Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #197 - 3rd 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
2B22GE		C211	43.26	-9.32	-11.00	1.01	-0.32	-0.43	1.14	HW
		C212	44.27	-9.65	-11.43					
4VET87		C211	43.26	-9.34	-10.77	1.01	-0.25	-0.50	1.16	XM
		C212	44.27	-9.59	-11.27					
6BB9AK		C211	42.63	-10.13	-10.73	1.10	-0.31	-0.40	1.21	BG
		C212	43.73	-10.44	-11.13					
6GBMX8		C211	42.92	-9.31	-10.43	1.26	-0.36	-0.44	1.38	GE
		C212	44.18	-9.67	-10.87					
6NB7VW		C211	43.51	-9.71	-10.73	0.87	-0.28	-0.43	1.01	XW
		C212	44.38	-9.99	-11.16					
6ZP2DG		C211	42.68	-10.04	-10.77	1.13	-0.31	-0.41	1.24	BG
		C212	43.81	-10.35	-11.18					
7MXY79		C211	43.12	-9.43	-10.44	1.04	-0.30	-0.46	1.17	GE
		C212	44.16	-9.73	-10.89					
842QRB		C211	42.72	-9.25	-10.81	1.15	-0.34	-0.43	1.27	HW
		C212	43.87	-9.59	-11.24					
8QELJE		C211	43.05	-9.20	-10.90	1.10	-0.20	-0.50	1.22	HW
		C212	44.15	-9.40	-11.40					
9X8CJE	X	C211	42.87	-9.37	-10.88	0.11	-0.14	-0.50	0.53	XP
		C212	42.99	-9.52	-11.38					
ABA4KQ		C211	42.85	-9.31	-10.65	1.16	-0.30	-0.39	1.26	XU
		C212	44.01	-9.61	-11.04					
AGXPRC	X	C211	43.25	-9.30	-11.05	1.50	-0.15	-0.20	1.52	HW
		C212	44.75	-9.45	-11.25					
C372AA		C211	42.56	-9.41	-10.90	1.10	-0.27	-0.42	1.21	HX
		C212	43.66	-9.68	-11.31					
CL7P29		C211	42.70	-9.40	-10.75	1.11	-0.30	-0.43	1.23	HX
		C212	43.81	-9.70	-11.18					
CMEYXC		C211	42.94	-9.33	-10.64	1.10	-0.33	-0.42	1.22	XU
		C212	44.04	-9.67	-11.06					
CZL263		C211	43.00	-9.37	-10.44	1.03	-0.34	-0.42	1.17	XU
		C212	44.04	-9.71	-10.87					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
DJBPXU		C211	42.88	-9.22	-11.04	1.23	-0.33	-0.35	1.33	HW
		C212	44.11	-9.55	-11.39					
G3CKKG		C211	42.43	-9.32	-10.50	1.24	-0.29	-0.41	1.34	GG
		C212	43.67	-9.61	-10.91					
GADWHZ		C211	42.46	-9.47	-10.70	1.09	-0.29	-0.41	1.19	HY
		C212	43.55	-9.75	-11.11					
GKCREA	X	C211	42.20	-7.39	-12.03	1.03	-0.20	-0.47	1.16	TA
		C212	43.24	-7.59	-12.51					
H2HDGW		C211	42.97	-9.45	-10.54	1.20	-0.38	-0.41	1.32	XS
		C212	44.17	-9.82	-10.95					
HL3F9P		C211	43.26	-9.47	-10.34	1.11	-0.32	-0.42	1.24	GH
		C212	44.38	-9.80	-10.76					
HRRTF6		C211	42.79	-9.22	-10.88	1.12	-0.27	-0.45	1.23	HW
		C212	43.91	-9.49	-11.32					
HVR7UG		C211	42.23	-9.10	-10.21	1.23	-0.37	-0.38	1.34	MP
		C212	43.46	-9.46	-10.59					
JRJBLX		C211	42.59	-10.07	-10.79	1.18	-0.32	-0.41	1.29	BG
		C212	43.77	-10.39	-11.19					
M64R82		C211	43.45	-9.22	-10.96	1.13	-0.36	-0.42	1.25	XH
		C212	44.58	-9.58	-11.37					
MAYGUZ		C211	42.93	-9.37	-10.42	1.20	-0.36	-0.33	1.29	GE
		C212	44.13	-9.73	-10.74					
MFZX2Y		C211	43.25	-9.45	-11.20	1.05	-0.15	-0.20	1.08	HW
		C212	44.30	-9.60	-11.40					
MNEJ9H		C211	42.65	-9.04	-11.02	1.25	-0.33	-0.34	1.34	HW
		C212	43.90	-9.37	-11.37					
MW7Z2T		C211	43.34	-9.31	-10.46	1.00	-0.30	-0.45	1.14	XD
		C212	44.34	-9.62	-10.91					
N2ZFQR	X	C211	42.90	-9.30	-10.44	1.14	-0.33	0.43	1.26	GA
		C212	44.04	-9.63	-10.01					
NGPNJJ		C211	42.66	-9.12	-11.02	1.04	-0.33	-0.42	1.17	MG
		C212	43.70	-9.45	-11.44					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
NQF9PG		C211	42.38	-9.36	-10.45	1.05	-0.33	-0.43	1.18	XE
		C212	43.42	-9.69	-10.88					
PJ86DN		C211	42.67	-9.42	-10.51	0.98	-0.29	-0.49	1.14	GG
		C212	43.65	-9.71	-10.99					
Q68N62		C211	43.19	-9.51	-10.69	1.09	-0.33	-0.39	1.21	MD
		C212	44.28	-9.84	-11.09					
T7EKPW		C211	43.36	-9.36	-10.82	1.25	-0.23	-0.38	1.33	MS
		C212	44.61	-9.60	-11.20					
TAW2KL		C211	43.32	-9.29	-10.88	1.18	-0.32	-0.35	1.27	XX
		C212	44.50	-9.61	-11.22					
TN9HMH		C211	42.87	-9.31	-10.68	1.21	-0.29	-0.46	1.33	XO
		C212	44.08	-9.60	-11.14					
TXM6ZR		C211	43.11	-9.36	-11.06	1.05	-0.27	-0.42	1.16	HW
		C212	44.16	-9.63	-11.49					
UJXPCJ		C211	42.74	-9.13	-10.78	1.04	-0.44	-0.36	1.19	HK
		C212	43.79	-9.57	-11.13					
UXFGVJ		C211	43.11	-9.71	-10.05	1.02	-0.22	-0.39	1.11	GE
		C212	44.13	-9.94	-10.45					
YVD8T4		C211	43.03	-9.35	-10.95	1.09	-0.31	-0.44	1.21	HW
		C212	44.12	-9.66	-11.39					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
C211	42.90	-9.39	-10.70	1.11	-0.31	-0.41	1.23
C212	44.01	-9.69	-11.11				
Stnd Dev Btwn Labs							
C211	0.33	0.24	0.24	0.09	0.05	0.05	0.08
C212	0.32	0.24	0.25				

Statistics based on 38 of 42 reporting participants

Comments Assigned on Data Flags for Test #408

9X8CJE(X) - Low "L*" value for Sample C212. Large replication difference for "L*" for Sample C212. Small Delta L & E. Large Delta a.

AGXPRC(X) - Large replication difference for "L*" for Sample C212. Large replication difference for both "b*" samples. Large Delta for L, a, b & E.

GKCREA(X) - Extreme data for both "a*" values. Very low "b*" values for both samples.

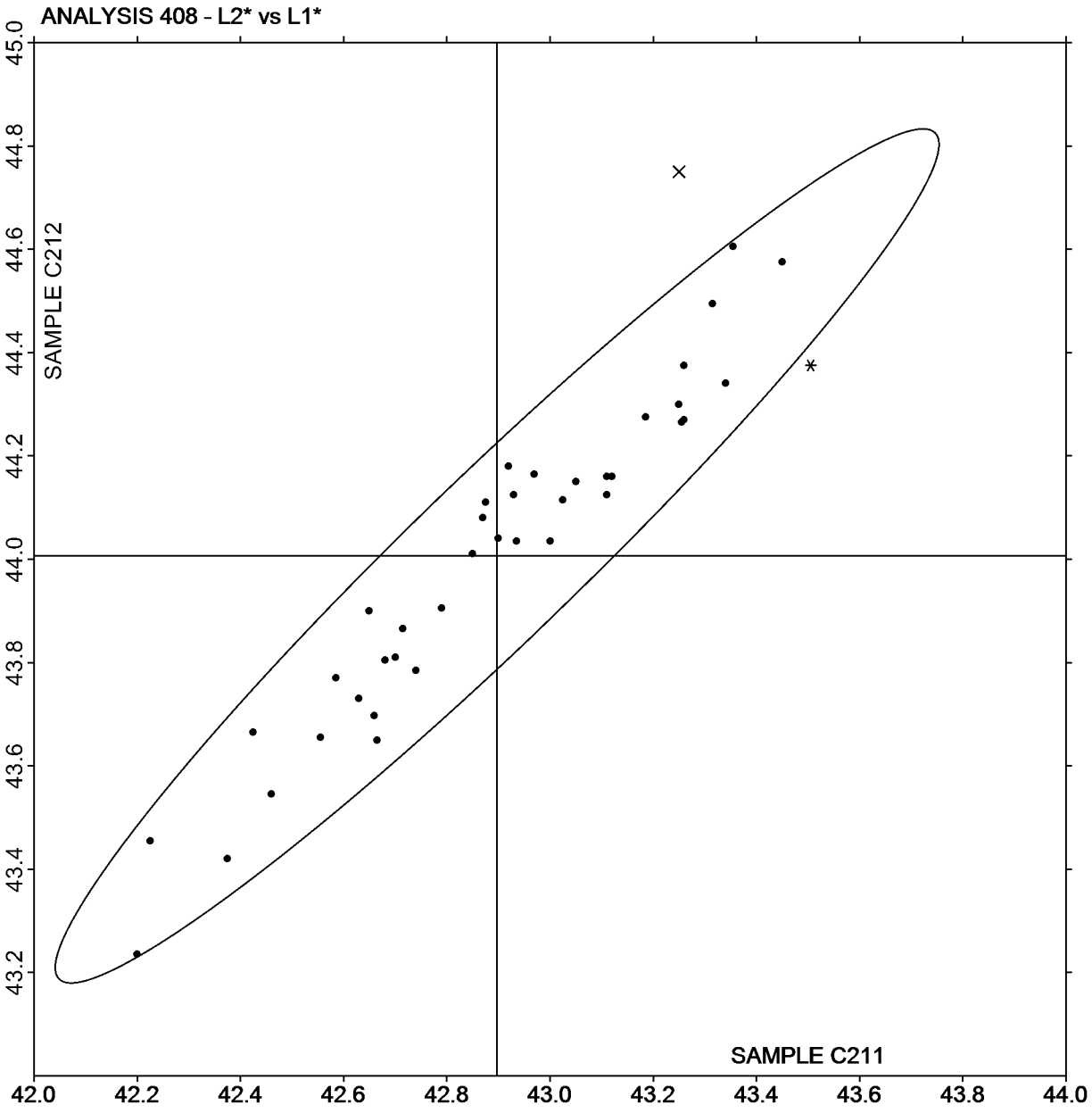
N2ZFQR(X) - High "b*" value for Sample C212. Large Delta b.

