

ID	M1 (D50/2)		a*	b*	X	Y	Z	x	y	Sample	Gloss	ASTM E313		Apparent W 3664 (2009)
	L*	a*										White M1	OBA	
1	93.80	2.39	-5.93	83.01	84.80	76.77	0.34	0.35	P1	5.6	109.9	6.4	2.66	
2	95.83	0.96	-4.42	86.91	89.60	79.14	0.34	0.35	P2	29.1	107.8	6.1	1.67	
3	95.63	2.53	-8.47	87.29	89.11	83.68	0.34	0.34	P3	67.7	124.1	8.3	3.69	
4	94.09	2.26	-6.27	83.60	85.47	77.76	0.34	0.35	P4	68.8	111.9	5.3	2.40	
5	95.85	1.96	-10.13	87.49	89.64	86.26	0.33	0.34	P5	8.1	131.3	9.8	3.97	
6	95.22	2.47	-9.21	86.30	88.13	83.72	0.33	0.34	P6	7.4	126.3	8.8	3.58	
7	95.44	1.24	-6.27	86.17	88.67	80.58	0.34	0.35	P7	39.7	114.6	5.8	2.45	
8	94.71	1.06	-3.84	84.37	86.92	76.14	0.34	0.35	P8	68.1	103.0	4.0	1.39	
9	96.26	1.47	-6.73	88.21	90.65	82.88	0.34	0.35	P9	74.7	118.3	8.7	2.10	
10	93.64	1.56	-8.10	82.22	84.43	79.02	0.33	0.34	P10	66.4	118.4	6.5	2.97	
11	93.35	2.74	-12.20	82.19	83.78	83.44	0.33	0.34	P11	6.7	135.1	8.1	4.00	
12	96.07	2.91	-9.69	88.52	90.17	86.18	0.33	0.34	P12	28.4	130.1	9.3	3.94	
13	94.55	1.93	-6.66	84.48	86.56	79.18	0.34	0.35	pf1a	4.7	114.4	6.4	2.67	
14	93.73	2.36	-6.06	82.85	84.65	76.79	0.34	0.35	pf1b	4.7	110.3	6.3	2.63	
15	95.67	0.69	-3.79	86.40	89.22	78.05	0.34	0.35	pf2a	68.6	104.8	4.5	1.47	
16	95.92	0.72	-3.52	86.99	89.82	78.25	0.34	0.35	pf2b	68.2	104.3	4.4	1.31	
17	95.68	1.46	-9.73	86.82	89.23	85.37	0.33	0.34	pf3a	62.3	129.3	9.9	3.87	
18	94.64	2.61	-11.39	85.04	86.76	85.21	0.33	0.34	pf3b	70.9	134.2	9.9	3.87	
19	93.80	0.74	-5.61	82.15	84.80	76.39	0.34	0.35	pf4a	63.7	108.3	4.0	2.25	
20	95.59	1.35	-9.56	86.57	89.03	84.97	0.33	0.34	pf4b	60.7	128.4	10.0	3.54	
21	96.75	2.53	-8.55	89.93	91.83	86.22	0.34	0.34	pf5a	4.4	126.8	9.7	3.69	
22	94.53	1.91	-9.30	84.42	86.50	82.36	0.33	0.34	pf5b	8.9	125.3	7.1	3.48	
23	96.17	2.60	-9.39	88.59	90.41	86.01	0.33	0.34	pf6a	4.3	129.0	10.0	3.75	
24	95.64	0.32	-4.64	86.13	89.15	79.01	0.34	0.35	pf7a	78.6	108.2	4.6	1.88	
25	95.53	0.28	-4.21	85.84	88.87	78.26	0.34	0.35	pf8a	59.4	106.2	3.6	1.81	
26	95.02	-0.17	-3.95	84.44	87.66	76.91	0.34	0.35	pf8b	47.4	103.9	3.3	1.75	
27	95.49	0.90	-6.93	86.08	88.78	81.47	0.34	0.35	pf9a	66.2	117.3	6.7	3.80	
28	95.89	0.72	-6.19	86.92	89.74	81.42	0.34	0.35	pf9b	78.8	115.2	5.8	2.55	
29	94.07	1.91	-8.43	83.38	85.43	80.32	0.33	0.34	KF1	9.9	120.7	6.7	2.83	
30	94.21	2.16	-8.72	83.83	85.76	80.97	0.33	0.34	KF2	6.3	122.2	7.4	3.04	
31	93.27	1.04	-2.91	81.13	83.59	72.23	0.34	0.35	KM1	23.9	96.0	3.2	1.30	
32	94.42	0.30	-0.82	83.31	86.24	72.10	0.34	0.36	KM2	10.0	89.7	1.3	0.88	
