

Test for the visual linearized output of Pictures D2W-130-0 to D7W-130-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-130-0

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

Test of the 14 CIE-test colours according to picture D3W-130-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-130-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-130-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-130-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH;  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings  
output 130-1:  $g_p=1.0$ ;  $g_N=1.0$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-130-0

Colour row	Test	Yes/No
$W-R_d$ White - Orangered:	Are all the 16 steps distinguishable?	Yes/No
	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	Are all the 16 steps distinguishable?	Yes/No
	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	Are all the 16 steps distinguishable?	Yes/No
	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	Are all the 16 steps distinguishable?	Yes/No
	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-130-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-130-0, and D7W-130-0

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

Colour row $W-R_d$	Colour row $W-G_d$	Colour row $W-B_d$	Colour row $W-N$
background - ring	background - ring	background - ring	background - ring
0 - 1	Yes/No	0 - 1	Yes/No
7 - 8	Yes/No	7 - 8	Yes/No
E - F	Yes/No	E - F	Yes/No
2 - 0	Yes/No	2 - 0	Yes/No
8 - 6	Yes/No	8 - 6	Yes/No
F - D	Yes/No	F - D	Yes/No

Part 1

OE690-3N-130-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> underline Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> underline Yes/No

Picture A7-130-2: contrast range: (>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/OE69/OE69F1P2.PDF>

picture A7-130-2 underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS>

picture A7-130-2 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

OE691-7N-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*
1	0.0	0.0	0.0	0.0	0.01
2	6.36	0.0	0.07	6.36	0.01
3	12.72	0.0	0.13	12.72	0.01
4	19.08	0.0	0.2	19.08	0.01
5	25.44	0.0	0.27	25.44	0.01
6	31.8	0.0	0.33	31.8	0.01
7	38.16	0.0	0.4	38.16	0.01
8	44.52	0.0	0.47	44.52	0.01
9	50.89	0.0	0.53	50.89	0.01
10	57.25	0.0	0.6	57.25	0.01
11	63.61	0.0	0.67	63.61	0.01
12	69.97	0.0	0.73	69.97	0.01
13	76.33	0.0	0.8	76.33	0.01
14	82.69	0.0	0.87	82.69	0.01
15	89.05	0.0	0.93	89.05	0.01
16	95.41	0.0	1.0	95.41	0.01
17	0.0	0.0	0.0	0.0	0.01
18	23.85	0.0	0.25	23.85	0.01
19	47.71	0.0	0.5	47.71	0.01
20	71.56	0.0	0.75	71.56	0.01
21	95.41	0.0	1.0	95.41	0.01

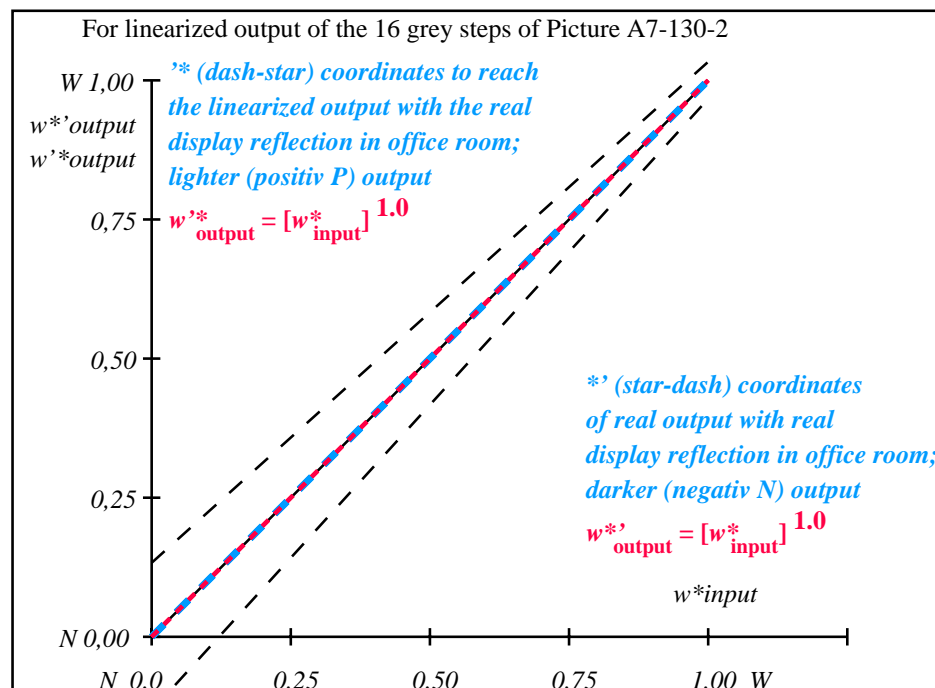
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 0.0$

Mean lightness difference (5 steps)  
 $\Delta L^*_{\text{CIELAB}} = 0.0$

Mean colour reproduction index:  $R^*_{\text{ab,m}} = 100$

OE690-3N-130-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-130-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

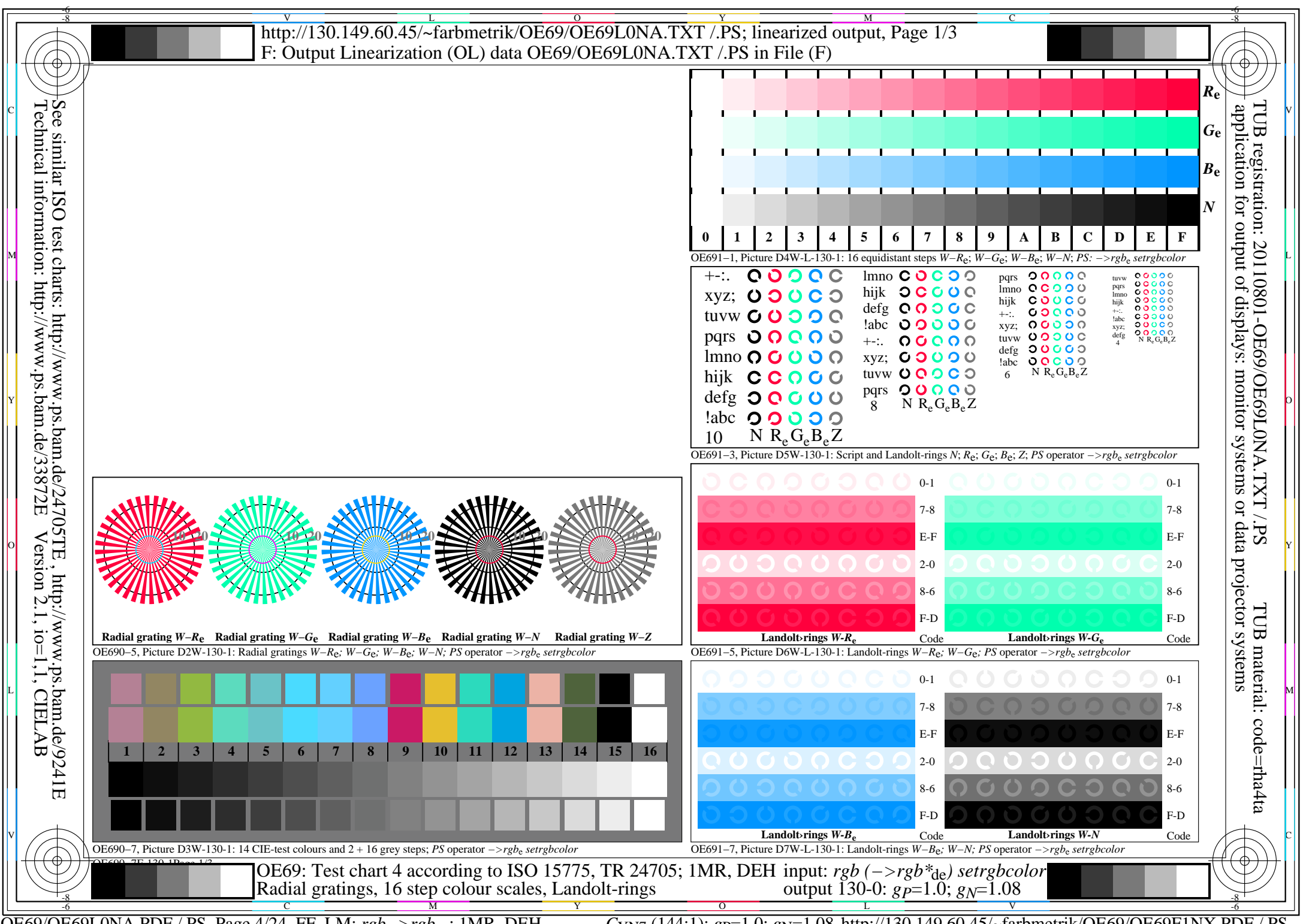
$L^*/Y_{\text{intended}}$ (absolute)	0.0/0.0	6.4/0.7	12.7/1.5	19.1/2.8	25.4/4.6	31.8/7.0	38.2/10.2	44.5/14.2	50.9/19.2	57.2/25.2	63.6/32.3	70.0/40.7	76.3/50.4	82.7/61.6	89.0/74.3	95.4/88.6
$w^* w^* w^*$ setrgb gp=1.0																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*$ CIELAB, r (relative)																
$w^*_{\text{intended}}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{\text{out}}$	0.0	0.067	0.133	0.2	0.267	0.333	0.4	0.467	0.533	0.6	0.667	0.733	0.8	0.867	0.933	1.0

OE690-7N, Picture A7-130-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*$  setrgbcolor

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,31$ ;  $Y_N$  range 0,0 to <0,46

input:  $rgb \rightarrow rgb^*_{\text{de}}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.0$

TUB registration: 20110801-OE69/OE69L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=th4ta





Test for the visual linearized output of Pictures D2W-131-0 to D7W-131-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-131-0

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

Test of the 14 CIE-test colours according to picture D3W-131-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-131-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-138-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-131-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH; Input:  $rgb(->rgb^*_{de})$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings output 130-1:  $g_P=1.0$ ;  $g_N=1.08$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-131-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-131-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-131-0, and D7W-131-0