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
MS	Minolta CM-600d Spectrophotometer	TA	Technidyne ColorTouch X 45 (45°/0°)
XD	X-Rite 500 Series SpectroDensitometer	XE	X-Rite eXact Portable Spectrophotometer
XH	X-Rite Color i5	XM	X-Rite MA58 Multi-Angle Spectrophotometer
XO	X-Rite MA68 II Multi-Angle Spectrophotometer	XP	X-Rite MA9 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

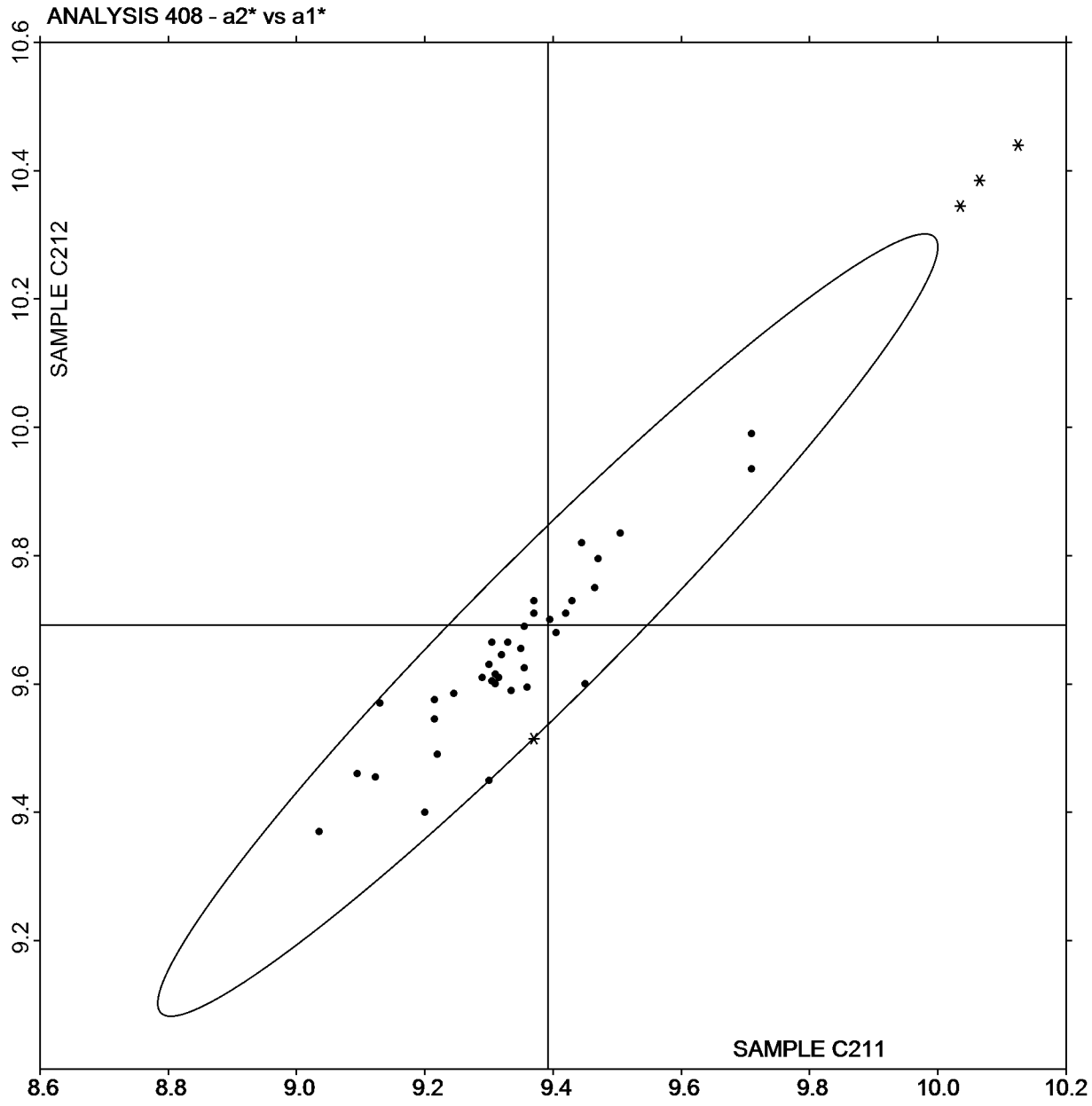
L2* vs L1*

SAMPLE C211 = 42.90 SAMPLE C212 = 44.01



a2* vs a1*

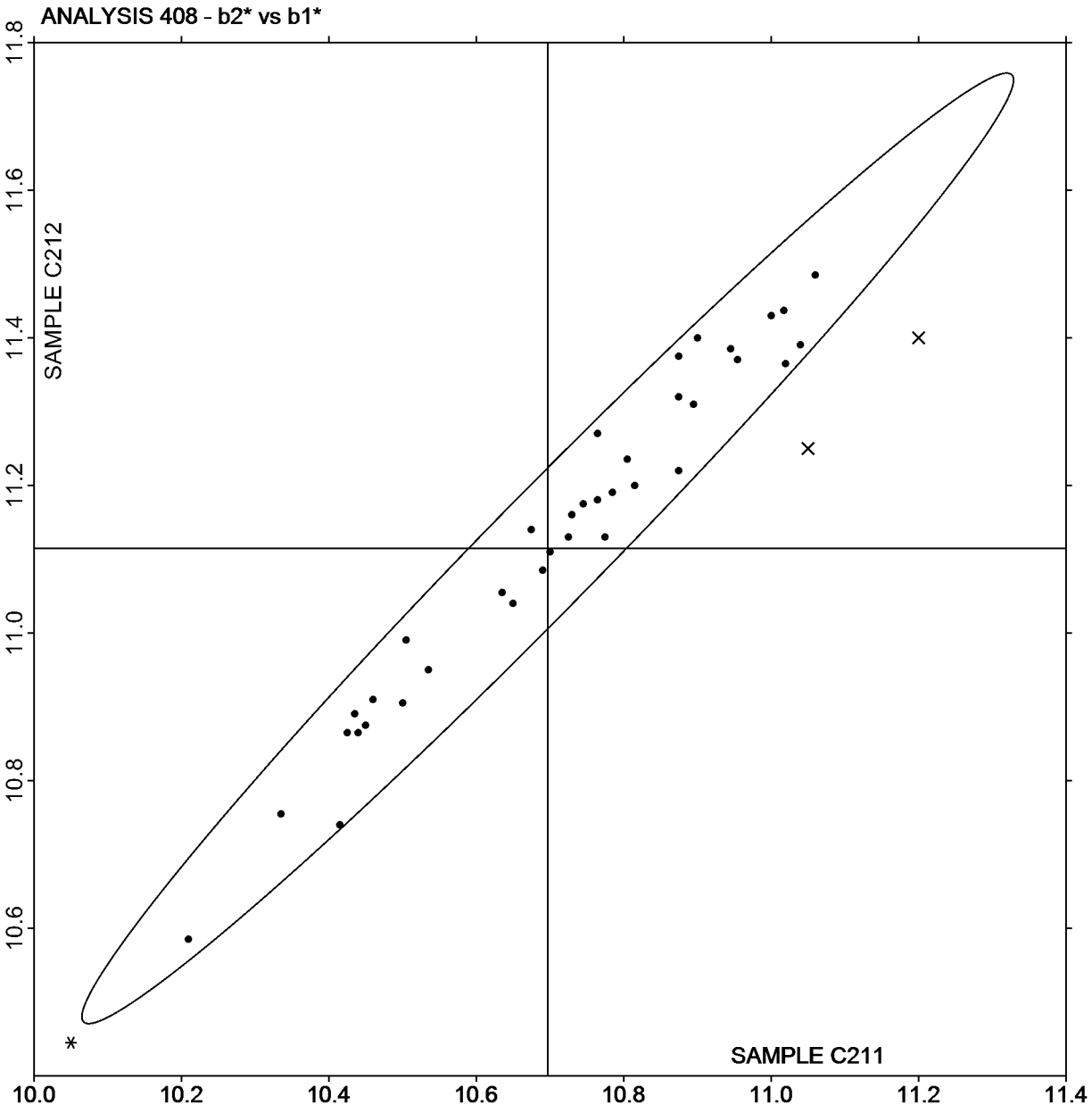
SAMPLE C211 = -9.39 SAMPLE C212 = -9.69



Plot created using absolute values.

b2* vs b1*

SAMPLE C211 = -10.70 SAMPLE C212 = -11.11



Plot created using absolute values.

