Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #212 - 2nd Qtr 2025

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-45-0, D65/10° Observer
409	Color & Color Difference Sphere, D65/10°Observer
411	Spectrophotometric - Sphere
440	Gloss 60 Degree

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, Collaborative Testing Services, Inc. (CTS) is a privately - owned company that specializes in interlaboratory tests for a variety of industries including color, rubber, plastics, fasteners and metals, containerboard, paper, agriculture, hemp, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality assurance objectives. Labs from the U.S., as well as more than 100 countries, currently participate in the CTS programs.

For further information concerning this report contact:

Collaborative Testing Services, Inc.
21331 Gentry Drive
Sterling, Virginia 20166 USA

+1-571-434-1925
FAX #: +1-571-434-1937
color@cts-interlab.com

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
2KXW4L		B251	33.10	7.98	-5.35	0.79	0.22	-0.67	1.06	GA
		B252	33.89	8.20	-6.02					
3M4JGQ		B251	34.32	7.99	-5.15	0.82	0.26	-0.68	1.09	HW
		B252	35.14	8.25	-5.83					
4TL8RM		B251	33.33	7.82	-5.28	0.77	0.26	-0.67	1.05	GG
		B252	34.09	8.08	-5.95					
68GB9H		B251	34.45	7.86	-5.45	0.72	0.26	-0.71	1.05	HL
		B252	35.17	8.13	-6.16					
6V988U		B251	32.89	7.79	-5.72	0.41	0.22	-0.66	0.80	XE
		B252	33.30	8.01	-6.38					
79PKYU		B251	34.16	7.88	-5.26	0.69	0.28	-0.72	1.03	XU
		B252	34.84	8.15	-5.98					
89P62N		B251	35.72	7.48	-5.64	0.70	0.24	-0.66	0.99	MS
		B252	36.42	7.71	-6.31					
9YE3FM		B251	34.81	7.82	-5.42	0.79	0.22	-0.63	1.03	XE
		B252	35.59	8.04	-6.05					
AEP3PH		B251	34.30	7.90	-5.60	0.80	0.25	-0.65	1.06	HL
		B252	35.10	8.15	-6.25					
BJD8XD		B251	33.82	8.20	-5.45	0.82	0.23	-0.69	1.10	GG
		B252	34.65	8.43	-6.14					
C4VYAE		B251	35.25	7.80	-5.10	0.60	0.35	-0.70	0.99	HW
		B252	35.85	8.15	-5.80					
CK3XHH		B251	32.54	8.14	-5.72	0.81	0.23	-0.73	1.11	BG
		B252	33.35	8.37	-6.45					
DMLAVT		B251	34.63	8.03	-5.12	0.75	0.28	-0.68	1.06	HW
		B252	35.38	8.31	-5.81					
E4P42R		B251	33.73	7.95	-5.41	0.66	0.29	-0.71	1.01	XU
		B252	34.39	8.24	-6.12					
EEQRVA		B251	33.37	8.08	-5.31	0.91	0.25	-0.69	1.17	XY
		B252	34.28	8.33	-6.00					
EU2BRG		B251	34.27	7.89	-5.29	0.71	0.28	-0.72	1.05	HM
		B252	34.98	8.18	-6.01					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
EXF68E		B251	35.71	7.52	-5.49	0.70	0.26	-0.65	1.00	GT
		B252	36.41	7.78	-6.15					
FP63MD		B251	33.26	7.87	-5.43	0.68	0.31	-0.74	1.05	GG
		B252	33.94	8.19	-6.17					
G38T2Q	X	B251	32.37	8.53	-6.26	0.29	0.13	-0.36	0.48	PR
		B252	32.66	8.66	-6.62					
GVMXZM		B251	33.35	8.12	-5.41	0.76	0.23	-0.70	1.06	GH
		B252	34.11	8.35	-6.10					
K4MPVK		B251	33.75	8.11	-5.58	0.77	0.25	-0.64	1.04	XM
		B252	34.52	8.36	-6.22					
KMZ4DF	X	B251	51.47	5.18	-3.42	0.80	0.28	-0.37	0.92	XP
		B252	52.27	5.46	-3.79					
L6GR32	X	B251	34.05	9.34	-5.45	0.50	0.32	-0.67	0.90	XG
		B252	34.55	9.66	-6.13					
L9XUA7		B251	34.32	8.11	-5.27	0.83	0.29	-0.71	1.13	HW
		B252	35.15	8.40	-5.98					
LT493E		B251	34.20	8.07	-5.20	0.76	0.27	-0.68	1.05	HW
		B252	34.95	8.34	-5.87					
LUG69H		B251	33.78	8.37	-5.25	0.80	0.28	-0.68	1.08	HW
		B252	34.58	8.65	-5.93					
LVQ7W3		B251	33.35	7.75	-5.32	0.80	0.29	-0.71	1.10	GG
		B252	34.14	8.04	-6.03					
M4JJUG		B251	36.07	7.44	-5.28	0.72	0.22	-0.62	0.97	XQ
		B252	36.78	7.66	-5.90					
N3JYH2		B251	33.40	8.07	-5.36	0.85	0.27	-0.69	1.14	XS
		B252	34.26	8.34	-6.05					
NJ97DE		B251	33.32	8.04	-5.44	0.65	0.29	-0.74	1.02	MT
		B252	33.97	8.33	-6.18					
NNNJH8		B251	33.76	8.10	-5.25	0.74	0.30	-0.69	1.06	HX
		B252	34.50	8.40	-5.94					
P96DLY	X	B251	34.37	8.16	-6.72	0.80	0.27	-0.64	1.06	XD
		B252	35.17	8.43	-7.36					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
PCQXQ3		B251	32.66	8.14	-5.86	0.76	0.24	-0.71	1.07	BG
		B252	33.42	8.38	-6.58					
QLMKV6		B251	35.83	7.58	-5.32	0.71	0.25	-0.67	1.00	AB
		B252	36.54	7.83	-5.99					
R9HLMY		B251	34.03	7.91	-5.30	0.80	0.26	-0.69	1.09	XU
		B252	34.83	8.17	-5.99					
RVRVZA		B251	34.02	7.89	-5.26	0.80	0.25	-0.68	1.08	XU
		B252	34.81	8.15	-5.94					
TPYAAY		B251	34.15	7.90	-5.55	0.75	0.20	-0.65	1.01	HL
		B252	34.90	8.10	-6.20					
TY9KYC		B251	33.70	8.04	-5.40	0.80	0.25	-0.72	1.10	XO
		B252	34.50	8.28	-6.12					
UKJYUA		B251	34.71	8.01	-5.21	0.76	0.27	-0.68	1.06	MG
		B252	35.47	8.28	-5.90					
UWCHBZ		B251	35.58	7.62	-5.47	0.71	0.30	-0.69	1.03	XJ
		B252	36.29	7.92	-6.16					
VXR3VX		B251	33.52	8.07	-5.38	0.72	0.30	-0.74	1.08	XO
		B252	34.24	8.37	-6.12					
WVGKCR		B251	34.24	7.97	-5.35	0.77	0.26	-0.67	1.06	HY
		B252	35.01	8.24	-6.02					
Y77HRM		B251	34.56	7.90	-5.24	0.50	0.29	-0.73	0.93	XE
		B252	35.06	8.19	-5.98					
YH42Q3		B251	33.38	7.96	-5.68	0.60	0.25	-0.72	0.97	XW
		B252	33.98	8.21	-6.39					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
B251	34.12	7.93	-5.39	0.74	0.26	-0.69	1.05
B252	34.86	8.20	-6.08				
Stnd Dev Btwn Labs							
B251	0.84	0.20	0.17	0.09	0.03	0.03	0.06
B252	0.83	0.20	0.17				

Statistics based on 40 of 44 reporting participants

Comments Assigned on Data Flags for Test #408

G38T2Q(X) - High a* values for Sample B251. Very low b* values for both samples. Large replication difference for both L* samples. Large replication difference for a* & b* Sample B251. Small Delta L, a & E. Large Delta b.

KMZ4DF(X) - Extreme data for both samples for all values. Large replication difference for L* Sample B251. Large Delta b.

L6GR32(X) - Extreme data for both a* values.

