Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #186 - 4th Qtr 2018

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.

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

Office Hours: 8:00 a.m. - 4:30 p.m. ET

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
26PEA6		D181	59.18	-19.74	7.27	0.91	0.14	-0.34	0.98	XO
		D182	60.09	-19.60	6.93					
28ZZCD		D181	58.84	-19.82	6.81	1.04	0.10	-0.32	1.09	MG
		D182	59.88	-19.71	6.49					
2FQTFW		D181	58.82	-19.43	7.05	1.00	0.10	-0.44	1.09	HK
		D182	59.82	-19.33	6.62					
2X84V4		D181	58.91	-19.88	6.91	0.89	0.13	-0.30	0.94	HW
		D182	59.80	-19.75	6.62					
3Q8P62		D181	59.10	-19.69	7.43	0.89	0.09	-0.32	0.94	XM
		D182	59.99	-19.61	7.11					
4EQMXT		D181	59.00	-19.66	7.29	1.09	0.11	-0.43	1.18	XO
		D182	60.09	-19.55	6.86					
69D9KM		D181	59.31	-19.57	7.49	1.00	0.07	-0.38	1.07	XD
		D182	60.30	-19.50	7.11					
6LMNRR		D181	59.08	-19.70	7.73	0.96	0.07	-0.44	1.06	GE
		D182	60.04	-19.63	7.30					
72QPUR		D181	58.86	-20.30	7.82	0.90	0.14	-0.31	0.96	FA
		D182	59.75	-20.16	7.51					
8HVGCN	X	D181	59.72	-19.64	7.43	0.98	0.15	-0.39	1.06	XE
		D182	60.70	-19.49	7.04					
ABURXG		D181	59.19	-19.65	7.73	0.90	0.15	-0.23	0.94	GB
		D182	60.09	-19.50	7.50					
CKM7JW		D181	59.23	-20.01	6.92	0.93	0.12	-0.29	0.98	HW
		D182	60.16	-19.89	6.64					
E26PLM	X	D181	52.08	-17.25	4.99	0.97	-0.01	-0.24	1.00	HW
		D182	53.05	-17.26	4.76					
HWVZFG		D181	59.06	-19.75	6.75	1.11	0.14	-0.41	1.18	HW
		D182	60.16	-19.61	6.35					
JF9URN		D181	58.95	-19.71	7.57	1.07	0.05	-0.32	1.12	XB
		D182	60.03	-19.65	7.25					
KYFGTM		D181	59.25	-19.52	7.85	0.93	0.09	-0.37	1.00	GE
		D182	60.18	-19.43	7.48					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
KYYCBN		D181	58.85	-19.74	6.34	0.92	0.16	-0.36	1.00	HW
		D182	59.77	-19.58	5.98					
LDCVTF		D181	59.13	-20.00	7.99	0.97	0.10	-0.33	1.03	TO
		D182	60.10	-19.90	7.66					
MHARYM		D181	59.32	-19.59	7.07	1.02	0.14	-0.42	1.11	MU
		D182	60.34	-19.45	6.65					
N6UJAZ		D181	59.09	-19.73	7.60	0.90	0.14	-0.34	0.97	XU
		D182	59.98	-19.59	7.26					
P4FAYE		D181	58.90	-19.87	6.92	0.88	0.11	-0.33	0.94	HW
		D182	59.77	-19.76	6.59					
PTENWL		D181	58.94	-19.94	7.37	1.04	0.13	-0.42	1.13	XZ
		D182	59.98	-19.81	6.96					
QAM3QN	X	D181	59.90	-19.51	7.39	1.03	0.08	-0.34	1.09	XZ
		D182	60.93	-19.44	7.05					
R62XA6		D181	59.00	-19.67	7.57	1.07	0.10	-0.38	1.14	XU
		D182	60.07	-19.58	7.20					
R7WCPH		D181	59.21	-19.50	7.13	0.94	0.12	-0.35	1.00	XZ
		D182	60.14	-19.39	6.78					
TG96KV		D181	59.03	-19.73	7.00	1.02	0.18	-0.37	1.10	HW
		D182	60.05	-19.55	6.63					
U7JP67		D181	59.12	-19.81	6.85	1.07	0.10	-0.42	1.15	HW
		D182	60.19	-19.72	6.43					
V3MFHB		D181	59.14	-19.94	7.94	1.01	0.10	-0.49	1.12	GE
		D182	60.15	-19.84	7.45					
VJ86R7		D181	58.97	-20.20	7.80	0.98	0.11	-0.36	1.04	FA
		D182	59.95	-20.09	7.44					
VPVYHC		D181	59.12	-19.77	7.30	1.06	0.12	-0.30	1.10	XO
		D182	60.18	-19.66	7.00					
VQ7U9A		D181	58.77	-19.73	6.91	0.94	0.11	-0.44	1.04	HW
		D182	59.71	-19.62	6.47					
WJ7KN3		D181	58.84	-19.68	6.80	0.97	0.13	-0.34	1.04	HW
		D182	59.81	-19.55	6.46					

Color and Color Difference - Paint Chips - 45-0 Geometry Instruments
CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
XVFJVG		D181	59.21	-19.51	7.43	1.03	0.14	-0.43	1.12	GH
		D182	60.24	-19.37	7.00					
XVRBTY		D181	58.98	-19.74	7.61	0.84	0.08	-0.41	0.93	MU
		D182	59.81	-19.66	7.21					
XW8HAE		D181	59.03	-19.80	7.37	0.91	0.14	-0.35	0.98	XU
		D182	59.93	-19.66	7.02					
Y9J8KP		D181	58.96	-19.57	7.24	0.75	0.08	-0.36	0.83	XN
		D182	59.71	-19.49	6.88					
YL4RYQ		D181	58.64	-19.76	7.39	1.03	0.08	-0.39	1.10	HY
		D182	59.66	-19.68	7.00					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D181	59.03	-19.74	7.30	0.97	0.11	-0.37	1.04
D182	60.00	-19.63	6.94				
Stnd Dev Btwn Labs							
D181	0.16	0.19	0.39	0.08	0.03	0.05	0.08
D182	0.18	0.18	0.39				

Statistics based on 34 of 37 reporting participants

Comments Assigned on Data Flags for Test #408

8HVGCN(X) - High "L*" values.

E26PLM(X) - Extreme Data. Small Delta "a" values.

