Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #210 - 4th Qtr 2024

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.

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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
2KDJPM		D241	61.00	-20.29	5.88	1.02	-0.01	-0.37	1.08	XU
		D242	62.02	-20.30	5.51					
2MJ4DM		D241	59.96	-20.24	5.62	1.03	-0.09	-0.39	1.10	PR
		D242	60.99	-20.32	5.23					
3XXPT2		D241	60.70	-20.16	5.72	1.07	-0.04	-0.45	1.16	HY
		D242	61.77	-20.20	5.27					
6Q8RFX		D241	60.23	-20.24	5.88	1.07	-0.02	-0.40	1.15	GG
		D242	61.31	-20.26	5.47					
78CKMX		D241	60.27	-20.17	5.60	1.03	-0.02	-0.40	1.11	GA
		D242	61.30	-20.20	5.20					
7AWRKZ		D241	60.87	-20.59	6.11	1.04	0.00	-0.40	1.11	BG
		D242	61.91	-20.59	5.71					
9DQ9AY		D241	60.80	-20.26	5.32	1.03	-0.12	-0.46	1.14	HW
		D242	61.84	-20.38	4.85					
9LPQTG		D241	61.09	-20.19	5.83	1.01	-0.04	-0.39	1.08	XV
		D242	62.10	-20.23	5.44					
9Z3433		D241	60.71	-20.43	5.84	0.95	-0.01	-0.44	1.05	HM
		D242	61.67	-20.43	5.39					
AJBMDW		D241	61.10	-20.40	5.60	1.00	0.00	-0.40	1.08	HL
		D242	62.10	-20.40	5.20					
C28UKT		D241	60.88	-20.37	5.92	0.95	-0.06	-0.44	1.05	XU
		D242	61.83	-20.43	5.48					
C897GQ		D241	61.14	-20.16	5.53	1.06	-0.02	-0.38	1.12	HL
		D242	62.20	-20.17	5.15					
CLQR6Q		D241	60.91	-20.27	5.93	1.08	-0.07	-0.44	1.17	XU
		D242	61.98	-20.35	5.48					
E2HBRR		D241	61.15	-20.60	5.15	1.10	0.00	-0.35	1.15	HW
		D242	62.25	-20.60	4.80					
E3U94N	X	D241	60.89	-20.24	5.79	4.43	2.11	0.02	4.91	XP
		D242	65.32	-18.13	5.82					
EE2Y2P	X	D241	61.24	-19.94	5.18	1.09	0.06	-0.37	1.15	XD
		D242	62.33	-19.88	4.81					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
F42PVR		D241	61.07	-20.39	6.84	0.98	-0.04	-0.41	1.06	GE
		D242	62.05	-20.43	6.43					
F7MU4P		D241	61.40	-20.20	5.90	1.00	-0.05	-0.40	1.08	HL
		D242	62.40	-20.25	5.50					
FRPMAU		D241	61.08	-20.03	5.34	1.02	-0.02	-0.42	1.10	XJ
		D242	62.10	-20.05	4.92					
G8ZJ9M		D241	60.87	-20.28	5.94	1.01	-0.06	-0.42	1.10	XU
		D242	61.88	-20.34	5.52					
HAZ744		D241	60.93	-20.23	5.59	0.98	-0.05	-0.39	1.06	XO
		D242	61.91	-20.28	5.19					
HHN8DL		D241	60.99	-20.24	5.80	1.00	-0.02	-0.36	1.06	XU
		D242	61.99	-20.26	5.44					
JJ3VCR		D241	59.89	-20.10	5.78	1.01	-0.09	-0.43	1.11	HX
		D242	60.90	-20.19	5.35					
KC2WJG		D241	60.85	-20.37	5.06	1.03	-0.05	-0.43	1.12	HW
		D242	61.88	-20.42	4.64					
L6A92G		D241	60.99	-20.30	5.85	0.95	-0.05	-0.44	1.04	XU
		D242	61.93	-20.35	5.41					
L8H42M		D241	61.25	-20.12	5.55	0.96	0.01	-0.39	1.04	DB
		D242	62.21	-20.11	5.16					
LHGWDK		D241	60.75	-20.24	5.20	1.02	-0.02	-0.38	1.09	HW
		D242	61.77	-20.27	4.82					
MLBEPG		D241	60.29	-20.38	5.89	1.01	0.02	-0.39	1.08	GG
		D242	61.30	-20.36	5.50					
MUN94J		D241	61.15	-20.50	5.80	1.05	0.05	-0.30	1.09	HL
		D242	62.20	-20.45	5.50					
NLUKLL		D241	61.05	-19.99	5.53	0.97	-0.15	-0.46	1.08	MS
		D242	62.02	-20.13	5.08					
PKTZFY		D241	61.15	-20.18	5.72	0.96	-0.09	-0.55	1.11	XM
		D242	62.11	-20.27	5.18					
PW9VTC	X	D241	62.01	-19.94	5.77	0.50	-0.07	-0.34	0.61	XE
		D242	62.52	-20.01	5.43					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
Q9UTTD		D241	60.41	-20.25	5.92	1.05	-0.04	-0.42	1.13	GG
		D242	61.45	-20.29	5.49					
TGMLEC		D241	60.83	-20.21	5.88	1.02	-0.04	-0.40	1.10	XS
		D242	61.85	-20.25	5.47					
TVMHJW		D241	60.46	-20.18	5.75	0.81	-0.11	-0.50	0.96	XG
		D242	61.27	-20.29	5.25					
TWYYWA		D241	60.48	-20.25	5.91	1.01	-0.04	-0.39	1.09	GG
		D242	61.49	-20.29	5.52					
TXA48D		D241	60.19	-20.29	5.66	0.74	-0.08	-0.52	0.91	HX
		D242	60.93	-20.37	5.15					
UZTDZB		D241	60.69	-20.29	5.08	1.05	-0.05	-0.45	1.14	MG
		D242	61.74	-20.34	4.63					
VWRPWA		D241	61.21	-20.33	5.88	0.98	-0.09	-0.45	1.08	GH
		D242	62.18	-20.42	5.43					
WTH78C	X	D241	60.88	-20.93	6.19	1.03	0.00	-0.41	1.11	BG
		D242	61.91	-20.93	5.78					
WZK7NT		D241	61.12	-20.28	6.83	0.99	-0.14	-0.44	1.09	GE
		D242	62.11	-20.42	6.39					
X6UQB6	X	D241	61.20	-20.54	5.67	1.24	-0.19	-0.40	1.32	XW
		D242	62.44	-20.73	5.27					
XLFA47		D241	60.80	-20.41	5.64	1.00	0.02	-0.33	1.06	MT
		D242	61.80	-20.39	5.31					
Y2BXTB		D241	61.68	-20.31	5.89	0.92	-0.05	-0.33	0.98	XE
		D242	62.60	-20.35	5.56					
YPW2N8		D241	60.58	-19.80	5.51	1.27	-0.14	-0.43	1.34	MS
		D242	61.84	-19.94	5.07					
ZDYDC6		D241	60.99	-20.11	5.27	1.04	-0.05	-0.41	1.12	XQ
		D242	62.03	-20.16	4.86					
ZF3C7A		D241	60.57	-20.36	5.55	1.00	-0.03	-0.34	1.05	XF
		D242	61.56	-20.39	5.21					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D241	60.86	-20.25	5.72	1.01	-0.05	-0.41	1.09
D242	61.88	-20.30	5.31				
Stnd Dev Btwn Labs							
D241	0.37	0.15	0.36	0.08	0.04	0.05	0.06
D242	0.36	0.14	0.36				

Statistics based on 42 of 47 reporting participants

Comments Assigned on Data Flags for Test #408

E3U94N(X) - Extreme data for L* & a* for sample D242 values. Inconsistent in testing between the b* values for both samples. Large Delta L, a, b & E.

EE2Y2P(X) - High a* value for Sample D242.

PW9VTC(X) - High L* value for Sample D241. Large replication difference for L* Sample D241. Small Delta L & E.

WTH78C(X) - Low a* values for both samples.