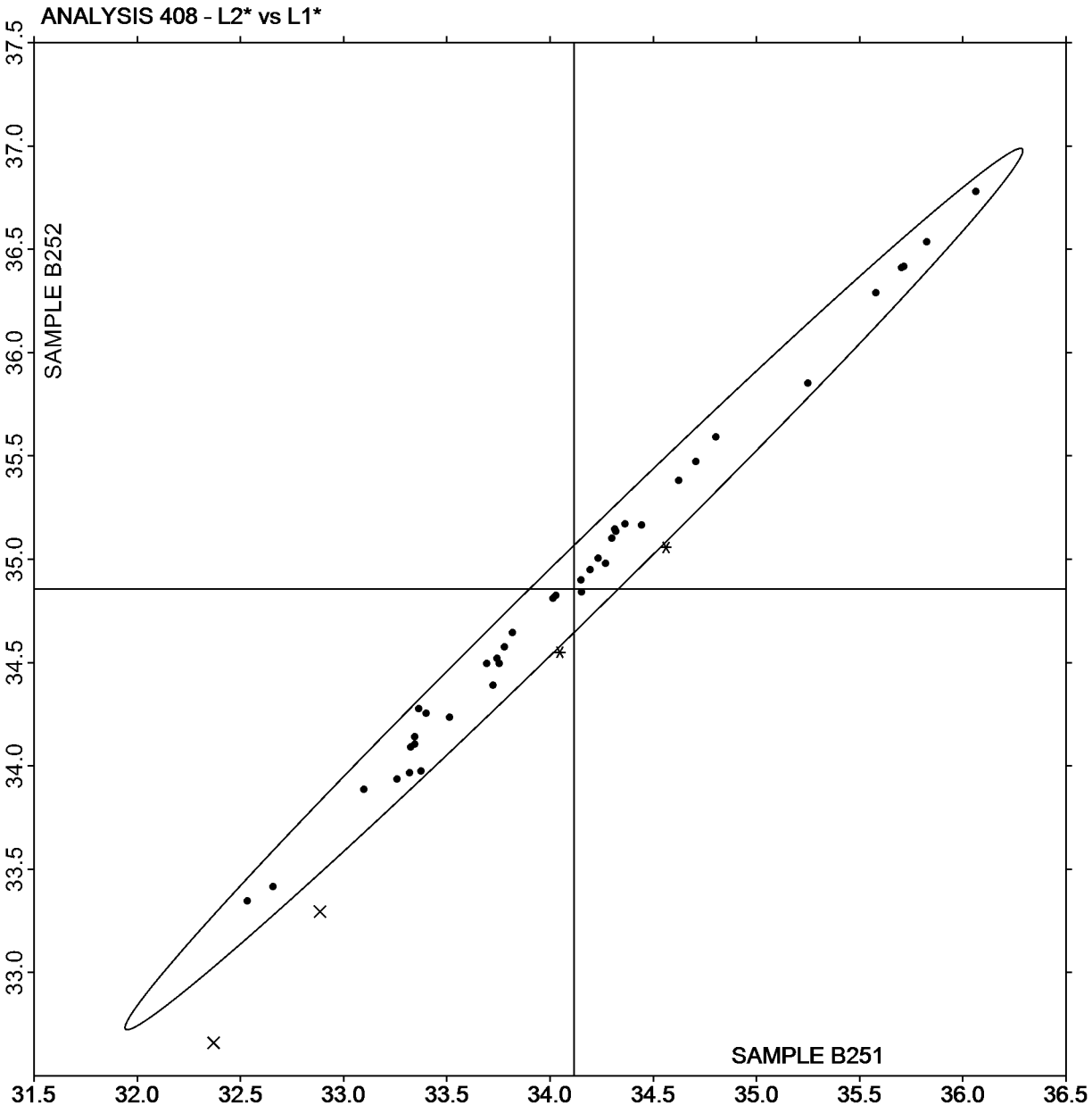
P96DLY(X) - Extreme data for both b* values.

Key to Instrument Codes Reported by Participants

AB	Data Color	BG	BYK Mac i
GA	BYK-Gardner	GG	BYK-Gardner spectro2-guide (45/0) gloss
GH	BYK-Gardner Color-View	GT	Gretag Macbeth Color Eye 7000A
HL	Hunter Agera	HM	Hunter MiniScan EZ 4500L
HW	Hunter LabScan XE	HX	Hunter Color FlexEZ 45/0
HY	Hunter Color Flex 45/0	MG	Macbeth 1500/PLUS or 2025+ Color Eye
MS	Minolta CM-600d Spectrophotometer	MT	Minolta CM-25cG Spectrophotometer
PR	PhotoResearch PR730	XD	X-Rite 500 Series SpectroDensitometer
XE	X-Rite eXact Portable Spectrophotometer	XG	X-Rite i1 Pro 2
XJ	X-Rite CI7XX0	XM	X-Rite MA58 Multi-Angle Spectrophotometer
XO	X-Rite MA68 II Multi-Angle Spectrophotometer	XP	X-Rite MA9 Multi-Angle Spectrophotometer
XQ	X-Rite Ci6x	XS	X-Rite 962 Portable Spectrophotometer
XU	X-Rite 964 Portable Spectrophotometer	XW	X-Rite
XY	X-Rite MA T6 Multi-Angle Spectrophotometer		

