Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #198 - 4th Qtr 2021

About the Color Program, About CTS

Key to Tables and Graphs (Color Tests)

Key to Tables and Graphs (Spectro Test)

Key to Tables and Graphs (Gloss Tests)

Analysis	Analysis Name
408	Color & Color Difference (Paint Chips) - 45-0
409	Color & Color Difference (Paint Chips) Sphere
411	Spectrophotometric (Paint Chips) - Sphere
440	Gloss 60 Degree (Paint Chips)

About The Color & Appearance Program

The Collaborative Reference Program for Color & Appearance is operated and maintained by Collaborative Testing Services, Inc. (CTS), with technical guidance and advice provided by representatives from various instrument manufacturers. The program allows laboratories to compare periodically the performance of their testing with that of other laboratories.

Paint chip samples, which have been custom-made specifically for Collaborative Testing Services by Munsell Color, X-Rite Inc., Grand Rapids, MI, are distributed four times per year to participating laboratories. Gloss participants test two pairs of paint chip samples at different gloss levels, approximately 5-10 units apart. Color & Color Difference participants measure a set of two opaque color paint chips, selected from throughout the full color spectrum, consisting of a nonmetameric match with small color differences. These data are analyzed in two separate tables based on the conditions of measurement used. Laboratories that also participate in the Spectrophotometric analyses measure one of the opaque color chips for % reflectance at 16 wavelengths.

Please refer to each test's 'Key' for definitions of terms used in the tables and graphs and guidelines to interpreting the results. Also shown are notes concerning specific laboratory results, as well as significant findings related to instrument types or other testing variations.

ABOUT CTS

Founded in 1971, CTS is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries, including rubber, plastics, fasteners and metals, containerboard, paper, color, and wine as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 80 countries, currently participate in the CTS programs.

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Key for Color Program Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Lab Mean — The average of the 2 test results obtained by the participant for CIE L*,a*,b* color space values.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value — An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Graphs — For each laboratory, the LAB MEAN for the first sample is plotted against the LAB MEAN for the second sample with each point representing a laboratory. The horizontal and vertical axes are the GRAND MEANS for each sample. For each test there are three plots: L*2 vs L*1, a*2 vs a*1 and b*2 vs b*1. The a* and b* plots are created using absolute values.

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	**CAUTION** - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse and one or more CPV are greater than critical value. See specific notes following each table for more information on why the data is excluded. It is also possible to have an "X" for individual color coordinate (L*, a* or b*) without overall "X" flag. It means that results fall outside the 99% ellipse for particular coordinate but have no CPV flags. Those results will not require any action.
M	EXCLUDED	**PROCEED** - lab was unable to report data for at least one sample. However, a lab receiving two of more M flags for a test may need to stop and review its testing procedures.

Key for Spectrophotometric Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. See specific notes following each table for more information on why the data is excluded.

In addition to the DATA FLAG column, it is also possible to have a flag on individual wavelength values as follows:

*	The laboratory's mean for that wavelength deviates from the GRAND MEAN by more than two BETWEEN-LAB STANDARD DEVIATIONS.
X	The laboratory's mean for that wavelength deviates from the GRAND MEAN by more than the critical limit determined by a 99.5% confidence interval.

Key for Gloss Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Lab Mean — The average of the test results obtained by the participant.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Difference from Grand Mean — The difference of the LAB MEAN from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value — An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Graphs — For each laboratory, the LAB MEAN for the first sample (x-axis) is plotted against the LAB MEAN for the second sample (y-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the GRAND MEANS for each sample. When 20 or more laboratories are in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained above.

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	**CAUTION** - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse. See specific notes following each table for more information on why the data is excluded.
M	EXCLUDED	**PROCEED** - lab was unable to report data for at least one sample. However, a lab receiving two of more M flags for a test may need to stop and review its testing procedures.

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
23GT96		D211	61.70	-18.50	8.65	0.90	-0.20	-0.50	1.05	HW
		D212	62.60	-18.70	8.15					
6CGEAN		D211	61.38	-18.36	8.56	0.93	-0.18	-0.53	1.08	HW
		D212	62.31	-18.54	8.03					
6FETYY		D211	61.53	-18.42	8.67	0.99	-0.17	-0.56	1.16	HW
		D212	62.52	-18.59	8.10					
6L4GDG		D211	61.11	-18.18	9.22	0.92	-0.18	-0.57	1.10	GA
		D212	62.03	-18.36	8.65					
7CTFRG		D211	61.82	-18.33	9.63	0.83	-0.23	-0.60	1.04	GE
		D212	62.64	-18.57	9.03					
8WVLXM		D211	61.54	-18.14	9.23	1.00	-0.17	-0.53	1.14	XU
		D212	62.53	-18.32	8.70					
997FMK		D211	61.60	-18.30	8.55	0.90	-0.20	-0.55	1.07	HW
		D212	62.50	-18.50	8.00					
9DW32Q		D211	61.33	-18.32	8.55	0.93	-0.14	-0.48	1.05	HW
		D212	62.26	-18.46	8.08					
9P98CT		D211	61.58	-18.24	9.41	0.95	-0.17	-0.58	1.13	GH
		D212	62.53	-18.41	8.83					
AAFZUK		D211	61.66	-18.41	9.01	0.93	-0.17	-0.53	1.08	XW
		D212	62.59	-18.58	8.48					
B9Y3ZZ		D211	61.62	-18.23	9.01	1.04	-0.11	-0.49	1.16	XM
		D212	62.67	-18.34	8.51					
BGM38X		D211	61.57	-18.31	8.72	0.79	-0.20	-0.56	0.98	HW
		D212	62.36	-18.51	8.16					
BXVUE9		D211	61.13	-18.19	9.17	0.89	-0.14	-0.54	1.05	HY
		D212	62.02	-18.34	8.63					
CE499B		D211	61.87	-18.06	9.21	0.82	-0.21	-0.54	1.00	XD
		D212	62.70	-18.27	8.68					
DJUVLW		D211	61.48	-18.59	9.61	1.08	-0.17	-0.58	1.24	BG
		D212	62.56	-18.76	9.03					
DRWJRY		D211	61.60	-17.90	8.75	0.90	-0.17	-0.55	1.07	MS
		D212	62.51	-18.07	8.20					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
DWHZTT		D211	61.44	-18.06	9.00	0.84	-0.20	-0.52	1.01	XO
		D212	62.28	-18.26	8.48					
E4P8JT		D211	61.34	-18.38	9.16	0.91	-0.16	-0.50	1.05	HX
		D212	62.25	-18.54	8.66					
HQUBR6		D211	61.61	-17.88	8.80	0.92	-0.18	-0.58	1.10	MR
		D212	62.53	-18.05	8.22					
JXTY7N	X	D211	55.10	-16.70	6.70	1.05	-0.20	-0.35	1.12	HW
		D212	56.15	-16.90	6.35					
KQ32TK		D211	61.38	-18.64	9.62	1.03	-0.16	-0.54	1.17	BG
		D212	62.41	-18.79	9.08					
LF3NHC		D211	61.46	-18.29	8.57	0.89	-0.17	-0.51	1.05	MG
		D212	62.36	-18.46	8.05					
MDPMKJ		D211	61.30	-18.41	9.01	0.91	-0.19	-0.55	1.07	HX
		D212	62.20	-18.60	8.47					
MELYNY		D211	61.30	-17.85	8.67	0.99	-0.11	-0.51	1.12	HK
		D212	62.29	-17.97	8.17					
MR97LY	X	D211	62.07	-21.19	9.89	0.93	-0.20	-0.58	1.11	GE
		D212	63.00	-21.39	9.31					
MV8J6H		D211	61.59	-18.24	9.26	0.81	-0.17	-0.60	1.02	MD
		D212	62.40	-18.41	8.67					
P2PMBC	X	D211	61.78	-20.61	7.95	0.92	-0.23	-0.57	1.11	XE
		D212	62.71	-20.85	7.38					
PDYCYF		D211	61.79	-18.60	8.58	0.85	-0.13	-0.54	1.01	HW
		D212	62.64	-18.72	8.05					
PPFWMH		D211	61.39	-18.43	9.46	1.00	-0.13	-0.49	1.12	BG
		D212	62.39	-18.56	8.97					
QKHUZU		D211	61.61	-18.11	9.44	0.92	-0.14	-0.48	1.05	GE
		D212	62.53	-18.25	8.96					
QM2379		D211	61.56	-18.57	8.57	0.96	-0.15	-0.50	1.10	HW
		D212	62.52	-18.71	8.07					
R3QE8G		D211	61.07	-18.07	8.60	0.92	-0.15	-0.55	1.08	XF
		D212	61.99	-18.21	8.05					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
T9EGRT		D211	61.79	-18.68	8.65	0.96	-0.08	-0.52	1.09	HW
		D212	62.75	-18.76	8.14					
TBNGXZ		D211	60.97	-18.17	9.20	0.99	-0.13	-0.57	1.16	GG
		D212	61.96	-18.30	8.63					
TVNMFY		D211	61.63	-18.25	9.22	0.89	-0.19	-0.53	1.05	XS
		D212	62.52	-18.43	8.69					
UUEU8H	X	D211	60.10	-17.65	8.02	1.07	0.03	-0.67	1.26	PS
		D212	61.17	-17.62	7.35					
V4D6TX		D211	60.93	-17.83	9.65	0.91	-0.20	-0.56	1.08	MP
		D212	61.84	-18.03	9.10					
W3FY9X		D211	61.72	-18.12	9.62	0.92	-0.18	-0.56	1.09	GE
		D212	62.64	-18.30	9.06					
XBNZZC	X	D211	61.64	-17.79	9.52	1.00	0.00	-0.80	1.28	XU
		D212	62.64	-17.79	8.72					
XWMN6D	X	D211	54.52	-16.61	7.09	0.82	-0.19	-0.43	0.94	XX
		D212	55.34	-16.80	6.66					
YCFFQE		D211	61.70	-17.90	8.52	0.82	-0.26	-0.49	1.00	XH
		D212	62.53	-18.16	8.03					
YGPNYV		D211	61.51	-18.13	9.16	0.79	-0.20	-0.58	1.00	XU
		D212	62.30	-18.33	8.58					
Z9EKQB		D211	61.60	-17.90	8.85	0.99	-0.20	-0.52	1.14	MR
		D212	62.59	-18.10	8.33					
ZG9RB3		D211	62.16	-18.25	9.26	0.45	-0.17	-0.54	0.72	XU
		D212	62.61	-18.42	8.72					
ZK6KY7	X	D211	62.40	-20.71	8.84	1.04	-0.16	-0.49	1.16	XB
		D212	63.44	-20.87	8.35					
ZPZC9N		D211	61.74	-18.21	9.37	0.80	-0.21	-0.57	1.01	GA
		D212	62.54	-18.43	8.80					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D211	61.52	-18.24	9.02	0.90	-0.17	-0.54	1.07
D212	62.44	-18.41	8.48				
Stnd Dev Btwn Labs							
D211	0.24	0.22	0.42	0.10	0.03	0.03	0.08
D212	0.24	0.22	0.41				

Statistics based on 39 of 46 reporting participants

Comments Assigned on Data Flags for Test #408

JXTY7N(X) - Extreme data for both "L" & "a" values. Very low data for both "b" values. Large Delta b.

