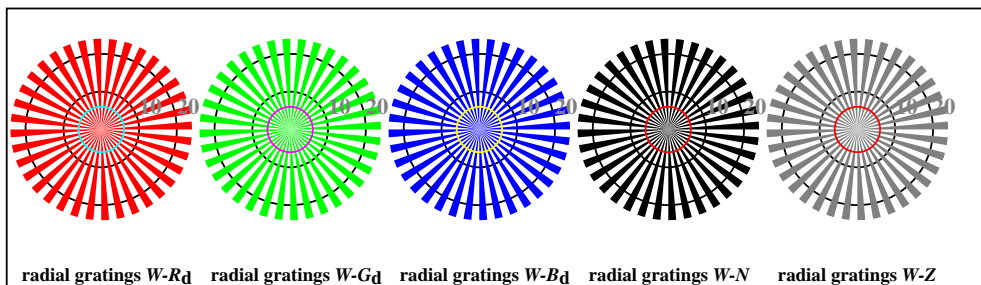


see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS;  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19F0NX.PDF> / .PS

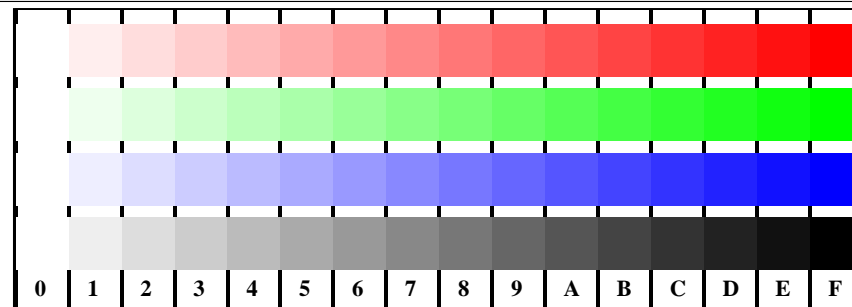


radial gratings W-R<sub>d</sub> radial gratings W-G<sub>d</sub> radial gratings W-B<sub>d</sub> radial gratings W-N radial gratings W-Z  
AE190-5, Picture D2Wdd: radial gratings W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; PS operator: *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*

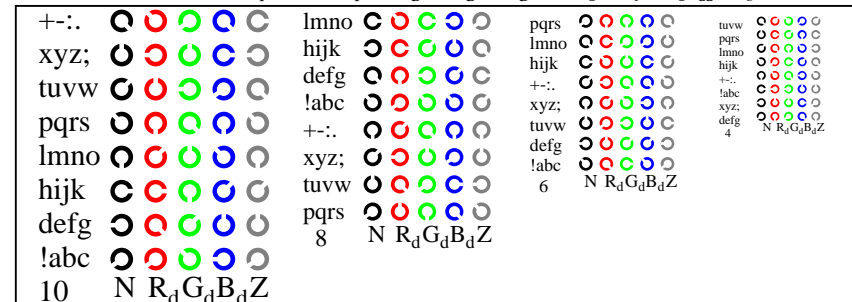


AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*

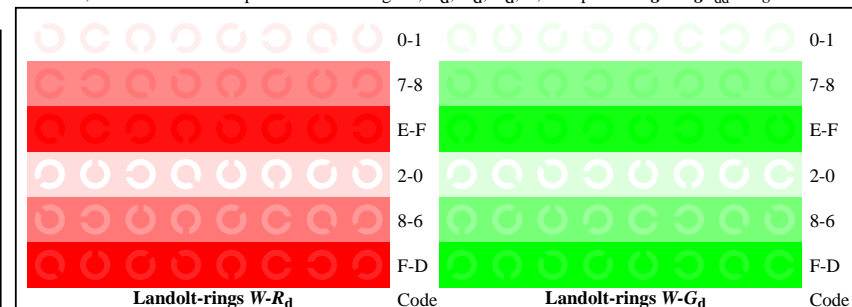
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



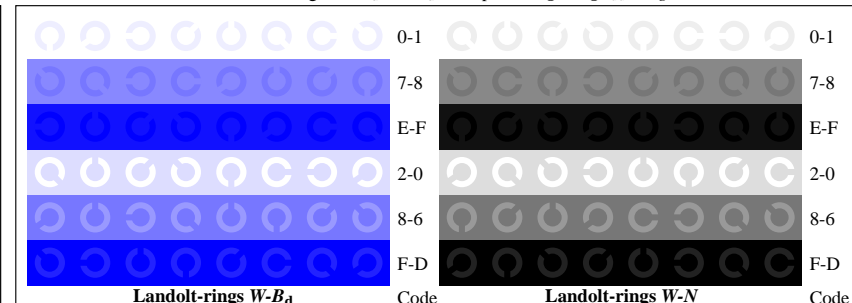
AE191-1, Picture D4Wdd: 16 equidistant steps W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*



AE191-3, Picture D5Wdd: Sript and Landolt-rings N; R<sub>d</sub>; G<sub>d</sub>; B<sub>d</sub>; Z; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-5, Picture D6Wdd: Landolt-rings W-R<sub>d</sub>; W-G<sub>d</sub>; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-7, Picture D7Wdd: Landolt-rings W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

input: *rgb-cmy0/000n/w set...*  
output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output

TUB material: code=th44ta

Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
 Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
 Is the resolution diameter < 6 mm? Yes/No  
 Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
 Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
 If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
 Are the 16 steps on the upper rows distinguishable? Yes/No  
 If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 01001

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

PDF file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN8\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN8_1.PDF) underline: Yes/No  
 PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN8\\_1.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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 AE19F0PX\_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 AE19F0PX\_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)

part 3, AE190-7dd: 01001

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>

W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
 If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
 W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
 If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
 W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
 If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
 W-N Are all the 16 steps distinguishable? Yes/No  
 If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
 Is the recognition > 50% for letters (17 of 32 at least)? , and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Rings N	Rings R <sub>d</sub>	Rings G <sub>d</sub>	Rings B <sub>d</sub>
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub>, and D7W<sub>dd</sub>

Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?

Colour row W-R <sub>d</sub> background - ring	Colour row W-G <sub>d</sub> background - ring	Colour row W-B <sub>d</sub> background - ring	Colour row W-N background - ring
0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No
7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No
E - F Yes/No	E - F Yes/No	E - F Yes/No	E - F Yes/No
2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No
8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No
F - D Yes/No	F - D Yes/No	F - D Yes/No	F - D Yes/No

part 2, AE191-3Ndd: 01001

#### 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/AE19/AE19F0PX\\_CYN8\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN8_3.PDF) underline: Yes/No

PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN8\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN8_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/AE19/AE19F0PX\\_CYN8\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN8_3.PDF) underline: Yes/No

PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN8\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN8_3.PS) or 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/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, AE191-7dd: 01001

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 3/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE19/AE19L0FA.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	0,00	0,00	0,00	0,00	0,00	0,01
2	6,36	0,00	0,06	6,36	0,00	0,01
3	12,72	0,00	0,13	12,72	0,00	0,01
4	19,08	0,00	0,20	19,08	0,00	0,01
5	25,44	0,00	0,26	25,44	0,00	0,01
6	31,80	0,00	0,33	31,80	0,00	0,01
7	38,16	0,00	0,40	38,16	0,00	0,01
8	44,52	0,00	0,46	44,52	0,00	0,01
9	50,88	0,00	0,53	50,88	0,00	0,01
10	57,24	0,00	0,60	57,24	0,00	0,01
11	63,60	0,00	0,66	63,60	0,00	0,01
12	69,96	0,00	0,73	69,96	0,00	0,01
13	76,32	0,00	0,80	76,32	0,00	0,01
14	82,68	0,00	0,86	82,68	0,00	0,01
15	89,04	0,00	0,93	89,04	0,00	0,01
16	95,41	0,00	1,00	95,41	0,00	0,01
17	0,00	0,00	0,00	0,00	0,00	0,01
18	23,85	0,00	0,25	23,85	0,00	0,01
19	47,70	0,00	0,50	47,70	0,00	0,01
20	71,55	0,00	0,75	71,55	0,00	0,01
21	95,41	0,00	1,00	95,41	0,00	0,01

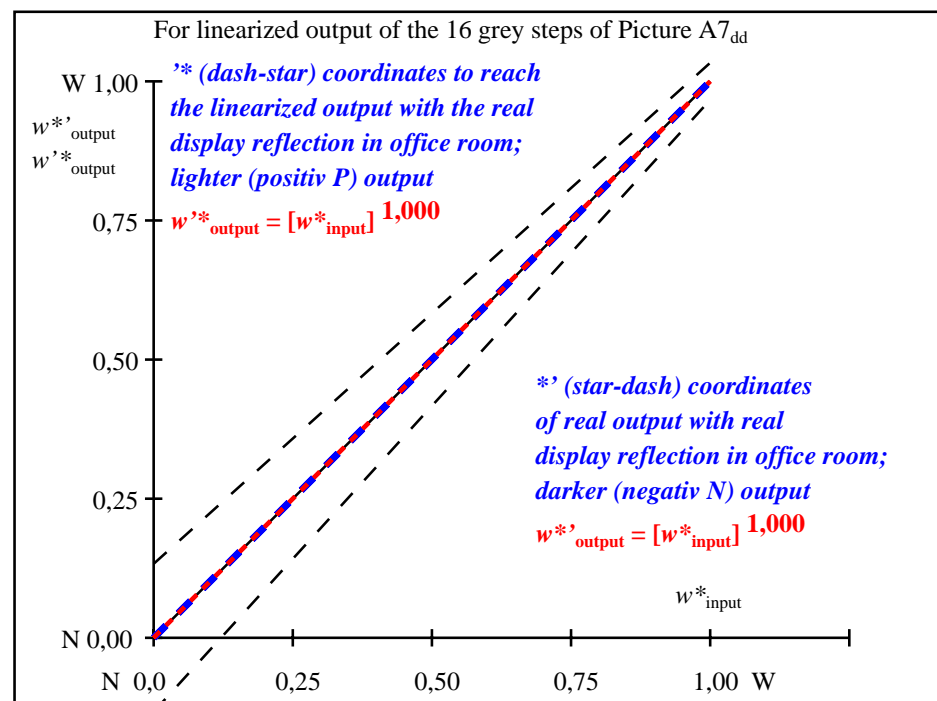
Mean lightness difference (16 steps)  
ΔE<sup>\*</sup><sub>CIELAB</sub> = 0,0

Mean lightness difference (5 steps)  
ΔL<sup>\*</sup><sub>CIELAB</sub> = 0,0

Mean colour reproduction index: R<sup>\*</sup><sub>ab,m</sub> = 99,9

part 1,

AE190-3dd: 01002



part 2,

AE191-3dd: 01002

L <sup>*</sup> /Y <sub>intended</sub> (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 <sup>*</sup> 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 <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	0,067	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

