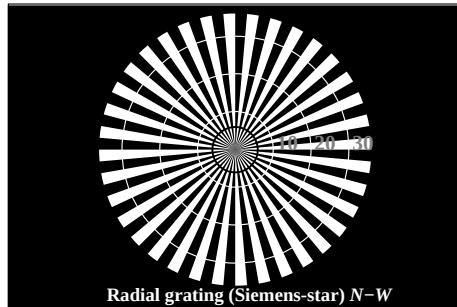
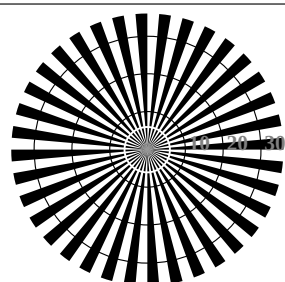


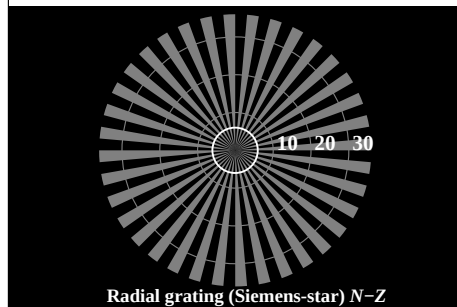
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



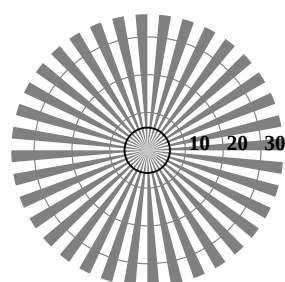
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

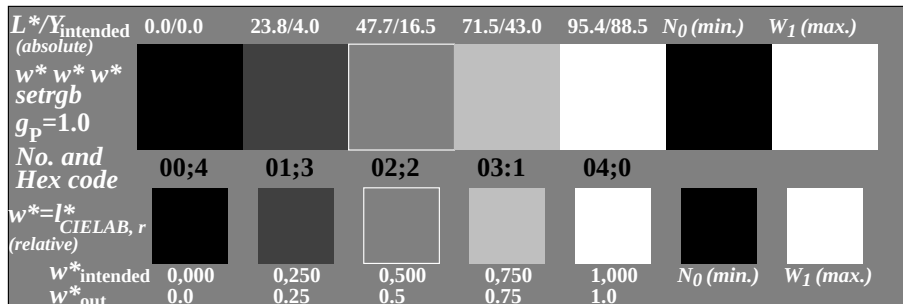


Radial grating (Siemens-star) N-Z

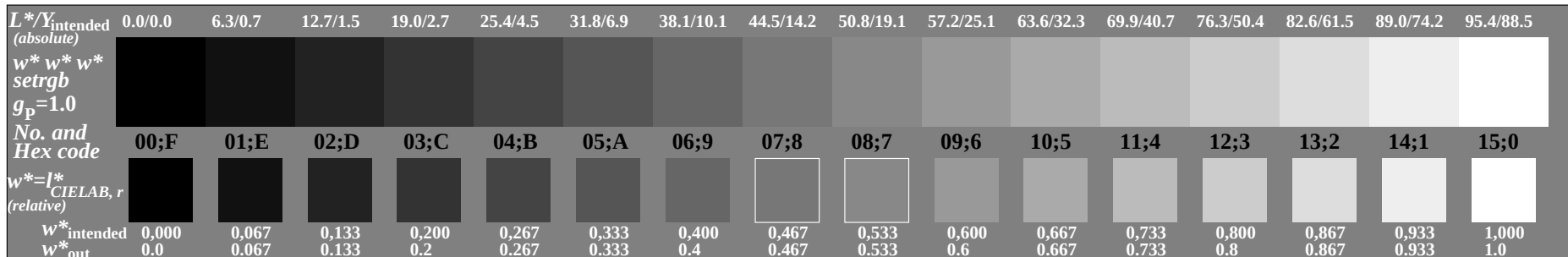


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-130-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

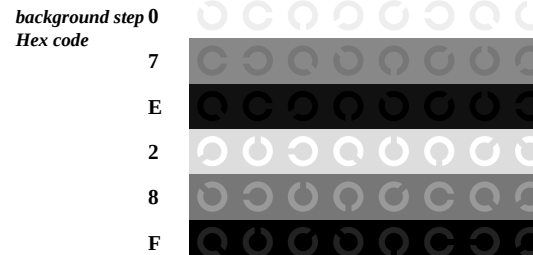


OE510-5N, Picture A2-130-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

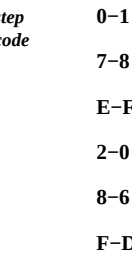


OE510-7N, Picture A3-130-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:0,31$ ;  $Y_N$  range 0,0 to <0,46

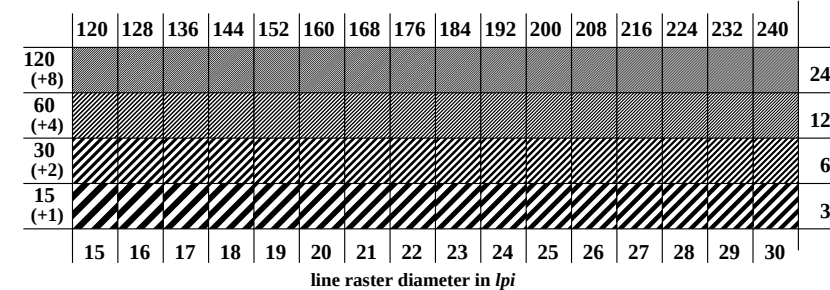


Landolt-rings W-N



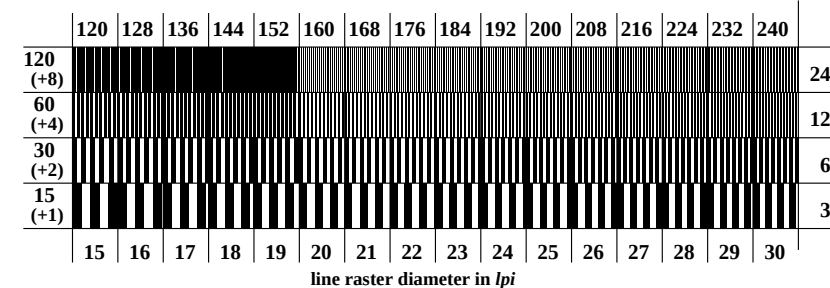
code: background-ring

OE511-1N, Picture A4-130-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-3N, Picture A5-130-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-5N, Picture A6-130-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

input:  $w$  ( $\rightarrow \text{rgb}^*_{\text{d}}$ )  $\text{setgray}$   
output 130-0:  $g_p=1.0$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

| Test for the best visual linearized output of Picture A7-130-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-130-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-130-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-130-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-130-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF>            **Yes/No**

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.PS>            **Yes/No**

**Used computer operating system:**  
either one of Windows/Mac/Unix/other and version:.....

**This evaluation is for the device output:**            **monitor/data projector/printer**  
Device model, driver and version:.....

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

**For device output with PDF-file OE51L0NP.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 OE51L0NA.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

OE510-7N-130-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:0,31$ ;  $Y_N$  range 0,0 to <0,46 output 130-1:  $g_P=1.0$ ;  $g_N=1.0$

| Test for the best visual linearized output of Picture A7-130-0               |                   | Yes/No |
|------------------------------------------------------------------------------|-------------------|--------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |        |
| <b>Test of the Landolt-rings N-W according to picture A4-130-0</b>           |                   |        |
| N-W-radial grating:                                                          |                   |        |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |        |
|                                                                              | background - ring | Yes/No |
|                                                                              | 0 - 1             | Yes/No |
|                                                                              | 7 - 8             | Yes/No |
|                                                                              | E - F             | Yes/No |
|                                                                              | 2 - 0             | Yes/No |
|                                                                              | 8 - 6             | Yes/No |
|                                                                              | F - D             | Yes/No |
| <b>Test of the radial grating under 45° according to picture A5-130-0</b>    |                   |        |
| Can equally spaced lines be seen?                                            |                   |        |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   |        |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   |        |
| to ..... lpi                                                                 |                   |        |
| <b>Test of the radial grating under 90° according to picture A6-130-0</b>    |                   |        |
| Can equally spaced lines be seen?                                            |                   |        |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   |        |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   |        |
| to ..... lpi                                                                 |                   |        |

Part 2

OE511-3N-130-1

**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            **Yes/No**  
or with test charts using colour points according to Ishihara            **Yes/unknown**  
or tested with, please specify: .....            **Yes/unknown**

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

Office workplace illumination is daylight (clouded/north sky)            **Yes/No**

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            **Yes/No**

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            **Yes/No**

**Picture A7-130-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)  
compare standard print output according to ISO/IEC 15775 with range F:0            **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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            **Yes/No**

**picture A7-130-2**            **Yes/No**

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            **Yes/No**

**picture A7-130-2**            **Yes/No**

**colour measurement and specification for:**

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

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

**Colorimetric specification with PS file for colours in the columns A to T**

Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer  
of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF            **Yes/No**

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

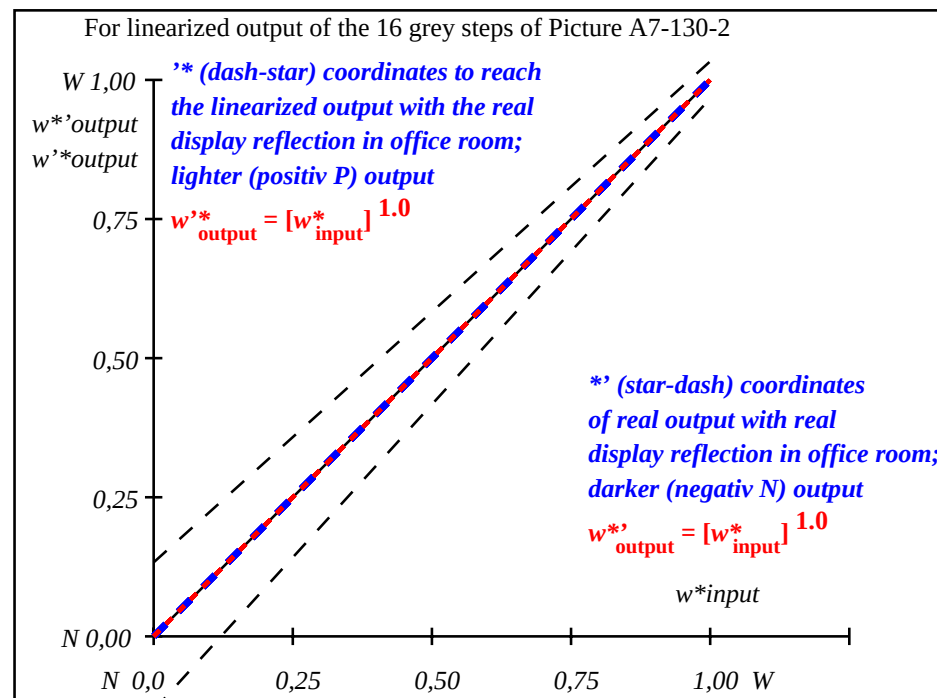
Part 4

OE511-7N-130-1

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                                    | LAB*ref | L*out | LAB*out | LAB*out/c-ref | ΔE* | Start output S1             |
|--------------------------------------|---------|-------|---------|---------------|-----|-----------------------------|
| 1                                    | 0.0     | 0.0   | 0.0     | 0.0           | 0.0 | 0.01                        |
| 2                                    | 6.36    | 0.0   | 0.07    | 6.36          | 0.0 | 0.01                        |
| 3                                    | 12.72   | 0.0   | 0.13    | 12.72         | 0.0 | 0.01                        |
| 4                                    | 19.08   | 0.0   | 0.2     | 19.08         | 0.0 | 0.01                        |
| 5                                    | 25.44   | 0.0   | 0.27    | 25.44         | 0.0 | 0.01                        |
| 6                                    | 31.8    | 0.0   | 0.33    | 31.8          | 0.0 | 0.01                        |
| 7                                    | 38.16   | 0.0   | 0.4     | 38.16         | 0.0 | 0.01                        |
| 8                                    | 44.52   | 0.0   | 0.47    | 44.52         | 0.0 | 0.01                        |
| 9                                    | 50.89   | 0.0   | 0.53    | 50.89         | 0.0 | 0.01                        |
| 10                                   | 57.25   | 0.0   | 0.6     | 57.25         | 0.0 | 0.01                        |
| 11                                   | 63.61   | 0.0   | 0.67    | 63.61         | 0.0 | 0.01                        |
| 12                                   | 69.97   | 0.0   | 0.73    | 69.97         | 0.0 | 0.01                        |
| 13                                   | 76.33   | 0.0   | 0.8     | 76.33         | 0.0 | 0.01                        |
| 14                                   | 82.69   | 0.0   | 0.87    | 82.69         | 0.0 | 0.01                        |
| 15                                   | 89.05   | 0.0   | 0.93    | 89.05         | 0.0 | 0.01                        |
| 16                                   | 95.41   | 0.0   | 1.0     | 95.41         | 0.0 | 0.01                        |
| 17                                   | 0.0     | 0.0   | 0.0     | 0.0           | 0.0 | 0.01                        |
| 18                                   | 23.85   | 0.0   | 0.25    | 23.85         | 0.0 | 0.01                        |
| 19                                   | 47.71   | 0.0   | 0.5     | 47.71         | 0.0 | 0.01                        |
| 20                                   | 71.56   | 0.0   | 0.75    | 71.56         | 0.0 | 0.01                        |
| 21                                   | 95.41   | 0.0   | 1.0     | 95.41         | 0.0 | 0.01                        |
| Mean lightness difference (16 steps) |         |       |         |               |     | ΔE* <sub>CIELAB</sub> = 0.0 |
| Mean lightness difference (5 steps)  |         |       |         |               |     | ΔL* <sub>CIELAB</sub> = 0.0 |
| Mean colour reproduction index:      |         |       |         |               |     | R* <sub>ab,m</sub> = 100    |

OE510-3N-130-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-130-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| L*/Y <sub>intended</sub><br>(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 |
|----------------------------------------|---------|---------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| w* w* w*<br>setrgb                     |         |         |          |          |          |          |           |           |           |           |           |           |           |           |           |           |
| g <sub>p</sub> =1.0                    |         |         |          |          |          |          |           |           |           |           |           |           |           |           |           |           |
| No. and<br>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*=[*]<br>CIELAB, r<br>(relative)      |         |         |          |          |          |          |           |           |           |           |           |           |           |           |           |           |
| w* <sub>intended</sub>                 | 0,000   | 0,067   | 0,133    | 0,200    | 0,267    | 0,333    | 0,400     | 0,467     | 0,533     | 0,600     | 0,667     | 0,733     | 0,800     | 0,867     | 0,933     | 1,000     |
| w* <sub>out</sub>                      | 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       |