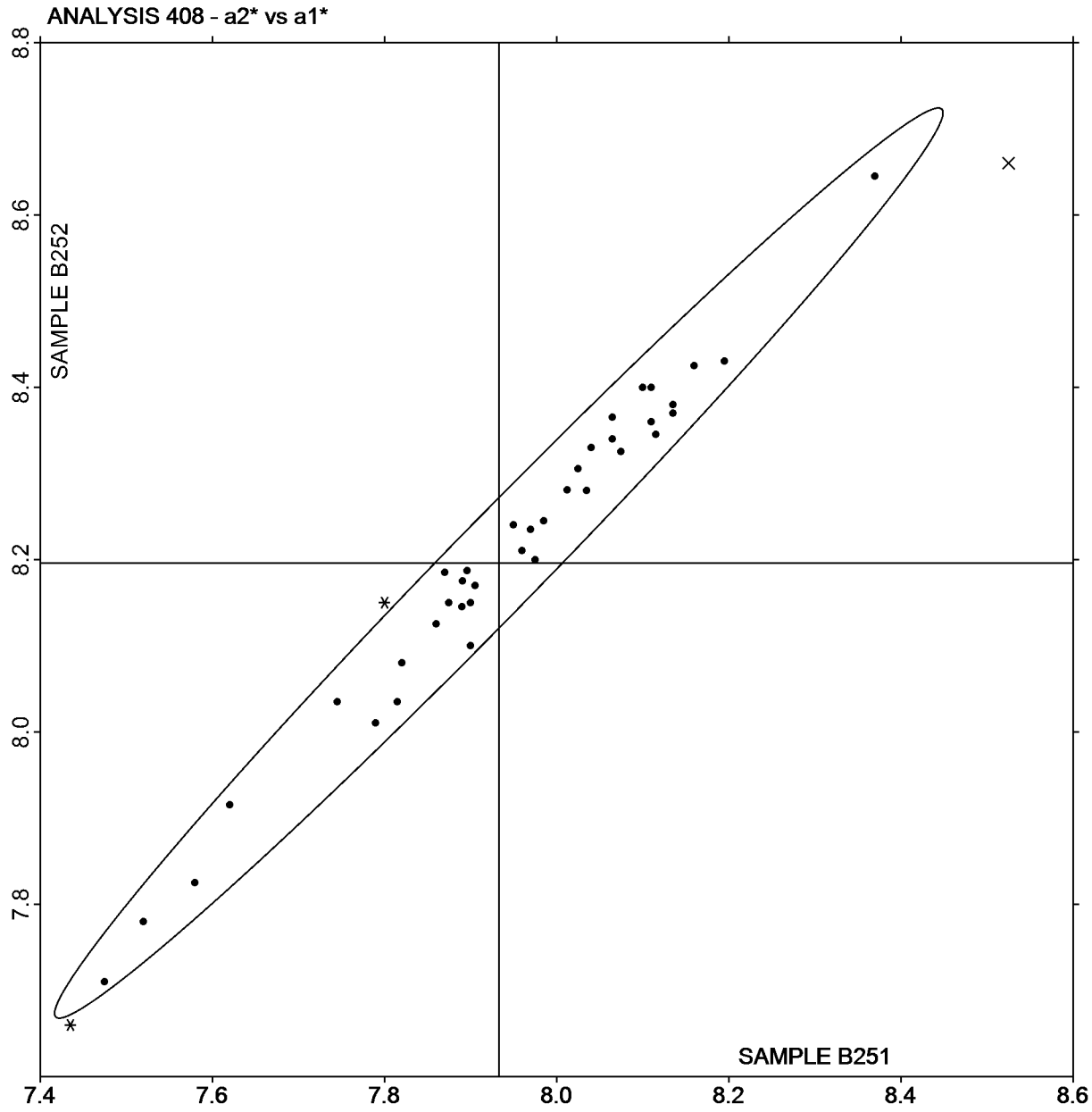
L2* vs L1*

SAMPLE B251 = 34.12 SAMPLE B252 = 34.86



a2* vs a1*

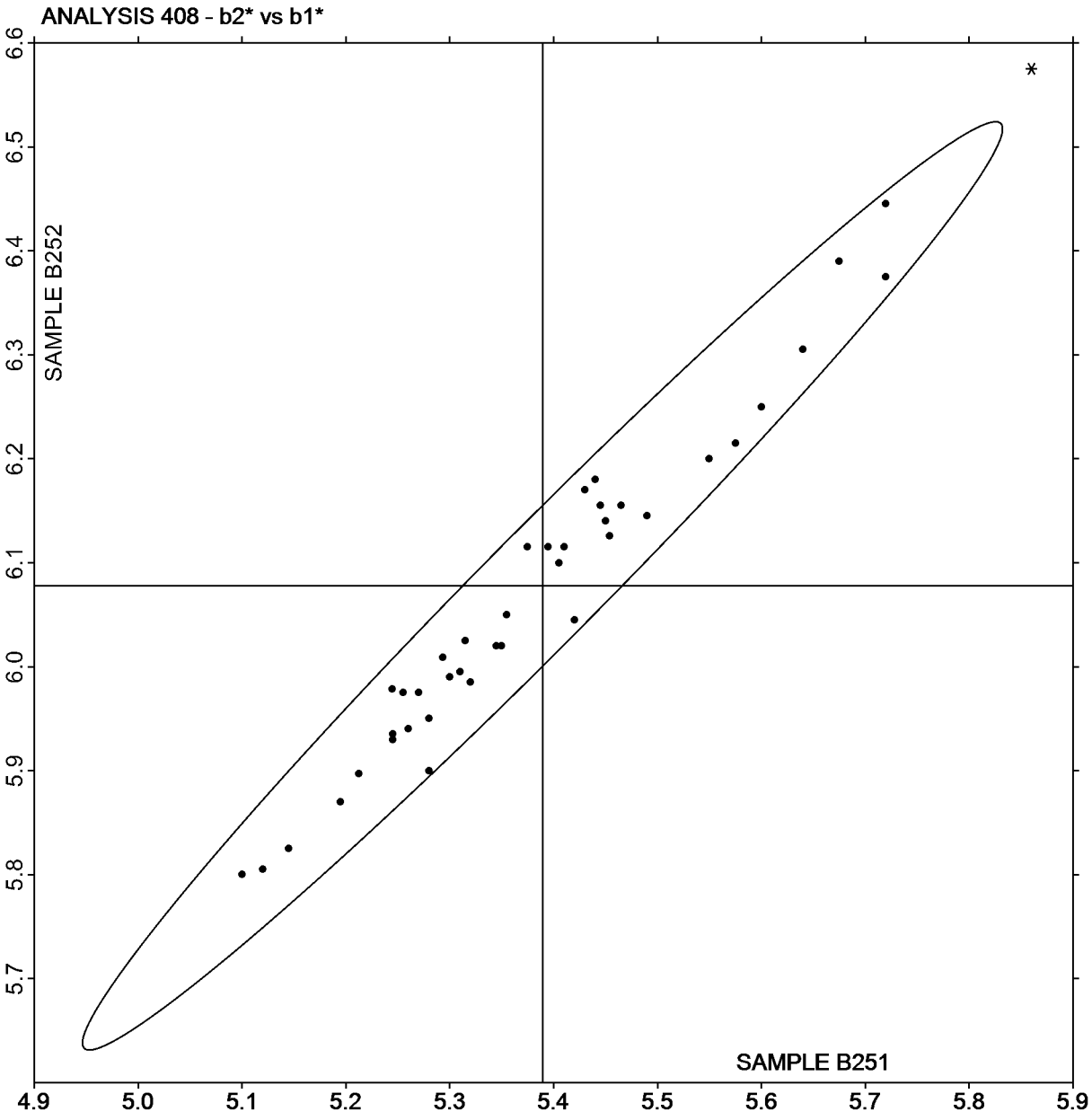
SAMPLE B251 = 7.93 SAMPLE B252 = 8.20



b2* vs b1*

SAMPLE B251 = -5.39

SAMPLE B252 = -6.08



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
23HPQ6		B251	35.66	7.56	-5.51	0.73	0.27	-0.66	1.02	MV
		B252	36.39	7.83	-6.17					
2KXW4L		B251	35.75	7.60	-5.34	0.72	0.28	-0.67	1.02	AJ
		B252	36.47	7.88	-6.01					
2WCU9P		B251	35.80	7.51	-5.39	0.69	0.25	-0.65	0.98	MW
		B252	36.49	7.76	-6.04					
3KGYCM		B251	35.81	7.57	-5.44	0.74	0.26	-0.64	1.01	AJ
		B252	36.55	7.82	-6.08					
3VD9VP	X	B251	35.51	7.70	-5.96	0.87	0.29	-0.66	1.12	CA
		B252	36.37	7.98	-6.62					
44MUJJ		B251	35.66	7.60	-5.49	0.75	0.22	-0.64	1.01	XG
		B252	36.41	7.82	-6.14					
49FVKX		B251	35.58	7.56	-5.61	0.83	0.22	-0.63	1.07	XB
		B252	36.41	7.79	-6.24					
4GCT9Z		B251	35.70	7.46	-5.64	0.74	0.29	-0.66	1.04	HP
		B252	36.45	7.75	-6.31					
684GQW		B251	35.67	7.53	-5.35	0.73	0.27	-0.65	1.01	XD
		B252	36.40	7.80	-6.00					
6H3EFH		B251	35.78	7.53	-5.45	0.73	0.27	-0.66	1.02	MU
		B252	36.51	7.80	-6.11					
79PKYU		B251	35.65	7.63	-5.49	0.73	0.25	-0.67	1.02	XE
		B252	36.38	7.88	-6.16					
7N6KTY		B251	35.99	7.42	-5.35	0.77	0.25	-0.61	1.01	XO
		B252	36.75	7.67	-5.96					
8D4KUZ		B251	35.50	7.65	-5.43	0.71	0.24	-0.67	1.01	MM
		B252	36.21	7.89	-6.10					
8R3NXR		B251	35.57	7.63	-5.52	0.73	0.25	-0.67	1.02	XD
		B252	36.30	7.88	-6.19					
8UN94V		B251	35.70	7.68	-5.28	0.72	0.25	-0.68	1.02	AE
		B252	36.42	7.93	-5.97					
8VYDEY		B251	35.96	7.42	-5.67	0.71	0.27	-0.68	1.02	HP
		B252	36.67	7.69	-6.35					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
AR9QWV		B251	35.93	7.53	-5.60	0.71	0.27	-0.67	1.01	XG
		B252	36.64	7.80	-6.27					
ARQ2BU		B251	35.94	7.49	-5.43	0.67	0.29	-0.62	0.95	AT
		B252	36.61	7.78	-6.05					
BDPMRC		B251	35.45	7.59	-5.60	0.73	0.22	-0.66	1.00	XX
		B252	36.17	7.81	-6.26					
BJFYPT		B251	35.79	7.51	-5.42	0.71	0.29	-0.67	1.01	AS
		B252	36.50	7.80	-6.09					
BPGBLQ		B251	35.66	7.58	-5.52	0.72	0.25	-0.66	1.00	MK
		B252	36.38	7.83	-6.18					
BUB89V		B251	36.00	7.46	-5.44	0.71	0.22	-0.65	0.99	CA
		B252	36.71	7.68	-6.09					
C8GHFH		B251	35.85	7.52	-5.38	0.77	0.27	-0.70	1.08	AU
		B252	36.63	7.79	-6.08					
CPWRFJ		B251	35.75	7.50	-5.45	0.74	0.27	-0.65	1.03	MW
		B252	36.49	7.77	-6.10					
CXRRVB		B251	35.78	7.56	-5.61	0.72	0.24	-0.63	0.98	MV
		B252	36.50	7.80	-6.24					
DWA48P		B251	35.54	7.63	-5.51	0.77	0.25	-0.63	1.02	XU
		B252	36.30	7.87	-6.15					
E4P42R		B251	35.80	7.63	-5.45	0.74	0.27	-0.66	1.03	XH
		B252	36.54	7.90	-6.11					
EEQRVA	X	B251	35.24	7.44	-5.40	1.18	0.26	-0.67	1.38	MP
		B252	36.43	7.70	-6.06					
EXF68E		B251	35.71	7.52	-5.49	0.70	0.26	-0.65	1.00	MM
		B252	36.41	7.78	-6.15					
F8M6GF		B251	35.83	7.53	-5.38	0.75	0.25	-0.63	1.01	XD
		B252	36.58	7.79	-6.01					
FP63MD	X	B251	35.78	7.32	-5.05	0.72	0.27	-0.64	1.00	GE
