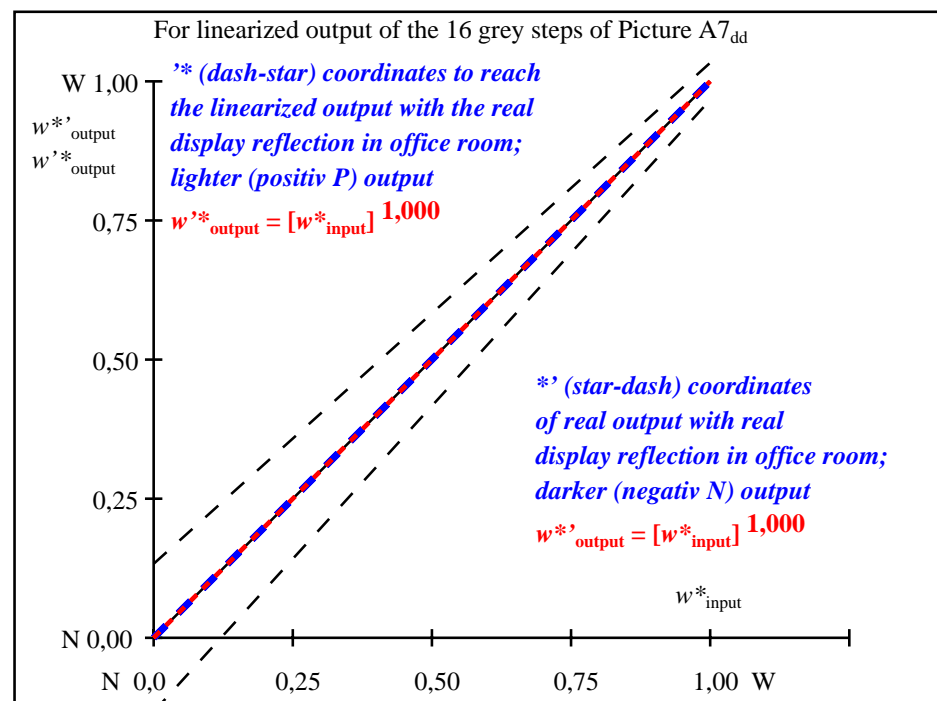
**Mean lightness difference**  
**(16 steps)**  
 $\Delta E^*_{\text{CIELAB}} = 0,0$

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

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

part 1,

AE490-3dd: 01002



part 2,

AE491-3dd: 01002

$L^*/Y_{\text{intended}}$ (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	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
$w^*_{\text{intended}}$	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
$w^*_{\text{output}}$	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<sub>dd</sub>: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

AE490-7dd: 01002

In-out: Test chart AE49 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:  $\rightarrow rgb_{\text{dd}}$  setrgbcOLOR

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output

TUB material: code=th4ta

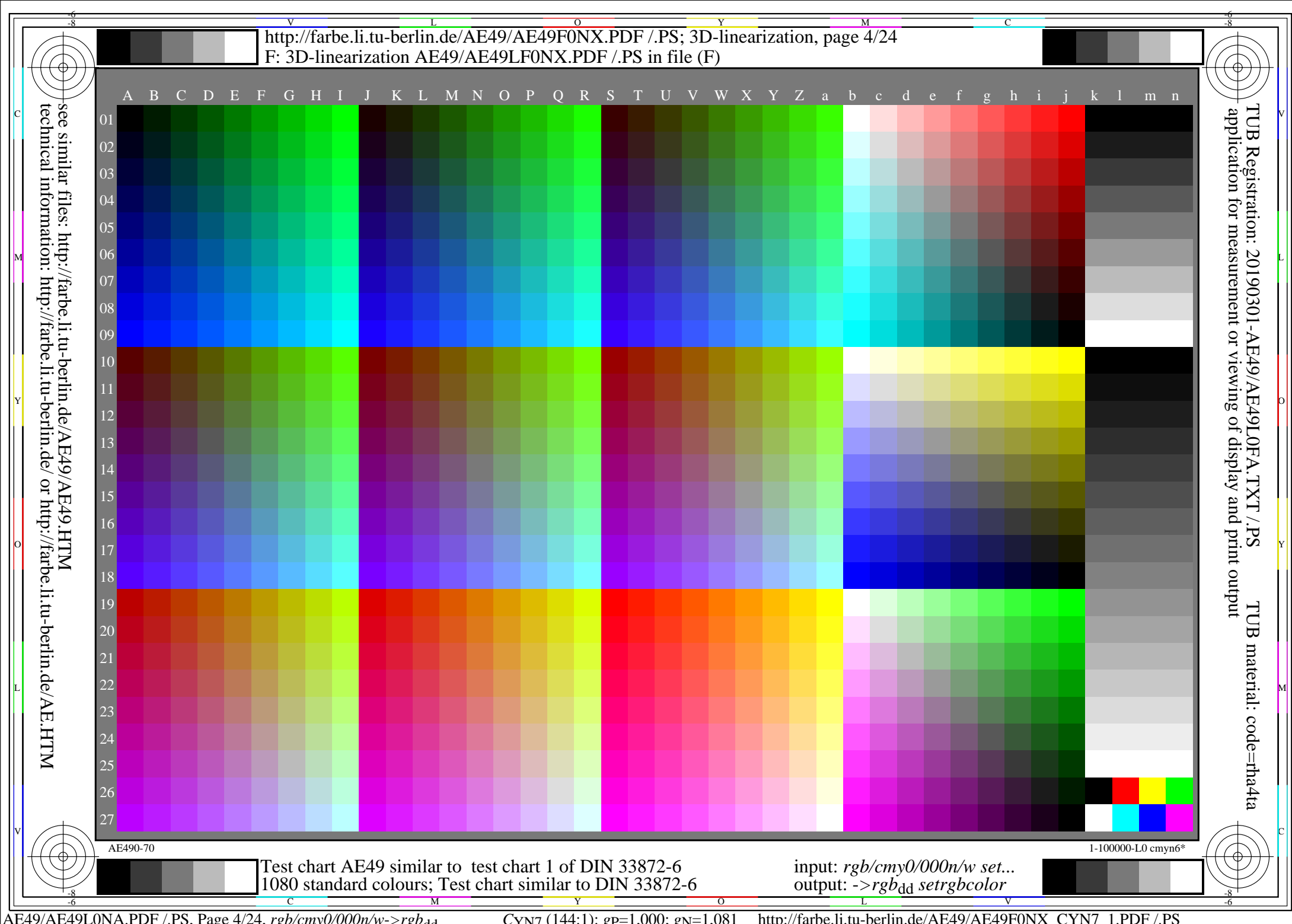


Figure 1 shows a large color chart (AE490-71) with 1080 colors arranged in a 10x10 grid. The colors are organized into several groups: 9 colors (rows 01-09, column b to j), 16 colors (rows 10-27, column b to j), 9 colors (rows 01-09, column k to n), 16 colors (rows 10-27, column k to n), and 9 colors (rows 01-09, column o to q). The colors are labeled with their respective row and column coordinates. The chart is titled 'AE490-71' and 'Part of test chart AE49 with 1080 colours: 9 or 16 sten colour scales; data in column (b-n): red'.

**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/AE49/AE49F0PX\\_CYN7\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN7_3.PDF) **underline: Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN7\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN7_3.PS) **underline: Yes/No**

**picture A7<sub>dd</sub>** **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/AE49/AE49F0PX\\_CYN7\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN7_3.PDF) **underline: Yes/No**

**picture A7<sub>dd</sub>** **underline: Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN7\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN7_3.PS) **underline: Yes/No**

**picture A7<sub>dd</sub>** **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/OE70LINP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82LONP.TXT> and transfer  
 of the PS file AE82LONP.PS (= .TXT) to the PDF-file AE82LONP.PDF **underline: Yes/No**

If No, please describe other method: .....



see similar files: <http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 6/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

i	LAB* <sub>ref</sub>	L* <sub>out</sub>	LAB* <sub>out</sub>	LAB* <sub>out-ref</sub>	ΔE*
1	5,69 0,00 0,00	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	0,04 9,36 0,00	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 0,00 -3,	0,00 0,00 3,63	
4	23,63 0,00 0,00	0,14 19,12 0,00	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 0,00 -5,	0,00 0,00 5,06	
6	35,59 0,00 0,00	0,27 30,23 0,00	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 0,00 -5,	0,00 0,00 5,45	
8	47,55 0,00 0,00	0,40 42,19 0,00	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 0,00 -5,	0,00 0,00 5,11	
10	59,52 0,00 0,00	0,54 54,79 0,00	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 0,00 -4,	0,00 0,00 4,20	
12	71,48 0,00 0,00	0,69 67,91 0,00	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 0,00 -2,	0,00 0,00 2,82	
14	83,44 0,00 0,00	0,84 81,47 0,00	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 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 0,00 0,01	
17	5,69 0,00 0,00	0,00 5,69 0,00	0,00 0,00 0,00	0,00 0,00 0,01	
18	28,12 0,00 0,00	0,19 23,16 0,00	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 0,00 -5,	0,00 0,00 5,26	
20	72,98 0,00 0,00	0,71 69,58 0,00	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 0,00 0,01	

