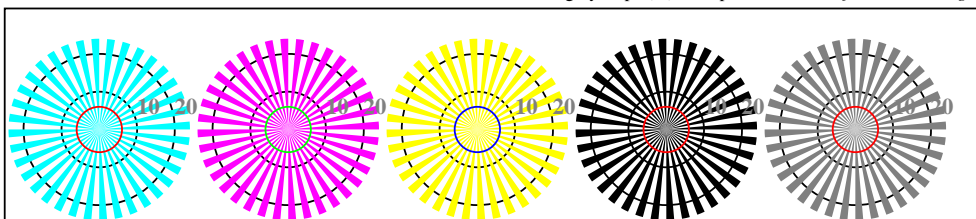


see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS;  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage

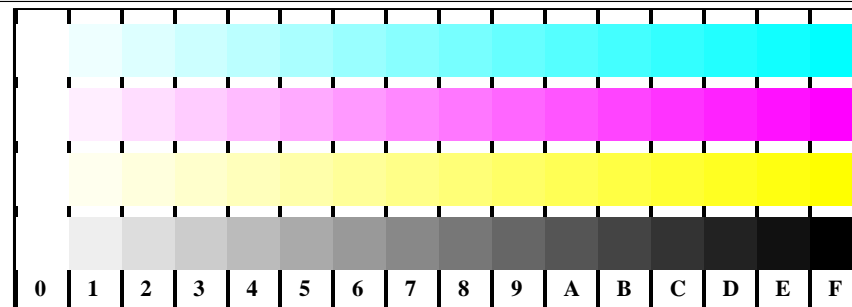
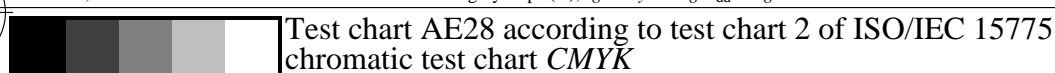


radial gratings W-C<sub>d</sub> radial gratings W-M<sub>d</sub> radial gratings W-Y<sub>d</sub> radial gratings W-N radial gratings W-Z

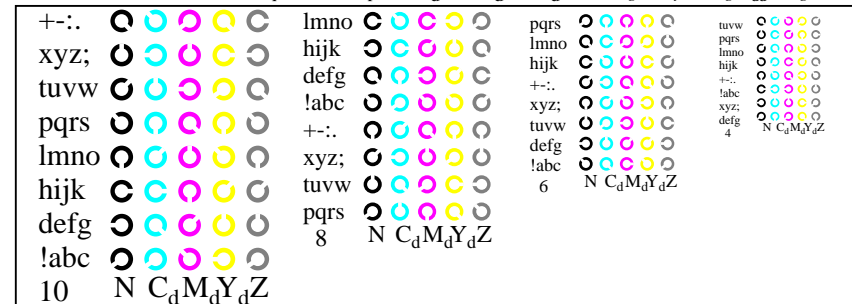
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



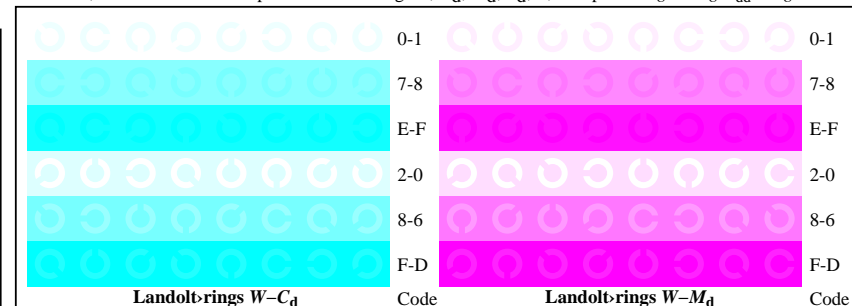
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



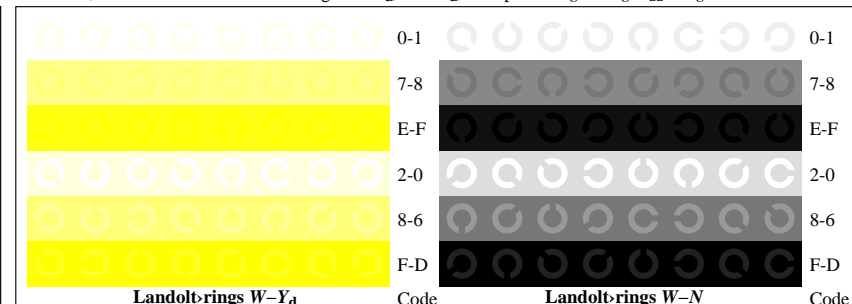
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th4ta

Test for the visual linearized output of pictures B1Wdd to B3Wdd  
Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**  
Is the resolution diameter < 6 mm? **Yes/No**  
Test with magnifying glass (6x),  
Resolution diameter: ..... mm ..... mm ..... mm ..... mm ..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**  
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 B3Wdd**  
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 AE280-3dd: 01001

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

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY8\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY8_1.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY8\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY8_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY8\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY8\_1.PS**

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

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

part 3 AE280-7N\*dd-01001

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart *CMYK* output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

$W-C_d$  White – Cyanblue: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-M_d$  White – Magentared: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-Y_d$  White – Yellow: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-N$  White – Black: 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$	Colour row $W-M_d$	Colour row $W-Y_d$	Colour row $W-N$
background – ring	background – ring	background – ring	background – ring
0 – 1	0 – 1	0 – 1	0 – 1
7 – 8	7 – 8	7 – 8	7 – 8
E – F	E – F	E – F	E – F
2 – 0	2 – 0	2 – 0	2 – 0
8 – 6	8 – 6	8 – 6	8 – 6
F – D	F – D	F – D	F – D

part 2 AE281-3Ndd: 01001

**Documentation of assessor colour vision properties for visual assessment**

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

**underline Yes/No**  
**underline Yes/unknown**  
**underline Yes/unknown**  
**underline Yes/unknown**

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

Office workplace illumination is daylight (clouded/north sky)

**underline Yes/No**

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY8\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY8_3.PDF)

**underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY8\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY8_3.PS)

**underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

*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/AE28/AE28F0PX\\_CY8\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY8_3.PDF)

**picture A7dd**

**underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY8\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY8_3.PS)

**picture A7dd**

**or underline Yes/No**

**colour measurement and specification for:**

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

**underline Yes/No**

If No, please give other parameters: .....

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

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

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

**underline Yes/No**

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

part 4 AE281-7dd: 01001

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 3/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

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

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

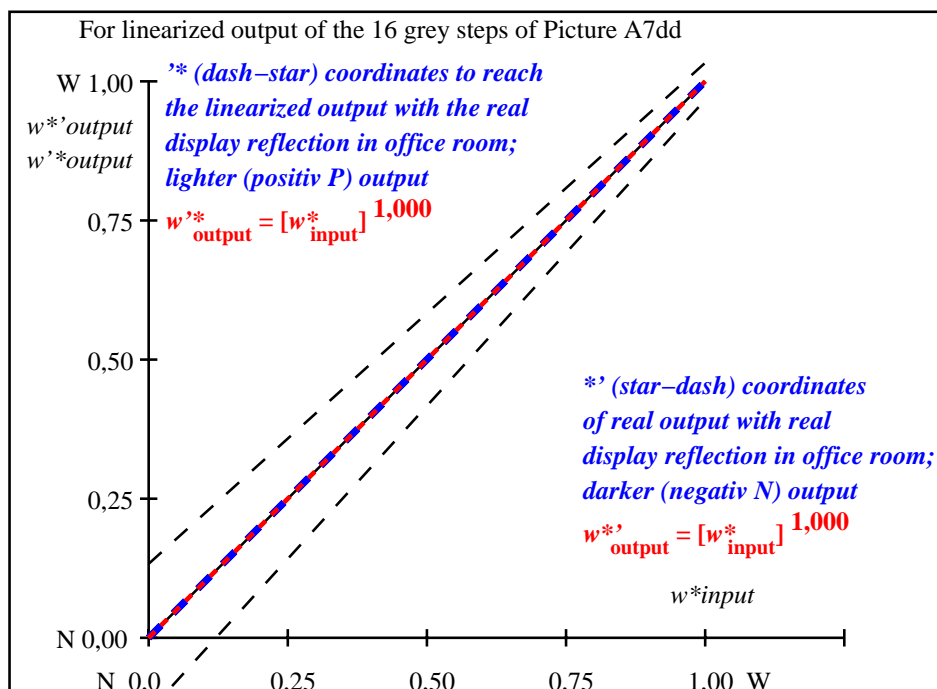
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 0,0$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 01002



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 01002

$L^*/Y_{\text{intended}}$ (absolute)	0.0/0.0	6.4/0.7	12.7/1.5	19.1/2.8	25.4/4.6	31.8/7.0	38.2/10.2	44.5/14.2	50.9/19.2	57.2/25.2	63.6/32.3	70.0/40.7	76.3/50.4	82.7/61.6	89.0/74.3	95.4/88.6
0 0 0 n*																
setcmyk																
gp=1.0																
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
$w^*_{\text{out}}$	0,0	0,067	0,133	0,2	0,267	0,333	0,4	0,467	0,533	0,6	0,667	0,733	0,8	0,867	0,933	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,31$ ;  $Y_N$ -range 0,0 to <0,46

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

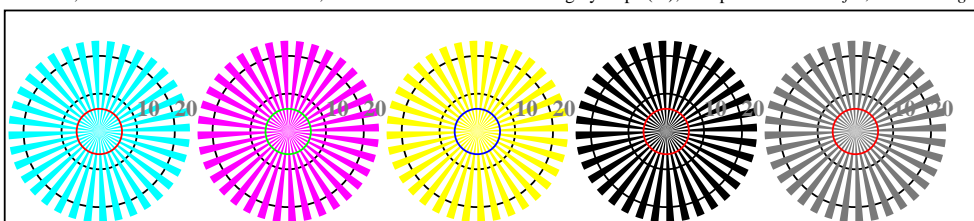
TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=thata4ta



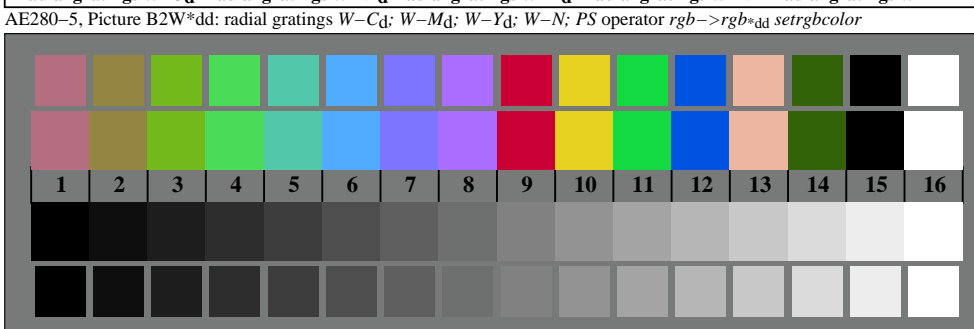
see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS;  
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE.HTM>