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

Part 1

OE690-3N-138-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> underline Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> underline Yes/No

Picture A7-131-2: contrast range: (>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/OE69/OE69F1P2.PDF>

picture A7-131-2 underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS>

picture A7-131-2 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

OE691-7N-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	LAB*out/c-ref	ΔE*
1	5.69 0.0 0.0	0.0 0.0 0.0	5.69 0.0 0.0	0.0 0.0 0.0	0.01
2	11.67 0.0 0.0	0.04 0.0 0.0	9.36 0.0 0.0	-2.3 0.0 0.0	2.31
3	17.65 0.0 0.0	0.09 0.0 0.0	14.01 0.0 0.0	-3.63 0.0 0.0	3.64
4	23.63 0.0 0.0	0.15 0.0 0.0	19.12 0.0 0.0	-4.5 0.0 0.0	4.51
5	29.62 0.0 0.0	0.21 0.0 0.0	24.55 0.0 0.0	-5.06 0.0 0.0	5.07
6	35.6 0.0 0.0	0.27 0.0 0.0	30.23 0.0 0.0	-5.36 0.0 0.0	5.37
7	41.58 0.0 0.0	0.34 0.0 0.0	36.12 0.0 0.0	-5.45 0.0 0.0	5.46
8	47.56 0.0 0.0	0.41 0.0 0.0	42.19 0.0 0.0	-5.36 0.0 0.0	5.37
9	53.54 0.0 0.0	0.48 0.0 0.0	48.42 0.0 0.0	-5.11 0.0 0.0	5.12
10	59.52 0.0 0.0	0.55 0.0 0.0	54.79 0.0 0.0	-4.72 0.0 0.0	4.73
11	65.5 0.0 0.0	0.62 0.0 0.0	61.29 0.0 0.0	-4.2 0.0 0.0	4.21
12	71.48 0.0 0.0	0.69 0.0 0.0	67.91 0.0 0.0	-3.56 0.0 0.0	3.57
13	77.47 0.0 0.0	0.77 0.0 0.0	74.64 0.0 0.0	-2.82 0.0 0.0	2.83
14	83.45 0.0 0.0	0.84 0.0 0.0	81.47 0.0 0.0	-1.97 0.0 0.0	1.98
15	89.43 0.0 0.0	0.92 0.0 0.0	88.4 0.0 0.0	-1.02 0.0 0.0	1.03
16	95.41 0.0 0.0	1.0 0.0 0.0	95.41 0.0 0.0	0.0 0.0 0.0	0.01
17	5.69 0.0 0.0	0.0 0.0 0.0	5.69 0.0 0.0	0.0 0.0 0.0	0.01
18	28.12 0.0 0.0	0.19 0.0 0.0	23.17 0.0 0.0	-4.94 0.0 0.0	4.95
19	50.55 0.0 0.0	0.44 0.0 0.0	45.29 0.0 0.0	-5.25 0.0 0.0	5.26
20	72.98 0.0 0.0	0.71 0.0 0.0	69.58 0.0 0.0	-3.39 0.0 0.0	3.4
21	95.41 0.0 0.0	1.0 0.0 0.0	95.41 0.0 0.0	0.0 0.0 0.0	0.01

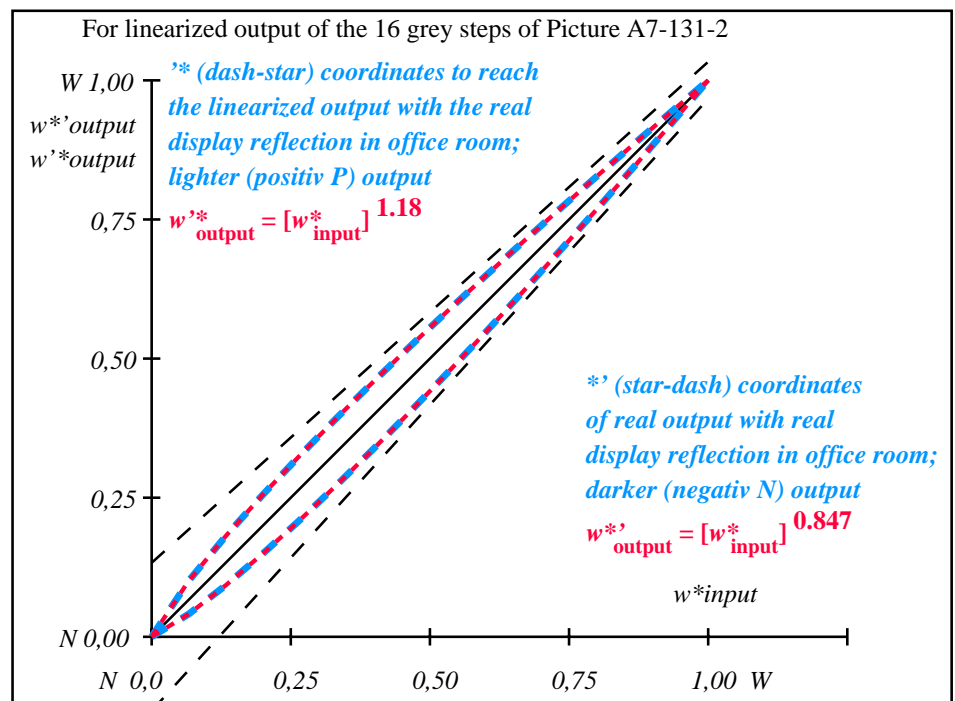
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 3.4$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 2.7$

Mean colour reproduction index:  $R^*_{ab,m} = 85$

OE690-3N-131-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



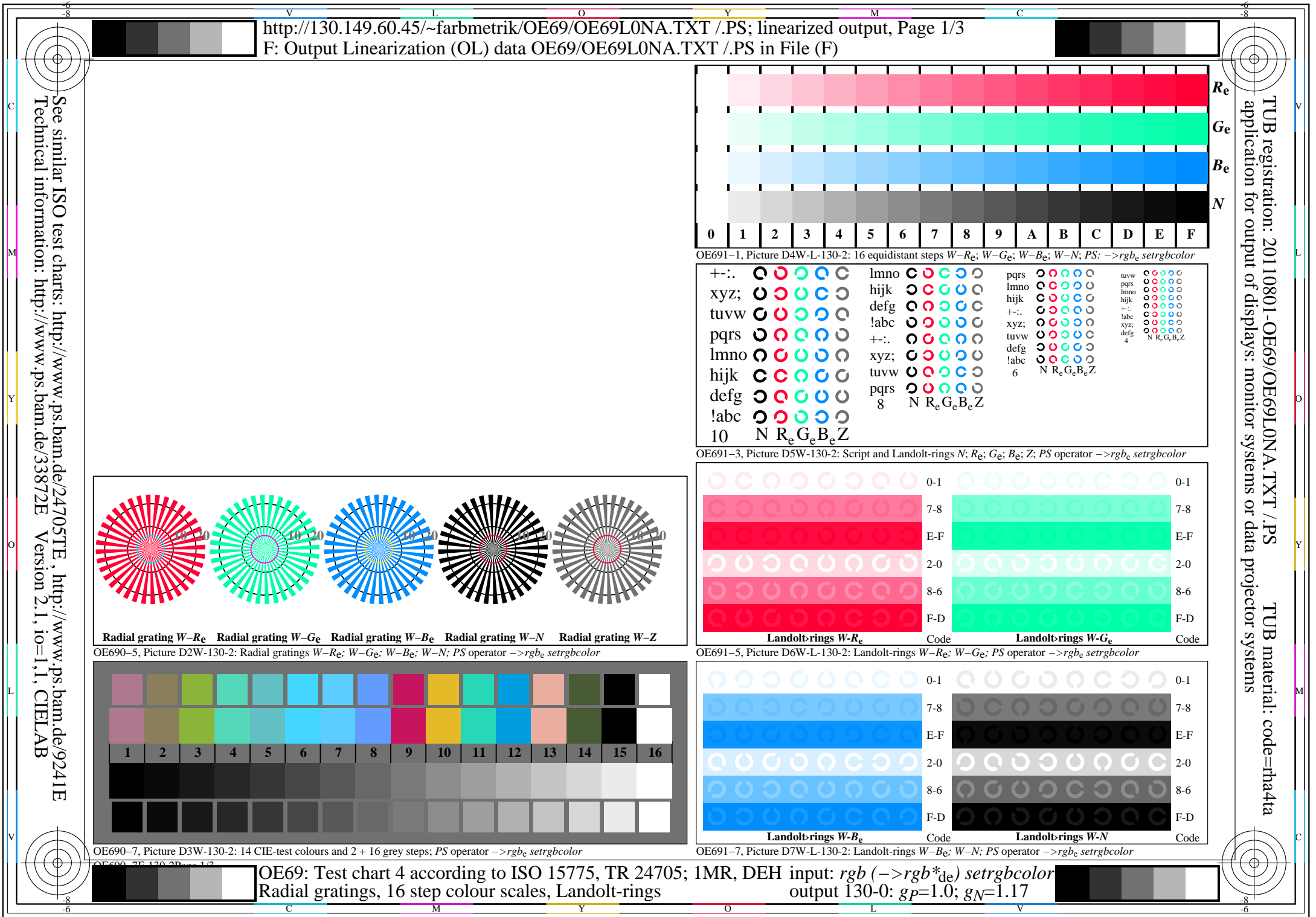
OE691-3N-131-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

$L^*/Y_{intended}$ (absolute)	5.7/0.6	11.7/1.4	17.7/2.4	23.6/4.0	29.6/6.1	35.6/8.8	41.6/12.2	47.6/16.5	53.5/21.5	59.5/27.6	65.5/34.7	71.5/42.9	77.5/52.3	83.4/63.0	89.4/75.1	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=1.18$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{out}$	0.0	0.041	0.093	0.15	0.211	0.273	0.339	0.407	0.476	0.547	0.62	0.693	0.769	0.845	0.921	1.0

OE690-7N, Picture A7-131-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:0,62$ ;  $Y_N$  range 0,46 to <0,93

input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.08$



Test for the visual linearized output of Pictures D2W-132-0 to D7W-132-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-132-0