MR97LY(X) - Extreme data for both "a" values.

P2PMBC(X) - Extreme data for both "a" values.

UUEU8H(X) - Very low data for both "L" & "b" D212. High data for "a" D212. Large replication difference for "L", "a" and "b" D211. Large Delta a & small Delta b.

XBNZZC(X) - High "a" value for Sample D212. Inconsistent in testing between the "b" values for both samples. Large Delta a & small Delta b.

XWMN6D(X) - Extreme data for both "L" & "a" values. Very low data for both "b" values. Large Delta b.

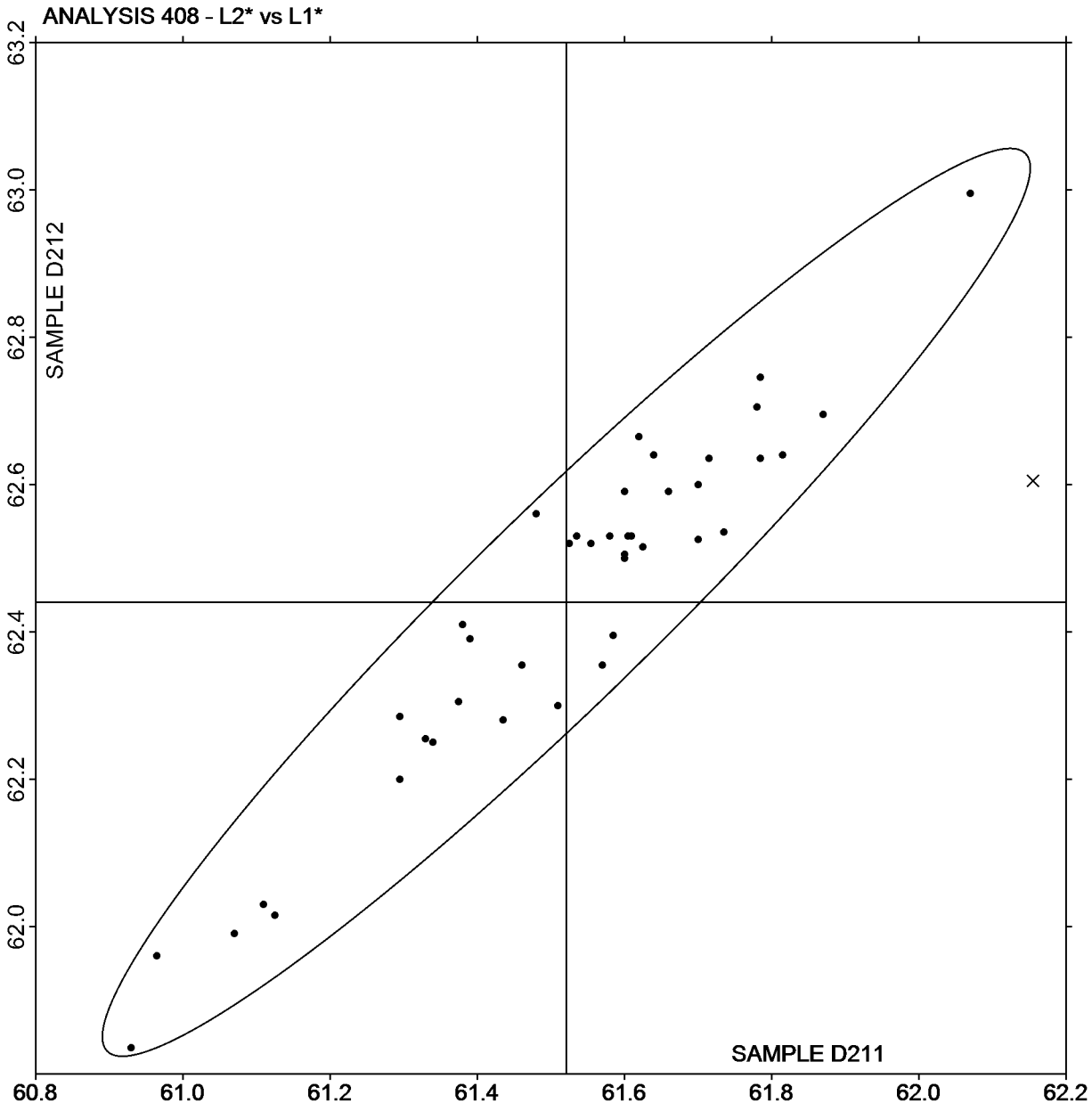
ZK6KY7(X) - Very high data for both "L" values. Extreme data for both "a" values.

Key to Instrument Codes Reported by Participants

BG	BYK Mac i	GA	BYK-Gardner
GE	BYK-Gardner spectro-guide (45/0)	GG	BYK-Gardner spectro2-guide (45/0) gloss
GH	BYK-Gardner Color-View	HK	Hunter MiniScan XE (45/0)
HW	Hunter LabScan XE	HX	Hunter Color FlexEZ 45/0
HY	Hunter Color Flex 45/0	MD	Minolta FD 7
MG	Macbeth 1500/PLUS or 2025+ Color Eye	MP	Minolta CM-2500c Spectrophotometer
MR	Minolta CM-3600A Spectrophotometer	MS	Minolta CM-600d Spectrophotometer
PS	PhotoResearch PR880	XB	X-Rite i1Basic Pro 2
XD	X-Rite 500 Series SpectroDensitometer	XE	X-Rite eXact Portable Spectrophotometer
XF	X-Rite i1 iSis	XH	X-Rite Color i5
XM	X-Rite MA58 Multi-Angle Spectrophotometer	XO	X-Rite MA68 II Multi-Angle Spectrophotometer
XS	X-Rite 962 Portable Spectrophotometer	XU	X-Rite 964 Portable Spectrophotometer
XW	X-Rite	XX	Instrument make/model not specified by lab