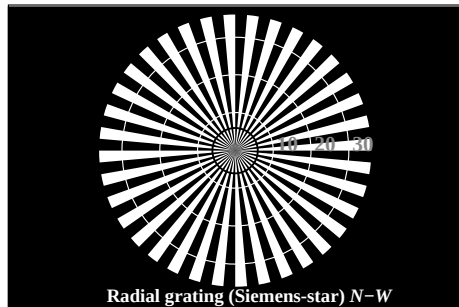
OE510-7N, Picture A7-130-2: 16 visual equidistant L\*-grey steps; PS operator: w\* w\* w\* setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast Y<sub>W</sub>:Y<sub>N</sub>=88,9:0,31; Y<sub>N</sub> range 0,0 to <0,46

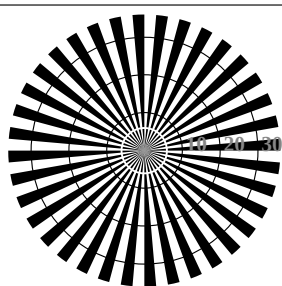
input: w (->rgb\*\_d) setgray  
output 130-2: g<sub>p</sub>=1.0; g<sub>N</sub>=1.0

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

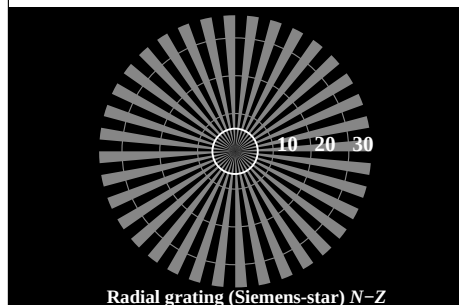
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



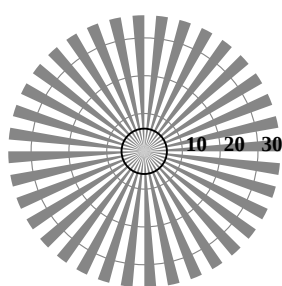
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

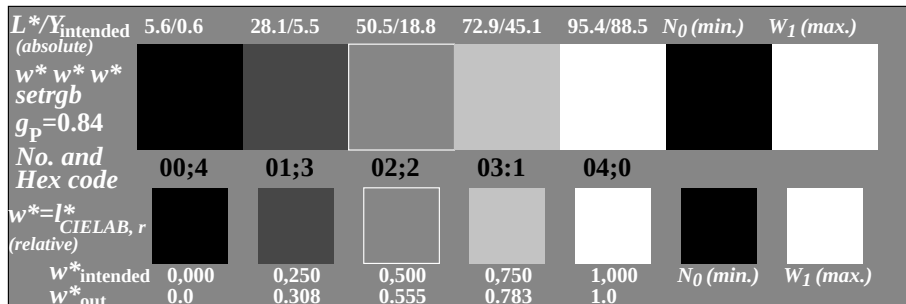


Radial grating (Siemens-star) N-Z

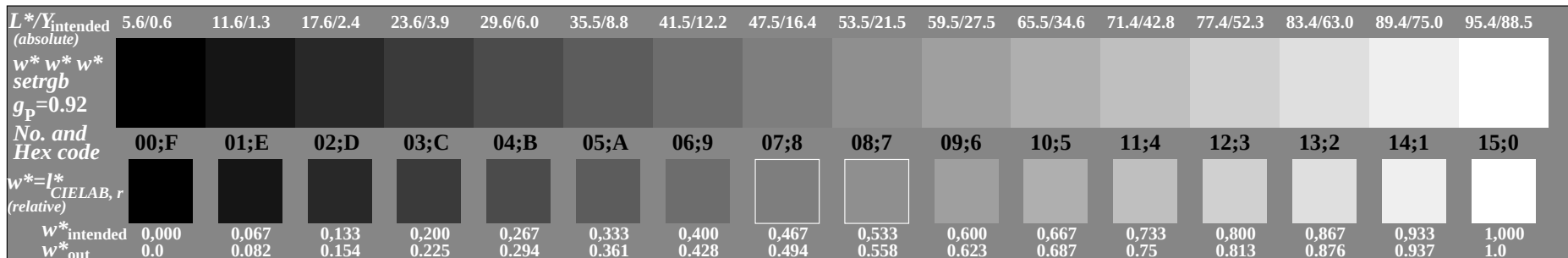


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-131-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

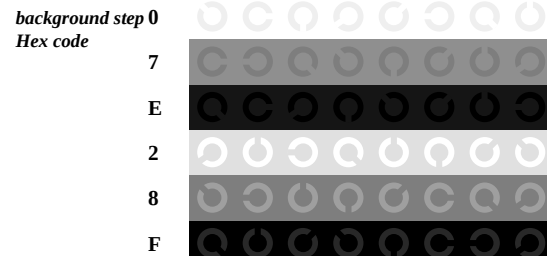


OE510-5N, Picture A2-131-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-7N, Picture A3-131-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

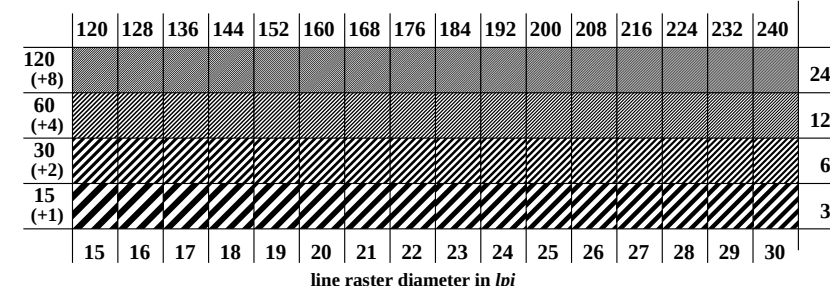
OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$  range 0,46 to <0,93



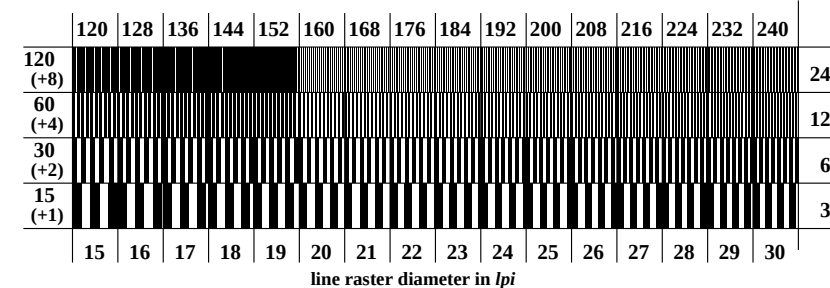
Landolt-rings W-N

code: background-ring

OE511-1N, Picture A4-131-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE511-3N, Picture A5-131-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE511-5N, Picture A6-131-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

input:  $w (-> \text{rgb}^*_d) \text{setgray}$   
output 131-0:  $g_p=0.92$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta



|                                                                                  |                                      |             |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Test for the best visual linearized output of Picture A7-131-0</b>            |                                      | Yes/No      |
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-131-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-131-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-131-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-131-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF>            Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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:**            monitor/data projector/printer  
Device model, driver and version:.....

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

**For device output with PDF-file OE51L0NP.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 OE51L0NA.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

OE510-7N-131-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$  range 0,46 to <0,93 output 131-1:  $g_P=0,92$ ;  $g_N=1,0$

|                                                                              |                                                                            |              |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| <b>Test for the best visual linearized output of Picture A7-131-0</b>        |                                                                            | Yes/No       |
| <b>Output test with the computer display ( ) or the external display ( )</b> |                                                                            |              |
| <b>Test of the Landolt-rings N-W according to picture A4-131-0</b>           |                                                                            |              |
| N-W-radial grating:                                                          | Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)? |              |
|                                                                              | background - ring                                                          | Yes/No       |
|                                                                              | 0 - 1                                                                      | Yes/No       |
|                                                                              | 7 - 8                                                                      | Yes/No       |
|                                                                              | E - F                                                                      | Yes/No       |
|                                                                              | 2 - 0                                                                      | Yes/No       |
|                                                                              | 8 - 6                                                                      | Yes/No       |
|                                                                              | F - D                                                                      | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-131-0</b>    |                                                                            |              |
| Can equally spaced lines be seen?                                            |                                                                            |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                                                                            | Yes/No       |
| Test with a magnifying glass (e.g. 6x):                                      | - from 15 lpi:                                                             | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-131-0</b>    |                                                                            |              |
| Can equally spaced lines be seen?                                            |                                                                            |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                                                                            | Yes/No       |
| Test with a magnifying glass (e.g. 6x):                                      | - from 15 lpi:                                                             | to ..... lpi |

Part 2

OE511-3N-131-1

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

The assessor has **normal** colour vision according to one test:            Yes/No  
either according to DIN 6160:1996 with Anomaloskop of Nagel            Yes/unknown  
or with test charts using colour points according to Ishihara            Yes/unknown  
or tested with, please specify: .....            Yes/unknown

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

Office workplace illumination is daylight (clouded/north sky)            Yes/No

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            Yes/No

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            Yes/No

**Picture A7-131-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)  
compare standard print output according to ISO/IEC 15775 with range F:0            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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            Yes/No

**picture A7-131-2**

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            Yes/No

**picture A7-131-2**            or underline Yes/No

**colour measurement and specification for:**  
CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:            Yes/No  
If No, please give other parameters: .....

**Colorimetric specification with PS file for colours in the columns A to T**  
Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer  
of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF            Yes/No  
If No, please describe other method: .....

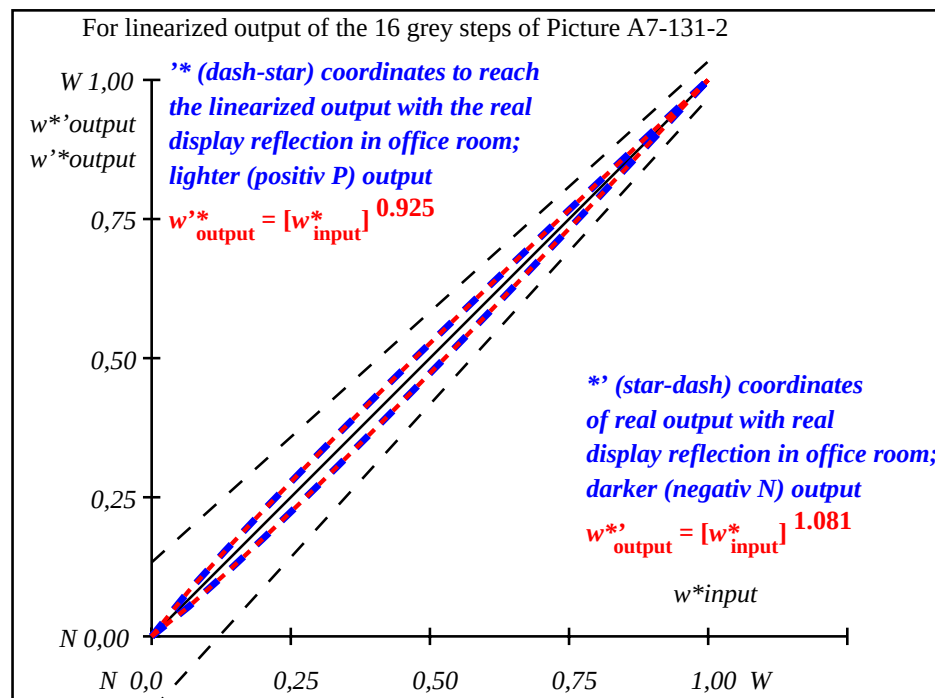
Part 4

OE511-7N-131-1

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                               | LAB*ref |     |     | L*out |       |     | LAB*out/c-ref |      |     | ΔE*                     | Start output S1                                                                |
|---------------------------------|---------|-----|-----|-------|-------|-----|---------------|------|-----|-------------------------|--------------------------------------------------------------------------------|
| 1                               | 5.69    | 0.0 | 0.0 | 0.0   | 5.69  | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                    | Specification according to<br>ISO/IEC 15775 Annex G<br>and DIN 33866-1 Annex G |
| 2                               | 11.67   | 0.0 | 0.0 | 0.08  | 13.02 | 0.0 | 0.0           | 1.35 | 0.0 | 1.35                    |                                                                                |
| 3                               | 17.65   | 0.0 | 0.0 | 0.16  | 19.6  | 0.0 | 0.0           | 1.95 | 0.0 | 1.95                    |                                                                                |
| 4                               | 23.63   | 0.0 | 0.0 | 0.23  | 25.94 | 0.0 | 0.0           | 2.3  | 0.0 | 2.3                     |                                                                                |
| 5                               | 29.62   | 0.0 | 0.0 | 0.29  | 32.11 | 0.0 | 0.0           | 2.49 | 0.0 | 2.49                    |                                                                                |
| 6                               | 35.6    | 0.0 | 0.0 | 0.36  | 38.17 | 0.0 | 0.0           | 2.57 | 0.0 | 2.57                    |                                                                                |
| 7                               | 41.58   | 0.0 | 0.0 | 0.43  | 44.13 | 0.0 | 0.0           | 2.55 | 0.0 | 2.55                    |                                                                                |
| 8                               | 47.56   | 0.0 | 0.0 | 0.49  | 50.02 | 0.0 | 0.0           | 2.46 | 0.0 | 2.46                    |                                                                                |
| 9                               | 53.54   | 0.0 | 0.0 | 0.56  | 55.85 | 0.0 | 0.0           | 2.31 | 0.0 | 2.31                    |                                                                                |
| 10                              | 59.52   | 0.0 | 0.0 | 0.62  | 61.62 | 0.0 | 0.0           | 2.1  | 0.0 | 2.1                     |                                                                                |
| 11                              | 65.5    | 0.0 | 0.0 | 0.69  | 67.35 | 0.0 | 0.0           | 1.85 | 0.0 | 1.85                    |                                                                                |
| 12                              | 71.48   | 0.0 | 0.0 | 0.75  | 73.03 | 0.0 | 0.0           | 1.55 | 0.0 | 1.55                    |                                                                                |
| 13                              | 77.47   | 0.0 | 0.0 | 0.81  | 78.68 | 0.0 | 0.0           | 1.21 | 0.0 | 1.21                    |                                                                                |
| 14                              | 83.45   | 0.0 | 0.0 | 0.88  | 84.29 | 0.0 | 0.0           | 0.84 | 0.0 | 0.84                    |                                                                                |
| 15                              | 89.43   | 0.0 | 0.0 | 0.94  | 89.86 | 0.0 | 0.0           | 0.43 | 0.0 | 0.43                    | Mean lightness difference (16 steps)                                           |
| 16                              | 95.41   | 0.0 | 0.0 | 1.0   | 95.41 | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                    | ΔE*CIELAB = 1.6                                                                |
| 17                              | 5.69    | 0.0 | 0.0 | 0.0   | 5.69  | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                    |                                                                                |
| 18                              | 28.12   | 0.0 | 0.0 | 0.28  | 30.58 | 0.0 | 0.0           | 2.46 | 0.0 | 2.46                    |                                                                                |
| 19                              | 50.55   | 0.0 | 0.0 | 0.53  | 52.94 | 0.0 | 0.0           | 2.39 | 0.0 | 2.39                    |                                                                                |
| 20                              | 72.98   | 0.0 | 0.0 | 0.77  | 74.45 | 0.0 | 0.0           | 1.47 | 0.0 | 1.47                    | Mean lightness difference (5 steps)                                            |
| 21                              | 95.41   | 0.0 | 0.0 | 1.0   | 95.41 | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                    | ΔL*CIELAB = 1.3                                                                |
| Mean colour reproduction index: |         |     |     |       |       |     |               |      |     | R* <sub>ab,m</sub> = 93 |                                                                                |