33	93.61	1.14	-3.20	81.94	84.37	73.22	0.34	0.35	KM3	20.3	97.9	3.5	1.29	
34	93.33	2.64	-12.94	82.09	83.72	84.31	0.33	0.33	KS1	5.6	138.2	8.6	3.93	
35	94.04	2.05	-10.18	83.39	85.37	82.41	0.33	0.34	KS2	22.0	128.0	8.2	3.81	
36	94.91	1.71	-5.97	85.18	87.40	79.09	0.34	0.35	KS3	21.1	112.3	4.1	2.48	
37	93.81	1.03	-2.73	82.33	84.83	73.08	0.34	0.35	KG1	70.9	96.4	3.2	1.13	
38	94.98	1.70	-5.85	85.33	87.56	79.09	0.34	0.35	KG2	23.2	111.9	4.0	2.29	
39	95.93	0.93	-3.08	87.12	89.83	77.73	0.34	0.35	KG3	58.6	102.6	3.6	1.30	
40	93.74	0.01	-2.80	81.86	84.82	74.15	0.34	0.35	Chroma	n/a	100.2	3.3	n/a	
41	94.48	0.85	-3.23	84.07	86.59	76.69	0.34	0.35	Udigital	n/a	105.6	4.8	n/a	

ID	M1 (D50/2)			X	Y	Z	x	y	Sample	ASTM E313		Apparent W	
	L*	a*	b*							Gloss	White M1	OBA	AW (2009)
32	94.42	0.30	-0.82	83.31	86.24	72.10	0.34	0.36	KM2	10.0	89.7	1.3	0.88
31	93.27	1.04	-2.91	81.13	83.59	72.23	0.34	0.35	KM1	23.9	96.0	3.2	1.30
37	93.81	1.03	-2.73	82.33	84.83	73.08	0.34	0.35	KG1	70.9	96.4	3.2	1.13
33	93.61	1.14	-3.20	81.94	84.37	73.22	0.34	0.35	KM3	20.3	97.9	3.5	1.29
40	94	0	-3	81.86	84.82	74.15	0.34	0.35	Chroma	n/a	100.2	3.3	n/a
39	95.93	0.93	-3.08	87.12	89.83	77.73	0.34	0.35	KG3	58.6	102.6	3.6	1.30
8	94.71	1.06	-3.84	84.37	86.92	76.14	0.34	0.35	P8	68.1	103.0	4.0	1.39
26	95.02	-0.17	-3.95	84.44	87.66	76.91	0.34	0.35	pf8b	47.4	103.9	3.3	1.75
16	95.92	0.72	-3.52	86.99	89.82	78.25	0.34	0.35	pf2b	68.2	104.3	4.4	1.31
15	95.67	0.69	-3.79	86.40	89.22	78.05	0.34	0.35	pf2a	68.6	104.8	4.5	1.47
41	94	1	-3	84.07	86.59	76.69	0.34	0.35	Udigital	n/a	105.6	4.8	n/a
25	95.53	0.28	-4.21	85.84	88.87	78.26	0.34	0.35	pf8a	59.4	106.2	3.6	1.81
2	95.83	0.96	-4.42	86.91	89.60	79.14	0.34	0.35	P2	29.1	107.8	6.1	1.67
24	95.64	0.32	-4.64	86.13	89.15	79.01	0.34	0.35	pf7a	78.6	108.2	4.6	1.88
19	93.80	0.74	-5.61	82.15	84.80	76.39	0.34	0.35	pf4a	63.7	108.3	4.0	2.25
1	93.80	2.39	-5.93	83.01	84.80	76.77	0.34	0.35	P1	5.6	109.9	6.4	2.66
14	93.73	2.36	-6.06	82.85	84.65	76.79	0.34	0.35	pf1b	4.7	110.3	6.3	2.63
4	94.09	2.26	-6.27	83.60	85.47	77.76	0.34	0.35	P4	68.8	111.9	5.3	2.40
38	94.98	1.70	-5.85	85.33	87.56	79.09	0.34	0.35	KG2	23.2	111.9	4.0	2.29
36	94.91	1.71	-5.97	85.18	87.40	79.09	0.34	0.35	KS3	21.1	112.3	4.1	2.48
13	94.55	1.93	-6.66	84.48	86.56	79.18	0.34	0.35	pf1a	4.7	114.4	6.4	2.67
7	95.44	1.24	-6.27	86.17	88.67	80.58	0.34	0.35	P7	39.7	114.6	5.8	2.45
28	95.89	0.72	-6.19	86.92	89.74	81.42	0.34	0.35	pf9b	78.8	115.2	5.8	2.55