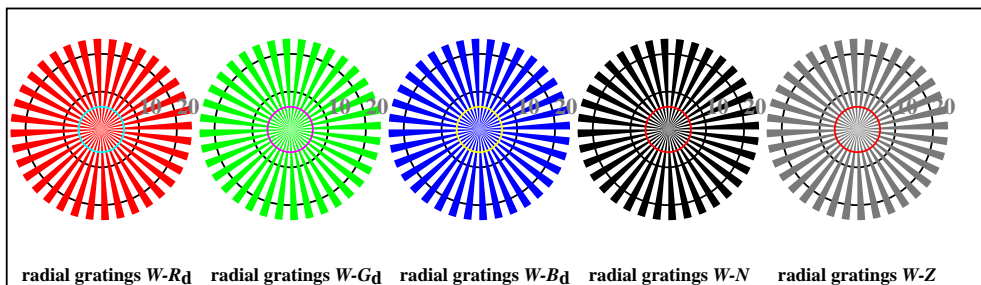
part 3, picture A7<sub>dd</sub>: 16 visual equidistant L<sup>\*</sup>-grey steps; PS operator: 0 0 0 n<sup>\*</sup> setcmykcolor

AE190-7dd: 01002

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing Y contrast Y<sub>W</sub>:Y<sub>N</sub>=88,9:0,31; Y<sub>N</sub>-range 0,0 to <0,46

input: rgb/cmy0/000n/w set...  
output: ->rgb<sub>dd</sub> setrgbcolor

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.HTM>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

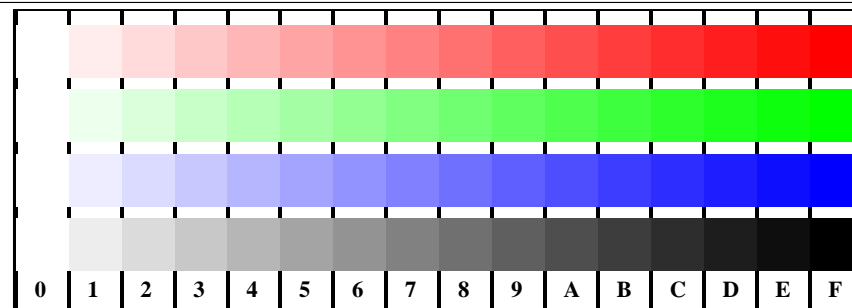


radial gratings W-R<sub>d</sub> radial gratings W-G<sub>d</sub> radial gratings W-B<sub>d</sub> radial gratings W-N radial gratings W-Z  
AE190-5, Picture D2Wdd: radial gratings W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; PS operator: *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*

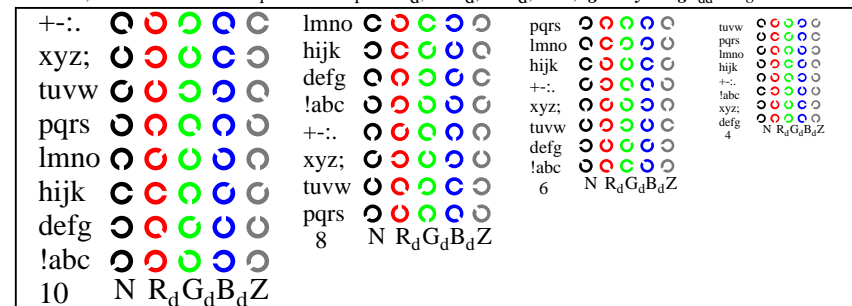


AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*

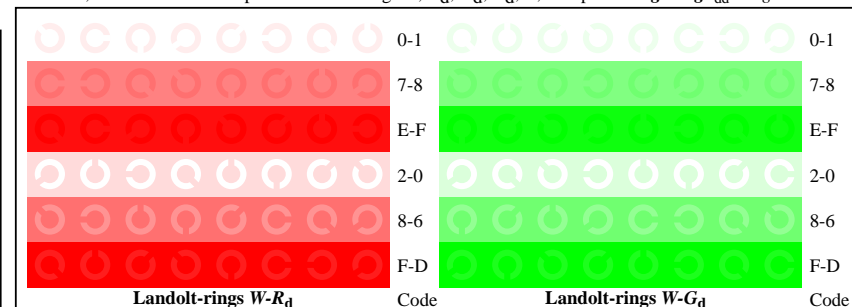
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



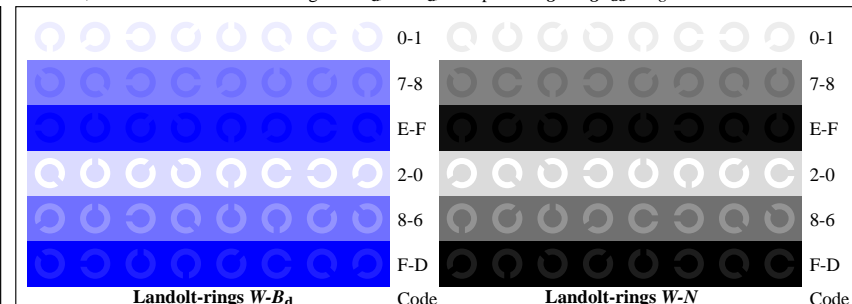
AE191-1, Picture D4Wdd: 16 equidistant steps W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; *rgb-cmy0->rgb<sub>dd</sub> setrgbcolor*



AE191-3, Picture D5Wdd: Sript and Landolt-rings N; R<sub>d</sub>; G<sub>d</sub>; B<sub>d</sub>; Z; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-5, Picture D6Wdd: Landolt-rings W-R<sub>d</sub>; W-G<sub>d</sub>; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-7, Picture D7Wdd: Landolt-rings W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

input: *rgb-cmy0/000n/w set...*  
output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output

TUB material: code=th44ta



see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.htm>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19/AE19.htm>

<http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS; 3D-linearization, page 5/24  
F: 3D-linearization AE19/AE19LF0NX.PDF /PS in file (F)

Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 01081

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

PDF file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN7\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN7_1.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN7\\_1.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 01081

Form A: Test chart AE19 according to test chart 4 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart RGB output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Red: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Green: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Blue: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
White - Black: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)?, and for Landolt-rings (minimum 5 of 8)?  

Relative size	Letters	Rings N	Rings R <sub>d</sub>	Rings G <sub>d</sub>	Rings B <sub>d</sub>
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub>, and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?

Colour row W-R <sub>d</sub> background - ring	Colour row W-G <sub>d</sub> background - ring	Colour row W-B <sub>d</sub> background - ring	Colour row W-N background - ring
0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No
7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No
E - F Yes/No	E - F Yes/No	E - F Yes/No	E - F Yes/No
2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No
8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No
F - D Yes/No	F - D Yes/No	F - D Yes/No	F - D Yes/No

part 2, AE191-3Ndd: 01081

#### 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/AE19/AE19F0PX\\_CYN7\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN7_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN7\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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/AE19/AE19F0PX\\_CYN7\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN7_3.PDF) underline: Yes/No  
picture A7<sub>dd</sub> underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN7\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN7_3.PS) or 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/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, AE191-7dd: 01081

TUB Registration: 20190301-AE19/AE19L0FA.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/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 6/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.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 0,00 0,00	9,36 0,00 0,00	-2, 0,00 0,00	2,30
3	17,65 0,00 0,00	0,09 0,00 0,00	14,01 0,00 0,00	-3, 0,00 0,00	3,63
4	23,63 0,00 0,00	0,14 0,00 0,00	19,12 0,00 0,00	-4, 0,00 0,00	4,51
5	29,61 0,00 0,00	0,21 0,00 0,00	24,55 0,00 0,00	-5, 0,00 0,00	5,06
6	35,59 0,00 0,00	0,27 0,00 0,00	30,23 0,00 0,00	-5, 0,00 0,00	5,36
7	41,57 0,00 0,00	0,33 0,00 0,00	36,12 0,00 0,00	-5, 0,00 0,00	5,45
8	47,55 0,00 0,00	0,40 0,00 0,00	42,19 0,00 0,00	-5, 0,00 0,00	5,36
9	53,54 0,00 0,00	0,47 0,00 0,00	48,42 0,00 0,00	-5, 0,00 0,00	5,11
10	59,52 0,00 0,00	0,54 0,00 0,00	54,79 0,00 0,00	-4, 0,00 0,00	4,72
11	65,50 0,00 0,00	0,61 0,00 0,00	61,29 0,00 0,00	-4, 0,00 0,00	4,20
12	71,48 0,00 0,00	0,69 0,00 0,00	67,91 0,00 0,00	-3, 0,00 0,00	3,57
13	77,46 0,00 0,00	0,76 0,00 0,00	74,64 0,00 0,00	-2, 0,00 0,00	2,82
14	83,44 0,00 0,00	0,84 0,00 0,00	81,47 0,00 0,00	-1, 0,00 0,00	1,97
15	89,42 0,00 0,00	0,92 0,00 0,00	88,39 0,00 0,00	-1, 0,00 0,00	1,03
16	95,41 0,00 0,00	1,00 0,00 0,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	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
18	28,12 0,00 0,00	0,19 0,00 0,00	23,16 0,00 0,00	-4, 0,00 0,00	4,95
19	50,55 0,00 0,00	0,44 0,00 0,00	45,28 0,00 0,00	-5, 0,00 0,00	5,26
20	72,98 0,00 0,00	0,71 0,00 0,00	69,58 0,00 0,00	-3, 0,00 0,00	3,39
21	95,41 0,00 0,00	1,00 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**

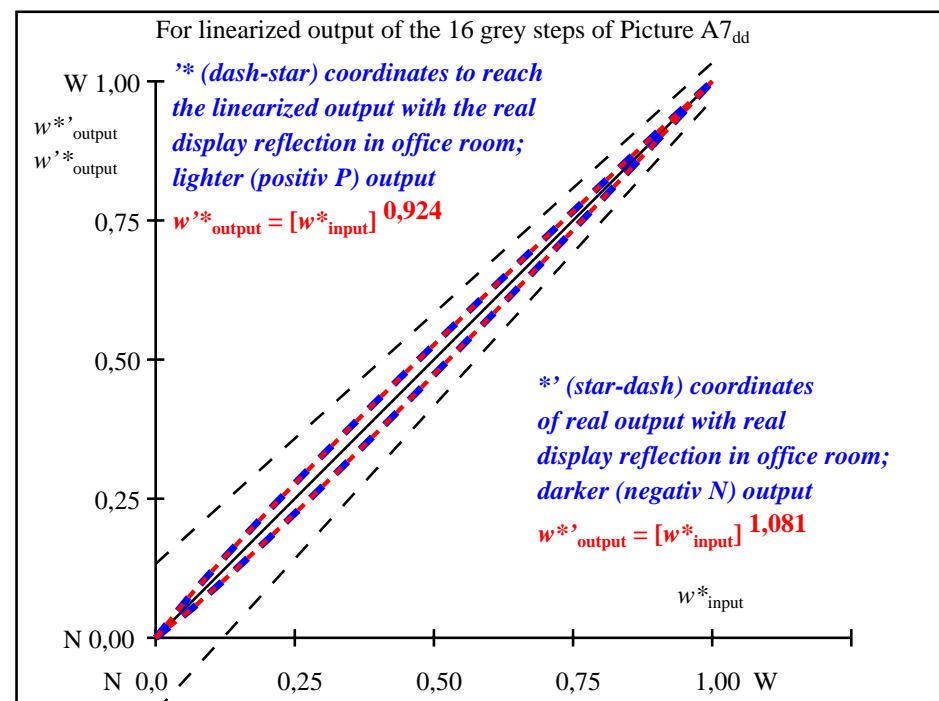
**Mean lightness difference (16 steps)**  
 $\Delta E^*_{CIELAB} = 3,4$

