

Colour stimuli of just noticeable colour thresholds ($p=50\%$) in 3 directions

number Colour series	Colour stimuli colour values Y x y	Colour stimuli differences at threshold -WN Δx -GR Δy -BY Δz	notes experimental series
0 WPN	196.9 0.3986 0.4175 1.19	-0.0011 0.0009 -0.0016 -0.0014	WN, GR, BY
1 WPN	74.13 0.3919 0.4139 0.41	-0.0012 0.0011 -0.0016 -0.0013	grey surround
2 WPN	34.31 0.3926 0.4114 0.18	-0.0013 0.0011 -0.0017 -0.0015	CIE data no. 03
3 WPN	17.69 0.3973 0.4153 0.09	-0.0016 0.0013 -0.002 -0.0017	with white border
4 WPN	9.15 0.4052 0.4185 0.07	-0.0017 0.0015 -0.0029 -0.0024	
5 WPN	4.65 0.4159 0.4226 0.05	-0.0023 0.002 -0.0042 -0.0036	
6 WPN	3.14 0.386 0.4113 0.04	-0.0027 0.0022 -0.0039 -0.0034	
7 WPN	1.26 0.3829 0.4091 0.02	-0.0045 0.0036 -0.0062 -0.0053	
8 WPN	0.62 0.3856 0.4108 0.02	-0.0076 0.0064 -0.0102 -0.0088	
9 WPN	0.29 0.3905 0.4148 0.01	-0.0132 0.0108 -0.0157 -0.0137	
10 WPN	0.16 0.402 0.4177 0.01	-0.021 0.0164 -0.0251 -0.0235	near P4000
11 WDN	27.11 0.3282 0.3627 0.09	-0.001 0.0006 -0.0006 -0.0006	WN, GR, BY
12 WDN	16.69 0.3236 0.3584 0.06	-0.0011 0.0006 -0.0008 -0.0006	grey surround
13 WDN	10.38 0.3205 0.3552 0.06	-0.0013 0.0007 -0.0009 -0.0009	CIE data no. 12
14 WDN	6.96 0.3198 0.3543 0.03	-0.0015 0.0008 -0.0012 -0.0011	with white border
15 WDN	4.77 0.3206 0.3553 0.03	-0.0017 0.0011 -0.0012 -0.0012	
16 WDN	3.3 0.3221 0.357 0.03	-0.002 0.0013 -0.0018 -0.0015	
17 WDN	2.27 0.3255 0.3593 0.03	-0.0027 0.0016 -0.0022 -0.0019	
18 WDN	1.76 0.33 0.3612 0.01	-0.0029 0.0019 -0.0025 -0.0021	
19 WDN	1.26 0.3347 0.3649 0.01	-0.0038 0.0024 -0.0029 -0.0026	
20 WDN	0.91 0.3399 0.3691 0.02	-0.0042 0.0028 -0.0042 -0.0032	
21 WDN	0.63 0.3465 0.3738 0.01	-0.0057 0.0039 -0.0056 -0.0048	near D65
22 GDR	14.96 0.1198 0.3961 0.06	-0.0061 0.003 -0.0012 -0.0022	WN, GR, BY
23 GDR	15.01 0.1817 0.3839 0.04	-0.005 0.0026 -0.0015 -0.0019	grey surround
24 GDR	15.71 0.2422 0.3728 0.06	-0.0037 0.0021 -0.0013 -0.0016	CIE data no. 27
25 GDR	16.76 0.2786 0.3655 0.06	-0.0026 0.0014 -0.0014 -0.0015	with white border
26 GDR	17.25 0.3041 0.3605 0.06	-0.002 0.0012 -0.0016 -0.0015	
27 GDR	16.52 0.321 0.3578 0.06	-0.0017 0.0016 -0.0016 -0.0013	
28 GDR	15.69 0.3808 0.3087 0.04	-0.0021 0.0013 -0.0019 -0.0012	
29 GDR	15.95 0.4326 0.2637 0.05	-0.002 0.0011 -0.0023 -0.001	
30 GDR	16.96 0.4598 0.2388 0.07	-0.0022 0.0011 -0.0022 -0.001	
31 GDR	17.1 0.4763 0.2229 0.09	-0.0019 0.0009 -0.0024 -0.001	
32 GDR	17.17 0.485 0.2119 0.09	-0.002 0.0009 -0.0026 -0.001	near D65
33 BDY	17.29 0.2497 0.2914 0.07	-0.0018 0.0008 -0.0011 -0.0009	WN, GR, BY
34 BDY	16.89 0.2685 0.3063 0.03	-0.0016 0.0007 -0.0015 -0.0012	grey surround
35 BDY	17.26 0.2877 0.3257 0.06	-0.0017 0.0009 -0.0013 -0.0011	CIE data no. 38
36 BDY	17.41 0.3011 0.3389 0.05	-0.0017 0.0008 -0.0013 -0.0011	with white border
37 BDY	17.48 0.3142 0.3498 0.05	-0.0017 0.0009 -0.0015 -0.0012	
38 BDY	16.44 0.3232 0.3593 0.06	-0.0016 0.001 -0.0014 -0.0013	
39 BDY	16.62 0.3611 0.3882 0.04	-0.0018 0.0012 -0.0024 -0.0019	
40 BDY	19.91 0.4048 0.4283 0.04	-0.002 0.0017 -0.002 -0.0018	
41 BDY	17.72 0.4338 0.4529 0.05	-0.002 0.0019 -0.0026 -0.0024	
42 BDY	18.05 0.4626 0.4772 0.05	-0.0021 0.0025 -0.003 -0.0027	
43 BDY	18.46 0.4841 0.4968 0.05	-0.002 0.0025 -0.0037 -0.0032	near D65

