

X	Y	Z	x	y	A	B	Cr	a	b	c	L*	a*	b*	C*ab	a'	b'	c'	OYLcvm_ONW_0	
CIE Illuminant E																			
61.4	35.7	0.0	0.632	0.367	25.7	14.2	29.4	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.258	-0.008	0.258	%O=JR	00 575_770
83.1	86.7	1.5	0.485	0.505	-3.5	34.0	34.2	-0.04	0.39	0.39	94.6	-6.6	140.9	141.1	0.212	-0.022	0.213	%Y=J=JG+JR	01 515_770
21.6	50.9	1.5	0.292	0.687	-29.3	19.7	35.3	-0.57	0.38	0.69	76.6	-99.1	110.4	148.3	0.161	-0.026	0.164	%L=JG	02 515_575
8.5	25.0	11.0	0.19	0.561	-16.5	5.5	17.4	-0.66	0.22	0.69	57.1	-95.3	30.0	99.9	0.15	-0.065	0.163	%Gs	03 0,35*JG+0,65*BG
1.4	11.0	16.2	0.049	0.385	-9.6	-2.0	9.8	-0.87	-0.18	0.89	39.7	-119.2	-13.0	119.9	0.108	-0.097	0.146	%Cs=BG	04 475_515
16.8	13.2	98.4	0.13	0.103	3.5	-34.0	34.2	0.26	-2.57	2.58	43.1	21.1	-96.9	99.2	0.233	-0.168	0.287	%V=B=BR+BG	05 380_515
15.4	2.1	82.2	0.154	0.021	13.2	-32.0	34.6	6.09	-14.73	15.94	16.3	128.5	-131.5	183.9	0.413	-0.289	0.505	%Ms=BR	06 380_475
55.0	31.0	11.5	0.563	0.318	23.9	7.8	25.2	0.77	0.25	0.81	62.5	71.1	38.0	80.7	0.26	-0.061	0.268	%Rs	07 0,14*BR+0,86*JR
61.4	35.7	0.0	0.632	0.367	25.7	14.2	29.4	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.258	-0.008	0.258	%O=JR	08 575_770
0.1	0.1	0.1	0.332	0.332	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.215	-0.086	0.232	%N0(β=0,001)	09 380_770
100.0	100.0	100.0	0.333	0.333	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.215	-0.086	0.232	%W1(β=1,000)	10 380_770
CIE Standard Illuminant D65																			
54.8	32.3	0.0	0.628	0.37	24.1	14.0	27.9	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.249	-0.008	0.249	%O=JR	00 575_770
76.8	85.2	1.6	0.469	0.52	-4.1	36.4	36.7	-0.04	0.42	0.43	94.0	-8.2	140.2	140.5	0.202	-0.022	0.203	%Y=J=JG+JR	01 515_770
22.0	52.9	1.6	0.288	0.69	-28.2	22.4	36.0	-0.53	0.42	0.68	77.8	-97.1	112.7	148.8	0.156	-0.026	0.158	%L=JG	02 515_575
8.7	26.4	12.5	0.183	0.554	-16.3	6.5	17.6	-0.61	0.24	0.66	58.5	-95.0	31.2	100.0	0.144	-0.065	0.158	%Gs	03 0,35*JG+0,65*BG
1.6	12.2	18.3	0.05	0.379	-10.0	-2.0	10.2	-0.81	-0.16	0.83	41.5	-119.5	-11.2	120.0	0.106	-0.095	0.143	%Cs=BG	04 475_515
18.1	14.7	107.2	0.129	0.105	4.1	-36.4	36.7	0.28	-2.47	2.49	45.2	23.9	-93.3	96.4	0.224	-0.162	0.277	%V=B=BR+BG	05 380_515
16.5	2.4	88.8	0.153	0.023	14.1	-34.4	37.2	5.7	-13.87	15.0	17.8	133.2	-128.5	185.1	0.393	-0.276	0.48	%Ms=BR	06 380_475
49.4	28.1	12.4	0.549	0.312	22.7	7.2	23.8	0.8	0.25	0.84	60.0	74.5	33.9	81.8	0.252	-0.063	0.26	%Rs	07 0,14*BR+0,86*JR
54.8	32.3	0.0	0.628	0.37	24.1	14.0	27.9	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.249	-0.008	0.249	%O=JR	08 575_770
0.0	0.1	0.1	0.311	0.327	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.205	-0.086	0.223	%N0(β=0,001)	09 380_770
95.0	100.0	108.8	0.312	0.329	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.205	-0.086	0.223	%W1(β=1,000)	10 380_770