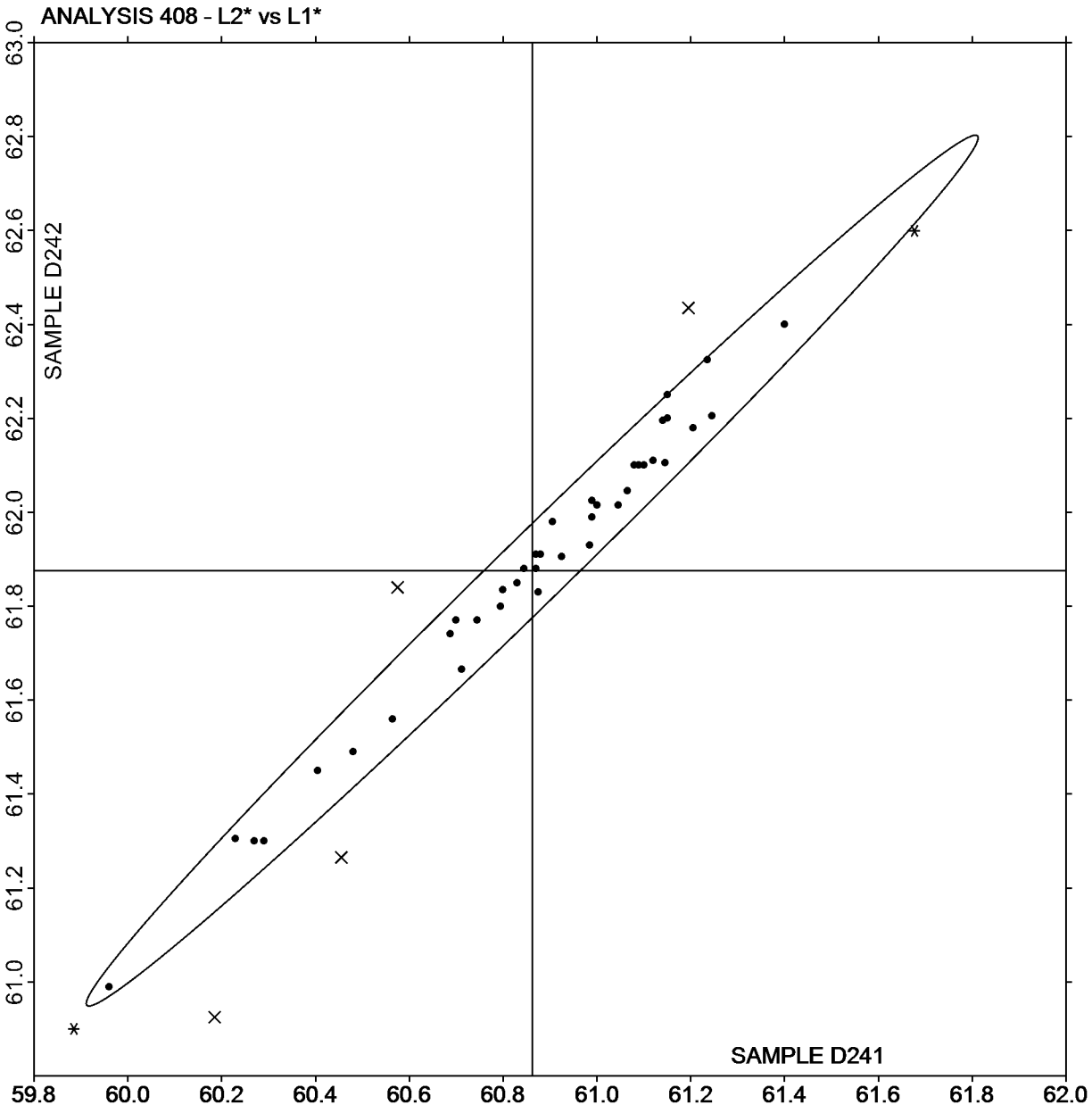
X6UQB6(X) - Inconsistent in testing between the L* values for both samples. Large replication difference for L* Sample D241. Low a* value for Sample D242. Large Delta L & E, small Delta a.

Key to Instrument Codes Reported by Participants

BG	BYK Mac i	DB	Datacolor 110
GA	BYK-Gardner	GE	BYK-Gardner spectro-guide (45/0)
GG	BYK-Gardner spectro2-guide (45/0) gloss	GH	BYK-Gardner Color-View
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	XF	X-Rite i1 iSis
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
XV	X-Rite 939	XW	X-Rite

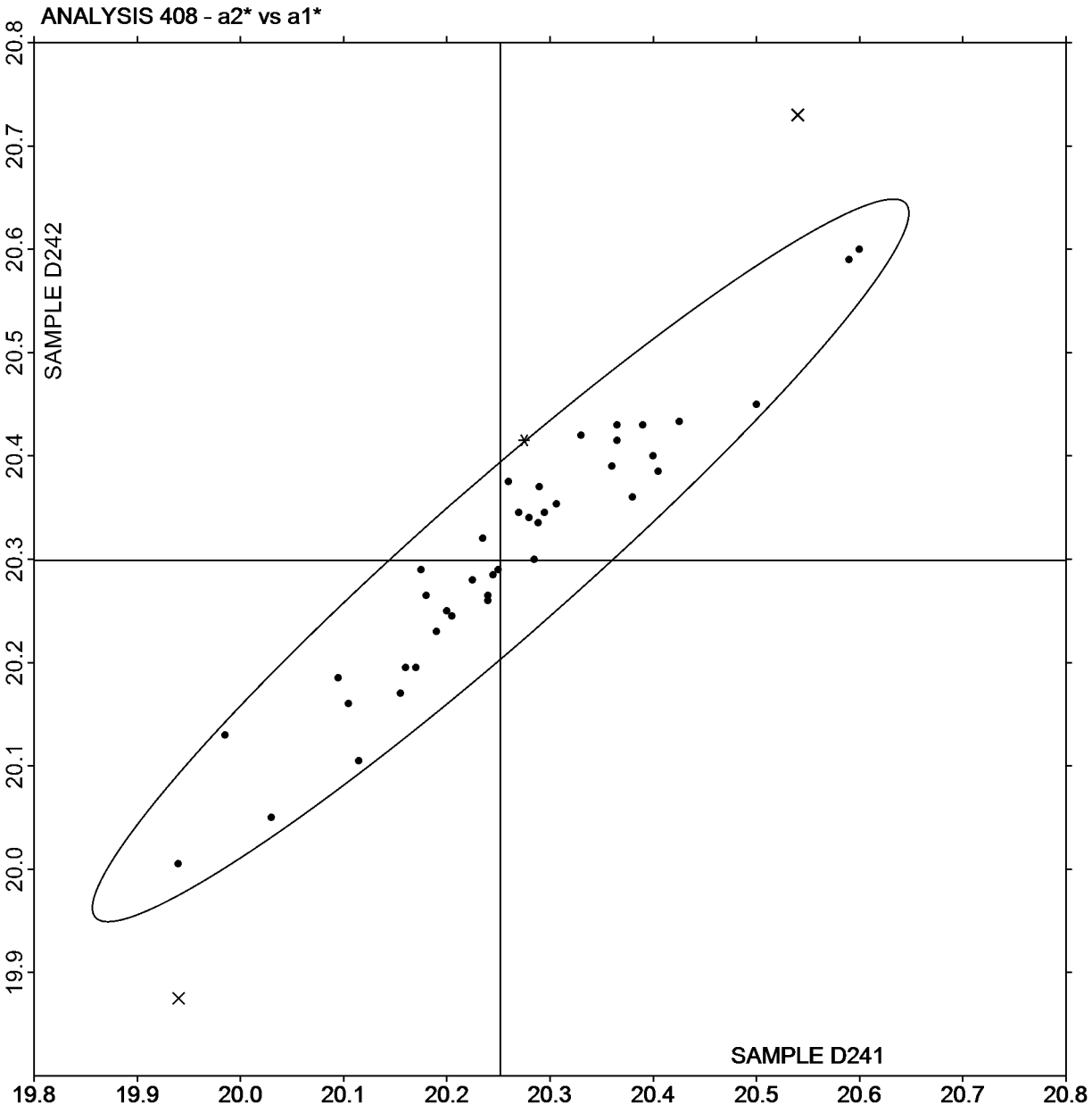
L2* vs L1*

SAMPLE D241 = 60.86 SAMPLE D242 = 61.88



a2* vs a1*

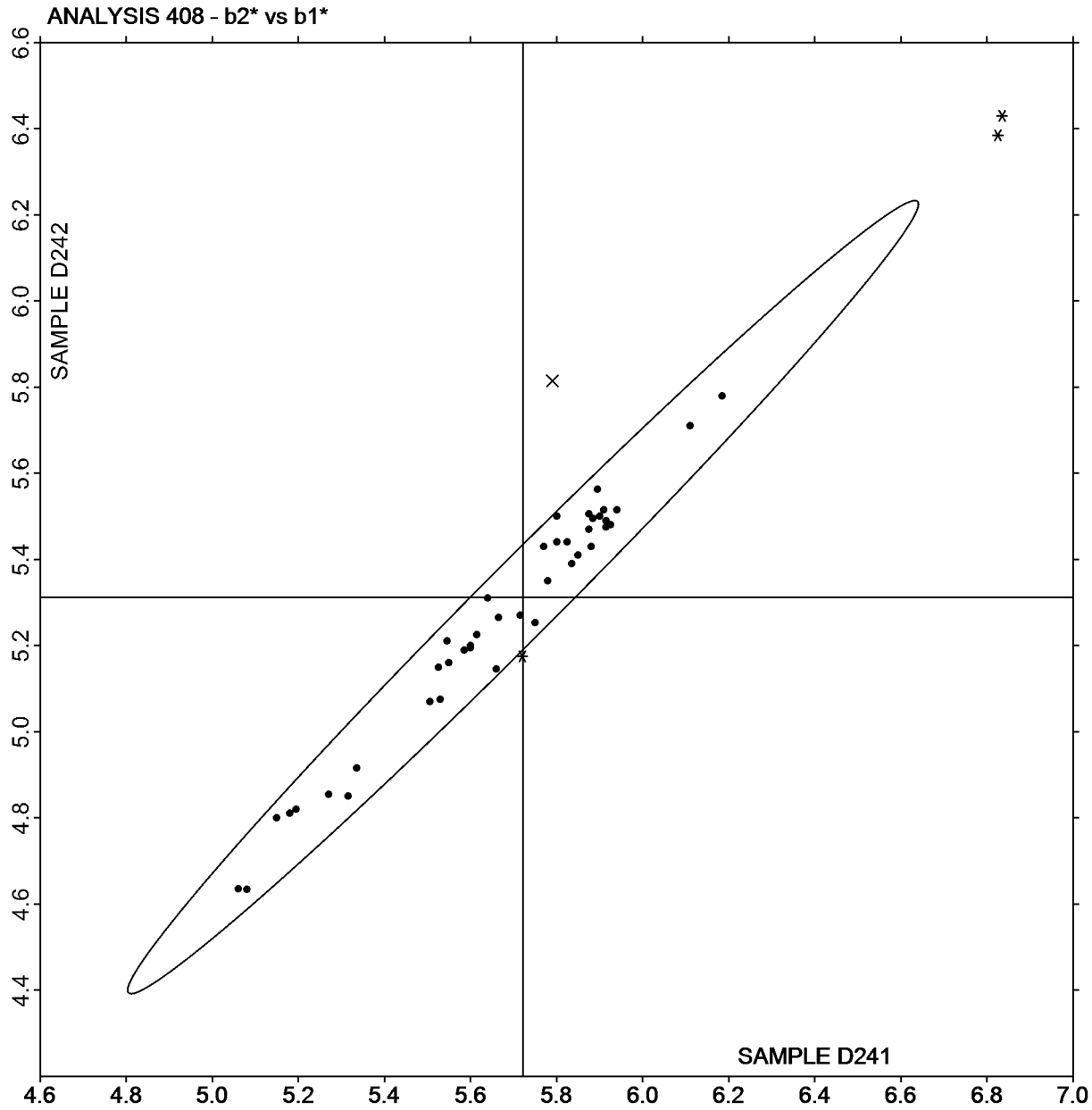
SAMPLE D241 = -20.25 SAMPLE D242 = -20.30



