

# Colour stimuli of just noticeable colour thresholds ( $p=50\%$ ) in BY direction

number Colour series	CIELAB differences lightness, chroma, $\Sigma$				LABJND differences lightness, chroma, $\Sigma$				colour differences other formulae			notes experimental series
	$\Delta L^*$	$\Delta a^*$	$\Delta b^*$	$\Delta E^*_{ab}$	$\Delta L^*$	$\Delta a^*$	$\Delta b^*$	$\Delta E^*$	CMC	C94	C00	
0 WPN	0.0	-0.14	-1.75	1.75	0.04	-0.09	-0.97	0.98	2.49	1.71	1.71	_WN, GR, BY
1 WPN	0.0	-0.1	-1.16	1.16	0.05	-0.09	-0.9	0.91	1.4	1.02	1.0	grey surround
2 WPN	0.0	-0.08	-1.01	1.02	0.05	-0.09	-0.98	0.98	1.32	0.93	0.91	$Y_G=16.6$
3 WPN	0.0	-0.08	-0.94	0.95	0.0	-0.11	-1.04	1.04	1.4	0.93	0.92	with white
4 WPN	0.0	-0.09	-1.08	1.08	0.0	-0.12	-1.25	1.25	1.43	1.01	1.02	border
5 WPN	0.0	-0.1	-1.31	1.32	0.0	-0.14	-1.42	1.42	1.55	1.12	1.15	$X_w=95.18$
6 WPN	0.0	-0.08	-0.97	0.98	0.0	-0.11	-1.2	1.21	1.29	0.9	0.89	$Y_w=100.0$
7 WPN	0.0	-0.12	-1.12	1.13	0.0	-0.13	-1.11	1.12	1.51	1.05	1.03	$Z_w=44.15$
8 WPN	0.0	-0.12	-1.26	1.27	0.0	-0.12	-1.06	1.07	1.88	1.24	1.21	$x_w=0.3977$
9 WPN	0.0	-0.08	-0.91	0.92	0.0	-0.08	-0.85	0.85	1.41	0.91	0.91	$y_w=0.4178$
10 WPN	0.0	-0.04	-0.84	0.84	0.0	-0.04	-0.82	0.82	1.27	0.84	0.84	near P4000
11 WDN	0.0	-0.04	-0.24	0.25	0.0	-0.05	-0.47	0.48	0.35	0.24	0.24	_WN, GR, BY
12 WDN	0.0	-0.04	-0.24	0.25	0.0	-0.05	-0.53	0.54	0.37	0.24	0.25	grey surround
13 WDN	0.0	-0.04	-0.26	0.27	0.0	-0.05	-0.63	0.63	0.38	0.25	0.25	$Y_G=16.6$
14 WDN	0.0	-0.04	-0.28	0.28	0.0	-0.05	-0.7	0.7	0.4	0.27	0.27	with white
15 WDN	0.0	-0.02	-0.27	0.27	0.0	-0.03	-0.67	0.67	0.39	0.26	0.26	border
16 WDN	0.0	-0.07	-0.32	0.33	0.0	-0.09	-0.76	0.77	0.5	0.32	0.33	$X_w=90.38$
17 WDN	0.0	-0.06	-0.34	0.35	0.0	-0.08	-0.76	0.76	0.54	0.35	0.36	$Y_w=100.0$
18 WDN	0.0	-0.08	-0.36	0.37	0.0	-0.09	-0.72	0.73	0.54	0.36	0.37	$Z_w=87.54$
19 WDN	0.0	-0.06	-0.39	0.39	0.0	-0.06	-0.67	0.68	0.55	0.37	0.38	$x_w=0.3251$
20 WDN	0.0	-0.12	-0.44	0.46	0.0	-0.11	-0.67	0.68	0.6	0.42	0.44	$y_w=0.3598$
21 WDN	0.0	-0.08	-0.42	0.43	0.0	-0.07	-0.68	0.69	0.58	0.4	0.41	near D65