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
24VNCN		C211	43.54	-9.40	-10.75	1.10	-0.27	-0.42	1.21	MT
		C212	44.65	-9.66	-11.17					
34BCAA		C211	43.54	-9.28	-10.87	1.10	-0.27	-0.41	1.21	HP
		C212	44.65	-9.55	-11.29					
4L9NKV		C211	43.51	-9.33	-10.82	1.10	-0.32	-0.40	1.22	AB
		C212	44.62	-9.65	-11.22					
4QNJZT		C211	43.72	-9.36	-10.65	1.09	-0.27	-0.41	1.19	AJ
		C212	44.81	-9.63	-11.06					
6PNJX8		C211	43.65	-9.33	-10.77	1.08	-0.31	-0.40	1.19	AJ
		C212	44.73	-9.64	-11.17					
6X2R2U		C211	43.51	-9.35	-10.87	1.18	-0.29	-0.39	1.27	AJ
		C212	44.69	-9.64	-11.25					
79DJ3A		C211	43.83	-9.23	-10.89	1.03	-0.29	-0.43	1.15	XI
		C212	44.86	-9.52	-11.32					
7QHPVD		C211	43.51	-9.33	-10.72	1.15	-0.35	-0.39	1.26	AS
		C212	44.66	-9.67	-11.11					
87P6DY		C211	43.76	-9.36	-10.72	1.09	-0.31	-0.42	1.20	AO
		C212	44.84	-9.67	-11.14					
8APDKV		C211	43.27	-9.19	-10.85	1.09	-0.23	-0.40	1.18	XH
		C212	44.36	-9.41	-11.25					
9U86YG		C211	43.59	-9.33	-10.68	1.16	-0.28	-0.44	1.27	AS
		C212	44.75	-9.62	-11.12					
9X8CJE		C211	43.33	-9.26	-10.91	1.20	-0.28	-0.38	1.29	XF
		C212	44.53	-9.54	-11.29					
9ZH227		C211	43.33	-9.38	-10.94	1.30	-0.27	-0.33	1.37	MV
		C212	44.63	-9.65	-11.28					
ABA4KQ		C211	43.40	-9.33	-10.69	1.18	-0.29	-0.41	1.28	XI
		C212	44.57	-9.61	-11.09					
AF6XHR		C211	43.57	-9.32	-10.83	1.22	-0.32	-0.35	1.30	AT
		C212	44.78	-9.64	-11.18					
AH8U4F		C211	43.72	-9.33	-10.94	1.06	-0.25	-0.44	1.17	AQ
		C212	44.78	-9.58	-11.38					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
AM2TD6		C211	43.36	-9.31	-10.83	1.20	-0.32	-0.35	1.30	MV
		C212	44.57	-9.64	-11.18					
BVD6A3	X	C211	44.53	-9.34	-10.76	0.13	-0.34	-0.38	0.53	AS
		C212	44.66	-9.69	-11.14					
C39QE8		C211	43.38	-9.26	-10.85	1.11	-0.34	-0.40	1.22	XI
		C212	44.48	-9.60	-11.25					
C4NTLF		C211	43.43	-9.26	-10.93	1.12	-0.29	-0.42	1.23	XD
		C212	44.55	-9.55	-11.35					
CACDPV		C211	43.47	-9.35	-10.78	1.22	-0.32	-0.43	1.33	AS
		C212	44.69	-9.67	-11.20					
CMEYXC		C211	43.51	-9.23	-10.92	1.05	-0.33	-0.39	1.17	XB
		C212	44.56	-9.56	-11.31					
DA7HJU		C211	43.68	-9.44	-10.73	1.12	-0.29	-0.42	1.23	AS
		C212	44.80	-9.73	-11.15					
DNLJDZ		C211	43.54	-9.25	-10.88	1.13	-0.29	-0.38	1.23	XI
		C212	44.67	-9.54	-11.27					
EDZUV7		C211	43.60	-9.31	-10.75	0.97	-0.35	-0.45	1.12	MW
		C212	44.56	-9.67	-11.20					
EGJUCL		C211	43.18	-9.20	-10.96	1.25	-0.28	-0.39	1.34	XI
		C212	44.43	-9.47	-11.35					
EY2V7N		C211	43.45	-9.28	-10.79	1.08	-0.30	-0.41	1.19	XB
		C212	44.53	-9.58	-11.20					
FN2JBL	X	C211	43.45	-9.28	-11.12	1.17	-0.31	-0.33	1.26	XB
		C212	44.63	-9.59	-11.45					
FPNFE7		C211	43.43	-9.28	-10.82	1.14	-0.29	-0.41	1.24	XB
		C212	44.56	-9.57	-11.24					
FX8N2G	X	C211	44.02	-9.05	-10.98	1.08	-0.22	-0.39	1.16	HH
		C212	45.10	-9.27	-11.37					
G3UVWV		C211	43.40	-9.25	-10.77	1.08	-0.23	-0.43	1.18	XI
		C212	44.48	-9.48	-11.20					
G7ELMZ		C211	43.41	-9.28	-10.91	1.10	-0.38	-0.39	1.24	AQ
		C212	44.51	-9.67	-11.30					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
G7U8RV		C211	43.41	-9.27	-10.77	1.05	-0.32	-0.39	1.16	XB
		C212	44.46	-9.59	-11.16					
G9J9Z4		C211	43.42	-9.24	-10.89	1.12	-0.32	-0.44	1.25	XB
		C212	44.54	-9.56	-11.33					
GGV8RU		C211	43.30	-9.21	-10.93	0.91	-0.32	-0.41	1.05	XO
		C212	44.21	-9.53	-11.34					
GU2HYG		C211	43.71	-9.31	-10.76	1.01	-0.28	-0.47	1.15	AJ
		C212	44.72	-9.59	-11.23					
GVUA92		C211	43.56	-9.34	-10.81	1.11	-0.32	-0.39	1.23	AS
		C212	44.68	-9.66	-11.21					
GX2WHZ		C211	43.31	-9.10	-10.67	1.15	-0.27	-0.40	1.24	MI
		C212	44.45	-9.36	-11.08					
H2HDGW		C211	43.46	-9.28	-10.74	1.23	-0.38	-0.41	1.35	AJ
		C212	44.68	-9.66	-11.15					
H3PVD7		C211	43.41	-9.38	-10.76	1.21	-0.29	-0.40	1.31	AS
		C212	44.62	-9.66	-11.16					
HJ28A7		C211	43.69	-9.29	-10.86	1.13	-0.26	-0.41	1.23	XE
		C212	44.82	-9.55	-11.27					
HJWRVK		C211	43.30	-9.18	-10.91	1.22	-0.34	-0.35	1.31	XI
		C212	44.52	-9.52	-11.26					
HL3F9P		C211	43.60	-9.32	-10.73	1.16	-0.31	-0.42	1.27	MV
		C212	44.76	-9.63	-11.14					
HNQUWY		C211	43.52	-9.20	-10.88	1.17	-0.34	-0.33	1.27	MM
		C212	44.69	-9.54	-11.21					
HQVEN7		C211	43.38	-9.24	-10.92	1.19	-0.31	-0.40	1.29	XD
		C212	44.56	-9.56	-11.32					
HRP482		C211	43.54	-9.33	-10.75	1.10	-0.27	-0.41	1.21	MM
		C212	44.65	-9.60	-11.16					
HVR7UG		C211	43.41	-9.40	-10.99	1.19	-0.30	-0.32	1.26	XB
		C212	44.59	-9.70	-11.31					
HYQGQG		C211	43.55	-9.26	-10.82	1.06	-0.29	-0.40	1.17	XI
		C212	44.61	-9.55	-11.22					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
JEMWTW		C211	43.44	-9.31	-10.86	1.05	-0.31	-0.40	1.16	MM
		C212	44.49	-9.62	-11.26					
JMPGNW		C211	43.31	-9.32	-10.96	1.07	-0.29	-0.43	1.19	XC
		C212	44.38	-9.62	-11.39					
KJ97FY		C211	43.66	-9.34	-10.81	1.11	-0.29	-0.41	1.21	MM
		C212	44.77	-9.63	-11.22					
LBA4QT		C211	43.61	-9.27	-10.89	1.18	-0.33	-0.39	1.29	XI
		C212	44.79	-9.60	-11.28					
LLQPVM		C211	43.32	-9.22	-10.90	1.14	-0.29	-0.41	1.24	XI
		C212	44.46	-9.51	-11.30					
LPUJUR		C211	43.69	-9.31	-10.81	1.11	-0.30	-0.39	1.21	HP
		C212	44.80	-9.61	-11.20					
M3WCWN		C211	43.62	-9.40	-10.84	1.06	-0.26	-0.41	1.17	HP
		C212	44.68	-9.67	-11.25					
M63YCE		C211	43.40	-9.30	-10.84	1.21	-0.30	-0.35	1.29	MK
		C212	44.61	-9.60	-11.19					
M7VQLY		C211	43.45	-9.32	-10.81	1.15	-0.32	-0.41	1.26	MS
		C212	44.60	-9.64	-11.22					
MKEB2M		C211	43.68	-9.36	-10.76	1.00	-0.32	-0.43	1.13	AS
		C212	44.67	-9.68	-11.19					
MKTWFU		C211	43.65	-9.26	-10.70	1.05	-0.34	-0.40	1.17	AS
		C212	44.70	-9.59	-11.10					
MQJACC		C211	43.59	-9.36	-10.88	1.06	-0.16	-0.43	1.15	HP
		C212	44.64	-9.52	-11.31					
MTLABN		C211	43.52	-9.30	-10.71	1.03	-0.28	-0.44	1.15	XI
		C212	44.55	-9.57	-11.14					
MXLJLP		C211	43.60	-9.31	-10.76	1.11	-0.31	-0.44	1.23	AJ
		C212	44.71	-9.63	-11.20					
N2ZFQR		C211	43.39	-9.23	-10.83	1.18	-0.32	-0.36	1.28	AJ
		C212	44.57	-9.56	-11.19					
N8Y3EK	X	C211	43.79	-8.93	-10.45	1.02	-0.29	-0.41	1.13	MU
		C212	44.80	-9.21	-10.86					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
NCXG2B		C211	43.78	-9.38	-10.63	1.06	-0.35	-0.41	1.19	AO
		C212	44.84	-9.73	-11.04					
NHGJ7R		C211	43.72	-9.45	-10.73	1.12	-0.30	-0.39	1.22	AO
		C212	44.84	-9.75	-11.12					
NJD39T		C211	43.55	-9.36	-10.76	1.11	-0.28	-0.41	1.21	MU
		C212	44.66	-9.63	-11.17					
PBGJ8P		C211	43.48	-9.32	-10.77	1.20	-0.32	-0.36	1.30	AT
		C212	44.68	-9.64	-11.13					
PJ86DN		C211	43.16	-9.38	-10.54	1.05	-0.25	-0.46	1.17	GE
		C212	44.21	-9.62	-11.00					
PV8TDX		C211	43.46	-9.25	-10.89	1.32	-0.33	-0.35	1.41	AJ
		C212	44.78	-9.58	-11.24					
PZGWFT	X	C211	43.76	-9.30	-11.26	1.05	-0.29	-0.38	1.16	CA
		C212	44.81	-9.59	-11.65					
RN2HDH		C211	43.21	-9.35	-10.91	1.22	-0.32	-0.33	1.30	MV
		C212	44.42	-9.66	-11.24					
RNEA7Y		C211	43.60	-9.33	-10.69	1.13	-0.30	-0.40	1.23	AJ
		C212	44.73	-9.62	-11.08					
RZWUPV		C211	43.40	-9.25	-10.81	1.19	-0.30	-0.38	1.28	XI
		C212	44.58	-9.55	-11.18					
T8MW6C		C211	43.29	-9.25	-10.76	1.11	-0.31	-0.41	1.22	XI
		C212	44.40	-9.56	-11.17					
T9HF7D		C211	43.40	-9.31	-10.95	1.21	-0.33	-0.38	1.30	XR
		C212	44.60	-9.64	-11.32					
TFJR4W		C211	43.68	-9.30	-10.69	1.20	-0.38	-0.41	1.32	AS
		C212	44.88	-9.68	-11.10					
TN9HMH		C211	43.48	-9.25	-11.00	1.18	-0.25	-0.41	1.27	MI
		C212	44.66	-9.50	-11.41					
TNWN8G		C211	43.31	-9.17	-10.96	1.09	-0.26	-0.39	1.19	XH
		C212	44.40	-9.43	-11.36					
TVUDQ8	X	C211	42.99	-9.59	-11.02	1.09	-0.29	-0.40	1.20	AJ
		C212	44.08	-9.88	-11.42					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
U6GQ7H		C211	43.64	-9.25	-10.86	1.19	-0.36	-0.41	1.31	XH
		C212	44.83	-9.61	-11.27					
U9F6RM		C211	43.47	-9.33	-10.74	1.04	-0.26	-0.42	1.15	XI
		C212	44.51	-9.60	-11.16					
UDQZUB		C211	43.55	-9.14	-10.74	1.21	-0.30	-0.39	1.30	MM
		C212	44.76	-9.43	-11.13					
UNUDQ6	X	C211	43.97	-9.43	-11.01	1.30	-0.36	-0.34	1.40	CA
		C212	45.27	-9.79	-11.36					
UQX4WK		C211	43.62	-9.36	-10.85	1.13	-0.28	-0.45	1.24	AS
		C212	44.75	-9.64	-11.30					
UVR38A	X	C211	43.09	-9.15	-10.71	0.98	-0.29	-0.41	1.10	XH
		C212	44.08	-9.43	-11.12					
UXFGVJ		C211	43.20	-9.20	-10.72	1.03	-0.24	-0.44	1.15	GD
		C212	44.23	-9.44	-11.17					
VFRNKK		C211	43.18	-9.25	-10.69	1.02	-0.31	-0.41	1.14	XM
		C212	44.19	-9.56	-11.10					
VGM2CJ		C211	43.41	-9.12	-10.79	1.10	-0.31	-0.44	1.23	XH
		C212	44.51	-9.44	-11.23					
VPGE8C		C211	43.40	-9.22	-11.00	1.23	-0.29	-0.40	1.33	AO
		C212	44.63	-9.51	-11.40					
WBHPTR	X	C211	45.04	-9.28	-10.71	-0.38	-0.33	-0.38	0.64	AS
		C212	44.66	-9.62	-11.09					
WGGBFK		C211	43.80	-9.42	-10.89	1.14	-0.34	-0.40	1.26	CA
		C212	44.94	-9.76	-11.29					
WTV9MA		C211	43.62	-9.28	-10.82	1.13	-0.32	-0.40	1.24	AJ
		C212	44.75	-9.59	-11.22					
XM3NWY		C211	43.65	-9.27	-10.89	1.09	-0.29	-0.40	1.19	AO
		C212	44.73	-9.56	-11.29					
XRZ6BE		C211	43.59	-9.35	-10.78	1.17	-0.33	-0.38	1.27	XX
		C212	44.76	-9.69	-11.16					
YE4L68		C211	43.50	-9.31	-10.81	1.30	-0.32	-0.38	1.40	XD
		C212	44.80	-9.63	-11.19					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
YRC3GJ	X	C211	43.45	-9.58	-11.02	1.13	-0.37	-0.41	1.26	CA
		C212	44.58	-9.95	-11.43					
Z92P4M		C211	43.09	-9.07	-10.74	1.20	-0.29	-0.40	1.30	XH
		C212	44.29	-9.36	-11.14					
ZB2ZVF	X	C211	43.69	-9.29	-10.53	1.01	-0.32	-0.50	1.17	XB
		C212	44.70	-9.61	-11.03					
ZYWHNM		C211	43.75	-9.31	-10.79	1.07	-0.32	-0.41	1.18	AT
		C212	44.81	-9.62	-11.20					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
C211	43.51	-9.29	-10.82	1.13	-0.30	-0.40	1.24
C212	44.63	-9.59	-11.22				
Stnd Dev Btwn Labs							
C211	0.17	0.07	0.10	0.08	0.04	0.03	0.07
C212	0.16	0.08	0.09				