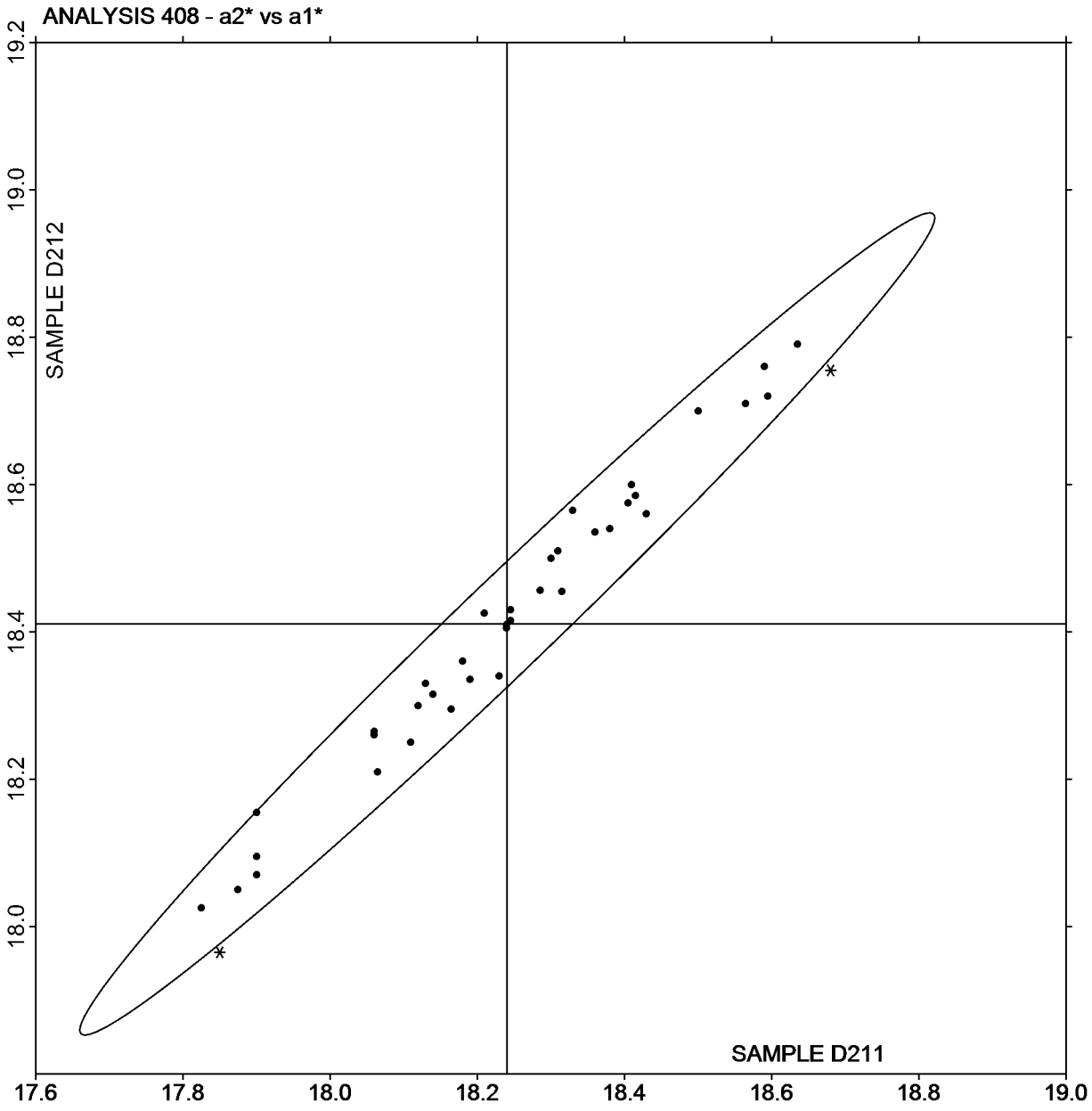
L2* vs L1*

SAMPLE D211 = 61.52 SAMPLE D212 = 62.44



a2* vs a1*

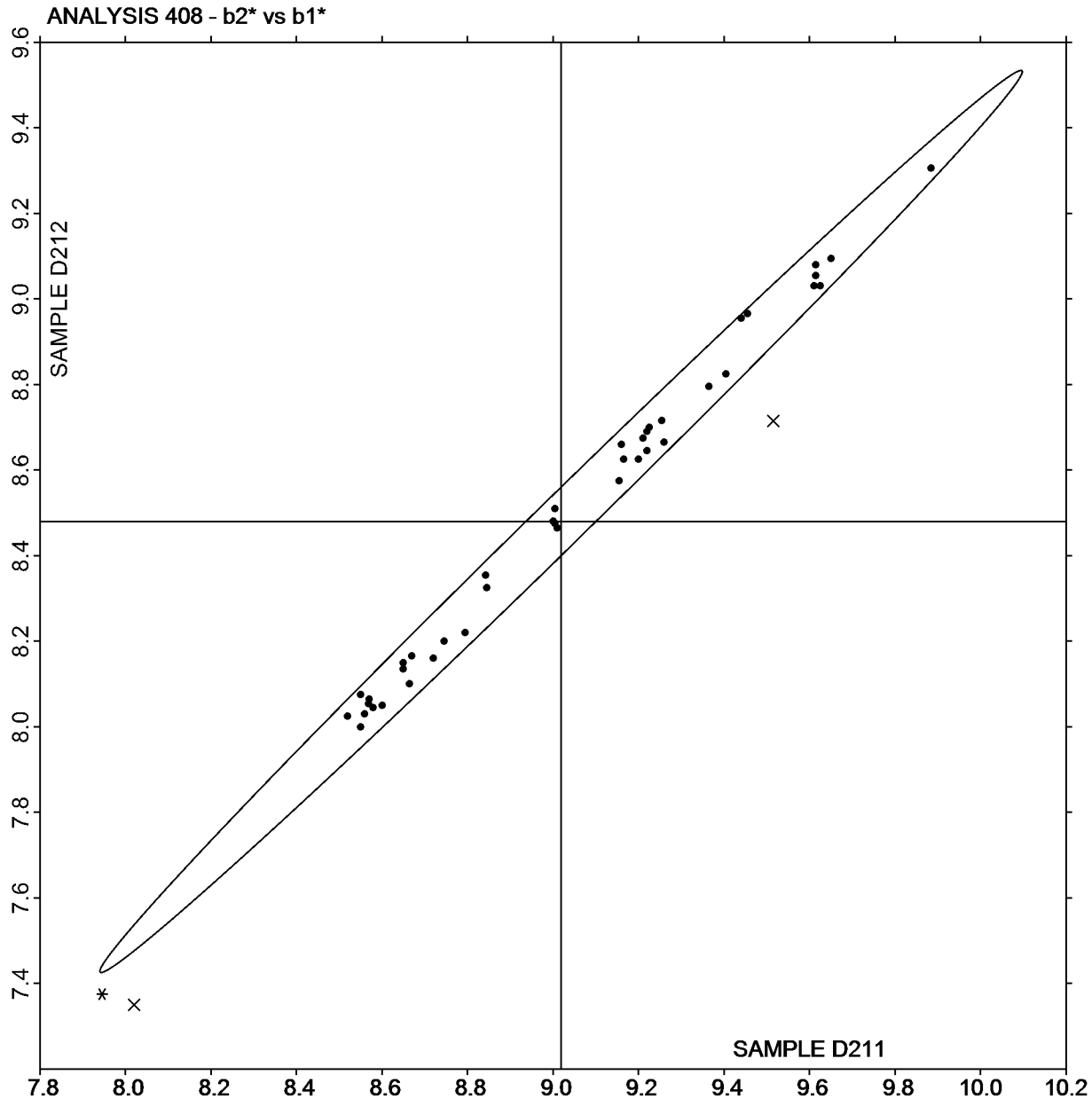
SAMPLE D211 = -18.24 SAMPLE D212 = -18.41



Plot created using absolute values.