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

Test of the 14 CIE-test colours according to picture D3W-132-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-132-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1316-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> **underline** Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-132-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH; Input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings output 130-1:  $g_P=1.0$ ;  $g_N=1.17$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-132-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-132-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-132-0, and D7W-132-0

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

Part 1

OE690-3N-1316-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> **underline** Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> **underline** Yes/No

Picture A7-132-2: contrast range: (>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/OE69/OE69F1P2.PDF>

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

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS>

picture A7-132-2 **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

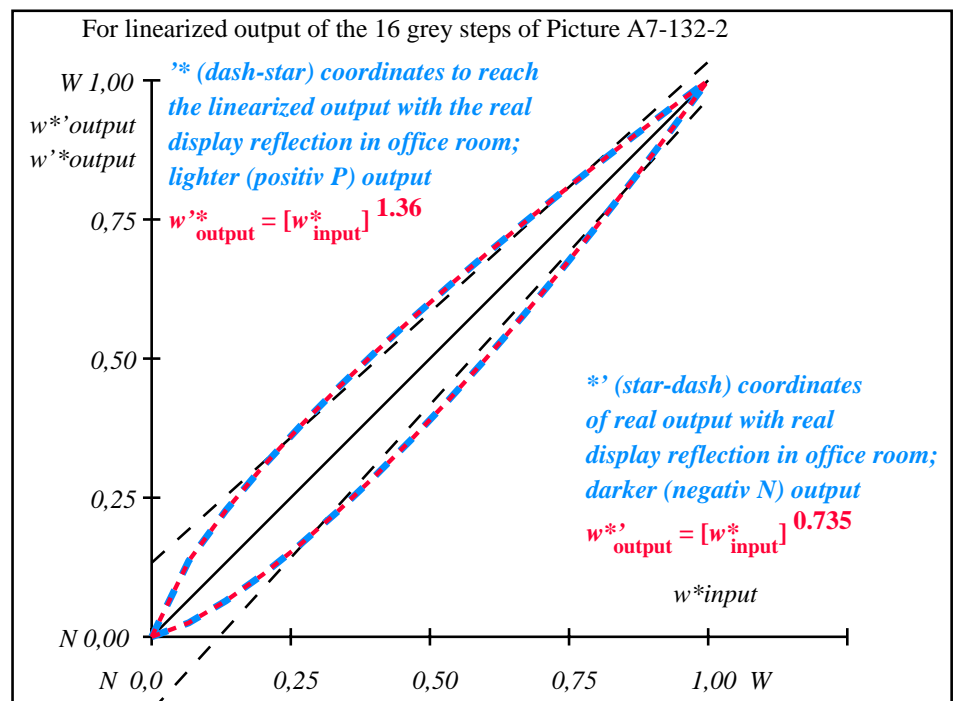
OE691-7N-132-1



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 Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G
1	10.99	0.0	0.0	0.0	10.99	0.0	0.0	0.0	0.0	0.0	0.0	0.01		
2	16.62	0.0	0.0	0.03	13.12	0.0	0.0	-3.49	0.0	0.0	3.5			
3	22.25	0.0	0.0	0.06	16.44	0.0	0.0	-5.8	0.0	0.0	5.81			
4	27.88	0.0	0.0	0.11	20.45	0.0	0.0	-7.41	0.0	0.0	7.42			
5	33.5	0.0	0.0	0.17	24.98	0.0	0.0	-8.51	0.0	0.0	8.52			
6	39.13	0.0	0.0	0.22	29.94	0.0	0.0	-9.18	0.0	0.0	9.19			
7	44.76	0.0	0.0	0.29	35.27	0.0	0.0	-9.48	0.0	0.0	9.49			
8	50.39	0.0	0.0	0.35	40.93	0.0	0.0	-9.44	0.0	0.0	9.45			
9	56.02	0.0	0.0	0.43	46.9	0.0	0.0	-9.11	0.0	0.0	9.12			
10	61.64	0.0	0.0	0.5	53.13	0.0	0.0	-8.5	0.0	0.0	8.51			
11	67.27	0.0	0.0	0.58	59.63	0.0	0.0	-7.63	0.0	0.0	7.64			
12	72.9	0.0	0.0	0.66	66.36	0.0	0.0	-6.53	0.0	0.0	6.54			
13	78.53	0.0	0.0	0.74	73.31	0.0	0.0	-5.2	0.0	0.0	5.21			
14	84.15	0.0	0.0	0.82	80.48	0.0	0.0	-3.66	0.0	0.0	3.67			
15	89.78	0.0	0.0	0.91	87.85	0.0	0.0	-1.92	0.0	0.0	1.93	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*CIELAB = 6.0		
17	10.99	0.0	0.0	0.0	10.99	0.0	0.0	0.0	0.0	0.0	0.01			
18	32.1	0.0	0.0	0.15	23.81	0.0	0.0	-8.28	0.0	0.0	8.29			
19	53.2	0.0	0.0	0.39	43.88	0.0	0.0	-9.31	0.0	0.0	9.32			
20	74.31	0.0	0.0	0.68	68.08	0.0	0.0	-6.22	0.0	0.0	6.23	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*CIELAB = 4.8		
Mean colour reproduction index:													R*ab,m = 74	

OE690-3N-132-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



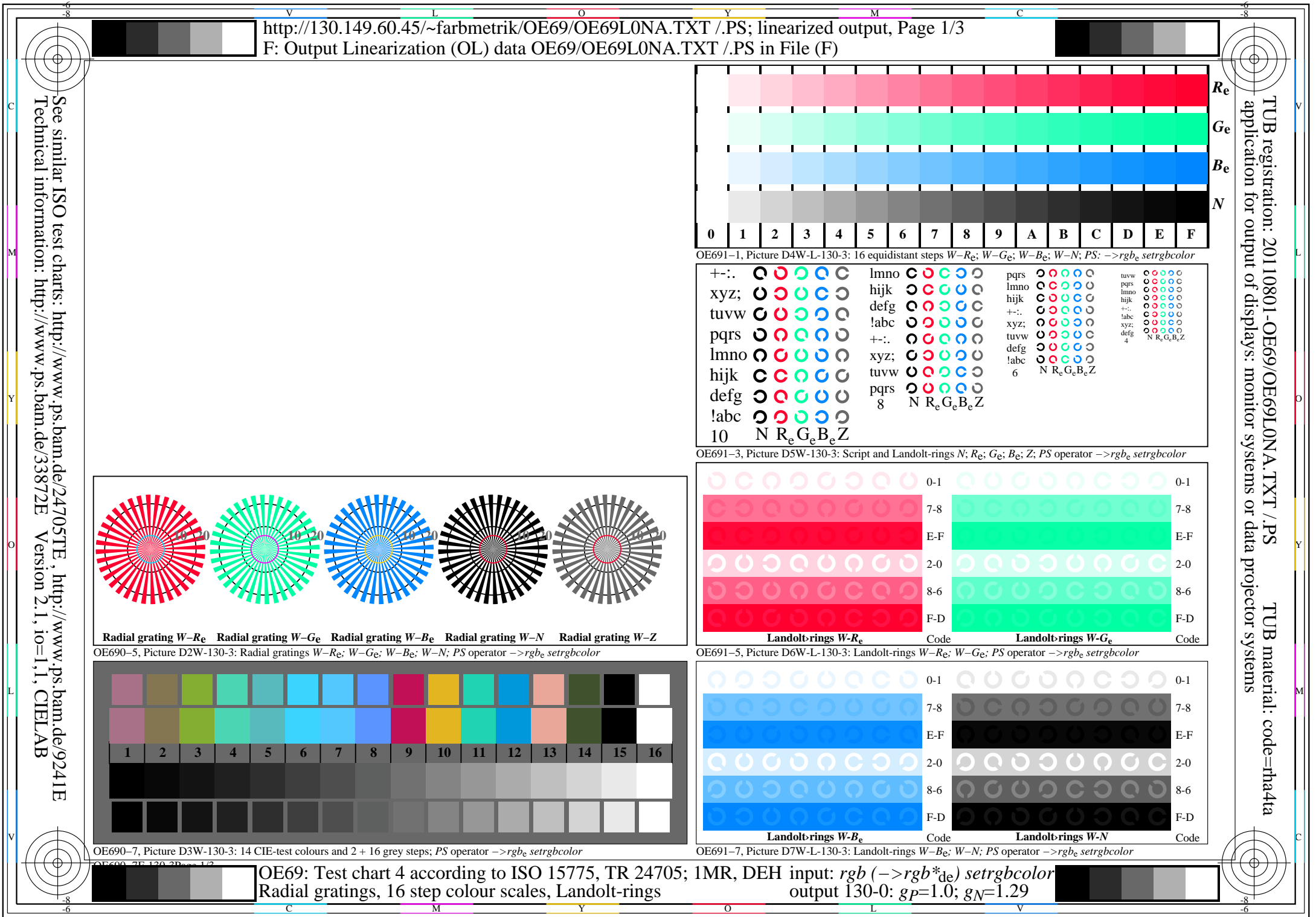
OE691-3N-132-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

$L^*/Y_{intended}$ (absolute)	11.0/1.3	16.6/2.2	22.2/3.6	27.9/5.4	33.5/7.8	39.1/10.7	44.8/14.4	50.4/18.7	56.0/23.9	61.6/30.0	67.3/37.0	72.9/45.0	78.5/54.1	84.2/64.4	89.8/75.8	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=1.36$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{out}$	0.0	0.025	0.064	0.112	0.166	0.224	0.288	0.355	0.425	0.499	0.577	0.655	0.738	0.824	0.91	1.0

OE690-7N, Picture A7-132-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:1,25$ ;  $Y_N$  range 0,93 to <1,87

input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.17$



**Test for the visual linearized output of Pictures D2W-133-0 to D7W-133-0**

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

**Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-133-0**

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

**Test of the 14 CIE-test colours according to picture D3W-133-0**

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

**Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-133-0**

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1324-1

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

**PDF-File:** <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> **underline Yes/No**

**PS-File:** <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-133-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH; Input:  $rgb(->rgb^*_{de})$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings output 130-1:  $g_P=1.0$ ;  $g_N=1.29$

**Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-133-0**

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

**Test of characters and Landolt-rings in four sizes according to picture D5W-133-0**

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

**Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-133-0, and D7W-133-0**

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

Part 1

OE690-3N-1324-1

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

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

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

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

**PDF file:** <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> **underline Yes/No**

**PS file:** <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> **underline Yes/No**

**Picture A7-133-2: contrast range:** (>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/OE69/OE69F1P2.PDF>

**picture A7-133-2** **underline Yes/No**

**PS-File:** <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS>

**picture A7-133-2** **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

OE691-7N-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 18.01 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
2	23.17 0.0 0.0	0.02 19.2 0.0	0.0 0.0 0.0	-3.95 0.0 0.0	3.96
3	28.33 0.0 0.0	0.04 21.49 0.0	0.0 0.0 0.0	-6.83 0.0 0.0	6.84
4	33.49 0.0 0.0	0.08 24.5 0.0	0.0 0.0 0.0	-8.98 0.0 0.0	8.99
5	38.65 0.0 0.0	0.13 28.12 0.0	0.0 0.0 0.0	-10.52 0.0 0.0	10.53
6	43.81 0.0 0.0	0.18 32.26 0.0	0.0 0.0 0.0	-11.53 0.0 0.0	11.54
7	48.97 0.0 0.0	0.24 36.89 0.0	0.0 0.0 0.0	-12.07 0.0 0.0	12.08
8	54.13 0.0 0.0	0.31 41.94 0.0	0.0 0.0 0.0	-12.18 0.0 0.0	12.19
9	59.29 0.0 0.0	0.38 47.41 0.0	0.0 0.0 0.0	-11.87 0.0 0.0	11.88
10	64.45 0.0 0.0	0.46 53.25 0.0	0.0 0.0 0.0	-11.19 0.0 0.0	11.2
11	69.61 0.0 0.0	0.54 59.46 0.0	0.0 0.0 0.0	-10.14 0.0 0.0	10.15
12	74.77 0.0 0.0	0.62 66.02 0.0	0.0 0.0 0.0	-8.74 0.0 0.0	8.75
13	79.93 0.0 0.0	0.71 72.9 0.0	0.0 0.0 0.0	-7.02 0.0 0.0	7.03
14	85.09 0.0 0.0	0.8 80.1 0.0	0.0 0.0 0.0	-4.98 0.0 0.0	4.99
15	90.25 0.0 0.0	0.9 87.61 0.0	0.0 0.0 0.0	-2.63 0.0 0.0	2.64
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 18.01 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
18	37.36 0.0 0.0	0.12 27.16 0.0	0.0 0.0 0.0	-10.19 0.0 0.0	10.2
19	56.71 0.0 0.0	0.34 44.63 0.0	0.0 0.0 0.0	-12.07 0.0 0.0	12.08
20	76.06 0.0 0.0	0.64 67.71 0.0	0.0 0.0 0.0	-8.34 0.0 0.0	8.35
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

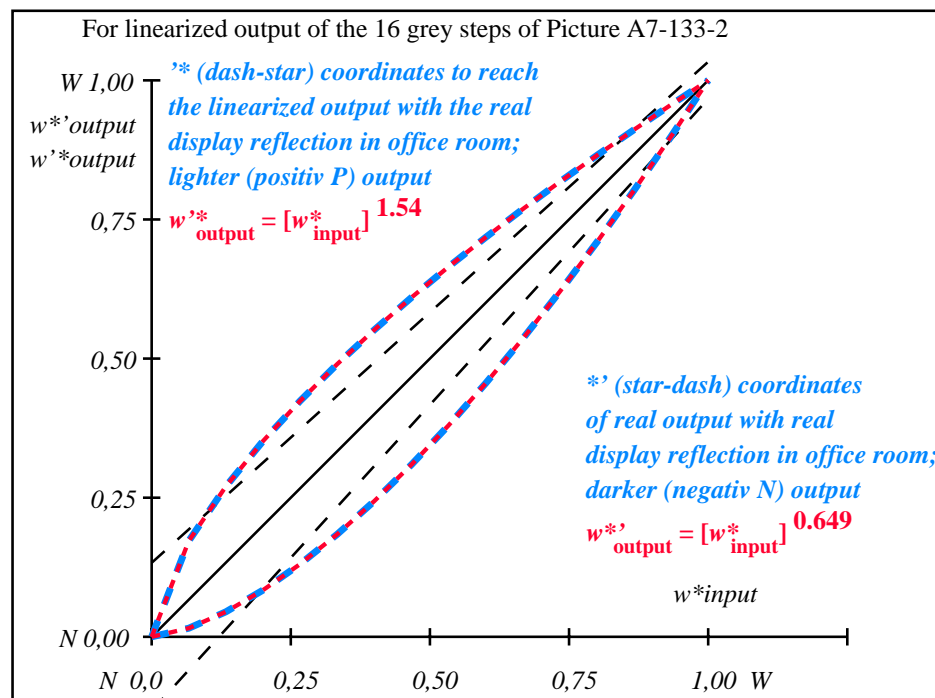
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 7.7$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 6.1$

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

OE690-3N-133-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-133-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

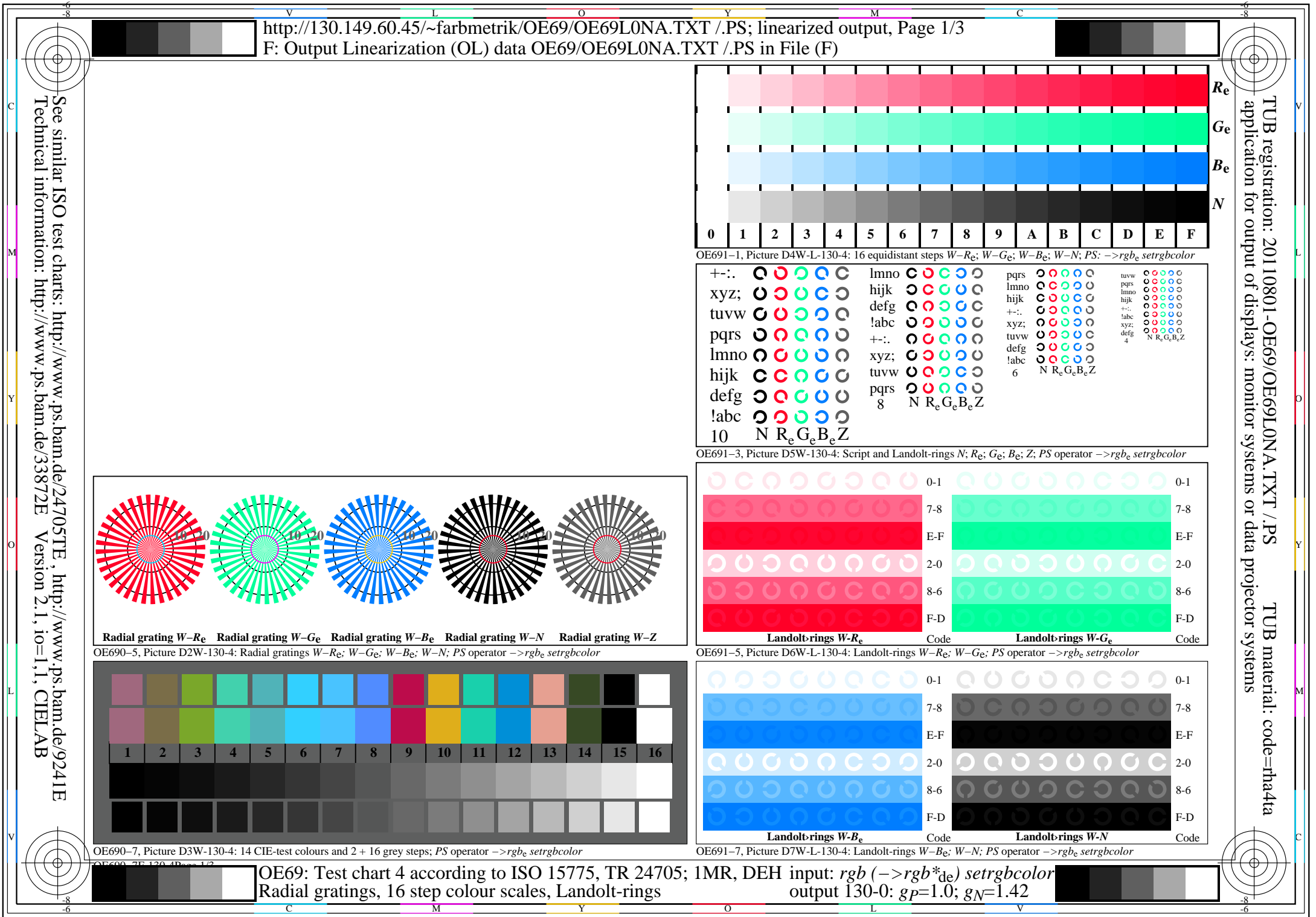
$L^*/Y_{intended}$ (absolute)	18.0/2.5	23.2/3.8	28.3/5.6	33.5/7.8	38.6/10.5	43.8/13.7	49.0/17.6	54.1/22.1	59.3/27.3	64.4/33.4	69.6/40.2	74.8/47.9	79.9/56.6	85.1/66.2	90.2/76.8	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=1.54$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{out}$	0.0	0.016	0.045	0.084	0.131	0.184	0.244	0.31	0.379	0.455	0.536	0.62	0.709	0.803	0.899	1.0

OE690-7N, Picture A7-133-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:2,5$ ;  $Y_N$  range 1,87 to <3,75

input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.29$





Test for the visual linearized output of Pictures D2W-134-0 to D7W-134-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-134-0

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

Test of the 14 CIE-test colours according to picture D3W-134-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-134-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1332-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> **underline** Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-134-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH  
Radial gratings, 16 step colour scales, Landolt-rings