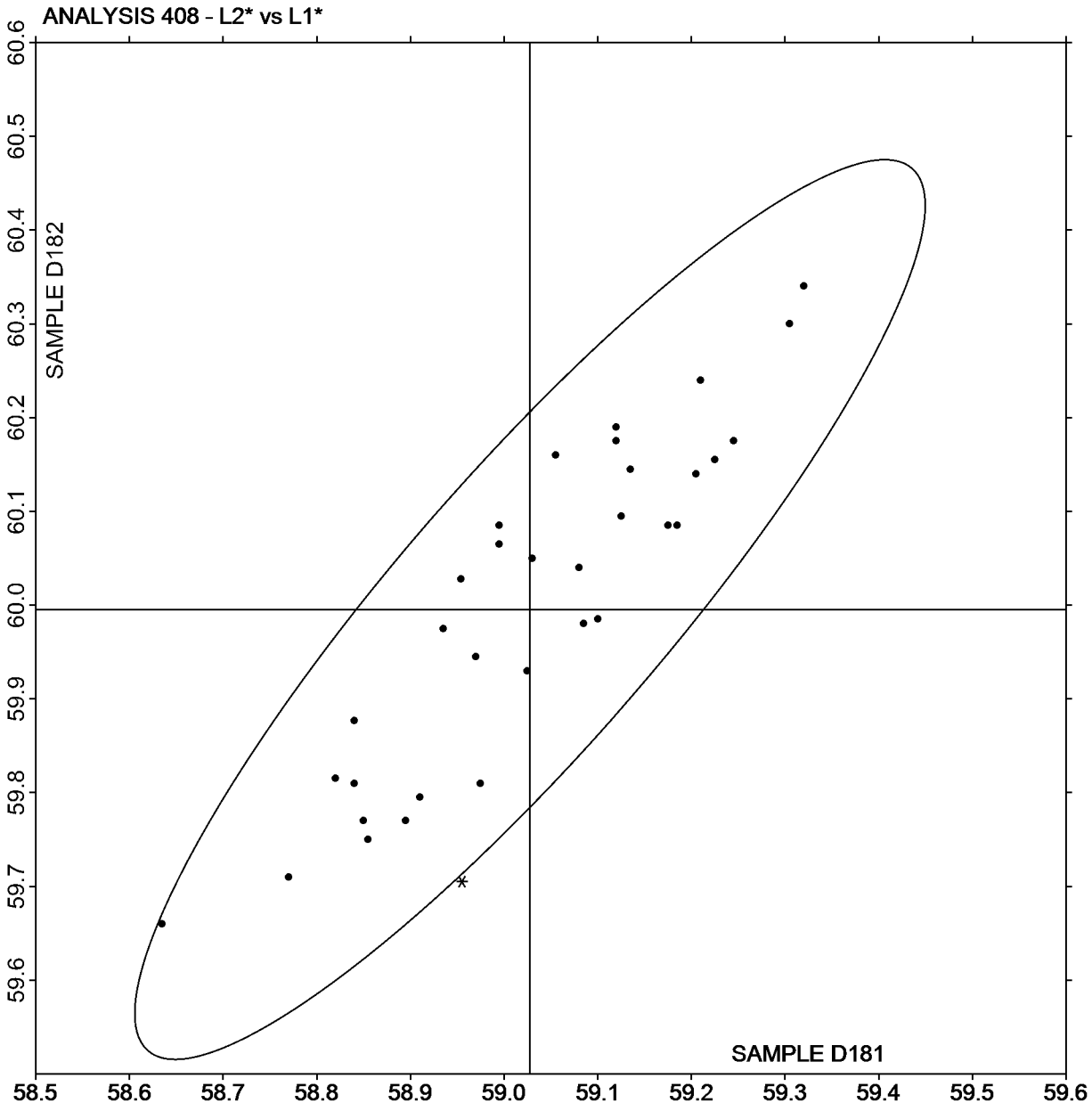
QAM3QN(X) - High "L*" values.

Key to Instrument Codes Reported by Participants

FA	BYK Mac	GB	BYK-Gardner spectro-guide sphere gloss
GE	BYK-Gardner spectro-guide (45/0)	GH	BYK-Gardner Color-View
HK	Hunter MiniScan XE (45/0)	HW	Hunter LabScan XE
HY	Hunter Color Flex 45/0	MG	Macbeth 1500/PLUS or 2025+ Color Eye
MU	Minolta	TO	Topcon SR-3 Spectroradiometer
XB	X-Rite i1Basic Pro 2	XD	X-Rite 500 Series SpectroDensitometer
XE	X-Rite eXact Portable Spectrophotometer	XM	X-Rite MA58 Multi-Angle Spectrophotometer
XN	X-Rite MA68 Multi-Angle Spectrophotometer	XO	X-Rite MA68 II Multi-Angle Spectrophotometer
XU	X-Rite 964 Portable Spectrophotometer	XZ	X-Rite