b2* vs b1*

SAMPLE D211 = 9.02 SAMPLE D212 = 8.48



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
2LD69R		D211	61.93	-17.90	8.94	0.91	-0.16	-0.57	1.08	AJ
		D212	62.83	-18.06	8.37					
2PUKRR		D211	61.87	-18.05	8.71	0.95	-0.13	-0.54	1.10	HP
		D212	62.82	-18.18	8.17					
333D44		D211	61.92	-17.99	8.70	0.88	-0.14	-0.56	1.06	AM
		D212	62.81	-18.13	8.14					
37FDZV		D211	61.79	-18.01	8.75	0.91	-0.16	-0.54	1.07	AS
		D212	62.70	-18.17	8.21					
39PBNK		D211	61.57	-17.93	8.76	0.79	-0.17	-0.58	0.99	XO
		D212	62.36	-18.10	8.18					
3EQMJH	X	D211	61.74	-17.82	8.56	0.00	0.00	0.01	0.01	XH
		D212	61.74	-17.82	8.58					
3QPBJR	X	D211	62.54	-17.54	5.03	0.90	-0.38	-0.64	1.17	CA
		D212	63.44	-17.92	4.39					
4NCCE9		D211	61.80	-18.20	9.00	0.90	-0.10	-0.60	1.09	GD
		D212	62.70	-18.30	8.40					
4UG6UX		D211	61.42	-17.91	8.57	0.88	-0.18	-0.55	1.05	XI
		D212	62.30	-18.09	8.02					
4VDHGQ		D211	61.57	-17.68	8.51	0.91	-0.16	-0.55	1.08	XI
		D212	62.48	-17.85	7.96					
6B9Y7N		D211	61.82	-17.80	8.63	0.90	-0.13	-0.56	1.07	AJ
		D212	62.73	-17.93	8.07					
6FXLTG		D211	61.85	-17.87	8.76	0.93	-0.19	-0.60	1.12	AT
		D212	62.78	-18.06	8.17					
6L4GDG		D211	61.47	-17.88	8.90	0.92	-0.18	-0.58	1.11	XX
		D212	62.39	-18.06	8.32					
72A2NE		D211	61.90	-17.89	8.74	0.86	-0.17	-0.59	1.06	XX
		D212	62.76	-18.06	8.15					
72R637		D211	61.96	-18.19	8.82	0.99	-0.12	-0.55	1.15	AO
		D212	62.96	-18.31	8.27					
7BHQ94	X	D211	61.61	-18.30	8.47	1.01	-0.18	-0.52	1.15	XC
		D212	62.62	-18.48	7.95					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
7UFNWR		D211	61.60	-17.94	8.69	0.82	-0.20	-0.57	1.02	XH
		D212	62.42	-18.14	8.12					
7V7YLY		D211	61.61	-17.79	8.67	0.88	-0.14	-0.55	1.04	MM
		D212	62.49	-17.93	8.12					
8R4BNN		D211	61.61	-17.85	8.57	0.97	-0.13	-0.50	1.10	XE
		D212	62.58	-17.98	8.08					
8WVLXM		D211	61.69	-17.88	8.60	0.95	-0.16	-0.52	1.09	XB
		D212	62.64	-18.04	8.08					
8X4ZY2		D211	61.57	-18.08	8.51	0.89	-0.16	-0.55	1.05	XI
		D212	62.45	-18.24	7.97					
92M872		D211	61.60	-17.83	8.64	0.92	-0.23	-0.57	1.11	MI
		D212	62.52	-18.05	8.07					
9EDYTQ		D211	61.75	-17.96	8.56	0.92	-0.13	-0.53	1.07	XD
		D212	62.67	-18.09	8.04					
9P98CT		D211	61.82	-18.12	8.73	0.98	-0.15	-0.58	1.16	MV
		D212	62.80	-18.27	8.14					
AC2JYP		D211	61.90	-18.03	8.79	1.09	-0.23	-0.57	1.26	AT
		D212	62.99	-18.27	8.22					
AJYKQ3		D211	61.59	-17.92	8.62	0.91	-0.16	-0.54	1.07	XD
		D212	62.50	-18.07	8.08					
BB4T6U		D211	61.53	-17.92	8.54	0.89	-0.16	-0.54	1.05	XI
		D212	62.42	-18.07	8.01					
BQX6TX		D211	61.91	-17.89	8.86	0.84	-0.23	-0.61	1.07	AS
		D212	62.76	-18.11	8.25					
BRPDMZ		D211	61.54	-18.12	8.76	0.96	-0.14	-0.53	1.11	MV
		D212	62.50	-18.26	8.23					
BUH8LP		D211	61.88	-18.01	8.74	0.95	-0.14	-0.53	1.10	AJ
		D212	62.83	-18.15	8.21					
CFUJPW		D211	62.18	-18.19	8.72	0.87	-0.14	-0.55	1.04	CA
		D212	63.05	-18.34	8.17					
D4TGZT		D211	61.57	-17.78	8.63	0.91	-0.16	-0.55	1.07	XI
		D212	62.47	-17.94	8.07					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
DN496F		D211	61.91	-17.85	8.87	0.90	-0.13	-0.55	1.06	AO
		D212	62.81	-17.97	8.33					
DVKPXP		D211	61.90	-18.04	8.68	0.97	-0.18	-0.50	1.10	HP
		D212	62.86	-18.22	8.19					
DWHZTT		D211	61.81	-17.90	8.54	0.84	-0.18	-0.52	1.01	MI
		D212	62.66	-18.08	8.03					
EYXT2D		D211	61.46	-17.90	8.52	0.91	-0.16	-0.50	1.05	XH
		D212	62.36	-18.06	8.02					
FCZUXE		D211	61.65	-17.79	8.71	0.94	-0.15	-0.55	1.10	AJ
		D212	62.59	-17.94	8.15					
FFHW6K		D211	61.53	-18.03	8.66	0.90	-0.19	-0.69	1.15	XI
		D212	62.43	-18.22	7.97					
FL9EC4		D211	61.75	-17.96	8.63	0.81	-0.21	-0.58	1.02	MM
		D212	62.57	-18.16	8.05					
FLPN8Q	X	D211	61.72	-20.31	8.35	0.85	-0.07	-0.58	1.03	HP
		D212	62.57	-20.38	7.77					
FRATX6		D211	61.83	-17.96	8.75	0.87	-0.16	-0.56	1.05	AJ
		D212	62.70	-18.12	8.19					
FX6D9G		D211	61.72	-17.95	8.57	0.88	-0.16	-0.55	1.06	XB
		D212	62.60	-18.10	8.02					
G7ML23		D211	61.68	-17.92	8.71	0.96	-0.14	-0.51	1.10	XB
		D212	62.65	-18.05	8.20					
GBMM8Q		D211	61.88	-18.06	8.85	0.78	-0.24	-0.58	1.00	MU
		D212	62.66	-18.31	8.27					
GJYQC6		D211	61.94	-17.97	8.90	0.86	-0.15	-0.62	1.07	AS
		D212	62.80	-18.12	8.28					
GRQ4C4		D211	61.72	-18.04	8.63	0.95	-0.19	-0.57	1.13	AQ
		D212	62.68	-18.23	8.05					
HEZWPM		D211	61.87	-17.89	8.83	0.91	-0.17	-0.57	1.09	AJ
		D212	62.78	-18.06	8.26					
HH3N6F		D211	61.72	-17.90	8.52	0.88	-0.16	-0.49	1.02	XR
		D212	62.60	-18.06	8.03					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
HXBKLT		D211	61.51	-17.93	8.50	0.96	-0.18	-0.54	1.11	XH
		D212	62.47	-18.11	7.96					
HY73NU		D211	61.54	-17.73	8.44	0.85	-0.18	-0.58	1.05	XI
		D212	62.40	-17.91	7.86					
J4TGGU		D211	61.75	-17.92	8.84	0.90	-0.14	-0.52	1.05	AS
		D212	62.65	-18.07	8.32					
JQBKMR		D211	61.78	-18.05	8.78	0.84	-0.21	-0.57	1.04	MV
		D212	62.62	-18.26	8.21					
K66BWU		D211	62.06	-18.03	9.02	0.81	-0.18	-0.60	1.02	AS
		D212	62.87	-18.21	8.42					
KX3CAB		D211	62.02	-17.99	8.72	0.90	-0.16	-0.55	1.07	AT
		D212	62.93	-18.15	8.17					
KYTMYJ		D211	61.75	-17.97	8.83	0.97	-0.15	-0.58	1.14	MT
		D212	62.72	-18.12	8.26					
L2MNN8		D211	61.81	-17.98	8.79	0.88	-0.16	-0.52	1.04	AB
		D212	62.69	-18.14	8.27					
LF3NGR		D211	61.85	-17.92	8.65	0.96	-0.16	-0.59	1.14	AJ
		D212	62.82	-18.09	8.06					
LNXT88		D211	61.76	-17.93	8.75	0.92	-0.08	-0.57	1.09	AT
		D212	62.68	-18.01	8.18					
M7TLPY		D211	61.69	-17.98	8.87	0.97	-0.15	-0.56	1.13	MV
		D212	62.66	-18.13	8.31					
MR97LY		D211	61.36	-17.93	8.78	0.93	-0.19	-0.58	1.12	GD
		D212	62.29	-18.12	8.20					
MTLQEA		D211	61.64	-17.99	8.69	0.87	-0.14	-0.52	1.02	XD
		D212	62.51	-18.13	8.17					
MUC23G		D211	61.79	-17.88	8.85	0.87	-0.09	-0.53	1.02	AS
		D212	62.66	-17.98	8.31					
NEGY24		D211	61.85	-17.98	8.72	0.90	-0.13	-0.54	1.06	AS
		D212	62.75	-18.11	8.18					
NLDXCP		D211	61.67	-17.83	8.56	0.80	-0.23	-0.59	1.02	XI
		D212	62.47	-18.06	7.97					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
PF9C78		D211	61.35	-17.80	8.77	0.94	-0.18	-0.55	1.10	XH
		D212	62.29	-17.98	8.22					
PGYMUF		D211	61.58	-18.02	8.83	0.96	-0.16	-0.47	1.08	MW
		D212	62.54	-18.18	8.35					
PHCZP4		D211	61.92	-17.94	8.74	0.95	-0.12	-0.56	1.11	AO
		D212	62.87	-18.07	8.19					
PM4GTG		D211	61.69	-17.85	8.75	0.94	-0.17	-0.52	1.08	MS
		D212	62.63	-18.03	8.23					
PZXNWD		D211	61.69	-18.00	8.48	0.88	-0.16	-0.51	1.03	XI
		D212	62.57	-18.15	7.97					
Q9JAG3		D211	61.94	-17.98	8.70	0.89	-0.15	-0.56	1.07	AO
		D212	62.83	-18.13	8.13					
QJMCXT		D211	61.50	-17.87	8.65	0.91	-0.17	-0.54	1.07	XI
		D212	62.40	-18.04	8.11					
QWTHUD		D211	61.92	-17.82	8.64	0.84	-0.18	-0.64	1.07	AO
		D212	62.75	-18.00	8.00					
RBN96F		D211	61.77	-17.84	8.71	0.87	-0.18	-0.55	1.04	MM
		D212	62.64	-18.02	8.17					
RJJZY4		D211	61.92	-17.87	8.64	0.80	-0.20	-0.56	1.00	AJ
		D212	62.72	-18.07	8.08					
T6VETZ		D211	61.93	-18.06	8.64	0.82	-0.21	-0.59	1.02	HP
		D212	62.75	-18.27	8.05					
TQCWYB		D211	61.42	-17.84	8.56	1.02	-0.19	-0.58	1.18	XI
		D212	62.44	-18.03	7.99					
TRPBKY		D211	61.72	-17.80	8.53	0.88	-0.14	-0.54	1.04	XI
		D212	62.59	-17.94	7.99					
TVNMFY		D211	61.70	-17.94	8.79	0.97	-0.13	-0.55	1.13	AJ
		D212	62.68	-18.07	8.24					
UUEU8H		D211	61.72	-18.06	8.41	0.92	-0.14	-0.57	1.09	CA
		D212	62.64	-18.20	7.84					
V4D6TX		D211	61.84	-18.17	8.74	0.90	-0.18	-0.55	1.07	XB
		D212	62.74	-18.35	8.19					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
VBX6AB		D211	61.66	-17.71	8.88	0.92	-0.16	-0.56	1.09	XB
		D212	62.58	-17.87	8.33					
VJ9ETX		D211	61.78	-17.95	8.58	0.89	-0.15	-0.56	1.07	XB
		D212	62.67	-18.11	8.02					
WETJA7		D211	61.85	-17.86	8.78	0.96	-0.19	-0.53	1.11	AJ
		D212	62.81	-18.05	8.25					
WU438X		D211	61.46	-17.77	8.57	0.89	-0.15	-0.59	1.07	XI
		D212	62.34	-17.92	7.98					
XM437A		D211	61.75	-17.69	8.56	0.96	-0.18	-0.57	1.14	MM
		D212	62.72	-17.87	7.99					
YGPNYV		D211	61.50	-17.90	8.58	0.79	-0.18	-0.56	0.99	XI
		D212	62.29	-18.08	8.02					
YHPMEX		D211	61.71	-18.04	8.73	0.88	-0.17	-0.53	1.04	MK
		D212	62.59	-18.21	8.20					
YJFW36		D211	61.94	-18.01	8.53	0.88	-0.19	-0.54	1.04	AQ
		D212	62.82	-18.20	7.99					
YT6KX8	X	D211	61.94	-18.39	8.85	0.94	-0.16	-0.55	1.10	CA
		D212	62.88	-18.55	8.30					
Z76WQC		D211	61.44	-17.94	8.59	0.98	-0.15	-0.52	1.12	XM
		D212	62.42	-18.09	8.07					
ZBXYWW		D211	61.34	-18.07	8.73	1.00	-0.15	-0.50	1.13	XH
		D212	62.35	-18.22	8.23					
ZG9RB3		D211	61.75	-17.82	8.61	0.95	-0.13	-0.54	1.10	XI
		D212	62.71	-17.94	8.07					
ZGNBRT		D211	61.89	-17.96	8.88	0.91	-0.14	-0.54	1.07	AS
		D212	62.80	-18.10	8.34					
ZPZC9N		D211	61.80	-17.83	8.84	0.94	-0.16	-0.55	1.10	AJ
		D212	62.74	-17.99	8.29					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D211	61.73	-17.93	8.69	0.91	-0.16	-0.55	1.08
D212	62.63	-18.10	8.14				
Stnd Dev Btwn Labs							
D211	0.17	0.11	0.14	0.06	0.03	0.03	0.04
D212	0.17	0.11	0.13				

Statistics based on 89 of 94 reporting participants

Comments Assigned on Data Flags for Test #409

3EQMJH(X) - Very low data for "L " Sample D212. High data for "b " Sample D212. Inconsistent in testing between the "a" values for both samples. Large Delta a & b. Small Delta L & E.

3QPBJR(X) - Very high data for both "L" & for "a" D211. Extreme data for both "b" values. Large replication difference for "L", "a" and "b" samples. Small Delta a.

7BHQ94(X) - Very low data for both "a" values.

FLPN8Q(X) - Extreme data for both "a" values. Large Delta a.