Plot created using absolute values.

b2* vs b1*

SAMPLE D241 = 5.72 SAMPLE D242 = 5.31



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
292DCZ		D241	61.09	-20.02	5.38	1.00	-0.12	-0.45	1.10	XD
		D242	62.09	-20.15	4.93					
2GXBY3		D241	61.13	-19.84	5.40	1.06	-0.03	-0.43	1.14	AO
		D242	62.19	-19.87	4.98					
2KDJPM		D241	60.89	-19.94	5.34	1.00	-0.12	-0.46	1.11	XH
		D242	61.89	-20.06	4.88					
2MJ4DM		D241	61.17	-20.17	5.47	0.91	-0.07	-0.39	0.99	CA
		D242	62.08	-20.24	5.07					
2TKM87		D241	61.24	-20.01	5.66	1.03	-0.03	-0.45	1.12	AS
		D242	62.27	-20.04	5.21					
3XEWYJ		D241	61.20	-20.22	5.55	1.02	0.00	-0.43	1.11	AS
		D242	62.22	-20.22	5.12					
3YT9V3		D241	61.11	-19.82	5.37	0.95	-0.15	-0.45	1.07	XH
		D242	62.06	-19.97	4.92					
43LQA7		D241	61.10	-20.09	5.69	1.00	-0.04	-0.41	1.08	MP
		D242	62.10	-20.14	5.28					
6LWY6Y		D241	61.01	-20.01	5.43	0.96	-0.11	-0.45	1.07	XI
		D242	61.97	-20.12	4.98					
6QLFE4		D241	61.29	-20.08	5.59	1.01	-0.04	-0.38	1.08	AU
		D242	62.29	-20.11	5.21					
6V69WY		D241	61.01	-20.04	5.44	0.99	-0.09	-0.42	1.08	XH
		D242	62.00	-20.13	5.02					
77XFNZ	X	D241	61.59	-20.53	5.36	1.02	-0.05	-0.42	1.10	CA
		D242	62.61	-20.59	4.94					
78CKMX		D241	61.27	-20.00	5.60	1.01	-0.01	-0.43	1.10	AJ
		D242	62.28	-20.01	5.17					
7JKJBX		D241	61.21	-19.98	5.39	0.98	-0.07	-0.46	1.08	AO
		D242	62.19	-20.05	4.93					
7PBXVY		D241	61.29	-20.06	5.46	1.04	0.01	-0.36	1.10	HP
		D242	62.33	-20.05	5.10					
7RC2KZ		D241	61.34	-20.03	5.52	1.04	-0.05	-0.35	1.10	HP
		D242	62.38	-20.08	5.17					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
7WAFEH		D241	61.23	-20.14	5.65	0.99	-0.10	-0.42	1.08	MW
		D242	62.22	-20.24	5.24					
8BNZCF		D241	61.03	-20.25	5.53	1.02	-0.04	-0.38	1.09	MV
		D242	62.05	-20.29	5.16					
8CKJDG		D241	61.13	-20.02	5.44	1.00	-0.09	-0.44	1.10	XD
		D242	62.13	-20.10	5.00					
8KXB4F	X	D241	61.76	-20.33	5.72	1.02	-0.08	-0.49	1.13	HP
		D242	62.78	-20.41	5.24					
97UBMW		D241	61.10	-19.98	5.42	0.99	-0.06	-0.40	1.07	XD
		D242	62.10	-20.04	5.02					
986BMW		D241	60.98	-20.06	5.24	1.04	0.02	-0.37	1.10	XE
		D242	62.02	-20.04	4.87					
9JHD33		D241	61.25	-19.90	5.52	1.01	-0.09	-0.44	1.11	AU
		D242	62.26	-19.99	5.08					
9RQ3PE		D241	61.28	-19.97	5.39	1.00	-0.12	-0.47	1.11	AO
		D242	62.28	-20.09	4.92					
ABZLRV		D241	61.10	-19.98	5.49	1.03	-0.04	-0.42	1.12	XB
		D242	62.13	-20.02	5.07					
BAGYVY		D241	61.29	-20.01	5.60	1.01	-0.11	-0.46	1.11	MW
		D242	62.29	-20.12	5.15					
BR3M6U		D241	61.37	-20.01	5.51	0.93	-0.09	-0.39	1.01	AP
		D242	62.30	-20.10	5.12					
BTX78V	X	D241	62.15	-20.49	5.33	1.06	-0.01	-0.42	1.14	SI
		D242	63.21	-20.50	4.92					
C27XAX		D241	61.35	-20.11	5.61	1.04	-0.04	-0.46	1.13	AT
		D242	62.39	-20.15	5.15					
C28UKT		D241	61.10	-19.96	5.31	1.00	-0.09	-0.39	1.08	XB
		D242	62.10	-20.05	4.91					
C8CLVC		D241	60.82	-20.08	5.17	0.96	-0.02	-0.42	1.05	XF
		D242	61.79	-20.10	4.75					
CB9HCQ		D241	61.27	-20.02	5.56	1.01	-0.02	-0.45	1.10	AT
		D242	62.28	-20.04	5.12					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
CJPVFV		D241	61.17	-20.01	5.26	1.04	-0.02	-0.41	1.11	XD
		D242	62.20	-20.03	4.85					
CLQR6Q		D241	61.08	-19.95	5.34	1.03	-0.08	-0.44	1.13	XE
		D242	62.12	-20.03	4.90					
CWU8TA		D241	61.08	-20.01	5.40	1.03	-0.02	-0.41	1.11	XB
		D242	62.11	-20.03	4.99					
DAV8WX		D241	61.06	-19.89	5.34	1.02	-0.02	-0.35	1.08	XD
		D242	62.08	-19.90	4.99					
DE7EGB		D241	61.26	-20.20	5.21	1.03	-0.03	-0.38	1.10	CA
		D242	62.29	-20.23	4.83					
DLBVCQ		D241	61.35	-20.05	5.56	1.00	-0.02	-0.40	1.08	AP
		D242	62.35	-20.07	5.16					
E3U94N		D241	60.93	-20.01	5.21	1.00	0.01	-0.41	1.08	XF
		D242	61.93	-20.00	4.80					
E6W9XT		D241	61.28	-19.91	5.63	0.99	-0.08	-0.42	1.08	MT
		D242	62.28	-19.99	5.21					
EAQ7QQ		D241	61.23	-20.23	5.38	1.04	0.04	-0.36	1.10	AS
		D242	62.27	-20.19	5.02					
EW3YUP		D241	61.10	-20.07	5.40	0.98	-0.04	-0.44	1.07	XD
		D242	62.08	-20.11	4.96					
FA6WBV		D241	61.11	-20.09	5.69	1.03	-0.05	-0.44	1.13	MW
		D242	62.15	-20.14	5.25					
FMUQMN		D241	61.13	-20.12	5.41	1.01	-0.10	-0.51	1.13	AQ
		D242	62.13	-20.22	4.90					
G7HUML		D241	61.10	-19.94	5.62	1.05	-0.05	-0.40	1.12	MK
		D242	62.15	-19.99	5.22					
GGJVMK		D241	61.42	-20.08	5.66	0.98	-0.05	-0.39	1.05	AS
		D242	62.39	-20.13	5.27					
HRFF44		D241	61.16	-19.97	5.38	1.03	-0.07	-0.42	1.12	XD
		D242	62.19	-20.03	4.96					
HX8R2L	X	D241	60.52	-19.71	5.30	1.54	-0.06	-0.44	1.60	AJ
		D242	62.06	-19.77	4.87					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
JZPBFN		D241	61.07	-19.92	5.43	1.02	-0.03	-0.43	1.11	MM
		D242	62.09	-19.96	5.00					
K2D38K		D241	61.40	-20.16	5.57	1.02	-0.02	-0.43	1.10	XX
		D242	62.41	-20.18	5.15					
KZL94N		D241	61.07	-19.89	5.28	1.02	-0.03	-0.35	1.07	XD
		D242	62.08	-19.92	4.93					
L6A92G		D241	61.07	-20.04	5.42	0.99	-0.09	-0.42	1.08	XD
		D242	62.07	-20.13	5.01					
NADQCE		D241	61.12	-20.07	5.22	0.92	-0.03	-0.41	1.01	XB
		D242	62.04	-20.10	4.82					
NTUZDF		D241	61.34	-20.08	5.68	1.00	-0.05	-0.38	1.08	AJ
		D242	62.35	-20.13	5.29					
PMXT9C		D241	61.02	-19.88	5.39	1.01	-0.07	-0.46	1.11	XG
		D242	62.03	-19.95	4.93					
PUYR2L		D241	61.26	-19.85	5.52	1.03	-0.10	-0.40	1.11	XD
		D242	62.28	-19.94	5.11					
Q476FV		D241	61.27	-20.04	5.61	0.99	-0.13	-0.51	1.12	AU
		D242	62.26	-20.17	5.10					
QG9BRE		D241	61.30	-20.13	5.59	1.03	-0.09	-0.44	1.12	AT
		D242	62.33	-20.21	5.15					
QZNKTF		D241	60.90	-20.08	5.23	0.99	-0.07	-0.39	1.06	XI
		D242	61.88	-20.15	4.84					
RA9BUX		D241	61.14	-20.24	5.41	1.09	-0.02	-0.47	1.19	MV
		D242	62.24	-20.26	4.94					
RMTQXX		D241	61.15	-20.16	5.58	0.95	-0.11	-0.43	1.05	MU
		D242	62.10	-20.27	5.14					
RPFCLE		D241	61.20	-20.29	5.57	0.93	-0.11	-0.40	1.01	MW
		D242	62.12	-20.40	5.17					
RQT2TX		D241	61.09	-19.95	5.49	1.00	-0.07	-0.39	1.08	MM
		D242	62.09	-20.02	5.10					
TGMLEC		D241	61.09	-20.06	5.61	1.05	-0.01	-0.43	1.13	AJ
		D242	62.14	-20.07	5.18					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
TWYYWA		D241	60.93	-19.96	5.58	1.00	-0.05	-0.35	1.06	GE
		D242	61.93	-20.00	5.23					
U28XMU		D241	61.43	-20.06	5.62	1.02	-0.08	-0.39	1.09	AW
		D242	62.45	-20.15	5.22					
UHBC7A		D241	61.06	-20.07	5.40	1.03	-0.01	-0.39	1.10	XD
		D242	62.09	-20.08	5.00					
UQ8ATC	X	D241	95.04	1.92	-8.42	-0.03	-0.04	0.11	0.12	HP
		D242	95.01	1.89	-8.31					
VRWV2T		D241	61.04	-19.96	5.75	0.99	-0.08	-0.44	1.09	MW
		D242	62.04	-20.04	5.32					
VWRPWA		D241	61.26	-20.19	5.45	1.02	-0.06	-0.46	1.12	MV
		D242	62.28	-20.25	4.99					
VYX8XQ		D241	60.98	-20.04	5.18	1.04	-0.05	-0.39	1.11	XO
		D242	62.02	-20.09	4.79					
WE293B		D241	61.06	-20.11	5.70	1.03	-0.05	-0.40	1.10	MB
		D242	62.09	-20.16	5.31					
WJK2J7		D241	61.25	-20.09	5.42	0.98	-0.04	-0.43	1.07	AT
		D242	62.23	-20.13	4.99					
WKQQH9		D241	61.26	-20.27	5.37	1.04	-0.02	-0.41	1.12	AJ
		D242	62.30	-20.29	4.97					
WZK7NT	X	D241	60.63	-20.05	5.46	1.00	-0.17	-0.45	1.11	GD
		D242	61.63	-20.22	5.01					
XFP2E7		D241	61.19	-20.14	5.42	1.04	-0.04	-0.41	1.12	AJ
		D242	62.23	-20.17	5.01					
XGKKF8		D241	61.13	-19.91	5.34	1.02	-0.05	-0.39	1.10	XD
		D242	62.16	-19.97	4.95					
XLFA47		D241	61.22	-20.30	5.46	1.01	0.03	-0.35	1.07	XB
		D242	62.23	-20.28	5.11					
Y348H7		D241	61.09	-19.89	5.41	1.06	-0.01	-0.40	1.14	XG
		D242	62.15	-19.91	5.00					
Y3LZEA		D241	61.06	-20.10	5.27	1.00	-0.02	-0.35	1.07	XE
		D242	62.07	-20.12	4.92					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
YDMJV6		D241	61.34	-20.11	5.49	0.98	-0.02	-0.38	1.05	AT
		D242	62.32	-20.13	5.11					
YHEK2P		D241	61.08	-20.33	5.24	1.03	-0.03	-0.40	1.11	XC
		D242	62.12	-20.36	4.84					
YJ7QDA		D241	61.44	-20.07	5.62	1.00	-0.03	-0.41	1.07	AU
		D242	62.44	-20.09	5.21					
YPW2N8		D241	61.01	-19.89	5.51	1.01	-0.10	-0.45	1.10	MS
		D242	62.01	-19.99	5.07					
Z7ZVU8		D241	60.91	-19.99	5.43	1.05	0.02	-0.39	1.12	AS
		D242	61.95	-19.97	5.03					
ZDYDC6		D241	61.07	-19.86	5.43	1.04	-0.05	-0.43	1.12	XD
		D242	62.11	-19.92	5.00					
ZKXZ6P		D241	61.05	-19.87	5.39	1.03	-0.08	-0.42	1.12	XG
		D242	62.08	-19.95	4.97					
ZVJ4B4		D241	61.25	-20.02	5.35	1.03	-0.01	-0.39	1.10	HP
		D242	62.28	-20.04	4.96					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D241	61.16	-20.04	5.46	1.01	-0.05	-0.41	1.09
D242	62.17	-20.09	5.04				
Stnd Dev Btwn Labs							
D241	0.14	0.12	0.14	0.03	0.04	0.03	0.03
D242	0.15	0.12	0.14				