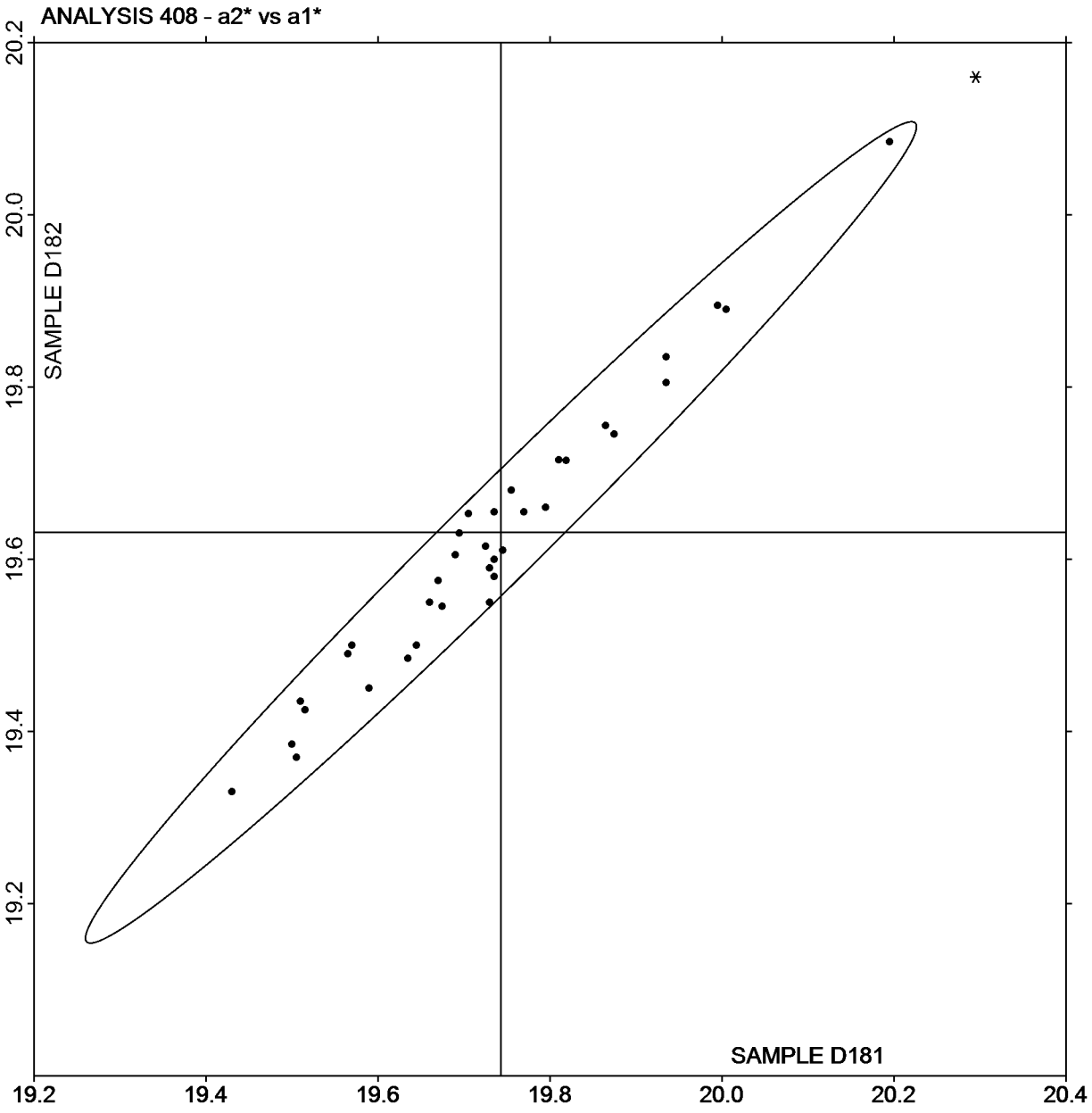
L2* vs L1*

SAMPLE D181 = 59.03 SAMPLE D182 = 60.00



a2* vs a1*

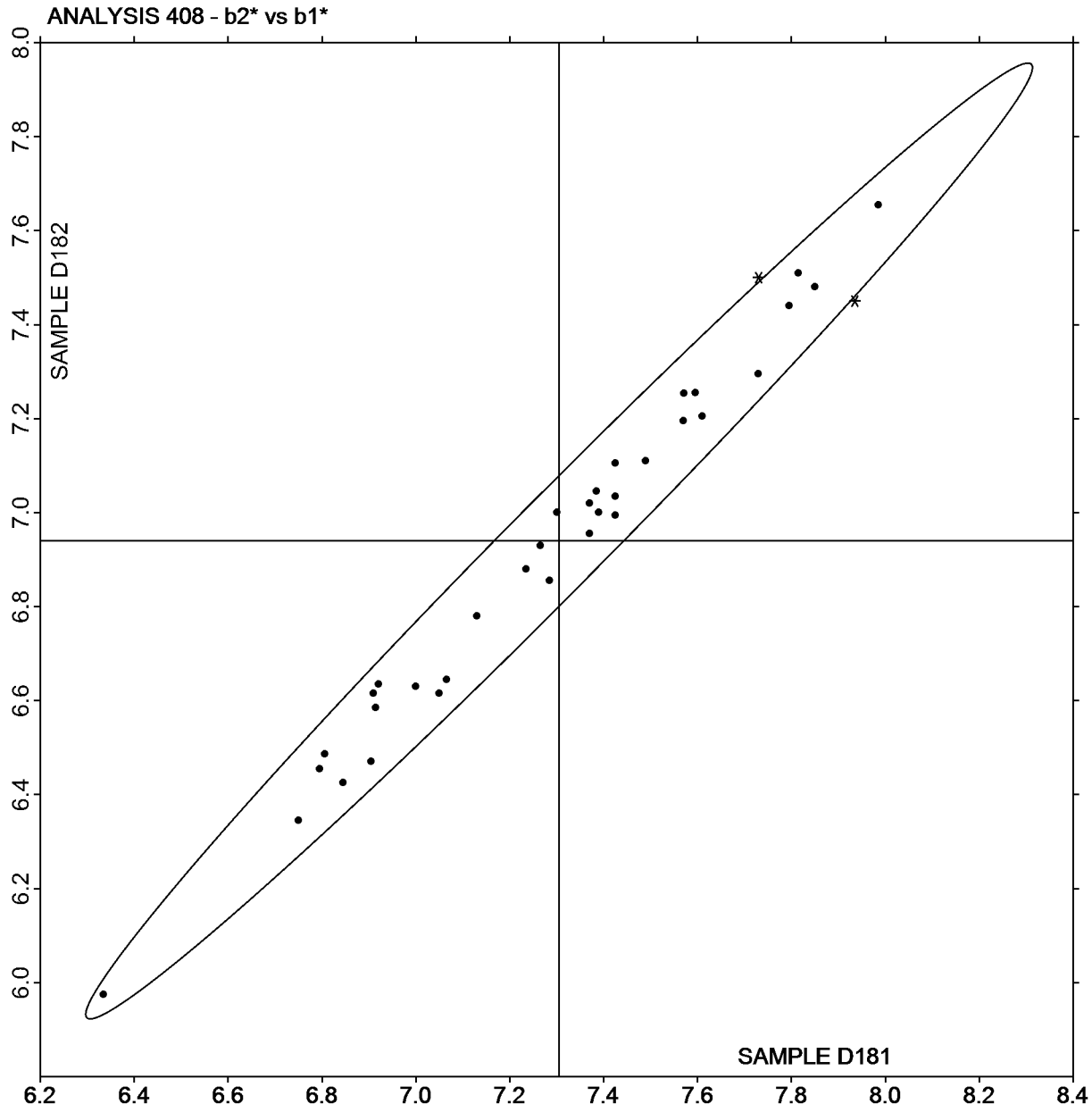
SAMPLE D181 = -19.74 SAMPLE D182 = -19.63



Plot created using absolute values.