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

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

part 1,

AE190-3dd: 01082



part 2,

AE191-3dd: 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

AE190-7dd: 01082

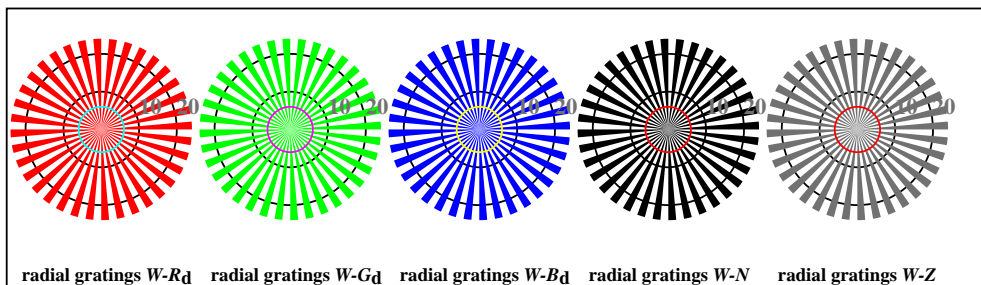
In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$ -range 0,46 to <0,93

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

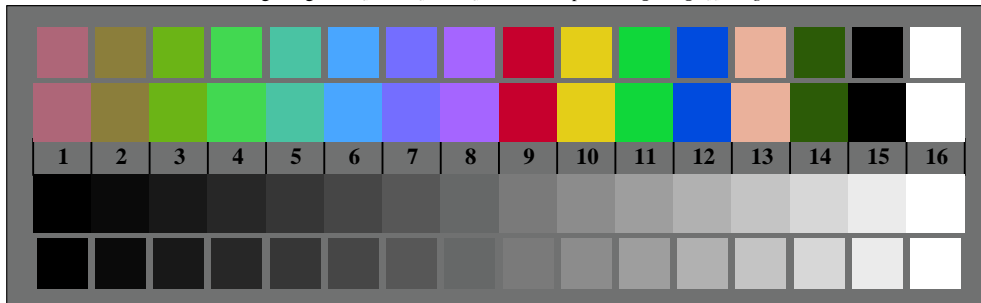
TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.HTM>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta



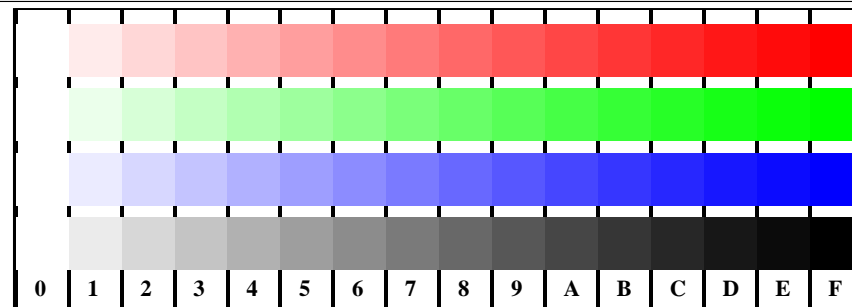
AE190-5, Picture D2Wdd: radial gratings W- $R_d$ ; W- $G_d$ ; W- $B_d$ ; W- $N$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



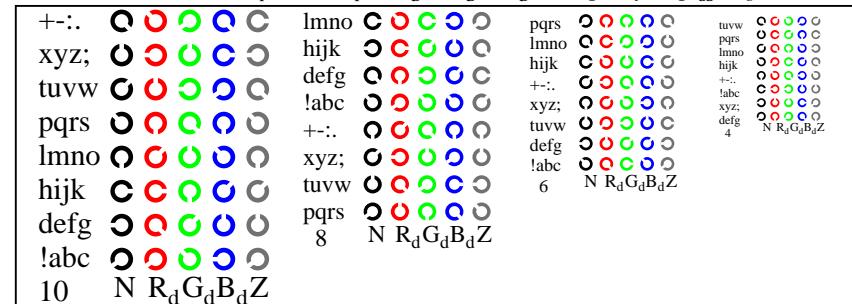
AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf);  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



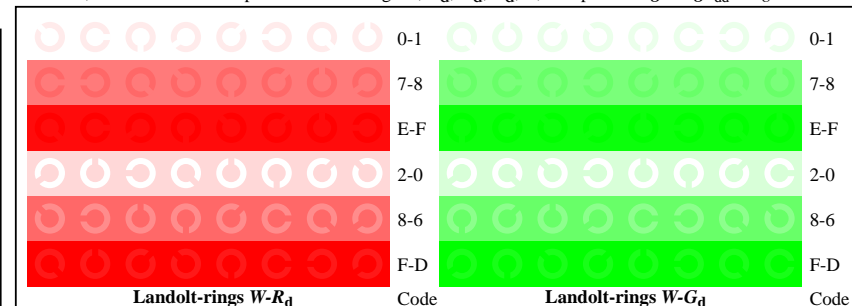
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



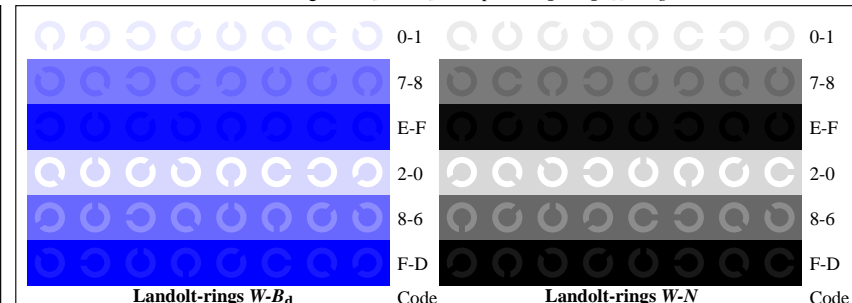
AE191-1, Picture D4Wdd: 16 equidistant steps W- $R_d$ ; W- $G_d$ ; W- $B_d$ ; W- $N$ ;  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



AE191-3, Picture D5Wdd: Sript and Landolt-rings N;  $R_d$ ;  $G_d$ ;  $B_d$ ;  $Z$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE191-5, Picture D6Wdd: Landolt-rings W- $R_d$ ; W- $G_d$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE191-7, Picture D7Wdd: Landolt-rings W- $B_d$ ; W- $N$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor

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



Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 010161

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

PDF file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN6\_1.PDF underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 010161

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Red: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Green: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Blue: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
White - Black: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)?, and for Landolt-rings (minimum 5 of 8)?  

Relative size	Letters	Rings N	Rings R <sub>d</sub>	Rings G <sub>d</sub>	Rings B <sub>d</sub>
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub>, and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?

Colour row W-R <sub>d</sub> background - ring	Colour row W-G <sub>d</sub> background - ring	Colour row W-B <sub>d</sub> background - ring	Colour row W-N background - ring
0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No
7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No
E - F Yes/No	E - F Yes/No	E - F Yes/No	E - F Yes/No
2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No
8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No
F - D Yes/No	F - D Yes/No	F - D Yes/No	F - D Yes/No

part 2, AE191-3Ndd: 010161

#### 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/AE19/AE19F0PX\_CYN6\_3.PDF underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN6\_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/AE19/AE19F0PX\_CYN6\_3.PDF underline: Yes/No  
picture A7<sub>dd</sub> underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN6\_3.PS or 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/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, AE191-7dd: 010161

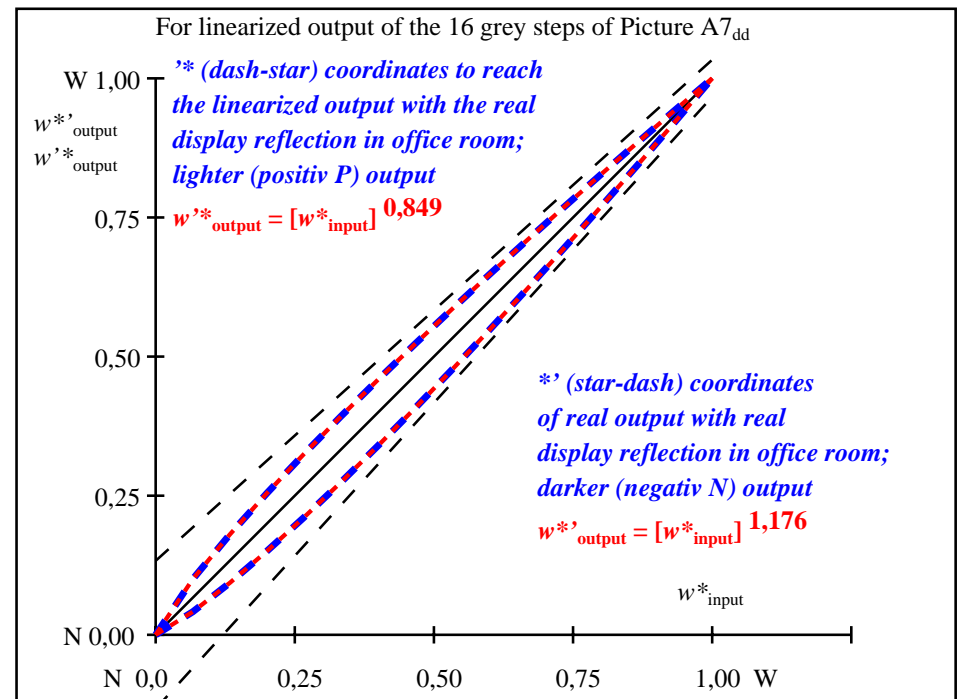


see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 9/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19.HTM>