		B252	36.50	7.59	-5.69					
FVUL3A		B251	35.84	7.58	-5.41	0.75	0.25	-0.65	1.02	AP
		B252	36.60	7.82	-6.05					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
G38T2Q		B251	35.59	7.45	-5.62	0.69	0.24	-0.63	0.96	CA
		B252	36.28	7.69	-6.24					
GVMXZM		B251	36.06	7.54	-5.39	0.66	0.25	-0.66	0.97	MV
		B252	36.72	7.79	-6.06					
H297Z7		B251	35.75	7.46	-5.55	0.72	0.25	-0.66	1.01	AQ
		B252	36.47	7.71	-6.21					
HJDDE9	X	B251	36.73	7.44	-5.95	0.77	0.30	-0.68	1.07	SI
		B252	37.50	7.74	-6.63					
J3GHFM		B251	35.76	7.55	-5.42	0.70	0.27	-0.66	1.00	XD
		B252	36.46	7.82	-6.08					
JKHMKB		B251	35.89	7.53	-5.25	0.71	0.26	-0.67	1.01	AT
		B252	36.60	7.79	-5.92					
JPEC34		B251	35.94	7.47	-5.56	0.70	0.27	-0.69	1.01	MV
		B252	36.63	7.73	-6.25					
KDCB2J		B251	35.87	7.56	-5.34	0.76	0.27	-0.67	1.05	XX
		B252	36.63	7.83	-6.01					
KMZ4DF		B251	36.01	7.42	-5.28	0.74	0.26	-0.64	1.02	XF
		B252	36.76	7.68	-5.92					
KQ2ARL		B251	35.89	7.55	-5.33	0.40	0.21	-0.62	0.76	XC
		B252	36.28	7.76	-5.95					
LKRBX8		B251	35.73	7.53	-5.31	0.73	0.24	-0.71	1.05	AS
		B252	36.47	7.77	-6.02					
M4JJUG		B251	35.65	7.59	-5.40	0.70	0.22	-0.63	0.97	XD
		B252	36.35	7.81	-6.04					
M822P8		B251	35.55	7.61	-5.51	0.71	0.23	-0.65	0.99	XD
		B252	36.26	7.84	-6.16					
MCFGGJ	X	B251	35.91	7.55	-5.33	0.70	0.01	-0.67	0.97	AW
		B252	36.61	7.57	-6.00					
MH7RT4		B251	35.57	7.59	-5.51	0.68	0.21	-0.64	0.96	XH
		B252	36.26	7.80	-6.15					
N3JYH2		B251	35.70	7.45	-5.33	0.74	0.26	-0.64	1.02	AJ
		B252	36.44	7.72	-5.98					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
N6T98D		B251	35.89	7.55	-5.37	0.70	0.25	-0.67	1.00	AP
		B252	36.59	7.81	-6.04					
N9PUYG		B251	35.48	7.65	-5.59	0.75	0.27	-0.66	1.03	XB
		B252	36.23	7.92	-6.25					
NHZWKG		B251	36.12	7.46	-5.26	0.70	0.29	-0.65	1.00	XF
		B252	36.82	7.74	-5.91					
NJ97DE		B251	35.53	7.55	-5.58	0.72	0.26	-0.66	1.01	XB
		B252	36.25	7.82	-6.24					
NRMVD8		B251	35.87	7.56	-5.33	0.74	0.27	-0.68	1.03	AU
		B252	36.61	7.83	-6.01					
NZVP7F		B251	35.54	7.67	-5.50	0.69	0.30	-0.67	1.01	XE
		B252	36.23	7.97	-6.17					
PEUTA7		B251	35.76	7.45	-5.34	0.69	0.25	-0.67	0.99	MP
		B252	36.45	7.70	-6.01					
QAXQJB	X	B251	29.46	6.46	-3.92	0.57	0.34	-0.55	0.86	XD
		B252	30.03	6.80	-4.46					
QRDZKC		B251	35.72	7.44	-5.60	0.70	0.24	-0.67	1.00	HP
		B252	36.42	7.68	-6.27					
QZUCZX		B251	35.63	7.58	-5.48	0.71	0.21	-0.63	0.98	XD
		B252	36.35	7.79	-6.11					
R7B8E8		B251	35.91	7.53	-5.32	0.78	0.24	-0.67	1.06	AS
		B252	36.69	7.77	-5.99					
R9HLMY		B251	35.66	7.61	-5.59	0.73	0.25	-0.65	1.01	XB
		B252	36.40	7.86	-6.24					
RATQY2		B251	35.79	7.58	-5.60	0.76	0.27	-0.67	1.05	MT
		B252	36.55	7.85	-6.27					
RB9NQ2		B251	35.53	7.61	-5.43	0.72	0.27	-0.66	1.01	XG
		B252	36.25	7.88	-6.09					
RMCBGA		B251	35.90	7.45	-5.38	0.73	0.24	-0.65	1.01	AJ
		B252	36.63	7.69	-6.03					
RVRVZA		B251	35.64	7.53	-5.53	0.73	0.28	-0.68	1.04	XD