b2* vs b1*

SAMPLE D181 = 7.30 SAMPLE D182 = 6.94



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
29UNV9		D181	59.24	-19.62	7.11	1.02	0.16	-0.41	1.11	MK
		D182	60.26	-19.46	6.70					
2A39BV		D181	59.45	-19.47	7.11	1.01	0.07	-0.47	1.12	AH
		D182	60.46	-19.40	6.64					
2BFPLN		D181	59.05	-19.84	6.97	0.95	0.16	-0.32	1.01	XM
		D182	60.00	-19.69	6.66					
2LVRQL		D181	59.37	-19.61	7.06	0.96	0.06	-0.43	1.05	AO
		D182	60.33	-19.55	6.63					
34BAB7		D181	59.38	-19.61	7.09	0.91	0.14	-0.31	0.97	HP
		D182	60.28	-19.47	6.78					
36JJ44		D181	59.65	-19.82	6.95	0.87	0.10	-0.32	0.93	AJ
		D182	60.52	-19.72	6.63					
4EQMXT		D181	59.54	-19.65	7.04	1.10	0.12	-0.41	1.18	MI
		D182	60.64	-19.53	6.63					
4FW2B2		D181	59.27	-19.55	6.91	0.90	0.14	-0.36	0.97	XI
		D182	60.17	-19.42	6.56					
4GQPTW		D181	59.27	-19.61	7.22	1.00	0.12	-0.41	1.08	MV
		D182	60.27	-19.49	6.81					
4L8YCU		D181	59.16	-19.37	7.03	0.96	0.07	-0.35	1.02	XI
		D182	60.11	-19.30	6.69					
6KTUDW		D181	59.09	-19.52	7.00	0.91	0.09	-0.36	0.98	XI
		D182	60.00	-19.44	6.64					
6LPCDC		D181	59.42	-19.77	7.13	1.00	0.10	-0.38	1.07	XB
		D182	60.42	-19.67	6.75					
6RWZTY		D181	59.18	-19.53	7.16	1.01	0.11	-0.42	1.10	MM
		D182	60.19	-19.42	6.74					
74UHQC		D181	59.27	-19.59	7.01	0.95	0.13	-0.41	1.04	XB
		D182	60.22	-19.46	6.61					
8MAZN4		D181	59.11	-19.49	7.04	1.00	0.12	-0.40	1.08	XH
		D182	60.11	-19.37	6.64					
8NZCVM		D181	59.16	-19.85	7.34	0.98	0.16	-0.37	1.06	GD
		D182	60.14	-19.69	6.97					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
96LXDT		D181	59.25	-19.51	7.09	1.02	0.11	-0.42	1.11	HP
		D182	60.27	-19.40	6.67					
96NVEG		D181	59.45	-19.57	7.23	0.96	0.19	-0.35	1.04	AS
		D182	60.41	-19.39	6.88					
9GG9NK		D181	58.93	-19.30	7.21	0.83	0.16	-0.34	0.90	MM
		D182	59.76	-19.14	6.87					
9MMU2H		D181	59.49	-19.81	7.27	0.89	0.16	-0.38	0.98	AJ
		D182	60.38	-19.65	6.90					
9YMKMP		D181	59.39	-19.34	7.06	1.03	0.20	-0.44	1.13	HF
		D182	60.42	-19.15	6.62					
AGW3NL		D181	59.31	-19.48	7.13	0.99	0.11	-0.44	1.08	SH
		D182	60.29	-19.37	6.69					
AM3GUW		D181	59.33	-19.59	6.97	0.99	0.11	-0.47	1.09	AM
		D182	60.31	-19.49	6.50					
AMHXPP		D181	59.25	-19.26	7.01	0.98	0.13	-0.35	1.05	MM
		D182	60.23	-19.13	6.65					
B9V96D		D181	59.46	-19.55	7.16	0.95	0.05	-0.42	1.03	AJ
		D182	60.40	-19.50	6.74					
BMC4JP		D181	59.03	-19.68	7.21	0.97	0.13	-0.39	1.05	XH
		D182	60.00	-19.56	6.83					
C6D73E		D181	58.88	-19.40	7.13	0.92	0.11	-0.37	0.99	XH
		D182	59.80	-19.30	6.77					
CXQKQL		D181	59.21	-19.57	7.29	1.00	0.12	-0.39	1.08	MU
		D182	60.21	-19.45	6.90					
D383R4		D181	59.03	-19.33	6.97	1.12	0.15	-0.44	1.21	XI
		D182	60.15	-19.18	6.53					
DFPWYM		D181	59.65	-19.71	7.16	0.91	0.11	-0.36	0.98	CA
		D182	60.56	-19.60	6.80					
DPWMMJ	X	D181	60.02	-19.34	6.60	-1.03	-0.10	0.37	1.10	XO
		D182	58.99	-19.44	6.97					
E328L3		D181	59.01	-19.30	6.86	1.05	0.09	-0.37	1.12	XI
		D182	60.06	-19.21	6.50					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
EYXJZL		D181	59.33	-19.43	6.93	1.00	0.13	-0.39	1.08	AM
		D182	60.33	-19.31	6.54					
F9WJ3R		D181	59.49	-19.58	7.12	0.97	0.12	-0.37	1.04	AS
		D182	60.46	-19.46	6.75					
FDEPTZ		D181	59.49	-19.45	7.14	1.08	0.13	-0.44	1.17	AO
		D182	60.57	-19.32	6.70					
FH7WB9		D181	59.20	-19.58	7.03	0.95	0.12	-0.34	1.01	XH
		D182	60.15	-19.46	6.70					
FVBFPT		D181	59.34	-19.75	7.16	1.08	0.19	-0.45	1.18	MV
		D182	60.41	-19.56	6.71					
GFXBUL		D181	59.50	-19.59	7.12	1.02	0.10	-0.39	1.10	AO
		D182	60.52	-19.49	6.73					
GXCMKQ		D181	59.34	-19.61	7.17	0.98	0.12	-0.41	1.07	MV
		D182	60.32	-19.49	6.76					
GZLMPX		D181	58.93	-19.40	7.06	1.04	0.14	-0.37	1.11	XI
		D182	59.97	-19.26	6.69					
HDLVZK		D181	58.98	-19.43	7.05	0.96	0.12	-0.42	1.05	XM
		D182	59.94	-19.32	6.63					
HR8YRP		D181	59.41	-19.59	7.09	1.04	0.11	-0.39	1.11	AO
		D182	60.45	-19.49	6.71					
HUTWQF		D181	59.13	-19.49	7.11	0.90	0.11	-0.32	0.96	MM
		D182	60.03	-19.38	6.79					
HVZENC		D181	59.39	-19.53	7.08	0.87	0.14	-0.38	0.96	MM
		D182	60.26	-19.39	6.70					
JQ6XVH	X	D181	60.02	-19.13	6.69	-0.94	-0.10	0.35	1.01	XI
		D182	59.08	-19.23	7.04					
JUVR4K		D181	58.94	-19.29	7.17	0.92	0.11	-0.33	0.98	XH
		D182	59.85	-19.18	6.84					
JWYPCR		D181	59.39	-19.43	7.17	0.96	0.15	-0.43	1.06	AJ
		D182	60.35	-19.29	6.74					
JXP3KC		D181	59.44	-19.56	7.29	0.99	0.13	-0.36	1.06	AJ
		D182	60.43	-19.44	6.93					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
K8TNEH		D181	59.20	-19.64	7.22	0.99	0.12	-0.41	1.08	MV
		D182	60.19	-19.53	6.81					
K9637X		D181	59.33	-19.59	7.24	0.93	0.08	-0.34	0.99	AD
		D182	60.26	-19.51	6.90					