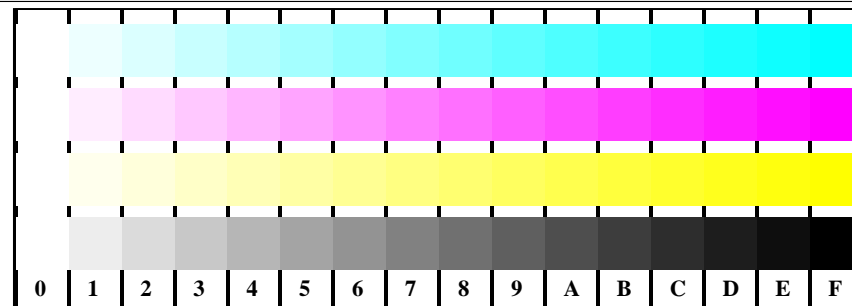
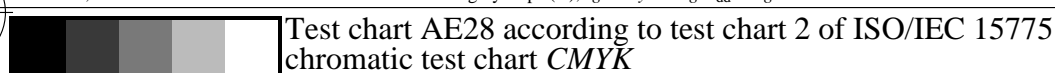
AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage



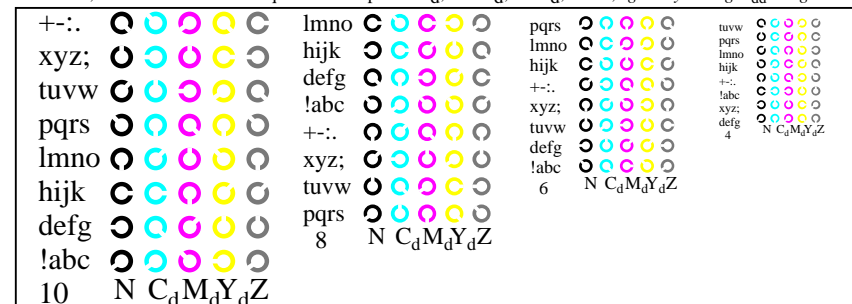
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



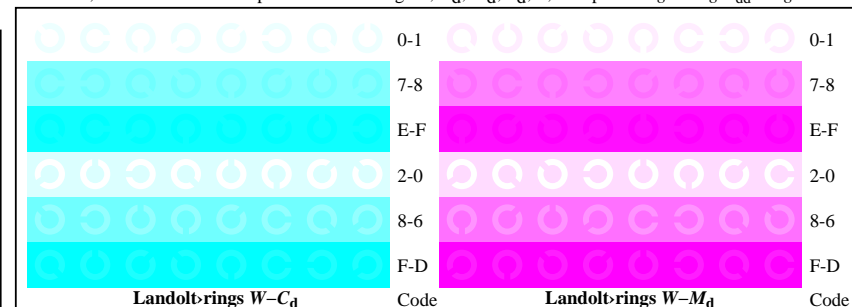
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



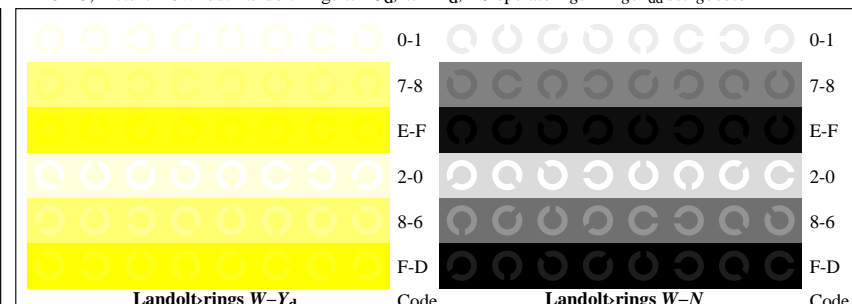
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th44a



Test for the visual linearized output of pictures B1Wdd to B3Wdd  
Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**  
Is the resolution diameter < 6 mm? **Yes/No**  
Test with magnifying glass (6x),  
Resolution diameter: ..... mm ..... mm ..... mm ..... mm ..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**  
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 B3Wdd**  
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 AE280-3dd: 01081

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

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY7\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY7_1.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY7\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY7_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY7\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY7\_1.PS**

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

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

part 3 AE280-7N\*dd-01081

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart *CMYK* output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

$W-C_d$  White – Cyanblue: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-M_d$  White – Magentared: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-Y_d$  White – Yellow: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-N$  White – Black: 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 B5Wdd**  
Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**  
Is the recognition frequency of the Landolt-rings > 50% (min. 5 of 8 at least)?

Colour row $W-C_d$ background – ring	Colour row $W-M_d$ background – ring	Colour row $W-Y_d$ 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 AE281-3Ndd: 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/AE28/AE28F0PX\\_CY7\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY7_3.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY7\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY7_3.PS) **underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

*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/AE28/AE28F0PX\\_CY7\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY7_3.PDF)

**picture A7dd** **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY7\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY7_3.PS)

**picture A7dd** **or underline Yes/No**

**colour measurement and specification for:**

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry: **underline Yes/No**

If No, please give other parameters: .....

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

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

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF **underline Yes/No**

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

part 4 AE281-7dd: 01081

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 6/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th4ta

i	LAB*ref	l*out	LAB*out	LAB*out-ref	ΔE*
1	5,69	0,00	0,00	0,00	0,00
2	11,67	0,00	0,04	9,36	0,00
3	17,65	0,00	0,09	14,01	0,00
4	23,63	0,00	0,14	19,12	0,00
5	29,61	0,00	0,21	24,55	0,00
6	35,59	0,00	0,27	30,23	0,00
7	41,57	0,00	0,33	36,12	0,00
8	47,55	0,00	0,40	42,19	0,00
9	53,54	0,00	0,47	48,42	0,00
10	59,52	0,00	0,54	54,79	0,00
11	65,50	0,00	0,61	61,29	0,00
12	71,48	0,00	0,69	67,91	0,00
13	77,46	0,00	0,76	74,64	0,00
14	83,44	0,00	0,84	81,47	0,00
15	89,42	0,00	0,92	88,39	0,00
16	95,41	0,00	1,00	95,41	0,00
17	5,69	0,00	0,00	5,69	0,00
18	28,12	0,00	0,19	23,16	0,00
19	50,55	0,00	0,44	45,28	0,00
20	72,98	0,00	0,71	69,58	0,00
21	95,41	0,00	1,00	95,41	0,00

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

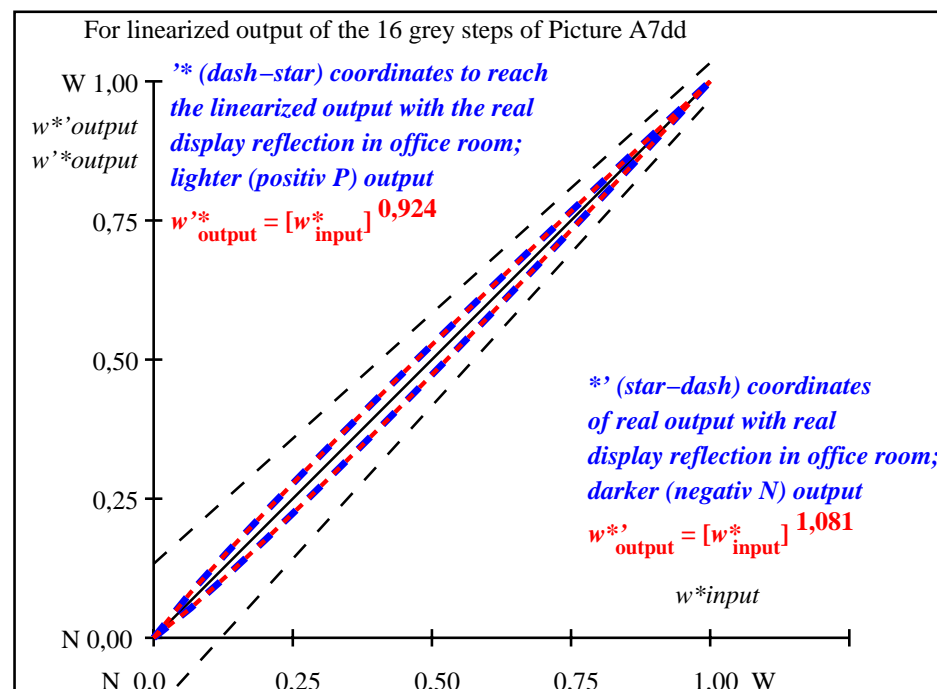
Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 3,4$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 01082



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 01082

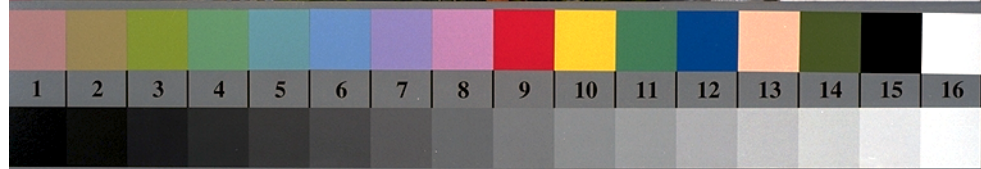
$L^*/Y_{intended}$ (absolute)	5.7/0.6	11.7/1.4	17.7/2.4	23.6/4.0	29.6/6.1	35.6/8.8	41.6/12.2	47.6/16.5	53.5/21.5	59.5/27.6	65.5/34.7	71.5/42.9	77.5/52.3	83.4/63.0	89.4/75.1	95.4/88.6
0 0 0 n* setcmyk gN=1.08 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{CIELAB, r}$ (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
$w^*_{intended}$	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
$w^*_{out}$	0,0	0,054	0,113	0,176	0,24	0,305	0,371	0,439	0,506	0,576	0,645	0,715	0,786	0,857	0,928	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

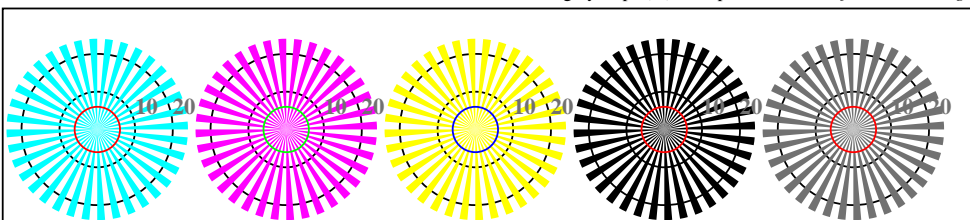
In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$ -range 0,46 to <0,93

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



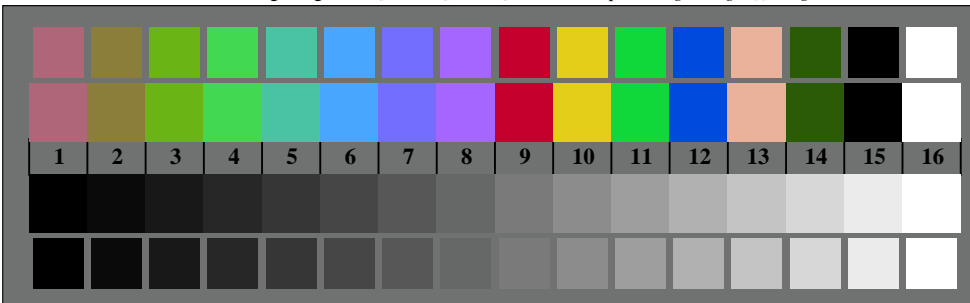


AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage

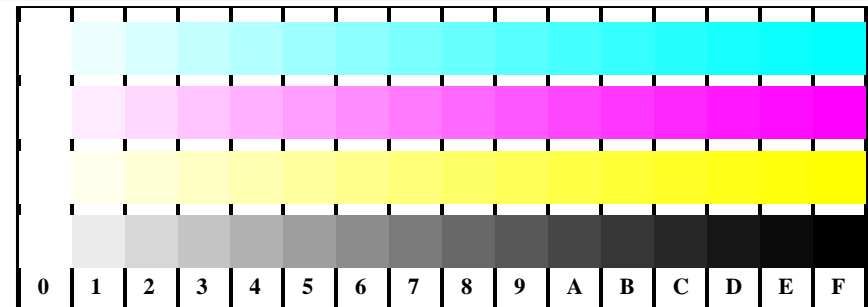
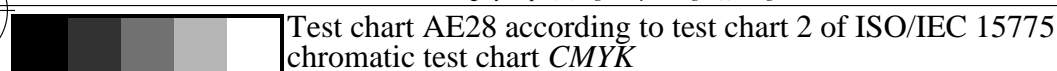


radial gratings W-C<sub>d</sub> radial gratings W-M<sub>d</sub> radial gratings W-Y<sub>d</sub> radial gratings W-N radial gratings W-Z