27	95.49	0.90	-6.93	86.08	88.78	81.47	0.34	0.35	pf9a	66.2	117.3	6.7	3.80
9	96.26	1.47	-6.73	88.21	90.65	82.88	0.34	0.35	P9	74.7	118.3	8.7	2.10
10	93.64	1.56	-8.10	82.22	84.43	79.02	0.33	0.34	P10	66.4	118.4	6.5	2.97
29	94.07	1.91	-8.43	83.38	85.43	80.32	0.33	0.34	KF1	9.9	120.7	6.7	2.83
30	94.21	2.16	-8.72	83.83	85.76	80.97	0.33	0.34	KF2	6.3	122.2	7.4	3.04
3	95.63	2.53	-8.47	87.29	89.11	83.68	0.34	0.34	P3	67.7	124.1	8.3	3.69
22	94.53	1.91	-9.30	84.42	86.50	82.36	0.33	0.34	pf5b	8.9	125.3	7.1	3.48
6	95.22	2.47	-9.21	86.30	88.13	83.72	0.33	0.34	P6	7.4	126.3	8.8	3.58
21	96.75	2.53	-8.55	89.93	91.83	86.22	0.34	0.34	pf5a	4.4	126.8	9.7	3.69
35	94.04	2.05	-10.18	83.39	85.37	82.41	0.33	0.34	KS2	22.0	128.0	8.2	3.81
20	95.59	1.35	-9.56	86.57	89.03	84.97	0.33	0.34	pf4b	60.7	128.4	10.0	3.54
23	96.17	2.60	-9.39	88.59	90.41	86.01	0.33	0.34	pf6a	4.3	129.0	10.0	3.75
17	95.68	1.46	-9.73	86.82	89.23	85.37	0.33	0.34	pf3a	62.3	129.3	9.9	3.87
12	96.07	2.91	-9.69	88.52	90.17	86.18	0.33	0.34	P12	28.4	130.1	9.3	3.94
5	95.85	1.96	-10.13	87.49	89.64	86.26	0.33	0.34	P5	8.1	131.3	9.8	3.97
18	94.64	2.61	-11.39	85.04	86.76	85.21	0.33	0.34	pf3b	70.9	134.2	9.9	3.87
11	93.35	2.74	-12.20	82.19	83.78	83.44	0.33	0.34	P11	6.7	135.1	8.1	4.00
34	93.33	2.64	-12.94	82.09	83.72	84.31	0.33	0.33	KS1	5.6	138.2	8.6	3.93

Page 3. Selecting substrates to match the reference, P1

L*	a*	b*	Reference	Gloss	White M1	OBA	AW (2009)
93.80	2.39	-5.93	P1	5.60	109.87	6.42	2.66

ID	M1 (D50/2)			Sample	ASTM E313			Apparent W		Reference		P1		ΔGloss	ΔAW
	L*	a*	b*		Gloss	White M1	OBA	AW (2009)	Sample	ΔWhite M1	ΔE00	ΔOBA	ΔCh		
32	94.42	0.30	-0.82	KM2	10.0	89.7	1.3	0.88	KM2	-20.1	5.1	-5.1		4.4	-1.8
31	93.27	1.04	-2.91	KM1	23.9	96.0	3.2	1.30	KM1	-13.9	3.0	-3.3		18.3	-1.4
37	93.81	1.03	-2.73	KG1	70.9	96.4	3.2	1.13	KG1	-13.5	3.1	-3.2		65.3	-1.5
33	93.61	1.14	-3.20	KM3	20.3	97.9	3.5	1.29	KM3	-12.0	2.7	-3.0		14.7	-1.4
40	93.74	0.01	-2.80	Chroma	n/a	100.2	3.3	n/a	Chroma	-9.7	4.1	-3.1		#VALUE!	#VALUE!
39	95.93	0.93	-3.08	KG3	58.6	102.6	3.6	1.30	KG3	-7.3	3.2	-2.8		53.0	-1.4
8	94.71	1.06	-3.84	P8	68.1	103.0	4.0	1.39	P8	-6.9	2.4	-2.5		62.5	-1.3
26	95.02	-0.17	-3.95	pf8b	47.4	103.9	3.3	1.75	pf8b	-6.0	3.9	-3.1		41.8	-0.9
16	95.92	0.72	-3.52	pf2b	68.2	104.3	4.4	1.31	pf2b	-5.5	3.2	-2.1		62.6	-1.3
15	95.67	0.69	-3.79	pf2a	68.6	104.8	4.5	1.47	pf2a	-5.0	3.0	-1.9		63.0	-1.2
41	94.48	0.85	-3.23	Udigital	n/a	105.6	4.8	n/a	Udigital	-4.3	2.9	-1.6		#VALUE!	#VALUE!