KCJRF9		D181	59.11	-19.84	6.76	0.90	0.14	-0.33	0.96	XM
		D182	60.01	-19.71	6.44					
KFA2HM		D181	59.39	-19.55	7.24	1.04	0.14	-0.38	1.11	AJ
		D182	60.43	-19.41	6.87					
KRYXJL		D181	58.96	-19.50	6.87	0.99	0.09	-0.38	1.06	XI
		D182	59.95	-19.41	6.50					
KYFGTM		D181	58.90	-19.40	6.85	0.96	0.09	-0.36	1.03	GD
		D182	59.86	-19.31	6.49					
LDCVTF	X	D181	58.85	-19.37	7.95	0.72	0.15	-0.35	0.81	CA
		D182	59.57	-19.23	7.60					
LRVTGG		D181	59.42	-19.48	7.04	0.98	0.11	-0.40	1.06	AO
		D182	60.40	-19.37	6.64					
M9XR4Q		D181	59.23	-19.32	6.94	0.92	0.10	-0.39	1.00	XI
		D182	60.14	-19.22	6.56					
MARFLL		D181	59.38	-19.39	7.05	1.04	0.15	-0.40	1.12	AJ
		D182	60.42	-19.25	6.66					
MCDDKC	X	D181	59.71	-19.70	6.27	0.88	0.14	-0.32	0.95	AQ
		D182	60.59	-19.56	5.95					
MFGVCD		D181	59.20	-19.43	7.07	1.01	0.10	-0.39	1.08	XZ
		D182	60.21	-19.33	6.68					
MFVM2N		D181	59.22	-19.33	7.10	1.01	0.14	-0.36	1.08	MM
		D182	60.23	-19.19	6.74					
MMDZVG		D181	59.37	-19.42	7.30	1.00	0.08	-0.46	1.10	AJ
		D182	60.37	-19.34	6.84					
N6UJAZ		D181	59.15	-19.32	7.05	0.90	0.13	-0.33	0.97	XI
		D182	60.05	-19.19	6.73					
NH4WTL		D181	59.41	-19.59	7.10	1.02	0.16	-0.46	1.13	AO
		D182	60.43	-19.44	6.65					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
NX8KQE		D181	58.94	-19.33	7.18	1.08	0.07	-0.38	1.14	XH
		D182	60.02	-19.26	6.80					
PHZRRH		D181	58.84	-19.39	6.91	1.16	0.09	-0.34	1.21	XO
		D182	59.99	-19.30	6.57					
PNZ6HK		D181	59.21	-19.46	6.94	0.90	0.12	-0.27	0.94	HP
		D182	60.10	-19.34	6.67					
QMM44P		D181	59.58	-19.42	7.04	0.96	0.11	-0.38	1.04	AO
		D182	60.54	-19.31	6.66					
QU2RW7		D181	59.35	-19.32	7.04	1.00	0.06	-0.44	1.09	XH
		D182	60.35	-19.27	6.61					
R7JNKA		D181	59.12	-19.63	7.28	1.00	0.12	-0.41	1.09	XH
		D182	60.12	-19.51	6.87					
R8BK8J		D181	59.17	-19.54	7.20	1.03	0.14	-0.43	1.12	XB
		D182	60.20	-19.40	6.77					
R93WF4		D181	59.30	-19.53	7.08	0.98	0.15	-0.40	1.07	MM
		D182	60.28	-19.39	6.68					
RWQBLB		D181	59.21	-19.90	6.86	0.98	0.11	-0.39	1.06	XC
		D182	60.19	-19.79	6.47					
T7AEX3		D181	59.27	-19.37	7.26	1.01	0.06	-0.43	1.10	AJ
		D182	60.28	-19.31	6.84					
T9DAG6		D181	59.46	-19.51	7.19	0.97	0.17	-0.35	1.04	AS
		D182	60.43	-19.35	6.84					
TUVCHW		D181	59.31	-19.56	6.99	0.92	0.13	-0.37	1.00	XI
		D182	60.23	-19.43	6.62					
TYBPGX	X	D181	59.45	-21.57	6.59	1.03	0.17	-0.45	1.13	AS
		D182	60.48	-21.40	6.15					
U3NZLD		D181	59.23	-19.49	7.04	0.95	0.15	-0.33	1.01	MS
		D182	60.18	-19.34	6.72					
UMEVR8		D181	59.25	-19.60	7.12	0.96	0.09	-0.41	1.05	GG
		D182	60.21	-19.51	6.71					
UVNMUB		D181	59.47	-19.73	7.28	0.97	0.09	-0.38	1.04	AS
		D182	60.43	-19.64	6.90					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
VC4APX		D181	59.42	-19.65	6.90	0.87	0.14	-0.32	0.93	AQ
		D182	60.28	-19.51	6.58					
VEV7C7		D181	59.01	-19.75	7.31	1.03	0.10	-0.44	1.12	CA
		D182	60.04	-19.65	6.88					
VF8VMV		D181	59.13	-19.39	7.07	1.02	0.07	-0.48	1.12	XI
		D182	60.14	-19.32	6.60					
VJP3YC		D181	59.35	-19.99	7.30	1.01	0.16	-0.40	1.09	CA
		D182	60.36	-19.83	6.90					
WHVKR9		D181	59.40	-19.39	7.04	0.94	0.08	-0.36	1.00	HW
		D182	60.34	-19.32	6.68					
WKYFBC	X	D181	59.50	-19.38	6.67	1.06	0.12	-0.40	1.13	HH
		D182	60.55	-19.26	6.27					
WVLE2G	X	D181	59.62	58.00	58.84	0.96	0.94	0.94	1.64	AJ
		D182	60.57	58.94	59.78					
WWDDFF		D181	59.50	-19.62	6.99	1.03	0.15	-0.39	1.11	AJ
		D182	60.52	-19.47	6.60					
WX2ZJ3		D181	59.39	-19.62	7.21	0.85	0.10	-0.27	0.89	MT
		D182	60.23	-19.52	6.94					
X7DHK2		D181	58.99	-19.26	7.10	1.02	0.12	-0.40	1.10	MM
		D182	60.01	-19.14	6.70					
XK9266		D181	59.49	-19.27	6.94	1.03	0.04	-0.42	1.11	XI
		D182	60.52	-19.23	6.52					
XNF8TR		D181	59.26	-19.54	7.04	1.02	0.14	-0.40	1.10	AQ
		D182	60.28	-19.40	6.65					
XVFJVG	X	D181	59.17	-19.84	7.59	0.94	0.10	-0.38	1.02	MV
		D182	60.11	-19.75	7.21					
XW8HAE		D181	59.26	-19.45	7.02	0.98	0.21	-0.39	1.07	XI
		D182	60.24	-19.24	6.63					
XZ9L22		D181	59.54	-19.57	7.14	0.96	0.09	-0.38	1.04	AM
		D182	60.50	-19.48	6.76					
Y9J8KP		D181	59.32	-19.49	7.06	1.00	0.19	-0.27	1.05	XO
		D182	60.31	-19.30	6.79					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
YDEYV8		D181	59.53	-19.58	7.32	0.95	0.07	-0.37	1.02	AJ
		D182	60.47	-19.51	6.95					
Z2WWNZ		D181	59.09	-19.52	7.05	1.02	0.12	-0.41	1.10	XM
		D182	60.10	-19.40	6.64					
ZYNUUN		D181	59.48	-19.48	7.18	0.95	0.05	-0.43	1.04	AJ
		D182	60.42	-19.44	6.76					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D181	59.29	-19.53	7.09	0.98	0.12	-0.38	1.06
D182	60.27	-19.41	6.71				
Stnd Dev Btwn Labs							
D181	0.19	0.16	0.12	0.06	0.03	0.04	0.06
D182	0.19	0.15	0.12				