		B252	36.38	7.81	-6.20					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
TCEV7Y		B251	35.71	7.59	-5.32	0.69	0.25	-0.63	0.97	AS
		B252	36.40	7.84	-5.96					
TDQ89B		B251	35.77	7.56	-5.31	0.71	0.28	-0.71	1.04	AU
		B252	36.48	7.84	-6.01					
TJXXD2		B251	35.60	7.61	-5.51	0.73	0.27	-0.67	1.02	XE
		B252	36.33	7.88	-6.18					
TUDQ2B		B251	36.04	7.43	-5.33	0.73	0.29	-0.63	1.00	XF
		B252	36.77	7.71	-5.95					
TXC2XB		B251	35.62	7.44	-5.36	0.72	0.30	-0.66	1.02	XI
		B252	36.34	7.73	-6.02					
U2QY3D		B251	35.76	7.50	-5.45	0.75	0.26	-0.65	1.03	MW
		B252	36.52	7.76	-6.10					
U8WRYU		B251	35.89	7.50	-5.32	0.70	0.23	-0.67	0.99	AT
		B252	36.58	7.73	-5.99					
UJCMD8		B251	35.86	7.40	-5.37	0.22	0.26	-0.67	0.75	AJ
		B252	36.08	7.65	-6.04					
UQC2ZU	X	B251	35.96	7.46	-5.27	0.77	0.03	-0.67	1.02	XF
		B252	36.73	7.49	-5.93					
VTVF4U		B251	35.83	7.47	-5.55	0.72	0.21	-0.63	0.98	XD
		B252	36.55	7.68	-6.18					
VXR3VX		B251	35.73	7.40	-5.55	0.75	0.28	-0.69	1.06	HP
		B252	36.49	7.68	-6.24					
W6KUGW		B251	35.64	7.61	-5.57	0.75	0.28	-0.68	1.05	XD
		B252	36.39	7.89	-6.24					
WGDFK7		B251	35.43	7.57	-5.37	0.73	0.25	-0.65	1.02	XI
		B252	36.17	7.82	-6.02					
X867T8		B251	35.75	7.60	-5.36	0.74	0.23	-0.67	1.02	AU
		B252	36.49	7.83	-6.03					
XPM4X6		B251	35.56	7.69	-5.42	0.70	0.28	-0.71	1.03	XI
		B252	36.25	7.98	-6.13					
XZJAR4		B251	35.90	7.58	-5.36	0.71	0.26	-0.66	1.00	AT
		B252	36.60	7.84	-6.02					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
YPJ2NQ		B251	35.75	7.43	-5.76	0.71	0.27	-0.63	0.99	HP
		B252	36.46	7.70	-6.38					
Z4H9F2		B251	35.94	7.56	-5.38	0.74	0.29	-0.66	1.04	XH
		B252	36.68	7.85	-6.04					
Z8EU84		B251	36.02	7.46	-5.23	0.73	0.30	-0.65	1.02	XF
		B252	36.75	7.76	-5.88					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
B251	35.75	7.53	-5.44	0.71	0.26	-0.66	1.01
B252	36.48	7.79	-6.10				
Stnd Dev Btwn Labs							
B251	0.15	0.08	0.11	0.07	0.02	0.02	0.05
B252	0.16	0.08	0.11				

Statistics based on 76 of 83 reporting participants

Comments Assigned on Data Flags for Test #409

3VD9VP(X) - Inconsistent in determinations of L* values. Large replication difference for L* Sample B252. Low b* values for both samples. Large replication difference for b* Sample B252.

EEQRVA(X) - Low L* values for Sample B251. Large replication difference for L* Sample B251. Large Delta L & E.

FP63MD(X) - High b* values for both samples.

HJDDE9(X) - Very high L* values for both samples. Large replication difference for L* Sample B252. Very low b* values for both samples. Large replication difference for b* Sample B251.

MCFGGJ(X) - Low a* values for Sample B252. Large replication difference for a* Sample B252. Small Delta a.

QAXQJB(X) - Extreme data for both samples for all values. Large Delta a & b. Small Delta E.

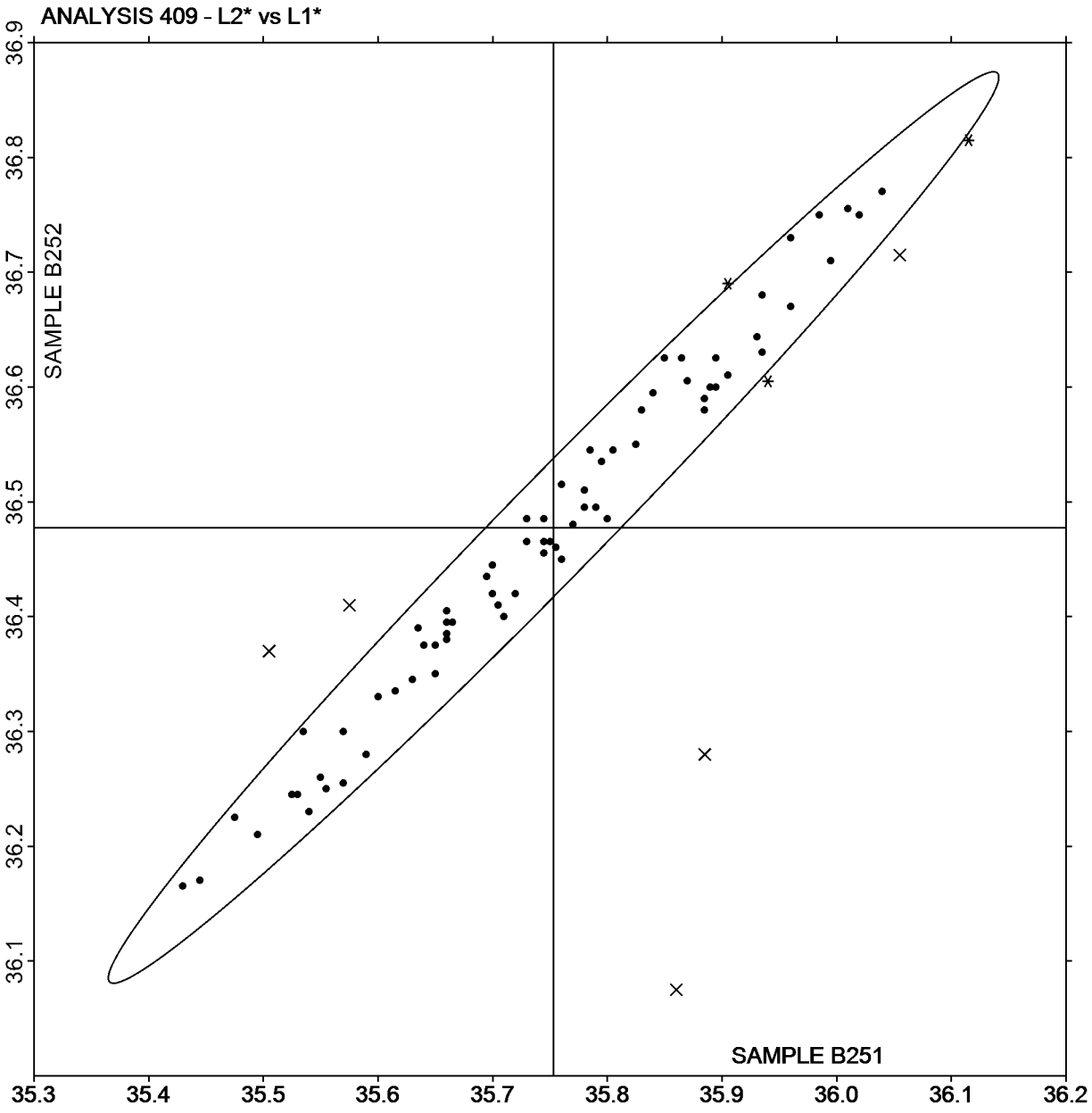
UQC2ZU(X) - Low a* values for Sample B252. Large replication difference for a* Sample B252. Small Delta a.

