Basic and mixed colors of standard sRGB and a special LED display

basic color or mixed color and name		CIE standard chromaticity x	y	CIE standard tristimulus value X	Y	Z
sRGB display: three additive basic colors and White:						
$O = R_d$	Orange red	0,6400	0,3300	43,03	22,19	2,02
$L = G_d$	Leaf green	0,2900	0,6000	34,16	70,68	12,96
$V = B_d$	Violet blue	0,1415	0,0482	17,82	7,13	93,87
W	White	0,3127	0,3291	95,01	100,00	108,85
special LED display: three additive basic colors and White:						
$O = R_d$	Orange red	0,6400	0,3300	43,03+21%	22,19+21%	2,02+21%
$L = G_d$	Leaf green	0,2900	0,6000	34,16+21%	70,68+21%	12,96+21%
$V = B_d$	Violet blue	0,1415	0,0482	17,82+21%	7,13+21%	93,87+21%
W	White	0,3127	0,3291	95,01+0%	100,00+0%	108,85+0%

Assumption: Display of 142+30 cd/m² (=+21% compared to office standard)
rgb input data for Red and no internal display change *i**: 1,0 0,0 0,0 = 1,0 0,0 0,0
rgb input data for D65 and internal 10%-change of *i**: 1,0 1,0 1,0 –> 0,9 0,9 0,9
Result: The office luminance 142 cd/m² for 500 lux on White paper is matched.
CIELAB lightness L^* and chroma C^*_{ab} of Red is 10% higher for the LED display.

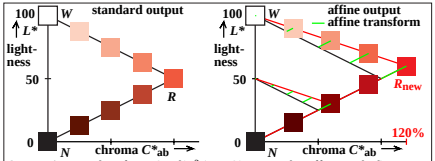
PE000−3N

Example files: Basic and mixed colors of a special LED display

basic color or mixed color and name		CIE standard chromaticity x	y	CIE standard tristimulus value X	Y	Z
special LED display: three additive basic colors and White:						
$O = R_d$	Orange red	0,6400	0,3300	43,03+44%	22,19+44%	2,02+44%
$L = G_d$	Leaf green	0,2900	0,6000	34,16+44%	70,68+44%	12,96+44%
$V = B_d$	Violet blue	0,1415	0,0482	17,82+44%	7,13+44%	93,87+44%
W	White	0,3127	0,3291	95,01+0%	100,00+0%	108,85+0%

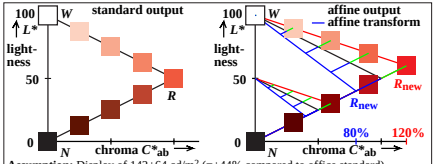
Assumption: Display of 142+64 cd/m² (=+44% compared to office standard)
rgb input data for Red and no internal display change *i**: 1,0 0,0 0,0 = 1,0 0,0 0,0
rgb input data for D65 and internal 20%-change of *i**: 1,0 1,0 1,0 –> 0,8 0,8 0,8
See example simulation files with 0, 5, 10, ..., 35%change on 8 pages and
white frame: http://130.149.60.45/~farbmetrik/LE52/LE52L0NP.PDF
grey frame: http://130.149.60.45/~farbmetrik/LE53/LE53L0NP.PDF
Compare for example samples 01b (White) and 01j (Orange red) on different papers
Result: Lightness L^* and chroma C^*_{ab} of Red is 20% higher for the LED display.
relative brilliance $i^* = I^* + 0{,}5\,c^*$ of Red is 30% higher for the LED display.
relative blackness $n^* = I^* - c^*$ of Red is 30% lower for the LED display.

PE000−7N



Assumption: Display of 142+64 cd/m² (=+44% compared to office standard)
rgb input data for Red and no internal display change *i**: 1,0 0,0 0,0 = 1,0 0,0 0,0
rgb input data for D65 and internal 20%-change of *i**: 1,0 1,0 1,0 –> 0,8 0,8 0,8
See example simulation files with 0, 5, 10, ..., 35% change on pages 1, 3,..,15
grey frame: http://130.149.60.45/~farbmetrik/LE53/LE53L0NP.PDF
Compare for example samples 01b (White) and 01j (Orange red) on different papers
Result if on page 5 sample 01b appears still White:
Lightness L^* and chroma C^*_{ab} of Red is 20% higher for the affine display output!
Similar effect for Green and displays with LED (3-band) backlight!
Problem in image technology: How to specify the affine output by a CRI?
Visual evaluation prefers the more chromatic affine output!
A fidelity metric gives low CRI's, similar in lighting for LED (3-band) output

PE001−3N



Assumption: Display of 142+64 cd/m² (=+44% compared to office standard)
rgb input data for Red and no internal display change *r**: 1,0 0,0 0,0 = 1,0 0,0 0,0
rgb input data for D65 and internal 20%-change of *w**: 1,0 1,0 1,0 –> 0,8 0,8 0,8
See example simulation files with 0, 5, 10, ..., 35% change on pages 1, 3,..,15 with
grey frame: http://130.149.60.45/~farbmetrik/LE53/LE53L0NP.PDF
Compare for example samples 01b (White) and 01j (Orange red) on different papers
The rgb data of all the colours are on the even pages 2, 4,..,16
Result if for example a white primary is added to the 3 primaries
rgb input data for D65 and internal 20%-change of *r**: 1,0 0,0 0,0 –> 0,8 0,0 0,0
rgb input data for White and no internal display change of *w**: 1,0 1,0 1,0 = 1,0 1,0 1,0
Result: R_{new} **appears not blackish = fluorent? = luminous?**
R_{new} **appears blackish = greyish?**

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