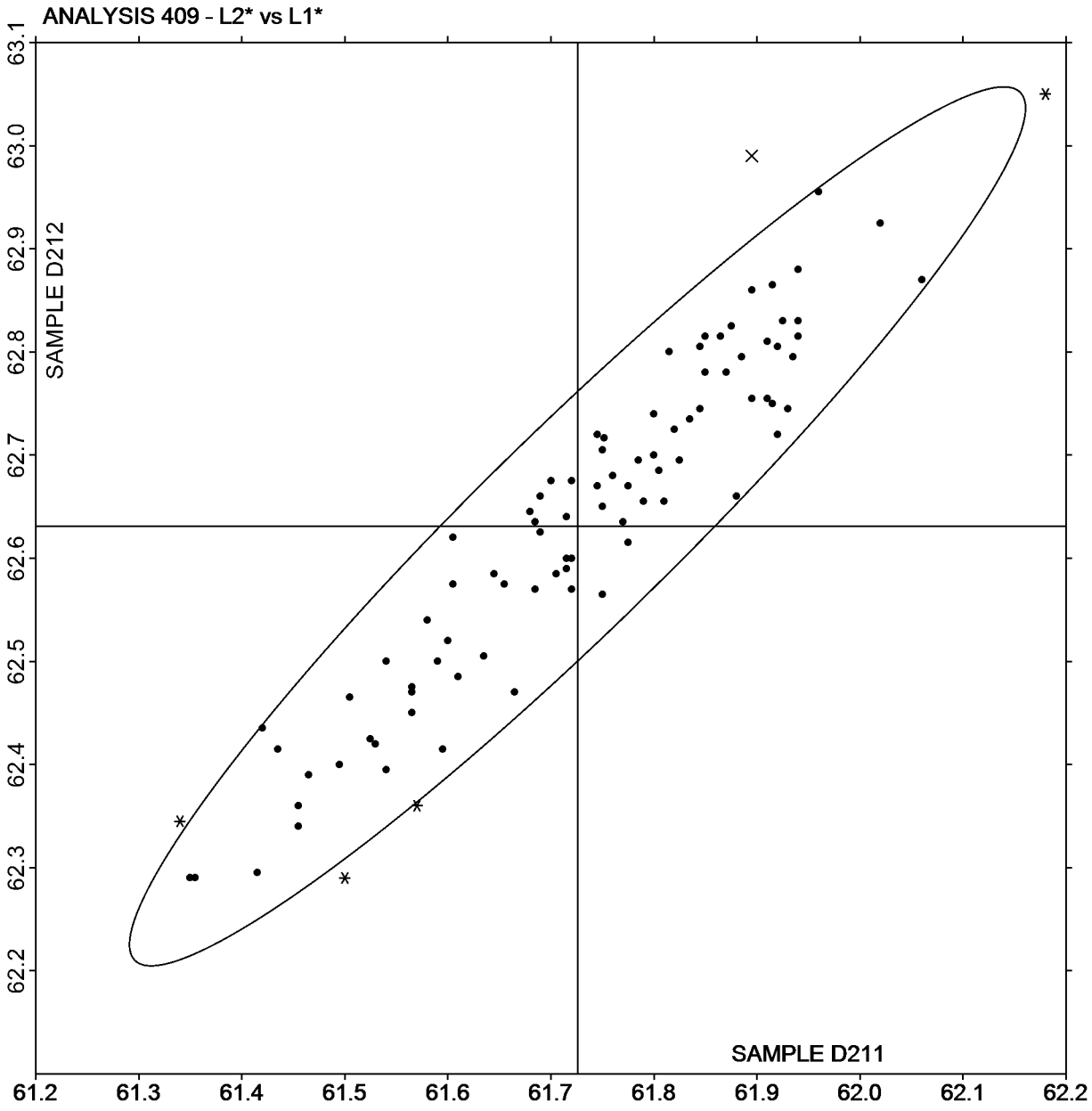
YT6KX8(X) - Very low data for both "a" values. Large replication difference for both "a" samples.

Key to Instrument Codes Reported by Participants

AB	Datacolor 100	AJ	Datacolor 600
AM	Datacolor 600 Plus	AO	Datacolor 650x
AQ	Datacolor 600x	AS	Datacolor 800
AT	Datacolor 850	CA	Cary 5000
GD	BYK-Gardner Spectro-Guide Sphere	HP	Hunter UltraScan PRO
MI	Macbeth Color i5	MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a	MS	Minolta CM-600d
MT	Minolta CM-2600d	MU	Minolta
MV	Minolta CM-3000d Spectrophotometer	MW	Minolta CM 3700a Spectrophotometer
XB	X-Rite Ci7000 Series Benchtop Spectrophotometer	XC	X-Rite Ci4200 Benchtop Spectrophotometer
XD	X-Rite Ci7800 Benchtop Spectrophotometer	XE	X-Rite Ci7600 Benchtop Spectrophotometer
XH	X-Rite Color i5 Benchtop Spectrophotometer	XI	X-Rite Color i7 Benchtop Spectrophotometer
XM	X-Rite SP62 Portable Sphere Spectrophotometer	XO	X-Rite SP64 Portable Sphere Spectrophotometer
XR	X-Rite	XX	Instrument make/model not specified by lab

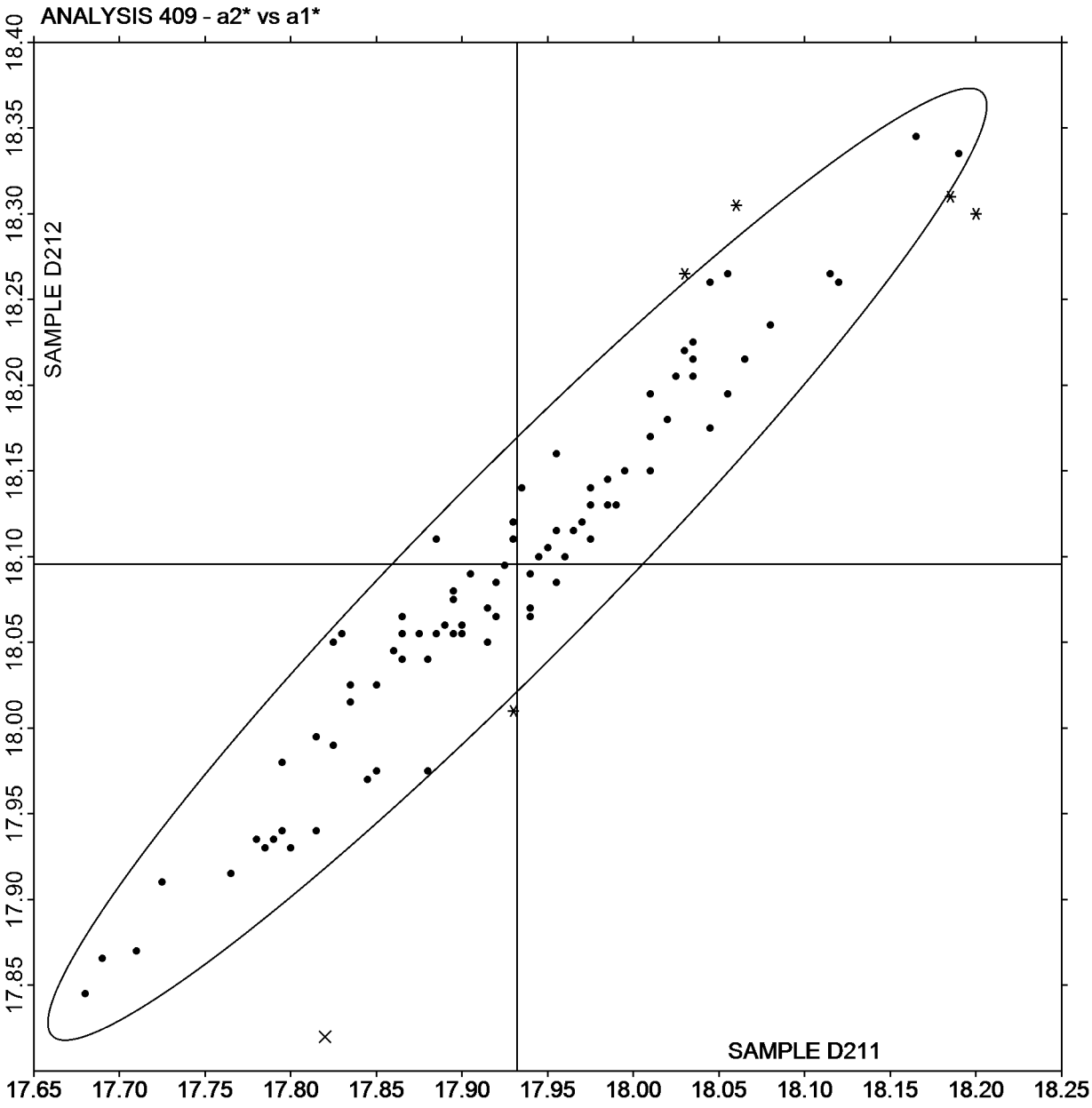
L2* vs L1*

SAMPLE D211 = 61.73 SAMPLE D212 = 62.63



a2* vs a1*

SAMPLE D211 = -17.93 SAMPLE D212 = -18.10

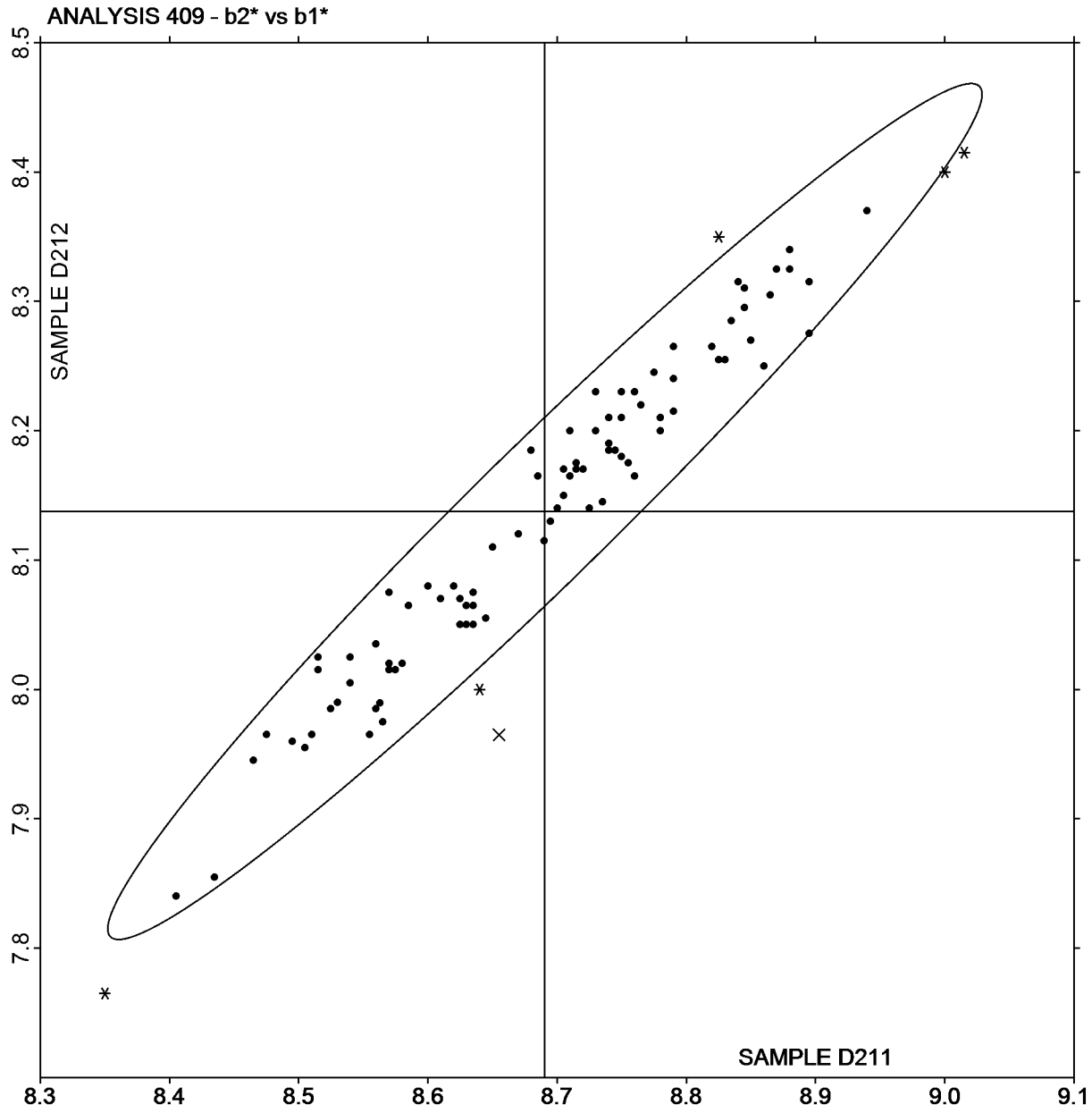


Plot created using absolute values.