OE510-3N-131-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-131-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y^*_{intended}$<br>(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 |
|--------------------------------------------------------------|---------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.92$<br>No. and<br>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      |
| $w^* = [L^*_{CIELAB, r}]$<br>(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     | 0.082    | 0.155    | 0.226    | 0.295    | 0.362    | 0.428     | 0.494     | 0.559     | 0.623     | 0.688     | 0.75      | 0.814     | 0.876     | 0.938     | 1.0       |

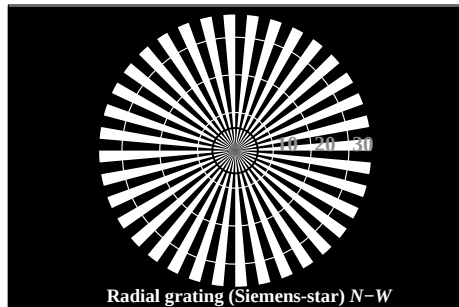
OE510-7N, Picture A7-131-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$  range 0,46 to <0,93

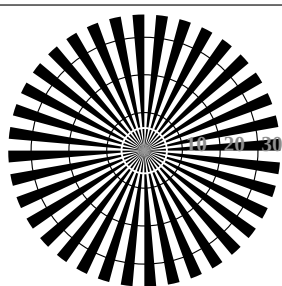
input:  $w (->rgb^*_d)$  setgray  
output 131-2:  $g_p=0.92$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

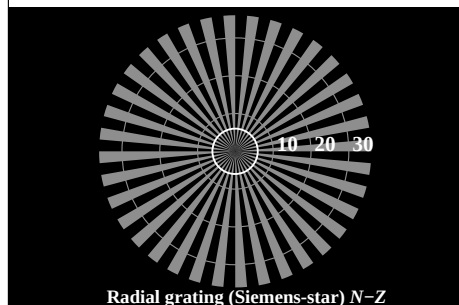
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



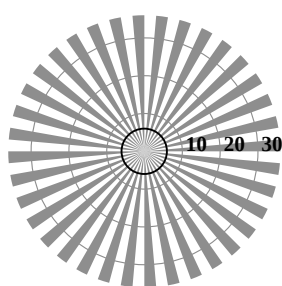
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

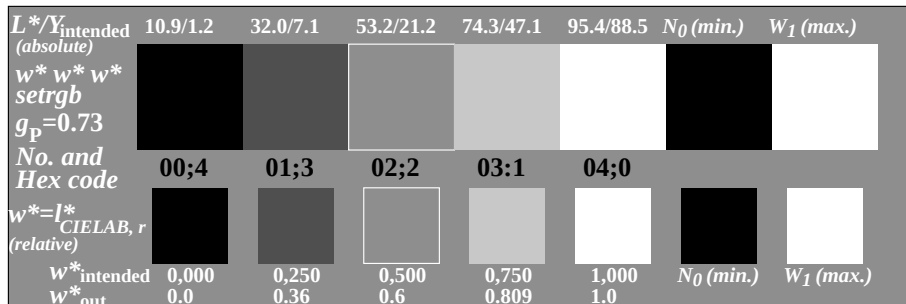


Radial grating (Siemens-star) N-Z

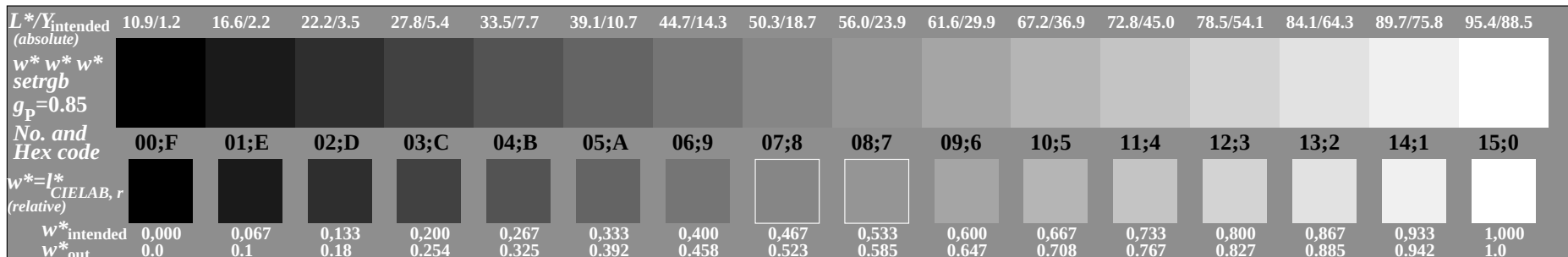


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-132-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-5N, Picture A2-132-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-7N, Picture A3-132-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

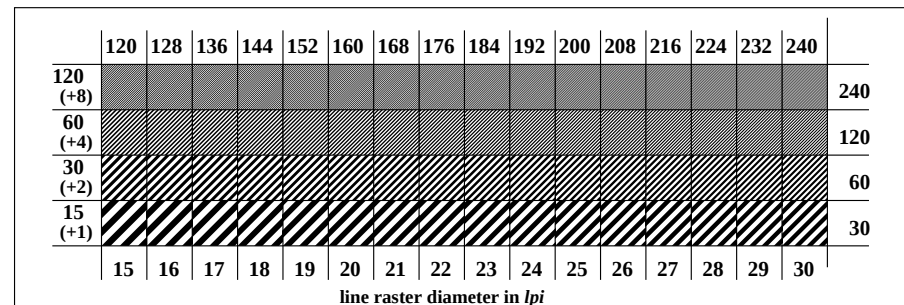
OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:1,25$ ;  $Y_N$  range 0,93 to <1,87

|                   |  |   |           |     |
|-------------------|--|---|-----------|-----|
| background step 0 |  | 1 | ring step | 0-1 |
| Hex code          |  | 8 | Hex code  | 7-8 |
| 7                 |  | F |           | E-F |
| E                 |  | 0 |           | 2-0 |
| 2                 |  | 6 |           | 8-6 |
| 8                 |  | D |           | F-D |
| F                 |  |   |           |     |

Landolt-rings W-N

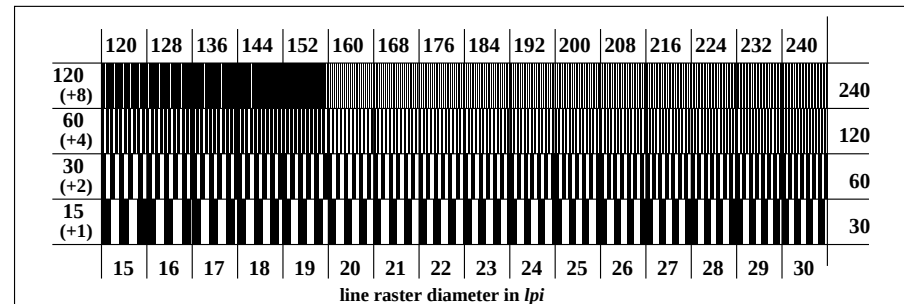
code: background-ring

OE511-1N, Picture A4-132-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-3N, Picture A5-132-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-5N, Picture A6-132-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

input:  $w$  ( $\rightarrow \text{rgb}^*_d$ )  $\text{setgray}$   
output 132-0:  $g_p=0.85$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

| Test for the best visual linearized output of Picture A7-132-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-132-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-132-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-132-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-132-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF>            Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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:**            monitor/data projector/printer  
Device model, driver and version:.....

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

**For device output with PDF-file OE51L0NP.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 OE51L0NA.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

OE510-7N-132-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:1,25$ ;  $Y_N$  range 0,93 to <1,87 output 132-1:  $g_P=0,85$ ;  $g_N=1,0$

| Test for the best visual linearized output of Picture A7-132-0               |                   | Yes/No       |
|------------------------------------------------------------------------------|-------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |              |
| <b>Test of the Landolt-rings N-W according to picture A4-132-0</b>           |                   |              |
| N-W-radial grating:                                                          |                   |              |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |              |
|                                                                              | background - ring | Yes/No       |
|                                                                              | 0 - 1             | Yes/No       |
|                                                                              | 7 - 8             | Yes/No       |
|                                                                              | E - F             | Yes/No       |
|                                                                              | 2 - 0             | Yes/No       |
|                                                                              | 8 - 6             | Yes/No       |
|                                                                              | F - D             | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-132-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-132-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |

Part 2

OE511-3N-132-1

**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            Yes/No  
or with test charts using colour points according to Ishihara            Yes/unknown  
or tested with, please specify: .....            Yes/unknown

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

Office workplace illumination is daylight (clouded/north sky)            Yes/No

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            Yes/No

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            Yes/No

**Picture A7-132-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)  
compare standard print output according to ISO/IEC 15775 with range F:0            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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>            Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>            Yes/No

**picture A7-132-2**            Yes/No

**picture A7-132-2**            or underline Yes/No

**colour measurement and specification for:**  
CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:            Yes/No  
If No, please give other parameters: .....

**Colorimetric specification with PS file for colours in the columns A to T**  
Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer  
of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF            Yes/No  
If No, please describe other method: .....

Part 4

OE511-7N-132-1



See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i  | LAB*ref | L*out | LAB*out | LAB*out/c-ref | ΔE* | Start output S1 |
|----|---------|-------|---------|---------------|-----|-----------------|
| 1  | 10.99   | 0.0   | 0.0     | 0.0           | 0.0 | 0.01            |
| 2  | 16.62   | 0.0   | 0.1     | 19.44         | 0.0 | 0.0             |
| 3  | 22.25   | 0.0   | 0.18    | 26.22         | 0.0 | 0.0             |
| 4  | 27.88   | 0.0   | 0.25    | 32.49         | 0.0 | 0.0             |
| 5  | 33.5    | 0.0   | 0.33    | 38.44         | 0.0 | 0.0             |
| 6  | 39.13   | 0.0   | 0.39    | 44.17         | 0.0 | 0.0             |
| 7  | 44.76   | 0.0   | 0.46    | 49.73         | 0.0 | 0.0             |
| 8  | 50.39   | 0.0   | 0.52    | 55.16         | 0.0 | 0.0             |
| 9  | 56.02   | 0.0   | 0.59    | 60.47         | 0.0 | 0.0             |
| 10 | 61.64   | 0.0   | 0.65    | 65.68         | 0.0 | 0.0             |
| 11 | 67.27   | 0.0   | 0.71    | 70.8          | 0.0 | 0.0             |
| 12 | 72.9    | 0.0   | 0.77    | 75.85         | 0.0 | 0.0             |
| 13 | 78.53   | 0.0   | 0.83    | 80.83         | 0.0 | 0.0             |
| 14 | 84.15   | 0.0   | 0.89    | 85.74         | 0.0 | 0.0             |
| 15 | 89.78   | 0.0   | 0.94    | 90.6          | 0.0 | 0.0             |
| 16 | 95.41   | 0.0   | 1.0     | 95.41         | 0.0 | 0.0             |
| 17 | 10.99   | 0.0   | 0.0     | 10.99         | 0.0 | 0.0             |
| 18 | 32.1    | 0.0   | 0.31    | 36.98         | 0.0 | 0.0             |
| 19 | 53.2    | 0.0   | 0.55    | 57.83         | 0.0 | 0.0             |
| 20 | 74.31   | 0.0   | 0.78    | 77.1          | 0.0 | 0.0             |
| 21 | 95.41   | 0.0   | 1.0     | 95.41         | 0.0 | 0.0             |

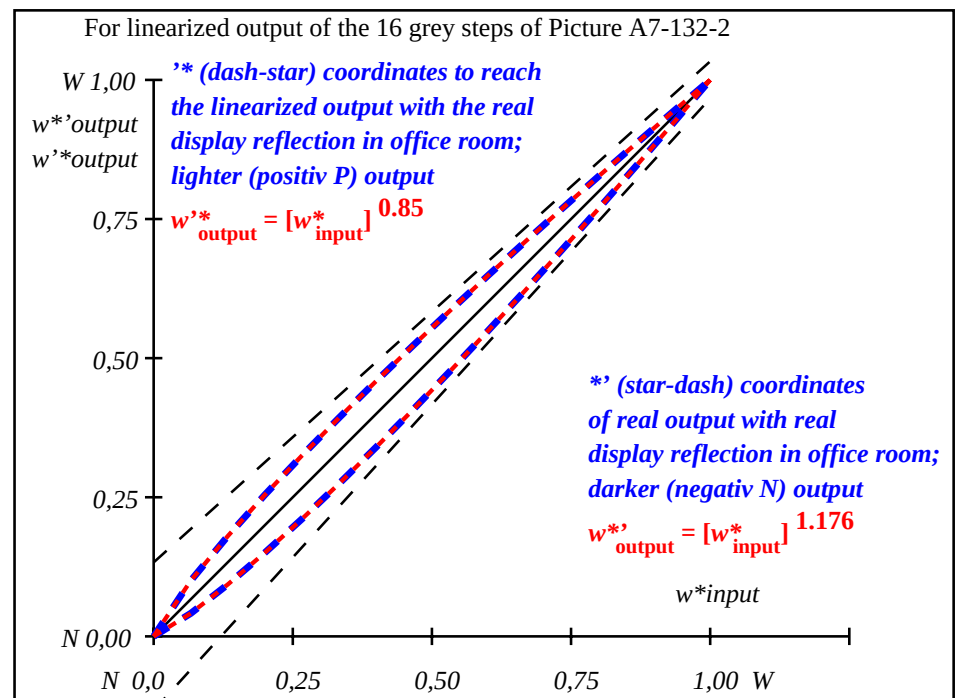
Specification according to  
ISO/IEC 15775 Annex G  
and DIN 33866-1 Annex G

Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 3.2$

Mean lightness difference (5 steps)  
 $\Delta L^*_{\text{CIELAB}} = 2.5$

Mean colour reproduction index:  
 $R^*_{\text{ab,m}} = 86$

OE510-3N-132-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-132-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y^*_{\text{intended}}$<br>(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 |
|--------------------------------------------------------------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_P=0.85$<br>No. and<br>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      |
| $w^* = [L^*_{\text{CIELAB}}]^r$<br>(relative)                | 0.000    | 0.067    | 0.133    | 0.200    | 0.267    | 0.333     | 0.400     | 0.467     | 0.533     | 0.600     | 0.667     | 0.733     | 0.800     | 0.867     | 0.933     | 1.000     |
| $w^*_{\text{intended}}$<br>$w^*_{\text{out}}$                | 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     |

OE510-7N, Picture A7-132-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:1,25$ ;  $Y_N$  range 0,93 to <1,87

input:  $w$  ( $\rightarrow \text{rgb}^*_{\text{d}}$ ) setgray  
output 132-2:  $g_P=0.85$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
TUB material: code=rh4ta  
application for output of displays: monitor systems or data projector systems



| Test for the best visual linearized output of Picture A7-133-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-133-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-133-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-133-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-133-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF> underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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 OE51L0NP.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 OE51L0NA.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

OE510-7N-133-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:2,5$ ;  $Y_N$  range 1,87 to <3,75 output 133-1:  $g_P=0,77$ ;  $g_N=1,0$

| Test for the best visual linearized output of Picture A7-133-0               |                                                                            | Yes/No       |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                                                                            |              |
| <b>Test of the Landolt-rings N-W according to picture A4-133-0</b>           |                                                                            |              |
| N-W-radial grating:                                                          | Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)? |              |
|                                                                              | background - ring                                                          | Yes/No       |
|                                                                              | 0 - 1                                                                      | Yes/No       |
|                                                                              | 7 - 8                                                                      | Yes/No       |
|                                                                              | E - F                                                                      | Yes/No       |
|                                                                              | 2 - 0                                                                      | Yes/No       |
|                                                                              | 8 - 6                                                                      | Yes/No       |
|                                                                              | F - D                                                                      | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-133-0</b>    |                                                                            |              |
| Can equally spaced lines be seen?                                            |                                                                            |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                                                                            | Yes/No       |
| Test with a magnifying glass (e.g. 6x):                                      | - from 15 lpi:                                                             | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-133-0</b>    |                                                                            |              |
| Can equally spaced lines be seen?                                            |                                                                            |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                                                                            | Yes/No       |
| Test with a magnifying glass (e.g. 6x):                                      | - from 15 lpi:                                                             | to ..... lpi |

Part 2

OE511-3N-133-1

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

The assessor has **normal** colour vision according to one test:  
either according to DIN 6160:1996 with Anomaloskop of Nagel underline Yes/No  
or with test charts using colour points according to Ishihara underline Yes/unknown  
or tested with, please specify: ..... underline Yes/unknown

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

Office workplace illumination is daylight (clouded/north sky) underline Yes/No

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF> underline Yes/No

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS> underline Yes/No

**Picture A7-133-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)  
compare standard print output according to ISO/IEC 15775 with range F:0 underline 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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF> underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS> or underline Yes/No

**picture A7-133-2**

**picture A7-133-2**

**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 with PS file for colours in the columns A to T**  
Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer  
of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF underline Yes/No  
If No, please describe other method: .....

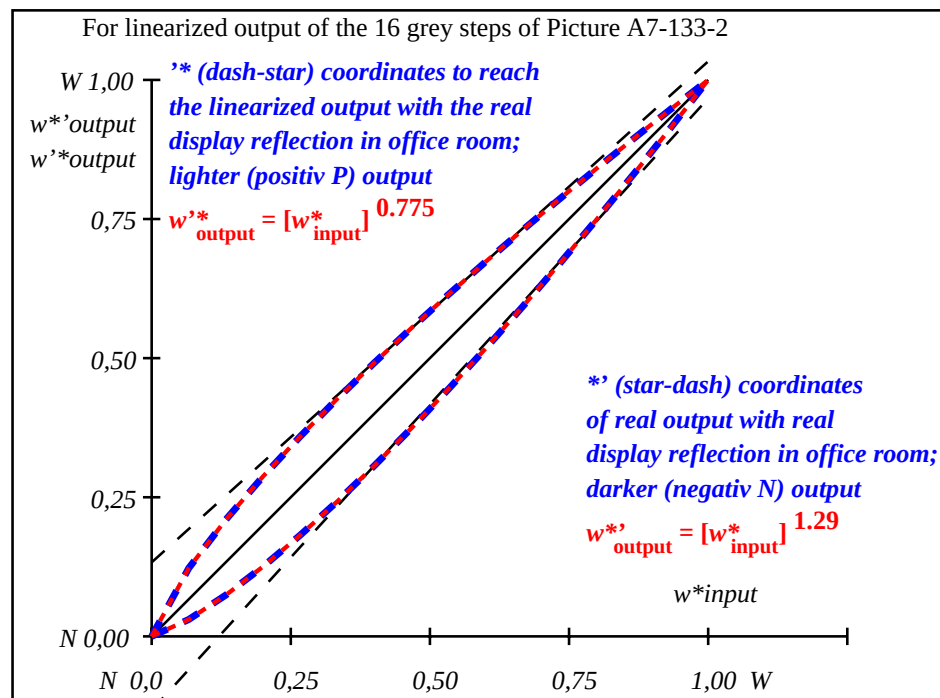
Part 4

OE511-7N-133-1

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                                    | LAB*ref       | L*out          | LAB*out       | LAB*out/c-ref | ΔE*                         |
|--------------------------------------|---------------|----------------|---------------|---------------|-----------------------------|
| 1                                    | 18.01 0.0 0.0 | 0.0 0.0 0.0    | 18.01 0.0 0.0 | 0.0 0.0 0.0   | 0.01                        |
| 2                                    | 23.17 0.0 0.0 | 0.12 27.5 0.0  | 0.0 0.0 0.0   | 4.33 0.0 0.0  | 4.33                        |
| 3                                    | 28.33 0.0 0.0 | 0.21 34.25 0.0 | 0.0 0.0 0.0   | 5.92 0.0 0.0  | 5.92                        |
| 4                                    | 33.49 0.0 0.0 | 0.29 40.24 0.0 | 0.0 0.0 0.0   | 6.76 0.0 0.0  | 6.76                        |
| 5                                    | 38.65 0.0 0.0 | 0.36 45.8 0.0  | 0.0 0.0 0.0   | 7.15 0.0 0.0  | 7.15                        |
| 6                                    | 43.81 0.0 0.0 | 0.43 51.04 0.0 | 0.0 0.0 0.0   | 7.23 0.0 0.0  | 7.23                        |
| 7                                    | 48.97 0.0 0.0 | 0.49 56.06 0.0 | 0.0 0.0 0.0   | 7.09 0.0 0.0  | 7.09                        |
| 8                                    | 54.13 0.0 0.0 | 0.55 60.89 0.0 | 0.0 0.0 0.0   | 6.76 0.0 0.0  | 6.76                        |
| 9                                    | 59.29 0.0 0.0 | 0.61 65.56 0.0 | 0.0 0.0 0.0   | 6.27 0.0 0.0  | 6.27                        |
| 10                                   | 64.45 0.0 0.0 | 0.67 70.11 0.0 | 0.0 0.0 0.0   | 5.66 0.0 0.0  | 5.66                        |
| 11                                   | 69.61 0.0 0.0 | 0.73 74.54 0.0 | 0.0 0.0 0.0   | 4.93 0.0 0.0  | 4.93                        |
| 12                                   | 74.77 0.0 0.0 | 0.79 78.87 0.0 | 0.0 0.0 0.0   | 4.1 0.0 0.0   | 4.1                         |
| 13                                   | 79.93 0.0 0.0 | 0.84 83.12 0.0 | 0.0 0.0 0.0   | 3.19 0.0 0.0  | 3.19                        |
| 14                                   | 85.09 0.0 0.0 | 0.9 87.28 0.0  | 0.0 0.0 0.0   | 2.19 0.0 0.0  | 2.2                         |
| 15                                   | 90.25 0.0 0.0 | 0.95 91.38 0.0 | 0.0 0.0 0.0   | 1.13 0.0 0.0  | 1.13                        |
| 16                                   | 95.41 0.0 0.0 | 1.0 95.41 0.0  | 0.0 0.0 0.0   | 0.0 0.0 0.0   | 0.01                        |
| 17                                   | 18.01 0.0 0.0 | 0.0 0.0 0.0    | 18.01 0.0 0.0 | 0.0 0.0 0.0   | 0.01                        |
| 18                                   | 37.36 0.0 0.0 | 0.34 44.44 0.0 | 0.0 0.0 0.0   | 7.08 0.0 0.0  | 7.08                        |
| 19                                   | 56.71 0.0 0.0 | 0.58 63.24 0.0 | 0.0 0.0 0.0   | 6.53 0.0 0.0  | 6.53                        |
| 20                                   | 76.06 0.0 0.0 | 0.8 79.94 0.0  | 0.0 0.0 0.0   | 3.88 0.0 0.0  | 3.88                        |
| 21                                   | 95.41 0.0 0.0 | 1.0 95.41 0.0  | 0.0 0.0 0.0   | 0.0 0.0 0.0   | 0.01                        |
| Mean lightness difference (16 steps) |               |                |               |               | ΔE* <sub>CIELAB</sub> = 4.5 |
| Mean lightness difference (5 steps)  |               |                |               |               | ΔL* <sub>CIELAB</sub> = 3.5 |
| Mean colour reproduction index:      |               |                |               |               | R* <sub>ab,m</sub> = 80     |

OE510-3N-133-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-133-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y_{intended}$<br>(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 |
|---------------------------------------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.78$ |          |          |          |          |           |           |           |           |           |           |           |           |           |           |           |           |
| No. and<br>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      |
| $w^*=L^*_{CIELAB, r}$<br>(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      | 0.123    | 0.209    | 0.287    | 0.359     | 0.426     | 0.492     | 0.554     | 0.614     | 0.673     | 0.731     | 0.786     | 0.841     | 0.895     | 0.948     | 1.0       |

OE510-7N, Picture A7-133-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

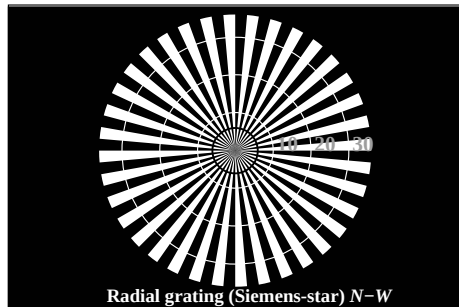
OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:2,5$ ;  $Y_N$  range 1,87 to <3,75

input:  $w$  ( $\rightarrow rgb_d$ ) setgray  
output 133-2:  $g_p=0.77$ ;  $g_N=1.0$

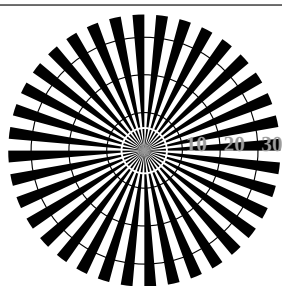
TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta



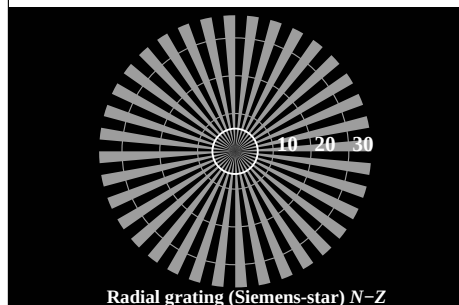
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



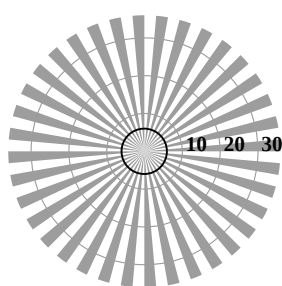
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

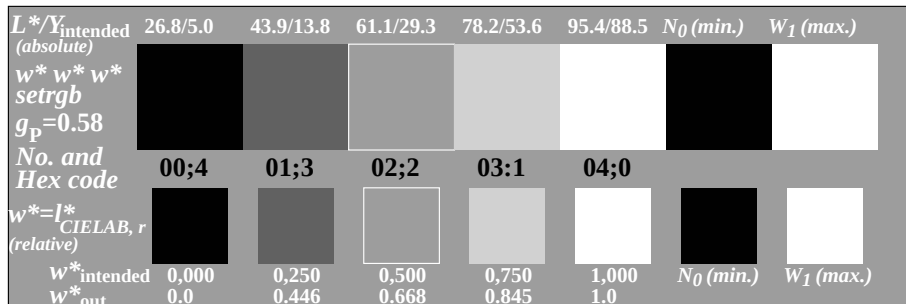


Radial grating (Siemens-star) N-Z

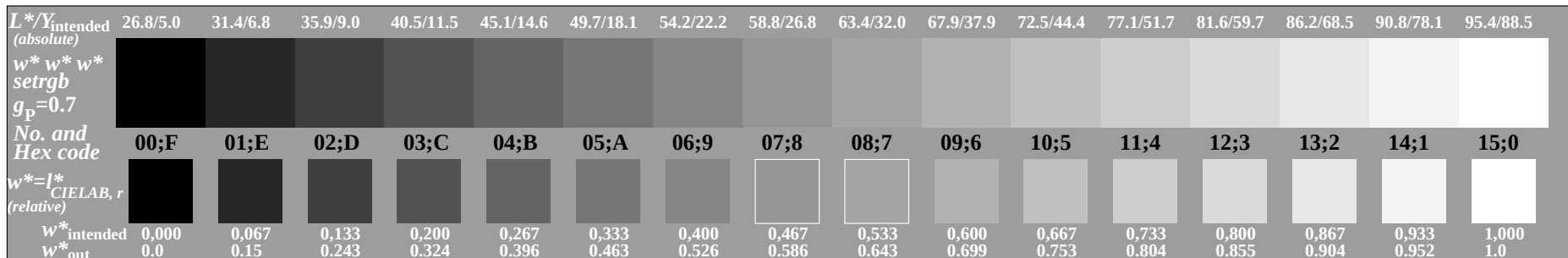


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-134-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



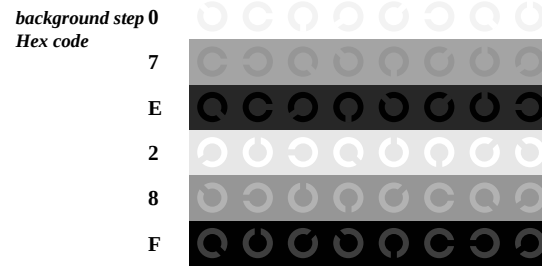
OE510-5N, Picture A2-134-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