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

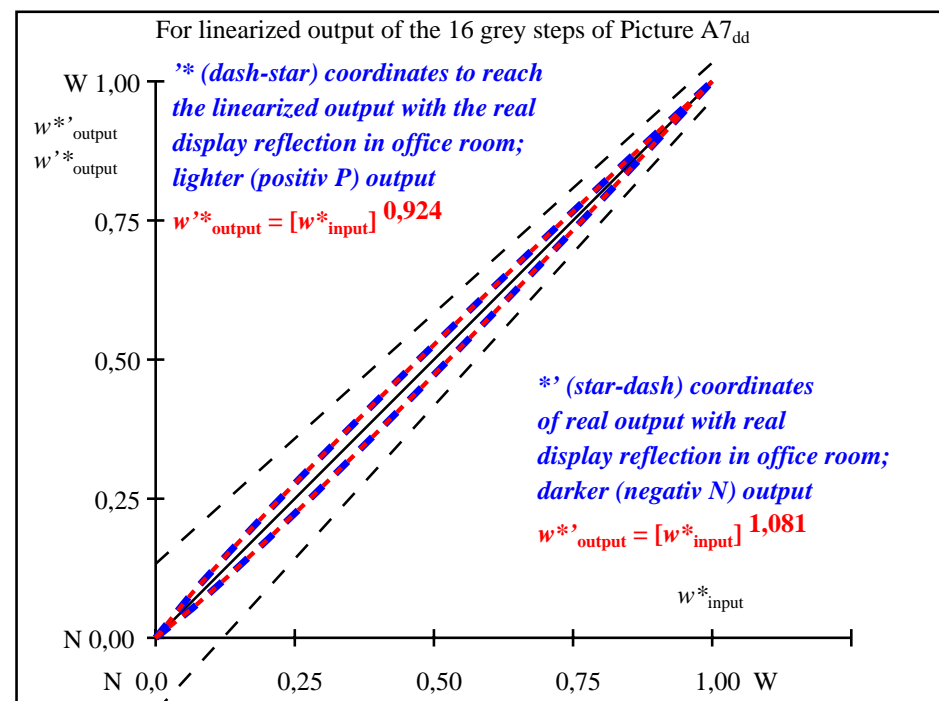
Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 3,4$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 2,7$

Mean colour reproduction index:  $R^*_{ab,m} = 84,9$

part 1,

AE490-3dd: 01082



part 2,

AE491-3dd: 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																
gN=1,081 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	0,053	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

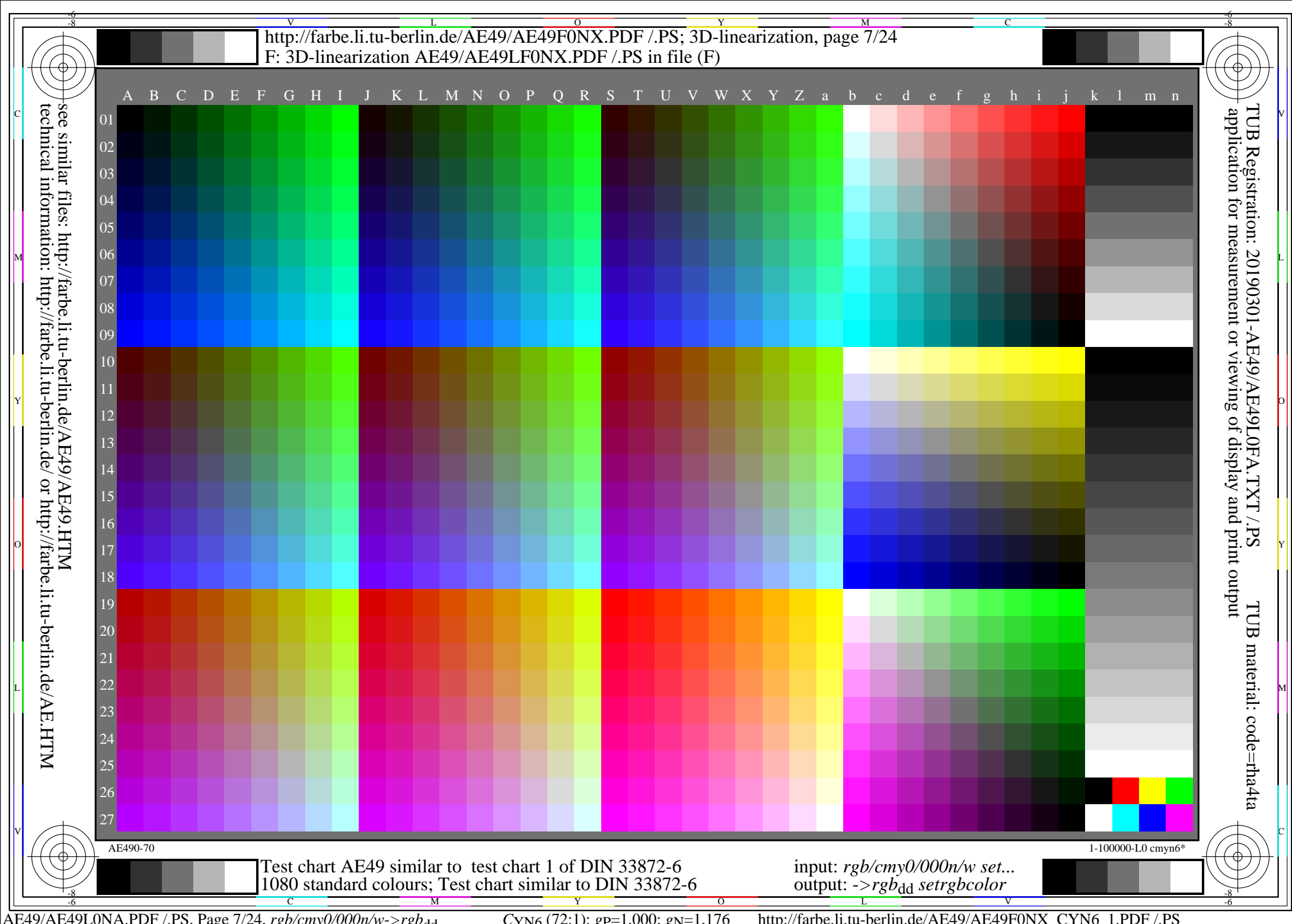
part 3, picture A7<sub>dd</sub>: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

AE490-7dd: 01082

In-out: Test chart AE49 similar to test chart 1 of DIN 33872-6  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$ -range 0,46 to <0,93

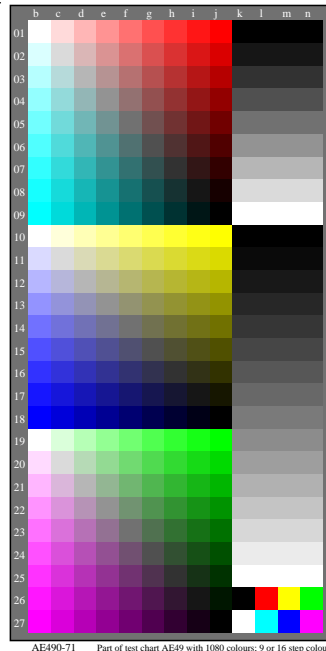
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{dd}$  setrgbcolor

TUB Registration: 20190301-AE49/AE49L0FA.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/AE49/AE49/HTML](http://farbe.li.tu-berlin.de/AE49/AE49/AE49/HTML)  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE49/HTML>

<http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> /PS; 3D-linearization, page 8/24  
F: 3D-linearization AE49/AE49LF0NX.PDF /PS in file (F)



#### 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.

1-100110-L0 cmy6\*

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

##### PDF file:

[http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN6\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN6_1.PDF)

underline: Yes/No

##### PS file:

[http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN6\\_1.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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 AE49F0PX\_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 AE49F0PX\_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)

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AE490-7dd: 010161



#### 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)

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.

1-100110-L0 cmy6\*

#### 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/AE49/AE49F0PX\\_CYN6\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN6_3.PDF)

underline: Yes/No

PS file: [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN6\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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/AE49/AE49F0PX\\_CYN6\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN6_3.PDF)

underline: Yes/No

PS file: [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN6\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN6_3.PS)

underline: Yes/No

picture A7dd

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: .....

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AE491-7dd: 010161

part 4,

input: *rgb/cmy0/000n/w set...*

output: *->rgb<sub>dd</sub> setrgbcolor*

Form A: Test chart AE49 similar to test chart 1 of DIN 33872-6

1080 standard colours; Test chart similar to DIN 33872-6



see similar files: <http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 9/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE49.HTM>

