

Ostw data  $rgb^*$ , XYZy, and  $LabC^*h_{ab}$  in the CIELAB-colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^*$	CIEXYZ data					$LabC^*h_{ab}$ data					
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$a_d^*$	$b_d^*$	$C_{ab,d}^*$	$h_{ab,d}$	
$R_d$	1.00	55.28	36.99	0.67	0.594	39.97	67.26	58.45	106.35	121.35	61
$Y_d$	1.10	67.93	72.65	1.12	0.479	0.512	88.28	-2.43	136.23	136.25	91
$G_d$	0.10	21.11	57.87	13.29	0.228	0.627	80.66	-113.86	67.46	132.34	149
$C_d$	0.11	28.91	51.60	95.79	0.163	0.292	77.04	-64.78	-31.21	71.91	205
$B_d$	0.01	16.26	15.93	95.34	0.127	0.124	46.89	6.50	-82.89	83.14	274
$M_d$	1.01	63.08	30.71	83.17	0.356	0.173	62.26	98.77	-47.87	109.76	334
$N_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	0.01	0.01	0.02	0
$W_d$	1.11	84.21	88.60	96.48	0.312	0.329	95.41	0.00	0.00	0.00	0
$Nl_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	-0.01	0.01	0.02	0
$Wl_d$	1.13	95.05	100.01	108.30	0.313	0.329	100.00	0.00	0.37	0.37	90
$Zl_d$	0.18	17.10	17.99	19.49	0.313	0.329	49.48	0.02	0.20	0.20	82

DEV20-1N

Ostw data  $rgb^*$ , XYZy, and  $LabC^*h_{ab}$  in the CIELAB-colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^* L_d^* A_d^* B_d^* C_{ab,d}^* h_{ab,d}$

$R_d$  1.00 67 55 39 68 35  
 $Y_d$  1.10 88 8 -2 136 136 91  
 $G_d$  0.10 80 -113 67 132 149  
 $C_d$  0.11 77 -64 -31 71 205  
 $B_d$  0.01 46 -82 83 274  
 $M_d$  1.01 62 61 62 -39 327  
 $N_d$  0.00 0 0 0 0 0  
 $W_d$  1.11 95 0 0 0 0

$a^* = 500 [(X/Y_{D65})^{1/3} - (Y/Y_{D65})^{1/3}] [1a]$   
 $b^* = 200 [(Y/Y_{D65})^{1/3} - (Z/Z_{D65})^{1/3}] [1a]$   
 $C_{ab}^* = [a^{*2} + b^{*2}]^{0.5} [3a]$   
 $h_{ab}^* = \text{atan} [b^*/a^*] [4a]$

DEV20-2N

Ostw data  $rgb^*$ , XYZy, and  $LabC^*h_{ab}$  in the CIELAB-colour space

Tristimulus values of black and white:  $Y_N=40.3, Y_W=88.6, Y_{Wa}=88.6$

$rgb^*$	CIEXYZ data					$LabC^*h_{ab}$ data					
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$a_d^*$	$b_d^*$	$C_{ab,d}^*$	$h_{ab,d}$	
$R_d$	1.00	68.44	60.47	44.26	0.594	0.397	82.09	25.33	20.97	32.89	39
$Y_d$	1.10	75.34	79.90	44.51	0.479	0.512	91.64	-1.24	37.16	37.18	91
$G_d$	0.10	49.82	71.85	51.14	0.228	0.627	87.89	-44.68	23.67	50.57	152
$C_d$	0.11	54.07	68.43	96.10	0.163	0.292	86.22	-26.32	-15.59	30.59	210
$B_d$	0.01	47.18	49.00	95.86	0.127	0.124	75.45	1.69	-33.99	34.03	272
$M_d$	1.01	72.69	57.05	89.23	0.356	0.173	80.21	42.54	-21.26	47.56	333
$N_d$	0.00	38.32	40.32	43.90	0.333	0.333	69.70	-0.01	0.01	0.01	0
$W_d$	1.11	84.21	88.60	96.48	0.312	0.329	95.41	0.00	0.00	0.00	0
$Nl_d$	0.00	38.32	40.32	43.90	0.333	0.333	69.70	-0.01	0.01	0.01	0
$Wl_d$	1.13	90.12	94.81	102.92	0.313	0.329	97.96	-0.00	0.20	0.20	90
$Zl_d$	0.18	47.64	50.12	54.52	0.313	0.329	76.14	-0.00	0.06	0.06	91