Key to Instrument Codes Reported by Participants

AE	Datacolor 110	AJ	Datacolor 600
AP	Datacolor 750	AQ	Datacolor 600x
AS	Datacolor 800	AT	Datacolor 850
AU	Datacolor 1000	AW	Datacolor 1050
CA	Cary 5000	GE	BYK-Gardner Spectro2-Guide Sphere Gloss
HP	Hunter UltraScan PRO	MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a	MP	Minolta CM-36dG
MT	Minolta CM-2600d	MU	Minolta
MV	Minolta CM-3000d Spectrophotometer	MW	Minolta CM 3700a Spectrophotometer
SI	SHIMADZU 3700i	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
XG	X-Rite Ci7860 Benchtop Spectrophotometer	XH	X-Rite Color i5 Benchtop Spectrophotometer
XI	X-Rite Color i7 Benchtop Spectrophotometer	XO	X-Rite SP64 Portable Sphere Spectrophotometer
XU	X-Rite Color Premier 8200 Spectrophotometer	XX	Instrument make/model not specified by lab

L2* vs L1*

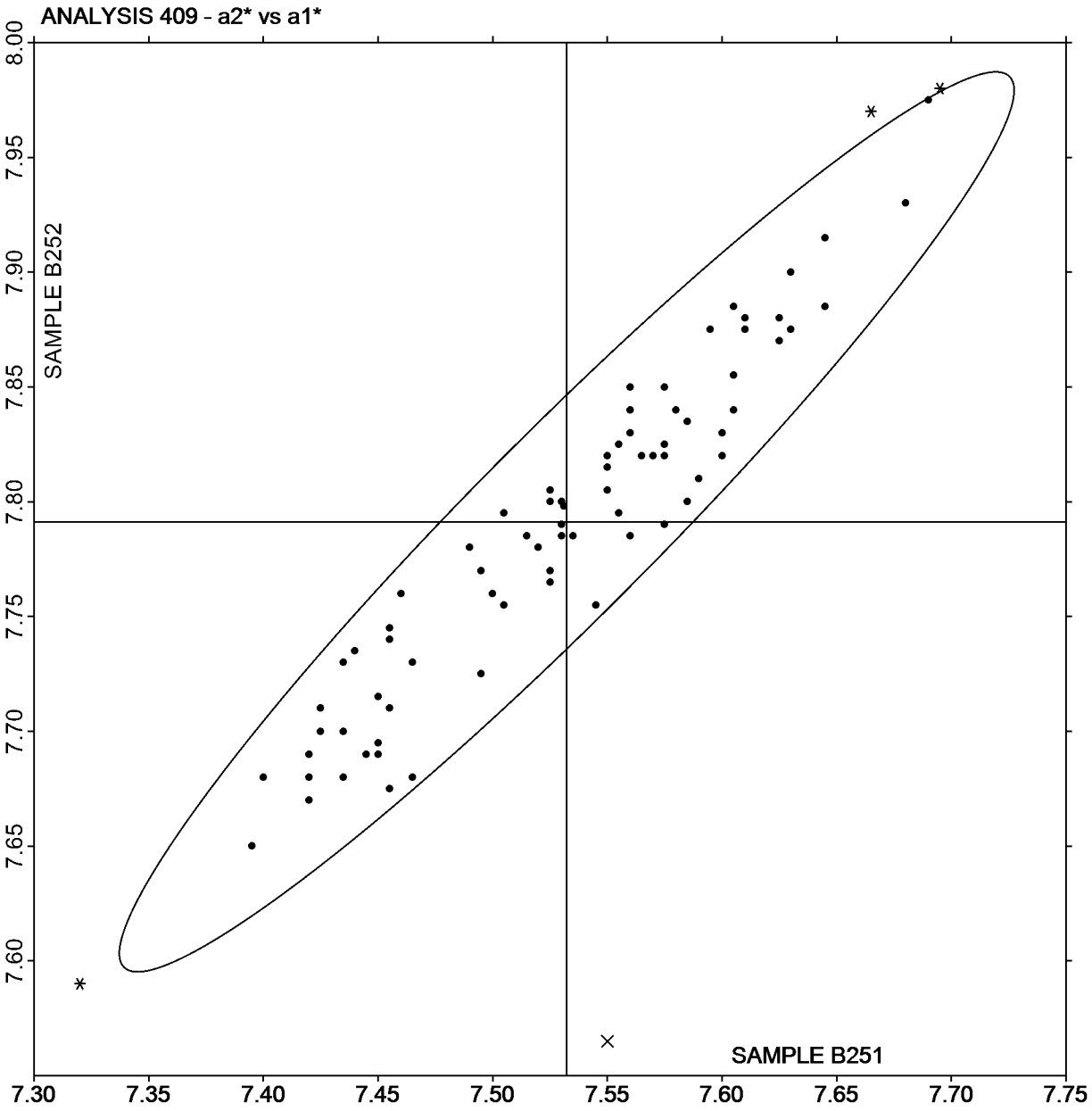
SAMPLE B251 = 35.75 SAMPLE B252 = 36.48



a2* vs a1*

SAMPLE B251 = 7.53

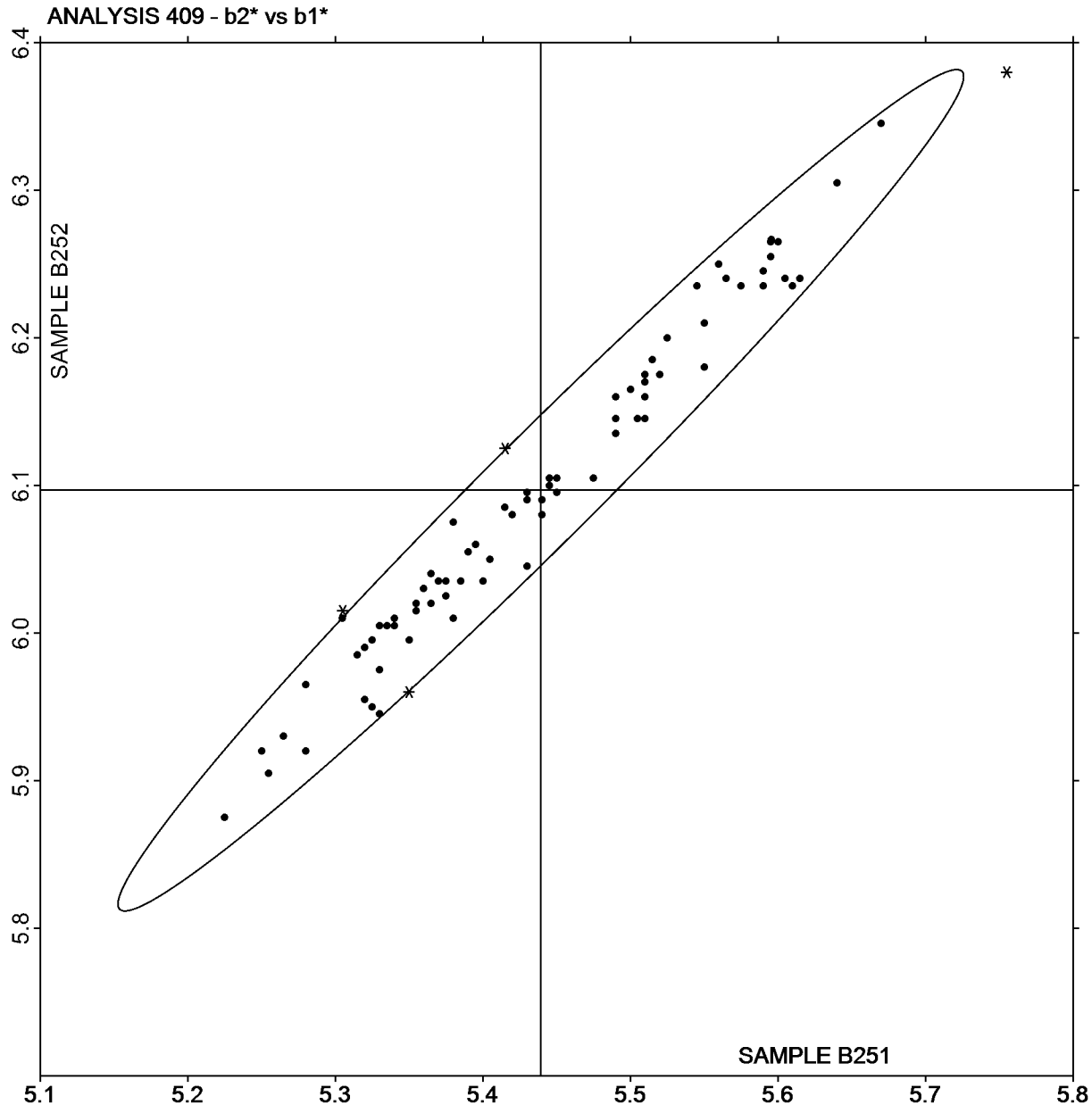
SAMPLE B252 = 7.79



b2* vs b1*

SAMPLE B251 = -5.44

SAMPLE B252 = -6.10



Plot created using absolute values.

Spectrophotometric - Sphere Geometry Instruments
Reflectance at 16 Selected Wavelengths

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 B251																		
23HPQ6		10.89	11.22	10.94	10.54	9.90	8.91	7.92	7.57	7.84	8.89	10.71	10.13	10.74	13.60	15.54	16.16	MV
3KGYCM		10.95	11.28	11.01	10.56	9.97	8.94	7.99	7.69	7.95	8.97	10.68	10.31	10.90	13.67	15.80	16.03	AJ
3VD9VP		11.25*	11.49*	11.16	10.75*	10.12	9.04	8.06	7.66	7.95	8.97	10.77	10.23	10.79	13.68	15.69	16.34	CA
44MUJJ	X	11.55X	11.92X	11.63X	11.17X	10.47X	9.34X	8.29X	7.89X	8.17X	9.30X	11.02X	10.56*	11.39X	14.26X	16.16X	16.71X	XG
49FVKX		10.78	11.19	10.94	10.50	9.86	8.84	7.90	7.55	7.83	8.90	10.47	10.13	10.81	13.43	15.27	15.89	XB
684GQW		10.75	11.10	10.88	10.48	9.86	8.87	7.95	7.59	7.87	8.95	10.59	10.17	10.90	13.64	15.48	16.05	XD
6H3EFH		10.90	11.24	10.98	10.59	9.98	8.93	7.99	7.62	7.92	8.98	10.68	10.27	10.81	13.56	15.65	16.26	MV
79PKYU		10.93	11.21	10.94	10.50	9.87	8.85	7.92	7.58	7.88	8.95	10.57	10.15	10.91	13.66	15.50	15.97	XE
7N6KTY		10.98	11.35	11.07	10.66	10.02	9.03	8.10	7.75	8.04	9.11	10.70	10.32	11.07	13.72	15.60	16.29	XO
8D4KUZ		10.68	11.06	10.81	10.41	9.80	8.78	7.86	7.49	7.78	8.85	10.49	10.12	10.84	13.62	15.50	16.08	MM
8UN94V		10.88	11.11	10.85	10.48	9.88	8.87	7.94	7.63	7.85	8.93	10.65	10.37	10.92	13.71	15.63	15.18X	AE
8VYDEY		11.06	11.46*	11.20*	10.76*	10.10	9.10	8.13	7.73	8.00	8.95	10.86*	10.39	10.63	13.80	15.77	16.39	HP
AR9QWV		11.15	11.43	11.15	10.69	10.05	9.01	8.07	7.70	8.00	9.06	10.68	10.31	11.03	13.74	15.60	16.19	XD
ARQ2BU		11.03	11.31	11.07	10.66	10.03	9.01	8.08	7.76	8.03	9.05	10.72	10.42	10.98	13.83	15.79	16.16	AT
BDPMRC		10.73	11.11	10.85	10.42	9.81	8.78	7.84	7.47	7.74*	8.79	10.50	10.07	10.68	13.40	15.25	15.78	XX
BJFYPT		10.93	11.27	10.98	10.54	9.95	8.95	8.01	7.68	7.94	8.96	10.67	10.33	10.87	13.69	15.81	16.04	AS
BPGBLQ		10.79	11.19	10.95	10.54	9.90	8.89	7.96	7.60	7.85	8.92	10.58	10.20	10.86	13.58	15.49	16.14	MK
BUB89V		11.05	11.35	11.10	10.71	10.10	9.05	8.10	7.73	8.02	9.06	10.86*	10.33	10.90	13.77	15.76	16.39	CA
C8GHFH		10.95	11.26	11.02	10.60	9.98	8.95	8.02	7.71	7.98	8.99	10.70	10.38	10.97	13.72	15.77	15.96	AU
CPWRFJ		10.79	11.24	10.95	10.56	9.96	8.95	7.99	7.62	7.89	8.93	10.65	10.30	10.79	13.52	15.63	16.26	MW
CXRRVB		10.90	11.30	11.00	10.65	10.00	9.00	8.00	7.60	7.90	8.90	10.70	10.30	10.80	13.60	15.65	16.35	MV
DWA48P		10.82	11.13	10.86	10.45	9.83	8.80	7.76*	7.52	7.81	8.88	10.52	10.10	10.80	13.54	15.41	15.91	XU