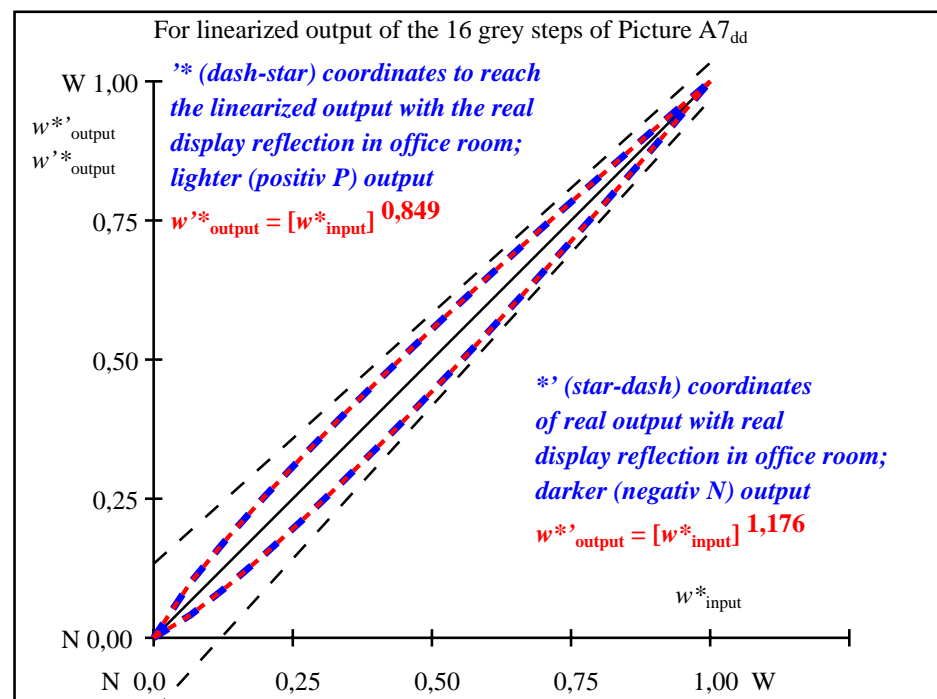
TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

i	LAB <sup>*</sup> <sub>ref</sub>	L <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out-ref</sub>	ΔE <sup>*</sup>	Start output S1
1	10,99 0,00 0,00	0,00 0,00	10,99 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	16,62 0,00 0,00	0,02 0,00	13,11 0,00 0,00	-3, 0,00 0,00	3,50	ISO/IEC 15775 Annex G
3	22,24 0,00 0,00	0,06 0,00	16,44 0,00 0,00	-5, 0,00 0,00	5,80	and DIN 33866-1 Annex G
4	27,87 0,00 0,00	0,11 0,00	20,45 0,00 0,00	-7, 0,00 0,00	7,42	
5	33,50 0,00 0,00	0,16 0,00	24,98 0,00 0,00	-8, 0,00 0,00	8,52	
6	39,13 0,00 0,00	0,22 0,00	29,94 0,00 0,00	-9, 0,00 0,00	9,19	
7	44,75 0,00 0,00	0,28 0,00	35,27 0,00 0,00	-9, 0,00 0,00	9,48	
8	50,38 0,00 0,00	0,35 0,00	40,93 0,00 0,00	-9, 0,00 0,00	9,45	
9	56,01 0,00 0,00	0,42 0,00	46,89 0,00 0,00	-9, 0,00 0,00	9,11	
10	61,64 0,00 0,00	0,49 0,00	53,13 0,00 0,00	-8, 0,00 0,00	8,50	
11	67,27 0,00 0,00	0,57 0,00	59,62 0,00 0,00	-7, 0,00 0,00	7,64	
12	72,89 0,00 0,00	0,65 0,00	66,35 0,00 0,00	-6, 0,00 0,00	6,54	
13	78,52 0,00 0,00	0,73 0,00	73,31 0,00 0,00	-5, 0,00 0,00	5,21	
14	84,15 0,00 0,00	0,82 0,00	80,48 0,00 0,00	-3, 0,00 0,00	3,67	Mean lightness difference
15	89,78 0,00 0,00	0,91 0,00	87,84 0,00 0,00	-1, 0,00 0,00	1,93	(16 steps)
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	ΔE <sup>*</sup> <sub>CIELAB</sub> = 6,0
17	10,99 0,00 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 0,00	23,80 0,00 0,00	-8, 0,00 0,00	8,29	Mean lightness difference
19	53,20 0,00 0,00	0,38 0,00	43,88 0,00 0,00	-9, 0,00 0,00	9,32	(5 steps)
20	74,30 0,00 0,00	0,67 0,00	68,07 0,00 0,00	-6, 0,00 0,00	6,22	ΔL <sup>*</sup> <sub>CIELAB</sub> = 4,7
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:  $R^*_{ab,m} = 73,7$

part 1,

AE490-3dd: 010162



part 2,

AE491-3dd: 010162

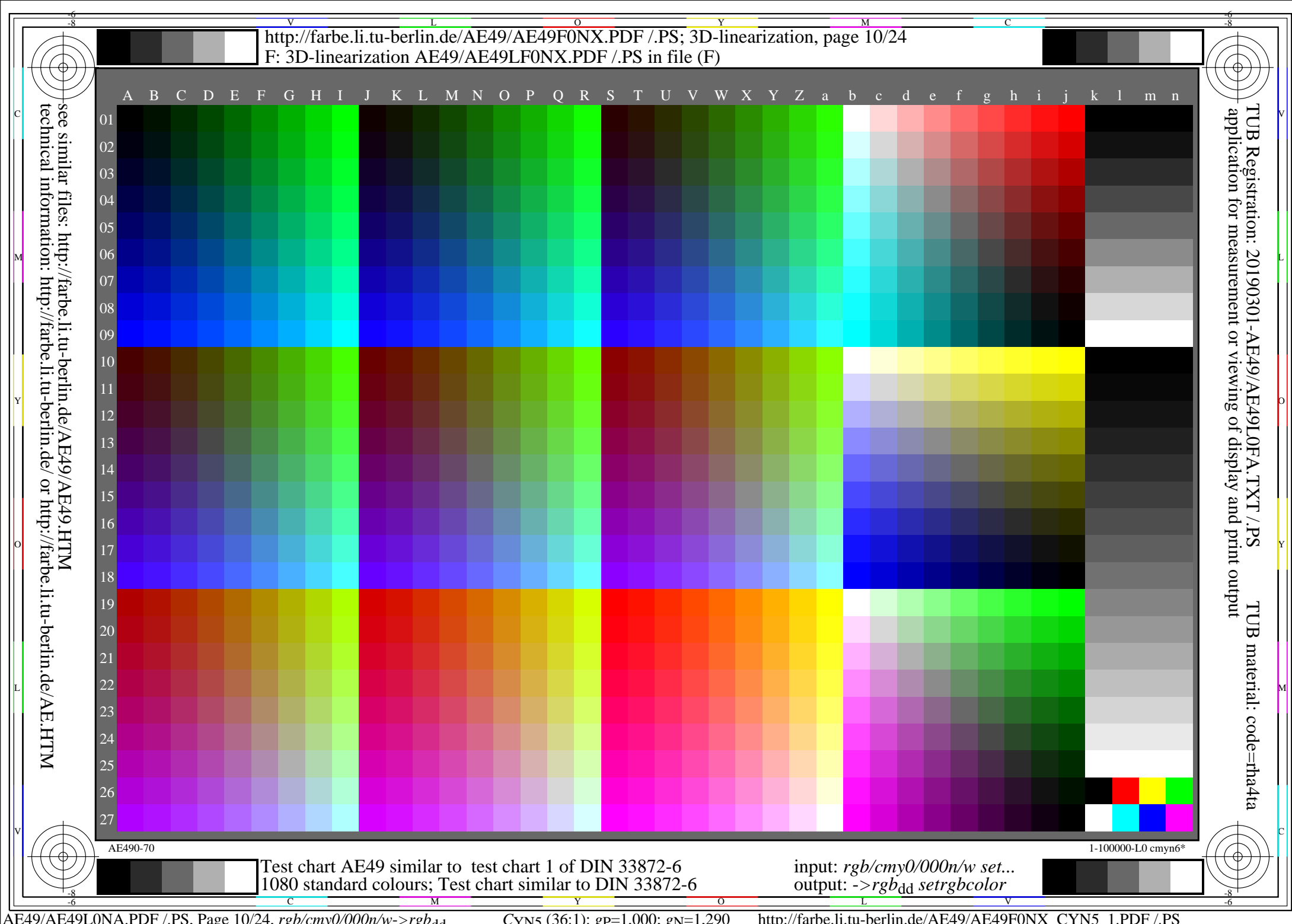
$L^*/Y_{intended}$ (absolute)	10,9/1,2	16,6/2,2	22,2/3,5	27,8/5,4	33,5/7,7	39,1/10,7	44,7/14,3	50,3/18,7	56,0/23,9	61,6/29,9	67,2/36,9	72,8/45,0	78,5/54,1	84,1/64,3	89,7/75,8	95,4/88,5
0 0 0 n <sup>*</sup> setcmyk																
g <sub>N</sub> =1,176 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	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	0,041	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 A7<sub>dd</sub>: 16 visual equidistant L<sup>\*</sup>-grey steps; PS operator: 0 0 0 n<sup>\*</sup> setcmykcolor

AE490-7dd: 010162

In-out: Test chart AE49 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/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 12/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

i	LAB <sup>*</sup> <sub>ref</sub>	L <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out-ref</sub>	ΔE <sup>*</sup>	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	0,01	19,20 0,00 0,00	-3, 0,00 0,00	3,96	ISO/IEC 15775 Annex G
3	28,32 0,00 0,00	0,04	21,48 0,00 0,00	-6, 0,00 0,00	6,84	and DIN 33866-1 Annex G
4	33,48 0,00 0,00	0,08	24,50 0,00 0,00	-8, 0,00 0,00	8,98	
5	38,64 0,00 0,00	0,13	28,11 0,00 0,00	-10, 0,00 0,00	10,53	
6	43,80 0,00 0,00	0,18	32,26 0,00 0,00	-11, 0,00 0,00	11,54	
7	48,96 0,00 0,00	0,24	36,88 0,00 0,00	-12, 0,00 0,00	12,08	
8	54,12 0,00 0,00	0,30	41,94 0,00 0,00	-12, 0,00 0,00	12,18	
9	59,28 0,00 0,00	0,37	47,40 0,00 0,00	-11, 0,00 0,00	11,88	
10	64,44 0,00 0,00	0,45	53,25 0,00 0,00	-11, 0,00 0,00	11,19	
11	69,60 0,00 0,00	0,53	59,46 0,00 0,00	-10, 0,00 0,00	10,14	
12	74,76 0,00 0,00	0,62	66,01 0,00 0,00	-8, 0,00 0,00	8,75	
13	79,92 0,00 0,00	0,70	72,90 0,00 0,00	-7, 0,00 0,00	7,02	
14	85,08 0,00 0,00	0,80	80,10 0,00 0,00	-4, 0,00 0,00	4,98	
15	90,24 0,00 0,00	0,89	87,60 0,00 0,00	-2, 0,00 0,00	2,64	
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	
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	0,11	27,16 0,00 0,00	-10, 0,00 0,00	10,19	
19	56,70 0,00 0,00	0,34	44,62 0,00 0,00	-12, 0,00 0,00	12,08	
20	76,05 0,00 0,00	0,64	67,70 0,00 0,00	-8, 0,00 0,00	8,35	
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	