22 GDR	0.0	-0.25	-0.51	0.57	0.0	-0.09	-1.25	1.25	0.22	0.22	0.22	_WN, GR, BY
23 GDR	0.0	-0.22	-0.51	0.55	0.0	-0.12	-1.21	1.22	0.26	0.27	0.28	grey surround
24 GDR	0.0	-0.11	-0.46	0.47	0.0	-0.09	-1.06	1.07	0.3	0.31	0.31	$Y_G=16.6$
25 GDR	0.0	-0.1	-0.47	0.48	0.0	-0.1	-1.07	1.08	0.41	0.37	0.35	with white
26 GDR	0.0	-0.09	-0.5	0.51	0.0	-0.1	-1.12	1.13	0.58	0.45	0.44	border
27 GDR	0.0	-0.09	-0.48	0.49	0.0	-0.11	-1.07	1.08	0.71	0.48	0.48	$X_w=90.38$
28 GDR	0.0	-0.1	-0.55	0.56	0.0	-0.11	-1.28	1.28	0.75	0.39	0.33	$Y_w=100.0$
29 GDR	0.01	-0.12	-0.6	0.62	0.12	-0.13	-1.43	1.44	0.59	0.32	0.27	$Z_w=87.54$
30 GDR	0.01	-0.07	-0.63	0.63	0.1	-0.08	-1.5	1.51	0.54	0.28	0.23	$x_w=0.3251$
31 GDR	0.01	-0.06	-0.69	0.69	0.09	-0.06	-1.67	1.67	0.55	0.28	0.23	$y_w=0.3598$
32 GDR	0.01	-0.08	-0.74	0.75	0.09	-0.07	-1.81	1.81	0.58	0.29	0.23	near D65
33 BDY	0.0	-0.09	-0.36	0.37	0.0	-0.1	-0.89	0.89	0.2	0.17	0.17	_WN, GR, BY
34 BDY	0.0	-0.12	-0.46	0.48	0.0	-0.14	-1.13	1.14	0.3	0.26	0.27	grey surround
35 BDY	0.0	-0.1	-0.42	0.44	0.0	-0.12	-1.0	1.01	0.34	0.28	0.29	$Y_G=16.6$
36 BDY	0.0	-0.1	-0.42	0.43	0.0	-0.11	-0.97	0.98	0.41	0.32	0.33	with white
37 BDY	0.0	-0.1	-0.46	0.47	0.0	-0.11	-1.02	1.03	0.56	0.41	0.41	border
38 BDY	0.0	-0.09	-0.45	0.46	0.0	-0.11	-1.10	1.0	0.69	0.45	0.46	$X_w=90.38$
39 BDY	0.0	-0.13	-0.74	0.75	0.0	-0.16	-1.22	1.23	0.6	0.5	0.51	$Y_w=100.0$
40 BDY	0.0	-0.09	-0.81	0.82	0.0	-0.1	-0.83	0.84	0.42	0.36	0.36	$Z_w=87.54$
41 BDY	0.0	-0.08	-1.24	1.24	0.0	-0.09	-0.92	0.92	0.54	0.45	0.45	$x_w=0.3251$
42 BDY	0.0	-0.09	-2.0	2.0	0.0	-0.11	-0.9	0.91	0.75	0.58	0.59	$y_w=0.3598$
43 BDY	0.01	-0.11	-4.84	4.85	0.08	-0.13	-0.99	1.0	1.59	1.1	1.14	near D65
<b>mean</b>				<b>0.79</b>					<b>1.01</b>	<b>0.77</b>	<b>0.54</b>	<b>0.53</b>
<b>standard deviation</b>				<b>0.73</b>					<b>0.28</b>	<b>0.51</b>	<b>0.35</b>	<b>0.35</b>

Samples: bright white (W, no. 0), dark black (S, no. 10), White (W, no. 11), Black (N, no. 21)  
 Green (G=T (turquoise), no. 22), Red (R=M (magenta), no. 32), Blue (B, no. 33), Yellow (Y, no. 43)  
 Source: BAM Research Report no. 115 (1985), Tables 5.40;1 to 11; LABJND;0.7; 1.3; 1.2