<i>i</i>	<i>LAB</i> * <sub>ref</sub>			<i>l</i> * <sub>out</sub> <i>LAB</i> * <sub>out</sub>			<i>LAB</i> * <sub>out-ref</sub>			<i>ΔE</i> * Start output S1		
1	10,99	0,00	0,00	0,00	10,99	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	Mean lightness difference (16 steps) <i>ΔE</i> * <sub>CIELAB</sub> = 6,0
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	Mean lightness difference (5 steps) <i>ΔL</i> * <sub>CIELAB</sub> = 4,7
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 colour reproduction index: <i>R</i> * <sub>ab,m</sub> = 73,7												

part 1,

AE190-3dd: 010162



part 2,

AE191-3dd: 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																
gN=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  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

AE190-7dd: 010162

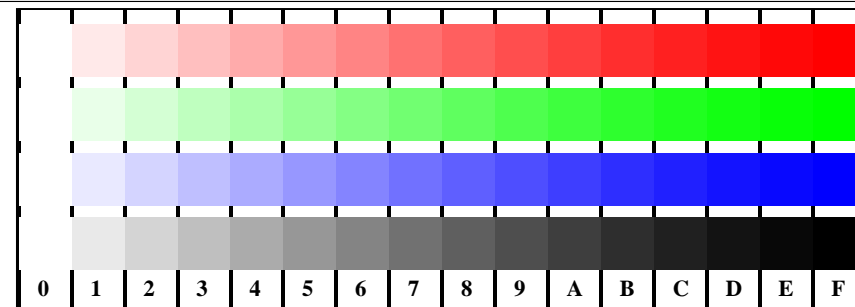
In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:1,25$ ;  $Y_N$ -range 0,93 to <1,87

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

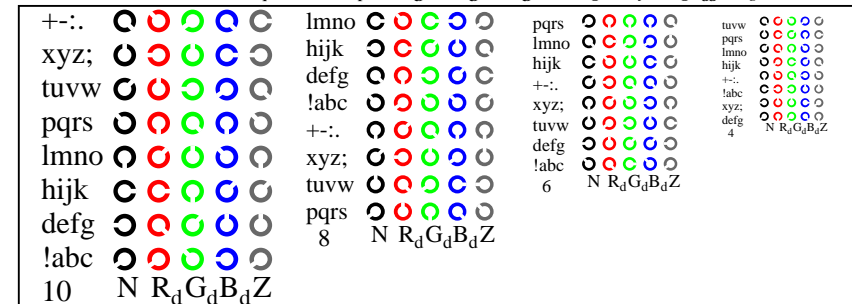
TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.HTM>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

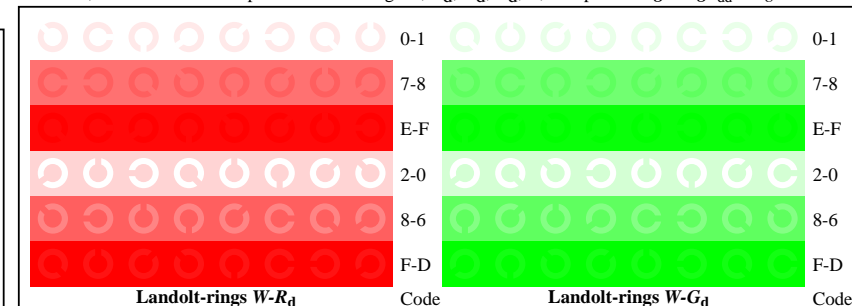
TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th44ta



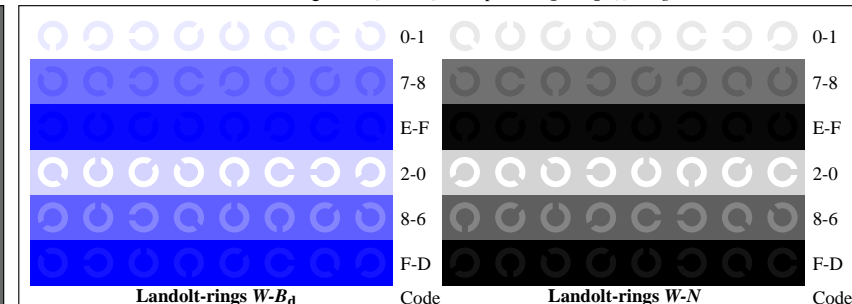
AE191-1, Picture D4Wdd: 16 equidistant steps  $W-R_d$ ;  $W-G_d$ ;  $W-B_d$ ;  $W-N$ ;  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



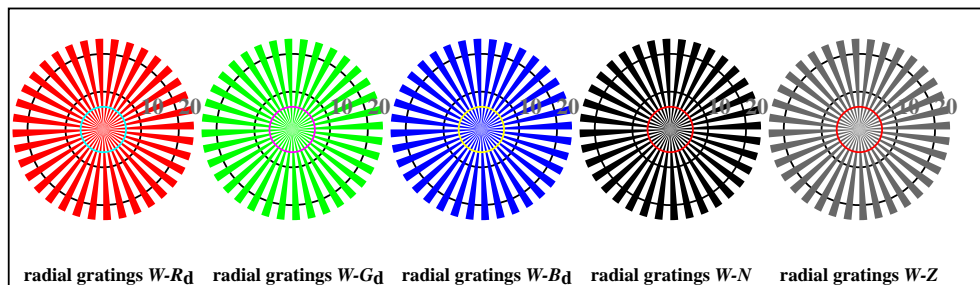
AE191-3, Picture D5Wdd: Sript and Landolt-rings  $N$ ;  $R_d$ ;  $G_d$ ;  $B_d$ ;  $Z$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



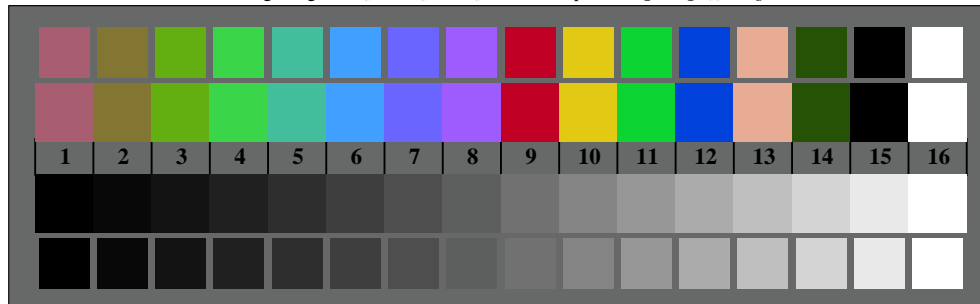
AE191-5, Picture D6Wdd: Landolt-rings  $W-R_d$ ;  $W-G_d$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



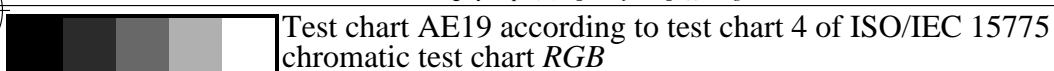
AE191-7, Picture D7Wdd: Landolt-rings  $W-B_d$ ;  $W-N$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE190-5, Picture D2Wdd: radial gratings  $W-R_d$ ;  $W-G_d$ ;  $W-B_d$ ;  $W-N$ ; PS operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf);  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB

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



Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm ..... mm ..... mm ..... mm ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 010241

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

PDF file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN5\_1.PDF underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 010241

Form A: Test chart AE19 according to test chart 4 of ISO/IEC 15775 input: rgb/cmy0/000n/w set...  
chromatic test chart RGB output: ->rgb<sub>dd</sub> setrgbcolor

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Red: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Green: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Blue: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
White - Black: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)? , and for Landolt-rings (minimum 5 of 8)?  

Relative size	Letters	Rings N	Rings R <sub>d</sub>	Rings G <sub>d</sub>	Rings B <sub>d</sub>
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub>, and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?

Colour row W-R <sub>d</sub> background - ring	Colour row W-G <sub>d</sub> background - ring	Colour row W-B <sub>d</sub> background - ring	Colour row W-N background - ring
0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No
7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No
E - F Yes/No	E - F Yes/No	E - F Yes/No	E - F Yes/No
2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No
8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No
F - D Yes/No	F - D Yes/No	F - D Yes/No	F - D Yes/No

part 2, AE191-3Ndd: 010241

#### 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/AE19/AE19F0PX\_CYN5\_3.PDF underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN5\_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/AE19/AE19F0PX\_CYN5\_3.PDF underline: Yes/No  
picture A7<sub>dd</sub> underline: Yes/No  
PS file: http://farbe.li.tu-berlin.de/AE19/AE19F0PX\_CYN5\_3.PS or 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/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, AE191-7dd: 010241

see similar files: http://farbe.li.tu-berlin.de/AE19/AE19.HTM  
technical information: http://farbe.li.tu-berlin.de/ or http://farbe.li.tu-berlin.de/AE.HTM

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

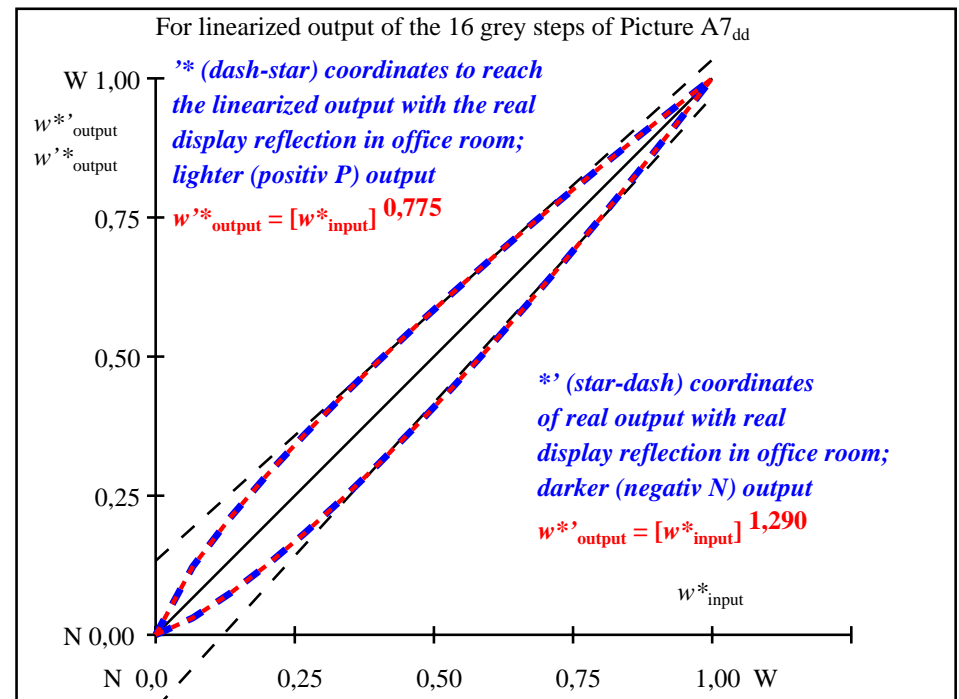
see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 12/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19LF0NX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rh4ta