25	95.53	0.28	-4.21	pf8a	59.4	106.2	3.6	1.81	pf8a	-3.7	3.3	-2.8		53.8	-0.9
2	95.83	0.96	-4.42	P2	29.1	107.8	6.1	1.67	P2	-2.0	2.5	-0.3		23.5	-1.0
24	95.64	0.32	-4.64	pf7a	78.6	108.2	4.6	1.88	pf7a	-1.7	3.2	-1.9	2.4	73.0	-0.8
19	93.80	0.74	-5.61	pf4a	63.7	108.3	4.0	2.25	pf4a	-1.6	2.3	-2.4	1.7	58.1	-0.4
1	93.80	2.39	-5.93	P1	5.6	109.9	6.4	2.66	P1	0.0	0.0	0.0	0.0	0.0	0.0
14	93.73	2.36	-6.06	pf1b	4.7	110.3	6.3	2.63	pf1b	0.4	0.1	-0.1	0.1	-0.9	0.0
4	94.09	2.26	-6.27	P4	68.8	111.9	5.3	2.40	P4	2.0	0.4	-1.2	0.4	63.2	-0.3
38	94.98	1.70	-5.85	KG2	23.2	111.9	4.0	2.29	KG2	2.1	1.2	-2.4	0.7	17.6	-0.4
36	94.91	1.71	-5.97	KS3	21.1	112.3	4.1	2.48	KS3	2.4	1.2	-2.3	0.7	15.5	-0.2
13	94.55	1.93	-6.66	pf1a	4.7	114.4	6.4	2.67	pf1a	4.5	1.0	0.0	0.9	-0.9	0.0
7	95.44	1.24	-6.27	P7	39.7	114.6	5.8	2.45	P7	4.7	1.9	-0.6	1.2	34.1	-0.2
28	95.89	0.72	-6.19	pf9b	78.8	115.2	5.8	2.55	pf9b	5.3	2.7	-0.6	1.7	73.2	-0.1
27	95.49	0.90	-6.93	pf9a	66.2	117.3	6.7	3.80	pf9a	7.5	2.6	0.3	1.8	60.6	1.1
9	96.26	1.47	-6.73	P9	74.7	118.3	8.7	2.10	P9	8.4	2.1	2.3	1.2	69.1	-0.6
10	93.64	1.56	-8.10	P10	66.4	118.4	6.5	2.97	P10	8.6	2.2	0.1	2.3	60.8	0.3
29	94.07	1.91	-8.43	KF1	9.9	120.7	6.7	2.83	KF1	10.9	2.2	0.3	2.5	4.3	0.2
30	94.21	2.16	-8.72	KF2	6.3	122.2	7.4	3.04	KF2	12.4	2.3	1.0	2.8	0.7	0.4
3	95.63	2.53	-8.47	P3	67.7	124.1	8.3	3.69	P3	14.3	2.3	1.9	2.5	62.1	1.0
22	94.53	1.91	-9.30	pf5b	8.9	125.3	7.1	3.48	pf5b	15.4	2.8	0.6	3.4	3.3	0.8
6	95.22	2.47	-9.21	P6	7.4	126.3	8.8	3.58	P6	16.5	2.7	2.3	3.3	1.8	0.9
21	96.75	2.53	-8.55	pf5a	4.4	126.8	9.7	3.69	pf5a	17.0	2.7	3.3	2.6	-1.2	1.0
35	94.04	2.05	-10.18	KS2	22.0	128.0	8.2	3.81	KS2	18.1	3.4	1.8	4.3	16.4	1.2
20	95.59	1.35	-9.56	pf4b	60.7	128.4	10.0	3.54	pf4b	18.5	3.5	3.6	3.8	55.1	0.9
23	96.17	2.60	-9.39	pf6a	4.3	129.0	10.0	3.75	pf6a	19.1	3.0	3.6	3.5	-1.3	1.1
17	95.68	1.46	-9.73	pf3a	62.3	129.3	9.9	3.87	pf3a	19.4	3.6	3.5	3.9	56.7	1.2
12	96.07	2.91	-9.69	P12	28.4	130.1	9.3	3.94	P12	20.2	3.1	2.9	3.8	22.8	1.3
5	95.85	1.96	-10.13	P5	8.1	131.3	9.8	3.97	P5	21.5	3.6	3.4	4.2	2.5	1.3
18	94.64	2.61	-11.39	pf3b	70.9	134.2	9.9	3.87	pf3b	24.3	4.1	3.5	5.5	65.3	1.2
11	93.35	2.74	-12.20	P11	6.65	135.1	8.1	4.00	P11	25.2	4.6	1.7	6.3	1.1	1.3
34	93.33	2.64	-12.94	KS1	5.55	138.2	8.6	3.93	KS1	28.3	5.1	2.2	7.0	0.0	1.3

L*	a*	b*	Reference	Gloss	White M1	OBA	AW (2009)
95.83	0.96	-4.42	P2	29.05	107.82	6.14	1.67

ID	M1 (D50/2)			Sample	ASTM E313			Apparent W		Reference		P2		ΔCh	ΔGloss	ΔAW
	L*	a*	b*		Gloss	White M1	OBA	AW (2009)	Sample	ΔWhite M1	ΔE00	ΔOBA				
32	94.42	0.30	-0.82	KM2	10.0	89.7	1.3	0.88	KM2	-18.1	3.4	-4.8	3.7	-19.1	-0.8	
31	93.27	1.04	-2.91	KM1	23.9	96.0	3.2	1.30	KM1	-11.9	2.0	-3.0	1.5	-5.2	-0.4	
37	93.81	1.03	-2.73	KG1	70.9	96.4	3.2	1.13	KG1	-11.4	1.9	-2.9	1.7	41.8	-0.5	
33	93.61	1.14	-3.20	KM3	20.3	97.9	3.5	1.29	KM3	-9.9	1.7	-2.7	1.2	-8.8	-0.4	
40	93.74	0.01	-2.80	Chroma	n/a	100.2	3.3	n/a	Chroma	-7.7	2.3	-2.9	1.9	#VALUE!	#VALUE!	