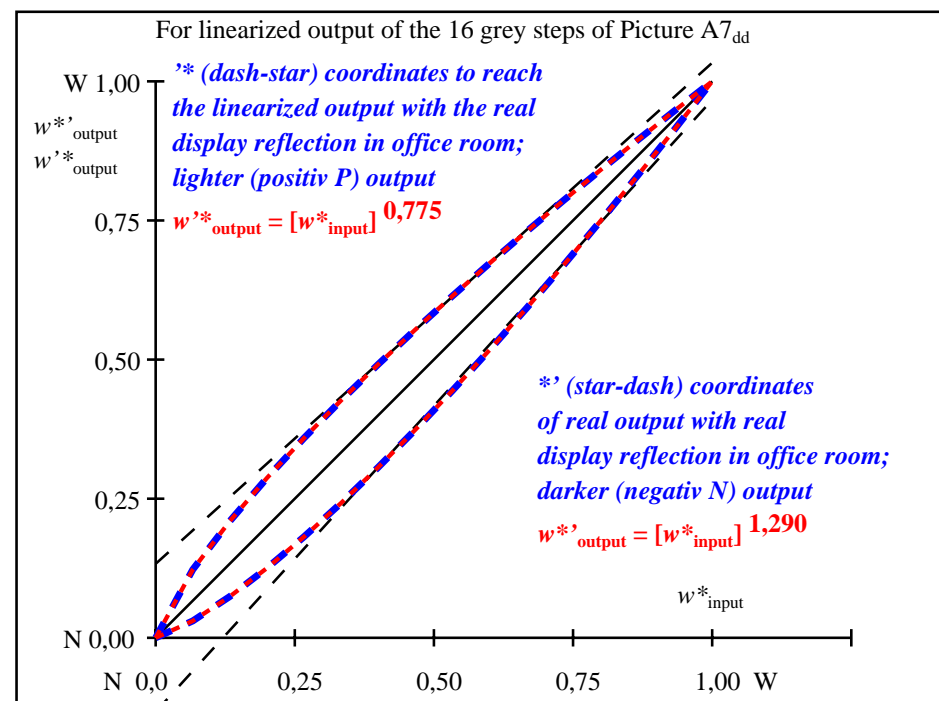
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 7,6$

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

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

part 1,

AE490-3dd: 010242



part 2,

AE491-3dd: 010242

L <sup>*</sup> /Y <sub>intended</sub> (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 <sup>*</sup> setcmyk																
gN=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 <sup>*</sup> =l <sup>*</sup> <sub>CIELAB, r</sub> (relative)																
w <sup>*</sup> <sub>intended</sub>	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 <sup>*</sup> <sub>output</sub>	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

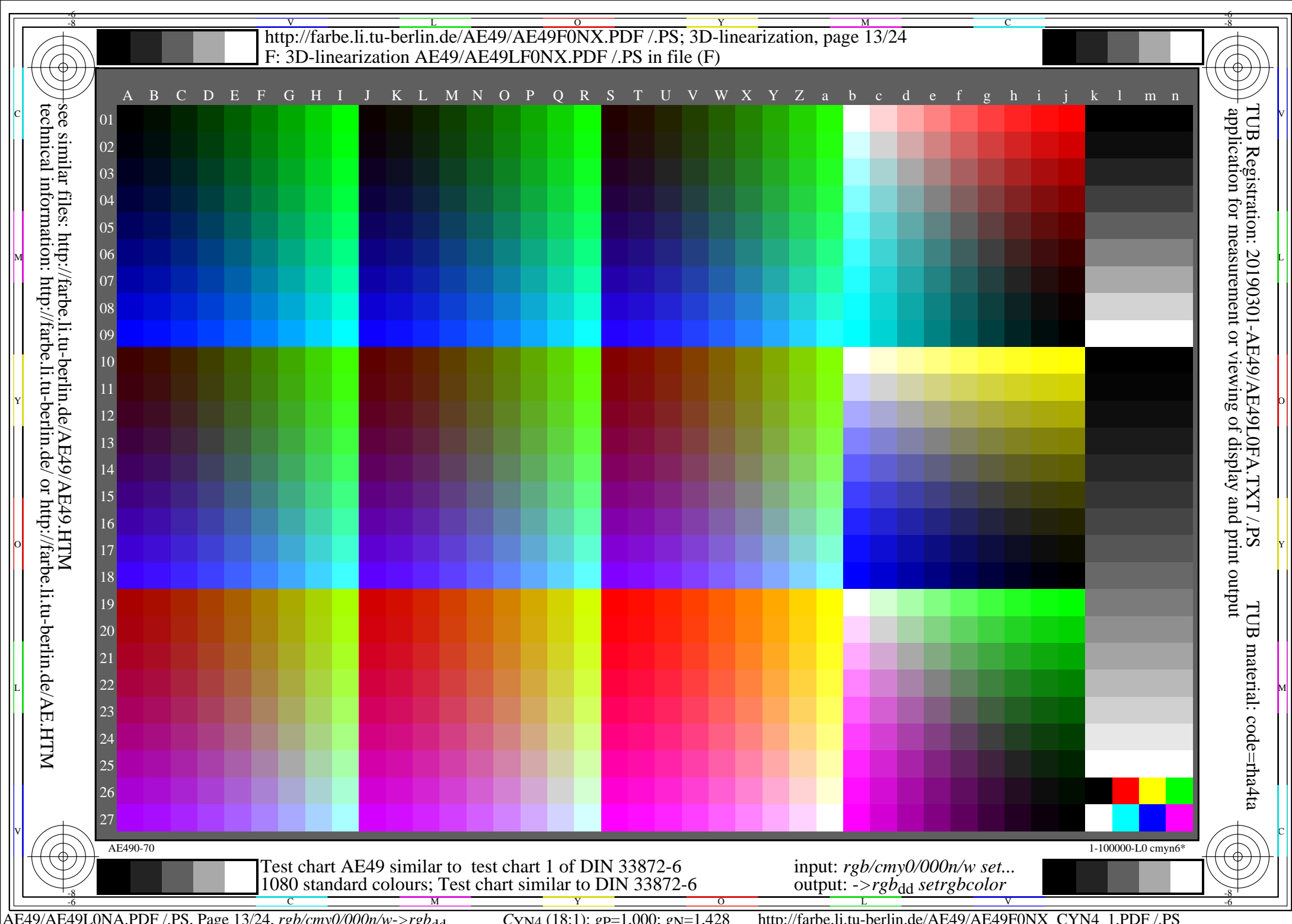
part 3, picture A7<sub>dd</sub>: 16 visual equidistant L<sup>\*</sup>-grey steps; PS operator: 0 0 0 n<sup>\*</sup> setcmykcolor

AE490-7dd: 010242

In-out: Test chart AE49 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<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

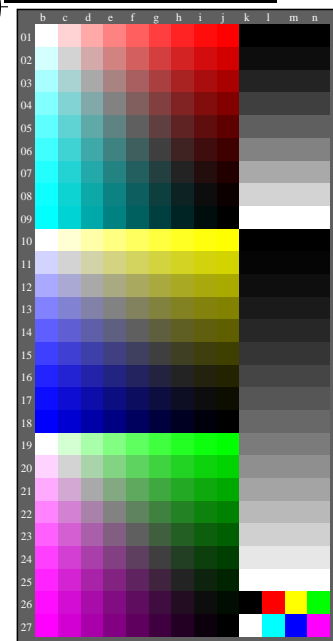




see similar files: [http://farbe.li.tu-berlin.de/AE49/AE49/HTML](http://farbe.li.tu-berlin.de/AE49/AE49/AE49/HTML)  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE49/HTML>



<http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> /PS; 3D-linearization, page 14/24  
F: 3D-linearization AE49/AE49LF0NX.PDF /PS in file (F)



#### 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.

AE490-71 Part of test chart AE49 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/AE49/AE49F0PX\\_CYN4\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN4_1.PDF)

underline: Yes/No

##### PS file:

[http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN4\\_1.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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 AE49F0PX\_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 AE49F0PX\_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)