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	Mean lightness difference
15	90,24 0,00 0,00	0,89	87,60 0,00 0,00	-2, 0,00 0,00	2,64	(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> = 7,6
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	Mean lightness difference
19	56,70 0,00 0,00	0,34	44,62 0,00 0,00	-12, 0,00 0,00	12,08	(5 steps)
20	76,05 0,00 0,00	0,64	67,70 0,00 0,00	-8, 0,00 0,00	8,35	ΔL <sup>*</sup> <sub>CIELAB</sub> = 6,1
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 <sup>*</sup> <sub>ab,m</sub> = 66,3

part 1,

AE190-3dd: 010242



part 2,

AE191-3dd: 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> CIELAB, r (relative)																
w <sup>*</sup> 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 <sup>*</sup> 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 A7<sub>dd</sub>: 16 visual equidistant L<sup>\*</sup>-grey steps; PS operator: 0 0 0 n<sup>\*</sup> setcmykcolor

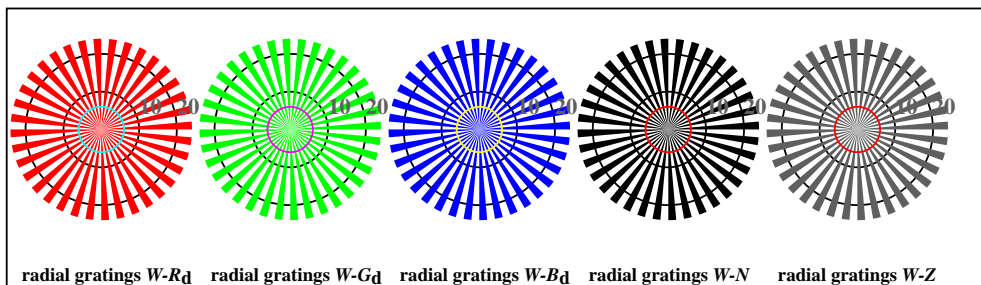
AE190-7dd: 010242

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing Y contrast Y<sub>W</sub>:Y<sub>N</sub>=88,9:2,5; Y<sub>N</sub>-range 1,87 to <3,75

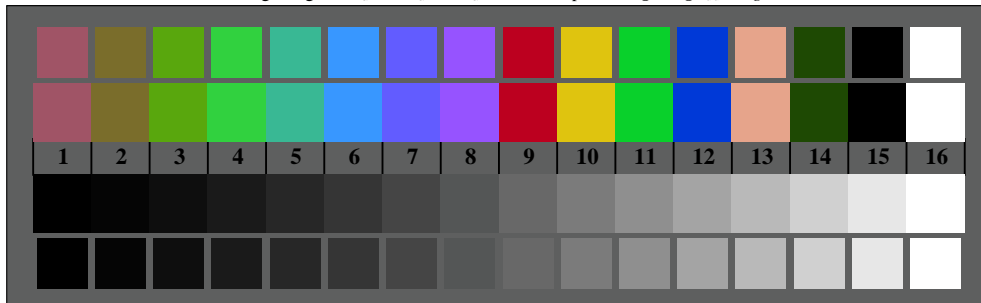
input: rgb/cmy0/000n/w set...  
output: ->rgb<sub>dd</sub> setrgbcolor



see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.HTM>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

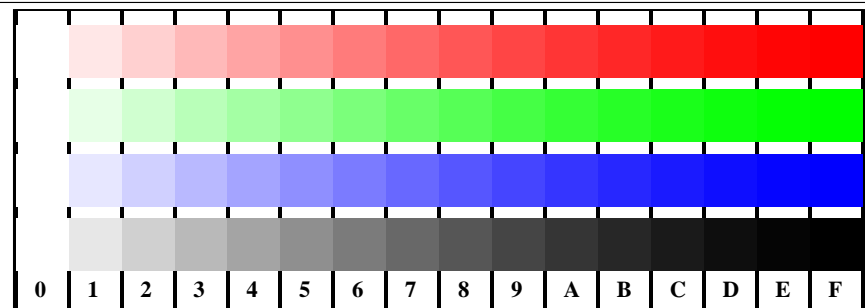


radial gratings W-R<sub>d</sub> radial gratings W-G<sub>d</sub> radial gratings W-B<sub>d</sub> radial gratings W-N radial gratings W-Z  
AE190-5, Picture D2Wdd: radial gratings W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

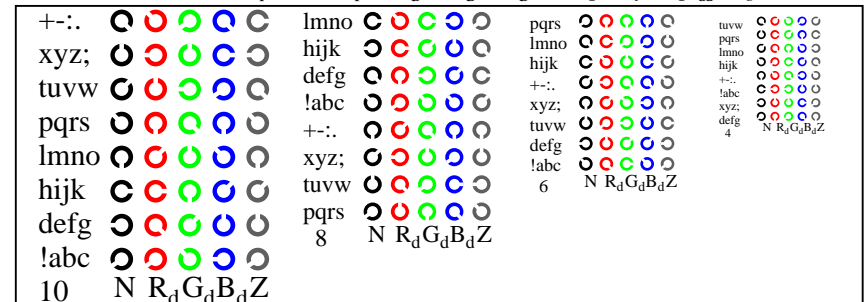


AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*

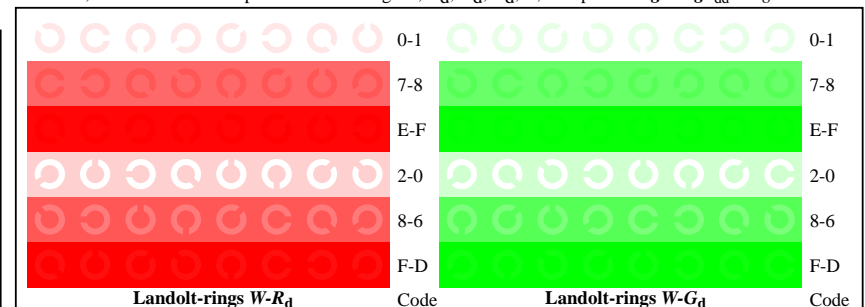
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



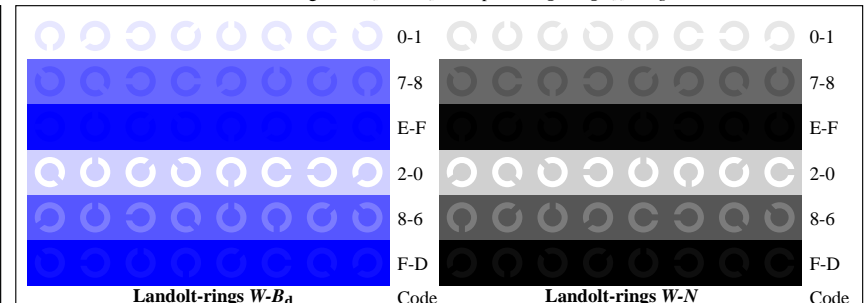
AE191-1, Picture D4Wdd: 16 equidistant steps W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*



AE191-3, Picture D5Wdd: Sript and Landolt-rings N; R<sub>d</sub>; G<sub>d</sub>; B<sub>d</sub>; Z; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-5, Picture D6Wdd: Landolt-rings W-R<sub>d</sub>; W-G<sub>d</sub>; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-7, Picture D7Wdd: Landolt-rings W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

input: *rgb/cmy0/000n/w set...*  
output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th44ta

see similar files: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_1.PDF)  
technical information: <http://farbe.li.tu-berlin.de/> or [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_1.PDF)

<http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS; 3D-linearization, page 14/24  
F: 3D-linearization AE19/AE19LF0NX.PDF /PS in file (F)

Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 010321

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

PDF file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_1.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_1.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 010321

Form A: Test chart AE19 according to test chart 4 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart RGB output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Red: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Green: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Blue: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
White - Black: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)? , and for Landolt-rings (minimum 5 of 8)?  
Relative size Letters Rings N Rings R<sub>d</sub> Rings G<sub>d</sub> Rings B<sub>d</sub>  
10 Yes/No Yes/No Yes/No Yes/No Yes/No  
8 Yes/No Yes/No Yes/No Yes/No Yes/No  
6 Yes/No Yes/No Yes/No Yes/No Yes/No  
4 Yes/No Yes/No Yes/No Yes/No Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub> and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?  
Colour row W-R<sub>d</sub> background - ring Colour row W-G<sub>d</sub> background - ring Colour row W-B<sub>d</sub> background - ring Colour row W-N background - ring  
0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No  
7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No  
E - F Yes/No E - F Yes/No E - F Yes/No E - F Yes/No  
2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No  
8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No  
F - D Yes/No F - D Yes/No F - D Yes/No F - D Yes/No

part 2, AE191-3Ndd: 010321

#### 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/AE19/AE19F0PX\\_CYN4\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_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/AE19/AE19F0PX\\_CYN4\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN4\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN4_3.PS) or underline: Yes/No  
picture A7<sub>dd</sub>

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, AE191-7dd: 010321

TUB Registration: 20190301-AE19/AE19L0FA.TXT /PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta

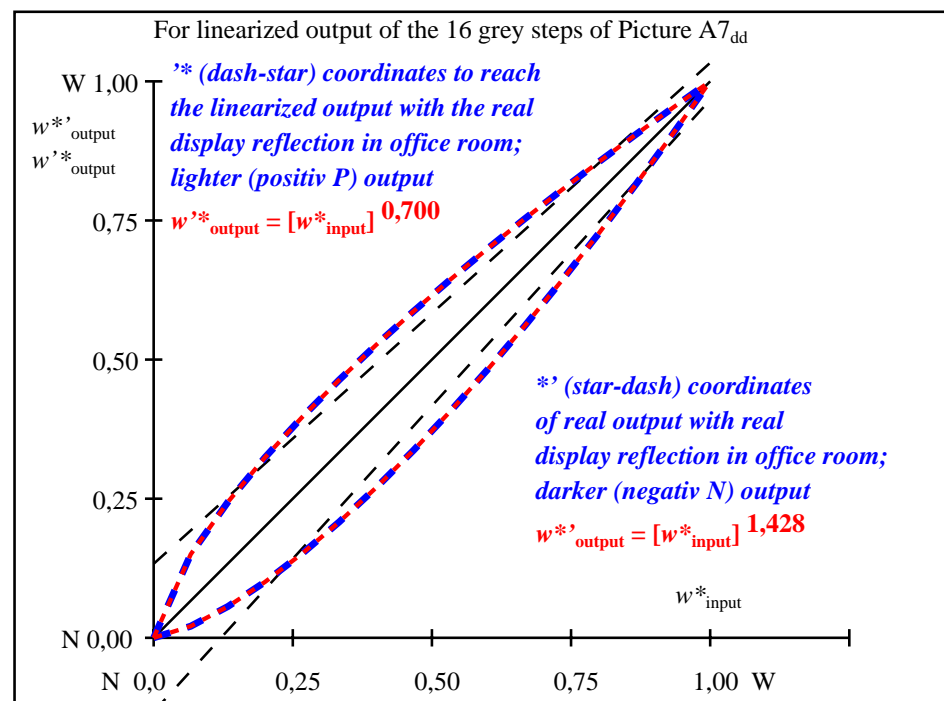
see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 15/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19LF0NX.PDF> / .PS in file (F)