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-134-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White – Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White – Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White – Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White – Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-134-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-134-0, and D7W-134-0

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

Colour row $W-R_d$ background – ring	Colour row $W-G_d$ background – ring	Colour row $W-B_d$ background – ring	Colour row $W-N$ background – ring
0 – 1	Yes/No	Yes/No	Yes/No
7 – 8	Yes/No	Yes/No	Yes/No
E – F	Yes/No	Yes/No	Yes/No
2 – 0	Yes/No	Yes/No	Yes/No
8 – 6	Yes/No	Yes/No	Yes/No
F – D	Yes/No	Yes/No	Yes/No

Part 1

OE690-3N-1332-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> **underline** Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> **underline** Yes/No

Picture A7-134-2: contrast range: (>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/OE69/OE69F1P2.PDF>

picture A7-134-2 **underline** Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS>

picture A7-134-2 **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

OE691-7N-134-1

DEH:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-1:  $g_p=1.0$ ;  $g_N=1.42$

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	26.85 0.0 0.0	0.0 26.85 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
2	31.42 0.0 0.0	0.01 27.5 0.0	0.0 -3.91 0.0	0.0 0.0 0.0	3.92
3	35.99 0.0 0.0	0.03 28.99 0.0	0.0 -6.99 0.0	0.0 0.0 0.0	7.0
4	40.56 0.0 0.0	0.06 31.15 0.0	0.0 -9.4 0.0	0.0 0.0 0.0	9.41
5	45.13 0.0 0.0	0.1 33.91 0.0	0.0 -11.21 0.0	0.0 0.0 0.0	11.22
6	49.7 0.0 0.0	0.15 37.21 0.0	0.0 -12.48 0.0	0.0 0.0 0.0	12.49
7	54.27 0.0 0.0	0.21 41.03 0.0	0.0 -13.24 0.0	0.0 0.0 0.0	13.25
8	58.84 0.0 0.0	0.27 45.33 0.0	0.0 -13.5 0.0	0.0 0.0 0.0	13.51
9	63.41 0.0 0.0	0.34 50.1 0.0	0.0 -13.3 0.0	0.0 0.0 0.0	13.31
10	67.99 0.0 0.0	0.42 55.33 0.0	0.0 -12.65 0.0	0.0 0.0 0.0	12.66
11	72.56 0.0 0.0	0.5 60.98 0.0	0.0 -11.56 0.0	0.0 0.0 0.0	11.57
12	77.13 0.0 0.0	0.59 67.06 0.0	0.0 -10.05 0.0	0.0 0.0 0.0	10.06
13	81.7 0.0 0.0	0.68 73.56 0.0	0.0 -8.13 0.0	0.0 0.0 0.0	8.14
14	86.27 0.0 0.0	0.78 80.45 0.0	0.0 -5.81 0.0	0.0 0.0 0.0	5.82
15	90.84 0.0 0.0	0.89 87.74 0.0	0.0 -3.09 0.0	0.0 0.0 0.0	3.1
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	26.85 0.0 0.0	0.0 26.85 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
18	43.99 0.0 0.0	0.09 33.17 0.0	0.0 -10.81 0.0	0.0 0.0 0.0	10.82
19	61.13 0.0 0.0	0.3 47.66 0.0	0.0 -13.46 0.0	0.0 0.0 0.0	13.47
20	78.27 0.0 0.0	0.61 68.65 0.0	0.0 -9.61 0.0	0.0 0.0 0.0	9.62
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

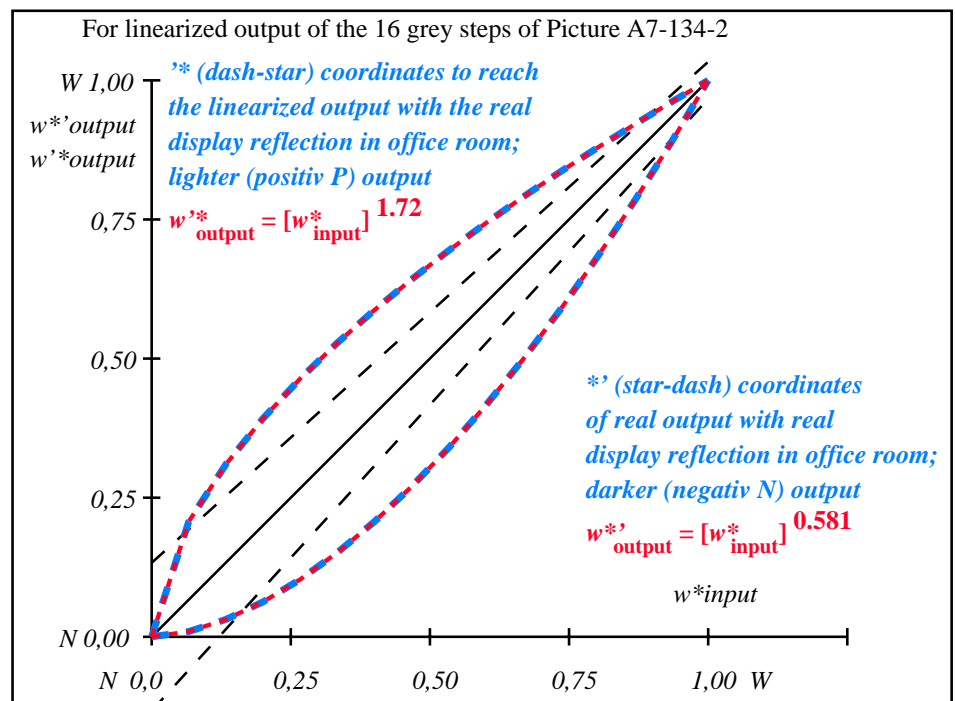
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{\text{CIELAB}} = 8.5$

Mean lightness difference (5 steps)  
 $\Delta L^*_{\text{CIELAB}} = 6.8$

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

OE690-3N-134-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-134-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

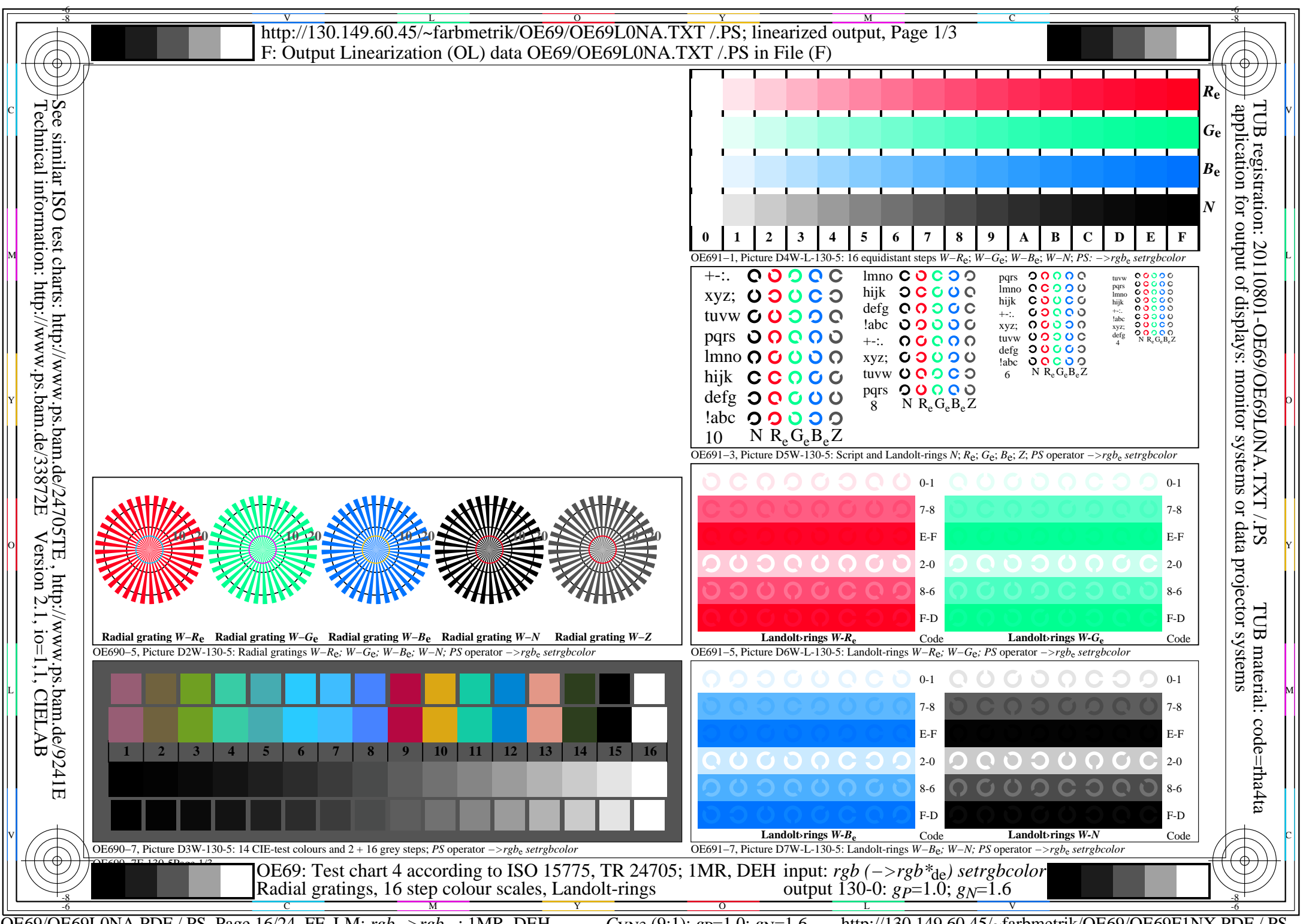
$L^*/Y_{\text{intended}}$ (absolute)	26.8/5.0	31.4/6.8	36.0/9.0	40.6/11.6	45.1/14.6	49.7/18.2	54.3/22.2	58.8/26.9	63.4/32.1	68.0/38.0	72.6/44.5	77.1/51.7	81.7/59.7	86.3/68.5	90.8/78.1	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=1.72$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*$ $_{\text{CIELAB},r}$ (relative)																
$w^*_{\text{intended}}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{\text{out}}$	0.0	0.01	0.031	0.063	0.103	0.151	0.207	0.27	0.339	0.415	0.498	0.586	0.681	0.782	0.888	1.0