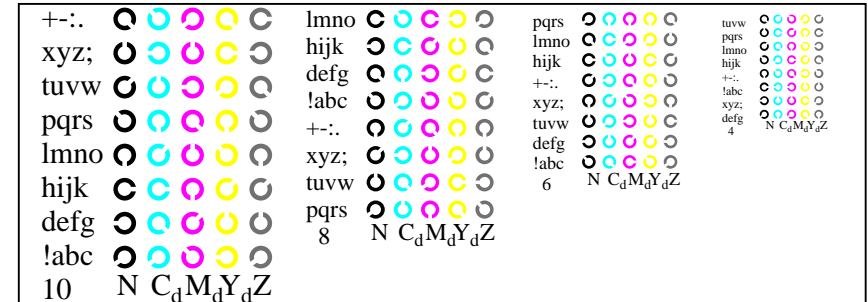
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb\*dd setrgbcolor*



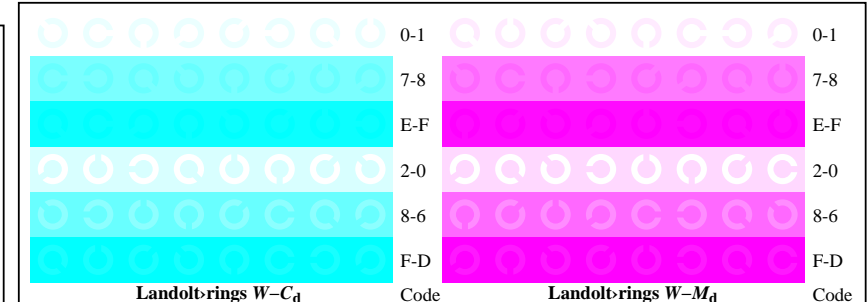
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb\*dd setrgbcolor*



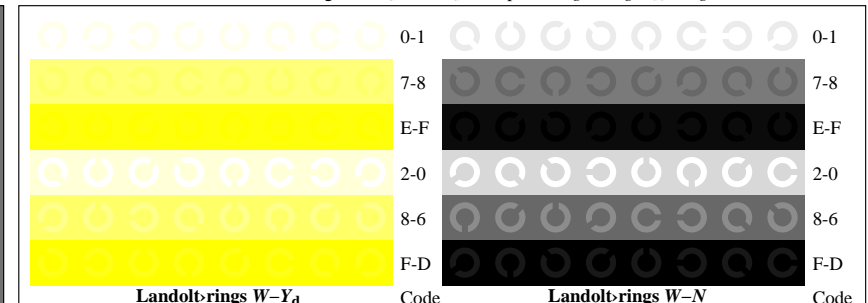
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0->rgb\*dd setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb\*dd setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb\*dd setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb\*dd setrgbcolor*

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

Test for the visual linearized output of pictures B1Wdd to B3Wdd

Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**

Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":

.....

.....

.....

.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**

	$W-C_d$	$W-M_d$	$W-Y_d$	$W-N$	$W-Z$
Is the resolution diameter < 6 mm?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Test with magnifying glass (6x), Resolution diameter:	..... mm	..... mm	..... mm	..... mm	..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**

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 B3Wdd**

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 AE280-3dd: 010161

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

PDF file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY6\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY6_1.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY6\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY6_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY6\_1.PDF**

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

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

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

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

**For device output with PS-file AE28F0NX\_CY6\_1.PS**

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

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

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

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

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

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.....

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

$W-C_d$  White – Cyanblue: Are all the 16 steps distinguishable? **Yes/No**

If No: How many steps can be distinguished? of the given 16 steps: **..... Steps**

$W-M_d$  White – Magentared: Are all the 16 steps distinguishable? **Yes/No**

If No: How many steps can be distinguished? of the given 16 steps: **..... Steps**

$W-Y_d$  White – Yellow: Are all the 16 steps distinguishable? **Yes/No**

If No: How many steps can be distinguished? of the given 16 steps: **..... Steps**

$W-N$  White – Black: 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$	Colour row $W-M_d$	Colour row $W-Y_d$	Colour row $W-N$
background – ring	background – ring	background – ring	background – ring
0 – 1	0 – 1	0 – 1	0 – 1
7 – 8	7 – 8	7 – 8	7 – 8
E – F	E – F	E – F	E – F
2 – 0	2 – 0	2 – 0	2 – 0
8 – 6	8 – 6	8 – 6	8 – 6
F – D	F – D	F – D	F – D

part 2 AE281-3Ndd: 010161

**Documentation of assessor colour vision properties for visual assessment**

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

**underline Yes/No**  
**underline Yes/unknown**  
**underline Yes/unknown**  
**underline Yes/unknown**

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

Office workplace illumination is daylight (clouded/north sky)

**underline Yes/No**

PDF file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY6\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY6_3.PDF)

**underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY6\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY6_3.PS)

**underline Yes/No**

Picture A7dd contrast range: (>F:0) (F: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 range**

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/AE28/AE28F0PX\\_CY6\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY6_3.PDF)

picture A7dd

**underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY6\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY6_3.PS)

picture A7dd

**or underline Yes/No**

**colour measurement and specification for:**

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

**underline Yes/No**

If No, please give other parameters: .....

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

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

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

**underline Yes/No**

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

part 3 AE280-7N\*dd:010161

part 4 AE281-7dd: 010161

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart *CMYK* output: *->rgb<sub>dd</sub> setrgbcolor*

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta



see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 9/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th4ta

i	LAB*ref	l*out	LAB*out	LAB*out-ref	ΔE*	Start output S1
1	10,99	0,00	0,00	0,00	0,00	0,01
2	16,62	0,00	0,02	13,11	0,00	3,50
3	22,24	0,00	0,06	16,44	0,00	5,80
4	27,87	0,00	0,11	20,45	0,00	7,42
5	33,50	0,00	0,16	24,98	0,00	8,52
6	39,13	0,00	0,22	29,94	0,00	9,19
7	44,75	0,00	0,28	35,27	0,00	9,48
8	50,38	0,00	0,35	40,93	0,00	9,45
9	56,01	0,00	0,42	46,89	0,00	9,11
10	61,64	0,00	0,49	53,13	0,00	8,50
11	67,27	0,00	0,57	59,62	0,00	7,64
12	72,89	0,00	0,65	66,35	0,00	6,54
13	78,52	0,00	0,73	73,31	0,00	5,21
14	84,15	0,00	0,82	80,48	0,00	3,67
15	89,78	0,00	0,91	87,84	0,00	1,93
16	95,41	0,00	1,00	95,41	0,00	0,01
17	10,99	0,00	0,00	10,99	0,00	0,01
18	32,09	0,00	0,15	23,80	0,00	8,29
19	53,20	0,00	0,38	43,88	0,00	9,32
20	74,30	0,00	0,67	68,07	0,00	6,22
21	95,41	0,00	1,00	95,41	0,00	0,01

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

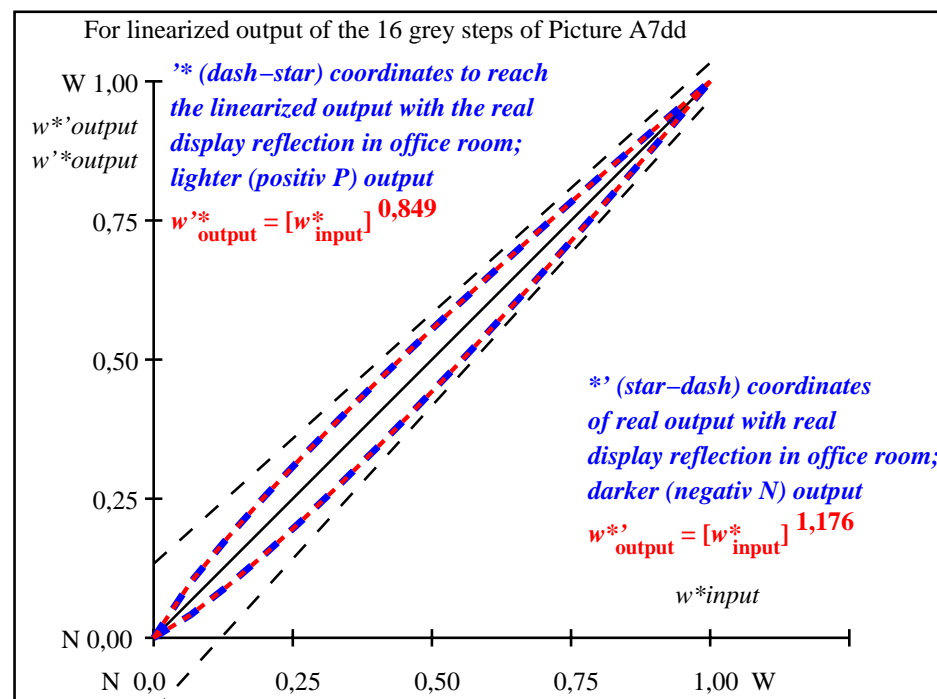
Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 6,0$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 4,7$

Mean colour reproduction index:  
 $R^*_{ab,m} = 73,7$

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010162



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 010162

$L^*/Y_{intended}$ (absolute)	11.0/1.3	16.6/2.2	22.2/3.6	27.9/5.4	33.5/7.8	39.1/10.7	44.8/14.4	50.4/18.7	56.0/23.9	61.6/30.0	67.3/37.0	72.9/45.0	78.5/54.1	84.2/64.4	89.8/75.8	95.4/88.6
0 0 0 n*																
setcmyk																
gN=1.18																
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
$w^*_{out}$	0,0	0,042	0,093	0,151	0,211	0,274	0,34	0,408	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,0

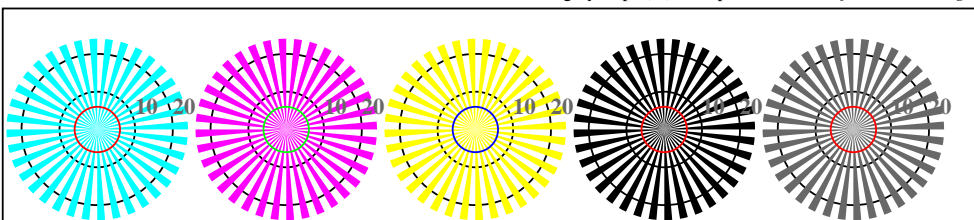
AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 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



AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage

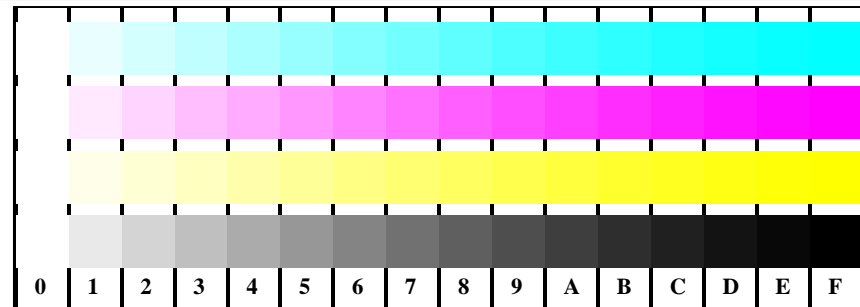
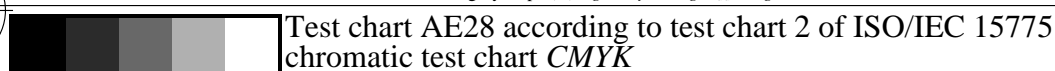


radial gratings W-C<sub>d</sub> radial gratings W-M<sub>d</sub> radial gratings W-Y<sub>d</sub> radial gratings W-N radial gratings W-Z

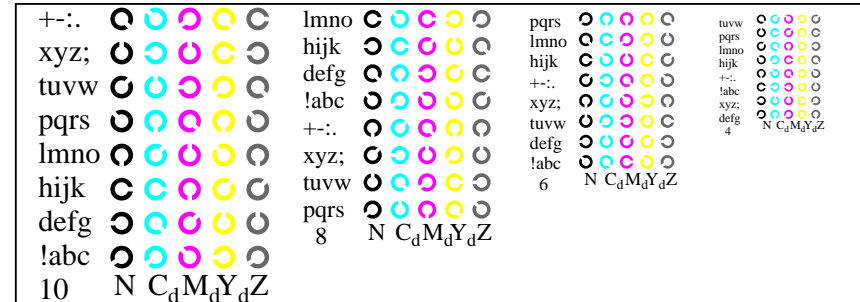
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb->rgb\*<sub>dd</sub> setrgbcolor*



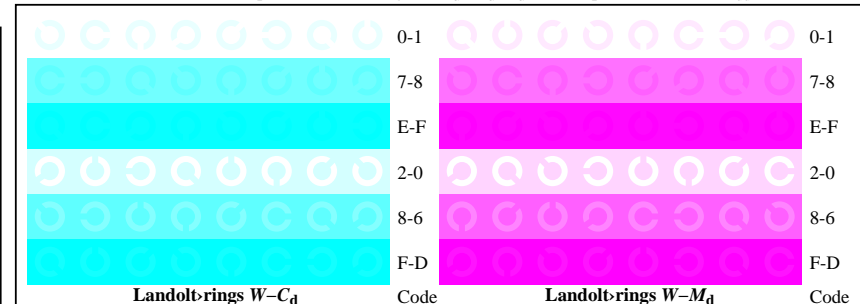
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb\*<sub>dd</sub> setrgbcolor*



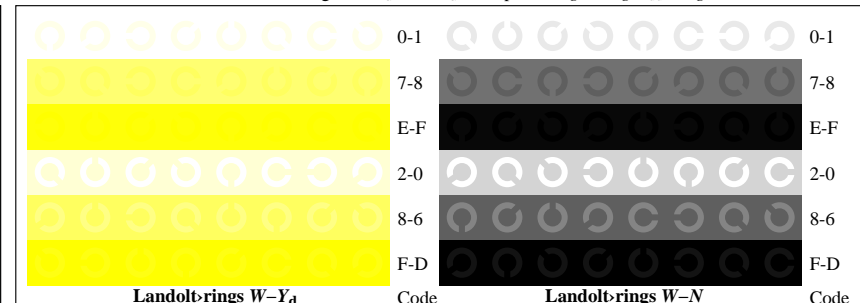
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0->rgb\*<sub>dd</sub> setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb->rgb\*<sub>dd</sub> setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb->rgb\*<sub>dd</sub> setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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*



Test for the visual linearized output of pictures B1Wdd to B3Wdd  
Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**  
Is the resolution diameter < 6 mm? **Yes/No**  
Test with magnifying glass (6x),  
Resolution diameter: ..... mm ..... mm ..... mm ..... mm ..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**  
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 B3Wdd**  
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 AE280-3dd: 010241

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

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY5\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY5_1.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY5\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY5_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY5\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY5\_1.PS**

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

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

part 3 AE280-7N\*dd-010241

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart *CMYK* output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

$W-C_d$  White – Cyanblue: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-M_d$  White – Magentared: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-Y_d$  White – Yellow: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-N$  White – Black: 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$	Colour row $W-M_d$	Colour row $W-Y_d$	Colour row $W-N$
background – ring	background – ring	background – ring	background – ring
0 – 1	0 – 1	0 – 1	0 – 1
7 – 8	7 – 8	7 – 8	7 – 8
E – F	E – F	E – F	E – F
2 – 0	2 – 0	2 – 0	2 – 0
8 – 6	8 – 6	8 – 6	8 – 6
F – D	F – D	F – D	F – D

part 2 AE281-3Ndd: 010241

**Documentation of assessor colour vision properties for visual assessment**

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

**underline Yes/No**  
**underline Yes/unknown**  
**underline Yes/unknown**  
**underline Yes/unknown**

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

Office workplace illumination is daylight (clouded/north sky)

**underline Yes/No**

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY5\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY5_3.PDF)

**underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY5\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY5_3.PS)

**underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

*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/AE28/AE28F0PX\\_CY5\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY5_3.PDF)

**picture A7dd**

**underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY5\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY5_3.PS)

**picture A7dd**

**or underline Yes/No**

**colour measurement and specification for:**

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

**underline Yes/No**

If No, please give other parameters: .....

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

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

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

**underline Yes/No**

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

part 4 AE281-7dd: 010241

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> /PS; 3D-linearization, page 12/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> /PS in file (F)

i	LAB*ref	l*out	LAB*out	LAB*out-ref	ΔE*	Start output S1
1	18,00	0,00	0,00	0,00	0,00	0,01
2	23,16	0,00	0,00	0,01	19,20	0,00
3	28,32	0,00	0,00	0,04	21,48	0,00
4	33,48	0,00	0,00	0,08	24,50	0,00
5	38,64	0,00	0,00	0,13	28,11	0,00
6	43,80	0,00	0,00	0,18	32,26	0,00
7	48,96	0,00	0,00	0,24	36,88	0,00
8	54,12	0,00	0,00	0,30	41,94	0,00
9	59,28	0,00	0,00	0,37	47,40	0,00
10	64,44	0,00	0,00	0,45	53,25	0,00
11	69,60	0,00	0,00	0,53	59,46	0,00
12	74,76	0,00	0,00	0,62	66,01	0,00
13	79,92	0,00	0,00	0,70	72,90	0,00
14	85,08	0,00	0,00	0,80	80,10	0,00
15	90,24	0,00	0,00	0,89	87,60	0,00
16	95,41	0,00	0,00	1,00	95,41	0,00
17	18,00	0,00	0,00	0,00	18,00	0,00
18	37,35	0,00	0,00	0,11	27,16	0,00
19	56,70	0,00	0,00	0,34	44,62	0,00
20	76,05	0,00	0,00	0,64	67,70	0,00
21	95,41	0,00	0,00	1,00	95,41	0,00

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

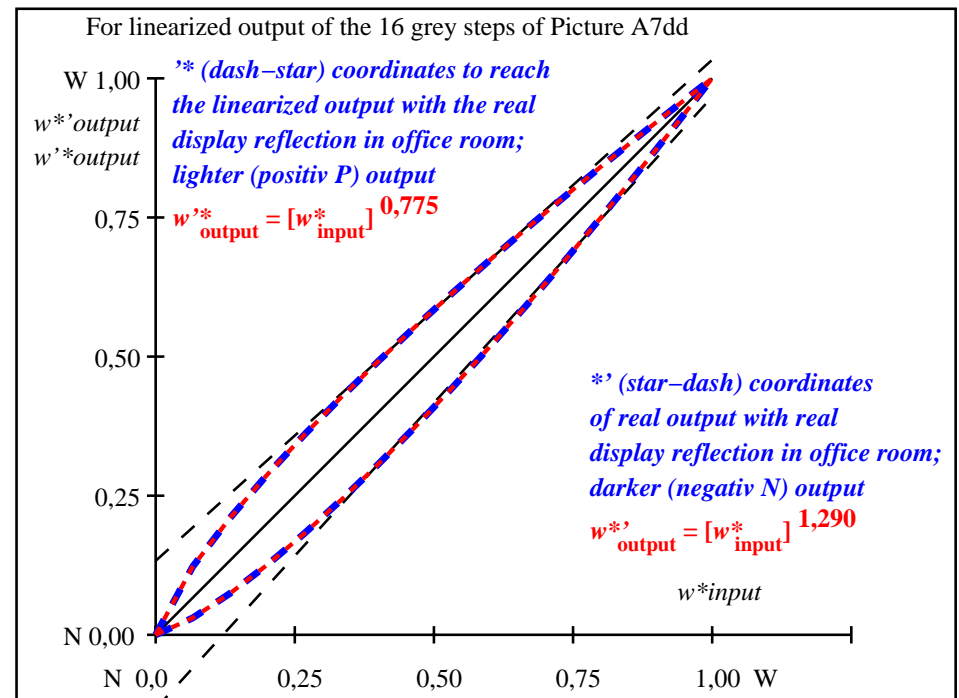
Mean lightness difference (16 steps)  
 $\Delta E^*_{CIE\text{LAB}} = 7,6$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010242



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 010242

$L^*/Y_{\text{intended}}$ (absolute)	18.0/2.5	23.2/3.8	28.3/5.6	33.5/7.8	38.6/10.5	43.8/13.7	49.0/17.6	54.1/22.1	59.3/27.3	64.4/33.4	69.6/40.2	74.8/47.9	79.9/56.6	85.1/66.2	90.2/76.8	95.4/88.6
0 0 0 n*																
setcmyk																
$g_N=1.29$																
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
$w^*=l^*_{CIE\text{LAB},r}$ (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
$w^*_{\text{out}}$	0,0	0,031	0,074	0,125	0,182	0,242	0,307	0,374	0,444	0,517	0,593	0,67	0,75	0,832	0,914	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:2,5$ ;  $Y_N$ -range 1,87 to <3,75

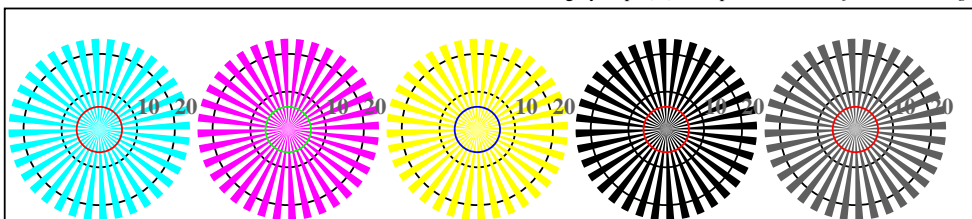
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{dd}$  setrgbcolor