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 B251																		
E4P42R		10.95	11.30	11.00	10.58	9.90	8.94	7.99	7.66	7.92	9.06	10.61	10.27	11.01	13.69	15.48	16.03	XH
EEQRVA		10.87	11.18	10.93	10.54	9.93	8.92	8.00	7.63	7.90	8.93	10.68	10.23	10.75	13.54	15.49	16.15	MP
EXF68E		10.89	11.20	10.97	10.56	9.91	8.89	7.97	7.61	7.88	8.92	10.58	10.21	10.90	13.63	15.52	16.15	MM
F8M6GF		10.84	11.20	10.99	10.59	9.97	8.77	8.01	7.66	7.94	9.01	10.68	10.29	10.95	13.73	15.56	16.19	XD
FP63MD		10.65	11.02*	10.83	10.47	9.90	8.92	7.99	7.68	7.94	9.00	10.61	10.27	10.93	13.58	15.49	16.13	GE
FVUL3A		10.94	11.28	11.01	10.59	9.98	8.99	8.01	7.71	7.97	8.97	10.75	10.41	10.89	13.79	15.74	16.06	AP
G38T2Q		10.82	11.13	10.87	10.51	9.89	8.85	7.92	7.55	7.85	8.83	10.59	10.11	10.65	13.47	15.44	16.07	CA
GVMXZM		11.04	11.38	11.13	10.73	10.10	9.07	8.08	7.76	8.06	9.16	10.85	10.39	11.02	13.80	15.80	16.42	MV
H297Z7		10.79	11.25	10.97	10.61	9.98	8.95	7.99	7.64	7.96	8.93	10.53	10.26	10.84	13.59	15.56	16.11	AQ
HJDDE9	X	11.72X	12.06X	11.78X	11.28X	10.64X	9.53X	8.51X	8.09X	8.34X	9.37X	11.20X	10.76X	11.30X	14.24X	16.18X	16.85X	SI
J3GHFM		10.85	11.18	10.95	10.55	9.94	8.93	8.01	7.61	7.90	8.98	10.63	10.22	10.98	13.73	15.49	16.16	XD
JKHMKB		11.10	11.27	10.97	10.57	9.95	8.96	8.02	7.72	8.01	9.03	10.76	10.34	11.01	13.84	16.03*	16.32	AT
JPEC34		11.02	11.43	11.11	10.71	10.09	9.05	8.08	7.72	7.96	9.00	10.78	10.32	10.85	13.72	15.69	16.37	MV
KMZ4DF		11.03	11.36	11.06	10.64	10.02	9.03	8.10	7.76	8.05	9.11	10.72	10.34	11.07	13.70	15.61	16.29	XF
KQ2ARL	X	11.00	11.30	11.02	10.58	9.94	8.94	8.04	7.71	8.00	9.08	10.67	10.29	11.08	13.74	15.62	16.33	XC
LKRBX8		10.88	11.17	10.91	10.50	9.86	8.91	7.95	7.66	7.92	8.94	10.63	10.34	10.89	13.58	15.79	15.93	AS
M4JJUG		10.80	11.15	10.89	10.49	9.87	8.86	7.92	7.56	7.85	8.94	10.57	10.16	10.92	13.75	15.58	16.16	XD
M822P8		11.26*	11.15	10.88	10.46	9.82	8.80	7.87	7.53	7.81	8.87	10.50	10.11	10.85	13.58	15.45	16.00	XD
MCFGGJ	X	31.77X	33.30X	34.13X	34.45X	34.50X	34.38X	34.20X	34.25X	34.70X	35.42X	36.36X	36.23X	36.52X	37.98X	38.95X	38.93X	AW
MH7RT4		10.84	11.17	10.89	10.47	9.83	8.82	7.89	7.53	7.82	8.88	10.52	10.10	10.85	13.65	15.47	16.01	XH
N6T98D		11.01	11.28	11.04	10.59	9.99	8.98	8.05	7.72	7.97	9.02	10.77	10.38	10.96	13.73	15.96*	16.07	AP
N9PUYG		11.21*	11.14	10.87	10.44	9.79	8.77	7.85	7.50	7.77	8.83	10.45	10.10	10.82	13.48	15.33	15.93	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 B251																		
NHZWKG		11.12	11.42	11.12	10.70	10.07	9.06	8.14	7.81	8.11*	9.20*	10.80	10.41	11.15	13.82	15.74	16.45	XF
NJ97DE		10.79	11.14	10.89	10.47	9.86	8.82	7.90	7.52	7.80	8.83	10.55	10.07	10.68	13.47	15.34	15.82	XB
NZVP7F		10.84	11.13	10.87	10.46	9.81	8.78	7.86	7.52	7.81	8.89	10.52	10.08	10.88	13.62	15.47	16.03	XE
PEUTA7		10.85	11.16	10.94	10.55	9.94	8.91	8.01	7.63	7.91	8.94	10.71	10.25	10.77	13.56	15.54	16.23	MP
QAXQJB		10.74	11.08	10.83	10.42	9.81	8.80	7.87	7.50	7.79	8.85	10.49	10.10	10.80	13.54	15.47	16.06	XD
QRDZKC		10.54*	11.32	11.12	10.67	10.23X	9.20X	8.24X	7.64	7.79	8.44X	10.38*	10.56*	9.97X	12.78X	15.25	16.04	HP
QZUCZX		10.74	11.13	10.91	10.51	9.87	8.87	7.93	7.57	7.84	8.92	10.55	10.17	10.86	13.63	15.45	16.11	XD
R7B8E8		11.00	11.27	10.97	10.63	9.96	8.98	8.02	7.73	8.01	9.04	10.76	10.39	10.98	13.77	15.91	16.03	AS
R9HLMY		10.93	11.24	10.98	10.55	9.92	8.88	7.92	7.58	7.86	8.95	10.59	10.16	10.81	13.53	15.39	15.93	XB
RATQY2		10.91	11.30	11.03	10.65	9.99	8.97	8.01	7.63	7.90	8.95	10.67	10.28	10.86	13.68	15.64	16.33	MT
RMCBGA		10.98	11.28	10.97	10.62	10.03	9.00	8.05	7.73	8.01	9.01	10.71	10.44	10.96	13.74	15.76	16.13	AJ
RVRVZA		10.86	11.21	10.93	10.52	9.90	8.87	7.93	7.56	7.85	8.90	10.59	10.15	10.77	13.49	15.41	15.96	XD
TCEV7Y		10.94	11.17	10.89	10.48	9.86	8.85	7.96	7.62	7.92	9.00	10.60	10.22	10.88	13.63	15.58	16.00	AS
TDQ89B		10.97	11.21	10.90	10.51	9.91	8.90	7.99	7.66	7.92	8.97	10.71	10.30	10.89	13.70	15.83	15.96	AU
TUDQ2B		11.16	11.40	11.10	10.67	10.04	9.04	8.12	7.77	8.06	9.13	10.74	10.38	11.08	13.76	15.65	16.36	XF
TXC2XB		10.85	11.19	10.82	10.44	9.81	8.89	7.95	7.56	7.83	8.96	10.47	10.15	10.91	13.42	15.26	15.77	XI
U2QY3D		10.80	11.20	11.00	10.60	10.00	8.95	8.00	7.60	7.90	8.95	10.70	10.30	10.80	13.55	15.65	16.25	MW
U8WRYU		11.12	11.30	11.03	10.50	9.98	8.98	8.04	7.74	7.95	9.02	10.75	10.40	10.97	13.70	15.76	16.11	AT
UJCMD8		10.85	11.32	11.04	10.54	9.93	8.93	8.03	7.77	7.94	9.02	10.50	10.38	11.06	13.49	15.52	15.97	AJ
UQC2ZU		11.04	11.18	10.94	10.50	9.87	8.89	7.93	7.61	7.91	9.01	10.61	10.20	10.94	13.59	15.47	16.21	XO
VTVF4U		10.99	11.33	11.05	10.62	9.99	8.98	8.05	7.67	7.94	9.02	10.61	10.24	10.96	13.61	15.52	16.09	XD
VXR3VX		10.98	11.29	11.01	10.61	9.99	8.98	8.01	7.80	7.91	8.85	10.63	10.26	10.75	13.45	15.50	16.15	HP

Spectrophotometric - Sphere Geometry Instruments
Reflectance at 16 Selected Wavelengths

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 B251																		
W6KUGW		10.93	11.23	10.95	10.52	9.88	8.86	7.93	7.57	7.85	8.94	10.54	10.11	10.91	13.64	15.46	16.04	XD
WGDFK7		10.70	11.00*	10.75*	10.34*	9.74*	8.74*	7.81*	7.46*	7.75	8.83	10.46	10.04	10.75	13.52	15.43	15.97	XI
X867T8		11.05	11.20	10.94	10.53	9.87	8.89	7.97	7.66	7.92	8.96	10.67	10.31	10.92	13.63	15.90	16.16	AU
XZJAR4		11.06	11.29	11.02	10.59	9.99	8.96	8.01	7.75	7.99	9.03	10.76	10.42	10.95	13.87	16.06*	16.05	AT
YPJ2NQ		11.11	11.34	11.09	10.66	10.01	8.95	7.99	7.65	7.87	8.86	10.59	10.27	10.57	13.73	15.60	16.09	HP
Z4H9F2		10.93	11.34	11.06	10.64	9.99	8.99	8.07	7.75	8.00	9.13	10.70	10.36	11.02	13.74	15.58	16.22	XH

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	10.92	11.24	10.97	10.56	9.94	8.92	7.98	7.64	7.91	8.95	10.64	10.26	10.86	13.63	15.59	16.10
SD Btwn Labs	0.14	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.11	0.11	0.12	0.16	0.15	0.18	0.19

44MUJJ (X) - High % reflectance data for almost all wavelengths.
HJDDE9 (X) - High % reflectance data at all wavelengths.
KQ2ARL (X) - Large replication difference for all wavelengths.
MCFGGJ (X) - Extreme data for all wavelengths.

Key to Instrument Codes Reported by Participants

AE	Datacolor 110	AJ	Datacolor 600	AP	Datacolor 750
AQ	Datacolor 600x	AS	Datacolor 800	AT	Datacolor 850
AU	Datacolor 1000	AW	Datacolor 1050	CA	Cary 5000
GE	BYK-Gardner Spectro2-Guide Sphere Gloss	HP	Hunter UltraScan PRO	MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a	MP	Minolta CM-36dG	MT	Minolta CM-2600d
MV	Minolta CM-3000d Spectrophotometer	MW	Minolta CM 3700a Spectrophotometer	SI	SHIMADZU 3700i
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	XG	X-Rite Ci7860 Benchtop Spectrophotometer
XH	X-Rite Color i5 Benchtop Spectrophotometer	XI	X-Rite Color i7 Benchtop Spectrophotometer	XO	X-Rite SP64 Portable Sphere Spectrophotometer
XU	X-Rite Color Premier 8200 Spectrophotometer	XX	Instrument make/model not specified by lab		