Statistics based on 91 of 99 reporting participants

Comments Assigned on Data Flags for Test #409

DPWMMJ(X) - High "L*" value for Sample D181; very low "L*" value for Sample D182. Inconsistent in testing between "a*" values. Low "b*" values on Sample D181. Low Delta L and Delta a values, high Delta b value.

JQ6XVH(X) - High "L*" value for Sample D181; very low "L*" value for Sample D182. Inconsistent in testing between "a*" values. Low "b*" values on Sample D181. Low Delta L and Delta a values, high Delta b value.

LDCVTF(X) - Low "L*" value of Sample D182. Large replication difference for both "L*" values. Extreme data for both "b*" values. Large replication difference for both "b*" values. Low Delta L & Delta E values.

MCDDKC(X) - Very low "b*" values.

TYBPGX(X) - Extreme data for "a*" values. Low "b*" values.

WKYFBC(X) - Low "b*" values.

WVLE2G(X) - Extreme data for "a*" and "b*" values. Large Delta a, Delta b and Delta E values.

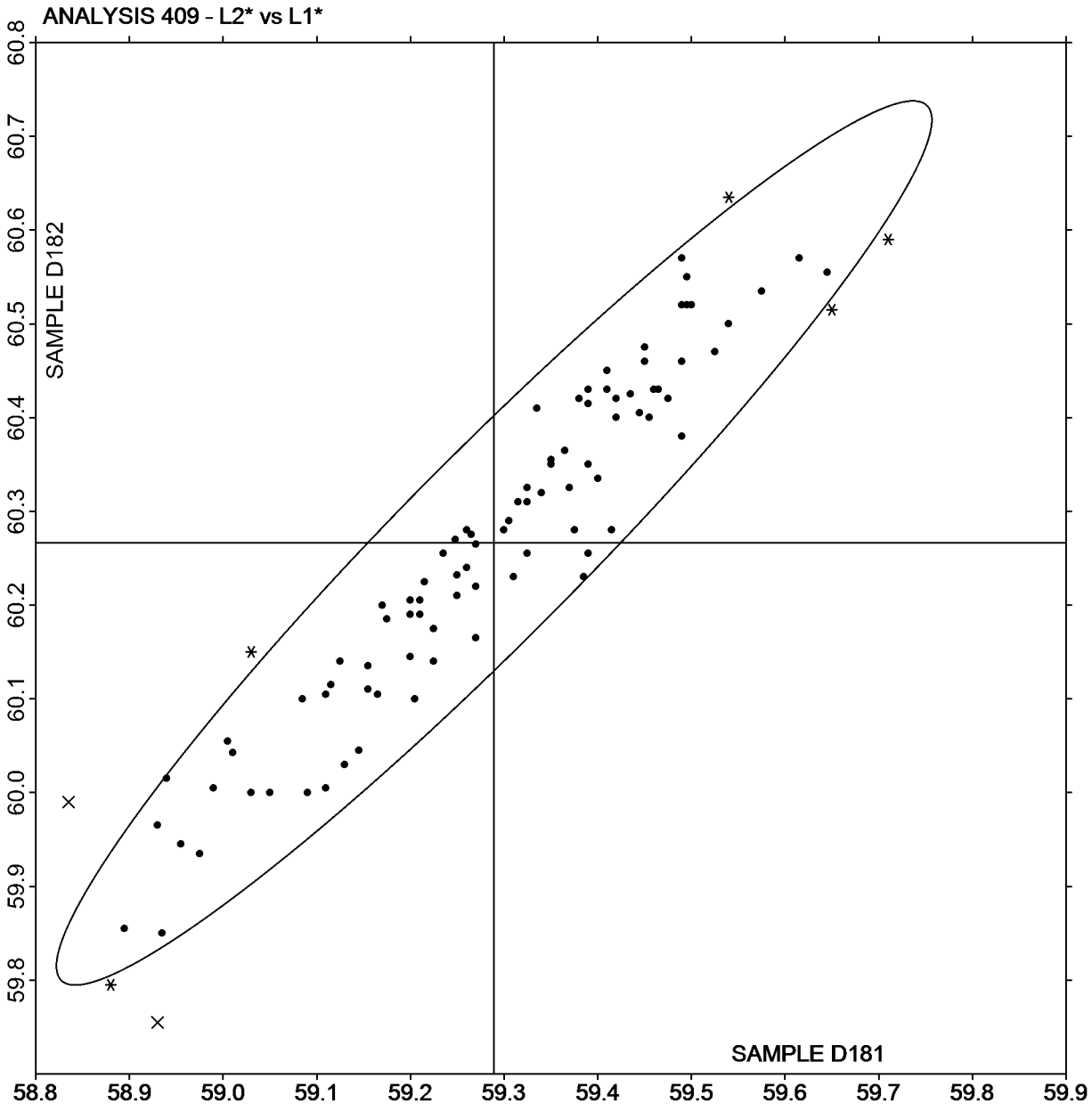
XVFJVG(X) - High "b*" values.