Statistics based on 82 of 88 reporting participants

Comments Assigned on Data Flags for Test #409

77XFNZ(X) - Low a* values for both samples. Large replication difference for a* values for both samples.

8KXB4F(X) - High L* values for both samples.

BTX78V(X) - Extreme data for both L* values. Low a* values for both samples. Large replication difference for a* Sample D241.

HX8R2L(X) - Low L* values for Sample D241. Large replication difference for L* Sample D241. Large Delta L & E.

UQ8ATC(X) - Extreme data for both samples for all values. Lab apparently measured back of the samples.

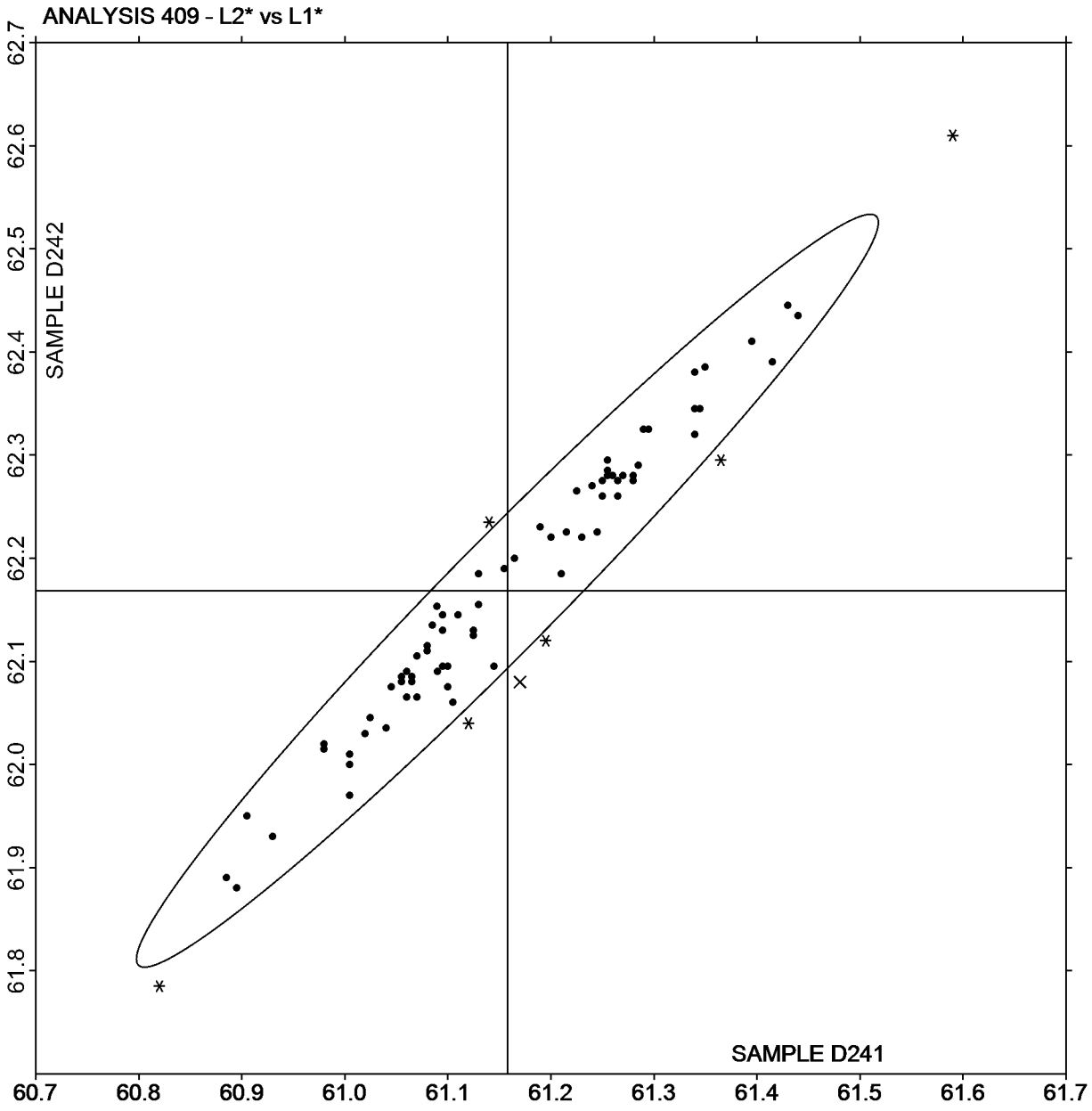
WZK7NT(X) - Low L* values for both samples. Small Delta a