39	95.93	0.93	-3.08	KG3	58.6	102.6	3.6	1.30	KG3	-5.2	1.2	-2.5	1.3	29.6	-0.4	
8	94.71	1.06	-3.84	P8	68.1	103.0	4.0	1.39	P8	-4.9	0.9	-2.2	0.6	39.1	-0.3	
26	95.02	-0.17	-3.95	pf8b	47.4	103.9	3.3	1.75	pf8b	-3.9	1.7	-2.8	1.2	18.4	0.1	
16	95.92	0.72	-3.52	pf2b	68.2	104.3	4.4	1.31	pf2b	-3.5	0.8	-1.8	0.9	39.1	-0.4	
15	95.67	0.69	-3.79	pf2a	68.6	104.8	4.5	1.47	pf2a	-3.0	0.6	-1.6	0.7	39.5	-0.2	
25	95.53	0.28	-4.21	pf8a	59.4	106.2	3.6	1.81	pf8a	-1.6	1.0	-2.5	0.7	30.3	0.1	
<b>2</b>	<b>95.83</b>	<b>0.96</b>	<b>-4.42</b>	<b>P2</b>	<b>29.1</b>	<b>107.8</b>	<b>6.1</b>	<b>1.67</b>	<b>P2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	
24	95.64	0.32	-4.64	pf7a	78.6	108.2	4.6	1.88	pf7a	0.4	1.0	-1.6	0.7	49.6	0.2	
19	93.80	0.74	-5.61	pf4a	63.7	108.3	4.0	2.25	pf4a	0.5	1.6	-2.1	1.2	34.6	0.6	
1	93.80	2.39	-5.93	P1	5.6	109.9	6.4	2.66	P1	2.0	2.5	0.3	2.1	-23.5	1.0	
14	93.73	2.36	-6.06	pf1b	4.7	110.3	6.3	2.63	pf1b	2.4	2.5	0.2	2.2	-24.4	1.0	
4	94.09	2.26	-6.27	P4	68.8	111.9	5.3	2.40	P4	4.0	2.4	-0.9	2.3	39.7	0.7	
38	94.98	1.70	-5.85	KG2	23.2	111.9	4.0	2.29	KG2	4.1	1.6	-2.1	1.6	-5.9	0.6	
36	94.91	1.71	-5.97	KS3	21.1	112.3	4.1	2.48	KS3	4.5	1.6	-2.0	1.7	-8.0	0.8	
13	94.55	1.93	-6.66	pf1a	4.7	114.4	6.4	2.67	pf1a	6.6	2.3	0.3	2.4	-24.4	1.0	
7	95.44	1.24	-6.27	P7	39.7	114.6	5.8	2.45	P7	6.8	1.5	-0.3	1.9	10.7	0.8	
28	95.89	0.72	-6.19	pf9b	78.8	115.2	5.8	2.55	pf9b	7.4	1.5	-0.3	1.8	49.7	0.9	
27	95.49	0.90	-6.93	pf9a	66.2	117.3	6.7	3.80	pf9a	9.5	2.0	0.6	2.5	37.2	2.1	
9	96.26	1.47	-6.73	P9	74.7	118.3	8.7	2.10	P9	10.5	1.9	2.6	2.4	45.7	0.4	
10	93.64	1.56	-8.10	P10	66.4	118.4	6.5	2.97	P10	10.6	3.2	0.4	3.7	37.4	1.3	
29	94.07	1.91	-8.43	KF1	9.9	120.7	6.7	2.83	KF1	12.9	3.4	0.6	4.1	-19.2	1.2	
30	94.21	2.16	-8.72	KF2	6.3	122.2	7.4	3.04	KF2	14.4	3.7	1.3	4.5	-22.8	1.4	
3	95.63	2.53	-8.47	P3	67.7	124.1	8.3	3.69	P3	16.3	3.6	2.2	4.3	38.7	2.0	
22	94.53	1.91	-9.30	pf5b	8.9	125.3	7.1	3.48	pf5b	17.4	3.9	0.9	5.0	-20.2	1.8	
6	95.22	2.47	-9.21	P6	7.4	126.3	8.8	3.58	P6	18.5	4.0	2.6	5.0	-21.7	1.9	
21	96.75	2.53	-8.55	pf5a	4.4	126.8	9.7	3.69	pf5a	19.0	3.7	3.6	4.4	-24.7	2.0	
35	94.04	2.05	-10.18	KS2	22.0	128.0	8.2	3.81	KS2	20.1	4.6	2.0	5.9	-7.1	2.1	
20	95.59	1.35	-9.56	pf4b	60.7	128.4	10.0	3.54	pf4b	20.6	3.9	3.9	5.2	31.6	1.9	
23	96.17	2.60	-9.39	pf6a	4.3	129.0	10.0	3.75	pf6a	21.2	4.2	3.8	5.2	-24.8	2.1	
17	95.68	1.46	-9.73	pf3a	62.3	129.3	9.9	3.87	pf3a	21.5	4.1	3.8	5.3	33.2	2.2	
12	96.07	2.91	-9.69	P12	28.4	130.1	9.3	3.94	P12	22.3	4.5	3.2	5.6	-0.6	2.3	
5	95.85	1.96	-10.13	P5	8.1	131.3	9.8	3.97	P5	23.5	4.4	3.6	5.8	-21.0	2.3	
18	94.64	2.61	-11.39	pf3b	70.9	134.2	9.9	3.87	pf3b	26.4	5.4	3.8	7.2	41.9	2.2	
11	93.35	2.74	-12.20	P11	6.65	135.1	8.1	4.00	P11	27.3	6.1	1.9	8.0	-22.4	2.3	
34	93.33	2.64	-12.94	KS1	5.55	138.2	8.6	3.93	KS1	30.3	6.5	2.5	8.7	-23.5	2.3	

L*	a*	b*	Reference	Gloss	White M1	OBA	AW (2009)
94.48	0.85	-3.23	Udigital	n/a	105.59	4.85	n/a

ID	M1 (D50/2)			Sample	ASTM E313			Apparent W		Sample	Reference		Udigital		ΔCh	ΔGloss	ΔAW
	L*	a*	b*		Gloss	White M1	OBA	AW (2009)	ΔWhite M1		ΔE00	ΔOBA	ΔE00	ΔOBA			
32	94.42	0.30	-0.82	KM2	10.0	89.7	1.3	0.88	KM2	-15.9	2.3	-3.5	#VALUE!	#VALUE!			