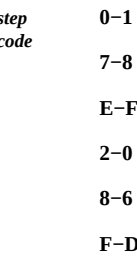
OE510-7N, Picture A3-134-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$  range 3,75 to <7,5

input:  $w (->rgb^*_d) \text{setgray}$   
output 134-0:  $g_p=0.7$ ;  $g_N=1.0$

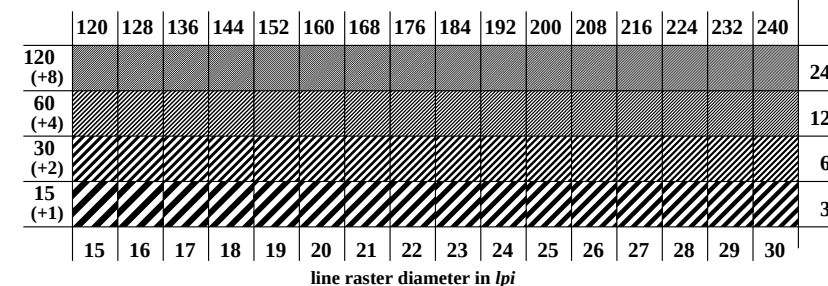


Landolt-rings W-N



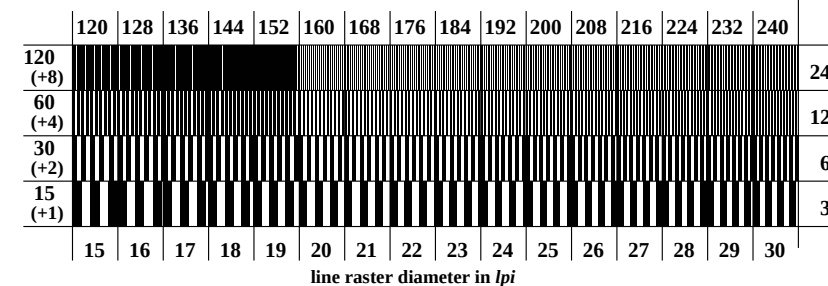
code: background-ring

OE511-1N, Picture A4-134-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-3N, Picture A5-134-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-5N, Picture A6-134-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

| Test for the best visual linearized output of Picture A7-134-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-134-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-134-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-134-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-134-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF> underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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 OE51L0NP.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 OE51L0NA.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

OE510-7N-134-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$  range 3,75 to <7,5  
output 134-1:  $g_P=0.7$ ;  $g_N=1.0$

| Test for the best visual linearized output of Picture A7-134-0               |                   | Yes/No       |
|------------------------------------------------------------------------------|-------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |              |
| <b>Test of the Landolt-rings N-W according to picture A4-134-0</b>           |                   |              |
| N-W-radial grating:                                                          |                   |              |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |              |
|                                                                              | background - ring | Yes/No       |
|                                                                              | 0 - 1             | Yes/No       |
|                                                                              | 7 - 8             | Yes/No       |
|                                                                              | E - F             | Yes/No       |
|                                                                              | 2 - 0             | Yes/No       |
|                                                                              | 8 - 6             | Yes/No       |
|                                                                              | F - D             | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-134-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-134-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |

Part 2

OE511-3N-134-1

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

The assessor has **normal** colour vision according to one test:  
either according to DIN 6160:1996 with Anomaloskop of Nagel underline Yes/No  
or with test charts using colour points according to Ishihara underline Yes/unknown  
or tested with, please specify: ..... underline Yes/unknown

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

Office workplace illumination is daylight (clouded/north sky) underline Yes/No

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF> underline Yes/No

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS> underline Yes/No

**Picture A7-134-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)  
compare standard print output according to ISO/IEC 15775 with range F:0 underline 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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF> underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS> 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 with PS file for colours in the columns A to T**  
Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer  
of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF underline Yes/No  
If No, please describe other method: .....

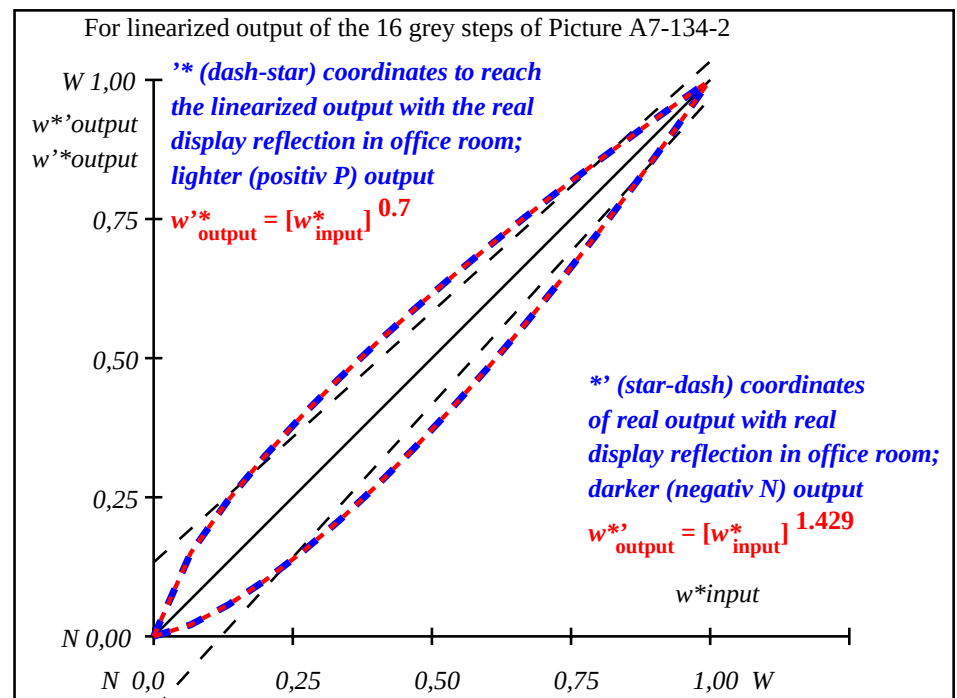
Part 4

OE511-7N-134-1

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                               | LAB*ref       | L*out | LAB*out       | LAB*out/c-ref | ΔE*                     | Start output S1                                                          |
|---------------------------------|---------------|-------|---------------|---------------|-------------------------|--------------------------------------------------------------------------|
| 1                               | 26.85 0.0 0.0 | 0.0   | 26.85 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    | Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G |
| 2                               | 31.42 0.0 0.0 | 0.15  | 37.15 0.0 0.0 | 5.73 0.0 0.0  | 5.73                    |                                                                          |
| 3                               | 35.99 0.0 0.0 | 0.24  | 43.58 0.0 0.0 | 7.59 0.0 0.0  | 7.59                    |                                                                          |
| 4                               | 40.56 0.0 0.0 | 0.32  | 49.07 0.0 0.0 | 8.51 0.0 0.0  | 8.51                    |                                                                          |
| 5                               | 45.13 0.0 0.0 | 0.4   | 54.03 0.0 0.0 | 8.9 0.0 0.0   | 8.9                     |                                                                          |
| 6                               | 49.7 0.0 0.0  | 0.46  | 58.62 0.0 0.0 | 8.92 0.0 0.0  | 8.92                    |                                                                          |
| 7                               | 54.27 0.0 0.0 | 0.53  | 62.95 0.0 0.0 | 8.68 0.0 0.0  | 8.68                    |                                                                          |
| 8                               | 58.84 0.0 0.0 | 0.59  | 67.06 0.0 0.0 | 8.22 0.0 0.0  | 8.22                    |                                                                          |
| 9                               | 63.41 0.0 0.0 | 0.64  | 71.0 0.0 0.0  | 7.59 0.0 0.0  | 7.59                    |                                                                          |
| 10                              | 67.99 0.0 0.0 | 0.7   | 74.8 0.0 0.0  | 6.81 0.0 0.0  | 6.81                    |                                                                          |
| 11                              | 72.56 0.0 0.0 | 0.75  | 78.47 0.0 0.0 | 5.91 0.0 0.0  | 5.91                    |                                                                          |
| 12                              | 77.13 0.0 0.0 | 0.8   | 82.03 0.0 0.0 | 4.9 0.0 0.0   | 4.9                     |                                                                          |
| 13                              | 81.7 0.0 0.0  | 0.86  | 85.5 0.0 0.0  | 3.8 0.0 0.0   | 3.8                     |                                                                          |
| 14                              | 86.27 0.0 0.0 | 0.9   | 88.87 0.0 0.0 | 2.61 0.0 0.0  | 2.61                    |                                                                          |
| 15                              | 90.84 0.0 0.0 | 0.95  | 92.18 0.0 0.0 | 1.34 0.0 0.0  | 1.34                    | Mean lightness difference (16 steps)                                     |
| 16                              | 95.41 0.0 0.0 | 1.0   | 95.41 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    | ΔE* <sub>CIELAB</sub> = 5.6                                              |
| 17                              | 26.85 0.0 0.0 | 0.0   | 26.85 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    |                                                                          |
| 18                              | 43.99 0.0 0.0 | 0.38  | 52.83 0.0 0.0 | 8.84 0.0 0.0  | 8.84                    |                                                                          |
| 19                              | 61.13 0.0 0.0 | 0.62  | 69.05 0.0 0.0 | 7.92 0.0 0.0  | 7.92                    |                                                                          |
| 20                              | 78.27 0.0 0.0 | 0.82  | 82.9 0.0 0.0  | 4.64 0.0 0.0  | 4.64                    | Mean lightness difference (5 steps)                                      |
| 21                              | 95.41 0.0 0.0 | 1.0   | 95.41 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    | ΔL* <sub>CIELAB</sub> = 4.3                                              |
| Mean colour reproduction index: |               |       |               |               | R* <sub>ab,m</sub> = 76 |                                                                          |

OE510-3N-134-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-134-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y^*_{\text{intended}}$<br>(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 |
|------------------------------------------------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.7$           |          |          |          |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 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      |
| $w^* = [L^*_{\text{CIELAB}, r}]$<br>(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      | 0.151    | 0.244    | 0.324     | 0.397     | 0.463     | 0.527     | 0.587     | 0.644     | 0.699     | 0.753     | 0.805     | 0.855     | 0.905     | 0.953     | 1.0       |

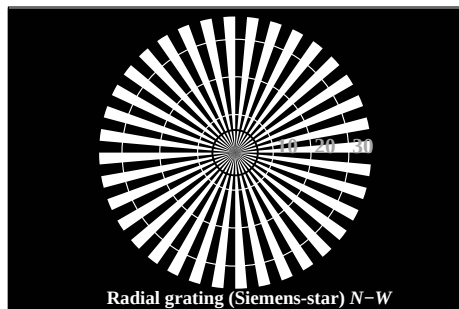
OE510-7N, Picture A7-134-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$  range 3,75 to <7,5

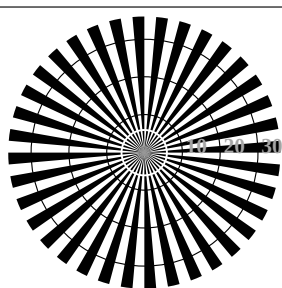
input:  $w$  ( $\rightarrow \text{rgb}^*_d$ ) setgray  
output 134-2:  $g_p=0.7$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

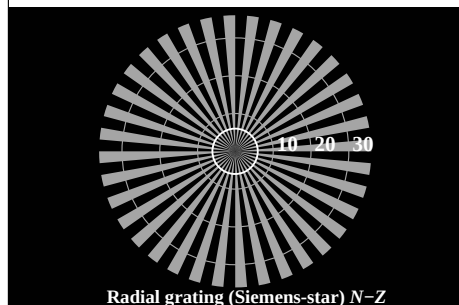
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



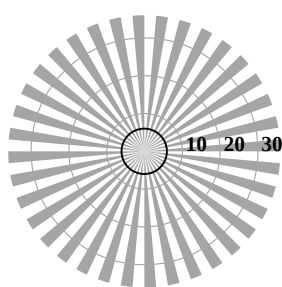
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

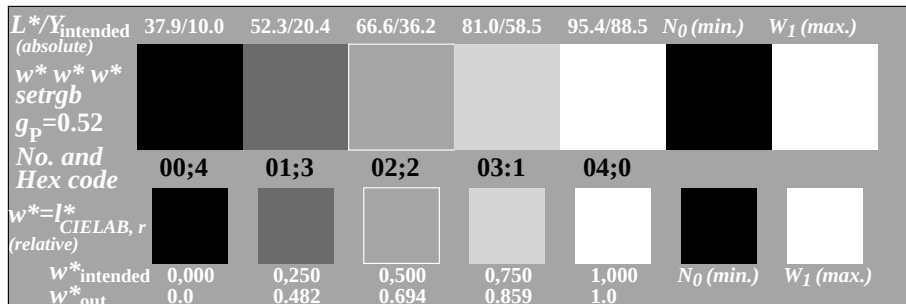


Radial grating (Siemens-star) N-Z

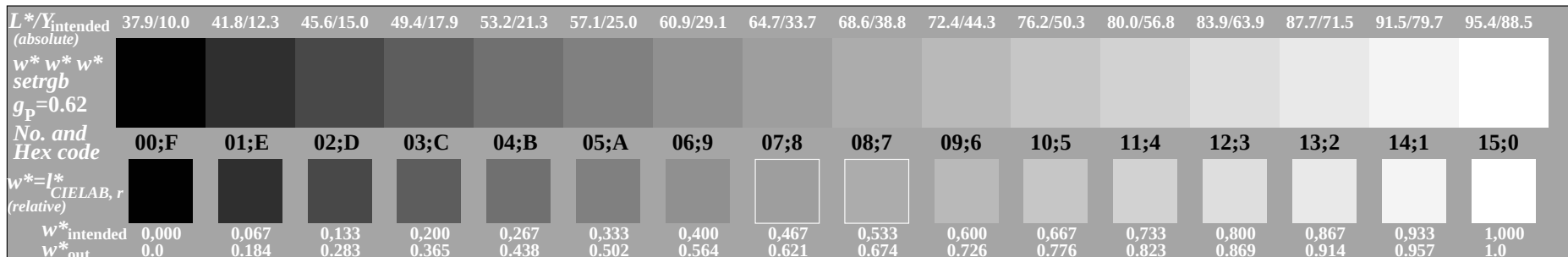


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-135-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