b2* vs b1*

SAMPLE D211 = 8.69

SAMPLE D212 = 8.14



Spectrophotometric Reflectance values (as %) at selected wavelengths

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
Sample D211																		
2LD69R		16.65	19.63	23.27	26.15	27.04	29.90	35.55	38.96	33.42	26.09	22.35	20.31	19.93	20.93	20.52	18.68	AJ
2PUKRR	X	18.21X	21.07X	24.87X	27.51X	28.32X	31.41X	37.13	40.59X	34.22X	26.81X	22.85X	20.78X	20.48X	21.71X	21.46X	19.39X	HP
333D44		16.63	19.69	23.62	26.20	27.06	30.02	35.73	39.02	33.26	25.98	22.26	20.19	19.92	20.96	20.77	18.41	AM
37FDZV		16.88	19.61	23.45	26.02	26.93	29.88	35.58	38.87	33.03	25.80	22.15	20.11	19.85	20.91	20.49	18.59	AS
39PBNK		16.48	19.45	23.15	25.94	26.73	29.70	35.49	38.77	32.50	25.68	21.90	19.99	19.80	20.81	20.45	18.51	XO
3EQMJH		16.71	19.79	23.49	26.11	26.91	29.93	35.48	38.80	32.87	25.84	22.13	20.19	19.88	20.86	20.51	18.45	XH
3QPBJR	X	16.44	19.04X	22.97*	25.40X	26.21X	29.15X	34.72	38.31	31.94*	24.94X	21.38X	19.52X	18.88X	20.26X	19.93X	18.03*	CA
4UG6UX		16.36	19.43	23.16	25.78	26.65	29.62	35.08	38.38	32.43	25.50	21.79	19.87	19.56	20.54	20.09	18.26	XI
4VDHGQ		16.86	19.62	23.37	25.99	26.82	29.76	33.85	38.60	32.56	25.61	22.02	20.15	19.85	20.75	20.29	18.31	XI
6B9Y7N		16.81	19.66	23.59	26.12	26.99	29.97	35.61	38.83	33.16	25.91	22.20	20.21	19.90	20.87	20.52	18.52	AJ
6FXLTG		16.82	19.74	23.50	26.02	27.01	29.99	35.66	38.88	33.22	25.95	22.26	20.20	19.90	20.91	20.32	18.37	AT
6L4GDG		16.36	19.15X	23.19	25.53*	26.55*	29.57	35.20	38.47	32.62	25.61	21.86	19.93	19.61	20.56	20.42	18.64	XX
72A2NE		16.65	19.70	23.58	26.16	27.04	29.98	35.64	38.86	33.27	26.00	22.29	20.26	19.96	21.18*	20.63	18.44	XX
72R637		16.61	19.66	23.52	26.18	27.13	30.17	35.85	39.03	33.35	26.01	22.20	20.18	19.87	20.91	20.62	18.52	AN
7BHQ94		16.58	19.56	23.47	25.92	26.85	30.05	35.73	38.75	32.44	25.47	21.77	19.90	19.66	20.68	20.39	18.50	XC
7UFNWR		16.64	19.59	23.27	25.90	26.74	29.67	35.34	38.72	32.69	25.66	21.95	20.04	19.70	20.69	20.41	18.43	XH
7V7YLY		16.68	19.55	23.31	25.92	26.76	29.74	35.22	38.73	32.83	25.76	21.95	20.02	19.70	20.70	20.39	18.50	MM
8WVLXM		16.81	19.69	23.49	25.96	26.82	29.85	35.49	38.77	32.73	25.82	22.05	20.12	19.77	20.78	20.38	18.34	XB
92M872		16.43	19.65	23.32	25.88	26.80	29.82	35.27	38.54	32.74	25.69	21.98	20.11	19.76	20.69	20.29	18.41	MI
9EDYTQ		18.88X	19.74	23.50	27.09X	26.98	30.00	35.53	38.90	32.78	25.80	22.10	20.16	19.78	20.73	20.32	18.39	XD
9P98CT		16.65	19.62	23.53	26.14	26.91	29.97	35.90	39.14	32.97	25.73	22.08	20.13	19.85	20.92	20.68	18.66	MV
AC2JYP		16.76	19.79	23.72	26.29	27.24*	30.23*	35.97	39.26	33.44	26.11	22.38	20.36	20.01	21.09	20.65	18.59	AT

Spectrophotometric Reflectance values (as %) at selected wavelengths

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
								Sample D211										
AJYKQ3		17.50*	19.58	23.36	25.87	26.76	29.80	35.42	38.78	32.62	25.62	21.93	20.03	19.69	20.70	20.29	18.37	XD
BQX6TX		16.95	19.64	23.53	26.08	26.99	29.97	35.69	38.86	33.27	26.04	22.34	20.28	19.99	21.14*	21.02X	18.84*	AS
BRPDMZ		16.36	19.34	23.19	25.89	26.57*	29.52*	35.32	39.01	32.60	25.43*	21.77	19.86	19.49*	20.63	20.55	18.47	MV
BUH8LP		16.76	19.74	23.55	26.08	26.97	29.92	35.62	39.01	33.24	25.94	22.19	20.17	19.84	20.85	20.34	18.42	AJ
CFUJPW		17.03	19.84	23.85*	26.50*	27.29*	30.32*	36.16	39.94X	33.43	26.09	22.37	20.36	19.94	21.07	20.79	18.82	CA
D4TGZT		16.62	19.62	23.30	25.86	26.72	29.72	35.15	38.53	32.74	25.72	21.97	20.02	19.69	20.63	20.20	18.32	XI
DN496F		16.80	19.70	23.50	26.20	27.10	29.90	35.60	38.95	33.40	26.05	22.30	20.30	19.90	20.90	20.65	18.50	AN
DVKPXP		16.88	19.69	23.57	26.17	27.07	30.16	35.72	39.22	33.13	26.03	22.20	20.12	19.57	20.93	20.55	18.58	HP
DWHZTT		16.74	19.82	23.58	26.18	27.10	30.11	35.62	38.99	35.36X	25.86	22.22	20.27	19.96	20.95	20.60	18.60	MI
EYXT2D		16.58	19.51	23.22	25.87	26.72	29.68	35.30	38.49	32.45	25.43*	21.78	19.93	19.64	20.62	20.22	18.18	XH
FCZUXE		16.49	19.50	23.28	25.96	26.80	29.66	35.28	38.64	32.96	25.76	22.06	20.02	19.70	20.63	20.44	18.62	AJ
FFHW6K		16.60	19.58	23.34	25.90	26.74	29.76	35.33	38.59	32.51	25.52	21.81	19.90	19.62	20.56	20.14	18.13	XI
FRATX6		16.65	19.60	23.49	26.08	26.96	29.93	35.59	38.85	33.14	25.90	22.20	20.14	19.85	20.85	20.52	18.47	AJ
FX6D9G		16.84	19.74	23.48	26.04	26.91	29.90	35.50	38.90	32.77	25.77	22.04	20.13	19.79	20.82	20.40	18.42	XB
G7ML23		16.74	19.63	23.35	25.92	26.83	29.84	35.36	38.79	32.83	25.82	22.05	20.09	19.71	20.69	20.30	18.37	XB
GBMM8Q		16.50	19.66	23.43	26.20	26.92	29.86	35.83	39.28	33.21	25.84	22.15	20.19	19.84	20.94	20.76	18.74	MV
GJYQC6		16.62	19.61	23.50	26.12	27.04	29.98	35.68	39.00	33.40	26.04	22.31	20.24	19.95	20.96	20.59	18.41	AS
GRQ4C4		16.49	19.52	23.47	26.00	26.95	29.87	35.59	38.74	32.85	25.75	22.04	20.03	19.78	20.68	20.38	18.48	AQ
HEZWPM		16.70	19.67	23.44	26.07	26.98	29.93	29.57X	38.88	33.25	26.01	22.30	20.18	19.93	20.99	20.69	18.46	AJ
HH3N6F		16.79	19.75	23.54	26.11	26.97	29.95	35.59	38.94	32.76	25.75	22.06	20.12	19.75	20.76	20.29	18.24	XR
HXBKLT		16.65	19.62	23.31	25.91	26.73	29.64	35.27	38.55	32.52	25.53	21.84	19.93	19.64	20.61	20.20	18.23	XH
HY73NU		16.75	19.70	23.45	25.95	26.80	29.70	35.25	38.60	32.60	25.60	22.00	19.95	19.70	20.70	20.25	18.25	XI