Statistics based on 89 of 100 reporting participants

Comments Assigned on Data Flags for Test #409

BVD6A3(X) - Extreme data for "L*" values for Sample C211. Small Delta L & E.

FN2JBL(X) - Low "b*" values for Sample C211.

FX8N2G(X) - High "a*" values for both samples.

N8Y3EK(X) - High "a*" and "b*" values for both samples.

PZGWFT(X) - Low "b*" values for both samples. Large replication difference for "b*" for Sample C212.

TVUDQ8(X) - Low "L*" & "a*" values for both samples.

UNUDQ6(X) - High "L*" values for Sample C212.

UVR38A(X) - Large replication difference for "L*" for Sample C211. Low "L*" values for Sample C212.

WBHPTR(X) - Extreme data for "L*" values for Sample C211. Small Delta L & Delta E

YRC3GJ(X) - Low "a*" values for both samples. Large replication difference for "a*" for Sample C211.

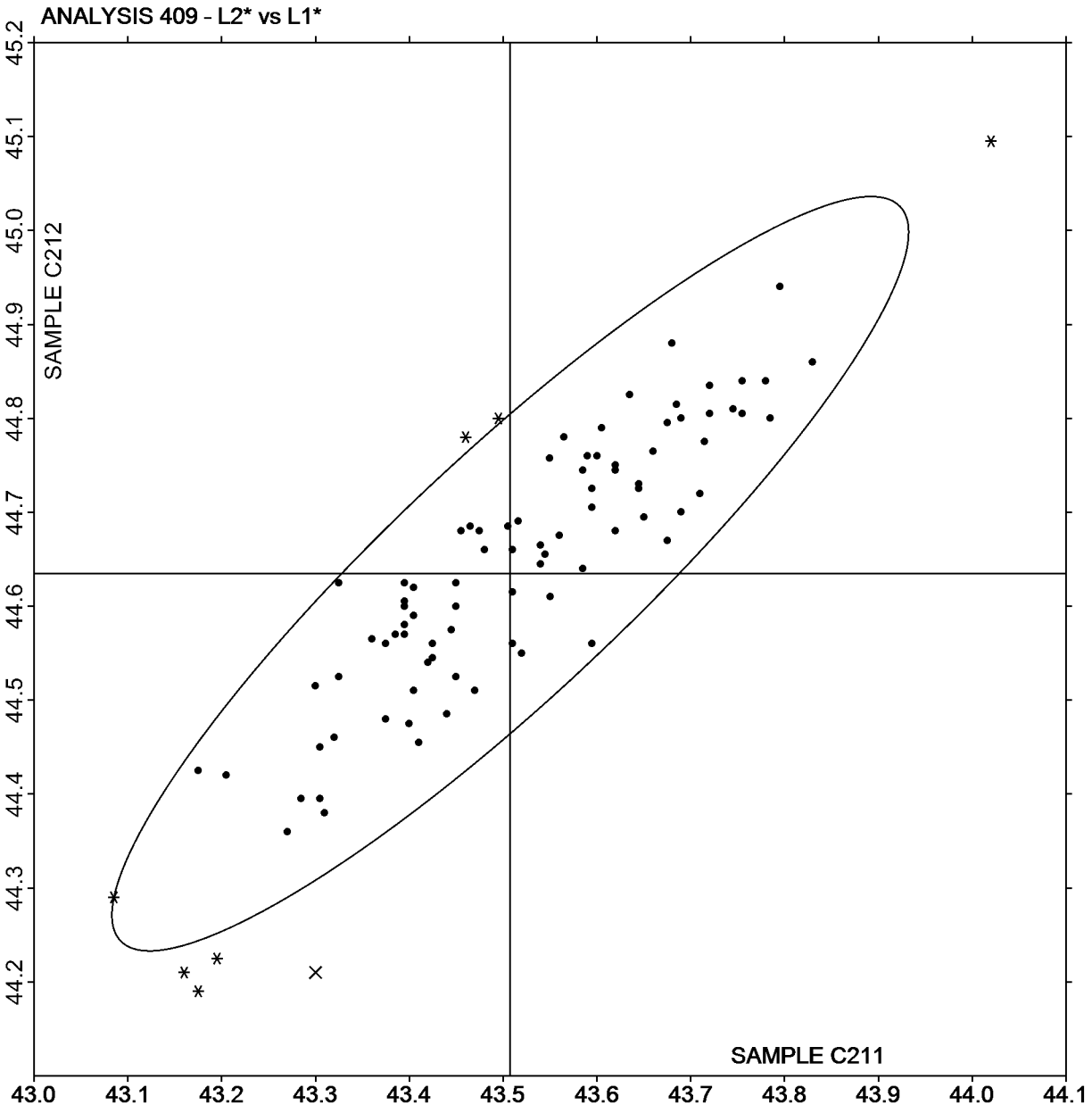
ZB2ZVF(X) - High "b*" values for Sample C211. Large replication difference for "b*" for Sample C211. Small Delta b.