OE690-7N, Picture A7-134-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{\text{setrgbcolor}}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:5$ ;  $Y_N$  range 3,75 to <7,5

input:  $rgb \rightarrow rgb^*_{\text{de}}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.42$

TUB registration: 20110801-OE69/OE69L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=th4ta





Test for the visual linearized output of Pictures D2W-135-0 to D7W-135-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-135-0

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

Test of the 14 CIE-test colours according to picture D3W-135-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-135-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1340-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-135-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH; Input:  $rgb(->rgb^*_{de})$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings output 130-1:  $g_P=1.0$ ;  $g_N=1.6$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-135-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-135-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-135-0, and D7W-135-0

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No	0 - 1 Yes/No
7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No	7 - 8 Yes/No
E - F Yes/No	E - F Yes/No	E - F Yes/No	E - F Yes/No
2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No	2 - 0 Yes/No
8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No	8 - 6 Yes/No
F - D Yes/No	F - D Yes/No	F - D Yes/No	F - D Yes/No

Part 1

OE690-3N-1340-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> underline Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> underline Yes/No

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 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/OE69/OE69F1P2.PDF>

picture A7-135-2 underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.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: 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

OE691-7N-135-1

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	37.99 0.0 0.0	0.0 37.99 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
2	41.81 0.0 0.0	0.01 38.32 0.0	0.0 -3.48 0.0	0.0 0.0 0.0	3.49
3	45.64 0.0 0.0	0.02 39.23 0.0	0.0 -6.4 0.0	0.0 0.0 0.0	6.41
4	49.47 0.0 0.0	0.05 40.68 0.0	0.0 -8.78 0.0	0.0 0.0 0.0	8.79
5	53.3 0.0 0.0	0.08 42.65 0.0	0.0 -10.64 0.0	0.0 0.0 0.0	10.65
6	57.13 0.0 0.0	0.12 45.11 0.0	0.0 -12.01 0.0	0.0 0.0 0.0	12.02
7	60.96 0.0 0.0	0.18 48.06 0.0	0.0 -12.89 0.0	0.0 0.0 0.0	12.9
8	64.78 0.0 0.0	0.24 51.48 0.0	0.0 -13.29 0.0	0.0 0.0 0.0	13.3
9	68.61 0.0 0.0	0.3 55.38 0.0	0.0 -13.22 0.0	0.0 0.0 0.0	13.23
10	72.44 0.0 0.0	0.38 59.74 0.0	0.0 -12.69 0.0	0.0 0.0 0.0	12.7
11	76.27 0.0 0.0	0.46 64.56 0.0	0.0 -11.69 0.0	0.0 0.0 0.0	11.7
12	80.1 0.0 0.0	0.55 69.84 0.0	0.0 -10.25 0.0	0.0 0.0 0.0	10.26
13	83.93 0.0 0.0	0.65 75.57 0.0	0.0 -8.35 0.0	0.0 0.0 0.0	8.36
14	87.75 0.0 0.0	0.76 81.74 0.0	0.0 -6.0 0.0	0.0 0.0 0.0	6.01
15	91.58 0.0 0.0	0.88 88.35 0.0	0.0 -3.22 0.0	0.0 0.0 0.0	3.23
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	37.99 0.0 0.0	0.0 37.99 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
18	52.34 0.0 0.0	0.07 42.11 0.0	0.0 -10.22 0.0	0.0 0.0 0.0	10.23
19	66.7 0.0 0.0	0.27 53.37 0.0	0.0 -13.32 0.0	0.0 0.0 0.0	13.33
20	81.05 0.0 0.0	0.58 71.23 0.0	0.0 -9.81 0.0	0.0 0.0 0.0	9.82
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

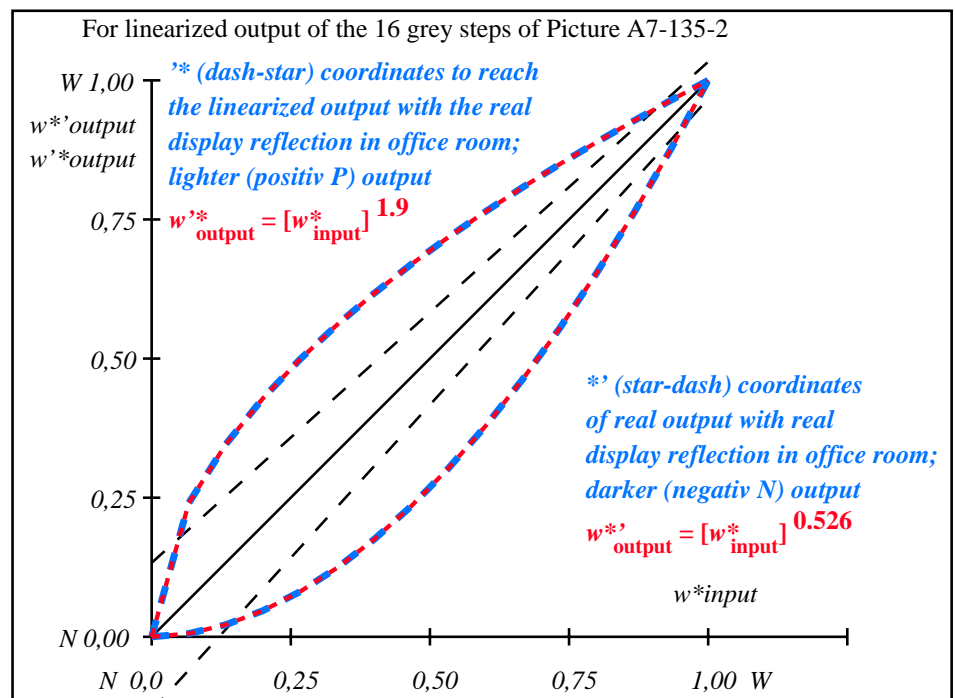
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 8.3$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 6.7$

Mean colour reproduction index:  $R^*_{ab,m} = 64$

OE690-3N-135-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-135-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

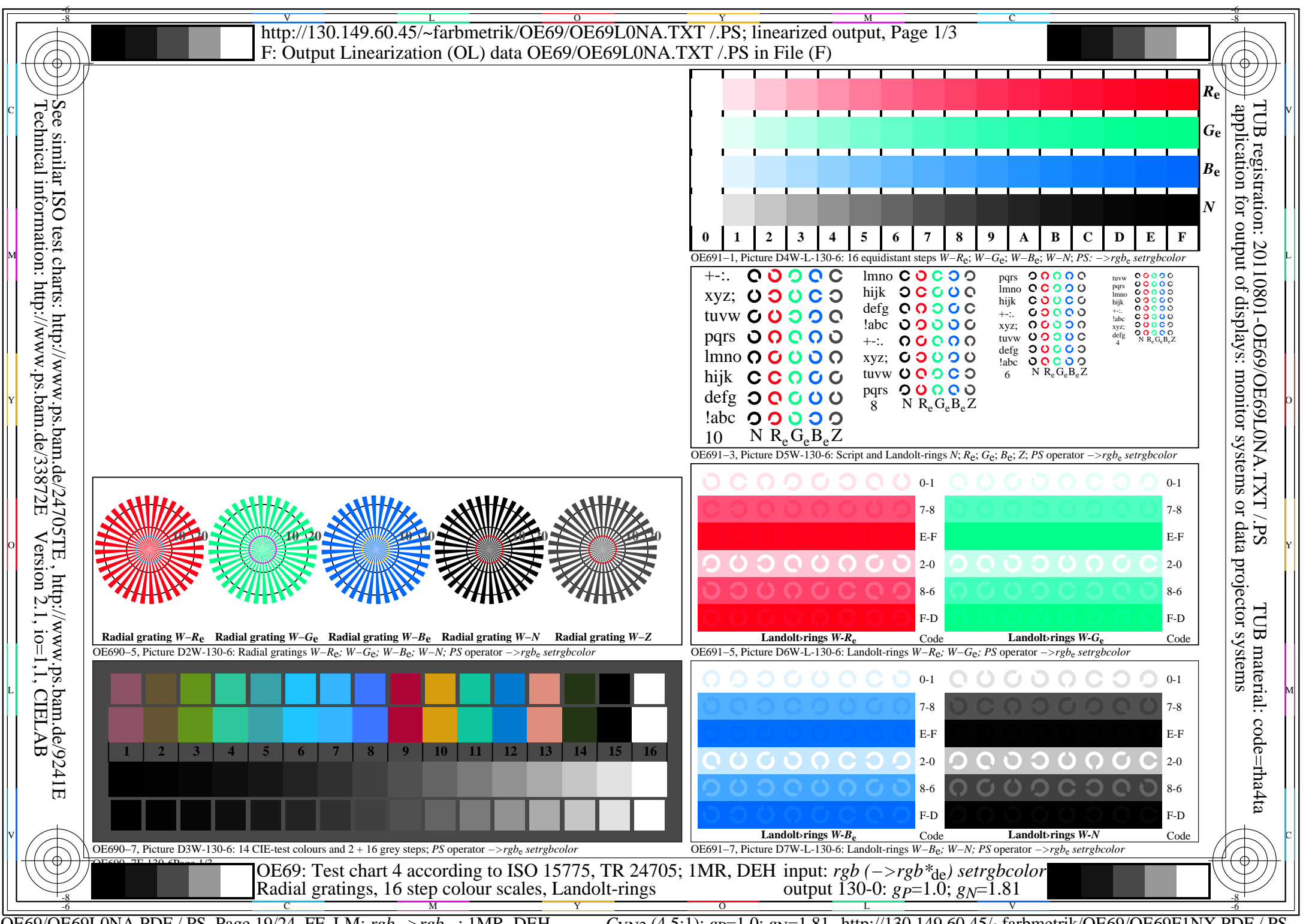
$L^*/Y_{intended}$ (absolute)	38.0/10.1	41.8/12.4	45.6/15.0	49.5/18.0	53.3/21.3	57.1/25.1	61.0/29.2	64.8/33.8	68.6/38.8	72.4/44.3	76.3/50.3	80.1/56.9	83.9/63.9	87.8/71.6	91.6/79.8	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=1.9$																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{out}$	0.0	0.006	0.022	0.047	0.081	0.124	0.175	0.235	0.303	0.379	0.463	0.554	0.654	0.762	0.877	1.0