Key to Instrument Codes Reported by Participants

AD	Datacolor 100	AH	ACS-DataColor 550
AJ	ACS-Datacolor 600	AM	ACS-Datacolor 600 Plus
AO	ACS-Datacolor 650X	AQ	ACS-Datacolor 600X
AS	ACS-Datacolor 800 Series	CA	Cary 5000
GD	BYK-Gardner spectro-guide sphere	GG	BYK-Gardner TCS II
HF	Hunter ColorFlex Diffuse	HH	Hunter ColorQUEST XE
HP	Hunter UltraScan PRO	HW	Hunter UltraScan XE
MI	Macbeth Color i 5	MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a	MS	Minolta CM-600d
MT	Minolta CM-2600d	MU	Minolta
MV	Minolta CM-3000d Series Spectrophotometer	SH	SIMADZU UV 3101PC
XB	X-Rite Ci7000 Series Benchtop Spectrophotometer	XC	X-Rite Ci4200 Benchtop Spectrophotometer
XH	X-Rite Color i5 Benchtop Spectrophotometer	XI	X-Rite Color i7 Benchtop Spectrophotometer
XM	X-Rite SP62 Portable Sphere Spectrophotometer	XO	X-Rite SP64 Portable Sphere Spectrophotometer
XZ	X-Rite		