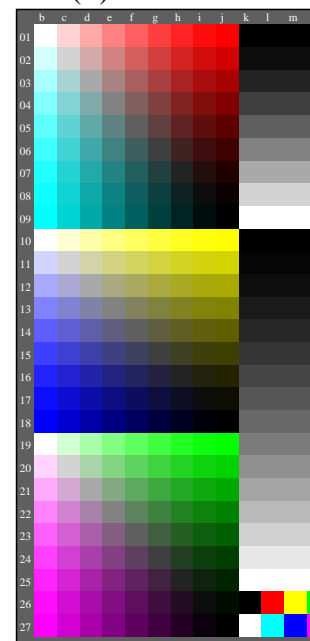
.....  
.....  
.....

part 3,

AE490-7dd: 010321



Form A: Test chart AE49 similar to test chart 1 of DIN 33872-6  
1080 standard colours; Test chart similar to DIN 33872-6



#### 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.

AE490-71 Part of test chart AE49 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6\*

#### 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/AE49/AE49F0PX\\_CYN4\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN4_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN4\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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/AE49/AE49F0PX\\_CYN4\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN4_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN4\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN4_3.PS)

underline: Yes/No

**picture A7dd**

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,

AE491-7dd: 010321



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

TUB Registration: 20190301-AE49/AE49L0FA.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/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 15/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rh4ta

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

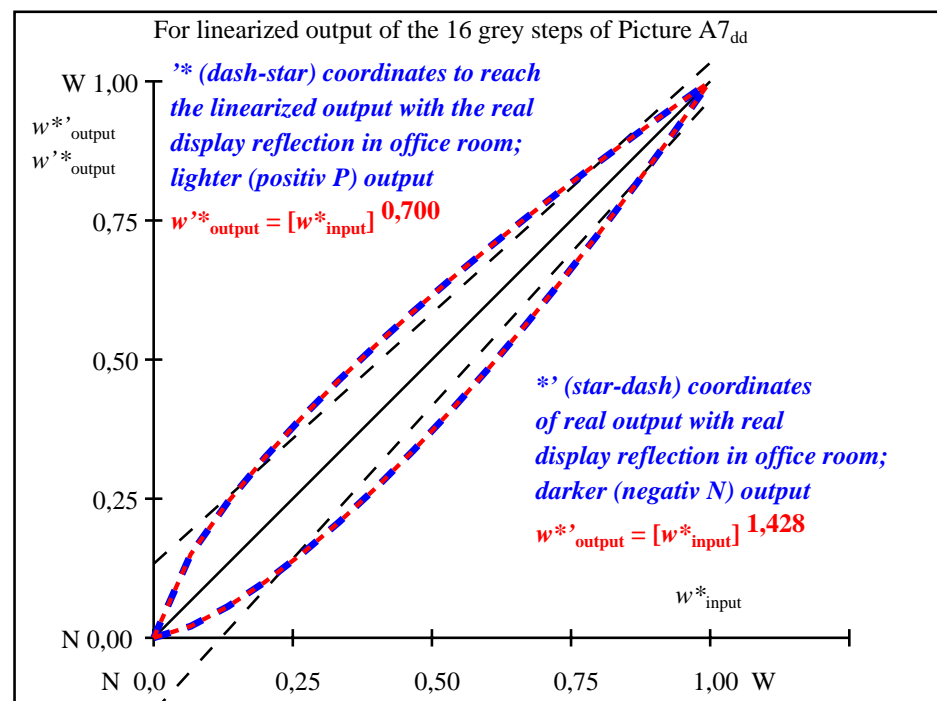
**Mean lightness difference**  
**(16 steps)**  
 $\Delta E^*_{CIELAB} = 8,4$

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

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

part 1,

AE490-3dd: 010322



part 2,

AE491-3dd: 010322

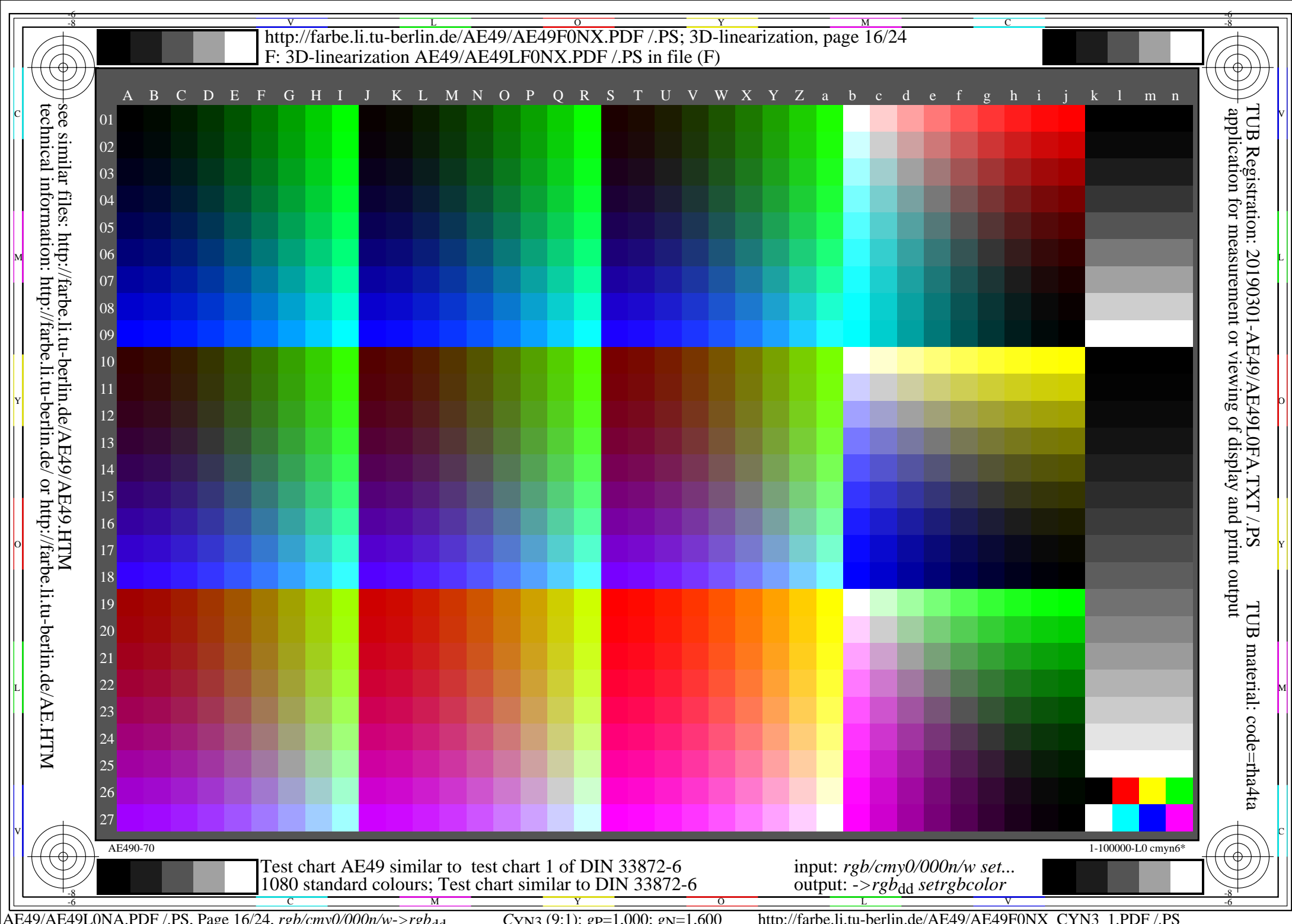
$L^*/Y_{intended}$ (absolute)	26,8/5,0	31,4/6,8	35,9/9,0	40,5/11,5	45,1/14,6	49,7/18,1	54,2/22,2	58,8/26,8	63,4/32,0	67,9/37,9	72,5/44,4	77,1/51,7	81,6/59,7	86,2/68,5	90,8/78,1	95,4/88,5
0 0 0 n*																
setcmyk																
gN=1,428																
No. and																
Hex code																
$w^*=l^*_{CIELAB,r}$ (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 A7<sub>dd</sub>: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

AE490-7dd: 010322

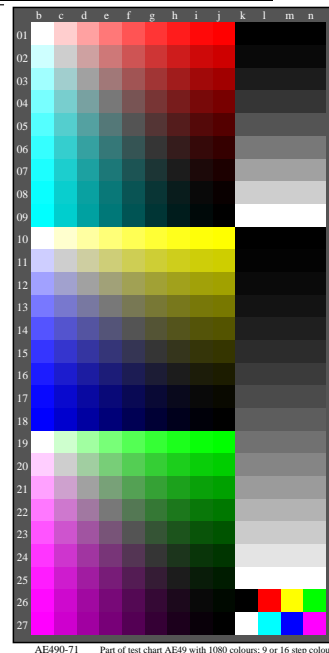
In-out: Test chart AE49 similar to test chart 1 of DIN 33872-6  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$ -range 3,75 to <7,5

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



see similar files: [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN3\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_1.PDF)  
technical information: <http://farbe.li.tu-berlin.de/> or [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN3\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_1.PDF)

<http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> /.PS; 3D-linearization, page 17/24  
F: 3D-linearization AE49/AE49LF0NX.PDF /.PS in file (F)



#### 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.

AE490-71 Part of test chart AE49 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/AE49/AE49F0PX\\_CYN3\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_1.PDF)

underline: Yes/No

##### PS file:

[http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN3\\_1.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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 AE49F0PX\_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 AE49F0PX\_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)

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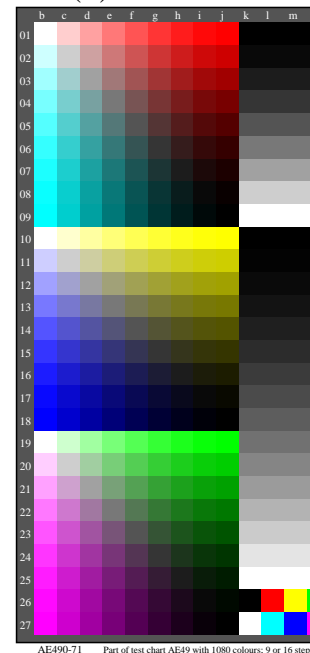
.....