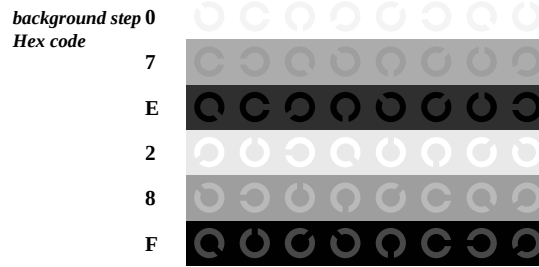
OE510-5N, Picture A2-135-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-7N, Picture A3-135-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:10$ ;  $Y_N$  range 7,5 to <15

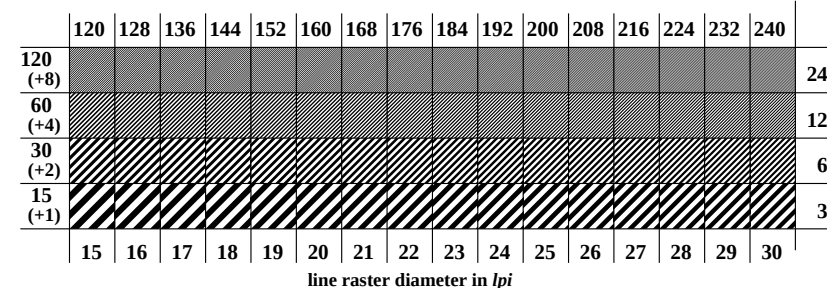
input:  $w (->rgb^*_d) \text{setgray}$   
output 135-0:  $g_p=0.62$ ;  $g_N=1.0$



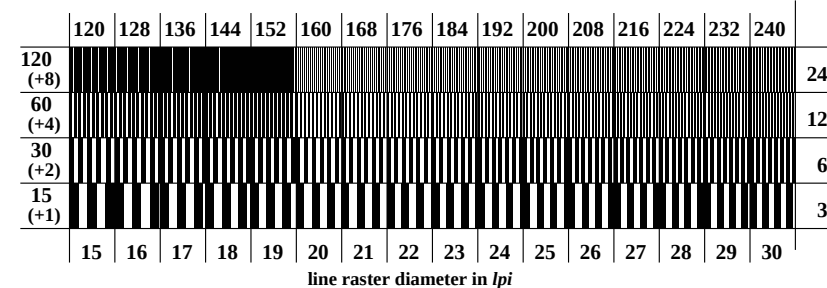
Landolt-rings W-N

code: background-ring

OE511-1N, Picture A4-135-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE511-3N, Picture A5-135-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE511-5N, Picture A6-135-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta



| Test for the best visual linearized output of Picture A7-135-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-135-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
|                                                                                  | resolution diameter                  | Yes/No      |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
|                                                                                  | resolution diameter                  | Yes/No      |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
|                                                                                  | resolution diameter                  | Yes/No      |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
|                                                                                  | resolution diameter                  | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-135-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| of the given 5 steps:                                                            |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-135-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| of the given 16 steps:                                                           |                                      | ..... Steps |

Part 1

OE510-3N-135-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF> underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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 OE51L0NP.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 OE51L0NA.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

OE510-7N-135-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:10$ ;  $Y_N$  range 7,5 to <15

| Test for the best visual linearized output of Picture A7-135-0               |                   | Yes/No       |
|------------------------------------------------------------------------------|-------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |              |
| <b>Test of the Landolt-rings N-W according to picture A4-135-0</b>           |                   |              |
| N-W-radial grating:                                                          |                   |              |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |              |
|                                                                              | background - ring | Yes/No       |
|                                                                              | 0 - 1             | Yes/No       |
|                                                                              | 7 - 8             | Yes/No       |
|                                                                              | E - F             | Yes/No       |
|                                                                              | 2 - 0             | Yes/No       |
|                                                                              | 8 - 6             | Yes/No       |
|                                                                              | F - D             | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-135-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-135-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |

Part 2

OE511-3N-135-1

**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)

**PDF file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>

**PS file:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>

**Picture A7-135-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

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

*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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF>

**picture A7-135-2**

underline Yes/No

**PS-File:** <http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS>

**picture A7-135-2**

or underline Yes/No

**colour measurement and specification for:**

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

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

underline Yes/No

**Colorimetric specification with PS file for colours in the columns A to T**

Exchange of CIELAB data in file [www.ps.bam.de/De17/10L/L17e00NP.PS](http://www.ps.bam.de/De17/10L/L17e00NP.PS) and transfer

of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF

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

underline Yes/No

Part 4

OE511-7N-135-1

output 135-1:  $g_P=0,62$ ;  $g_N=1,0$

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

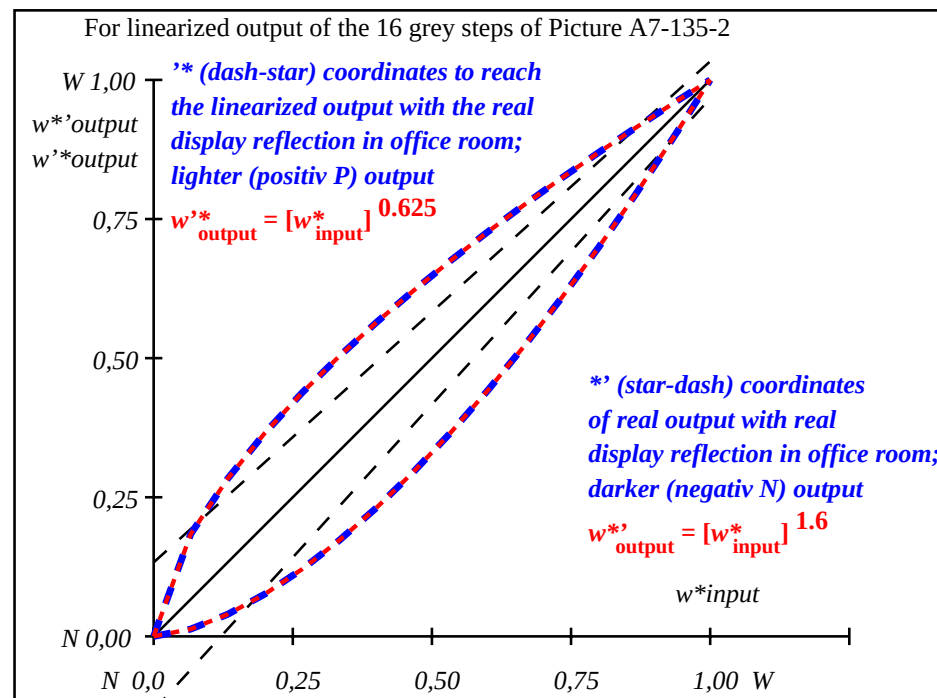
| i  | LAB*ref | I*out | LAB*out | LAB*out/c-ref | $\Delta E^*$ | Start output S1 |
|----|---------|-------|---------|---------------|--------------|-----------------|
| 1  | 37.99   | 0.0   | 0.0     | 37.99         | 0.0          | 0.0             |
| 2  | 41.81   | 0.0   | 0.18    | 48.55         | 0.0          | 0.0             |
| 3  | 45.64   | 0.0   | 0.28    | 54.29         | 0.0          | 0.0             |
| 4  | 49.47   | 0.0   | 0.37    | 58.99         | 0.0          | 0.0             |
| 5  | 53.3    | 0.0   | 0.44    | 63.12         | 0.0          | 0.0             |
| 6  | 57.13   | 0.0   | 0.5     | 66.89         | 0.0          | 0.0             |
| 7  | 60.96   | 0.0   | 0.56    | 70.37         | 0.0          | 0.0             |
| 8  | 64.78   | 0.0   | 0.62    | 73.65         | 0.0          | 0.0             |
| 9  | 68.61   | 0.0   | 0.68    | 76.75         | 0.0          | 0.0             |
| 10 | 72.44   | 0.0   | 0.73    | 79.71         | 0.0          | 0.0             |
| 11 | 76.27   | 0.0   | 0.78    | 82.56         | 0.0          | 0.0             |
| 12 | 80.1    | 0.0   | 0.82    | 85.29         | 0.0          | 0.0             |
| 13 | 83.93   | 0.0   | 0.87    | 87.93         | 0.0          | 0.0             |
| 14 | 87.75   | 0.0   | 0.91    | 90.5          | 0.0          | 0.0             |
| 15 | 91.58   | 0.0   | 0.96    | 92.99         | 0.0          | 0.0             |
| 16 | 95.41   | 0.0   | 1.0     | 95.41         | 0.0          | 0.0             |
| 17 | 37.99   | 0.0   | 0.0     | 37.99         | 0.0          | 0.0             |
| 18 | 52.34   | 0.0   | 0.42    | 62.13         | 0.0          | 0.0             |
| 19 | 66.7    | 0.0   | 0.65    | 75.22         | 0.0          | 0.0             |
| 20 | 81.05   | 0.0   | 0.84    | 85.96         | 0.0          | 0.0             |
| 21 | 95.41   | 0.0   | 1.0     | 95.41         | 0.0          | 0.0             |

Mean lightness difference (16 steps)  $\Delta E^*_{\text{CIELAB}} = 6.1$

Mean lightness difference (5 steps)  $\Delta E^*_{\text{CIELAB}} = 4.6$

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

OE510-3N-135-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



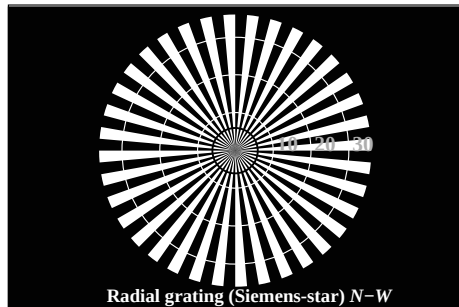
OE511-3N-135-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y^*_{\text{intended}}$<br>(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 |
|--------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.63$<br>No. and<br>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      |
| $w^* = I^*_{\text{CIELAB}, r}$<br>(relative)                 | 0.000     | 0.067     | 0.133     | 0.200     | 0.267     | 0.333     | 0.400     | 0.467     | 0.533     | 0.600     | 0.667     | 0.733     | 0.800     | 0.867     | 0.933     | 1.000     |
| $w^*_{\text{intended}}$<br>$w^*_{\text{out}}$                | 0.000     | 0.185     | 0.283     | 0.366     | 0.438     | 0.503     | 0.564     | 0.621     | 0.675     | 0.727     | 0.776     | 0.824     | 0.87      | 0.915     | 0.958     | 1.0       |

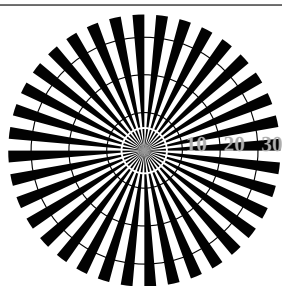
OE510-7N, Picture A7-135-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:10$ ;  $Y_N$  range 7,5 to <15

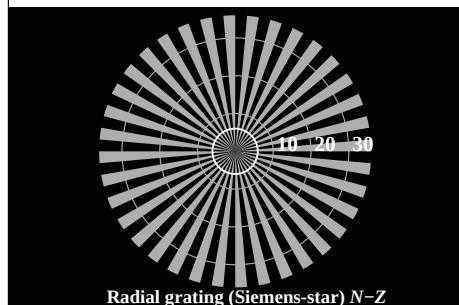
input:  $w$  ( $\rightarrow \text{rgb}^*_{\text{d}}$ ) setgray  
output 135-2:  $g_p=0.62$ ;  $g_N=1.0$



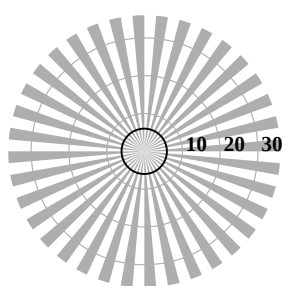
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

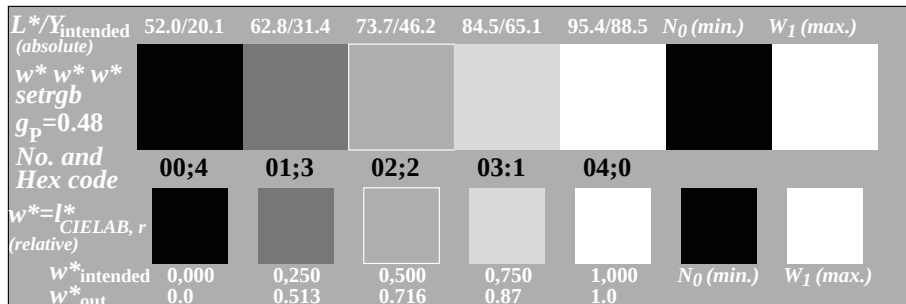


Radial grating (Siemens-star) N-Z

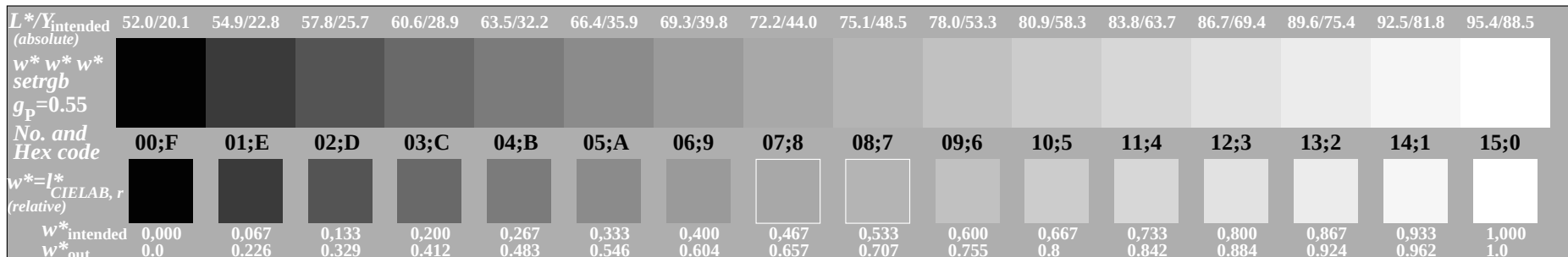


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-136-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-5N, Picture A2-136-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-7N, Picture A3-136-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

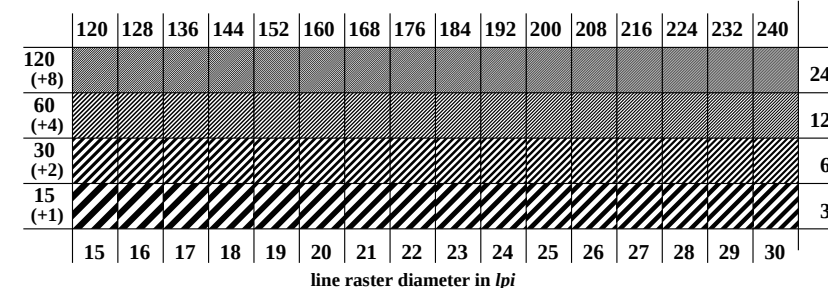
OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$  range 15 to <30

|                   |  |   |           |     |
|-------------------|--|---|-----------|-----|
| background step 0 |  | 1 | ring step | 0-1 |
| Hex code          |  | 8 | Hex code  | 7-8 |
| 7                 |  | F | E-F       |     |
| E                 |  | 0 | 2-0       |     |
| 2                 |  | 6 | 8-6       |     |
| 8                 |  | D | F-D       |     |
| F                 |  |   |           |     |