31	93.27	1.04	-2.91	KM1	23.9	96.0	3.2	1.30	KM1	-9.6	0.8	-1.7	#VALUE!	#VALUE!			
37	93.81	1.03	-2.73	KG1	70.9	96.4	3.2	1.13	KG1	-9.2	0.7	-1.6	#VALUE!	#VALUE!			
33	93.61	1.14	-3.20	KM3	20.3	97.9	3.5	1.29	KM3	-7.7	0.7	-1.4	#VALUE!	#VALUE!			
40	93.74	0.01	-2.80	Chroma	n/a	100.2	3.3	n/a	Chroma	-5.4	1.4	-1.6	#VALUE!	#VALUE!			
39	95.93	0.93	-3.08	KG3	58.6	102.6	3.6	1.30	KG3	-3.0	0.9	-1.2	#VALUE!	#VALUE!			
8	94.71	1.06	-3.84	P8	68.1	103.0	4.0	1.39	P8	-2.6	0.6	-0.9	#VALUE!	#VALUE!			
26	95.02	-0.17	-3.95	pf8b	47.4	103.9	3.3	1.75	pf8b	-1.7	1.7	-1.5	#VALUE!	#VALUE!			
16	95.92	0.72	-3.52	pf2b	68.2	104.3	4.4	1.31	pf2b	-1.3	0.9	-0.5	0.3	#VALUE!	#VALUE!		
15	95.67	0.69	-3.79	pf2a	68.6	104.8	4.5	1.47	pf2a	-0.7	0.9	-0.3	0.6	#VALUE!	#VALUE!		
41	94.48	0.85	-3.23	Udigital	n/a	105.6	4.8	n/a	Udigital	0.0	0.0	0.0	0.0	#VALUE!	#VALUE!		
25	95.53	0.28	-4.21	pf8a	59.4	106.2	3.6	1.81	pf8a	0.6	1.4	-1.3	1.1	#VALUE!	#VALUE!		
2	95.83	0.96	-4.42	P2	29.1	107.8	6.1	1.67	P2	2.2	1.3	1.3	1.2	#VALUE!	#VALUE!		
24	95.64	0.32	-4.64	pf7a	78.6	108.2	4.6	1.88	pf7a	2.6	1.6	-0.3	1.5	#VALUE!	#VALUE!		
19	93.80	0.74	-5.61	pf4a	63.7	108.3	4.0	2.25	pf4a	2.7	2.1	-0.8	2.4	#VALUE!	#VALUE!		
1	93.80	2.39	-5.93	P1	5.6	109.9	6.4	2.66	P1	4.3	2.9	1.6	3.1	#VALUE!	#VALUE!		
14	93.73	2.36	-6.06	pf1b	4.7	110.3	6.3	2.63	pf1b	4.7	3.0	1.4	3.2	#VALUE!	#VALUE!		
4	94.09	2.26	-6.27	P4	68.8	111.9	5.3	2.40	P4	6.3	3.0	0.4	3.4	#VALUE!	#VALUE!		
38	94.98	1.70	-5.85	KG2	23.2	111.9	4.0	2.29	KG2	6.3	2.4	-0.8	2.8	#VALUE!	#VALUE!		
36	94.91	1.71	-5.97	KS3	21.1	112.3	4.1	2.48	KS3	6.7	2.5	-0.7	2.9	#VALUE!	#VALUE!		
13	94.55	1.93	-6.66	pf1a	4.7	114.4	6.4	2.67	pf1a	8.8	3.1	1.6	3.6	#VALUE!	#VALUE!		
7	95.44	1.24	-6.27	P7	39.7	114.6	5.8	2.45	P7	9.0	2.6	1.0	3.1	#VALUE!	#VALUE!		
28	95.89	0.72	-6.19	pf9b	78.8	115.2	5.8	2.55	pf9b	9.6	2.6	1.0	3.0	#VALUE!	#VALUE!		
27	95.49	0.90	-6.93	pf9a	66.2	117.3	6.7	3.80	pf9a	11.8	3.1	1.8	3.7	#VALUE!	#VALUE!		
9	96.26	1.47	-6.73	P9	74.7	118.3	8.7	2.10	P9	12.7	3.1	3.9	3.5	#VALUE!	#VALUE!		
10	93.64	1.56	-8.10	P10	66.4	118.4	6.5	2.97	P10	12.9	4.0	1.7	4.9	#VALUE!	#VALUE!		