Spectrophotometric Reflectance values (as %) at selected wavelengths

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
Sample D211																		
J4TGGU		16.54	19.54	23.36	25.96	26.87	29.77	35.43	38.75	33.09	25.89	22.16	20.08	19.80	20.71	20.49	18.44	AS
JQBKMR		16.44	19.57	23.41	26.08	26.77	29.82	30.55X	39.29	32.96	25.72	22.02	20.12	19.71	20.91	20.66	18.70	MV
K66BWU		16.70	19.63	23.54	26.23	27.16	30.09	35.87	39.24	33.53	26.17	22.44	20.34	20.08*	21.13	20.72	18.35	AS
KX3CAB		16.89	19.81	23.68	26.32	27.19	30.18	35.88	39.07	33.38	26.08	22.38	20.29	20.01	21.20*	21.04X	18.31	AT
KYTMYJ		16.39	19.50	23.39	26.01	26.86	29.80	35.62	38.99	32.98	25.80	22.08	20.11	19.77	20.80	20.48	18.62	MT
L2MNN8		16.49	19.59	23.45	26.06	26.96	29.93	35.55	38.91	33.07	25.92	22.18	20.16	19.76	20.77	20.52	18.56	AB
LF3NGR		16.81	19.77	23.63	26.10	27.03	29.94	35.58	38.88	33.14	25.94	22.21	20.18	19.87	20.86	20.38	18.34	AJ
LNXT88		16.63	19.55	23.42	26.01	26.91	29.80	35.46	38.73	33.13	25.86	22.15	20.09	19.79	20.88	20.42	18.30	AT
M7TLPY		16.30	19.40	23.30	26.00	26.70	29.60	35.40	39.20	33.00	25.70	22.00	20.00	19.65	20.75	20.55	18.65	MV
MR97LY		16.74	19.08X	22.84X	25.66	26.75	29.65	34.95	38.05X	32.63	25.71	21.62*	19.49X	19.51*	20.58	20.41	18.52	GD
MTLQEA		16.65	19.59	23.35	25.87	26.78	29.80	35.43	38.79	32.67	25.68	21.98	20.06	19.71	20.71	20.31	18.32	XD
MUC23G		16.51	19.42	23.37	25.97	26.90	29.86	35.48	38.69	33.15	25.94	22.20	20.18	19.87	20.91	20.44	18.39	AS
NEGY24		16.73	19.62	23.57	26.10	27.00	29.89	35.56	38.94	33.17	25.87	22.17	20.13	19.87	20.87	20.59	18.34	AS
NLDXCP		16.55	19.78	23.46	26.00	26.86	29.90	35.43	38.79	32.76	25.82	22.01	20.05	19.73	20.80	20.31	18.42	XI
PHCZP4		16.80	19.80	23.50	26.20	27.05	30.05	35.70	39.05	33.30	26.00	22.20	20.20	19.90	21.00	20.55	18.40	AN
PM4GTG		16.55	19.60	23.30	26.00	26.80	29.70	35.50	38.90	32.85	25.85	22.05	20.05	19.75	20.75	20.50	18.60	MS
PZXNWD		16.82	19.79	23.47	26.10	26.94	29.93	35.48	38.79	32.80	25.72	21.94	20.04	19.64	20.65	20.27	18.32	XI
Q9JAG3		16.78	19.72	23.63	26.25	27.12	29.95	35.66	39.09	33.31	26.04	22.27	20.20	19.86	20.89	20.58	18.67	AO
QJMCXT		16.45	19.47	23.21	25.80	26.64	29.64	35.11	38.45	32.64	25.62	21.86	19.94	19.63	20.58	20.14	18.33	XI
QWTHUD		16.89	19.80	23.59	26.27	27.10	29.88	35.58	38.93	33.35	26.10	22.31	20.24	19.89	20.89	20.63	18.82	AO
RBN96F		16.73	19.68	23.46	26.03	26.90	29.88	35.36	38.95	33.01	25.94	22.13	20.20	19.82	20.86	20.57	18.63	MM
RJJZY4		16.76	19.80	23.73	26.20	27.10	30.00	35.64	38.97	33.26	26.04	22.29	20.26	19.94	20.94	20.58	18.60	AJ

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
									Sample D211									
T6VETZ		17.31	19.81	23.66	26.21	27.14	30.14	35.71	39.41	33.08	26.03	22.18	20.26	19.60	21.17*	20.77	18.68	HP
TQCWYB		16.56	19.49	23.20	25.76	26.61	29.54	35.04	38.40	32.43	25.49	21.82	19.92	19.58	20.51	20.06*	18.12	XI
TRPBKY		17.11	19.84	23.49	26.07	26.90	29.93	35.50	38.74	32.73	25.81	22.14	20.19	19.89	20.87	20.36	18.50	XI
UUEU8H		16.76	19.53	23.54	26.32	26.91	29.79	35.50	39.26	32.86	25.63	21.98	19.95	19.57	20.68	20.38	18.44	CA
V4D6TX		16.69	19.64	23.47	26.09	26.98	29.95	35.65	39.22	32.99	25.83	22.08	20.12	19.66	20.73	20.35	18.22	XB
VBX6AB		16.45	19.51	23.19	25.81	26.74	29.69	35.21	38.59	32.90	25.93	22.14	20.18	19.78	20.67	20.35	18.46	XB
VJ9ETX		16.81	19.78	23.55	26.12	26.97	29.94	35.55	39.01	32.84	25.84	22.10	20.16	19.79	20.79	20.39	18.47	XB
WETJA7		18.09X	19.65	23.50	26.04	26.95	29.83	35.51	38.89	33.19	25.94	22.27	20.21	19.92	20.83	20.55	18.79	AJ
XM437A		16.75	19.79	23.54	26.09	26.99	29.95	35.47	38.79	32.99	25.96	22.14	20.20	19.83	20.77	20.53	18.64	MM
YGPNYV		16.62	19.55	23.30	25.81	26.69	29.68	35.23	38.54	32.52	25.55	21.86	20.00	19.71	20.61	20.22	18.26	XI
YHPMEX		16.50	19.52	23.38	25.98	26.83	29.88	35.44	38.89	32.85	25.79	21.98	20.06	19.70	20.73	20.42	18.51	MK
YJFW36		17.38	19.87	23.76	26.32	27.21	30.12	35.83	39.07	33.17	25.99	22.25	20.20	19.89	20.90	20.71	18.68	AQ
YT6KX8		16.78	19.58	23.55	26.22	27.01	30.01	35.80	39.60*	33.09	25.81	22.11	20.13	19.71	20.87	20.60	18.62	CA
Z76WQC		17.00	19.70	23.70	26.10	27.00	30.00	35.70	38.70	32.50	25.65	22.00	20.10	19.70	21.00	20.80	19.10X	HW
ZBXYWW		16.18	19.25*	22.95X	25.61*	26.49*	29.55	35.12	38.33	32.28	25.39*	21.62*	19.82*	19.55	20.51	20.19	18.30	XH
ZG9RB3		16.60	19.75	23.44	26.11	26.96	29.92	35.41	38.75	32.99	25.89	22.12	20.51*	19.82	20.81	20.42	18.52	XI
ZGNBRT		16.70	19.54	23.33	26.07	26.98	29.93	35.62	38.91	33.22	26.02	22.25	20.24	19.92	20.93	20.82	18.22	AS

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	16.74	19.62	23.44	26.05	26.91	29.87	35.36	38.87	32.98	25.82	22.09	20.11	19.78	20.81	20.47	18.47
SD Btwn Labs	0.36	0.15	0.17	0.20	0.16	0.17	0.90	0.28	0.40	0.19	0.18	0.15	0.13	0.16	0.20	0.18

2PUKRR (X) - High % reflectance data for almost all wavelengths.

3QPBJR (X) - Low % reflectance data for most wavelengths.

Key to Instrument Codes Reported by Participants

AB	Datacolor 100	AJ	Datacolor 600	AM	Datacolor 600 Plus
AN	Datacolor 650	AO	Datacolor 650x	AQ	Datacolor 600x
AS	Datacolor 800	AT	Datacolor 850	CA	Cary 5000
GD	BYK-Gardner Spectro-Guide Sphere	HP	Hunter UltraScan PRO	HW	Hunter UltraScan XE
MI	Macbeth Color i5	MK	Macbeth Color-Eye 7000	MM	Macbeth Color-Eye 7000a
MS	Minolta CM-600d	MT	Minolta CM-2600d	MV	Minolta CM-3000d Spectrophotometer
XB	X-Rite Ci7000 Series Benchtop Spectrophotometer	XC	X-Rite Ci4200 Benchtop Spectrophotometer	XD	X-Rite Ci7800 Benchtop Spectrophotometer
XH	X-Rite Color i5 Benchtop Spectrophotometer	XI	X-Rite Color i7 Benchtop Spectrophotometer	XO	X-Rite SP64 Sphere Spectrophotometer
XR	X-Rite	XX	Instrument make/model not specified by lab		

WebCode	Data Flag	Sample H211 Lab Mean	Sample H211 Diff from Grand Mean	Sample H211 CPV	Sample H212 Lab Mean	Sample H212 Diff from Grand Mean	Sample H212 CPV	Instr Code
2LD69R		52.93	0.78	0.58	64.73	1.74	1.62	NH
39PBNK		54.60	2.46	1.83	64.23	1.24	1.16	GN
4NCCE9	X	50.10	-2.04	-1.52	49.75	-13.23	-12.30	GK
4UG6UX		51.60	-0.54	-0.40	62.70	-0.28	-0.26	MM
6B9Y7N		53.95	1.81	1.34	64.35	1.37	1.27	GL
6FETYY		50.23	-1.92	-1.42	62.05	-0.93	-0.87	GL
7CTFRG	*	55.70	3.56	2.64	64.15	1.17	1.09	GN
7FBPMY		51.83	-0.32	-0.24	62.48	-0.51	-0.47	GL
7UFNWR		53.40	1.26	0.93	63.25	0.27	0.25	GK
7V7YLY		51.38	-0.76	-0.56	62.59	-0.39	-0.37	GL
8WVLXM		51.83	-0.32	-0.24	62.53	-0.46	-0.42	GL
8X4ZY2		51.78	-0.37	-0.27	63.95	0.97	0.90	GL
92M872	*	54.80	2.66	1.97	62.85	-0.13	-0.12	GL
AAFZUK		53.03	0.88	0.66	62.65	-0.33	-0.31	GN
AJYKQ3		51.73	-0.42	-0.31	62.50	-0.48	-0.45	RA
B9Y3ZZ		51.15	-0.99	-0.74	62.48	-0.51	-0.47	GL
BB4T6U		51.60	-0.54	-0.40	63.25	0.27	0.25	GL
BQX6TX		52.45	0.31	0.23	62.93	-0.06	-0.05	GK
DJUVLW		51.70	-0.44	-0.33	63.38	0.39	0.37	GL
DWHZTT		51.43	-0.72	-0.53	63.28	0.29	0.27	GL
E7EMXU		50.08	-2.07	-1.54	61.53	-1.46	-1.35	GL
EYXT2D		51.40	-0.74	-0.55	62.65	-0.33	-0.31	GL
FFHW6K		51.99	-0.15	-0.11	64.03	1.05	0.98	GL
FLPN8Q		50.93	-1.22	-0.90	63.20	0.22	0.20	GL
FRATX6		51.53	-0.62	-0.46	61.95	-1.03	-0.96	MW
GBMM8Q		51.58	-0.57	-0.42	63.45	0.47	0.44	GL
GJYQC6		51.90	-0.24	-0.18	62.90	-0.08	-0.08	GK
HEZWPM		51.38	-0.77	-0.57	61.08	-1.91	-1.77	GL
HH3N6F		53.03	0.88	0.66	63.18	0.19	0.18	GK
HQUBR6		50.95	-1.19	-0.89	61.95	-1.03	-0.96	GL