DEV21-1N

Ostw data  $rgb^*$ , XYZy, and  $LabC^*h_{ab}$  in the CIELAB-colour space

Tristimulus values of black and white:  $Y_N=40.3, Y_W=88.6, Y_{Wa}=88.6$

$rgb^* L_d^* A_d^* B_d^* C_{ab,d}^* h_{ab,d}$

$R_d$  1.00 82 25 20 32 39  
 $Y_d$  1.10 91 -1 37 37 91  
 $G_d$  0.10 87 -44 23 50 152  
 $C_d$  0.11 86 -26 -15 30 210  
 $B_d$  0.01 75 -1 -33 34 272  
 $M_d$  1.01 80 48 -24 54 332  
 $N_d$  0.00 69 0 0 0 0  
 $W_d$  1.11 95 0 0 0 0

$a^* = 500 [(X/Y_{D65})^{1/3} - (Y/Y_{D65})^{1/3}] [1a]$   
 $b^* = 200 [(Y/Y_{D65})^{1/3} - (Z/Z_{D65})^{1/3}] [2a]$   
 $C_{ab}^* = [a^{*2} + b^{*2}]^{0.5} [3a]$   
 $h_{ab}^* = \text{atan} [b^*/a^*] [4a]$

DEV21-2N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB}$  in  $L^*ABJND$ -colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^*$	CIEXYZ data					$L^*ABCh_{AB}$ data					
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$A_d$	$B_d$	$C_{AB,d}$	$h_{AB,d}$	
$R_d$	1.00	55.28	36.99	0.67	0.594	0.397	67.26	52.93	36.37	64.22	34
$Y_d$	1.10	67.93	72.65	1.12	0.479	0.512	88.28	-2.93	71.61	71.67	92
$G_d$	0.10	21.11	57.87	13.29	0.228	0.627	80.66	-89.15	45.66	100.16	152
$C_d$	0.11	28.91	51.60	95.79	0.163	0.292	77.04	-52.96	-36.36	64.24	214
$B_d$	0.01	16.26	15.93	95.34	0.127	0.124	46.89	2.93	-71.61	71.67	272
$M_d$	1.01	63.08	30.71	83.17	0.356	0.173	62.26	89.12	-45.66	100.14	332
$N_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	0.00	0.00	0.00	0
$W_d$	1.11	84.21	88.60	96.48	0.312	0.329	95.41	0.00	0.00	0.00	0
$Nl_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	0.00	0.00	0.00	0
$Wl_d$	1.13	95.05	100.01	108.30	0.313	0.329	100.00	-0.00	0.55	0.55	90
$Zl_d$	0.18	17.10	17.99	19.49	0.313	0.329	49.48	0.01	0.09	0.09	82

DEV20-3N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB}$  in  $L^*ABJND$ -colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^* L_d^* A_d^* B_d^* C_{AB,d}^* h_{AB,d}$

$R_d$  1.00 67 52 36 64 34  
 $Y_d$  1.10 88 2 71 71 92  
 $G_d$  0.10 80 -89 45 100 152  
 $C_d$  0.11 77 -52 36 64 214  
 $B_d$  0.01 46 -71 71 272  
 $M_d$  1.01 62 61 62 -45 100 332  
 $N_d$  0.00 0 0 0 0 0  
 $W_d$  1.11 95 0 0 0 0

$A = 250 [(X/Y_{D65})^{1/3} - (Y/Y_{D65})^{1/3}] [1b]$   
 $B = 100 [(Y/Y_{D65})^{1/3} - (Z/Z_{D65})^{1/3}] [2b]$   
 $C_{AB} = [A^2 + B^2]^{0.5} [3b]$   
 $h_{AB} = \text{atan} [B/A] [4b]$

DEV20-4N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB}$  in  $L^*ABJND$ -colour space

Tristimulus values of black and white:  $Y_N=40.3, Y_W=88.6, Y_{Wa}=88.6$

$rgb^*$	CIEXYZ data					$L^*ABCh_{AB}$ data					
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$A_d$	$B_d$	$C_{AB,d}$	$h_{AB,d}$	
$R_d$	1.00	68.44	60.47	44.26	0.594	0.397	82.09	28.84	19.82	35.00	34
$Y_d$	1.10	75.34	79.90	44.51	0.479	0.512	91.64	-1.60	39.03	39.06	92
$G_d$	0.10	49.82	71.85	51.14	0.228	0.627	87.89	-48.58	24.89	54.59	152
$C_d$	0.11	54.07	68.43	96.10	0.163	0.292	86.22	-28.86	-19.81	35.01	214
$B_d$	0.01	47.18	49.00	95.86	0.127	0.124	75.45	1.59	-39.02	39.05	272
$M_d$	1.01	72.69	57.05	89.23	0.356	0.173	80.21	48.56	-24.88	54.56	332
$N_d$	0.00	38.32	40.32	43.90	0.333	0.333	69.70	-0.01	0.00	0.01	0
$W_d$	1.11	84.21	88.60	96.48	0.312	0.329	95.41	0.00	0.00	0.00	0
$Nl_d$	0.00	38.32	40.32	43.90	0.333	0.333	69.70	-0.01	0.00	0.01	0
$Wl_d$	1.13	90.12	94.81	102.92	0.313	0.329	97.96	-0.00	0.30	0.30	90
$Zl_d$	0.18	47.64	50.12	54.52	0.313	0.329	76.14	-0.00	0.05	0.05	91