29	94.07	1.91	-8.43	KF1	9.9	120.7	6.7	2.83	KF1	15.1	4.3	1.9	5.3	#VALUE!	#VALUE!		
30	94.21	2.16	-8.72	KF2	6.3	122.2	7.4	3.04	KF2	16.6	4.5	2.6	5.6	#VALUE!	#VALUE!		
3	95.63	2.53	-8.47	P3	67.7	124.1	8.3	3.69	P3	18.6	4.6	3.4	5.5	#VALUE!	#VALUE!		
22	94.53	1.91	-9.30	pf5b	8.9	125.3	7.1	3.48	pf5b	19.7	4.8	2.2	6.2	#VALUE!	#VALUE!		
6	95.22	2.47	-9.21	P6	7.4	126.3	8.8	3.58	P6	20.7	5.0	3.9	6.2	#VALUE!	#VALUE!		
21	96.75	2.53	-8.55	pf5a	4.4	126.8	9.7	3.69	pf5a	21.2	4.8	4.8	5.6	#VALUE!	#VALUE!		
35	94.04	2.05	-10.18	KS2	22.0	128.0	8.2	3.81	KS2	22.4	5.5	3.3	7.1	#VALUE!	#VALUE!		
20	95.59	1.35	-9.56	pf4b	60.7	128.4	10.0	3.54	pf4b	22.8	5.0	5.2	6.3	#VALUE!	#VALUE!		
23	96.17	2.60	-9.39	pf6a	4.3	129.0	10.0	3.75	pf6a	23.4	5.2	5.1	6.4	#VALUE!	#VALUE!		
17	95.68	1.46	-9.73	pf3a	62.3	129.3	9.9	3.87	pf3a	23.7	5.1	5.0	6.5	#VALUE!	#VALUE!		
12	96.07	2.91	-9.69	P12	28.4	130.1	9.3	3.94	P12	24.5	5.5	4.5	6.8	#VALUE!	#VALUE!		
5	95.85	1.96	-10.13	P5	8.1	131.3	9.8	3.97	P5	25.7	5.5	4.9	7.0	#VALUE!	#VALUE!		
18	94.64	2.61	-11.39	pf3b	70.9	134.2	9.9	3.87	pf3b	28.6	6.4	5.1	8.3	#VALUE!	#VALUE!		
11	93.35	2.74	-12.20	P11	6.65	135.1	8.1	4.00	P11	29.5	6.9	3.2	9.2	#VALUE!	#VALUE!		
34	93.33	2.64	-12.94	KS1	5.55	138.2	8.6	3.93	KS1	32.6	7.3	3.8	9.9	#VALUE!	#VALUE!		

Page 6. Selecting substrates to match the reference, Chromaticity

L*	a*	b*	Reference	Gloss	White M1	OBA	AW (2009)
93.74	0.01	-2.80	Chroma	n/a	100.15	3.27	n/a

ID	M1 (D50/2)			Sample	ASTM E313			Apparent W		Reference		Chroma		ΔGloss	ΔAW
	L*	a*	b*		Gloss	White M1	OBA	AW (2009)	Sample	ΔWhite M1	ΔE00	ΔOBA	ΔCh		
32	94.42	0.30	-0.82	KM2	10.0	89.7	1.3	0.88	KM2	-10.4	1.9	-2.0		#VALUE!	#VALUE!
31	93.27	1.04	-2.91	KM1	23.9	96.0	3.2	1.30	KM1	-4.2	1.5	-0.1		#VALUE!	#VALUE!
37	93.81	1.03	-2.73	KG1	70.9	96.4	3.2	1.13	KG1	-3.8	1.5	0.0	1.0	#VALUE!	#VALUE!
33	93.61	1.14	-3.20	KM3	20.3	97.9	3.5	1.29	KM3	-2.3	1.7	0.2	1.2	#VALUE!	#VALUE!
40	93.74	0.01	-2.80	Chroma	n/a	100.2	3.3	n/a	Chroma	0.0	0.0	0.0	0.0	#VALUE!	#VALUE!
39	95.93	0.93	-3.08	KG3	58.6	102.6	3.6	1.30	KG3	2.4	1.9	0.3	1.0	#VALUE!	#VALUE!
8	94.71	1.06	-3.84	P8	68.1	103.0	4.0	1.39	P8	2.8	1.8	0.7	1.5	#VALUE!	#VALUE!
26	95.02	-0.17	-3.95	pf8b	47.4	103.9	3.3	1.75	pf8b	3.8	1.3	0.0	1.2	#VALUE!	#VALUE!
16	95.92	0.72	-3.52	pf2b	68.2	104.3	4.4	1.31	pf2b	4.2	1.8	1.1	1.0	#VALUE!	#VALUE!
15	95.67	0.69	-3.79	pf2a	68.6	104.8	4.5	1.47	pf2a	4.7	1.7	1.3	1.2	#VALUE!	#VALUE!
41	94.48	0.85	-3.23	Udigital	n/a	105.6	4.8	n/a	Udigital	5.4	1.4	1.6	1.0	#VALUE!	#VALUE!