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	26,84 0,00 0,00	0,00	26,84 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	31,41 0,00 0,00	0,00	27,49 0,00 0,00	-3, 0,00 0,00	3,92	ISO/IEC 15775 Annex G
3	35,98 0,00 0,00	0,03	28,99 0,00 0,00	-6, 0,00 0,00	6,99	and DIN 33866-1 Annex G
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	Mean lightness difference
15	90,83 0,00 0,00	0,88	87,73 0,00 0,00	-3, 0,00 0,00	3,10	(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> = 8,4
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	Mean lightness difference
20	78,26 0,00 0,00	0,60	68,64 0,00 0,00	-9, 0,00 0,00	9,62	(5 steps)
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔL <sup>*</sup> <sub>CIELAB</sub> = 6,7

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

part 1,

AE190-3dd: 010322



part 2,

AE191-3dd: 010322

$L^*/Y_{\text{intended}}$ (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 <sub>N</sub> =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
$w^* = l^*_{\text{CIELAB}, r}$ (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	0,021	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

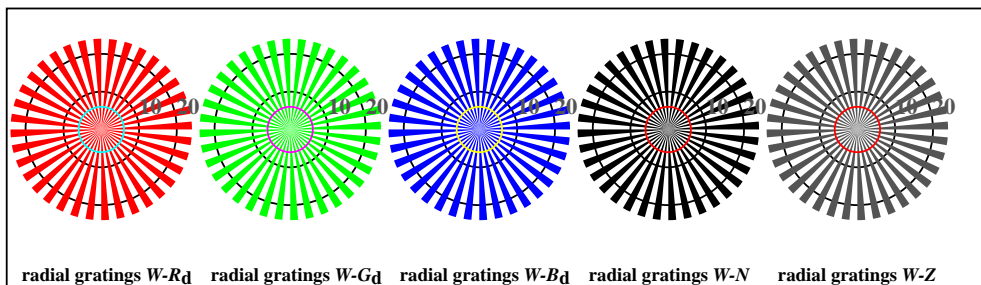
AE190-7dd: 010322

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
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

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rh4ta

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS;  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19F0NX.PDF> / .PS

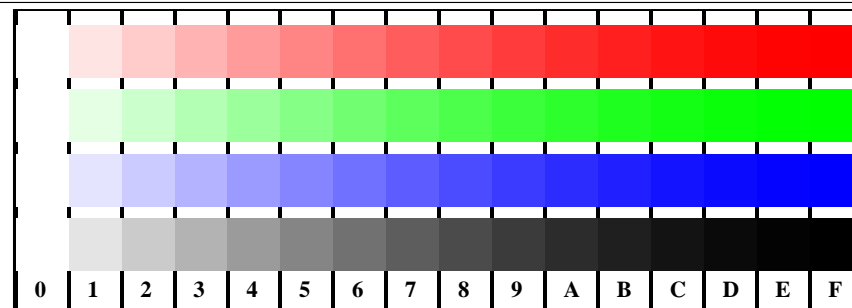


radial gratings W-R<sub>d</sub> radial gratings W-G<sub>d</sub> radial gratings W-B<sub>d</sub> radial gratings W-N radial gratings W-Z  
AE190-5, Picture D2Wdd: radial gratings W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

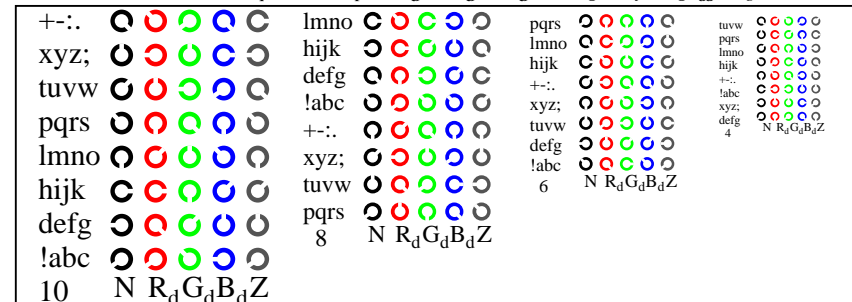


AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*

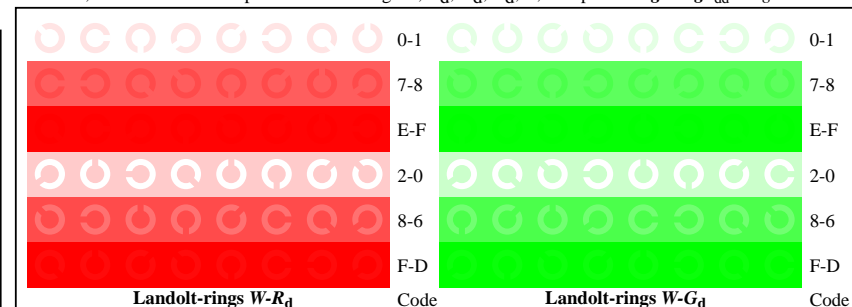
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



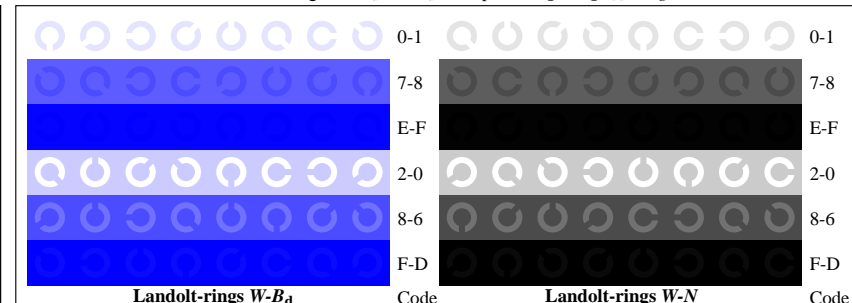
AE191-1, Picture D4Wdd: 16 equidistant steps W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*



AE191-3, Picture D5Wdd: Script and Landolt-rings N; R<sub>d</sub>; G<sub>d</sub>; B<sub>d</sub>; Z; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-5, Picture D6Wdd: Landolt-rings W-R<sub>d</sub>; W-G<sub>d</sub>; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-7, Picture D7Wdd: Landolt-rings W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

input: *rgb/cmy0/000n/w set...*  
output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th44ta



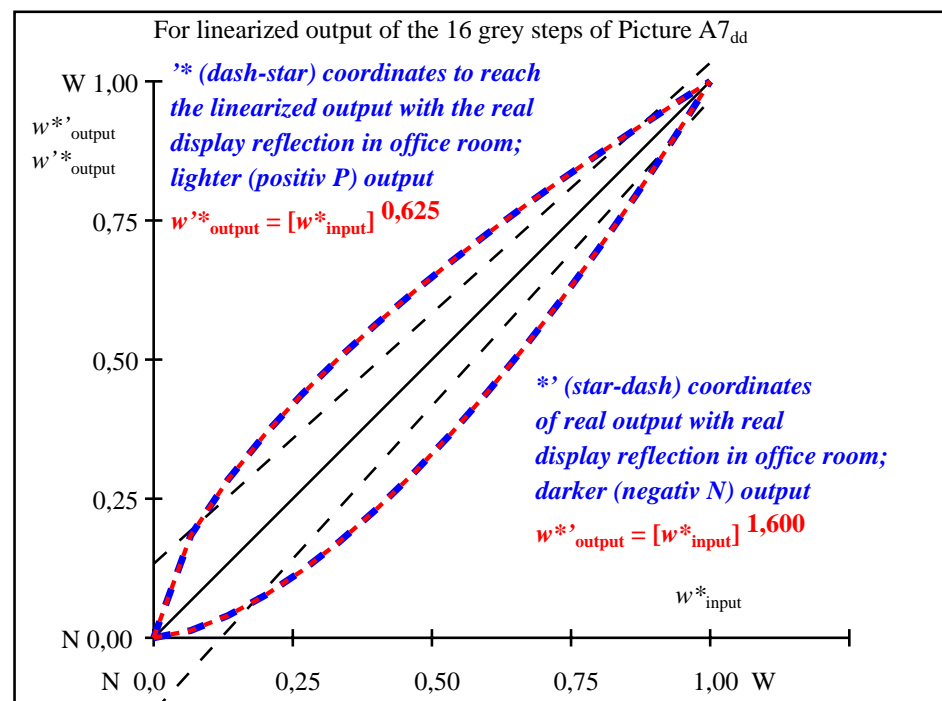


see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 18/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS in file (F)

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 <sup>*</sup> <sub>ab,m</sub> = 63,5

part 1,

AE190-3dd: 010402



part 2,

AE191-3dd: 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* = l <sup>*</sup> <sub>CIELAB, r</sub> (relative)																
w* <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* <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

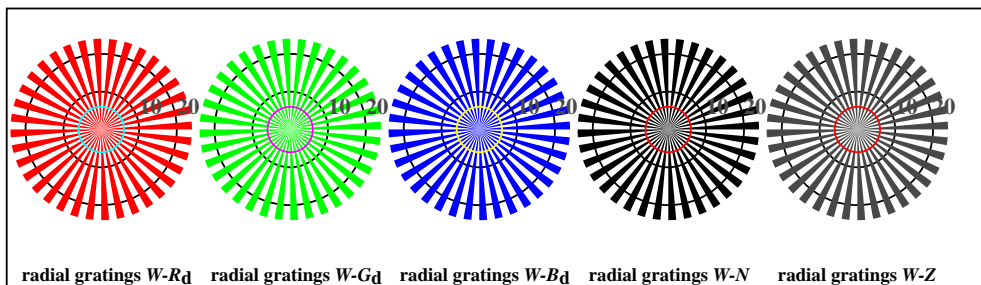
AE190-7dd: 010402

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing Y contrast Y<sub>W</sub>:Y<sub>N</sub>=88,9:10; Y<sub>N</sub>-range 7,5 to <15

input: rgb/cmy0/000n/w set...  
output: ->rgb<sub>dd</sub> setrgbcolor

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=rh4ta

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19.HTM>  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>