.....

.....

.....

.....



#### 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)

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.

AE490-71 Part of test chart AE49 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb

1-100110-L0 cmy6\*

#### 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/AE49/AE49F0PX\\_CYN3\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN3\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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/AE49/AE49F0PX\\_CYN3\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN3\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN3_3.PS)

underline: Yes/No

**picture A7dd**

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 3,

AE490-7dd: 010401

part 4,

AE491-7dd: 010401

Form A: Test chart AE49 similar to test chart 1 of DIN 33872-6  
1080 standard colours; Test chart similar to DIN 33872-6

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

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

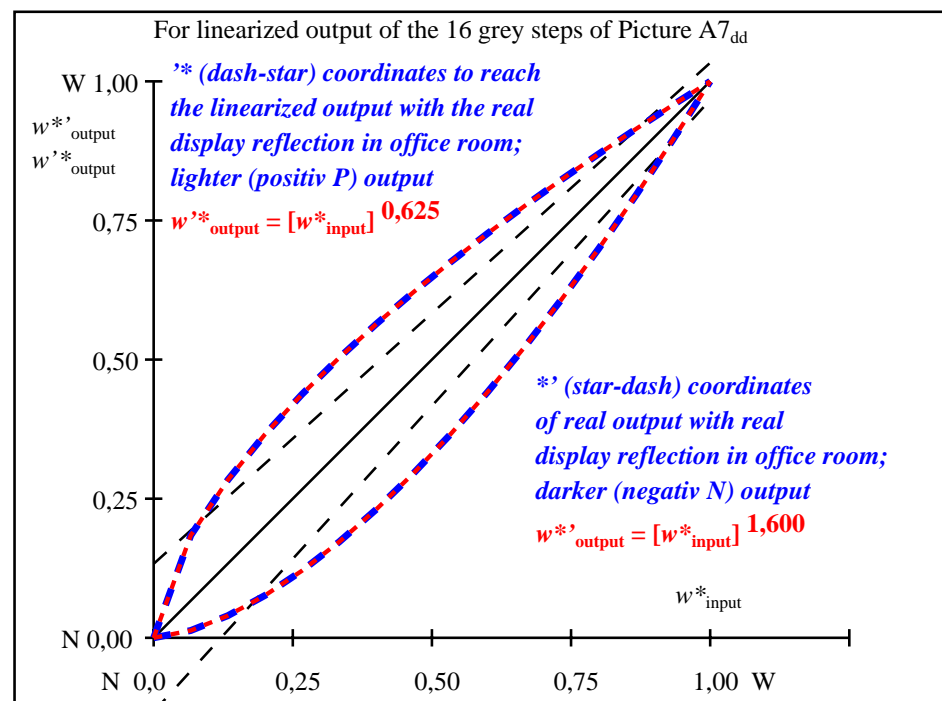
see similar files: <http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 18/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

i	LAB <sup>*</sup> <sub>ref</sub>	L <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out</sub>	LAB <sup>*</sup> <sub>out-ref</sub>	ΔE <sup>*</sup>	Start output S1
1	37,98 0,00 0,00	0,00	37,98 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	41,81 0,00 0,00	0,00	38,32 0,00 0,00	-3, 0,00 0,00	3,49	ISO/IEC 15775 Annex G
3	45,64 0,00 0,00	0,02	39,23 0,00 0,00	-6, 0,00 0,00	6,40	and DIN 33866-1 Annex G
4	49,47 0,00 0,00	0,04	40,68 0,00 0,00	-8, 0,00 0,00	8,78	
5	53,29 0,00 0,00	0,08	42,64 0,00 0,00	-10, 0,00 0,00	10,65	
6	57,12 0,00 0,00	0,12	45,10 0,00 0,00	-12, 0,00 0,00	12,02	
7	60,95 0,00 0,00	0,17	48,05 0,00 0,00	-12, 0,00 0,00	12,90	
8	64,78 0,00 0,00	0,23	51,48 0,00 0,00	-13, 0,00 0,00	13,30	
9	68,61 0,00 0,00	0,30	55,37 0,00 0,00	-13, 0,00 0,00	13,23	
10	72,44 0,00 0,00	0,37	59,74 0,00 0,00	-12, 0,00 0,00	12,69	
11	76,26 0,00 0,00	0,46	64,56 0,00 0,00	-11, 0,00 0,00	11,70	
12	80,09 0,00 0,00	0,55	69,83 0,00 0,00	-10, 0,00 0,00	10,25	
13	83,92 0,00 0,00	0,65	75,56 0,00 0,00	-8, 0,00 0,00	8,35	
14	87,75 0,00 0,00	0,76	81,73 0,00 0,00	-6, 0,00 0,00	6,01	Mean lightness difference
15	91,58 0,00 0,00	0,87	88,35 0,00 0,00	-3, 0,00 0,00	3,22	(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 <sup>*</sup> <sub>CIELAB</sub> = 8,3
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	0,07	42,10 0,00 0,00	-10, 0,00 0,00	10,23	Mean lightness difference
19	66,69 0,00 0,00	0,26	53,37 0,00 0,00	-13, 0,00 0,00	13,32	(5 steps)
20	81,05 0,00 0,00	0,57	71,22 0,00 0,00	-9, 0,00 0,00	9,82	ΔL <sup>*</sup> <sub>CIELAB</sub> = 6,6
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:  $R^*_{ab,m} = 63,5$

part 1,

AE490-3dd: 010402



part 2,

AE491-3dd: 010402

L <sup>*</sup> /Y <sub>intended</sub> (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 <sup>*</sup> setcmyk																
gN=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 <sup>*</sup> =l <sup>*</sup> CIELAB, r (relative)																
w <sup>*</sup> <sub>intended</sub>	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 <sup>*</sup> <sub>output</sub>	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 A7<sub>dd</sub>: 16 visual equidistant L<sup>\*</sup>-grey steps; PS operator: 0 0 0 n<sup>\*</sup> setcmykcolor

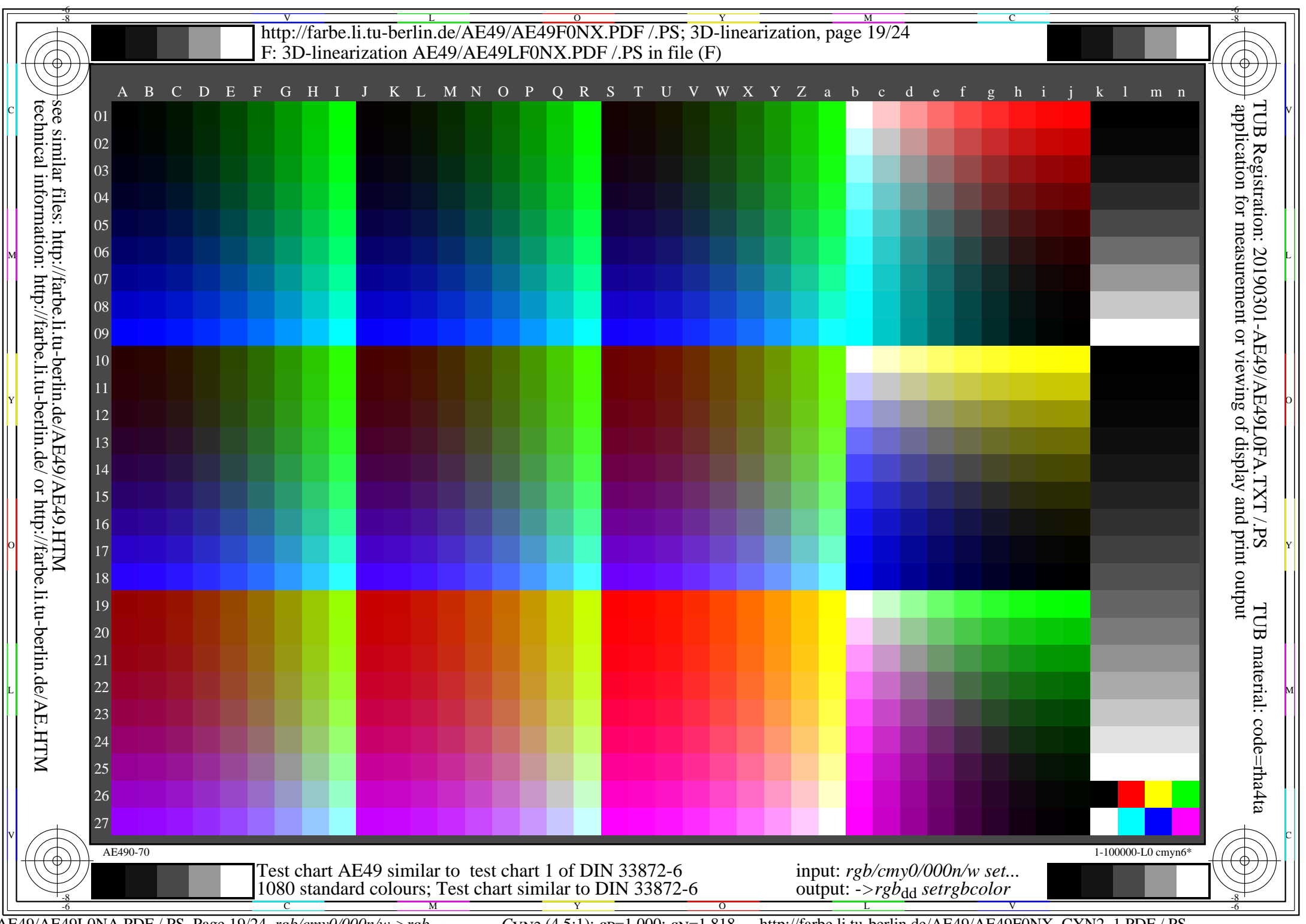
AE490-7dd: 010402

In-out: Test chart AE49 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<sub>dd</sub> setrgbcolor*