25	95.53	0.28	-4.21	pf8a	59.4	106.2	3.6	1.81	pf8a	6.0	1.7	0.3	1.4	#VALUE!	#VALUE!
2	95.83	0.96	-4.42	P2	29.1	107.8	6.1	1.67	P2	7.7	2.3	2.9	1.9	#VALUE!	#VALUE!
24	95.64	0.32	-4.64	pf7a	78.6	108.2	4.6	1.88	pf7a	8.1	2.0	1.3	1.9	#VALUE!	#VALUE!
19	93.80	0.74	-5.61	pf4a	63.7	108.3	4.0	2.25	pf4a	8.1	2.6	0.8	2.9	#VALUE!	#VALUE!
1	93.80	2.39	-5.93	P1	5.6	109.9	6.4	2.66	P1	9.7	4.1	3.1	3.9	#VALUE!	#VALUE!
14	93.73	2.36	-6.06	pf1b	4.7	110.3	6.3	2.63	pf1b	10.1	4.1	3.0	4.0	#VALUE!	#VALUE!
4	94.09	2.26	-6.27	P4	68.8	111.9	5.3	2.40	P4	11.7	4.1	2.0	4.1	#VALUE!	#VALUE!
38	94.98	1.70	-5.85	KG2	23.2	111.9	4.0	2.29	KG2	11.8	3.5	0.8	3.5	#VALUE!	#VALUE!
36	94.91	1.71	-5.97	KS3	21.1	112.3	4.1	2.48	KS3	12.1	3.5	0.8	3.6	#VALUE!	#VALUE!
13	94.55	1.93	-6.66	pf1a	4.7	114.4	6.4	2.67	pf1a	14.2	4.1	3.1	4.3	#VALUE!	#VALUE!
7	95.44	1.24	-6.27	P7	39.7	114.6	5.8	2.45	P7	14.4	3.5	2.5	3.7	#VALUE!	#VALUE!
28	95.89	0.72	-6.19	pf9b	78.8	115.2	5.8	2.55	pf9b	15.0	3.2	2.6	3.5	#VALUE!	#VALUE!
27	95.49	0.90	-6.93	pf9a	66.2	117.3	6.7	3.80	pf9a	17.2	3.7	3.4	4.2	#VALUE!	#VALUE!
9	96.26	1.47	-6.73	P9	74.7	118.3	8.7	2.10	P9	18.1	4.0	5.4	4.2	#VALUE!	#VALUE!
10	93.64	1.56	-8.10	P10	66.4	118.4	6.5	2.97	P10	18.3	4.7	3.2	5.5	#VALUE!	#VALUE!
29	94.07	1.91	-8.43	KF1	9.9	120.7	6.7	2.83	KF1	20.6	5.1	3.4	5.9	#VALUE!	#VALUE!
30	94.21	2.16	-8.72	KF2	6.3	122.2	7.4	3.04	KF2	22.1	5.4	4.1	6.3	#VALUE!	#VALUE!
3	95.63	2.53	-8.47	P3	67.7	124.1	8.3	3.69	P3	24.0	5.6	5.0	6.2	#VALUE!	#VALUE!
22	94.53	1.91	-9.30	pf5b	8.9	125.3	7.1	3.48	pf5b	25.1	5.6	3.8	6.8	#VALUE!	#VALUE!
6	95.22	2.47	-9.21	P6	7.4	126.3	8.8	3.58	P6	26.2	5.9	5.5	6.9	#VALUE!	#VALUE!
21	96.75	2.53	-8.55	pf5a	4.4	126.8	9.7	3.69	pf5a	26.7	5.8	6.4	6.3	#VALUE!	#VALUE!
35	94.04	2.05	-10.18	KS2	22.0	128.0	8.2	3.81	KS2	27.8	6.2	4.9	7.7	#VALUE!	#VALUE!
20	95.59	1.35	-9.56	pf4b	60.7	128.4	10.0	3.54	pf4b	28.3	5.6	6.7	6.9	#VALUE!	#VALUE!
23	96.17	2.60	-9.39	pf6a	4.3	129.0	10.0	3.75	pf6a	28.9	6.2	6.7	7.1	#VALUE!	#VALUE!
17	95.68	1.46	-9.73	pf3a	62.3	129.3	9.9	3.87	pf3a	29.1	5.8	6.6	7.1	#VALUE!	#VALUE!
12	96.07	2.91	-9.69	P12	28.4	130.1	9.3	3.94	P12	29.9	6.5	6.1	7.5	#VALUE!	#VALUE!
5	95.85	1.96	-10.13	P5	8.1	131.3	9.8	3.97	P5	31.2	6.2	6.5	7.6	#VALUE!	#VALUE!
18	94.64	2.61	-11.39	pf3b	70.9	134.2	9.9	3.87	pf3b	34.0	7.2	6.7	9.0	#VALUE!	#VALUE!
11	93.35	2.74	-12.20	P11	6.65	135.1	8.1	4.00	P11	35.0	7.6	4.8	9.8	#VALUE!	#VALUE!
34	93.33	2.64	-12.94	KS1	5.55	138.2	8.6	3.93	KS1	38.0	8.0	5.4	10.5	#VALUE!	#VALUE!