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=rh4ta

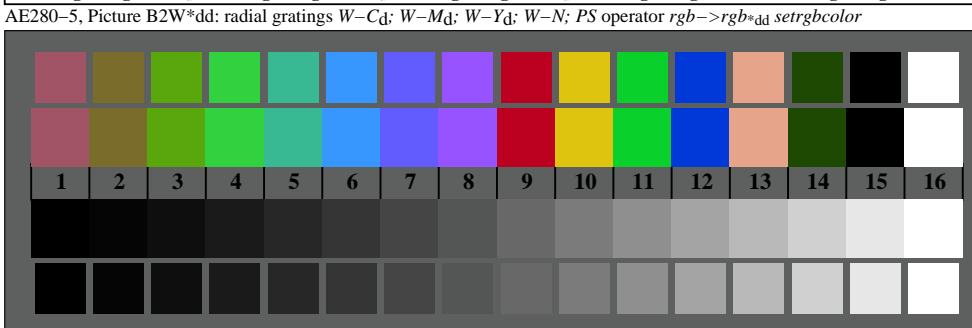




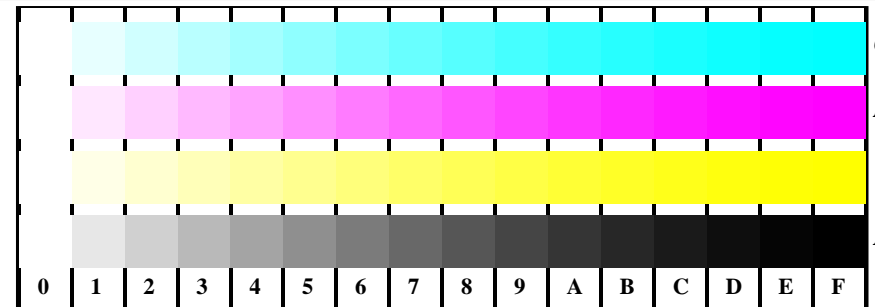
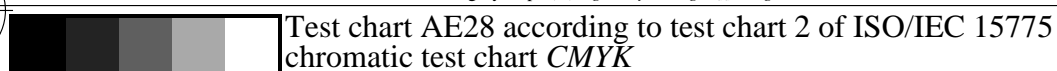
AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage



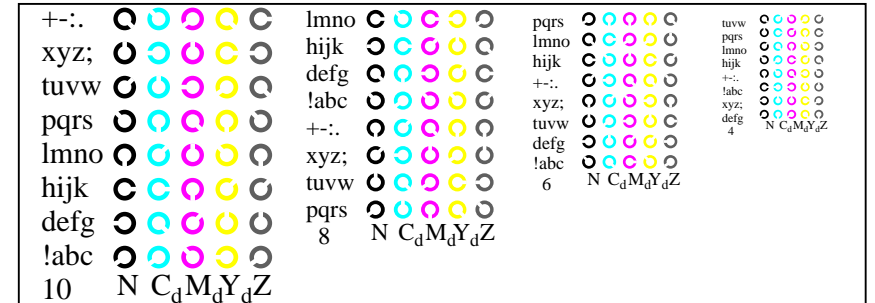
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



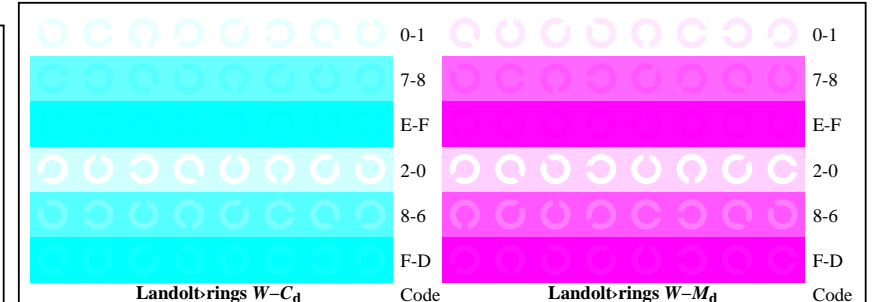
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



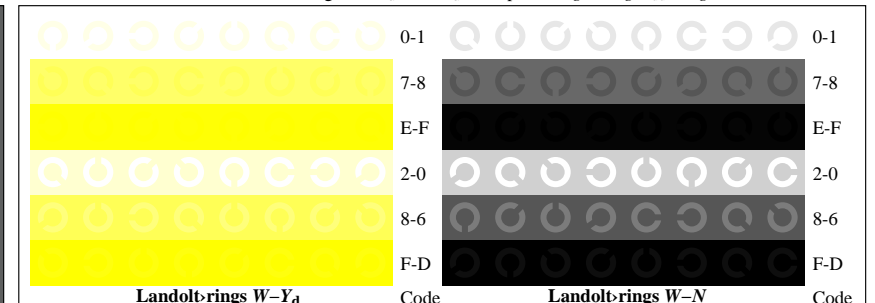
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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*

Test for the visual linearized output of pictures B1Wdd to B3Wdd

Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**

	$W-C_d$	$W-M_d$	$W-Y_d$	$W-N$	$W-Z$
Is the resolution diameter < 6 mm?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Test with magnifying glass (6x), Resolution diameter:	..... mm	..... mm	..... mm	..... mm	..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**

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 B3Wdd**

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 AE280-3dd: 010321

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

PDF file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY4\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY4_1.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY4\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY4_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY4\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY4\_1.PS**

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

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

part 3 AE280-7N\*dd-010321

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input:  $rgb/cmy0/000n/w$  set...  
chromatic test chart CMYK output:  $->rgb_{dd}$  setrgbcolor

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

Row	Are all the 16 steps distinguishable?	Yes/No
$W-C_d$ White - Cyanblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-M_d$ White - Magentared:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-Y_d$ White - Yellow:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$	Colour row $W-M_d$	Colour row $W-Y_d$	Colour row $W-N$
background - ring	background - ring	background - ring	background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

part 2 AE281-3Ndd: 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/AE28/AE28F0PX\\_CY4\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY4_3.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY4\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY4_3.PS) **underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

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/AE28/AE28F0PX\\_CY4\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY4_3.PDF)

picture A7dd **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY4\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY4_3.PS)

picture A7dd **or underline Yes/No**

**colour measurement and specification for:**

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry: **underline Yes/No**

If No, please give other parameters: .....

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

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

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF **underline Yes/No**

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

part 4 AE281-7dd: 010321

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 15/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

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

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

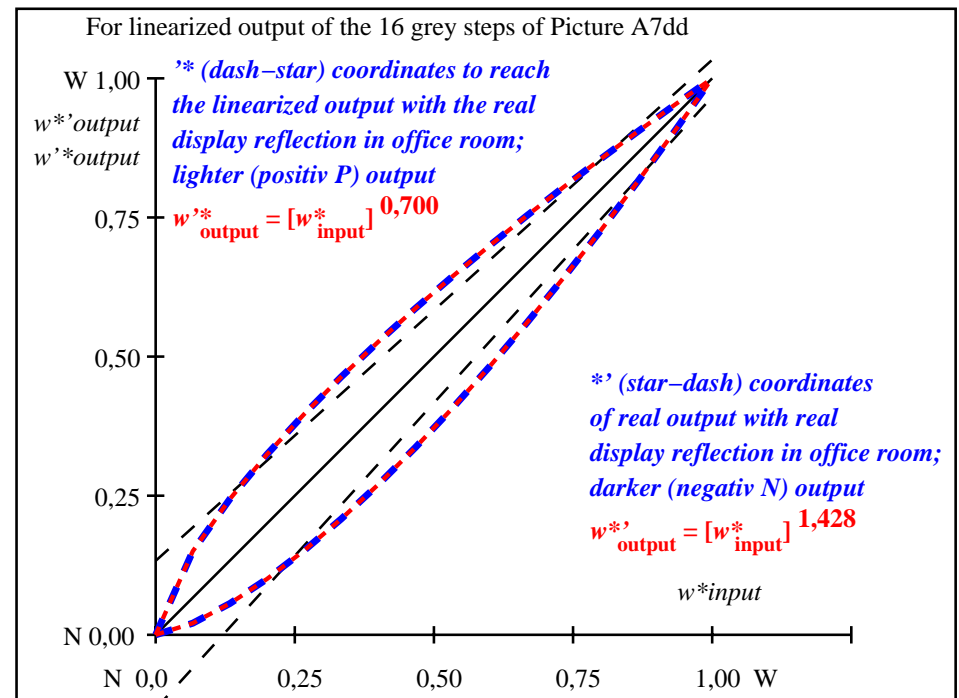
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 8,4$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010322



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 010322

$L^*/Y_{\text{intended}}$ (absolute)	26.8/5.0	31.4/6.8	36.0/9.0	40.6/11.6	45.1/14.6	49.7/18.2	54.3/22.2	58.8/26.9	63.4/32.1	68.0/38.0	72.6/44.5	77.1/51.7	81.7/59.7	86.3/68.5	90.8/78.1	95.4/88.6
0 0 0 n*																
setcmyk																
gN=1.43																
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
$w^*_{\text{out}}$	0,0	0,021	0,056	0,1	0,152	0,208	0,27	0,337	0,407	0,482	0,561	0,642	0,727	0,816	0,906	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$ -range 3,75 to <7,5

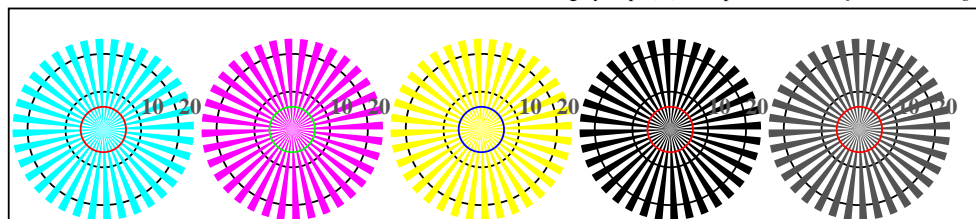
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{\text{dd}}$  setrgbcolor

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th4ta



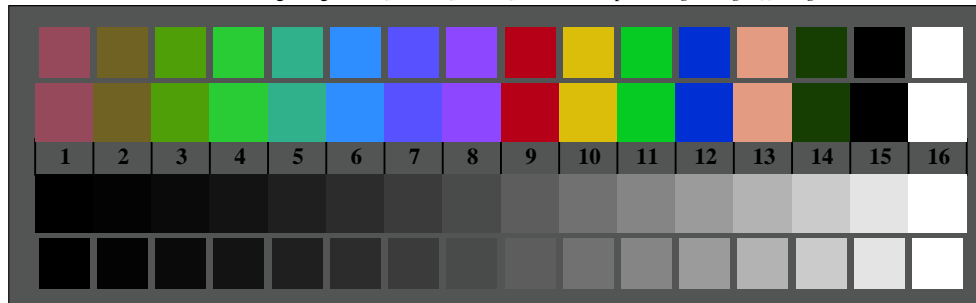


AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage

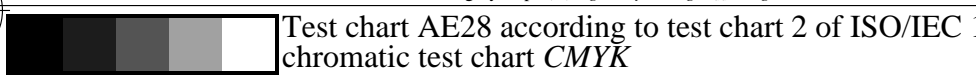


radial gratings W-C<sub>d</sub> radial gratings W-M<sub>d</sub> radial gratings W-Y<sub>d</sub> radial gratings W-N radial gratings W-Z

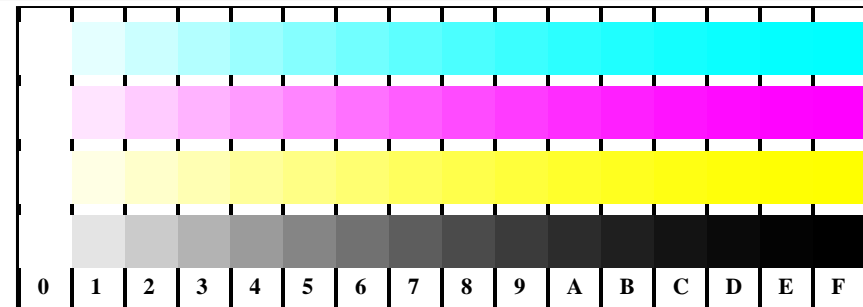
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb->rgb\*dd setrgbcolor*