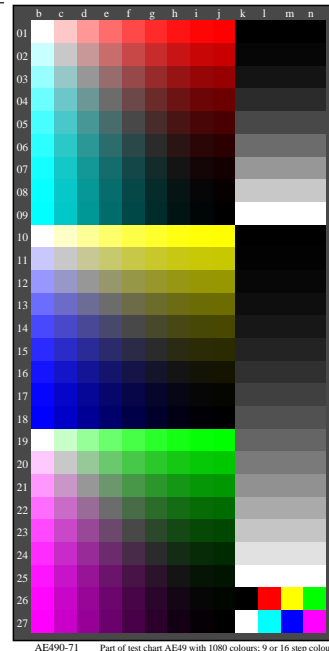
TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta





see similar files: [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN2\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_1.PDF)  
technical information: <http://farbe.li.tu-berlin.de/> or [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN2\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_1.PDF)

<http://farbe.li.tu-berlin.de/AE49/AE49F0NX.PDF> /.PS; 3D-linearization, page 20/24  
F: 3D-linearization AE49/AE49LF0NX.PDF /.PS in file (F)



#### 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.

AE490-71 Part of test chart AE49 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/AE49/AE49F0PX\\_CYN2\\_1.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_1.PDF)

underline: Yes/No

##### PS file:

[http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN2\\_1.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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 AE49F0PX\_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 AE49F0PX\_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)

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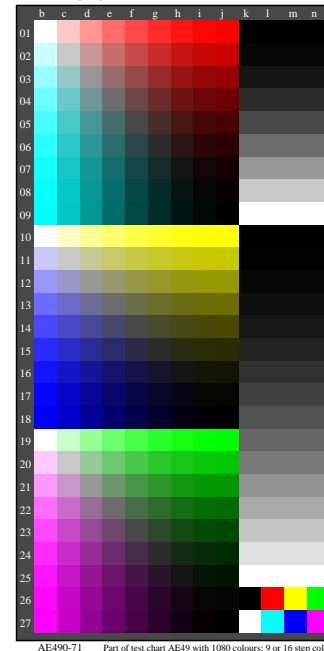
.....

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Form A: Test chart AE49 similar to test chart 1 of DIN 33872-6  
1080 standard colours; Test chart similar to DIN 33872-6



#### 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.

AE490-71 Part of test chart AE49 with 1080 colours; 9 or 16 step colour scales; data in column (b-n): rgb 1-100110-L0 cmy6\*

#### 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/AE49/AE49F0PX\\_CYN2\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN2\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_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/AE49/AE49F0PX\\_CYN2\\_3.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_3.PDF)

underline: Yes/No

**PS file:** [http://farbe.li.tu-berlin.de/AE49/AE49F0PX\\_CYN2\\_3.PS](http://farbe.li.tu-berlin.de/AE49/AE49F0PX_CYN2_3.PS)

underline: Yes/No

**picture A7dd**

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: .....

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

AE491-7dd: 010481

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CYN2 (4,5:1): gp=1,000; gN=1,818

[http://farbe.li.tu-berlin.de/AE49/AE49F0NX\\_CYN2\\_2.PDF](http://farbe.li.tu-berlin.de/AE49/AE49F0NX_CYN2_2.PDF) /.PS

TUB Registration: 20190301-AE49/AE49L0FA.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/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 21/24  
technical information: <http://farbe.li.tu-berlin.de/AE49/AE49LF0NX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rha4ta

i	LAB* <sub>ref</sub>	L* <sub>out</sub>	LAB* <sub>out</sub>	LAB* <sub>out-ref</sub>	ΔE*
1	52,01 0,00 0,00	52,01 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	52,17 0,00 0,00	52,17 0,00 0,00	-2, 0,00 0,00	2,73
3	57,80 0,00 0,00	52,67 0,00 0,00	52,67 0,00 0,00	-5, 0,00 0,00	5,12
4	60,69 0,00 0,00	53,54 0,00 0,00	53,54 0,00 0,00	-7, 0,00 0,00	7,15
5	63,58 0,00 0,00	54,79 0,00 0,00	54,79 0,00 0,00	-8, 0,00 0,00	8,79
6	66,48 0,00 0,00	56,43 0,00 0,00	56,43 0,00 0,00	-10, 0,00 0,00	10,04
7	69,37 0,00 0,00	58,46 0,00 0,00	58,46 0,00 0,00	-10, 0,00 0,00	10,90
8	72,26 0,00 0,00	60,90 0,00 0,00	60,90 0,00 0,00	-11, 0,00 0,00	11,35
9	75,16 0,00 0,00	63,75 0,00 0,00	63,75 0,00 0,00	-11, 0,00 0,00	11,40
10	78,05 0,00 0,00	67,01 0,00 0,00	67,01 0,00 0,00	-11, 0,00 0,00	11,03
11	80,94 0,00 0,00	70,68 0,00 0,00	70,68 0,00 0,00	-10, 0,00 0,00	10,25
12	83,83 0,00 0,00	74,78 0,00 0,00	74,78 0,00 0,00	-9, 0,00 0,00	9,05
13	86,73 0,00 0,00	79,29 0,00 0,00	79,29 0,00 0,00	-7, 0,00 0,00	7,43
14	89,62 0,00 0,00	84,23 0,00 0,00	84,23 0,00 0,00	-5, 0,00 0,00	5,38
15	92,51 0,00 0,00	89,60 0,00 0,00	89,60 0,00 0,00	-2, 0,00 0,00	2,90
16	95,41 0,00 0,00	95,41 0,00 0,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	52,01 0,00 0,00	52,01 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	54,44 0,00 0,00	54,44 0,00 0,00	-8, 0,00 0,00	8,42
19	73,71 0,00 0,00	62,28 0,00 0,00	62,28 0,00 0,00	-11, 0,00 0,00	11,43
20	84,56 0,00 0,00	75,87 0,00 0,00	75,87 0,00 0,00	-8, 0,00 0,00	8,69
21	95,41 0,00 0,00	95,41 0,00 0,00	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**

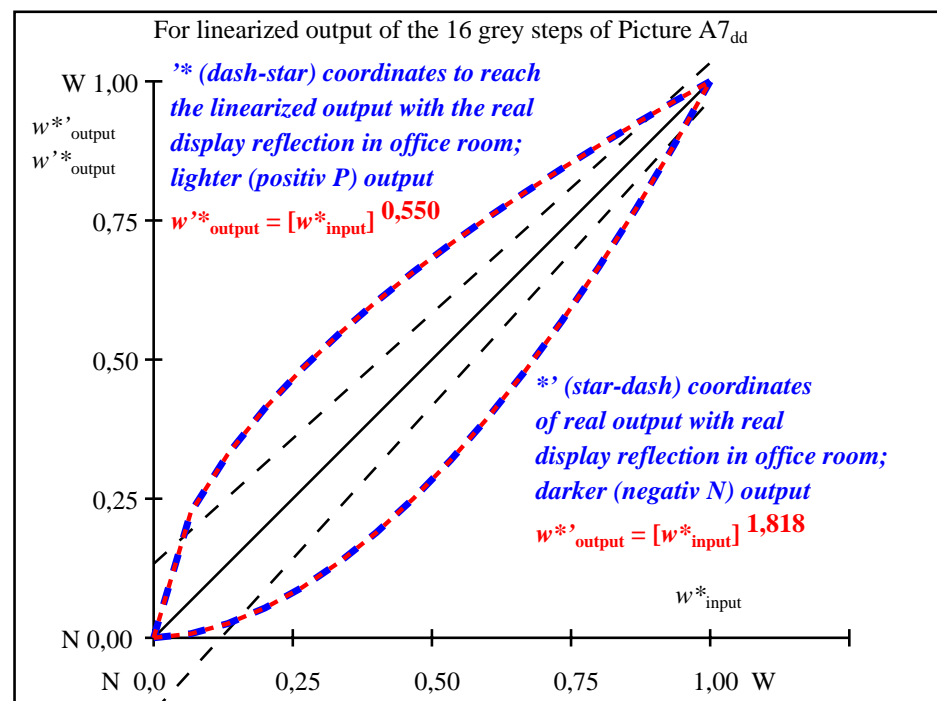
**Mean lightness difference**  
**(16 steps)**  
 $\Delta E^*_{CIELAB} = 7,1$

