

### percieved color terms (colorness: cube root coordinates)

| percieved color terms | name and relationship with standard chromaticity values                                     | notes:                                       |
|-----------------------|---------------------------------------------------------------------------------------------|----------------------------------------------|
| lightness             | $L^* = 116 (Y / 100)^{1/3} - 16$<br><i>Näherung: <math>L^* = 100 (Y / 100)^{1/3}</math></i> | definition 1976 in:<br><i>CIELUV, CIELAB</i> |
| chromaticness         | for linear chromatic value diagram (AT, B)                                                  |                                              |
| red-green             | $a^* = 500 [ (X / X_n)^{1/3} - (Y / Y_n)^{1/3} ]$<br>$= 500 (a' - a'_n) Y^{1/3}$            | definition 1976 in:<br><i>CIELAB</i>         |
| yellow-blue           | $b^* = 200 [ (Y / Y_n)^{1/3} - (Z / Z_n)^{1/3} ]$<br>$= 500 (b' - b'_n) Y^{1/3}$            | <i>n=D65 (surround)</i>                      |
| radial                | $C^* = [ a^{*2} + b^{*2} ]^{1/2}$                                                           |                                              |
| saturation            | = chromaticness / lightness                                                                 | definition                                   |
| red-green             | $S_a^* = a^* / [ 100 (Y / 100)^{1/3} ]$<br>$= 21,6 (a' - a'_n)$                             | for:<br><i>CIELAB 1976</i>                   |
| yellow-blue           | $S_b^* = b^* / [ 100 (Y / 100)^{1/3} ]$<br>$= 21,6 (b' - b'_n)$                             |                                              |
| radial                | $S_c^* = C^* / [ 100 (Y / 100)^{1/3} ]$<br>$= 21,6 [ (a' - a'_n)^2 + (b' - b'_n)^2 ]^{1/2}$ |                                              |
| chromaticity          | for nonlinear chromaticity diagram ( $a'$ , $b'$ ) definition                               |                                              |
| red-green             | $a' = (1 / X_n)^{1/3} (x / y)^{1/3}$                                                        | opponent                                     |
| yellow-blue           | $= 0,2191 (x / y)^{1/3}$ for D65                                                            | color system                                 |
| radial                | $b' = -0,4 (1 / Z_n)^{1/3} (z / y)^{1/3}$<br>$= -0,08376 (z / y)^{1/3}$ for D65             |                                              |
|                       | $c' = [ (a' - a'_n)^2 + (b' - b'_n)^2 ]^{1/2}$                                              |                                              |

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