DEV21-3N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB}$  in  $L^*ABJND$ -colour space

Tristimulus values of black and white:  $Y_N=40.3, Y_W=88.6, Y_{Wa}=88.6$

$rgb^* L_d^* A_d^* B_d^* C_{AB,d}^* h_{AB,d}$

$R_d$  1.00 82 28 19 35 34  
 $Y_d$  1.10 91 -1 39 39 92  
 $G_d$  0.10 87 -48 24 54 152  
 $C_d$  0.11 86 -28 -19 35 214  
 $B_d$  0.01 75 1 -39 39 272  
 $M_d$  1.01 80 48 -24 54 332  
 $N_d$  0.00 69 0 0 0 0  
 $W_d$  1.11 95 0 0 0 0

$A = 250 [(X/Y_{D65})^{1/3} - (Y/Y_{D65})^{1/3}] [1b]$   
 $B = 100 [(Y/Y_{D65})^{1/3} - (Z/Z_{D65})^{1/3}] [2b]$   
 $C_{AB} = [A^2 + B^2]^{0.5} [3b]$   
 $h_{AB} = \text{atan} [B/A] [4b]$

DEV21-4N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB1}$  in  $L^*AB1JND$ -colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^*$	CIEXYZ data					$L^*ABCh_{AB1}$ data					
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$A_{d1}$	$B_{d1}$	$C_{AB1,d}$	$h_{AB1,d}$	
$R_d$	1.00	55.28	36.99	0.67	0.594	0.397	67.26	55.67	39.60	68.32	35
$Y_d$	1.10	67.93	72.65	1.12	0.479	0.512	88.28	18.96	77.99	80.26	76
$G_d$	0.10	21.11	57.87	13.29	0.228	0.627	80.66	-61.74	49.73	79.28	141
$C_d$	0.11	28.91	51.60	95.79	0.163	0.292	77.04	-55.69	-39.60	68.33	215
$B_d$	0.01	16.26	15.93	95.34	0.127	0.124	46.89	-18.96	-79.98	80.25	256
$M_d$	1.01	63.08	30.71	83.17	0.356	0.173	62.26	61.72	-49.72	79.26	321
$N_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	0.00	0.00	0.00	0
$W_d$	1.11	84.21	88.60	96.48	0.312	0.329	95.41	0.00	0.00	0.00	0
$Nl_d$	0.00	0.00	0.00	0.00	0.333	0.333	0.08	0.00	0.00	0.00	0
$Wl_d$	1.13	95.05	100.01	108.30	0.313	0.329	100.00	0.16	0.60	0.62	75
$Zl_d$	0.18	17.10	17.99	19.49	0.313	0.329	49.48	0.03	0.10	0.11	69

DEV20-5N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB1}$  in  $L^*AB1JND$ -colour space

Tristimulus values of black and white:  $Y_N=0.0, Y_W=88.6$

$rgb^* L_d^* A_{d1}^* B_{d1}^* C_{AB1,d}^* h_{AB1,d}$

$R_d$  1.00 67 55 39 68 35  
 $Y_d$  1.10 88 18 77 80 76  
 $G_d$  0.10 80 -61 49 79 141  
 $C_d$  0.11 77 -55 -39 68 215  
 $B_d$  0.01 46 -18 -79 80 256  
 $M_d$  1.01 62 61 62 -49 79 321  
 $N_d$  0.00 0 0 0 0 0  
 $W_d$  1.11 95 0 0 0 0

$a_1 = a_0 [(x - x_c)/y]$   
 $b_1 = b_0 [(z/y)]$   
 $a_{20} = 1, b_{20} = -0.4$   
 $x_c = 0.110, B_c = 1.000$   
 $A_1 = 2.5 (a_1 - a_{1m}) Y$   
 $B_1 = 2.5 B_c (b_1 - b_{1m}) Y$   
 $C_{AB1} = [A_1^2 + B_1^2]^{0.5}$   
 $h_{AB1} = \text{atan} [B_1/A_1]$

[1c]  
[2c]  
[3c]  
[4c]

DEV20-6N

Ostw data  $rgb^*$ , XYZy, and  $L^*ABCh_{AB1}$  in  $L^*AB1JND$ -colour space

Tristimulus values of black and white:  $Y_N=40.3, Y_W=88.6, Y_{Wa}=88.6$

$rgb^*$	CIEXYZ data					$L^*ABCh_{AB1}$ data				
	$X_d$	$Y_d$	$Z_d$	$x_d$	$y_d$	$L_d^*$	$A_{d1}$	$B_{d1}$	$C_{AB1,d}$	$h_{AB1,d}$
$R_d$	1.00	68.44	60.47	4						