Key to Instrument Codes Reported by Participants

AJ	Datacolor 600	AO	Datacolor 650x
AP	Datacolor 750	AQ	Datacolor 600x
AS	Datacolor 800	AT	Datacolor 850
AU	Datacolor 1000	AW	Datacolor 1050
CA	Cary 5000	GD	BYK-Gardner Spectro-Guide Sphere
GE	BYK-Gardner Spectro2-Guide Sphere Gloss	HP	Hunter UltraScan PRO
MB	Minolta CM 3700d Spectrophotometer	MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a	MP	Minolta CM-36dG
MS	Minolta CM-600d	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	XX	Instrument make/model not specified by lab

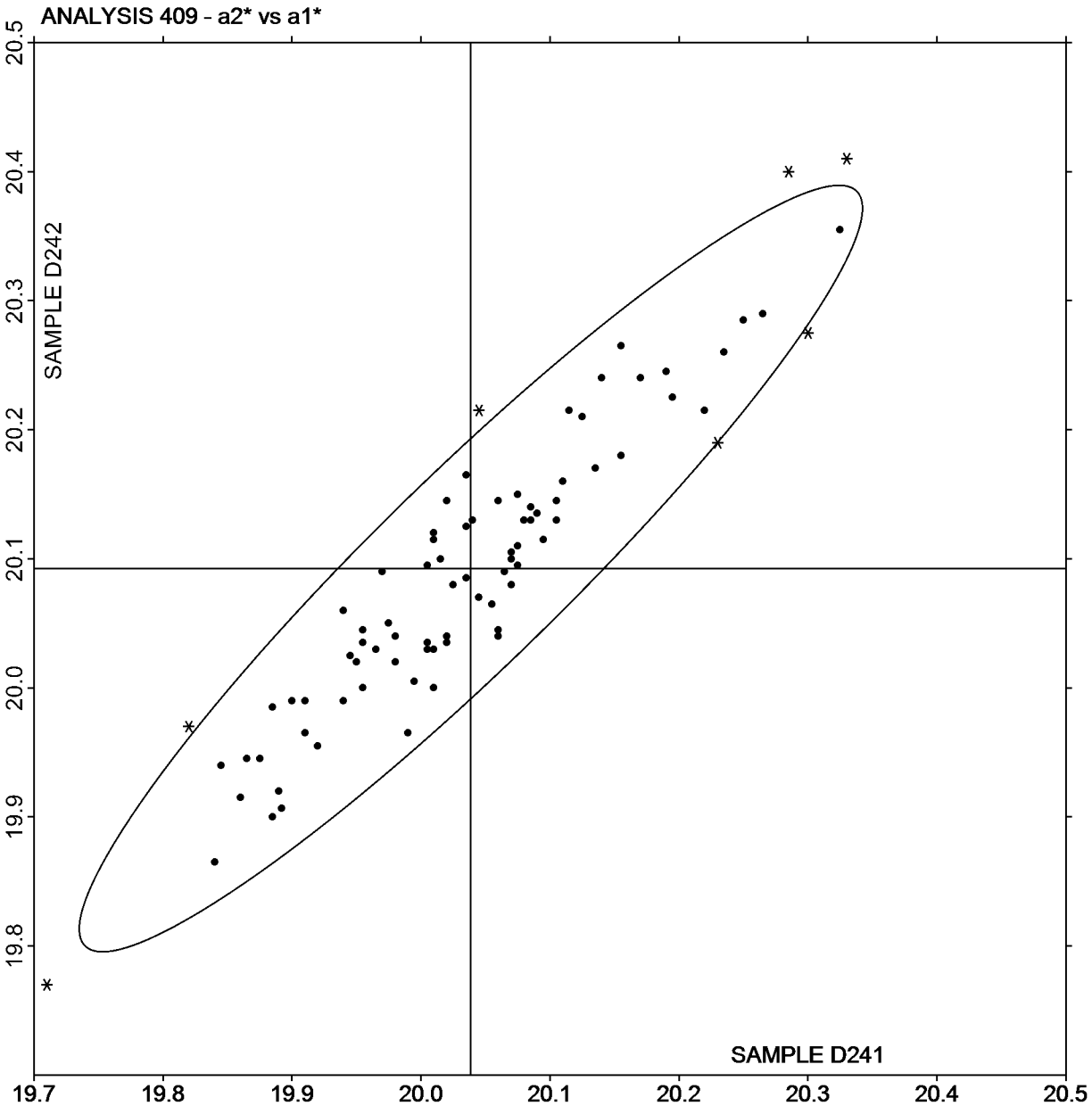
L2* vs L1*

SAMPLE D241 = 61.16 SAMPLE D242 = 62.17



a2* vs a1*

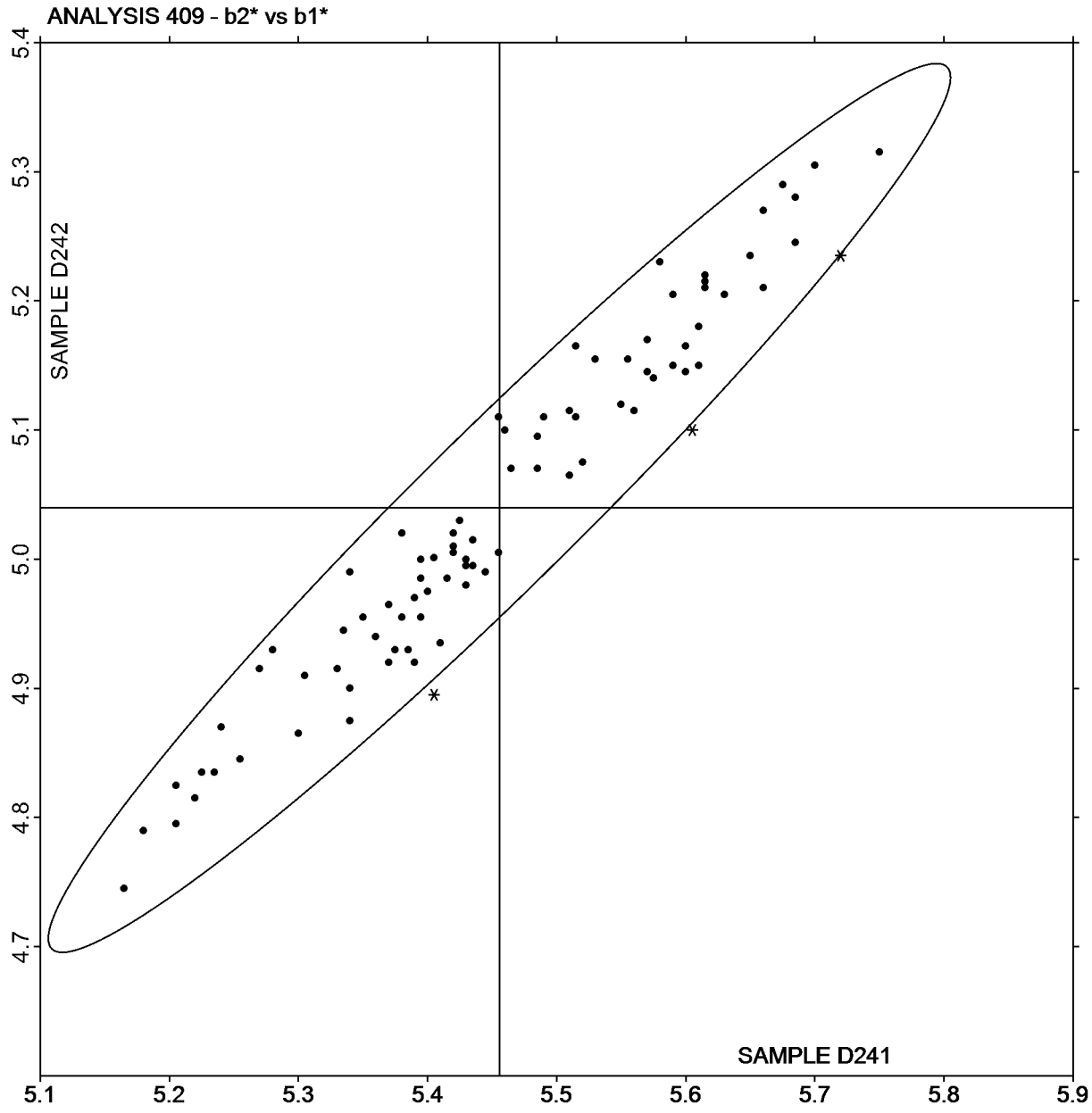
SAMPLE D241 = -20.04 SAMPLE D242 = -20.09