Landolt-rings W-N

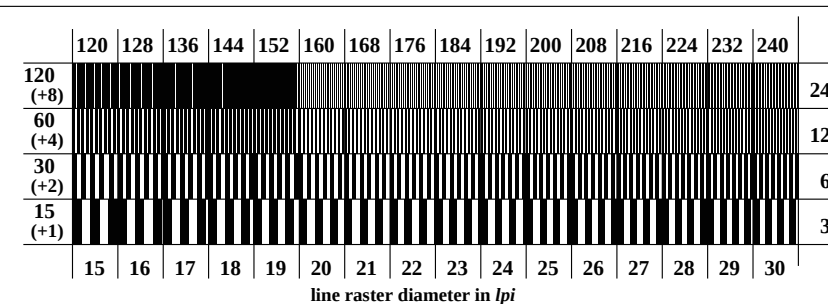
code: background-ring

OE511-1N, Picture A4-136-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-3N, Picture A5-136-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-5N, Picture A6-136-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

input:  $w (->rgb^*_d) \text{setgray}$   
output 136-0:  $g_p=0.55$ ;  $g_N=1.0$

| Test for the best visual linearized output of Picture A7-136-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-136-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-136-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-136-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-136-1

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

**PDF-File:** http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF underline Yes/No

**PS-File:** http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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 OE51L0NP.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 OE51L0NA.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

OE510-7N-136-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$  range 15 to <30

| Test for the best visual linearized output of Picture A7-136-0               |                   | Yes/No       |
|------------------------------------------------------------------------------|-------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |              |
| <b>Test of the Landolt-rings N-W according to picture A4-136-0</b>           |                   |              |
| N-W-radial grating:                                                          |                   |              |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |              |
|                                                                              | background - ring | Yes/No       |
|                                                                              | 0 - 1             | Yes/No       |
|                                                                              | 7 - 8             | Yes/No       |
|                                                                              | E - F             | Yes/No       |
|                                                                              | 2 - 0             | Yes/No       |
|                                                                              | 8 - 6             | Yes/No       |
|                                                                              | F - D             | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-136-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-136-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |

Part 2

OE511-3N-136-1

**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)

**PDF file:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF

**PS file:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS

**Picture A7-136-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0 underline 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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF

**picture A7-136-2**

underline Yes/No

**PS-File:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS

**picture A7-136-2**

or underline Yes/No

**colour measurement and specification for:**

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

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

underline Yes/No

**Colorimetric specification with PS file for colours in the columns A to T**

Exchange of CIELAB data in file www.ps.bam.de/De17/10L/L17e00NP.PS and transfer

of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF

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

underline Yes/No

Part 4

OE511-7N-136-1

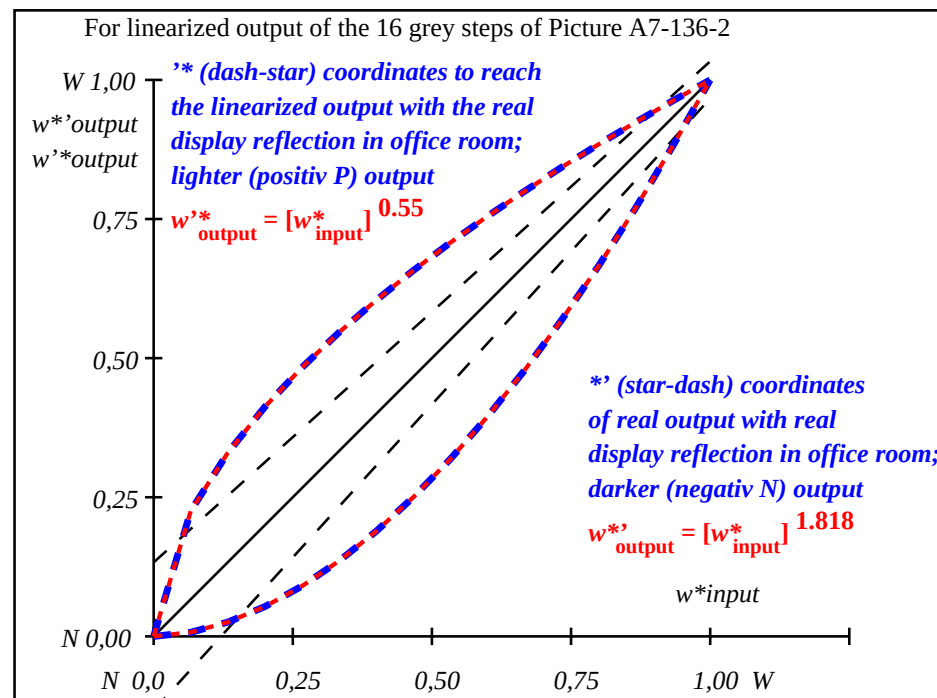
output 136-1:  $g_P=0.55$ ;  $g_N=1.0$



See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                               | LAB*ref       | L*out          | LAB*out       | LAB*out/c-ref | ΔE*                     | Start output S1                      |
|---------------------------------|---------------|----------------|---------------|---------------|-------------------------|--------------------------------------|
| 1                               | 52.02 0.0 0.0 | 0.0 0.0 0.0    | 52.02 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    | Specification according to           |
| 2                               | 54.91 0.0 0.0 | 0.23 61.8 0.0  | 0.0 0.0 0.0   | 6.89 0.0 0.0  | 6.89                    | ISO/IEC 15775 Annex G                |
| 3                               | 57.8 0.0 0.0  | 0.33 66.34 0.0 | 0.0 0.0 0.0   | 8.54 0.0 0.0  | 8.54                    | and DIN 33866-1 Annex G              |
| 4                               | 60.7 0.0 0.0  | 0.41 69.92 0.0 | 0.0 0.0 0.0   | 9.23 0.0 0.0  | 9.23                    |                                      |
| 5                               | 63.59 0.0 0.0 | 0.48 72.99 0.0 | 0.0 0.0 0.0   | 9.4 0.0 0.0   | 9.4                     |                                      |
| 6                               | 66.48 0.0 0.0 | 0.55 75.73 0.0 | 0.0 0.0 0.0   | 9.25 0.0 0.0  | 9.25                    |                                      |
| 7                               | 69.37 0.0 0.0 | 0.6 78.23 0.0  | 0.0 0.0 0.0   | 8.86 0.0 0.0  | 8.86                    |                                      |
| 8                               | 72.27 0.0 0.0 | 0.66 80.55 0.0 | 0.0 0.0 0.0   | 8.28 0.0 0.0  | 8.28                    |                                      |
| 9                               | 75.16 0.0 0.0 | 0.71 82.73 0.0 | 0.0 0.0 0.0   | 7.57 0.0 0.0  | 7.57                    |                                      |
| 10                              | 78.05 0.0 0.0 | 0.76 84.78 0.0 | 0.0 0.0 0.0   | 6.73 0.0 0.0  | 6.73                    |                                      |
| 11                              | 80.95 0.0 0.0 | 0.8 86.74 0.0  | 0.0 0.0 0.0   | 5.79 0.0 0.0  | 5.79                    |                                      |
| 12                              | 83.84 0.0 0.0 | 0.84 88.6 0.0  | 0.0 0.0 0.0   | 4.77 0.0 0.0  | 4.77                    |                                      |
| 13                              | 86.73 0.0 0.0 | 0.88 90.4 0.0  | 0.0 0.0 0.0   | 3.67 0.0 0.0  | 3.67                    |                                      |
| 14                              | 89.62 0.0 0.0 | 0.92 92.13 0.0 | 0.0 0.0 0.0   | 2.5 0.0 0.0   | 2.5                     |                                      |
| 15                              | 92.52 0.0 0.0 | 0.96 93.79 0.0 | 0.0 0.0 0.0   | 1.28 0.0 0.0  | 1.28                    | Mean lightness difference (16 steps) |
| 16                              | 95.41 0.0 0.0 | 1.0 95.41 0.0  | 0.0 0.0 0.0   | 0.0 0.0 0.0   | 0.01                    | ΔE*CIELAB = 5.8                      |
| 17                              | 52.02 0.0 0.0 | 0.0 0.0 0.0    | 52.02 0.0 0.0 | 0.0 0.0 0.0   | 0.01                    |                                      |
| 18                              | 62.87 0.0 0.0 | 0.47 72.26 0.0 | 0.0 0.0 0.0   | 9.4 0.0 0.0   | 9.4                     |                                      |
| 19                              | 73.71 0.0 0.0 | 0.68 81.66 0.0 | 0.0 0.0 0.0   | 7.94 0.0 0.0  | 7.94                    |                                      |
| 20                              | 84.56 0.0 0.0 | 0.85 89.06 0.0 | 0.0 0.0 0.0   | 4.5 0.0 0.0   | 4.5                     | Mean lightness difference (5 steps)  |
| 21                              | 95.41 0.0 0.0 | 1.0 95.41 0.0  | 0.0 0.0 0.0   | 0.0 0.0 0.0   | 0.01                    | ΔL*CIELAB = 4.4                      |
| Mean colour reproduction index: |               |                |               |               | R* <sub>ab,m</sub> = 75 |                                      |

OE510-3N-136-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-136-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

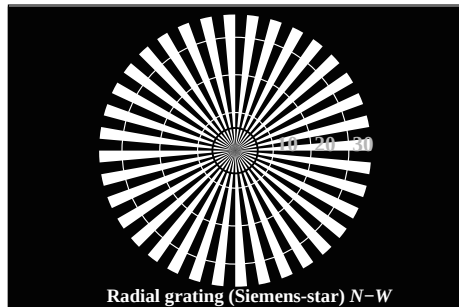
| $L^*/Y_{\text{intended}}$<br>(absolute)                          | 52.0/20.2 | 54.9/22.8 | 57.8/25.8 | 60.7/28.9 | 63.6/32.3 | 66.5/36.0 | 69.4/39.9 | 72.3/44.1 | 75.2/48.5 | 78.1/53.3 | 80.9/58.4 | 83.8/63.8 | 86.7/69.5 | 89.6/75.5 | 92.5/81.9 | 95.4/88.6 |
|------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.55$<br>No. and<br>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      |
| $w^* = [L^*_{\text{intended}}]_{\text{CIELAB}, r}$<br>(relative) | 0.000     | 0.067     | 0.133     | 0.200     | 0.267     | 0.333     | 0.400     | 0.467     | 0.533     | 0.600     | 0.667     | 0.733     | 0.800     | 0.867     | 0.933     | 1.000     |
| $w^*_{\text{out}}$                                               | 0.0       | 0.226     | 0.33      | 0.413     | 0.484     | 0.546     | 0.604     | 0.658     | 0.707     | 0.755     | 0.8       | 0.843     | 0.885     | 0.925     | 0.963     | 1.0       |

OE510-7N, Picture A7-136-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

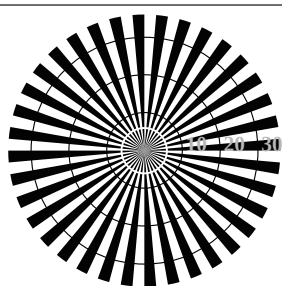
OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$  range 15 to <30

input:  $w (-> \text{rgb}^*_d) \text{setgray}$   
output 136-2:  $g_p=0.55$ ;  $g_N=1.0$

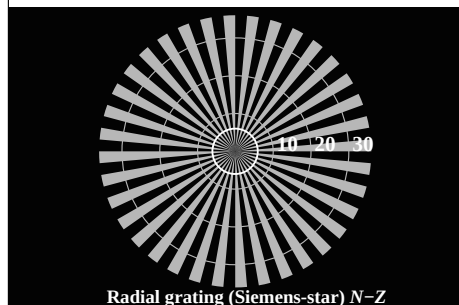
See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB



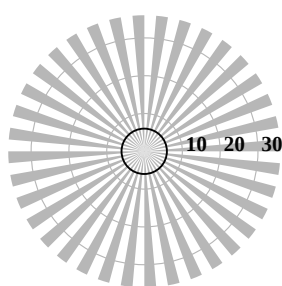
Radial grating (Siemens-star) N-W



Radial grating (Siemens-star) W-N

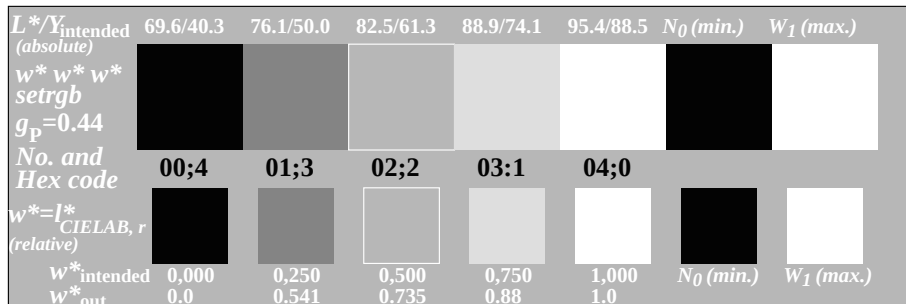


Radial grating (Siemens-star) N-Z

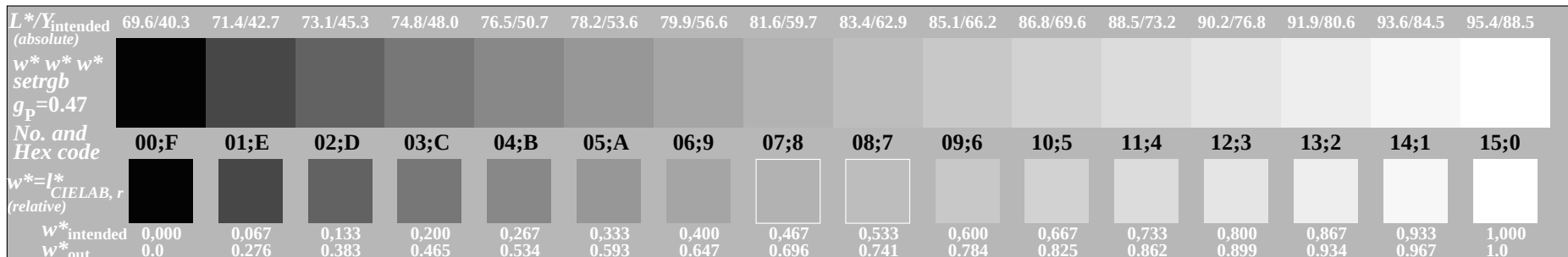


Radial grating (Siemens-star) W-Z

OE510-3N, Picture A1-137-0: Radial grating N-W, W-N, N-Z, W-Z; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-5N, Picture A2-137-0: 5 equidistant  $L^*$ -grey steps+ $N_0$ + $W_1$ ; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