OE690-7N, Picture A7-135-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:10$ ;  $Y_N$  range 7,5 to <15

input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.6$

TUB registration: 20110801-OE69/OE69L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta



Test for the visual linearized output of Pictures D2W-136-0 to D7W-136-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-136-0

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

Test of the 14 CIE-test colours according to picture D3W-136-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-136-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1348-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> **underline** Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-136-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH, Input:  $rgb(->rgb^*_{de})$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings output 130-1:  $g_P=1.0$ ;  $g_N=1.81$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-136-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-136-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-136-0, and D7W-136-0

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

Part 1

OE690-3N-1348-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> **underline** Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> **underline** Yes/No

Picture A7-136-2: contrast range: (>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/OE69/OE69F1P2.PDF>

picture A7-136-2 **underline** Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.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: **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

OE691-7N-136-1



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	52.02 0.0 0.0	0.0 52.02 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
2	54.91 0.0 0.0	0.0 52.17 0.0	0.0 -2.73 0.0	0.0 0.0 0.0	2.74
3	57.8 0.0 0.0	0.02 52.67 0.0	0.0 -5.12 0.0	0.0 0.0 0.0	5.13
4	60.7 0.0 0.0	0.04 53.54 0.0	0.0 -7.14 0.0	0.0 0.0 0.0	7.15
5	63.59 0.0 0.0	0.06 54.79 0.0	0.0 -8.79 0.0	0.0 0.0 0.0	8.8
6	66.48 0.0 0.0	0.1 56.43 0.0	0.0 -10.04 0.0	0.0 0.0 0.0	10.05
7	69.37 0.0 0.0	0.15 58.47 0.0	0.0 -10.89 0.0	0.0 0.0 0.0	10.9
8	72.27 0.0 0.0	0.2 60.91 0.0	0.0 -11.35 0.0	0.0 0.0 0.0	11.36
9	75.16 0.0 0.0	0.27 63.75 0.0	0.0 -11.4 0.0	0.0 0.0 0.0	11.41
10	78.05 0.0 0.0	0.35 67.01 0.0	0.0 -11.03 0.0	0.0 0.0 0.0	11.04
11	80.95 0.0 0.0	0.43 70.69 0.0	0.0 -10.25 0.0	0.0 0.0 0.0	10.26
12	83.84 0.0 0.0	0.52 74.78 0.0	0.0 -9.05 0.0	0.0 0.0 0.0	9.06
13	86.73 0.0 0.0	0.63 79.3 0.0	0.0 -7.42 0.0	0.0 0.0 0.0	7.43
14	89.62 0.0 0.0	0.74 84.24 0.0	0.0 -5.38 0.0	0.0 0.0 0.0	5.39
15	92.52 0.0 0.0	0.87 89.61 0.0	0.0 -2.9 0.0	0.0 0.0 0.0	2.91
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	52.02 0.0 0.0	0.0 52.02 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
18	62.87 0.0 0.0	0.06 54.44 0.0	0.0 -8.41 0.0	0.0 0.0 0.0	8.42
19	73.71 0.0 0.0	0.24 62.28 0.0	0.0 -11.42 0.0	0.0 0.0 0.0	11.43
20	84.56 0.0 0.0	0.55 75.87 0.0	0.0 -8.68 0.0	0.0 0.0 0.0	8.69
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

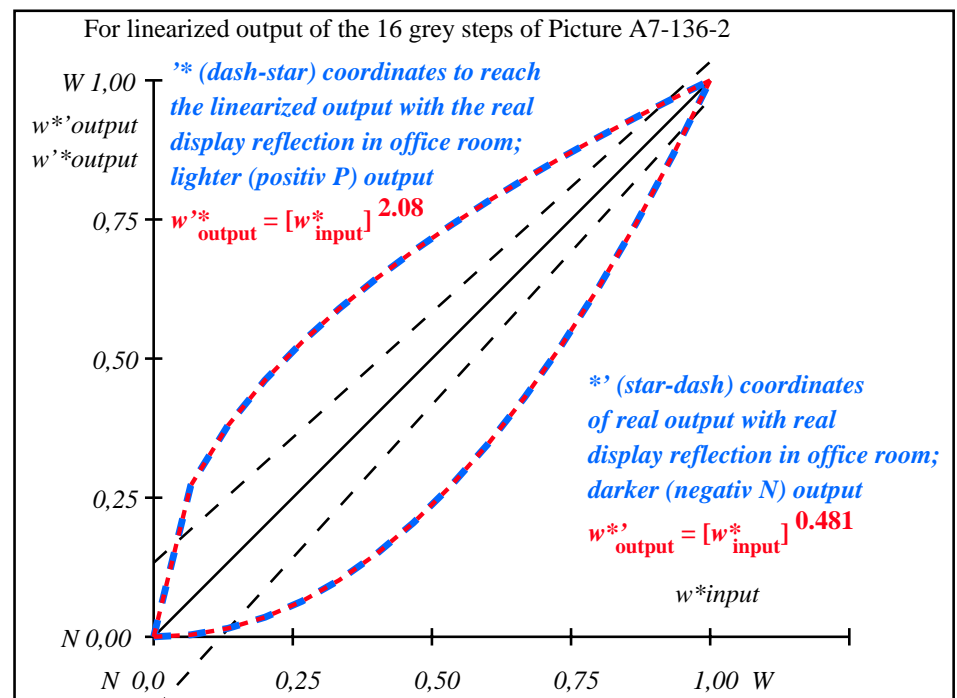
**Start output S1**  
**Specification according to**  
**ISO/IEC 15775 Annex G**  
**and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 7.1$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 5.7$

Mean colour reproduction index:  $R^*_{ab,m} = 69$

OE690-3N-136-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-136-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

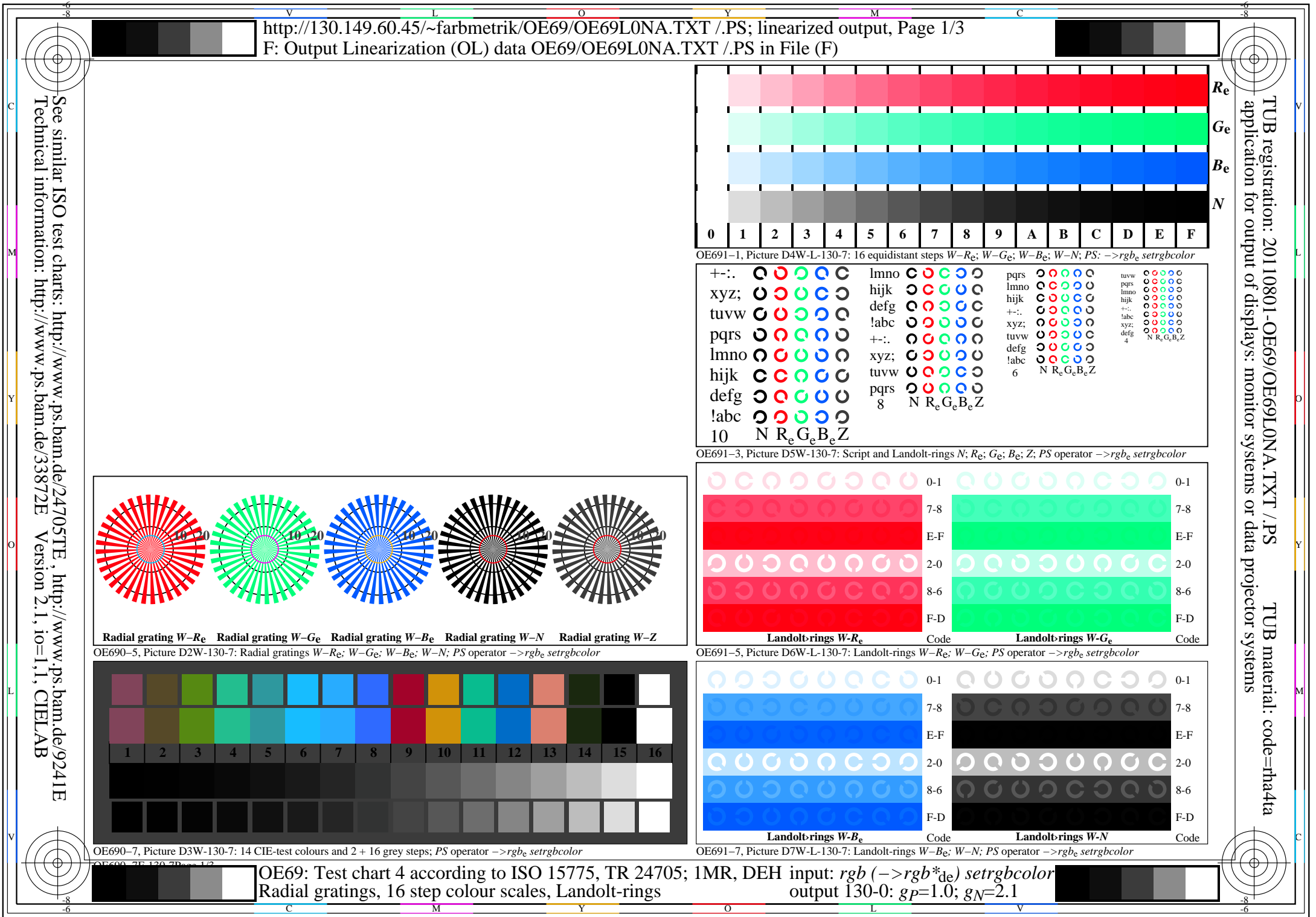
$L^*/Y_{intended}$ (absolute)	52.0/20.2	54.9/22.8	57.8/25.8	60.7/28.9	63.6/32.3	66.5/36.0	69.4/39.9	72.3/44.1	75.2/48.5	78.1/53.3	80.9/58.4	83.8/63.8	86.7/69.5	89.6/75.5	92.5/81.9	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=2.08$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	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	0.004	0.015	0.035	0.064	0.102	0.149	0.205	0.27	0.346	0.431	0.524	0.629	0.743	0.866	1.0