Plot created using absolute values.

b2* vs b1*

SAMPLE D241 = 5.46 SAMPLE D242 = 5.04



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 D241																		
2GXBY3		16.56	20.55	24.61	27.59	28.73	31.70	36.59	37.76	30.88	23.96	20.35	18.53	18.28	18.97	18.59	16.90	AN
2KDJPM		16.93	20.42	24.43	27.33	28.27	31.23	36.27	37.69	30.43	23.65	20.11	18.29	18.00	18.86	18.52	16.78	XH
2MJ4DM		17.00	20.33	24.71	27.62	28.45	31.53	36.67	38.45	30.89	23.75	20.28	18.38	18.03	19.00	18.81	17.17	CA
2TKM87		16.82	20.27	24.59	27.51	28.56	31.52	36.62	38.14	31.13	24.02	20.46	18.52	18.23	19.13	18.76	16.95	AS
3XEWYJ		17.42	20.40	24.62	27.55	28.57	31.55	36.65	38.20	31.00	23.88	20.32	18.34	18.07	18.98	18.69	16.99	AS
3YT9V3		17.05	20.57	24.71	27.52	28.52	31.50	36.54	38.01	30.76	23.85	20.33	18.52	18.20	19.07	18.65	16.92	XH
43LQA7		16.76	20.22	24.47	27.41	28.32	31.32	36.51	38.33	30.84	23.72	20.24	18.37	18.04	19.03	18.94	17.40*	MP
6LWY6Y		16.99	20.38	24.52	27.40	28.45	31.45	36.46	37.91	30.63	23.72	20.18	18.34	18.02	18.93	18.63	16.88	XI
6QLFE4		16.87	20.45	24.70	27.66	28.58	31.60	36.72	38.19	31.19	24.02	20.49	18.49	18.22	19.13	18.85	16.90	AU
6V69WY		17.03	20.45	24.50	27.39	28.37	31.33	36.45	37.88	30.64	23.70	20.19	18.36	18.06	18.89	18.67	16.94	XH
77XFNZ		17.55	20.90*	25.23*	28.21X	29.09X	32.15X	37.43X	39.10X	31.33	24.11	20.58	18.63	18.26	19.26	19.05	17.29	CA
7JKJBX		16.59	20.59	24.70	27.65	28.82	31.88	36.77	37.89	30.94	24.02	20.35	18.54	18.30	19.05	18.60	16.80	AN
7PBXVY		17.41	20.52	24.88	27.63	28.67	31.67	36.71	38.36	31.08	24.09	20.45	18.44	17.82*	19.11	18.82	16.95	HP
7WAFEH		17.27	20.32	24.59	27.67	28.46	31.43	36.85	38.39	31.08	23.83	20.34	18.47	18.15	19.08	18.99	17.21	MY
8BNZCF		16.73	20.27	24.50	27.48	28.28	31.31	36.60	38.27	30.64	23.58	20.07	18.24	17.92	18.93	18.74	17.04	MV
8CKJDG		16.95	20.50	24.64	27.49	28.53	31.55	36.56	37.98	30.75	23.89	20.29	18.48	18.14	18.96	18.56	16.81	XD
8KXB4F		17.91*	21.15X	24.96	28.07X	29.20X	32.18X	37.40*	39.22X	31.46*	24.57X	20.80*	18.70*	18.13	19.33	18.66	17.49*	HP
97UBMW		16.98	20.54	24.61	27.45	28.52	31.51	36.51	37.94	30.74	23.89	20.29	18.42	18.16	18.96	18.61	16.85	XD
986BMW		17.18	20.51	24.67	27.42	28.43	31.50	36.50	37.84	30.44	23.65	20.14	18.35	18.02	18.95	18.61	16.88	XE
9JHD33		16.90	20.48	24.72	27.60	28.60	31.60	36.72	38.16	31.13	23.99	20.52	18.50	18.26	19.10	18.79	16.75	AU
9RQ3PE		17.17	20.63	24.80	27.76	28.70	31.52	36.67	38.31	31.52*	24.04	20.47	18.49	18.20	19.03	18.82	17.25	AO
ABZLRV		17.05	20.45	24.59	27.44	28.49	31.52	36.51	38.03	30.78	23.86	20.27	18.41	18.09	18.95	18.63	16.95	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 D241																		
BAGYVY		16.85	20.61	24.65	27.75	28.47	31.45	36.82	38.47	31.17	23.98	20.43	18.54	18.16	19.07	18.98	17.52*	MW
BR3M6U		17.01	20.64	24.82	27.74	28.67	31.65	36.79	38.34	31.25	24.08	20.54	18.58	18.31	19.18	19.01	17.03	AP
BTX78V	X	17.74*	21.31X	25.73X	28.83X	29.69X	32.78X	38.00X	39.92X	32.25X	24.67X	20.94X	18.87X	18.48*	19.51X	19.29*	17.63X	SI
C27XAX		17.43	20.52	24.76	27.66	28.68	31.73	36.87	38.32	31.22	24.04	20.54	18.57	18.32	19.35*	19.39X	17.31	AT
C28UKT		17.20	20.62	24.74	27.50	28.51	31.54	36.58	37.96	30.66	23.80	20.31	18.47	18.15	19.06	18.74	16.88	XB
C8CLVC		17.40	20.50	24.90	27.60	28.60	31.70	36.70	37.80	30.50	23.70	20.25	18.45	18.05	19.25	19.10	17.60X	HW
CB9HCQ		17.12	20.58	24.69	27.55	28.65	31.63	36.78	38.29	31.11	23.98	20.45	18.49	18.23	19.10	18.67	16.93	AT
CJPVFV		17.26	20.68	24.86	27.62	28.60	31.66	36.69	38.11	30.69	23.87	20.34	18.50	18.18	19.05	18.65	16.91	XD
CLQR6Q		17.19	20.54	24.72	27.46	28.44	31.50	36.55	37.86	30.69	23.86	20.28	18.42	18.10	19.01	18.67	16.83	XE
CWU8TA		18.11X	20.54	24.62	27.45	28.46	31.47	36.49	37.96	30.74	23.83	20.26	18.40	18.09	18.90	18.60	16.87	XB
DAV8WX		17.13	20.57	24.67	27.48	28.47	31.51	36.51	37.96	30.69	23.76	20.24	18.45	18.14	19.07	18.74	16.98	XD
DE7EGB		17.19	20.66	25.06	27.88	28.77	31.84	37.03	38.35	30.79	23.81	20.29	18.44	18.11	19.12	18.81	17.06	CA
DLBVCQ		17.06	20.54	24.80	27.70	28.72	31.67	36.78	38.35	31.24	24.06	20.54	18.55	18.27	19.13	19.09	17.00	AP
E3U94N		16.81	20.38	24.65	27.34	28.32	31.37	36.39	37.64	30.38	23.52*	20.01	18.61	18.40*	19.30	18.71	16.95	XF
E6W9XT		16.65	20.35	24.69	27.74	28.60	31.52	36.72	38.29	31.19	24.08	20.49	18.56	18.25	19.13	18.92	17.27	MT
EAQ7QQ		17.03	20.58	24.80	27.62	28.66	31.68	36.78	38.24	30.95	23.84	20.34	18.35	18.10	19.01	18.63	16.89	AS
EW3YUP		17.13	20.50	24.64	27.49	28.54	31.56	36.59	37.99	30.70	23.79	20.25	18.42	18.12	19.05	18.67	16.91	XD
FA6WBV		16.57	20.35	24.37	27.50	28.33	31.27	36.61	38.18	31.01	23.75	20.26	18.36	18.05	18.97	18.89	17.15	MW
FMUQMN		16.81	20.37	24.62	27.51	28.55	31.50	36.62	38.01	30.79	23.81	20.27	18.35	18.10	18.89	18.66	16.97	AQ
G7HUML		16.74	20.35	24.43	27.41	28.40	31.32	36.30	37.97	30.98	23.96	20.27	18.39	18.05	18.93	18.75	17.08	MK
GGJVMK		17.07	20.51	24.67	27.70	28.74	31.72	36.87	38.47	31.29	24.17	20.56	18.65	18.37	19.19	19.23*	16.96	AS
HRFF44		17.10	20.54	24.74	27.54	28.57	31.63	36.68	38.02	30.75	23.87	20.36	18.55	18.23	19.13	18.66	17.00	XD