CIE Illuminant D50																			
60.9	35.4	0.0	0.632	0.367	26.8	11.6	29.2	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.275	-0.009	0.275	%O=JR	00 575_770
82.9	87.3	1.5	0.482	0.508	-1.2	28.1	28.2	-0.01	0.32	0.32	94.8	-2.3	137.9	137.9	0.225	-0.023	0.227	%Y=J=JG+JR	01 515_770
22.0	51.9	1.5	0.291	0.688	-28.0	16.5	32.5	-0.54	0.31	0.62	77.2	-96.2	107.9	144.6	0.172	-0.028	0.174	%L=JG	02 515_575
8.5	25.1	10.6	0.193	0.566	-15.6	4.0	16.1	-0.62	0.16	0.64	57.2	-92.3	25.2	95.7	0.16	-0.068	0.174	%Gs	03 0,35*JG+0,65*BG
1.3	10.7	15.5	0.049	0.388	-9.0	-2.6	9.3	-0.83	-0.24	0.87	39.1	-117.0	-19.5	118.6	0.115	-0.103	0.155	%Cs=BG	04 475_515
13.4	12.6	80.9	0.125	0.118	1.2	-28.1	28.2	0.09	-2.22	2.22	42.2	8.1	-98.3	98.6	0.234	-0.17	0.289	%V=B=BR+BG	05 380_515
12.0	1.9	65.3	0.152	0.024	10.2	-25.5	27.5	5.35	-13.35	14.38	15.0	116.5	-131.6	175.8	0.424	-0.298	0.519	%Ms=BR	06 380_475
54.1	30.7	9.1	0.575	0.326	24.5	6.4	25.3	0.79	0.21	0.82	62.2	75.0	38.7	84.4	0.277	-0.061	0.284	%Rs	07 0,14*BR+0,86*JR
60.9	35.4	0.0	0.632	0.367	26.8	11.6	29.2	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.275	-0.009	0.275	%O=JR	08 575_770
0.0	0.0	0.0	0.344	0.357	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.226	-0.086	0.242	%N0(β=0,001)	09 380_770
96.4	100.0	82.4	0.345	0.358	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.226	-0.086	0.242	%W1(β=1,000)	10 380_770
CIE Standard Illuminant A																			
83.5	46.7	0.0	0.64	0.358	32.1	6.6	32.8	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.368	-0.012	0.369	%O=JR	00 575_770
104.3	92.5	1.2	0.526	0.467	2.7	12.6	12.9	0.02	0.13	0.14	97.0	4.2	130.1	130.2	0.316	-0.028	0.317	%Y=J=JG+JR	01 515_770
20.8	45.8	1.1	0.307	0.675	-29.4	6.0	30.0	-0.64	0.13	0.65	73.4	-97.9	90.3	133.2	0.233	-0.035	0.236	%L=JG	02 515_575
7.7	20.3	5.9	0.228	0.597	-14.5	0.5	14.5	-0.71	0.02	0.71	52.2	-87.2	7.5	87.5	0.22	-0.08	0.234	%Gs	03 0,35*JG+0,65*BG
0.7	6.6	8.5	0.045	0.418	-6.5	-2.4	7.0	-0.99	-0.37	1.05	30.9	-108.0	-43.1	116.3	0.144	-0.132	0.195	%Cs=BG	04 475_515
5.4	7.4	34.3	0.115	0.157	-2.7	-12.6	12.9	-0.36	-1.7	1.74	32.7	-26.3	-113.6	116.6	0.274	-0.202	0.341	%V=B=BR+BG	05 380_515
4.7	0.8	25.8	0.151	0.025	3.8	-10.2	10.9	4.81	-12.75	13.63	7.2	75.2	-139.7	158.7	0.549	-0.387	0.672	%Ms=BR	06 380_475
72.4	40.3	3.6	0.622	0.346	28.1	4.2	28.5	0.69	0.1	0.7	69.7	65.9	54.0	85.2	0.369	-0.054	0.373	%Rs	07 0,14*BR+0,86*JR
83.5	46.7	0.0	0.64	0.358	32.1	6.6	32.8	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.368	-0.012	0.369	%O=JR	08 575_770
0.1	0.0	0.0	0.445	0.405	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.313	-0.086	0.325	%N0(β=0,001)	09 380_770
109.8	99.9	35.5	0.447	0.407	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.313	-0.086	0.325	%W1(β=1,000)	10 380_770