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

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

colour match of just noticeable colour differences (JND) in the direction												
number Colour series	CIE LAB differences lightness, chroma, ΔL^* Δa^* Δb^* ΔE^*				LABJND differences lightness, chroma, ΔL^* Δa^* Δb^* ΔE^*				colour differences other formulae CMC/C94 C00		notes experimental series	
	ΔL^*	Δa^*	Δb^*	ΔE^*	ΔL^*	Δa^*	Δb^*	ΔE^*	CMC/C94	C00		
0 WPN	0.29	0.0	0.0	0.29	1.23	0.0	0.0	1.23	0.14	0.29	0.13	WN, GR, BY
1 WPN	0.19	0.0	0.0	0.19	1.1	0.0	0.0	1.1	0.1	0.19	0.12	grey surround
2 WPN	0.14	0.0	0.0	0.14	0.99	0.0	0.0	0.99	0.09	0.14	0.11	$\bar{Y}_C=16.6$
3 WPN	0.12	0.0	0.0	0.12	0.99	0.0	0.0	0.99	0.09	0.12	0.12	with white border
4 WPN	0.15	-0.01	-0.01	0.15	1.36	-0.02	-0.02	1.36	0.14	0.15	0.12	
5 WPN	0.15	-0.02	-0.03	0.15	1.38	-0.04	-0.04	1.38	0.19	0.15	0.11	$X_W=95.18$
6 WPN	0.19	0.0	0.02	0.19	1.69	0.0	0.0	1.69	0.28	0.19	0.13	$Y_W=100.0$
7 WPN	0.21	0.02	0.01	0.21	1.47	0.03	0.03	1.47	0.41	0.21	0.13	$Z_W=44.15$
8 WPN	0.18	0.0	0.0	0.18	1.16	0.0	0.02	1.16	0.35	0.18	0.1	$x_W=0.3977$
9 WPN	0.18	0.0	0.0	0.18	1.28	0.0	0.01	1.28	0.35	0.18	0.1	$y_W=0.4178$
10 WPN	0.18	0.0	0.0	0.18	1.33	-0.01	-0.01	1.33	0.35	0.18	0.1	near P4000
11 WDN	0.08	0.0	0.0	0.08	0.61	0.0	0.0	0.61	0.05	0.08	0.07	WN, GR, BY
12 WDN	0.08	0.0	0.0	0.08	0.73	0.0	0.0	0.73	0.07	0.08	0.08	grey surround
13 WDN	0.1	0.0	0.0	0.1	0.93	0.0	0.0	0.93	0.09	0.1	0.09	$\bar{Y}_C=16.6$
14 WDN	0.09	0.0	0.0	0.09	0.83	0.0	0.0	0.83	0.09	0.09	0.07	with white border
15 WDN	0.11	0.0	0.0	0.11	1.07	0.0	0.0	1.07	0.14	0.11	0.08	
16 WDN	0.11	0.0	0.0	0.11	1.02	0.0	0.01	1.02	0.16	0.11	0.08	$X_W=90.38$
17 WDN	0.14	-0.02	0.01	0.15	1.22	-0.02	0.02	1.22	0.25	0.15	0.1	$Y_W=100.0$
18 WDN	0.11	-0.03	0.01	0.11	0.88	-0.03	-0.02	0.88	0.22	0.11	0.08	$Z_W=87.54$
19 WDN	0.14	0.0	-0.01	0.14	0.98	-0.01	-0.03	0.98	0.27	0.14	0.09	$x_W=0.3251$
20 WDN	0.17	-0.01	0.0	0.17	1.07	-0.01	-0.03	1.07	0.34	0.17	0.1	$y_W=0.3598$