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

**Mean colour reproduction index:  $R^*_{ab,m} = 68,8$**

part 1,

AE490-3dd: 010482



part 2,

AE491-3dd: 010482

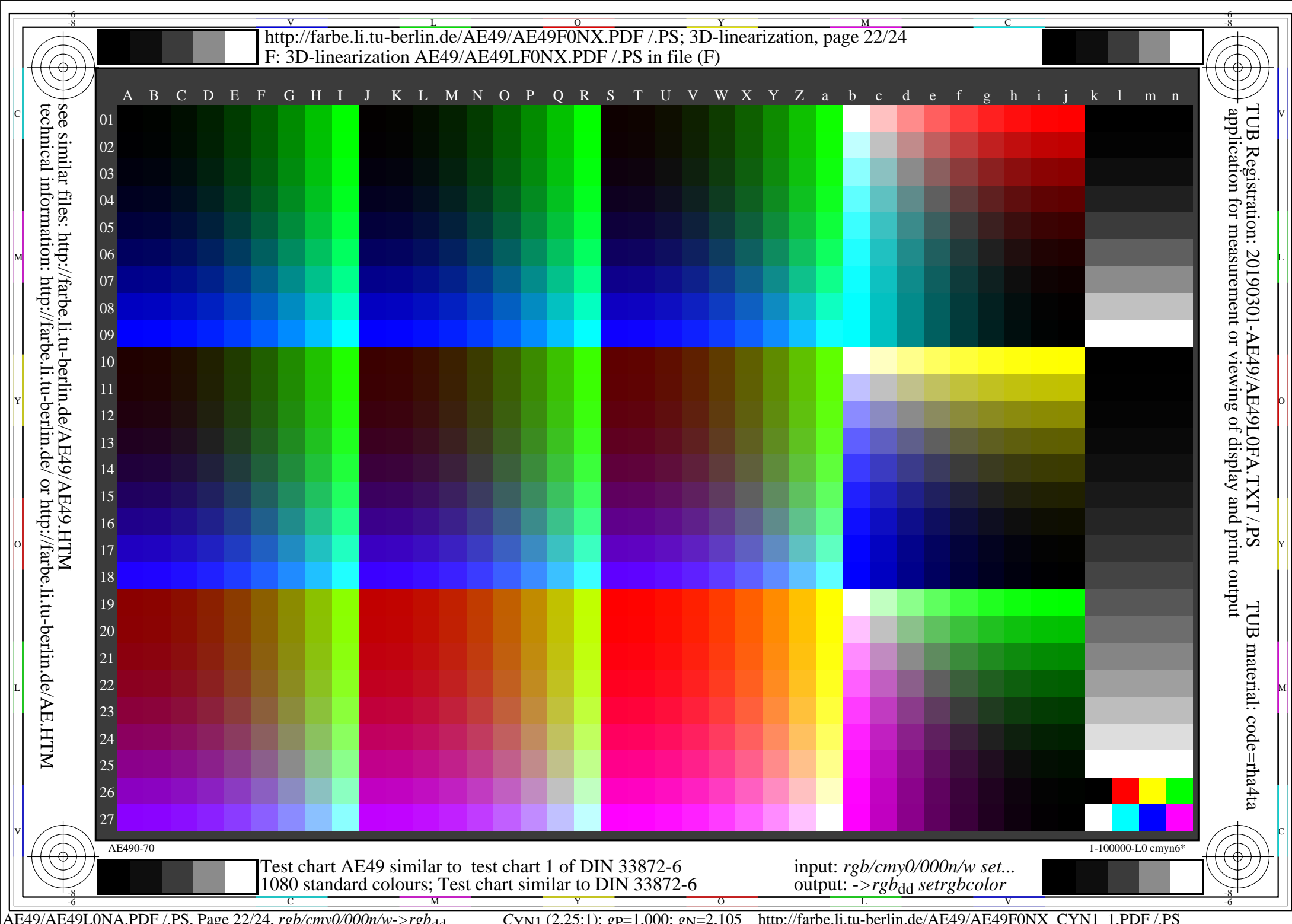
$L^*/Y^*_{intended}$ (absolute)	52,0/20,1	54,9/22,8	57,8/25,7	60,6/28,9	63,5/32,2	66,4/35,9	69,3/39,8	72,2/44,0	75,1/48,5	78,0/53,3	80,9/58,3	83,8/63,7	86,7/69,4	89,6/75,4	92,5/81,8	95,4/88,5
0 0 0 n*																
setcmk																
$g_N=1,818$																
No. and																
Hex code																
$w^*=l^*_{CIELAB,r}$ (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	0,007	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 A7<sub>dd</sub>: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmkcolor

AE490-7dd: 010482

In-out: Test chart AE49 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/AE49/AE49F0NX.PDF> / .PS; 3D-linearization, page 24/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE49.HTM>

i	LAB* <sub>ref</sub>	L* <sub>out</sub>	LAB* <sub>out</sub>	LAB* <sub>out-ref</sub>	ΔE*
1	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01
2	71,41 0,00 0,00	0,00	69,75 0,00 0,00	-1, 0,00 0,00	1,65
3	73,12 0,00 0,00	0,01	69,96 0,00 0,00	-3, 0,00 0,00	3,15
4	74,83 0,00 0,00	0,02	70,37 0,00 0,00	-4, 0,00 0,00	4,46
5	76,55 0,00 0,00	0,05	70,99 0,00 0,00	-5, 0,00 0,00	5,56
6	78,26 0,00 0,00	0,08	71,84 0,00 0,00	-6, 0,00 0,00	6,42
7	79,98 0,00 0,00	0,12	72,93 0,00 0,00	-7, 0,00 0,00	7,04
8	81,69 0,00 0,00	0,17	74,28 0,00 0,00	-7, 0,00 0,00	7,40
9	83,41 0,00 0,00	0,24	75,90 0,00 0,00	-7, 0,00 0,00	7,50
10	85,12 0,00 0,00	0,31	77,80 0,00 0,00	-7, 0,00 0,00	7,32
11	86,83 0,00 0,00	0,39	79,98 0,00 0,00	-6, 0,00 0,00	6,85
12	88,55 0,00 0,00	0,49	82,45 0,00 0,00	-6, 0,00 0,00	6,09
13	90,26 0,00 0,00	0,60	85,22 0,00 0,00	-5, 0,00 0,00	5,04
14	91,98 0,00 0,00	0,72	88,30 0,00 0,00	-3, 0,00 0,00	3,67
15	93,69 0,00 0,00	0,85	91,69 0,00 0,00	-1, 0,00 0,00	1,99
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	0,04	70,81 0,00 0,00	-5, 0,00 0,00	5,30
19	82,55 0,00 0,00	0,20	75,06 0,00 0,00	-7, 0,00 0,00	7,48
20	88,98 0,00 0,00	0,52	83,11 0,00 0,00	-5, 0,00 0,00	5,86
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**

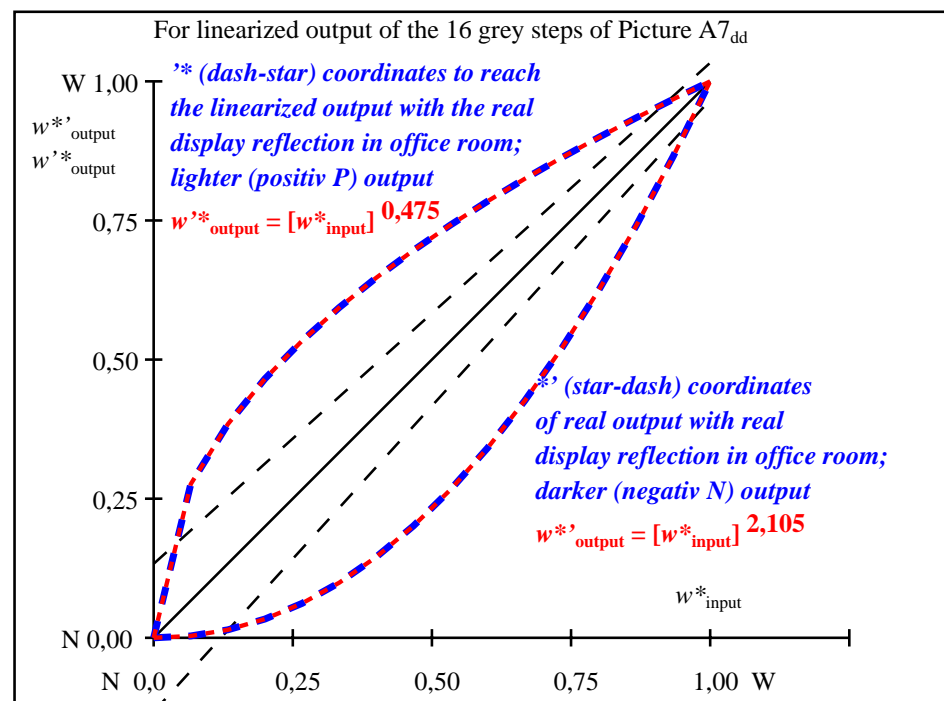
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 4,6$

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

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

part 1,

AE490-3dd: 010562



part 2,

AE491-3dd: 010562

$L^*/Y_{\text{intended}}$ (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																
gN=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
$w^* = l^*_{\text{CIELAB}, r}$ (relative)																
$w^*_{\text{intended}}$	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
$w^*_{\text{output}}$	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 A7<sub>dd</sub>: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

AE490-7dd: 010562

In-out: Test chart AE49 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:  $\rightarrow rgb_{\text{dd}}$  setrgbcolor

TUB Registration: 20190301-AE49/AE49L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rha4ta