$$A = [(X/X_n) - (Y/Y_n)]Y = [a - a_n]Y \quad B = -0,4[(Z/Z_n) - (Y/Y_n)]Y = -0,4[b - b_n]Y \quad a = X/Y = x/y \quad b = -0,4Z/Y = -0,4z/y \quad (X, Y, Z \geq 0,89)$$

$$a^* = 500[(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \quad b^* = 200[(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \quad a' = (1/X_n)^{1/3}(x/y)^{1/3} \quad b' = -0,4(1/Z_n)^{1/3}(z/y)^{1/3}$$

$$= 500(a' - a_n')Y^{1/3} \quad = 500(b' - b_n')Y^{1/3} \quad = 0,2191(x/y)^{1/3} \quad = -0,08376(z/y)^{1/3} \quad \text{CIELAB for } n=D65$$

X	Y	Z	x	y	A	B	Cr	a	b	c	L*	a*	b*	C*ab	a'	b'	c'	OYLcvm_ONW_1
CIE Illuminant E																		
61.4	35.7	0.0	0.632	0.367	25.7	14.2	29.4	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.258	-0.008	0.258	%O=JR
83.1	86.7	1.5	0.485	0.505	-3.5	34.0	34.2	-0.04	0.39	0.39	94.6	-6.6	140.9	141.1	0.212	-0.022	0.213	%Y=J=JG+JR
21.6	50.9	1.5	0.292	0.687	-29.3	19.7	35.3	-0.57	0.38	0.69	76.6	-99.1	110.4	148.3	0.161	-0.026	0.164	%L=JG
26.7	54.9	31.0	0.237	0.487	-28.2	9.5	29.8	-0.51	0.17	0.54	79.0	-87.5	28.4	92.0	0.169	-0.071	0.183	%G
38.5	64.2	99.9	0.189	0.316	-25.7	-14.2	29.4	-0.4	-0.22	0.45	84.0	-67.6	-27.3	73.0	0.181	-0.099	0.207	%C=L+V
16.8	13.2	98.4	0.13	0.103	3.5	-34.0	34.2	0.26	-2.57	2.58	43.1	21.1	-96.9	99.2	0.233	-0.168	0.287	%V=B=BR+BG
78.3	49.0	98.4	0.346	0.217	29.3	-19.7	35.3	0.59	-0.4	0.72	75.4	66.6	-41.3	78.4	0.251	-0.108	0.274	%M=V+O
64.5	38.1	17.7	0.535	0.316	26.3	8.1	27.6	0.69	0.21	0.72	68.1	69.4	32.6	76.7	0.256	-0.066	0.265	%R
61.4	35.7	0.0	0.632	0.367	25.7	14.2	29.4	0.71	0.39	0.82	66.3	70.3	113.7	133.7	0.258	-0.008	0.258	%O=JR
0.1	0.1	0.1	0.332	0.332	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.215	-0.086	0.232	%N0 (β=0,001)
100.0	100.0	100.0	0.333	0.333	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.215	-0.086	0.232	%W1 (β=1,000)
CIE Standard Illuminant D65																		
54.8	32.3	0.0	0.628	0.37	24.1	14.0	27.9	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.249	-0.008	0.249	%O=JR
76.8	85.2	1.6	0.469	0.52	-4.1	36.4	36.7	-0.04	0.42	0.43	94.0	-8.2	140.2	140.5	0.202	-0.022	0.203	%Y=J=JG+JR
22.0	52.9	1.6	0.288	0.69	-28.2	22.4	36.0	-0.53	0.42	0.68	77.8	-97.1	112.7	148.8	0.156	-0.026	0.158	%L=JG
27.5	57.3	33.7	0.231	0.483	-27.0	11.4	29.3	-0.47	0.2	0.51	80.3	-84.6	30.8	90.1	0.163	-0.07	0.178	%G
40.2	67.6	108.8	0.185	0.312	-24.1	-14.0	27.9	-0.35	-0.2	0.41	85.8	-63.5	-24.3	68.1	0.176	-0.098	0.201	%C=L+V
18.1	14.7	107.2	0.129	0.105	4.1	-36.4	36.7	0.28	-2.47	2.49	45.2	23.9	-93.3	96.4	0.224	-0.162	0.277	%V=B=BR+BG
72.9	47.0	107.2	0.321	0.206	28.2	-22.4	36.0	0.6	-0.47	0.76	74.2	68.9	-43.4	81.5	0.242	-0.11	0.266	%M=V+O
58.0	34.9	19.3	0.516	0.311	24.8	7.4	25.9	0.71	0.21	0.74	65.7	72.0	28.4	77.4	0.248	-0.068	0.257	%R
54.8	32.3	0.0	0.628	0.37	24.1	14.0	27.9	0.74	0.43	0.86	63.6	73.0	109.1	131.3	0.249	-0.008	0.249	%O=JR
0.0	0.1	0.1	0.311	0.327	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.205	-0.086	0.223	%N0 (β=0,001)
95.0	100.0	108.8	0.312	0.329	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.205	-0.086	0.223	%W1 (β=1,000)