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 D241																		
HX8R2L		16.73	20.60	24.62	27.45	28.53	31.47	37.95X	37.64	30.75	23.91	20.29	18.42	18.17	18.81	18.45	16.73	AJ
JZPBFN		17.10	20.46	24.59	27.50	28.45	31.45	36.40	37.98	30.86	23.84	20.21	18.36	18.05	18.94	18.70	17.01	MM
KZL94N		18.17X	20.59	24.70	27.53	28.50	31.52	36.53	37.97	30.71	23.79	20.25	18.41	18.09	18.97	18.66	16.95	XD
L6A92G		16.94	20.48	24.62	27.47	28.48	31.48	36.58	38.06	30.74	23.72	20.22	18.39	17.99	18.89	18.65	16.83	XD
NADQCE		17.18	20.67	24.77	27.61	28.60	31.63	36.64	38.02	30.71	23.78	20.23	18.42	18.10	18.98	18.67	16.92	XB
NTUZDF		16.94	20.52	24.52	27.65	28.70	31.59	36.72	38.35	31.26	24.08	20.55	18.58	18.27	19.13	18.81	17.16	AJ
PMXT9C		17.04	20.49	24.60	27.41	28.43	31.44	36.45	37.89	30.65	23.76	20.25	18.41	18.09	18.95	18.65	16.95	XG
PUYR2L		17.11	20.59	26.24X	27.59	28.66	31.69	36.74	38.21	30.96	24.05	20.50	18.64	18.31	19.22	18.88	17.13	XD
Q476FV		17.26	20.45	24.73	27.52	28.57	31.60	36.72	38.20	31.13	23.98	20.46	18.52	18.24	19.15	19.32X	17.23	AU
QG9BRE		16.88	20.48	24.70	27.58	28.64	31.63	36.78	38.36	31.13	23.97	20.47	18.54	18.23	19.16	18.80	17.09	AT
QZNKTF		17.01	20.47	24.52	27.40	28.33	31.38	36.35	37.69	30.45	23.57	20.02	18.21	17.95	18.73*	18.42	16.65	XI
RA9BUX		16.75	20.49	24.65	27.65	28.45	31.50	36.67	38.41	30.80	23.71	20.14	18.35	18.06	19.05	18.84	17.11	MV
RMTQXX		16.72	20.42	24.52	27.58	28.42	31.40	36.78	38.24	30.92	23.73	20.25	18.40	18.07	19.03	18.92	17.14	MV
RQT2TX		16.87	20.44	24.53	27.46	28.48	31.46	36.46	37.97	30.77	23.83	20.28	18.44	18.13	19.05	18.68	16.94	MM
TWYYWA		16.21*	19.71X	24.25	27.06X	28.19*	31.28	36.34	37.71	30.66	23.64	20.06	18.21	17.92	18.74*	18.56	16.98	GE
U28XMU		17.13	20.54	24.73	27.78	28.77	31.79	36.93	38.38	31.33	24.16	20.60	18.65	18.38	19.36*	18.87	16.91	AW
UHBC7A	X	17.86*	21.71X	25.95X	28.82X	29.88X	32.95X	37.98X	39.27X	31.86X	24.77X	21.06X	19.20X	18.93X	19.83X	19.50X	17.65X	XD
VRWV2T		16.50	20.20	24.30	27.40	28.20	31.10*	36.50	38.15	30.80	23.80	20.20	18.40	18.10	19.00	18.90	17.20	MW
VWRPWA		17.03	20.53	24.82	27.69	28.62	31.73	37.06	38.32	30.90	23.81	20.36	18.50	18.25	19.18	19.00	17.22	MV
VYX8XQ		16.65	20.41	24.55	27.45	28.49	31.62	36.69	37.78	30.47	23.60	20.10	18.29	18.10	18.99	18.73	17.07	XO
WJK2J7		17.06	20.45	24.80	27.64	28.66	31.62	36.72	38.21	31.01	23.93	20.40	18.48	18.22	19.20	18.81	17.02	AT
WKQQH9		17.11	20.56	24.79	27.64	28.69	31.67	36.83	38.29	30.99	23.87	20.29	18.39	18.11	18.96	18.58	16.88	AJ

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 D241										
WZK7NT		17.17	19.83X	24.04*	27.24	28.20	31.53	35.77X	37.23X	30.49	23.91	19.31X	17.92X	17.75X	18.62X	18.46	17.35	GE
XFP2E7		17.00	20.48	24.71	27.60	28.58	31.59	36.71	38.15	30.96	23.84	20.36	18.40	18.10	18.97	18.71	16.93	AJ
XGKKF8		17.17	20.65	24.72	27.54	28.54	31.52	36.52	37.96	30.81	23.92	20.35	18.46	18.14	18.98	18.68	16.99	XD
XLFA47		16.99	20.51	24.69	27.61	28.63	31.63	36.76	38.34	30.88	23.84	20.29	18.39	17.97	18.90	18.59	16.72	XB
Y348H7		17.10	20.54	24.65	27.48	28.49	31.54	36.57	37.96	30.73	23.85	20.30	18.45	18.15	19.03	18.70	16.96	XD
YDMJV6		17.13	20.61	24.82	27.72	28.73	31.74	36.89	38.32	31.19	24.02	20.48	18.54	18.27	19.28	19.14	16.88	AT
YHEK2P		16.91	20.46	24.76	27.49	28.54	31.76	36.81	38.00	30.56	23.63	20.10	18.30	18.05	18.97	18.76	17.05	XC
YJ7QDA		17.25	20.58	24.81	27.78	28.79	31.82	36.95	38.44	31.36	24.17	20.63	18.68	18.35	19.37*	19.12	17.25	AU
YPW2N8	X	17.55	21.28X	25.52X	28.25X	29.40X	32.40X	37.52X	38.91*	31.47*	24.40X	20.78*	18.92X	18.64X	19.63X	19.38X	17.64X	MS
Z7ZVU8		16.85	20.32	24.38	27.32	28.26	31.29	36.42	37.69	30.39	23.65	20.19	18.33	18.02	18.89	18.69	17.07	AS
ZDYDC6		16.98	20.47	24.57	27.50	28.51	31.50	36.51	37.94	30.71	23.83	20.29	18.48	18.20	19.10	18.71	17.00	XD
ZKXZ6P		17.14	20.52	24.64	27.41	28.40	31.40	36.45	37.89	30.62	23.81	20.32	18.50	18.16	19.05	18.73	16.99	XG
ZVJ4B4		17.79*	20.64	24.85	27.70	28.70	31.67	36.70	38.33	30.92	24.03	20.49	18.58	17.83*	19.23	18.93	17.17	HP

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	17.05	20.49	24.68	27.56	28.55	31.56	36.67	38.11	30.88	23.87	20.31	18.45	18.13	19.04	18.77	17.02
SD Btwn Labs	0.32	0.18	0.25	0.17	0.18	0.18	0.27	0.30	0.27	0.17	0.19	0.12	0.13	0.14	0.19	0.19

BTX78V (X) - High % reflectance data for almost all wavelengths. Large replication difference for most wavelengths.

UHBC7A (X) - High % reflectance data for almost all wavelengths.

YPW2N8 (X) - High % reflectance data for most wavelengths. Large replication difference for most wavelengths.

Key to Instrument Codes Reported by Participants

AJ	Datacolor 600	AN	Datacolor 650	AO	Datacolor 650x
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
HW	Hunter UltraScan XE	MK	Macbeth Color-Eye 7000	MM	Macbeth Color-Eye 7000a
MP	Minolta CM-36dG	MS	Minolta CM-600d	MT	Minolta CM-2600d
MV	Minolta CM-3000d Spectrophotometer	MW	Minolta CM 3700a Spectrophotometer	MY	Minolta Benchtop Spectrophotometer CM-3600a
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				

WebCode	Data Flag	Sample H241 Lab Mean	Sample H241 Diff from Grand Mean	Sample H241 CPV	Sample H242 Lab Mean	Sample H242 Diff from Grand Mean	Sample H242 CPV	Instr Code
292DCZ		56.76	-0.07	-0.08	67.20	-0.15	-0.14	GL
2KDJPM		56.90	0.06	0.07	67.73	0.38	0.36	GL
2MJ4DM		56.88	0.04	0.05	66.60	-0.75	-0.71	GL
2W77CA		57.65	0.81	0.93	68.70	1.35	1.28	GL
3FDYU3		55.78	-1.06	-1.21	65.85	-1.50	-1.42	GK
3YT9V3		57.00	0.16	0.19	68.05	0.70	0.67	GL
43LQA7		56.68	-0.16	-0.18	68.03	0.68	0.64	MX
64EWAW		57.38	0.54	0.62	68.35	1.00	0.95	XX
6LWY6Y		56.90	0.06	0.07	68.03	0.68	0.64	GL
6Q8RFX		56.45	-0.39	-0.44	67.88	0.53	0.50	GL
6QLFE4		56.18	-0.66	-0.76	67.15	-0.20	-0.19	GL
78CKMX		56.20	-0.64	-0.73	68.08	0.73	0.69	GK
7WAFEH	*	57.88	1.04	1.19	66.85	-0.50	-0.47	GL
8CKJDG		56.83	-0.01	-0.01	67.28	-0.07	-0.07	GL
9JHD33		55.68	-1.16	-1.33	65.38	-1.97	-1.87	EN
C28UKT		57.43	0.59	0.68	67.88	0.53	0.50	GL
C8CLVC		54.88	-1.96	-2.24	65.20	-2.15	-2.04	GK
CLQR6Q		56.73	-0.11	-0.13	67.33	-0.02	-0.02	GL
CUNRDQ		55.85	-0.99	-1.13	67.30	-0.05	-0.04	GL
DAV8WX		57.53	0.69	0.79	66.98	-0.37	-0.35	GK
DTN2Q9		56.33	-0.51	-0.58	66.78	-0.57	-0.54	GL
E3U94N		57.38	0.54	0.62	67.60	0.25	0.24	GL
F42PVR		57.78	0.94	1.08	67.90	0.55	0.52	GL
FA6WBV		56.38	-0.46	-0.53	67.75	0.40	0.38	GN
G8ZJ9M		57.53	0.69	0.79	68.70	1.35	1.28	GL
HAZ744		58.13	1.29	1.48	68.85	1.50	1.42	GL
HHN8DL		56.75	-0.09	-0.10	66.73	-0.62	-0.59	GK
HX8R2L		56.10	-0.74	-0.84	67.35	0.00	0.00	GL
JZPBFN		57.17	0.34	0.39	67.54	0.20	0.19	GL
KZL94N		56.58	-0.26	-0.30	66.33	-1.02	-0.97	RA
L6A92G		54.68	-2.16	-2.47	65.50	-1.85	-1.75	GL
L8H42M	*	55.83	-1.01	-1.16	64.53	-2.82	-2.68	GK
LJUN6F		57.10	0.26	0.30	67.75	0.40	0.38	GK