Key to Instrument Codes Reported by Participants

AB	Datacolor 100	AJ	Datacolor 600
AO	Datacolor 650x	AQ	Datacolor 600x
AS	Datacolor 800	AT	Datacolor 850
CA	Cary 5000	GD	BYK-Gardner Spectro-Guide Sphere
GE	BYK-Gardner Spectro2-Guide Sphere Gloss	HH	Hunter ColorQUEST XE
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	XF	X-Rite Ci6x Portable 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

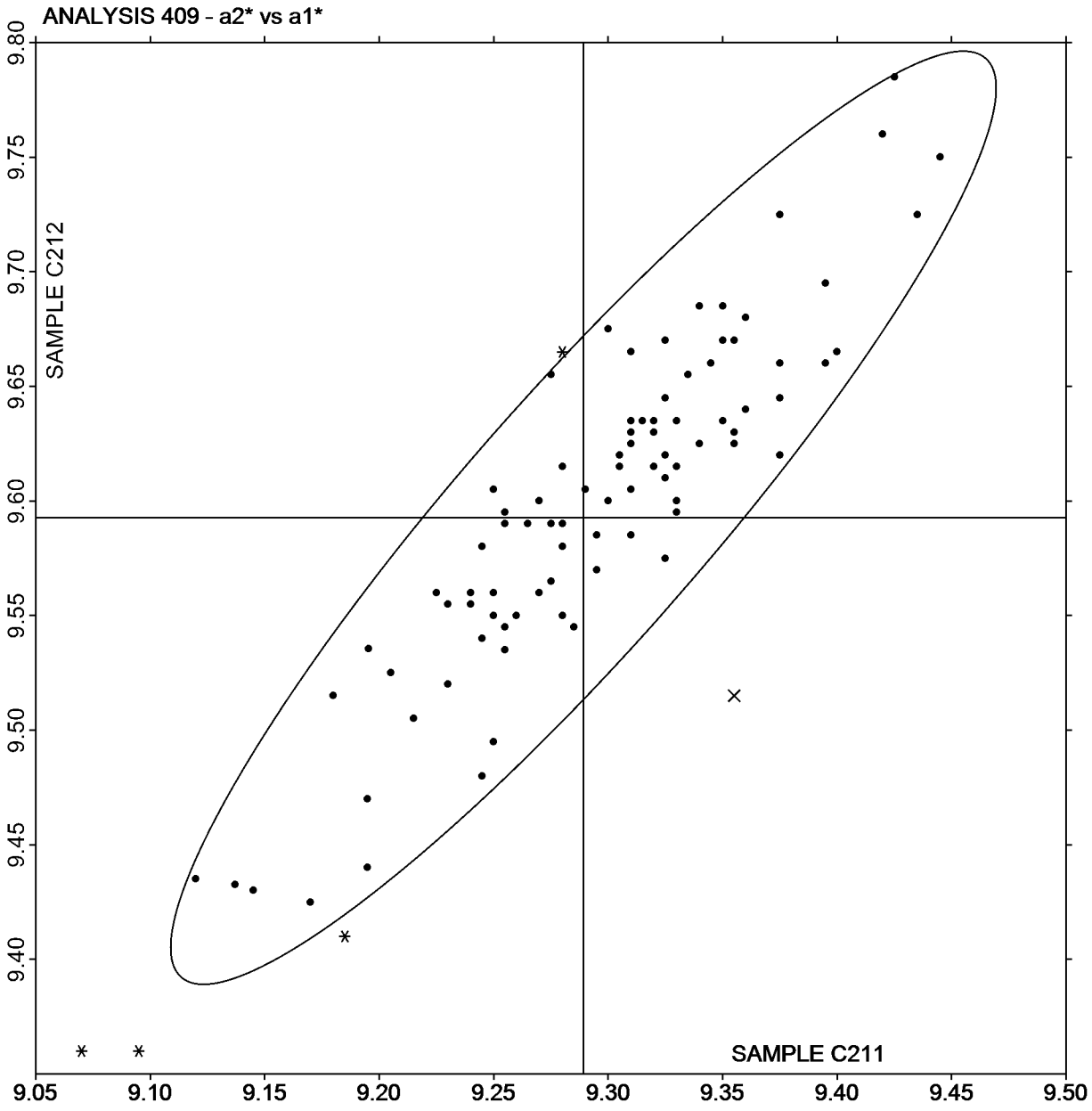
L2* vs L1*

SAMPLE C211 = 43.51 SAMPLE C212 = 44.63



a2* vs a1*

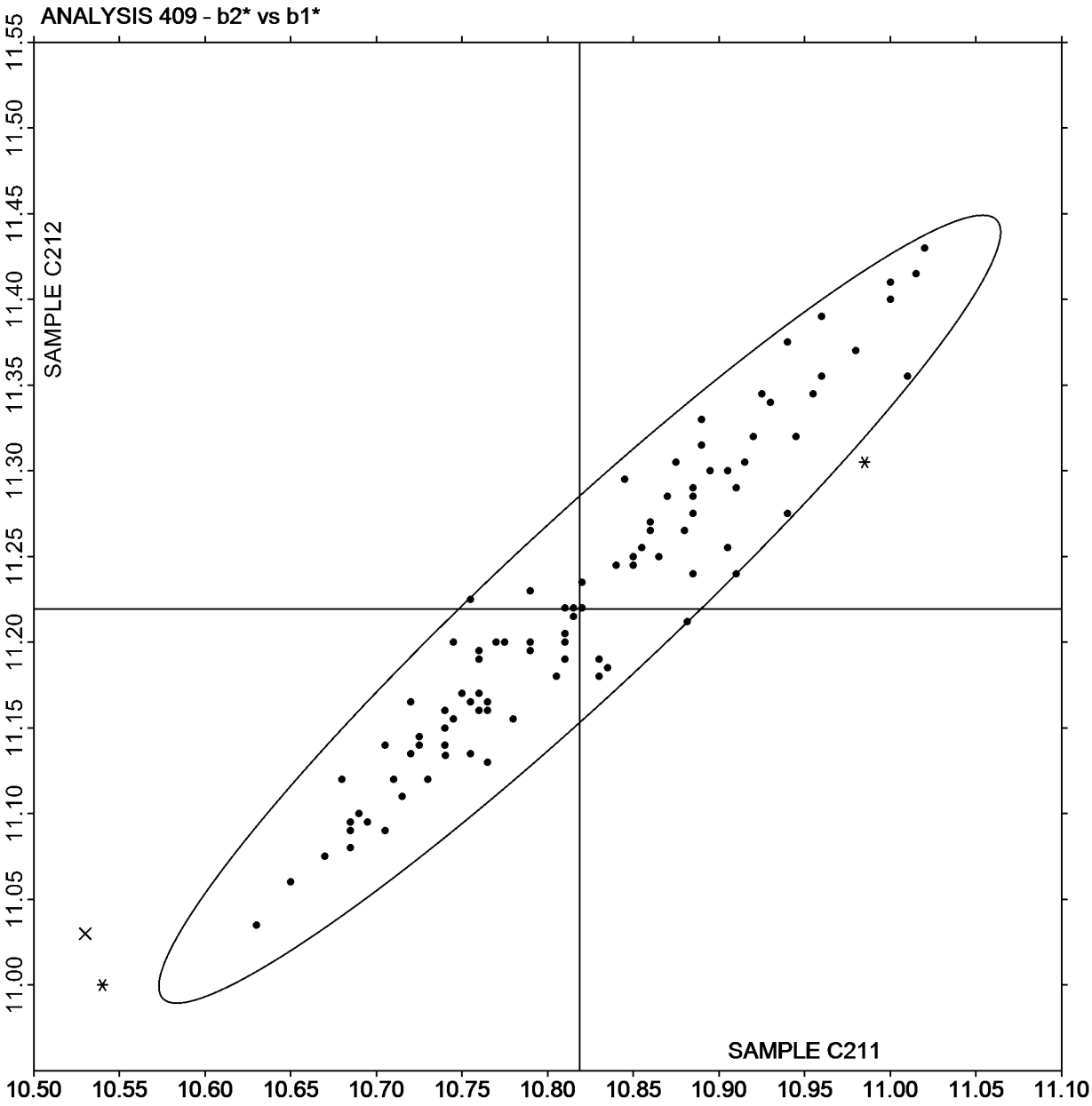
SAMPLE C211 = -9.29 SAMPLE C212 = -9.59



Plot created using absolute values.

b2* vs b1*

SAMPLE C211 = -10.82 SAMPLE C212 = -11.22



Plot created using absolute values.