OE690-7N, Picture A7-136-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:20$ ;  $Y_N$  range 15 to <30

input:  $rgb \rightarrow rgb^*_{de}$  setrgbcolor  
output 130-2:  $g_P=1.0$ ;  $g_N=1.81$

TUB registration: 20110801-OE69/OE69L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta



Test for the visual linearized output of Pictures D2W-137-0 to D7W-137-0

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

Test of the resolution of radial gratings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$  according to picture D2W-137-0

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

Test of the 14 CIE-test colours according to picture D3W-137-0

Are clear (immediately conspicuous) differences recognized between reproduction and test chart? **Yes/No**  
If Yes: How many colours have clear differences? of the given 14 steps: ..... Steps

Test of 16 visual equidistant  $L^*$ -grey steps according to picture D3W-137-0

Are the 16 steps on the upper rows distinguishable? **Yes/No**  
If No: How many steps can be distinguished? of the given 16 steps: ..... Steps

Part 1

OE690-3N-1356-1

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

PDF-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NP.PDF> underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69L0NA.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 OE69L0NP.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 OE69L0NA.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

OE690-7N-137-1

OE69: Form A for test chart 4 according to ISO/IEC 15775; 1MR, DEH; Input:  $rgb(->rgb^*_{de})$  setrgbcolor  
Radial gratings, 16 step colour scales, Landolt-rings  
output 130-1:  $g_P=1.0$ ;  $g_N=2.1$

Test of 16 visually equally spaced steps of the colour rows  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to picture D4W-137-0

	Are all the 16 steps distinguishable?	Yes/No
$W-R_d$ White - Orangered:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-G_d$ White - Leafgreen:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-B_d$ White - Violetblue:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps
$W-N$ White - Black:	If No: How many steps can be distinguished? of the given 16 steps	..... Steps

Test of characters and Landolt-rings in four sizes according to picture D5W-137-0

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

Relative size	Letters	Ring $N$	Ring $R_d$	Ring $G_d$	Ring $B_d$
10	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
8	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
6	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
4	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Test of recognition frequency of Landolt-rings  $W-R_d$ ,  $W-G_d$ ,  $W-B_d$ , and  $W-N$  according to pictures D6W-137-0, and D7W-137-0

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

Colour row $W-R_d$ background - ring	Colour row $W-G_d$ background - ring	Colour row $W-B_d$ background - ring	Colour row $W-N$ background - ring
0 - 1	0 - 1	0 - 1	0 - 1
7 - 8	7 - 8	7 - 8	7 - 8
E - F	E - F	E - F	E - F
2 - 0	2 - 0	2 - 0	2 - 0
8 - 6	8 - 6	8 - 6	8 - 6
F - D	F - D	F - D	F - D

Part 1

OE690-3N-1356-1

Documentation of assessor colour vision properties for visual assessment

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

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

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

PDF file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PDF> underline Yes/No

PS file: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.PS> underline Yes/No

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/OE69/OE69F1P2.PDF>

picture A7-137-2 underline Yes/No

PS-File: <http://130.149.60.45/farbmetrik/OE69/OE69F1P2.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: 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

OE691-7N-137-1

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	69.7 0.0 0.0	0.0 69.7 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
2	71.41 0.0 0.0	0.0 69.75 0.0	0.0 0.0 0.0	-1.65 0.0 0.0	1.66
3	73.13 0.0 0.0	0.01 69.97 0.0	0.0 0.0 0.0	-3.15 0.0 0.0	3.16
4	74.84 0.0 0.0	0.03 70.37 0.0	0.0 0.0 0.0	-4.46 0.0 0.0	4.47
5	76.55 0.0 0.0	0.05 70.99 0.0	0.0 0.0 0.0	-5.55 0.0 0.0	5.56
6	78.27 0.0 0.0	0.08 71.84 0.0	0.0 0.0 0.0	-6.41 0.0 0.0	6.42
7	79.98 0.0 0.0	0.13 72.94 0.0	0.0 0.0 0.0	-7.03 0.0 0.0	7.04
8	81.7 0.0 0.0	0.18 74.29 0.0	0.0 0.0 0.0	-7.4 0.0 0.0	7.41
9	83.41 0.0 0.0	0.24 75.91 0.0	0.0 0.0 0.0	-7.49 0.0 0.0	7.5
10	85.12 0.0 0.0	0.32 77.8 0.0	0.0 0.0 0.0	-7.31 0.0 0.0	7.32
11	86.84 0.0 0.0	0.4 79.98 0.0	0.0 0.0 0.0	-6.85 0.0 0.0	6.86
12	88.55 0.0 0.0	0.5 82.45 0.0	0.0 0.0 0.0	-6.09 0.0 0.0	6.1
13	90.27 0.0 0.0	0.6 85.23 0.0	0.0 0.0 0.0	-5.03 0.0 0.0	5.04
14	91.98 0.0 0.0	0.72 88.3 0.0	0.0 0.0 0.0	-3.67 0.0 0.0	3.68
15	93.7 0.0 0.0	0.86 91.7 0.0	0.0 0.0 0.0	-1.99 0.0 0.0	2.0
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	69.7 0.0 0.0	0.0 69.7 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.01
18	76.13 0.0 0.0	0.04 70.82 0.0	0.0 0.0 0.0	-5.3 0.0 0.0	5.31
19	82.55 0.0 0.0	0.21 75.07 0.0	0.0 0.0 0.0	-7.48 0.0 0.0	7.49
20	88.98 0.0 0.0	0.52 83.12 0.0	0.0 0.0 0.0	-5.85 0.0 0.0	5.86
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

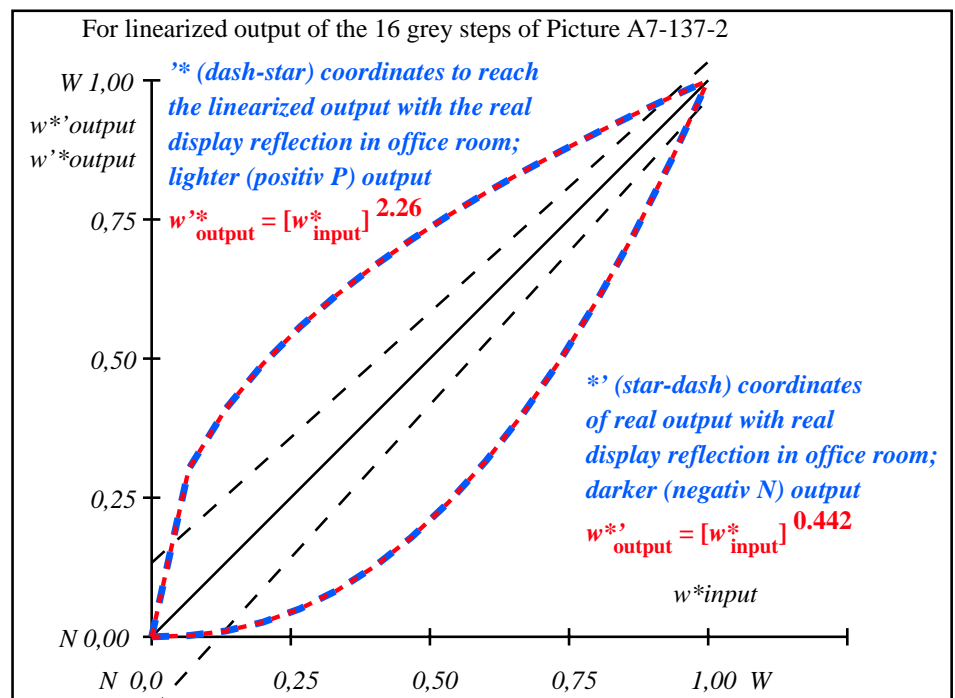
**Start output S1**  
**Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G**

Mean lightness difference (16 steps)  
 $\Delta E^*_{CIELAB} = 4.6$

Mean lightness difference (5 steps)  
 $\Delta L^*_{CIELAB} = 3.7$

Mean colour reproduction index:  $R^*_{ab,m} = 80$

OE690-3N-137-2: File: Measure unknown; Device: Device unknown; Date: Date unknown



OE691-3N-137-2: File: Measure unknown; Device: Device unknown; Date: Date unknown

$L^*/Y_{intended}$ (absolute)	69.7/40.3	71.4/42.8	73.1/45.4	74.8/48.0	76.6/50.8	78.3/53.7	80.0/56.6	81.7/59.7	83.4/62.9	85.1/66.3	86.8/69.7	88.6/73.2	90.3/76.9	92.0/80.7	93.7/84.6	95.4/88.6
$w^* w^* w^*$ setrgb $g_N=2.26$ No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0.000	0.067	0.133	0.200	0.267	0.333	0.400	0.467	0.533	0.600	0.667	0.733	0.800	0.867	0.933	1.000
$w^*_{out}$	0.0	0.002	0.01	0.026	0.051	0.083	0.126	0.179	0.241	0.315	0.4	0.496	0.604	0.724	0.855	1.0

OE690-7N, Picture A7-137-2: 16 visual equidistant  $L^*$ -grey steps; PS operator:  $w^* w^* w^*_{setrgbcolor}$

OE69: In-output relation according to ISO 9241-306; 1MR, DEH  
Viewing  $Y$  contrast  $Y_W:Y_N=88,9:40$ ;  $Y_N$  range 30 to <60

input:  $rgb \rightarrow rgb^*_{de}$   $setrgbcolor$   
output 130-2:  $g_P=1.0$ ;  $g_N=2.1$

TUB registration: 20110801-OE69/OE69L0NA.TXT /.PS  
application for output of displays: monitor systems or data projector systems  
TUB material: code=rh4ta