WebCode	Data Flag	Sample H241 Lab Mean	Sample H241 Diff from Grand Mean	Sample H241 CPV	Sample H242 Lab Mean	Sample H242 Diff from Grand Mean	Sample H242 CPV	Instr Code
M4TGJJ		57.53	0.69	0.79	68.48	1.13	1.07	GN
MLBEPG		56.33	-0.51	-0.58	67.53	0.18	0.17	GK
NTUZDF		58.43	1.59	1.82	69.33	1.98	1.88	NH
PKTZFY		55.98	-0.86	-0.99	66.65	-0.70	-0.66	GL
PW9VTC		56.48	-0.36	-0.41	67.48	0.13	0.12	DE
Q9UTTD		58.55	1.71	1.96	69.38	2.03	1.92	GD
QWP9WF		55.48	-1.36	-1.56	64.95	-2.40	-2.27	GK
QZNKTF		56.85	0.01	0.01	66.74	-0.61	-0.58	GL
RFAUNG		55.65	-1.19	-1.36	66.13	-1.22	-1.16	GB
RKTM7B		55.95	-0.89	-1.01	65.23	-2.12	-2.01	GK
RMTQXX		56.80	-0.04	-0.04	68.48	1.13	1.07	GL
RPFCLE		58.40	1.56	1.79	68.70	1.35	1.28	GN
RQT2TX		58.33	1.49	1.71	68.23	0.88	0.83	GL
T98XKB		57.00	0.16	0.19	67.55	0.20	0.19	GL
TGMLEC		56.30	-0.54	-0.61	66.58	-0.77	-0.73	GL
U28XMU		57.40	0.56	0.65	67.55	0.20	0.19	GL
UHUFDA		56.93	0.09	0.10	67.28	-0.07	-0.07	GX
UQ8ATC		57.95	1.11	1.28	68.63	1.28	1.21	GL
V2ZBK7		56.80	-0.04	-0.04	67.00	-0.35	-0.33	GL
VPQFLA		57.38	0.54	0.62	68.00	0.65	0.62	GK
VRWV2T		55.68	-1.16	-1.33	65.13	-2.22	-2.11	GK
VYX8XQ		57.63	0.79	0.90	66.93	-0.42	-0.40	RA
WKQQH9		56.03	-0.81	-0.93	66.93	-0.42	-0.40	GK
WTH78C		58.75	1.91	2.19	68.55	1.20	1.14	GL
WXU6KQ		56.40	-0.44	-0.50	67.08	-0.27	-0.26	GN
WZ6RJ6		56.83	-0.01	-0.01	66.90	-0.45	-0.42	RA
WZK7NT		57.20	0.36	0.42	67.63	0.28	0.26	GN
X6UQB6		57.38	0.54	0.62	67.78	0.43	0.41	GN
XLFA47		57.90	1.06	1.22	68.60	1.25	1.19	ZA
Y2BXTB		56.85	0.01	0.02	68.00	0.65	0.62	GL
Y3LZEA		57.83	0.99	1.13	68.28	0.93	0.88	GN
YPW2N8		56.30	-0.54	-0.61	67.73	0.38	0.36	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H241 Lab Mean	Sample H241 Diff from Grand Mean	Sample H241 CPV	Sample H242 Lab Mean	Sample H242 Diff from Grand Mean	Sample H242 CPV	Instr Code
Z7ZVU8		55.45	-1.39	-1.59	66.50	-0.85	-0.80	GK
ZDYDC6		55.78	-1.06	-1.21	66.68	-0.67	-0.64	GN
ZF4AF7	X	16.88	-39.96	-45.76	17.55	-49.80	-47.24	GN
ZKXZ6P		57.03	0.19	0.22	67.80	0.45	0.43	GL
ZVJ4B4		56.95	0.11	0.13	67.58	0.23	0.22	GL

Summary Statistics

Grand Means

56.84 Gloss Units | 67.35 Gloss Units

Stnd Dev Btwn Labs

0.87 Gloss Units | 1.05 Gloss Units

Statistics based on 69 of 70 reporting participants

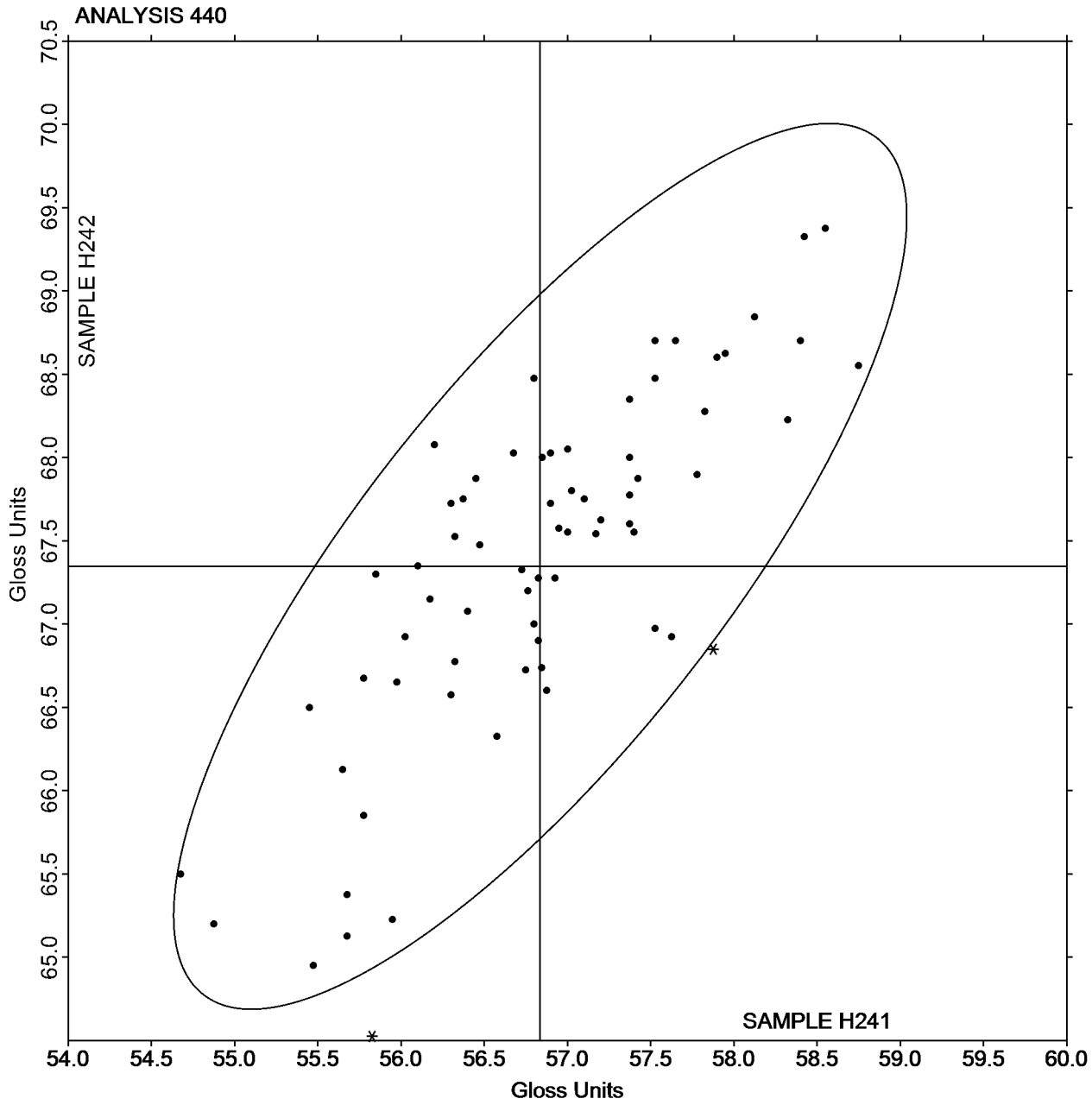
Comments on Assigned Data Flags for Test #440

ZF4AF7(X) - Extreme data.

Key to Instrument Codes Reported by Participants

DE	DeFelsko PosiTector GLS 60	EN	Elcometer 480
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	GX	BYK-Gardner (model not specified)
MX	Minolta Multi-Gloss 268 Plus	NH	3nh NHG268 Multi-angle Precise Gloss Meter
RA	Rhopoint Novo-Gloss Glossmeter	XX	Instrument make/model not specified by lab
ZA	Zehntner ZGM Series		

SAMPLE H241 = 56.84 Gloss Units SAMPLE H242 = 67.35 Gloss Units



-End of Report-