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 C211																		
24VNCN		15.75	17.97	18.50	18.44	17.94	17.45	16.67	15.15	12.65	10.48	9.33	8.71	8.56	8.79	8.64	8.12	MT
34BCAA		16.26	18.07	18.62	18.48	17.96	17.48	16.67	15.08	12.68	10.53	9.36	8.71	8.57	8.76	8.60	8.12	HP
4L9NKV		15.76	18.05	18.51	18.40	17.96	17.42	16.62	15.11	12.64	10.47	9.32	8.72	8.57	8.77	8.65	7.95	AB
4QNJZT		16.03	18.11	18.49	18.52	18.08	17.54	16.74	15.27	12.83	10.61	9.46	8.86	8.69	8.84	8.68	8.19	AJ
6PNJX8		17.15X	18.11	18.58	18.47	18.00	17.51	16.73	15.22	12.75	10.54	9.41	8.79	8.67	8.81	8.68	8.22	AJ
6X2R2U		16.01	18.05	18.50	18.39	17.97	17.47	16.63	15.12	12.62	10.46	9.31	8.71	8.56	8.71	8.53	8.09	AJ
79DJ3A		16.35	18.40*	18.85*	18.70*	18.20	17.70	16.90	15.30	12.80	10.65	9.40	9.00X	8.80*	9.00*	8.80	8.20	XI
7QHPVD		15.94	17.96	18.42	18.35	17.88	17.38	16.63	15.10	12.66	10.48	9.33	8.74	8.60	8.78	8.56	8.14	AS
87P6DY		16.30	18.10	18.60	18.60	18.10	17.60	16.80	15.30	12.80	10.60	9.45	8.85	8.70	8.90	8.70	8.30	AN
8APDKV		15.93	17.89	18.34	18.21	17.69	17.19	16.42	14.94	12.45	10.34	9.23	8.66	8.49	8.71	8.51	8.03	XH
9U86YG		16.03	18.03	18.49	18.39	17.96	17.46	16.70	15.16	12.72	10.50	9.38	8.77	8.63	8.79	8.56	8.17	AS
9X8CJE		16.08	17.94	18.42	18.24	17.77	17.34	16.51	14.93	12.45	10.34	9.21	8.64	8.51	8.70	8.56	8.05	XR
9ZH227		15.75	17.96	18.44	18.30	17.81	17.36	16.50	14.99	12.48	10.30	9.20	8.60	8.44	8.71	8.58	8.02	MV
ABA4KQ		15.81	17.81	18.33	18.26	17.79	17.34	16.52	15.01	12.53	10.45	9.30	8.70	8.54	8.70	8.50	8.11	XI
AF6XHR		16.17	18.10	18.52	18.44	17.99	17.50	16.67	15.15	12.68	10.47	9.35	8.75	8.62	8.80	8.75	8.18	AT
AH8U4F		17.15X	18.27	18.71	18.62	18.13	17.62	16.83	15.24	12.75	10.57	9.42	8.81	8.68	8.82	8.64	8.19	AQ
AM2TD6		15.70	18.00	18.40	18.30	17.80	17.30	16.50	15.00	12.50	10.40	9.20	8.70	8.50	8.75	8.60	8.10	MV
BVD6A3		15.98	17.99	18.49	18.37	17.95	17.44	16.65	15.09	12.67	10.46	9.35	8.73	8.61	8.75	8.65	8.14	AS
C4NTLF		17.42X	18.02	18.49	18.36	17.87	17.36	16.57	15.02	12.55	10.67	9.28	8.70	8.56	8.75	8.55	7.99	XD
CACDPV		16.26	17.98	18.41	18.33	17.93	17.43	16.61	15.08	12.59	10.43	9.31	8.71	8.58	8.73	8.53	8.13	AS
CMEYXC		16.25	18.10	18.57	18.43	17.92	17.42	16.61	15.08	12.63	10.50	9.33	8.74	8.58	8.73	8.54	7.99	XB
DA7HJU		16.04	18.12	18.57	18.50	18.04	17.55	16.77	15.26	12.77	10.54	9.40	8.81	8.65	8.82	8.68	8.24	AS

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 C211																		
DNLJDZ		16.02	18.06	18.53	18.47	17.98	17.40	16.63	15.11	12.40	10.52	9.32	8.74	8.65	8.81	8.61	8.07	XI
EY2V7N		16.04	17.96	18.45	18.31	17.83	17.36	16.58	15.06	12.57	10.45	9.30	8.71	8.57	8.75	8.54	7.99	XB
FN2JBL		16.22	18.18	18.63	18.47	17.95	17.44	16.61	15.05	12.56	10.41	9.25	8.68	8.54	8.75	8.55	8.06	XB
FPNFE7		16.11	17.97	18.46	18.34	17.84	17.36	16.56	15.05	12.57	10.42	9.29	8.69	8.54	8.75	8.58	8.05	XB
FX8N2G	X	16.54	18.51X	19.18X	18.87X	18.32*	17.83X	17.04X	15.43*	13.02X	10.79X	9.62X	9.04X	8.95X	9.16X	9.00X	8.49X	HH
G3UVWV		15.89	17.96	18.39	18.28	17.79	17.29	16.54	14.99	12.55	10.44	9.29	8.70	8.57	8.71	8.50	8.02	XI
G7ELMZ		15.92	17.95	18.42	18.39	17.90	17.38	16.56	15.00	12.55	10.41	9.28	8.69	8.56	8.69	8.51	8.09	AQ
G7U8RV		15.93	17.93	18.40	18.28	17.80	17.31	16.53	15.02	12.56	10.43	9.29	8.70	8.54	8.73	8.55	8.05	XB
G9J9Z4		16.23	18.23	18.70	18.54	18.03	17.51	16.69	15.16	12.66	10.52	9.37	8.78	8.63	8.80	8.64	8.12	XB
GGV8RU		15.75	17.95	18.41	18.29	17.78	17.25	16.47	14.94	12.47	10.30	9.23	8.63	8.55	8.70	8.57	8.04	XO
GU2HYG		16.23	18.19	18.61	18.55	18.11	17.56	16.78	15.23	12.80	10.60	9.43	8.84	8.68	8.82	8.66	8.18	AJ
GVUA92		16.22	18.06	18.53	18.41	17.97	17.45	16.70	15.14	12.69	10.51	9.40	8.76	8.60	8.75	8.62	8.20	AS
GX2WHZ		15.68	17.79	18.29	18.12*	17.64*	17.16*	16.36*	14.93	12.52	10.44	9.28	8.72	8.59	8.73	8.56	8.06	MI
H3PVD7		15.92	17.96	18.36	18.26	17.84	17.34	16.57	15.04	12.59	10.41	9.26	8.66	8.52	8.64	8.52	8.05	AS
HJWRVK		15.92	17.92	18.37	18.27	17.75	17.28	16.46	14.90	12.43	10.38	9.23	8.68	8.55	8.71	8.52	8.03	XI
HL3F9P		15.84	18.06	18.53	18.46	18.00	17.48	16.69	15.17	12.70	10.52	9.38	8.79	8.65	8.86	8.75	8.21	MV
HNQUWY		16.06	18.11	18.58	18.42	17.95	17.44	16.63	15.09	12.63	10.48	9.28	8.74	8.60	8.79	8.67	8.17	MM
HRP482		15.98	18.00	18.50	18.42	17.94	17.42	16.65	15.14	12.67	10.49	9.33	8.74	8.58	8.79	8.64	8.13	MM
HVR7UG		16.03	18.02	18.53	18.38	17.90	17.38	16.60	15.04	12.52	10.37	9.24	8.64	8.44	8.65	8.45	7.90*	XB
HYQGQG		16.24	18.14	18.54	18.46	17.95	17.49	16.70	15.17	12.65	10.51	9.37	8.80	8.66	8.82	8.58	8.03	XI
JMPGNW		15.85	17.92	18.43	18.26	17.80	17.34	16.51	14.94	12.43	10.33	9.19	8.62	8.50	8.71	8.57	8.07	XC
KJ97FY		16.09	18.12	18.65	18.52	18.05	17.55	16.73	15.21	12.75	10.57	9.38	8.81	8.67	8.87	8.70	8.18	MM