WebCode	Data Flag	Sample F251 Lab Mean	Sample F251 Diff from Grand Mean	Sample F251 CPV	Sample F252 Lab Mean	Sample F252 Diff from Grand Mean	Sample F252 CPV	Instr Code
2KXW4L		35.68	-0.23	-0.27	47.03	0.13	0.14	GK
2WCU9P	*	33.48	-2.43	-2.82	44.98	-1.92	-2.07	GN
44MUJJ		36.13	0.22	0.25	46.15	-0.74	-0.80	GL
4TL8RM		35.45	-0.46	-0.53	46.33	-0.57	-0.61	GK
6H3EFH		36.33	0.42	0.48	46.93	0.03	0.04	GL
6V988U		34.68	-1.23	-1.43	46.50	-0.39	-0.42	DE
79PKYU		34.93	-0.98	-1.14	45.43	-1.47	-1.58	GL
7N6KTY		37.43	1.52	1.76	47.95	1.06	1.14	RA
8D4KUZ		35.90	-0.01	-0.01	46.73	-0.17	-0.18	GL
8FA3UG		34.88	-1.03	-1.20	46.98	0.08	0.09	GL
8R3NXR		36.75	0.84	0.97	47.55	0.66	0.71	GL
8UN94V		36.20	0.29	0.34	46.70	-0.19	-0.21	GL
9J4JHV		35.83	-0.08	-0.10	46.55	-0.34	-0.37	GL
BJD8XD		35.90	-0.01	-0.01	47.68	0.78	0.85	GL
CK3XHH		37.03	1.12	1.29	47.50	0.61	0.66	GL
CPWRFJ		35.98	0.07	0.08	47.58	0.68	0.74	GN
DMLAVT		36.05	0.14	0.16	46.35	-0.54	-0.58	GL
DWA48P	*	38.53	2.62	3.03	48.93	2.03	2.19	RC
E4P42R		36.30	0.39	0.45	46.48	-0.42	-0.45	GL
EEQRVA		37.20	1.29	1.50	47.90	1.01	1.09	RQ
EKE9AL		36.65	0.74	0.86	47.05	0.16	0.17	GL
EXF68E		36.36	0.45	0.52	47.40	0.50	0.54	GL
FP63MD		34.60	-1.31	-1.52	45.70	-1.19	-1.28	GL
G38T2Q		34.83	-1.08	-1.26	45.60	-1.29	-1.39	GL
HA4BT8		35.13	-0.78	-0.91	46.83	-0.07	-0.07	GN
K4MPVK		35.33	-0.58	-0.68	46.93	0.03	0.04	GL
K72UUJ		36.05	0.14	0.16	47.40	0.51	0.55	GL
KJ2QRB		36.08	0.17	0.19	47.58	0.68	0.74	GL
KMZ4DF		35.58	-0.33	-0.39	47.20	0.31	0.33	GL
L3C3X7		37.20	1.29	1.50	47.38	0.48	0.52	GL
LKRBX8		35.15	-0.76	-0.88	46.30	-0.59	-0.64	GL
LVQ7W3		36.35	0.44	0.51	46.53	-0.37	-0.39	GD
LZLZU4		36.35	0.44	0.51	47.55	0.66	0.71	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample F251 Lab Mean	Sample F251 Diff from Grand Mean	Sample F251 CPV	Sample F252 Lab Mean	Sample F252 Diff from Grand Mean	Sample F252 CPV	Instr Code
M4JJUG		35.18	-0.73	-0.85	45.55	-1.34	-1.45	GN
M822P8		35.88	-0.03	-0.04	45.73	-1.17	-1.26	RA
MCFGGJ	X	42.13	6.22	7.20	47.95	1.06	1.14	GL
MH7RT4		37.30	1.39	1.61	47.70	0.81	0.87	GL
N3JYH2		36.33	0.42	0.48	47.58	0.68	0.74	GL
NHZWKG		35.58	-0.33	-0.39	46.73	-0.17	-0.18	MW
NJ97DE	*	36.38	0.47	0.54	48.95	2.06	2.22	ZA
NRMVD8		35.50	-0.41	-0.47	46.18	-0.72	-0.77	GL
PEUTA7		36.63	0.72	0.83	46.25	-0.64	-0.69	MX
QEN2TA		35.70	-0.21	-0.24	48.03	1.13	1.22	GK
QRDZKC		35.20	-0.71	-0.82	46.38	-0.52	-0.56	GL
R9HLMY		36.08	0.17	0.19	47.48	0.58	0.63	GL
RB9NQ2		36.42	0.51	0.59	47.64	0.75	0.81	GL
RMCBGA		36.10	0.19	0.22	47.95	1.06	1.14	NH
RVRVZA		35.38	-0.53	-0.62	46.63	-0.27	-0.29	GL
TCEV7Y		34.75	-1.16	-1.34	45.25	-1.64	-1.77	GK
TGRBYC		35.65	-0.26	-0.30	47.35	0.46	0.50	GL
TXC2XB		36.18	0.27	0.31	47.47	0.57	0.62	GL
TY9KYC		36.05	0.14	0.16	48.10	1.21	1.30	GL
U2QY3D		37.20	1.29	1.50	48.35	1.46	1.57	GK
UJCMD8		35.15	-0.76	-0.88	46.35	-0.54	-0.58	GL
UQC2ZU		35.68	-0.23	-0.27	46.33	-0.57	-0.61	GN
VXR3VX		34.05	-1.86	-2.16	44.78	-2.12	-2.28	EN
WAZ8J6		35.38	-0.53	-0.62	45.43	-1.47	-1.58	XX
WE9T83		36.55	0.64	0.74	46.55	-0.34	-0.37	RA
WGDFK7		35.35	-0.56	-0.65	45.83	-1.07	-1.15	GL
XPM4X6		36.25	0.34	0.39	47.60	0.71	0.77	GL
YH42Q3		36.50	0.59	0.68	47.75	0.86	0.93	GN
YYNRP2	X	41.20	5.29	6.13	41.40	-5.49	-5.92	GK

Summary Statistics

Grand Means			
	35.91 Gloss Units		46.89 Gloss Units
Stnd Dev Btwn Labs			
	0.86 Gloss Units		0.93 Gloss Units

Statistics based on 60 of 62 reporting participants

Comments on Assigned Data Flags for Test #440

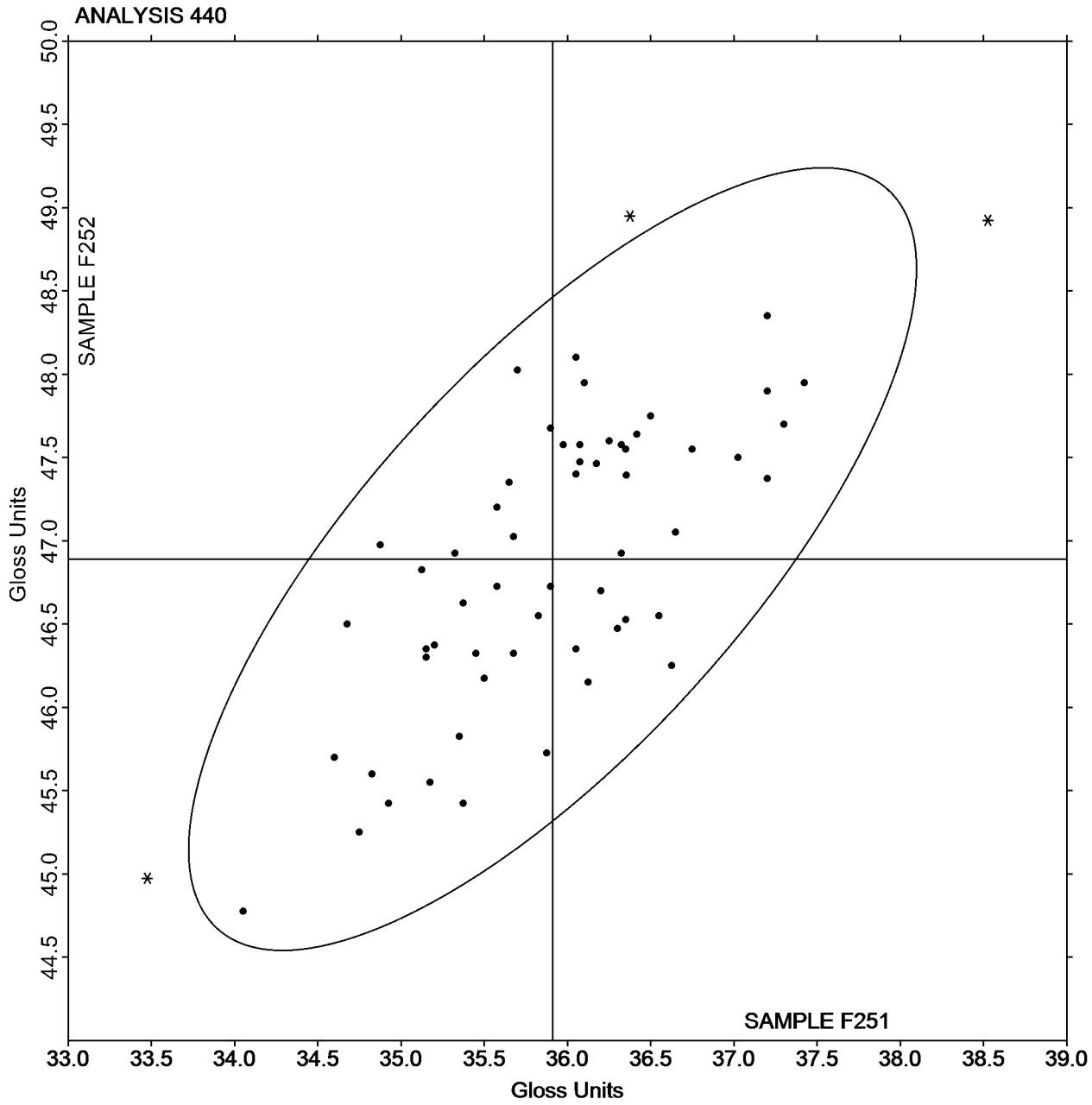
MCFGGJ(X) - Extreme data for Sample F251.

YYNRP2(X) - Extreme data.

Key to Instrument Codes Reported by Participants

DE	DeFelsko PosiTector GLS 60	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
MW	Minolta Multi-Gloss 268	MX	Minolta Multi-Gloss 268 Plus
NH	3nh NHG268 Multi-angle Precise Gloss Meter	RA	Rhopoint Novo-Gloss Glossmeter
RC	Novo-Gloss Trio 20/60/85 Glossmeter	RQ	Rhopoint IQ Goniophotometer 20/60/85°
XX	Instrument make/model not specified by lab	ZA	Zehntner ZGM Series

SAMPLE F251 = 35.91 Gloss Units SAMPLE F252 = 46.89 Gloss Units



-End of Report-