WebCode	Data Flag	Sample H211 Lab Mean	Sample H211 Diff from Grand Mean	Sample H211 CPV	Sample H212 Lab Mean	Sample H212 Diff from Grand Mean	Sample H212 CPV	Instr Code
HXBKLT		51.68	-0.47	-0.35	63.05	0.07	0.06	GL
HY73NU		52.03	-0.12	-0.09	63.13	0.14	0.13	GK
J4TGGU		51.65	-0.49	-0.37	61.00	-1.98	-1.84	GK
JLTGFL	*	49.98	-2.17	-1.61	59.85	-3.13	-2.91	RA
K66BWU		52.13	-0.02	-0.01	63.80	0.82	0.76	GL
KQ32TK		50.35	-1.79	-1.33	60.75	-2.23	-2.07	GL
L2MNN8		52.95	0.81	0.60	64.30	1.32	1.23	GL
LF3NGR		53.08	0.93	0.69	63.45	0.47	0.44	GL
LNXT88		49.33	-2.82	-2.09	60.55	-2.43	-2.26	GK
M9GZBN	X	57.43	5.28	3.92	65.28	2.29	2.13	ST
MELYNY		50.98	-1.17	-0.87	62.78	-0.21	-0.19	GL
MR97LY		52.50	0.36	0.27	62.98	-0.01	-0.01	GN
MUC23G		53.08	0.93	0.69	63.58	0.59	0.55	GL
NGMEGM		54.33	2.18	1.62	64.33	1.34	1.25	GN
NHDMFP	X	29.55	-22.59	-16.78	28.95	-34.03	-31.63	GK
NLDXCP		49.60	-2.54	-1.89	62.03	-0.96	-0.89	GT
P2PMBC		54.38	2.23	1.66	64.68	1.69	1.57	RQ
PF9C78		51.28	-0.87	-0.64	62.85	-0.13	-0.12	GL
PGYMUF		51.65	-0.49	-0.37	64.00	1.02	0.95	GN
PM4GTG		52.73	0.58	0.43	62.38	-0.61	-0.56	GK
QDYN22		52.28	0.13	0.10	63.25	0.27	0.25	GN
QKHUZU		54.43	2.28	1.70	62.73	-0.26	-0.24	GK
TBNGXZ		51.68	-0.47	-0.35	64.45	1.47	1.36	GD
TVNMFY		52.95	0.81	0.60	62.90	-0.08	-0.08	GL
U4YBRC		54.03	1.88	1.40	63.95	0.97	0.90	GX
UUEU8H		51.40	-0.74	-0.55	63.55	0.57	0.53	GL
UZH37X		51.58	-0.57	-0.42	63.33	0.34	0.32	GK
V4D6TX		53.90	1.76	1.31	63.70	0.72	0.67	ZA
VVKW98		52.40	0.26	0.19	63.38	0.39	0.37	GN
W3FY9X	*	50.05	-2.09	-1.55	60.13	-2.86	-2.65	GD

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H211 Lab Mean	Sample H211 Diff from Grand Mean	Sample H211 CPV	Sample H212 Lab Mean	Sample H212 Diff from Grand Mean	Sample H212 CPV	Instr Code
WU438X		53.25	1.11	0.82	64.83	1.84	1.71	GL
XBNZZC		51.93	-0.22	-0.16	61.40	-1.58	-1.47	EN
XDA49A		53.35	1.21	0.90	64.23	1.24	1.16	GK
XM437A		51.10	-1.04	-0.77	63.03	0.04	0.04	GL
XUGX6P		53.18	1.03	0.77	62.73	-0.26	-0.24	GL
YGPNYV		51.30	-0.84	-0.63	63.28	0.29	0.27	GL
Z76WQC		50.48	-1.67	-1.24	62.55	-0.43	-0.40	GK
Z9EKQB		52.33	0.18	0.14	64.03	1.04	0.97	GL
ZG9RB3		51.40	-0.74	-0.55	63.15	0.17	0.16	GN
ZK6KY7		54.90	2.76	2.05	63.80	0.82	0.76	GL
ZPZC9N		52.33	0.18	0.14	62.75	-0.23	-0.22	GK

Summary Statistics

	Sample H211	Sample H212
Grand Means	52.14 Gloss Units	62.98 Gloss Units
Stnd Dev Btwn Labs	1.35 Gloss Units	1.08 Gloss Units

Statistics based on 68 of 71 reporting participants

Comments on Assigned Data Flags for Test #440

4NCCE9(X) - Extreme data for Sample H212.

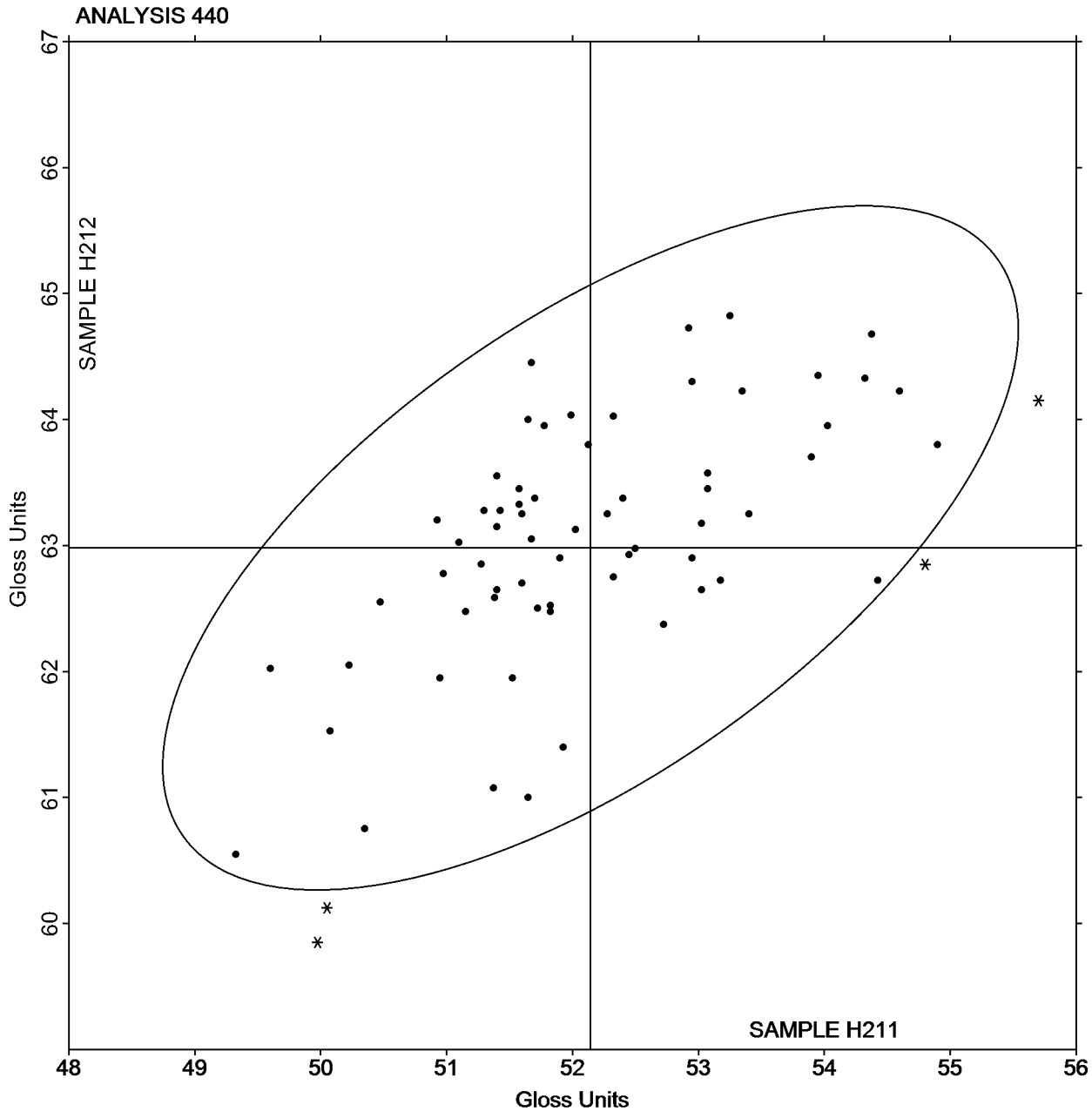
M9GZBN(X) - High data for Sample H211.

NHDMFP(X) - Extreme data.

Key to Instrument Codes Reported by Participants

EN	Elcometer 480	GD	BYK Gardner Spectro2Guide 45/0
GK	BYK-Gardner micro-gloss (60)	GL	BYK-Gardner micro-TRI-gloss
GN	BYK-Gardner new micro-TRI-gloss	GT	Gardco Novo-Gloss (20/60/85)
GX	BYK-Gardner (model not specified)	MM	Macbeth Lab-Gloss
MW	Minolta Multi-Gloss 268	NH	3nh NHG268 Multi-angle Precise Gloss Meter
RA	Rhopoint Novo-Gloss Glossmeter	RQ	Rhopoint IQ Goniophotometer 20/60/85°
ST	Sheen Tri-Glossmaster	ZA	Zehntner ZGM Series

SAMPLE H211 = 52.14 Gloss Units SAMPLE H212 = 62.98 Gloss Units



-End of Report-