OE510-7N, Picture A3-137-0: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^* \text{setrgbcolor}$

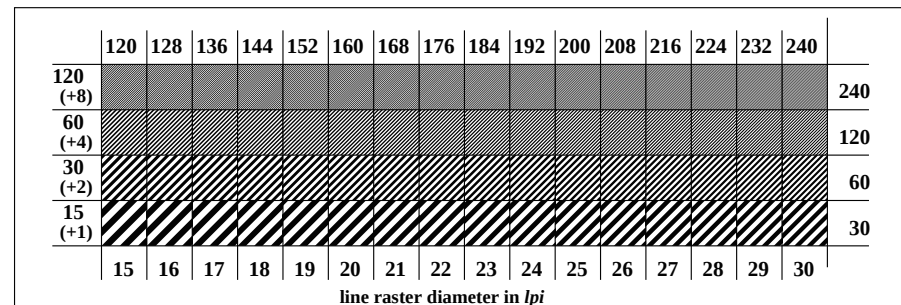
OE51: similar ME16 according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:40$ ;  $Y_N$  range 30 to <60

|                   |  |   |           |     |
|-------------------|--|---|-----------|-----|
| background step 0 |  | 1 | ring step | 0-1 |
| Hex code          |  | 8 | Hex code  | 7-8 |
| 7                 |  | F |           | E-F |
| E                 |  | 0 |           | 2-0 |
| 2                 |  | 6 |           | 8-6 |
| 8                 |  | D |           | F-D |
| F                 |  |   |           |     |

Landolt-rings W-N

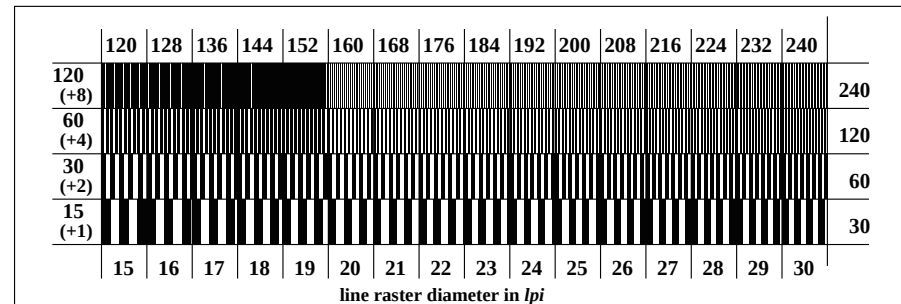
code: background-ring

OE511-1N, Picture A4-137-0: Landolt-rings W-N; PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-3N, Picture A5-137-0: Line raster under 45° (or 135°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$



line raster diameter in lpi

OE511-5N, Picture A6-137-0: Line raster under 90° (or 0°); PS operator:  $w^* w^* w^* \text{setrgbcolor}$

input:  $w$  ( $\rightarrow \text{rgb}^*_d$ )  $\text{setgray}$   
output 137-0:  $g_p=0.47$ ;  $g_N=1.0$

TUB registration: 20110801-OE51/OE51L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta

| Test for the best visual linearized output of Picture A7-137-0                   |                                      | Yes/No      |
|----------------------------------------------------------------------------------|--------------------------------------|-------------|
| <b>Output test with the computer display ( ) or the external display ( )</b>     |                                      |             |
| <b>Test of the radial grating according to picture A1-137-0</b>                  |                                      |             |
| N-W-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-N-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| N-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| W-Z-radial grating:                                                              | Is the resolution diameter < 6 mm?   | Yes/No      |
|                                                                                  | Test with magnifying glass (e.g. 6x) | ..... mm    |
| <b>Test of 5 visual equidistant L*-grey steps according to picture A2-137-0</b>  |                                      |             |
| Are the 5 steps on the upper rows distinguishable?                               |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | ..... Steps |
| <b>Test of 16 visual equidistant L*-grey steps according to picture A3-137-0</b> |                                      |             |
| Are the 16 steps on the upper rows distinguishable?                              |                                      | Yes/No      |
| If No: How many steps can be distinguished?                                      |                                      | .... Steps  |

Part 1

OE510-3N-137-1

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

**PDF-File:** http://130.149.60.45/farbmetrik/OE51/OE51L0NP.PDF underline Yes/No

**PS-File:** http://130.149.60.45/farbmetrik/OE51/OE51L0NA.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 OE51L0NP.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 OE51L0NA.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

OE510-7N-137-1

OE51: Form A for test chart according to ISO 9241-306; 1MR, DH input: w (->rgb\*d) setgray  
Viewing Y contrast  $Y_W:Y_N=88,9:40$ ;  $Y_N$  range 30 to <60

| Test for the best visual linearized output of Picture A7-137-0               |                   | Yes/No       |
|------------------------------------------------------------------------------|-------------------|--------------|
| <b>Output test with the computer display ( ) or the external display ( )</b> |                   |              |
| <b>Test of the Landolt-rings N-W according to picture A4-137-0</b>           |                   |              |
| N-W-radial grating:                                                          |                   |              |
| Is the recognition frequency of the Landolt-rings > 50% (5 of 8 at least)?   |                   |              |
|                                                                              | background - ring | Yes/No       |
|                                                                              | 0 - 1             | Yes/No       |
|                                                                              | 7 - 8             | Yes/No       |
|                                                                              | E - F             | Yes/No       |
|                                                                              | 2 - 0             | Yes/No       |
|                                                                              | 8 - 6             | Yes/No       |
|                                                                              | F - D             | Yes/No       |
| <b>Test of the radial grating under 45° according to picture A5-137-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |
| <b>Test of the radial grating under 90° according to picture A6-137-0</b>    |                   |              |
| Can equally spaced lines be seen?                                            |                   |              |
| Visual testing: for radial diameter from 15 to 60 lpi                        |                   | Yes/No       |
| Test with a magnifying glass (e.g. 6x): - from 15 lpi:                       |                   | to ..... lpi |

Part 2

OE511-3N-137-1

**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)

**PDF file:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF

**PS file:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS

**Picture A7-137-2: contrast range:** (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0 underline 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://130.149.60.45/farbmetrik/OE51/OE51F1P2.PDF

**picture A7-137-2**

underline Yes/No

**PS-File:** http://130.149.60.45/farbmetrik/OE51/OE51F1P2.PS

**picture A7-137-2**

or underline Yes/No

**colour measurement and specification for:**

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

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

underline Yes/No

**Colorimetric specification with PS file for colours in the columns A to T**

Exchange of CIELAB data in file www.ps.bam.de/De17/10L/L17e00NP.PS and transfer

of the PS-file L17e00NP.PS in PDF-file L17e00NP.PDF

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

underline Yes/No

Part 4

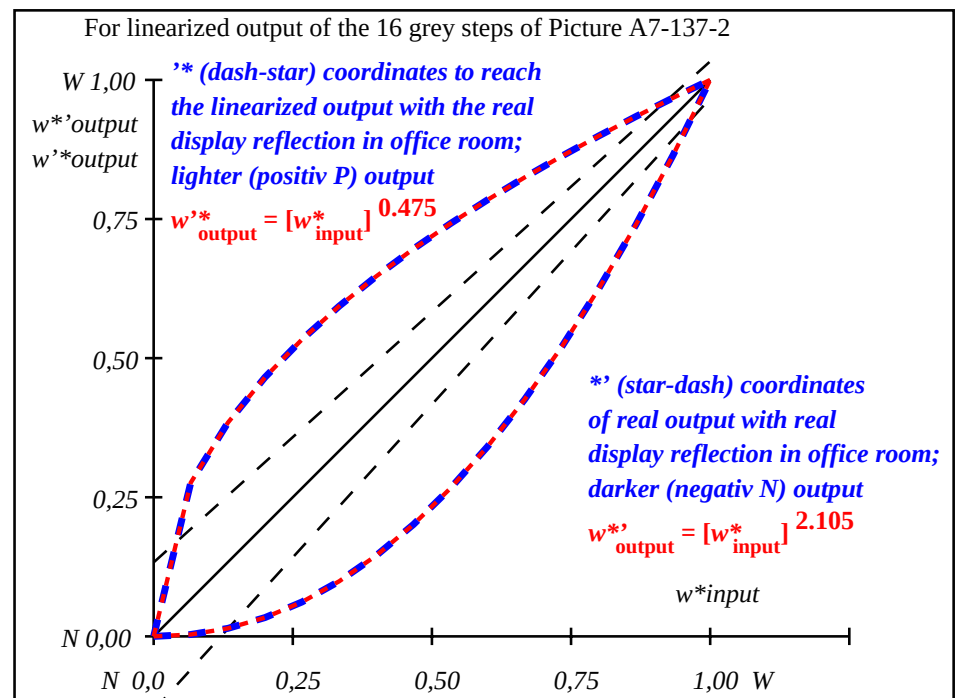
OE511-7N-137-1

output 137-1:  $g_P=0,47$ ;  $g_N=1,0$

See similar ISO test charts: <http://www.ps.bam.de/24705TE>, <http://www.ps.bam.de/9241E>  
Technical information: <http://www.ps.bam.de/33872E> Version 2.1, io=1,1, CIELAB

| i                               | LAB*ref |     |     | L*out |       |     | LAB*out/c-ref |      |     | $\Delta E^*$             | <div>Start output S1</div> <div>Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G</div> |
|---------------------------------|---------|-----|-----|-------|-------|-----|---------------|------|-----|--------------------------|----------------------------------------------------------------------------------------------------------------|
| 1                               | 69.7    | 0.0 | 0.0 | 0.0   | 69.7  | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                     |                                                                                                                |
| 2                               | 71.41   | 0.0 | 0.0 | 0.28  | 76.8  | 0.0 | 0.0           | 5.39 | 0.0 | 5.39                     |                                                                                                                |
| 3                               | 73.13   | 0.0 | 0.0 | 0.38  | 79.57 | 0.0 | 0.0           | 6.45 | 0.0 | 6.45                     |                                                                                                                |
| 4                               | 74.84   | 0.0 | 0.0 | 0.47  | 81.67 | 0.0 | 0.0           | 6.83 | 0.0 | 6.83                     |                                                                                                                |
| 5                               | 76.55   | 0.0 | 0.0 | 0.53  | 83.42 | 0.0 | 0.0           | 6.87 | 0.0 | 6.87                     |                                                                                                                |
| 6                               | 78.27   | 0.0 | 0.0 | 0.59  | 84.96 | 0.0 | 0.0           | 6.69 | 0.0 | 6.69                     |                                                                                                                |
| 7                               | 79.98   | 0.0 | 0.0 | 0.65  | 86.34 | 0.0 | 0.0           | 6.35 | 0.0 | 6.35                     |                                                                                                                |
| 8                               | 81.7    | 0.0 | 0.0 | 0.7   | 87.6  | 0.0 | 0.0           | 5.9  | 0.0 | 5.9                      |                                                                                                                |
| 9                               | 83.41   | 0.0 | 0.0 | 0.74  | 88.77 | 0.0 | 0.0           | 5.36 | 0.0 | 5.36                     |                                                                                                                |
| 10                              | 85.12   | 0.0 | 0.0 | 0.78  | 89.87 | 0.0 | 0.0           | 4.75 | 0.0 | 4.75                     |                                                                                                                |
| 11                              | 86.84   | 0.0 | 0.0 | 0.82  | 90.91 | 0.0 | 0.0           | 4.07 | 0.0 | 4.07                     |                                                                                                                |
| 12                              | 88.55   | 0.0 | 0.0 | 0.86  | 91.89 | 0.0 | 0.0           | 3.33 | 0.0 | 3.33                     |                                                                                                                |
| 13                              | 90.27   | 0.0 | 0.0 | 0.9   | 92.82 | 0.0 | 0.0           | 2.56 | 0.0 | 2.56                     |                                                                                                                |
| 14                              | 91.98   | 0.0 | 0.0 | 0.93  | 93.72 | 0.0 | 0.0           | 1.74 | 0.0 | 1.74                     |                                                                                                                |
| 15                              | 93.7    | 0.0 | 0.0 | 0.97  | 94.58 | 0.0 | 0.0           | 0.89 | 0.0 | 0.89                     |                                                                                                                |
| 16                              | 95.41   | 0.0 | 0.0 | 1.0   | 95.41 | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                     |                                                                                                                |
| 17                              | 69.7    | 0.0 | 0.0 | 0.0   | 69.7  | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                     |                                                                                                                |
| 18                              | 76.13   | 0.0 | 0.0 | 0.52  | 83.01 | 0.0 | 0.0           | 6.88 | 0.0 | 6.88                     |                                                                                                                |
| 19                              | 82.55   | 0.0 | 0.0 | 0.72  | 88.2  | 0.0 | 0.0           | 5.64 | 0.0 | 5.64                     |                                                                                                                |
| 20                              | 88.98   | 0.0 | 0.0 | 0.87  | 92.13 | 0.0 | 0.0           | 3.14 | 0.0 | 3.14                     |                                                                                                                |
| 21                              | 95.41   | 0.0 | 0.0 | 1.0   | 95.41 | 0.0 | 0.0           | 0.0  | 0.0 | 0.01                     |                                                                                                                |
| Mean colour reproduction index: |         |     |     |       |       |     |               |      |     | $R^*_{\text{ab,m}} = 82$ |                                                                                                                |

OE510-3N-137-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE511-3N-137-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

| $L^*/Y^*_{\text{intended}}$<br>(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 |
|--------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $w^* w^* w^*$<br>setrgb<br>$g_p=0.48$<br>No. and<br>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      |
| $w^* = L^*_{\text{CIELAB}, r}$<br>(relative)                 | 0.000     | 0.067     | 0.133     | 0.200     | 0.267     | 0.333     | 0.400     | 0.467     | 0.533     | 0.600     | 0.667     | 0.733     | 0.800     | 0.867     | 0.933     | 1.000     |
| $w^*_{\text{intended}}$<br>$w^*_{\text{out}}$                | 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     |

OE510-7N, Picture A7-137-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE51: In-output relation according to ISO 9241-306; 1MR, DH  
Viewing Y contrast  $Y_W:Y_N=88,9:40$ ;  $Y_N$  range 30 to <60

input:  $w$  ( $\rightarrow \text{rgb}^*_d$ ) setgray  
output 137-2:  $g_p=0.47$ ;  $g_N=1.0$