CIE Illuminant D50																		
60.9	35.4	0.0	0.632	0.367	26.8	11.6	29.2	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.275	-0.009	0.275	%O=JR
82.9	87.3	1.5	0.482	0.508	-1.2	28.1	28.2	-0.01	0.32	0.32	94.8	-2.3	137.9	137.9	0.225	-0.023	0.227	%Y=J=JG+JR
22.0	51.9	1.5	0.291	0.688	-28.0	16.5	32.5	-0.54	0.31	0.62	77.2	-96.2	107.9	144.6	0.172	-0.028	0.174	%L=JG
26.0	55.7	25.7	0.242	0.518	-27.6	8.0	28.8	-0.49	0.14	0.51	79.4	-88.2	28.8	92.8	0.178	-0.071	0.191	%G
35.4	64.5	82.4	0.194	0.353	-26.8	-11.6	29.2	-0.41	-0.18	0.45	84.2	-73.9	-27.0	78.7	0.188	-0.099	0.212	%C=L+V
13.4	12.6	80.9	0.125	0.118	1.2	-28.1	28.2	0.09	-2.22	2.22	42.2	8.1	-98.3	98.6	0.234	-0.17	0.289	%V=B=BR+BG
74.4	48.0	80.9	0.365	0.236	28.0	-16.5	32.5	0.58	-0.34	0.67	74.8	66.9	-42.1	79.0	0.265	-0.109	0.287	%M=V+O
63.3	37.6	14.6	0.547	0.325	27.0	6.5	27.8	0.71	0.17	0.73	67.7	73.5	32.1	80.3	0.273	-0.066	0.281	%R
60.9	35.4	0.0	0.632	0.367	26.8	11.6	29.2	0.75	0.32	0.82	66.0	75.4	113.1	135.9	0.275	-0.009	0.275	%O=JR
0.0	0.0	0.0	0.344	0.357	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.226	-0.086	0.242	%N0 (β=0,001)
96.4	100.0	82.4	0.345	0.358	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.226	-0.086	0.242	%W1 (β=1,000)
CIE Standard Illuminant A																		
83.5	46.7	0.0	0.64	0.358	32.1	6.6	32.8	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.368	-0.012	0.369	%O=JR
104.3	92.5	1.2	0.526	0.467	2.7	12.6	12.9	0.02	0.13	0.14	97.0	4.2	130.1	130.2	0.316	-0.028	0.317	%Y=J=JG+JR
20.8	45.8	1.1	0.307	0.675	-29.4	6.0	30.0	-0.64	0.13	0.65	73.4	-97.9	90.3	133.2	0.233	-0.035	0.236	%L=JG
22.5	48.0	11.4	0.274	0.585	-30.2	2.2	30.3	-0.62	0.04	0.63	74.8	-96.7	19.5	98.7	0.236	-0.075	0.247	%G
26.3	53.2	35.5	0.228	0.462	-32.1	-6.6	32.8	-0.6	-0.12	0.61	78.0	-94.6	-37.8	101.9	0.24	-0.106	0.262	%C=L+V
5.4	7.4	34.3	0.115	0.157	-2.7	-12.6	12.9	-0.36	-1.7	1.74	32.7	-26.3	-113.6	116.6	0.274	-0.202	0.341	%V=B=BR+BG
88.9	54.1	34.4	0.501	0.305	29.4	-6.0	30.0	0.54	-0.11	0.55	78.5	58.4	-34.7	67.9	0.358	-0.104	0.373	%M=V+O
84.4	48.0	6.2	0.608	0.346	31.6	4.3	31.9	0.65	0.09	0.66	74.8	66.3	44.7	80.0	0.366	-0.061	0.371	%R
83.5	46.7	0.0	0.64	0.358	32.1	6.6	32.8	0.68	0.14	0.7	74.0	68.2	125.5	142.9	0.368	-0.012	0.369	%O=JR
0.1	0.0	0.0	0.445	0.405	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.313	-0.086	0.325	%N0 (β=0,001)
109.8	99.9	35.5	0.447	0.407	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.313	-0.086	0.325	%W1 (β=1,000)

$$A = [(X/X_n) - (Y/Y_n)]Y = [a - a_n]Y \quad B = -0.4[(Z/Z_n) - (Y/Y_n)]Y = -0.4[b - b_n]Y \quad a = X/Y = x/y \quad b = -0.4Z/Y = -0.4z/y \quad (X, Y, Z \geq 0.89)$$

$$a^* = 500[(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \quad b^* = 200[(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \quad a' = (1/X_n)^{1/3}(x/y)^{1/3} \quad b' = -0.4(1/Z_n)^{1/3}(z/y)^{1/3}$$

$$= 500(a' - a_n')Y^{1/3} \quad = 500(b' - b_n')Y^{1/3} \quad = 0.2191(x/y)^{1/3} \quad = -0.08376(z/y)^{1/3} \quad \text{CIE LAB for } n=D65$$