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 C211										
LBA4QT		16.47	18.20	18.59	18.52	18.00	17.48	16.70	15.19	12.67	10.54	9.39	8.79	8.63	8.83	8.63	8.08	XI
LLQPVM		15.96	17.96	18.39	18.27	17.77	17.27	16.45	14.97	12.47	10.35	9.24	8.68	8.52	8.69	8.46	7.97	XI
LPUJUR		16.51	18.27	18.67	18.52	18.08	17.59	16.80	15.19	12.77	10.61	9.44	8.82	8.62	8.85	8.72	8.19	HP
M63YCE		15.83	17.91	18.41	18.32	17.83	17.33	16.54	15.01	12.57	10.42	9.24	8.67	8.55	8.75	8.59	8.09	MK
M7VQLY		15.85	18.00	18.45	18.40	17.90	17.40	16.60	15.10	12.60	10.45	9.30	8.70	8.55	8.75	8.60	8.10	MS
MKEB2M		16.51	18.12	18.58	18.51	18.08	17.66	16.78	15.21	12.74	10.56	9.44	8.81	8.68	8.81	8.65	8.20	AS
MKTWFU		16.29	18.10	18.54	18.41	17.98	17.48	16.70	15.18	12.79	10.57	9.40	8.84	8.70	8.85	8.66	8.25	AS
MQJACC		16.46	18.08	18.66	18.53	18.06	17.51	16.68	15.18	12.73	10.50	9.41	8.74	8.63	8.60	8.79	8.03	HP
MXLJLP		16.12	18.09	18.53	18.44	17.98	17.51	16.71	15.16	12.70	10.53	9.39	8.78	8.63	8.76	8.56	8.19	AJ
N8Y3EK		16.06	18.11	18.57	18.46	17.98	17.53	16.73	15.24	12.86	10.74*	9.64X	9.04X	8.91X	9.13X	9.02X	8.56X	MU
NCXG2B		16.20	18.20	18.60	18.55	18.15	17.65	16.80	15.30	12.90*	10.60	9.50	8.90	8.70	8.90	8.70	8.30	AN
NHGJ7R		16.10	18.10	18.61	18.55	18.14	17.61	16.80	15.26	12.81	10.60	9.43	8.82	8.66	8.82	8.75	8.26	AN
NJD39T		15.84	18.08	18.48	18.43	17.96	17.43	16.70	15.14	12.64	10.47	9.35	8.73	8.61	8.82	8.71	8.17	MV
PBGJ8P		16.20	18.06	18.44	18.27	17.88	17.41	16.61	15.10	12.61	10.44	9.32	8.70	8.57	8.70	8.45	8.16	AT
PJ86DN		15.28*	17.44X	18.10X	18.04X	17.59*	17.12*	16.31*	14.86*	12.45	10.31	9.15*	8.54*	8.41*	8.61	8.47	7.97	GE
PV8TDX		16.11	18.13	18.45	18.38	17.88	17.34	16.58	15.05	12.60	10.44	9.28	8.72	8.59	8.73	8.63	8.17	AJ
PZGWFT		16.60	18.41*	18.94X	18.76*	18.21	17.69	16.87	15.31	12.77	10.56	9.39	8.79	8.63	8.84	8.69	8.15	CA
RN2HDH		15.79	17.89	18.29	18.22	17.67	17.23	16.44	14.91	12.39	10.23*	9.13*	8.56*	8.43*	8.67	8.54	8.02	MV
RNEA7Y		15.99	18.01	18.48	18.42	17.95	17.48	16.69	15.19	12.68	10.55	9.19	9.08X	8.70	8.72	8.76	8.17	AJ
RZWUPV		15.86	17.96	18.44	18.29	17.85	17.33	16.52	14.98	12.55	10.44	9.27	8.67	8.56	8.73	8.53	8.06	XI
T8MW6C		15.68	17.83	18.27	18.18	17.71	17.26	16.44	14.92	12.46	10.37	9.23	8.67	8.53	8.71	8.51	8.04	XI
T9HF7D		16.07	18.02	18.50	18.37	17.87	17.37	16.55	15.02	12.52	10.39	9.25	8.63	8.45	8.63	8.43	7.86*	XR

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 C211																		
TFJR4W		16.12	18.13	18.54	18.47	18.05	17.52	16.77	15.24	12.77	10.56	9.46	8.68	8.72	8.85	8.69	8.21	AS
TN9HMH		16.00	18.06	18.62	18.44	17.98	17.48	16.64	15.09	12.54	10.40	9.32	8.81	8.55	8.80	8.63	8.15	MI
TNWN8G		15.93	17.95	18.42	18.29	17.75	17.24	16.45	14.94	12.42	10.38	9.23	8.66	8.52	8.69	8.38*	7.97	XH
TVUDQ8	X	15.61	17.74*	18.15*	18.07*	17.62*	17.10*	16.31*	14.75X	12.29X	10.10X	8.94X	8.34X	8.19X	8.31X	7.82X	6.26X	AJ
U6GQ7H		16.02	18.23	18.66	18.49	18.06	17.53	16.71	15.18	12.70	10.56	9.42	8.80	8.69	8.82	8.69	8.16	XH
U9F6RM		15.86	17.99	18.43	18.34	17.82	17.39	16.58	15.06	12.63	10.46	9.30	8.71	8.58	8.72	8.52	8.06	XI
UDQZUB		16.10	18.07	18.52	18.39	17.91	17.40	16.59	15.10	12.70	10.56	9.39	8.80	8.63	8.79	8.66	8.16	MM
UNUDQ6		16.60	18.43*	19.03X	18.89X	18.38X	17.88X	17.05X	15.47X	12.90*	10.66	9.49	8.90	8.74	8.98*	8.82*	8.29	CA
UQX4WK		16.23	18.12	18.61	18.50	18.06	17.50	16.72	15.18	12.70	10.51	9.37	8.78	8.63	8.77	8.62	8.19	AS
UVR38A	X	15.52	17.63X	18.08X	18.00X	17.51X	17.08*	16.26X	14.76X	12.32*	10.29*	9.12*	8.62	8.53	8.71	8.51	8.06	XH
UXFGVJ		16.80*	17.69*	18.24	18.22	17.58*	17.06*	16.35*	14.98	12.35*	10.37	9.14*	8.58	8.46	8.61	8.49	7.85*	GD
VFRNKK		16.60	18.10	18.70	18.60	18.10	17.60	16.70	15.20	12.60	10.50	9.40	8.80	8.70	9.10X	8.60	8.20	HW
VGM2CJ		16.01	17.99	18.41	18.31	17.79	17.30	16.52	15.00	12.56	10.43	9.32	8.74	8.62	8.82	8.58	8.05	XH
VPGE8C		16.10	18.04	18.46	18.40	17.88	17.31	16.54	15.00	12.58	10.40	9.28	8.67	8.50	8.63	8.51	8.15	AO
WBHPTR		16.24	18.02	18.44	18.36	17.91	17.37	16.62	15.14	12.69	10.47	9.38	8.76	8.63	8.76	8.63	8.19	AS
WGGBFK		16.34	18.20	18.81*	18.68	18.19	17.68	16.90*	15.33	12.80	10.58	9.43	8.83	8.67	8.90	8.75	8.22	CA
WTV9MA		16.20	18.22	18.58	18.47	18.00	17.49	16.71	15.17	12.74	10.53	9.38	8.80	8.64	8.79	8.60	8.23	AJ
XM3NWY		16.19	18.17	18.63	18.53	18.08	17.52	16.73	15.21	12.74	10.55	9.41	8.80	8.65	8.81	8.66	8.20	AO
XRZ6BE		16.04	18.12	18.53	18.42	17.99	17.51	16.70	15.15	12.72	10.50	9.39	8.76	8.63	8.82	8.64	8.18	XX
YE4L68		16.12	18.01	18.49	18.39	17.90	17.40	16.61	15.09	12.64	10.48	9.32	8.72	8.56	8.74	8.52	7.97	XD
YRC3GJ		16.14	18.05	18.62	18.54	18.06	17.55	16.77	15.23	12.70	10.50	9.36	8.75	8.59	8.81	8.67	8.15	CA
ZB2ZVF		16.18	18.08	18.55	18.46	17.98	17.51	16.75	15.24	12.77	10.61	9.46	8.86	8.71	8.86	8.69	8.17	XB

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 C211																		
ZYWHNM		16.23	18.19	18.67	18.57	18.12	17.62	16.82	15.27	12.81	10.61	9.50	8.86	8.71	8.89	8.67	8.27	AT

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	16.12	18.05	18.52	18.41	17.94	17.44	16.64	15.11	12.64	10.48	9.33	8.75	8.60	8.78	8.61	8.12
SD Btwn Labs	0.32	0.14	0.14	0.14	0.14	0.14	0.13	0.12	0.13	0.09	0.09	0.09	0.08	0.09	0.10	0.11

FX8N2G (X) - High % reflectance data for almost all wavelengths.

TVUDQ8 (X) - Low % reflectance data for most wavelengths.

UVR38A (X) - Low % reflectance data for most wavelengths. Large replication difference for almost all wavelengths.

Key to Instrument Codes Reported by Participants

AB Datacolor 100
AJ Datacolor 600
AN Datacolor 650
AO Datacolor 650x
AQ Datacolor 600x
AS Datacolor 800
AT Datacolor 850
CA Cary 5000
GD BYK-Gardner Spectro-Guide Sphere
GE BYK-Gardner Spectro2-Guide Sphere Gloss
HH Hunter ColorQUEST XE
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
MU Minolta
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 G211 Lab Mean	Sample G211 Diff from Grand Mean	Sample G211 CPV	Sample G212 Lab Mean	Sample G212 Diff from Grand Mean	Sample G212 CPV	Instr Code
3A3DD9		47.28	-0.19	-0.27	55.50	-0.49	-0.55	GN
4L9NKV		48.05	0.58	0.82	57.18	1.19	1.35	GL
4QNJZT		49.05	1.58	2.23	57.50	1.51	1.72	GA
4VET87		47.25	-0.22	-0.31	55.50	-0.49	-0.55	GL
6BB9AK	*	45.83	-1.64	-2.32	54.80	-1.19	-1.35	GL
6GBMX8		47.65	0.18	0.26	55.30	-0.69	-0.78	GK
6NB7VW		47.45	-0.02	-0.02	56.20	0.21	0.24	GN
79DJ3A		48.38	0.91	1.28	56.55	0.56	0.64	GK
7MXY79		47.90	0.43	0.61	57.05	1.06	1.21	GN
7QHPVD		48.15	0.68	0.96	56.18	0.19	0.21	GL
8APDKV		47.80	0.33	0.47	56.68	0.69	0.78	GK
8RK76T		47.13	-0.34	-0.48	55.00	-0.99	-1.12	GK
9X8CJE		46.53	-0.94	-1.33	54.38	-1.61	-1.83	GL
ABA4KQ		47.20	-0.27	-0.38	56.53	0.54	0.61	GL
BP9BCZ		46.55	-0.92	-1.29	54.25	-1.74	-1.97	RA
BVD6A3		46.38	-1.09	-1.54	55.28	-0.71	-0.81	GK
C39QE8		47.83	0.36	0.51	56.30	0.31	0.35	GL
C4NTLF		47.45	-0.02	-0.02	55.53	-0.46	-0.52	RA
CMEYXC		47.03	-0.44	-0.62	54.85	-1.14	-1.29	GL
CZL263		45.88	-1.59	-2.24	54.10	-1.89	-2.14	EN
DJBPXU		47.55	0.08	0.12	55.75	-0.24	-0.27	GL
EDZUV7		48.55	1.08	1.53	57.18	1.19	1.35	GN
EGJUCL		48.48	1.01	1.42	57.28	1.29	1.46	GL
FFNRKN		47.90	0.43	0.61	56.68	0.69	0.78	GL
FX8N2G	*	47.25	-0.22	-0.31	57.13	1.14	1.29	RA
G3CKKG		47.83	0.36	0.51	56.55	0.56	0.64	GD
GGV8RU		47.03	-0.44	-0.62	55.48	-0.51	-0.58	MW
GKCREA		48.10	0.63	0.89	56.45	0.46	0.52	GL
GU2HYG		48.95	1.48	2.09	57.78	1.79	2.03	GL
GX2WHZ		47.70	0.23	0.33	56.28	0.29	0.33	GL