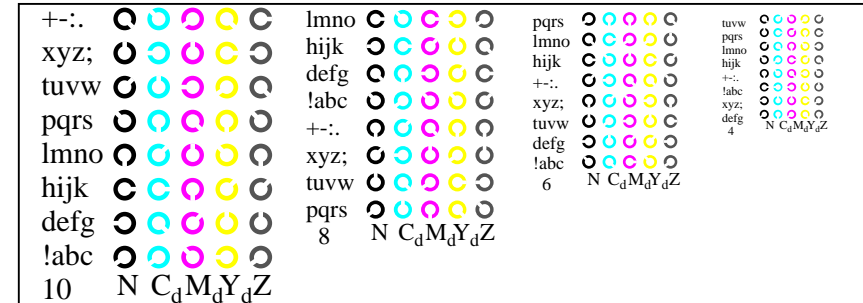
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0->rgb\*dd setrgbcolor*



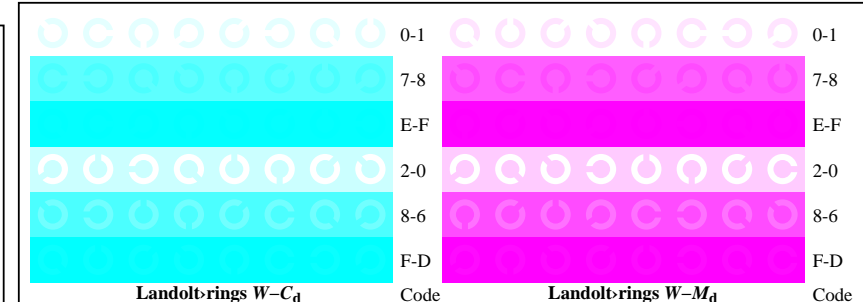
Test chart AE28 according to test chart 2 of ISO/IEC 15775  
chromatic test chart CMYK



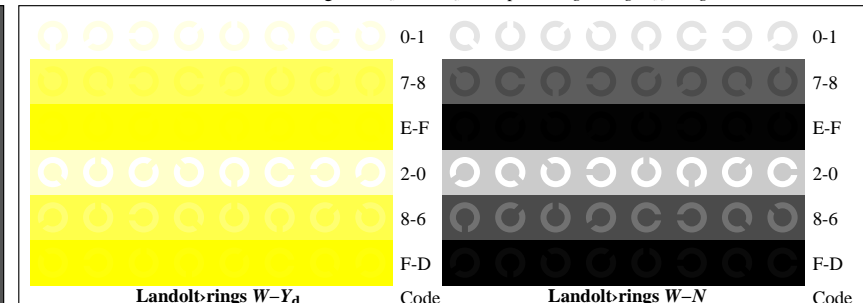
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0->rgb\*dd setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb->rgb\*dd setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb->rgb\*dd setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<sub>d</sub>; W-N; PS operator *rgb->rgb\*dd setrgbcolor*

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

Test for the visual linearized output of pictures B1Wdd to B3Wdd

Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**

	$W-C_d$	$W-M_d$	$W-Y_d$	$W-N$	$W-Z$
Is the resolution diameter < 6 mm?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Test with magnifying glass (6x), Resolution diameter:	..... mm	..... mm	..... mm	..... mm	..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**

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 B3Wdd**

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 AE280-3dd: 010401

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

PDF file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY3\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY3_1.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY3\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY3_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY3\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY3\_1.PS**

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

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

part 3 AE280-7N\*dd-010401

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input: *rgb/cmy0/000n/w set...*  
chromatic test chart *CMYK* output: *->rgb<sub>dd</sub> setrgbcolor*

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

Colour row	Are all the 16 steps distinguishable?	Yes/No
$W-C_d$ White - Cyanblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-M_d$ White - Magentared:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-Y_d$ White - Yellow:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$ background - ring	Colour row $W-M_d$ background - ring	Colour row $W-Y_d$ 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 AE281-3Ndd: 010401

**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/AE28/AE28F0PX\\_CY3\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY3_3.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY3\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY3_3.PS) **underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

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/AE28/AE28F0PX\\_CY3\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY3_3.PDF)

picture A7dd **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY3\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY3_3.PS)

picture A7dd **or underline Yes/No**

**colour measurement and specification for:**

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry: **underline Yes/No**

If No, please give other parameters: .....

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

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF **underline Yes/No**

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

part 4 AE281-7dd: 010401

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 18/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

i	LAB*ref	l*out	LAB*out	LAB*out-ref	ΔE*	Start output S1
1	37,98	0,00	0,00	37,98	0,00	0,00
2	41,81	0,00	0,00	38,32	0,00	0,00
3	45,64	0,00	0,02	39,23	0,00	0,00
4	49,47	0,00	0,04	40,68	0,00	0,00
5	53,29	0,00	0,08	42,64	0,00	0,00
6	57,12	0,00	0,12	45,10	0,00	0,00
7	60,95	0,00	0,17	48,05	0,00	0,00
8	64,78	0,00	0,23	51,48	0,00	0,00
9	68,61	0,00	0,30	55,37	0,00	0,00
10	72,44	0,00	0,37	59,74	0,00	0,00
11	76,26	0,00	0,46	64,56	0,00	0,00
12	80,09	0,00	0,55	69,83	0,00	0,00
13	83,92	0,00	0,65	75,56	0,00	0,00
14	87,75	0,00	0,76	81,73	0,00	0,00
15	91,58	0,00	0,87	88,35	0,00	0,00
16	95,41	0,00	1,00	95,41	0,00	0,00
17	37,98	0,00	0,00	37,98	0,00	0,00
18	52,34	0,00	0,07	42,10	0,00	0,00
19	66,69	0,00	0,26	53,37	0,00	0,00
20	81,05	0,00	0,57	71,22	0,00	0,00
21	95,41	0,00	1,00	95,41	0,00	0,00

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

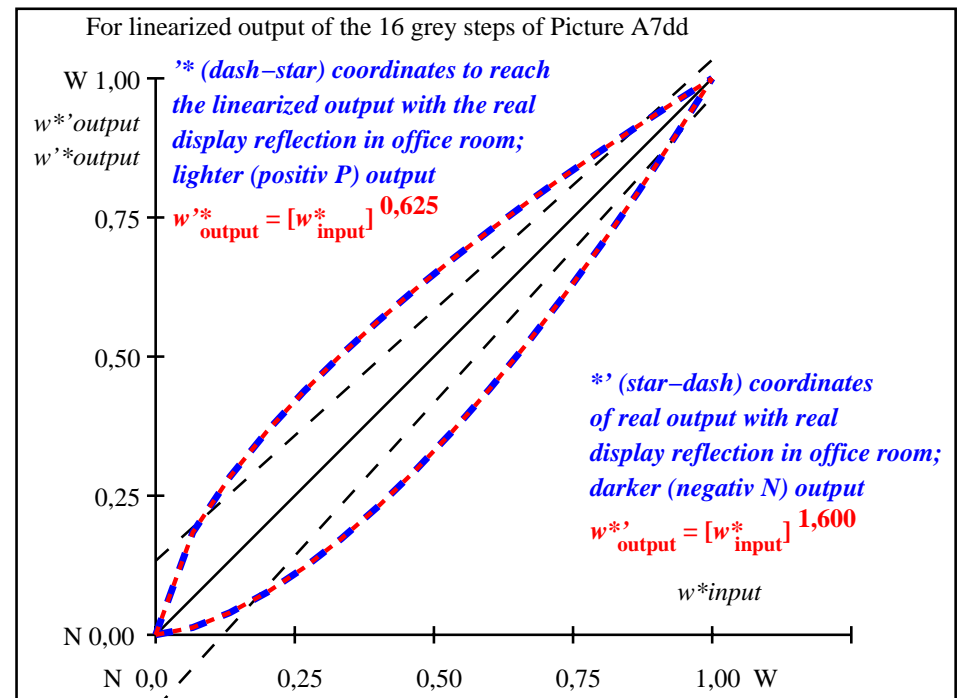
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 8,3$

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

Mean colour reproduction index:  
 $R^*_{\text{ab,m}} = 63,5$

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010402



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 010402

$L^*/Y_{\text{intended}}$ (absolute)	38.0/10.1	41.8/12.4	45.6/15.0	49.5/18.0	53.3/21.3	57.1/25.1	61.0/29.2	64.8/33.8	68.6/38.8	72.4/44.3	76.3/50.3	80.1/56.9	83.9/63.9	87.8/71.6	91.6/79.8	95.4/88.6
0 0 0 n*																
setcmyk																
gN=1.6																
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
$w^*_{\text{out}}$	0,0	0,013	0,04	0,076	0,121	0,172	0,231	0,296	0,365	0,442	0,523	0,608	0,7	0,796	0,895	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:10$ ;  $Y_N$ -range 7,5 to <15

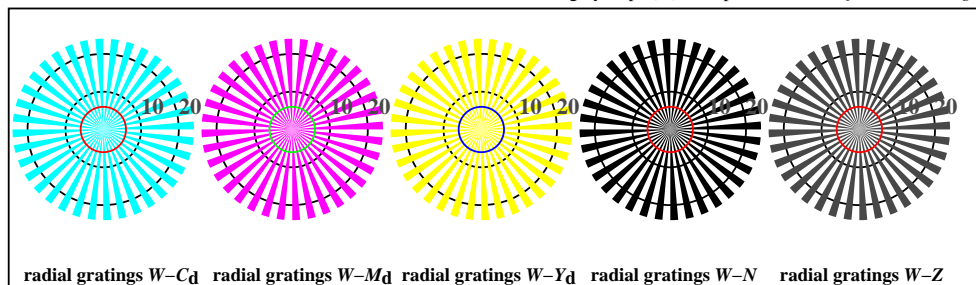
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{\text{dd}}$  setrgbcolor

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=rh4ta

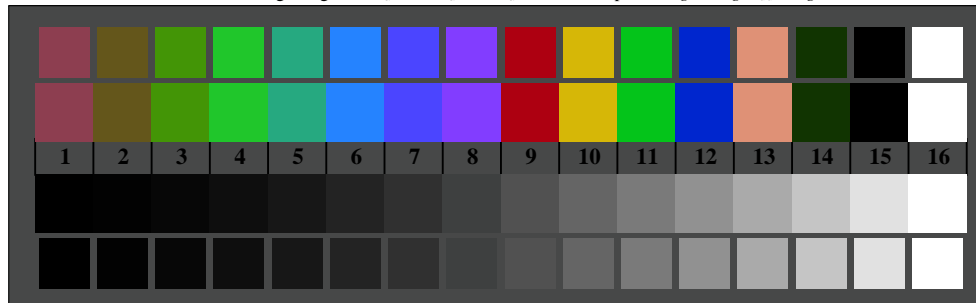




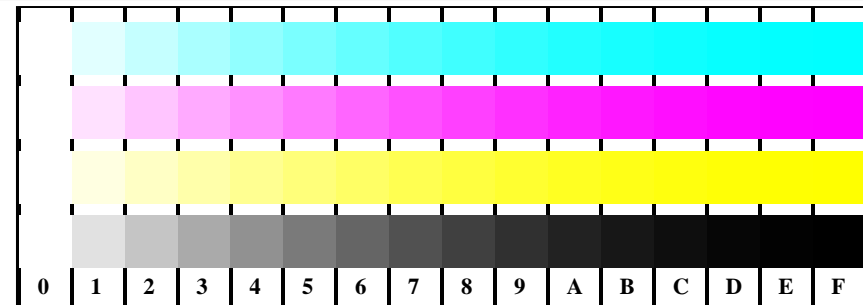
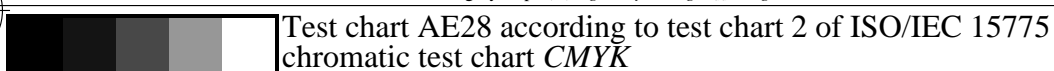
AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage



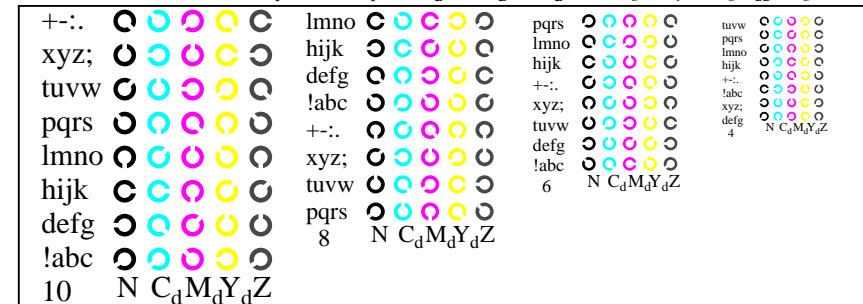
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



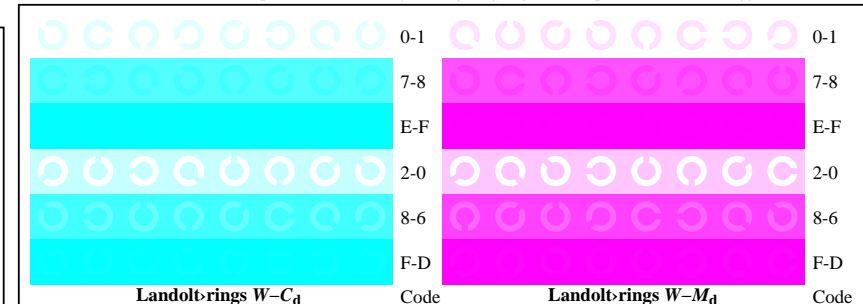
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



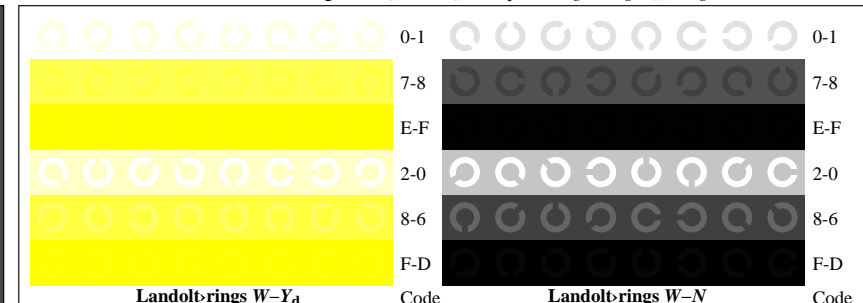
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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*

Test for the visual linearized output of pictures B1Wdd to B3Wdd  
Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**  
Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**  
Is the resolution diameter < 6 mm? **Yes/No**  
Test with magnifying glass (6x),  
Resolution diameter: ..... mm ..... mm ..... mm ..... mm ..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**  
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 B3Wdd**  
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 AE280-3dd: 010481

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

**PDF file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY2\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY2_1.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY2\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY2_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY2\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY2\_1.PS**

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

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

part 3 AE280-7N\*dd-010481

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input:  $rgb/cmy0/000n/w$  set...  
chromatic test chart  $CMYK$  output:  $->rgb_{dd}$  set $rgbcolor$

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

$W-C_d$  White – Cyanblue: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-M_d$  White – Magentared: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-Y_d$  White – Yellow: Are all the 16 steps distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps ..... Steps

$W-N$  White – Black: 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 B5Wdd**  
Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**  
Is the recognition frequency of the Landolt-rings > 50% (min. 5 of 8 at least)?

Colour row $W-C_d$ background – ring	Colour row $W-M_d$ background – ring	Colour row $W-Y_d$ 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 AE281-3Ndd: 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/AE28/AE28F0PX\\_CY2\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY2_3.PDF) **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY2\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY2_3.PS) **underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

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/AE28/AE28F0PX\\_CY2\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY2_3.PDF)

**picture A7dd** **underline Yes/No**

**PS file:** [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY2\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY2_3.PS)

**picture A7dd** **or underline Yes/No**

**colour measurement and specification for:**

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry: **underline Yes/No**

If No, please give other parameters: .....

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

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

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF **underline Yes/No**

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

part 4 AE281-7dd: 010481

TUB Registration: 20191001-AE28/AE28L0FA.TXT /PS  
application for measurement or viewing of the output on display and print

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 21/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

i	LAB*ref	l*out	LAB*out	LAB*out-ref	ΔE*	Start output S1
1	52,01	0,00	0,00	0,00	0,00	0,01
2	54,91	0,00	0,00	0,00	0,00	2,73
3	57,80	0,00	0,01	0,00	0,00	5,12
4	60,69	0,00	0,03	0,00	0,00	7,15
5	63,58	0,00	0,06	0,00	0,00	8,79
6	66,48	0,00	0,10	0,00	0,00	10,04
7	69,37	0,00	0,14	0,00	0,00	10,90
8	72,26	0,00	0,20	0,00	0,00	11,35
9	75,16	0,00	0,27	0,00	0,00	11,40
10	78,05	0,00	0,34	0,00	0,00	11,03
11	80,94	0,00	0,43	0,00	0,00	10,25
12	83,83	0,00	0,52	0,00	0,00	9,05
13	86,73	0,00	0,62	0,00	0,00	7,43
14	89,62	0,00	0,74	0,00	0,00	5,38
15	92,51	0,00	0,86	0,00	0,00	2,90
16	95,41	0,00	1,00	0,00	0,00	0,01
17	52,01	0,00	0,00	0,00	0,00	0,01
18	62,86	0,00	0,05	0,00	0,00	8,42
19	73,71	0,00	0,23	0,00	0,00	11,43
20	84,56	0,00	0,54	0,00	0,00	8,69
21	95,41	0,00	1,00	0,00	0,00	0,01

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

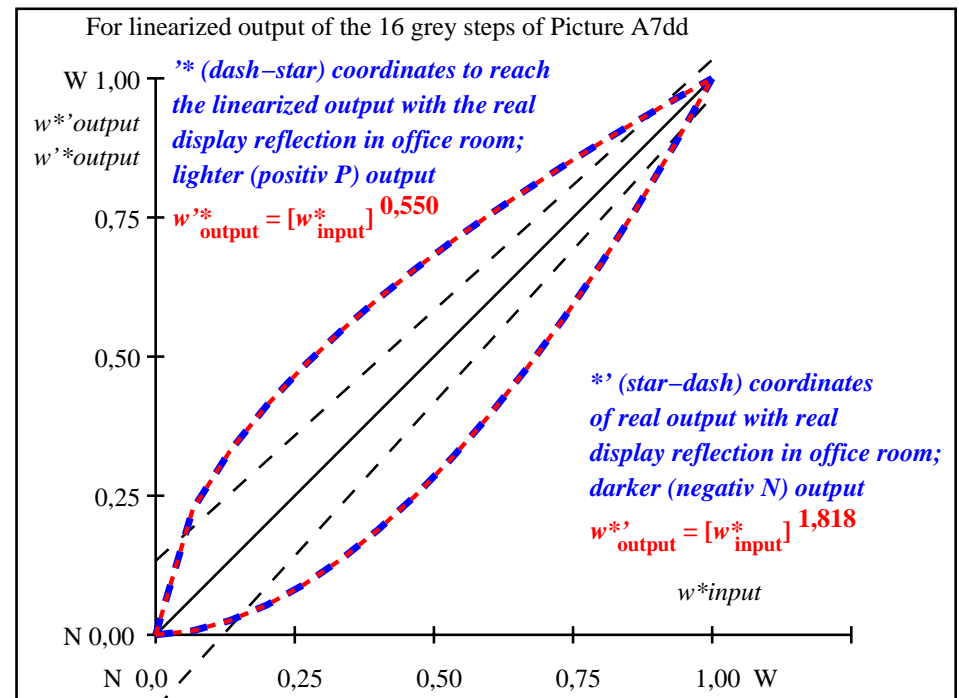
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 7,1$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010482



$L^*/Y_{\text{intended}}$ (absolute)	52.0/20.2	54.9/22.8	57.8/25.8	60.7/28.9	63.6/32.3	66.5/36.0	69.4/39.9	72.3/44.1	75.2/48.5	78.1/53.3	80.9/58.4	83.8/63.8	86.7/69.5	89.6/75.5	92.5/81.9	95.4/88.6
0 0 0 n*																
setcmyk																
$g_N=1.82$																
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
$w^*_{\text{out}}$	0,0	0,007	0,026	0,054	0,091	0,135	0,189	0,25	0,319	0,395	0,479	0,569	0,666	0,771	0,882	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 of ISO/IEC 15775  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$ -range 15 to <30

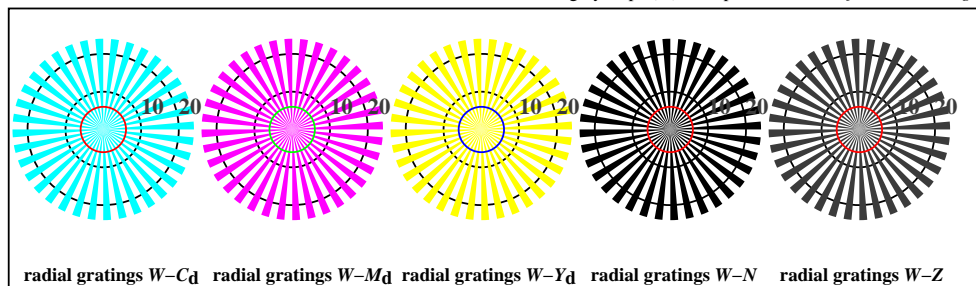
input:  $rgb/cmy0/000n/w$  set...  
output:  $->rgb_{\text{dd}}$  setrgbcolor