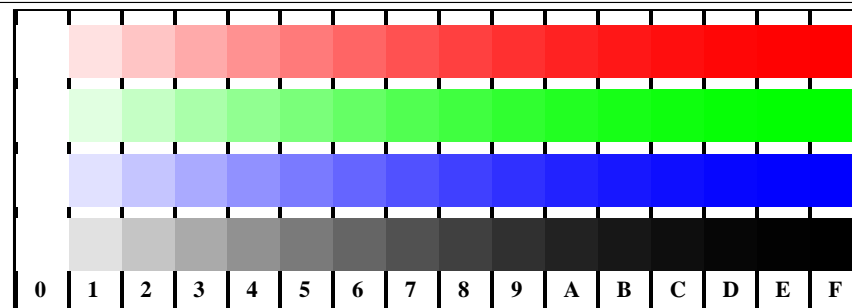


radial gratings W-R<sub>d</sub> radial gratings W-G<sub>d</sub> radial gratings W-B<sub>d</sub> radial gratings W-N radial gratings W-Z  
AE190-5, Picture D2Wdd: radial gratings W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

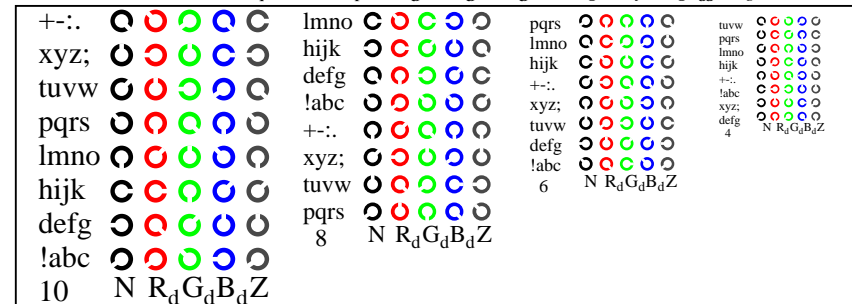


AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*

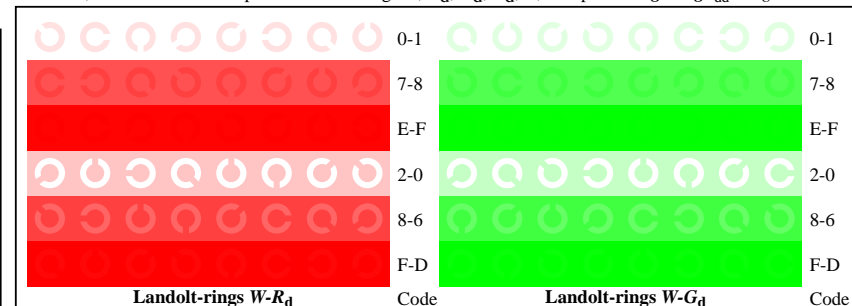
Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart RGB



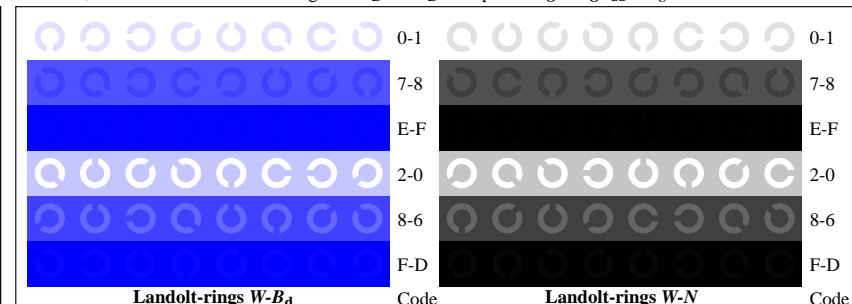
AE191-1, Picture D4Wdd: 16 equidistant steps W-R<sub>d</sub>; W-G<sub>d</sub>; W-B<sub>d</sub>; W-N; *rgb/cmy0->rgb<sub>dd</sub> setrgbcolor*



AE191-3, Picture D5Wdd: Sript and Landolt-rings N; R<sub>d</sub>; G<sub>d</sub>; B<sub>d</sub>; Z; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-5, Picture D6Wdd: Landolt-rings W-R<sub>d</sub>; W-G<sub>d</sub>; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*



AE191-7, Picture D7Wdd: Landolt-rings W-B<sub>d</sub>; W-N; PS operator: *rgb->rgb<sub>dd</sub> setrgbcolor*

input: *rgb/cmy0/000n/w set...*  
output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output

TUB material: code=th44ta

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS; 3D-linearization, page 20/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS in file (F)

<http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS; 3D-linearization, page 20/24  
F: 3D-linearization AE19/AE19LF0NX.PDF /PS in file (F)

Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 010481

Documentation of file format, hardware and software for this test:  
PDF file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN2\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN2_1.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN2\\_1.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 010481

Form A: Test chart AE19 according to test chart 4 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart RGB output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Red: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Green: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
White - Blue: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
White - Black: If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)?, and for Landolt-rings (minimum 5 of 8)?  
Relative size Letters Rings N Rings R<sub>d</sub> Rings G<sub>d</sub> Rings B<sub>d</sub>  
10 Yes/No Yes/No Yes/No Yes/No Yes/No  
8 Yes/No Yes/No Yes/No Yes/No Yes/No  
6 Yes/No Yes/No Yes/No Yes/No Yes/No  
4 Yes/No Yes/No Yes/No Yes/No Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub> and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?  
Colour row W-R<sub>d</sub> background - ring Colour row W-G<sub>d</sub> background - ring Colour row W-B<sub>d</sub> background - ring Colour row W-N background - ring  
0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No  
7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No  
E - F Yes/No E - F Yes/No E - F Yes/No E - F Yes/No  
2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No  
8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No  
F - D Yes/No F - D Yes/No F - D Yes/No F - D Yes/No

part 2, AE191-3Ndd: 010481

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/AE19/AE19F0PX\\_CYN2\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN2_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN2\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN2_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/AE19/AE19F0PX\\_CYN2\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN2_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN2\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN2_3.PS) or 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/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, AE191-7dd: 010481

TUB Registration: 20190301-AE19/AE19L0FA.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/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 21/24  
technical information: <http://farbe.li.tu-berlin.de/AE19/AE19LF0NX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE19/AE19L0FA.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	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**

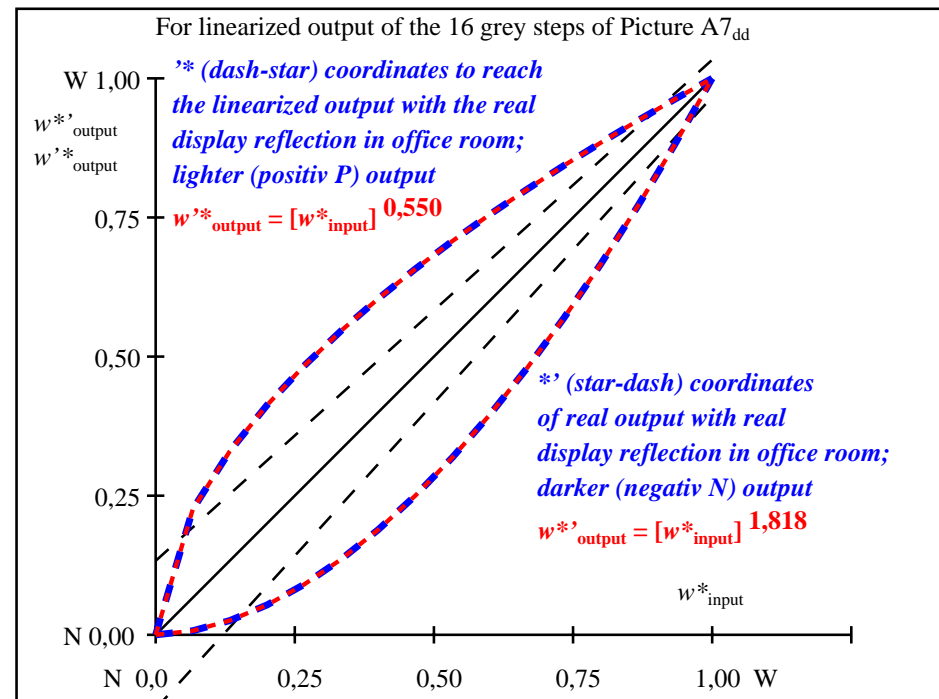
**Mean lightness difference**  
**(16 steps)**  
 $\Delta E^*_{CIELAB} = 7,1$

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

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

part 1,

AE190-3dd: 010482



part 2,

AE191-3dd: 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 <sub>N</sub> =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

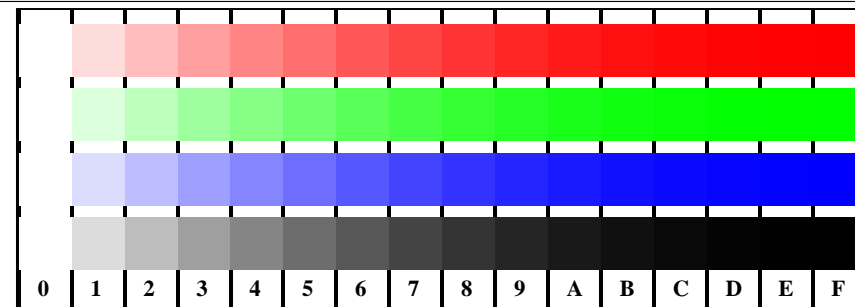
AE190-7dd: 010482

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$ -range 15 to <30

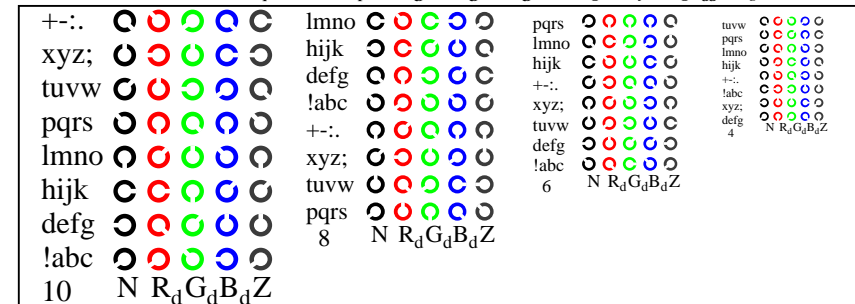
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{dd}$  setrgbcolor

see similar files: <http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 22/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19F0NX.PDF>

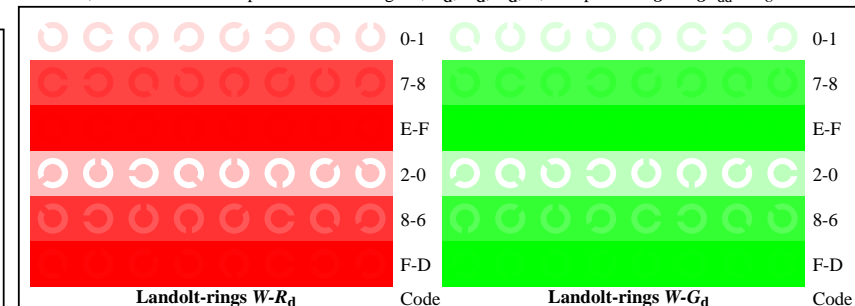
TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta



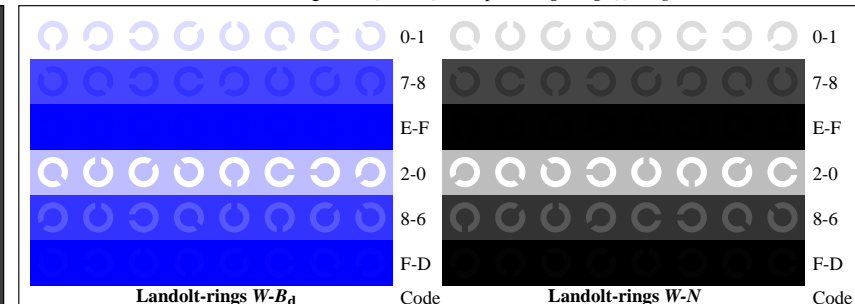
AE191-1, Picture D4Wdd: 16 equidistant steps  $W-R_d$ ;  $W-G_d$ ;  $W-B_d$ ;  $W-N$ ;  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



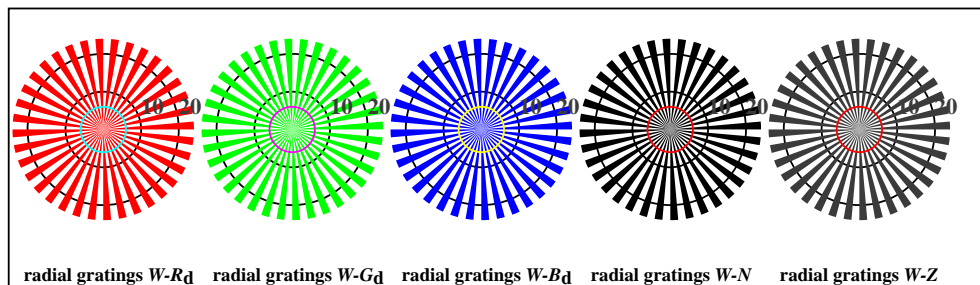
AE191-3, Picture D5Wdd: Sript and Landolt-rings  $N$ ;  $R_d$ ;  $G_d$ ;  $B_d$ ;  $Z$ ;  $PS$  operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



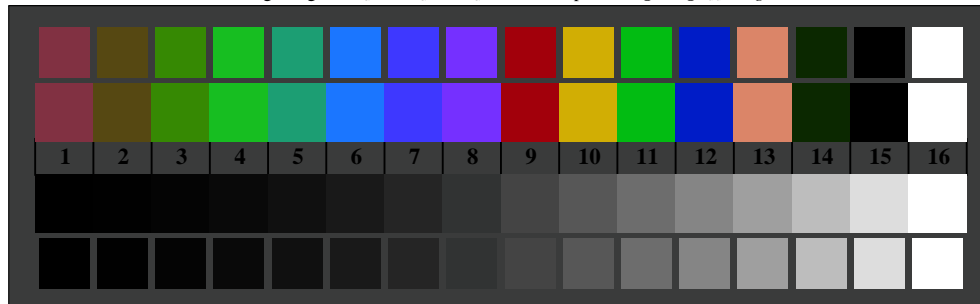
AE191-5, Picture D6Wdd: Landolt-rings  $W-R_d$ ;  $W-G_d$ ;  $PS$  operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



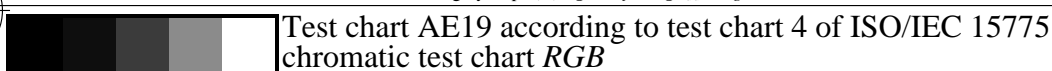
AE191-7, Picture D7Wdd: Landolt-rings  $W-B_d$ ;  $W-N$ ;  $PS$  operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE190-5, Picture D2Wdd: radial gratings  $W-R_d$ ;  $W-G_d$ ;  $W-B_d$ ;  $W-N$ ;  $PS$  operator:  $rgb \rightarrow rgb_{dd}$  setrgbcolor



AE190-7, Picture D3Wdd: 14 CIE-test colours and 2 + 16 grey steps (sf);  $rgb/cmy0 \rightarrow rgb_{dd}$  setrgbcolor



Test chart AE19 according to test chart 4 of ISO/IEC 15775  
chromatic test chart  $RGB$

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

see similar files: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_1.PDF)  
technical information: <http://farbe.li.tu-berlin.de/> or [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_1.PDF)

<http://farbe.li.tu-berlin.de/AE19/AE19F0NX.PDF> /PS; 3D-linearization, page 23/24  
F: 3D-linearization AE19/AE19LF0NX.PDF /PS in file (F)

Test of visual linearized output of pictures D2W<sub>dd</sub> to D3W<sub>dd</sub> please underline Yes/No  
Output test with computer display ( ) or the external display ( ) please mark by (x)!

Test of the resolution of radial gratings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub> according to picture D2W<sub>dd</sub>  
Is the resolution diameter < 6 mm? Yes/No  
Test with magnifying glass (e.g. 6x) resolution diameter ..... mm

Test of the 14 CIE-test colours according to picture D3W<sub>dd</sub>  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? Yes/No  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant L\*-grey steps according to picture D3W<sub>dd</sub>  
Are the 16 steps on the upper rows distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

part 1, AE190-3dd: 010561

Documentation of file format, hardware and software for this test:  
PDF file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_1.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_1.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_1.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_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 AE19F0PX\_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 AE19F0PX\_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, AE190-7dd: 010561

Form A: Test chart AE19 according to test chart 4 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart RGB output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D4W<sub>dd</sub>  
W-R<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-G<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-B<sub>d</sub> Are all the 16 steps distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps  
W-N Are all the 16 steps distinguishable? Yes/No  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W<sub>dd</sub>  
Is the recognition > 50% for letters (17 of 32 at least)? , and for Landolt-rings (minimum 5 of 8)?  
Relative size Letters Rings N Rings R<sub>d</sub> Rings G<sub>d</sub> Rings B<sub>d</sub>  
10 Yes/No Yes/No Yes/No Yes/No Yes/No  
8 Yes/No Yes/No Yes/No Yes/No Yes/No  
6 Yes/No Yes/No Yes/No Yes/No Yes/No  
4 Yes/No Yes/No Yes/No Yes/No Yes/No

Test of the recognition frequency of the Landolt rings W-R<sub>d</sub>, W-G<sub>d</sub>, W-B<sub>d</sub>, and W-N according to picture D6W<sub>dd</sub> and D7W<sub>dd</sub>  
Is the recognition frequency of the Landolt rings > 50% (5 of 8 at least)?  
Colour row W-R<sub>d</sub> background - ring Colour row W-G<sub>d</sub> background - ring Colour row W-B<sub>d</sub> background - ring Colour row W-N background - ring  
0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No 0 - 1 Yes/No  
7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No 7 - 8 Yes/No  
E - F Yes/No E - F Yes/No E - F Yes/No E - F Yes/No  
2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No 2 - 0 Yes/No  
8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No 8 - 6 Yes/No  
F - D Yes/No F - D Yes/No F - D Yes/No F - D Yes/No

part 2, AE191-3Ndd: 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/AE19/AE19F0PX\\_CYN1\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_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/AE19/AE19F0PX\\_CYN1\\_3.PDF](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_3.PDF) underline: Yes/No  
PS file: [http://farbe.li.tu-berlin.de/AE19/AE19F0PX\\_CYN1\\_3.PS](http://farbe.li.tu-berlin.de/AE19/AE19F0PX_CYN1_3.PS) or underline: Yes/No  
picture A7<sub>dd</sub> 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, AE191-7dd: 010561

TUB Registration: 20190301-AE19/AE19L0FA.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/AE19/AE19F0NX.PDF> / .PS; 3D-linearization, page 24/24  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE19.HTM>

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	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	71,41 0,00 0,00	0,00	69,75 0,00 0,00	-1, 0,00 0,00	1,65	ISO/IEC 15775 Annex G
3	73,12 0,00 0,00	0,01	69,96 0,00 0,00	-3, 0,00 0,00	3,15	and DIN 33866-1 Annex G
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	

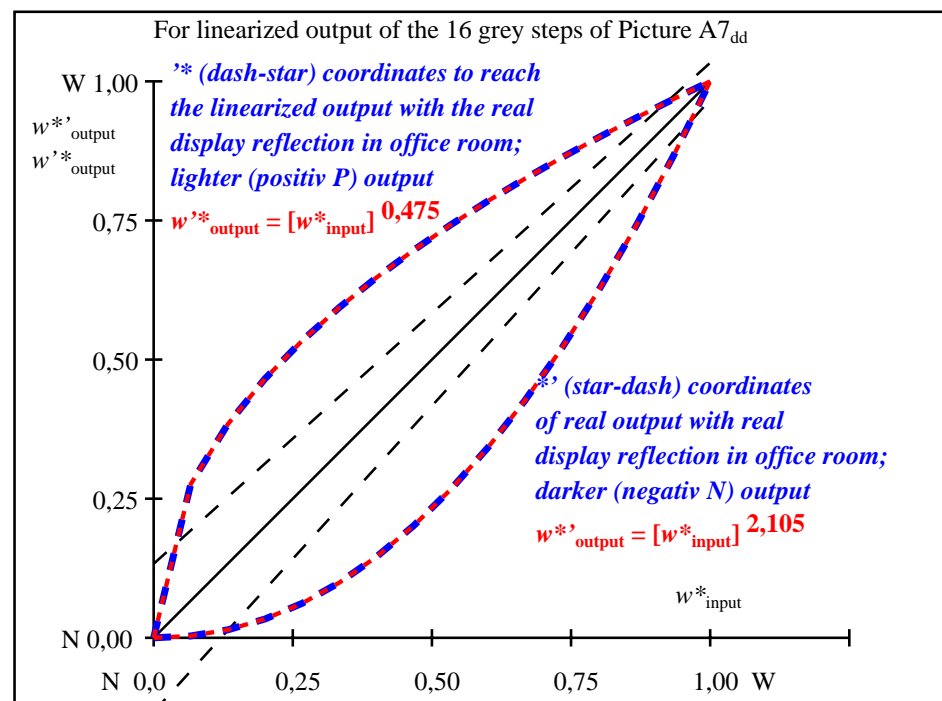
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 4,6$

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

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

part 1,

AE190-3dd: 010562



part 2,

AE191-3dd: 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 <sup>*</sup> 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<sup>\*</sup> setcmykcolor

AE190-7dd: 010562

In-out: Test chart AE19 according to test chart 4 of ISO/IEC 15775  
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

TUB Registration: 20190301-AE19/AE19L0FA.TXT /.PS  
application for measurement or viewing of display and print output  
TUB material: code=th4ta