21 WDN	0.18	0.0	0.0	0.18	1.15	-0.02	-0.05	1.16	0.35	0.18	0.1	near D65
22 GDR	0.09	0.46	0.03	0.47	0.8	0.2	0.12	0.84	0.16	0.13	0.13	WN, GR, BY
23 GDR	0.05	0.11	0.01	0.13	0.47	0.09	0.04	0.48	0.06	0.06	0.06	grey surround
24 GDR	0.09	0.11	0.01	0.14	0.77	0.11	0.04	0.78	0.09	0.1	0.1	$\bar{Y}_C=16.6$
25 GDR	0.08	0.03	0.01	0.09	0.73	0.05	0.04	0.73	0.07	0.09	0.09	with white border
26 GDR	0.07	0.02	0.0	0.07	0.61	0.03	0.02	0.61	0.06	0.07	0.07	
27 GDR	0.08	0.0	0.0	0.08	0.74	0.0	0.0	0.74	0.07	0.08	0.08	$X_W=90.38$
28 GDR	0.05	-0.03	0.01	0.06	0.45	-0.07	0.03	0.45	0.04	0.05	0.05	$Y_W=100.0$
29 GDR	0.07	-0.12	0.03	0.15	0.65	-0.19	0.1	0.69	0.07	0.08	0.08	$Z_W=87.54$
30 GDR	0.1	-0.17	0.04	0.2	0.83	-0.26	0.16	0.88	0.09	0.1	0.1	$x_W=0.3251$
31 GDR	0.11	-0.18	0.03	0.22	0.92	-0.38	0.15	0.98	0.1	0.11	0.11	$y_W=0.3598$
32 GDR	0.11	-0.25	0.06	0.28	0.92	-0.33	0.25	1.01	0.11	0.12	0.12	near D65
33 BDY	0.08	0.0	0.03	0.09	0.71	0.0	0.17	0.73	0.07	0.08	0.08	WN, GR, BY
34 BDY	0.05	0.0	0.02	0.05	0.41	0.0	0.08	0.42	0.04	0.05	0.05	grey surround
35 BDY	0.07	0.0	0.01	0.07	0.61	0.0	0.07	0.61	0.06	0.07	0.07	$\bar{Y}_C=16.6$
36 BDY	0.07	0.0	0.02	0.07	0.6	0.0	0.07	0.61	0.06	0.07	0.07	with white border
37 BDY	0.07	0.0	0.0	0.07	0.6	0.0	0.0	0.6	0.05	0.07	0.07	
38 BDY	0.07	0.0	0.0	0.07	0.65	0.0	0.0	0.65	0.06	0.07	0.07	$X_W=90.38$
39 BDY	0.05	0.0	-0.02	0.05	0.44	0.0	-0.05	0.44	0.04	0.05	0.05	$Y_W=100.0$
40 BDY	0.05	-0.02	0.07	0.09	0.45	-0.03	-0.1	0.46	0.06	0.06	0.06	$Z_W=87.54$
41 BDY	0.07	-0.01	-0.17	0.19	0.6	-0.02	-0.16	0.62	0.09	0.09	0.09	$x_W=0.3251$
42 BDY	0.07	-0.01	-0.31	0.32	0.59	-0.02	-0.16	0.61	0.13	0.11	0.11	$y_W=0.3598$
43 BDY	0.07	-0.01	-0.8	0.8	0.57	-0.02	-0.18	0.6	0.27	0.2	0.2	near D65
mean				0.16				0.89	0.14	0.12	0.09	
standard deviation				0.12				0.3	0.1	0.05	0.02	

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; LABJND0.7; 1.3; 1.2

TUB-test chart XE04; Colour thresholds data

RI experiments: Series WPN, WDN, GDR, BDY in directions WN, GR, BY; LABJND0.7; 1.3; 1.2

input: w/rqb/cmyk -> w/rqb/cmyk-

LABJND0.7; 1.3; 1.2