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=th4ta

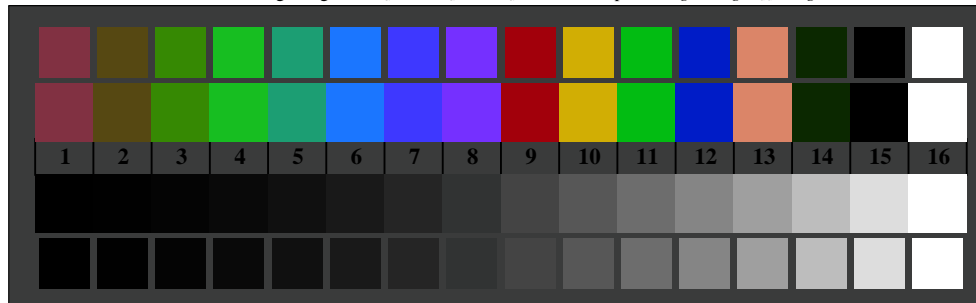




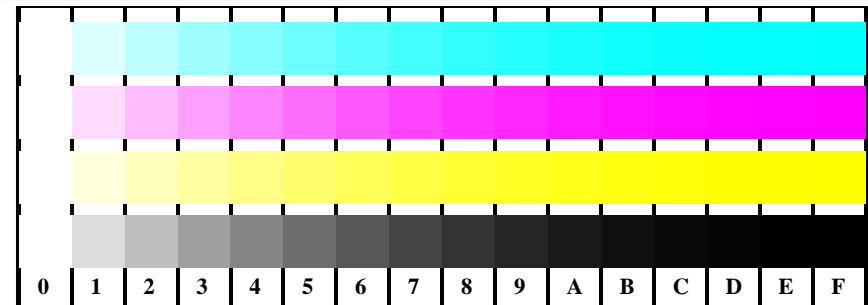
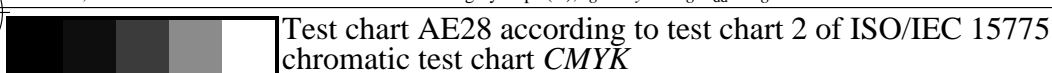
AE280-3, Picture B1W\*dd: Flower motif, 14 CIE-test colours and 2 + 16 grey steps (nf); PS operators *settransfer*, 3 colorimage



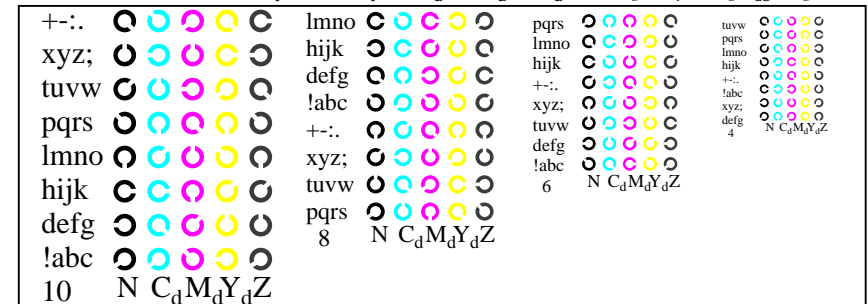
AE280-5, Picture B2W\*dd: radial gratings W-C<sub>d</sub>; W-M<sub>d</sub>; W-Y<sub>d</sub>; W-N; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



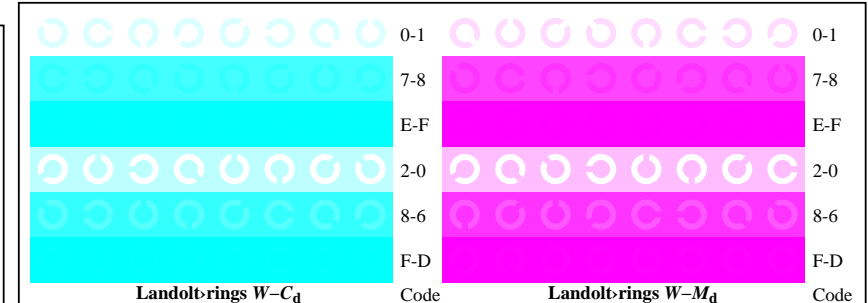
AE280-7, Picture B3W\*dd: 14 CIE-test colours and 2 + 16 grey steps (sf); *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



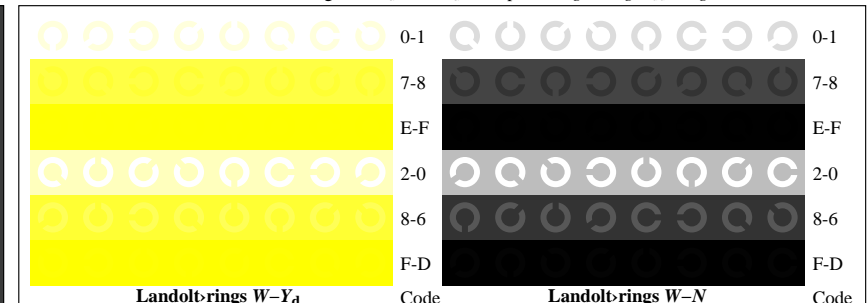
AE281-1, Picture B4W\*dd: 16 equidistant steps W-C<sub>d</sub>; W-M<sub>d</sub>; W-J<sub>d</sub>; W-N; *rgb/cmy0*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-3, Picture B5W\*dd: Sript and Landolt-rings N; C<sub>d</sub>; M<sub>d</sub>; Y<sub>d</sub>; Z; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-5, Picture B6W\*dd: Landolt-rings W-C<sub>d</sub>; W-M<sub>d</sub>; PS operator *rgb*->*rgb*\*<sub>dd</sub> *setrgbcolor*



AE281-7, Picture B7W\*dd: Landolt-rings W-Y<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*

Test for the visual linearized output of pictures B1Wdd to B3Wdd

Output test with the computer display ( ) or the external display ( ) please mark by (x)!

**Test of the (flower) image according to picture B1Wdd**

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
Subjective remarks about the colour reproduction of the (flower) image, the CIE-test colours and the 16 grey steps within the image, for example "less contrast":  
.....  
.....  
.....

**Test of the resolution of radial gratings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$  according to picture B2Wdd**

	$W-C_d$	$W-M_d$	$W-Y_d$	$W-N$	$W-Z$
Is the resolution diameter < 6 mm?	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Test with magnifying glass (6x), Resolution diameter:	..... mm	..... mm	..... mm	..... mm	..... mm

**Test of the 14 CIE-test colours according to picture B3Wdd**

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 B3Wdd**

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 AE280-3dd: 010561

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

PDF file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY1\\_1.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY1_1.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0NX\\_CY1\\_1.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0NX_CY1_1.PS) **or underline Yes/No**

**Used computer operating system:**

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

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

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

**Device output with PDF/PS-file:** **underline PDF/PS-file**

**For device output with PDF-file AE28F0NX\_CY1\_1.PDF**

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

**For device output with PS-file AE28F0NX\_CY1\_1.PS**

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

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

part 3 AE280-7N\*dd: 010561

Form A: Test chart AE28 according to test chart 2 of ISO/IEC 15775 input:  $rgb/cmy0/000n/w$  set...  
chromatic test chart CMYK output:  $->rgb_{dd}$  setrgbcolor

Test of 16 visually equally spaced steps of the colour rows  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to picture B4Wdd

Row	Are all the 16 steps distinguishable?	Yes/No
$W-C_d$ White - Cyanblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-M_d$ White - Magentared:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-Y_d$ White - Yellow:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ 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 B5Wdd**

Is the recognition frequency > 50% for letters (17 from 32 at least) and for Landolt-rings (minimum 5 of 8)?

Relative size	Letters	Ring $N$	Ring $C_d$	Ring $M_d$	Ring $Y_d$
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 recognition frequency of Landolt-rings  $W-C_d$ ,  $W-M_d$ ,  $W-Y_d$ , and  $W-N$  according to pictures B6Wdd, and B7Wdd**

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

Colour row $W-C_d$	Colour row $W-M_d$	Colour row $W-Y_d$	Colour row $W-N$
background - ring	background - ring	background - ring	background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

part 2 AE281-3Ndd: 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/AE28/AE28F0PX\\_CY1\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY1_3.PDF) **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY1\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY1_3.PS) **underline Yes/No**

**Picture A7dd contrast range:** (>F:0) (F: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 range**

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/AE28/AE28F0PX\\_CY1\\_3.PDF](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY1_3.PDF)

picture A7dd **underline Yes/No**

PS file: [http://farbe.li.tu-berlin.de/AE28/AE28F0PX\\_CY1\\_3.PS](http://farbe.li.tu-berlin.de/AE28/AE28F0PX_CY1_3.PS)

picture A7dd **or underline Yes/No**

**colour measurement and specification for:**

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry: **underline Yes/No**

If No, please give other parameters: .....

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

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF **underline Yes/No**

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

part 4 AE281-7dd: 010561

see similar files: <http://farbe.li.tu-berlin.de/AE28/AE28F0NX.PDF> / .PS; 3D-linearization, page 24/24  
technical information: <http://farbe.li.tu-berlin.de/AE28/AE28LF0NX.PDF> / .PS in file (F)

TUB Registration: 20191001-AE28/AE28L0FA.TXT /.PS  
application for measurement or viewing of the output on display and print  
TUB material: code=rh4ta

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

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

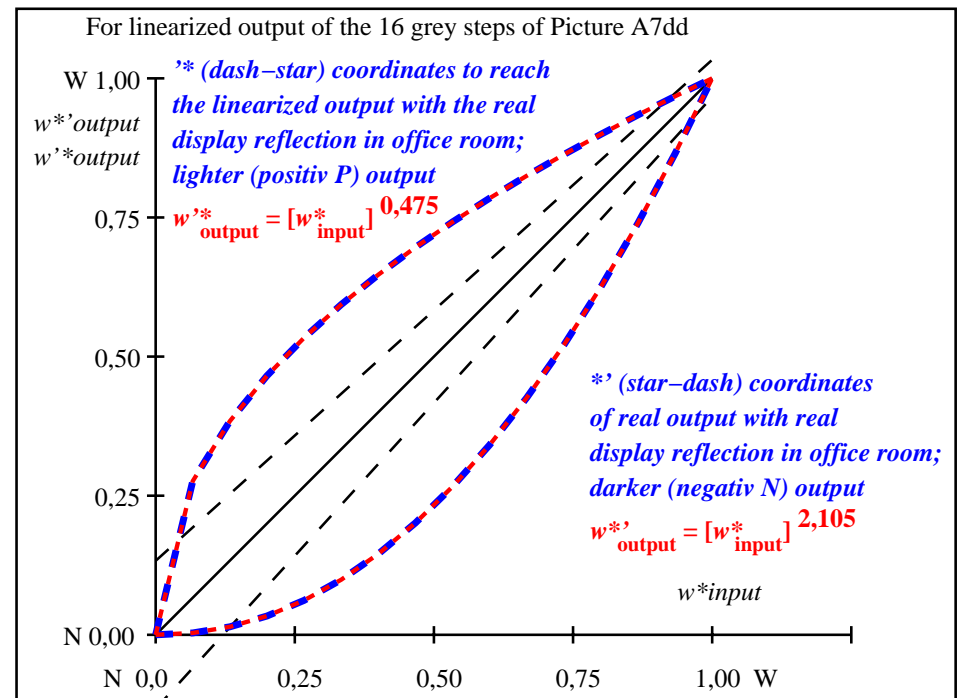
Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 4,6$

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

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

part 1; Measure: unknown; Device: unknown; Date: unknown

AE280-3dd: 010562



part 2; Measure: unknown; Device: unknown; Date: unknown

AE281-3dd: 010562

$L^*/Y_{\text{intended}}$ (absolute)	69.7/40.3	71.4/42.8	73.1/45.4	74.8/48.0	76.6/50.8	78.3/53.7	80.0/56.6	81.7/59.7	83.4/62.9	85.1/66.3	86.8/69.7	88.6/73.2	90.3/76.9	92.0/80.7	93.7/84.6	95.4/88.6
0 0 0 n*																
setcmyk																
gN=2.11																
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
$w^*_{\text{out}}$	0,0	0,003	0,014	0,034	0,062	0,099	0,145	0,201	0,266	0,341	0,426	0,52	0,625	0,74	0,864	1,0

AE280-7N, Picture A7\*dd: 16 visual equidistant  $L^*$ -grey steps; PS operator: 0 0 0 n\* setcmykcolor

In-out: Test chart AE28 according to test chart 2 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