

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

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