WebCode	Data Flag	Sample G211 Lab Mean	Sample G211 Diff from Grand Mean	Sample G211 CPV	Sample G212 Lab Mean	Sample G212 Diff from Grand Mean	Sample G212 CPV	Instr Code
H2HDGW		48.23	0.76	1.07	56.90	0.91	1.04	GL
H3PVD7		47.20	-0.27	-0.38	56.18	0.19	0.21	GK
HJWRVK		47.68	0.22	0.30	56.04	0.05	0.06	GL
HNQUWY		47.70	0.23	0.33	56.15	0.16	0.18	GL
HQVEN7		47.08	-0.39	-0.55	55.35	-0.64	-0.72	GL
HRP482		47.73	0.26	0.37	56.53	0.55	0.62	GL
HVR7UG		47.95	0.48	0.68	56.63	0.64	0.72	ZA
HY9948		48.80	1.33	1.88	56.90	0.91	1.04	GX
JRJBLX		47.90	0.43	0.61	56.73	0.74	0.84	GL
KCRXPH		47.13	-0.34	-0.48	54.80	-1.19	-1.35	GL
KM9HBY		46.75	-0.72	-1.01	54.95	-1.04	-1.18	GL
KQNRKW		47.90	0.43	0.61	56.53	0.54	0.61	GN
L7G2MT		47.38	-0.09	-0.13	56.70	0.71	0.81	GL
LHQNKR		47.03	-0.44	-0.62	54.83	-1.16	-1.32	ST
M3WCWN		48.18	0.71	1.00	56.60	0.61	0.70	GL
M7VQLY		46.60	-0.86	-1.22	55.10	-0.89	-1.01	GK
MAYGUZ	X	40.93	-6.54	-9.22	47.95	-8.04	-9.12	GB
MKTWFU		47.50	0.03	0.05	55.33	-0.66	-0.75	GK
MTLABN	X	45.70	-1.77	-2.49	55.40	-0.59	-0.67	GL
MXLJLP	X	48.90	1.43	2.02	55.53	-0.46	-0.52	MW
N2ZFQR		47.75	0.28	0.40	56.78	0.79	0.89	GK
NDCNPD		46.55	-0.92	-1.29	55.05	-0.94	-1.06	GL
NJD39T		47.03	-0.44	-0.62	55.53	-0.46	-0.52	GL
NQF9PG		48.28	0.81	1.14	56.85	0.86	0.98	RA
PZGWFT		46.85	-0.62	-0.87	54.63	-1.36	-1.55	GL
RNEA7Y		48.88	1.41	1.99	57.38	1.39	1.57	GL
RRFDXL		47.55	0.08	0.12	56.33	0.34	0.38	GK
RZWUPV		46.55	-0.92	-1.29	54.93	-1.06	-1.21	GT
T8MW6C		47.55	0.08	0.12	56.03	0.04	0.04	MM
T9HF7D		47.13	-0.34	-0.48	56.20	0.21	0.24	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample G211 Lab Mean	Sample G211 Diff from Grand Mean	Sample G211 CPV	Sample G212 Lab Mean	Sample G212 Diff from Grand Mean	Sample G212 CPV	Instr Code
TAW2KL	X	44.55	-2.92	-4.11	53.25	-2.74	-3.11	GL
TFJR4W	*	46.35	-1.12	-1.57	55.68	-0.31	-0.35	GL
TKA2EU		47.60	0.13	0.19	56.08	0.09	0.10	GK
TN9HMH		47.83	0.36	0.51	56.73	0.74	0.84	GL
TNWN8G		47.13	-0.34	-0.48	56.53	0.54	0.61	GL
U2FTRJ		46.80	-0.67	-0.94	55.25	-0.74	-0.84	GL
U6GQ7H		47.63	0.16	0.22	56.10	0.11	0.13	GL
UJXPCJ		47.13	-0.34	-0.48	55.95	-0.04	-0.04	GL
UNQQDX		47.95	0.48	0.68	56.58	0.59	0.67	GN
UXFGVJ		47.68	0.21	0.29	56.43	0.44	0.50	GN
VFRNKK		47.55	0.08	0.12	56.38	0.39	0.44	GK
VGM2CJ		47.48	0.01	0.01	55.93	-0.06	-0.07	GL
YAD7JL		45.93	-1.54	-2.17	54.15	-1.84	-2.09	GN
Z8KF9Z		46.20	-1.27	-1.79	54.30	-1.69	-1.91	GK
Z92P4M		47.75	0.28	0.40	56.05	0.06	0.07	GL
ZYWHNM		47.78	0.31	0.43	55.95	-0.04	-0.04	GK

Summary Statistics

	Sample G211	Sample G212
Grand Means	47.47 Gloss Units	55.99 Gloss Units
Stnd Dev Btwn Labs	0.71 Gloss Units	0.88 Gloss Units

Statistics based on 72 of 76 reporting participants

Comments on Assigned Data Flags for Test #440

MAYGUZ(X) - Extreme data.

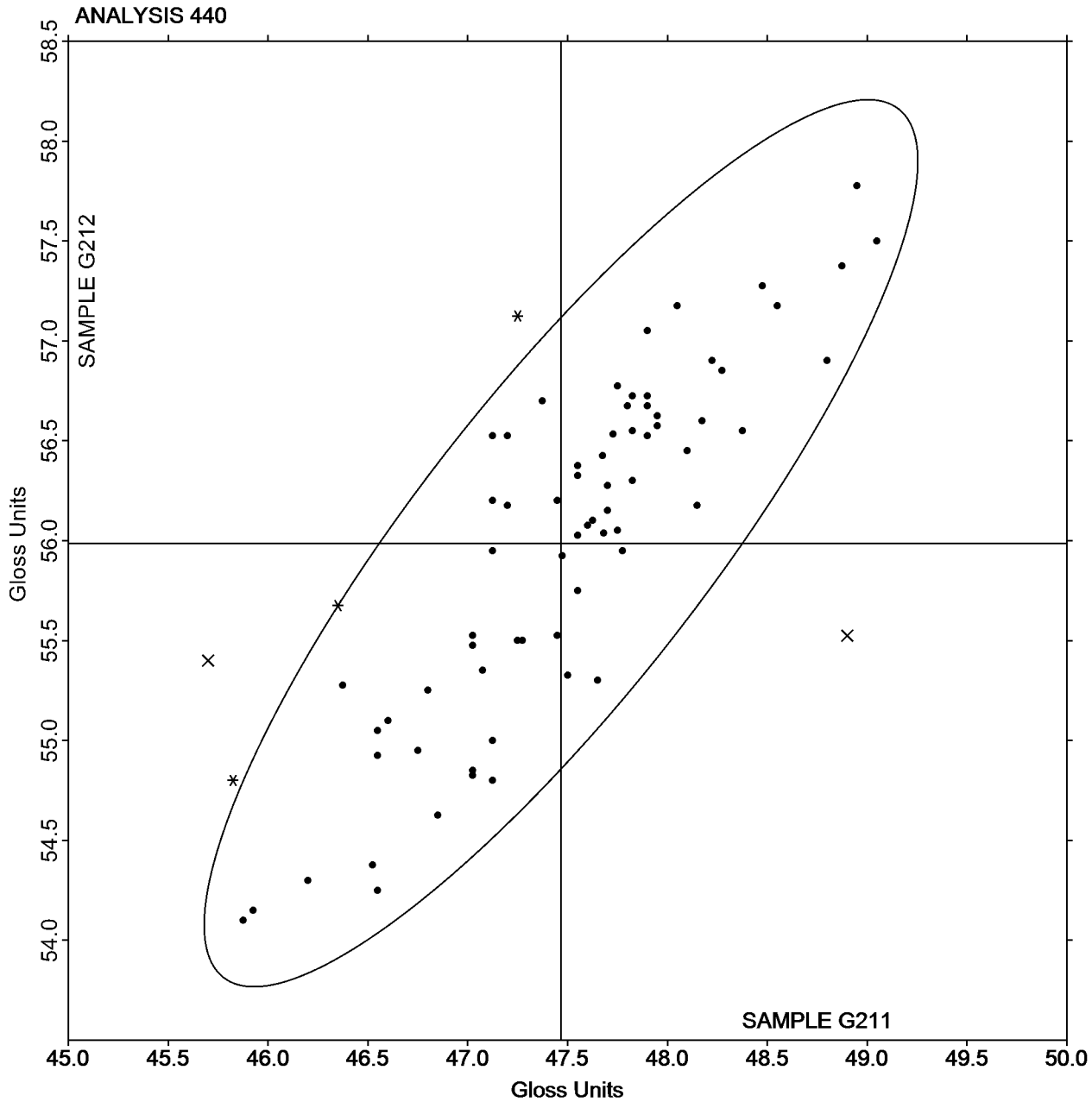
MTLABN(X) - Inconsistent in testing between samples.

MXLJLP(X) - Inconsistent in testing between samples. Inconsistent within the determinations for both samples.

TAW2KL(X) - Data for both samples are low. Possible systematic error.

Key to Instrument Codes Reported by Participants			
EN	Elcometer 480	GA	BYK Gardner Color - Guide Gloss
GB	BYK Gardner Spectro - Guide Sphere Gloss	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	RA	Rhopoint Novo-Gloss Glossmeter
ST	Sheen Tri-Glossmaster	ZA	Zehntner ZGM Series

SAMPLE G211 = 47.47 Gloss Units SAMPLE G212 = 55.99 Gloss Units



-End of Report-