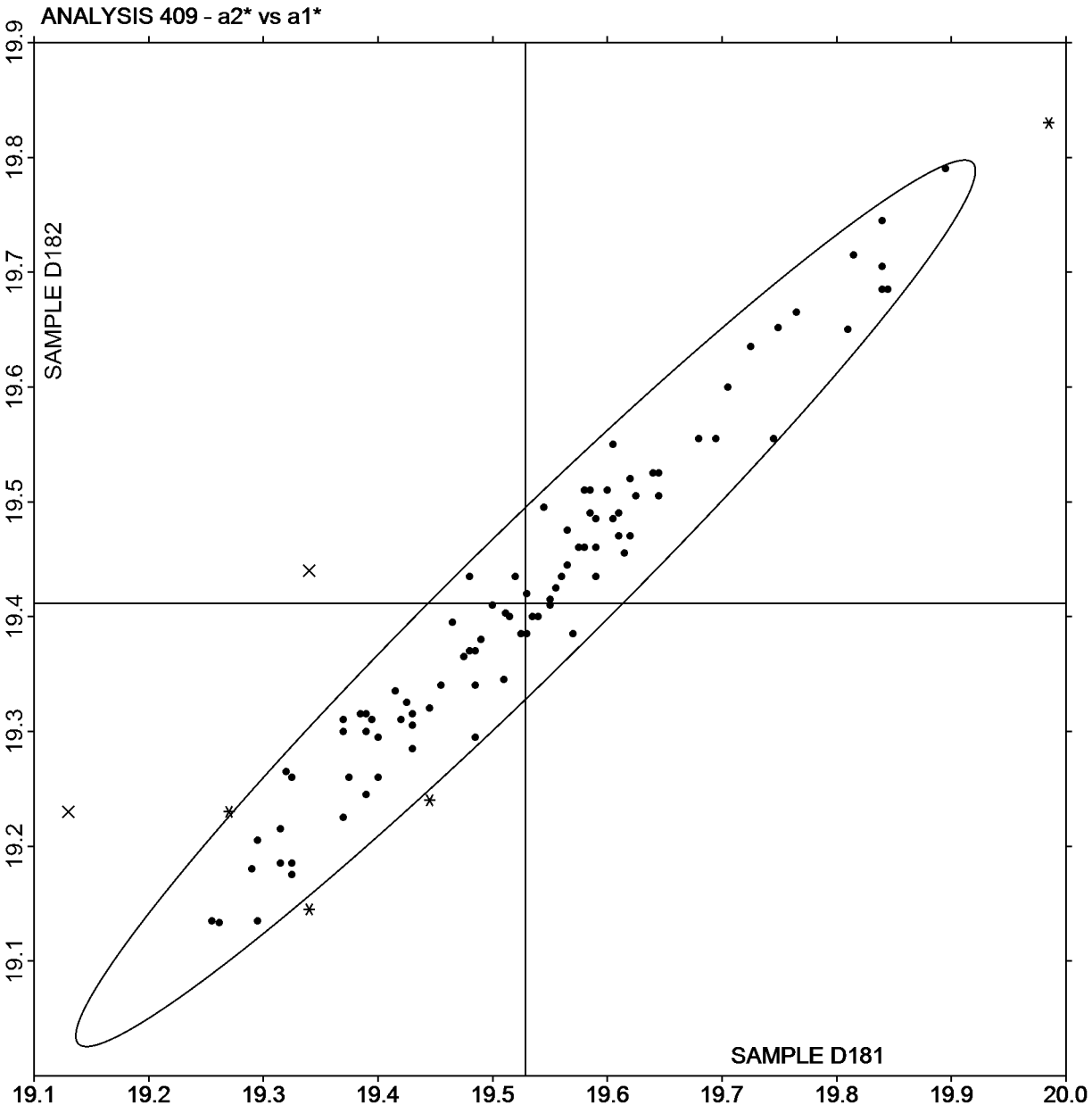
L2* vs L1*

SAMPLE D181 = 59.29 SAMPLE D182 = 60.27



a2* vs a1*

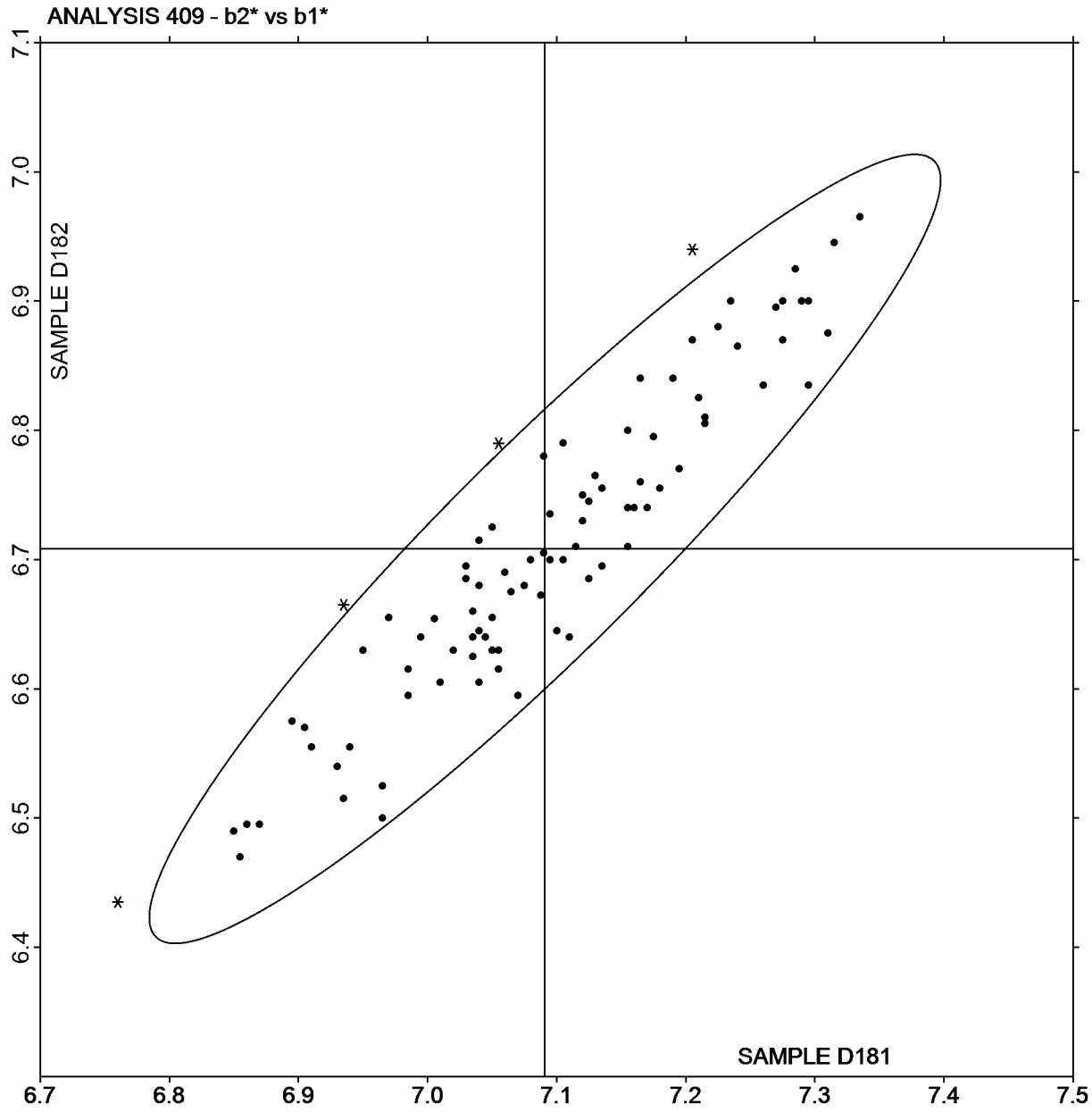
SAMPLE D181 = -19.53 SAMPLE D182 = -19.41



Plot created using absolute values.

b2* vs b1*

SAMPLE D181 = 7.09 SAMPLE D182 = 6.71



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 D181																		
29UNV9		15.57	18.24	21.87	24.40	25.29	28.22	33.41	35.94	29.30	22.32	18.77	17.18	16.95	18.01	17.77	16.00	MK
2A39BV		15.75	18.43	22.00	24.66	25.51	28.20	33.59	36.24	29.70	22.53	19.10	17.38	17.12	18.08	17.86	16.15	AH
2BFPLN		15.40	18.11	21.69	24.26	25.19	28.16	33.56	35.74	28.77*	21.92*	18.52*	16.95	16.78	17.85	17.64	15.84	XF
2LVRQL		15.82	18.40	22.03	24.53	25.40	28.28	33.61	36.11	29.49	22.37	18.98	17.26	17.09	18.18	17.78	15.87	AO
36JJ44		16.52	18.70	22.36	24.85	25.81*	28.66	34.08*	36.55	29.76	22.59	19.09	17.40	17.17	18.19	17.88	16.07	AJ
4EQMXT		15.77	18.57	22.16	24.73	25.71	28.66	33.80	36.35	29.57	22.60	19.09	17.44	17.20	18.18	17.97	16.18	MI
4FW2B2		15.81	18.48	21.99	24.52	25.43	28.35	33.56	35.87	29.25	22.31	18.84	17.27	17.13	18.14	17.69	15.94	XI
6KTUDW		15.47	18.25	21.76	24.33	25.21	28.11	33.26	35.66	29.08	22.18	18.72	17.16	16.95	17.98	17.61	15.92	XI
6LPCDC		15.78	18.40	22.01	24.57	25.49	28.35	33.71	36.38	29.45	22.39	18.95	17.30	16.93	18.02	17.73	15.71	XB
6RWZTY	X	16.48	19.33X	23.00X	25.58	26.45X	29.37X	34.55X	37.11X	30.35X	23.24X	19.65X	17.98X	17.75X	18.85X	18.58X	16.72X	MM
8MAZN4		15.46	18.22	21.74	24.35	25.22	28.07	33.27	35.70	29.10	22.21	18.77	17.16	17.02	18.06	17.64	15.85	XH
8NZCVM		17.66X	17.38X	21.24*	24.26	25.19	27.22X	33.66	36.53	29.36	22.46	18.72	15.89X	16.97	17.75	17.78	16.37	GD
96LXDT		15.96	18.32	21.88	24.46	25.26	28.18	33.38	36.03	29.42	22.43	18.96	17.16	16.73	17.91	17.64	16.02	HP
96NVEG		15.67	18.33	21.95	24.58	25.46	28.29	33.63	36.17	29.68	22.49	19.08	17.33	17.15	18.18	17.86	15.95	AS
9GG9NK		15.47	17.95	21.55	24.01	24.94	27.74	32.79*	35.51	29.25	22.05	18.58	17.02	16.84	17.77	17.28X	15.68	MM
9MMU2H		15.79	18.32	21.98	24.53	25.51	28.38	33.75	36.43	29.67	22.47	19.01	17.29	17.08	18.09	17.90	16.12	AJ
9YMKMP		15.31	18.69	22.09	24.50	25.55	28.36	33.53	36.03	29.52	22.53	19.06	17.31	16.97	18.35	18.06	16.48*	HF
AGW3NL		15.78	18.34	21.94	29.49X	25.26	28.09	33.40	36.28	29.41	22.32	18.99	17.31	17.01	18.08	17.94	16.15	SH
AM3GUW		15.78	18.38	22.06	24.58	25.51	28.27	33.62	36.24	29.38	22.36	18.90	17.19	16.99	17.98	17.73	15.93	AM
AMHXPP		15.77	18.44	21.94	24.46	25.36	28.24	33.36	35.83	29.39	22.46	18.93	17.29	17.03	17.99	17.83	16.09	MM
B9V96D		15.74	18.37	22.03	24.60	25.50	28.33	33.65	36.23	29.62	22.50	19.10	17.37	17.17	18.17	17.91	15.99	AJ
BMC4JP		15.34	18.05	21.56	24.15	25.07	28.03	33.26	35.64	29.00	22.11	18.59	17.07	16.88	17.86	17.59	15.81	XH
CXQKQL		15.39	18.18	21.66	24.39	25.13	27.93	33.50	36.05	29.40	22.18	18.84	17.19	16.95	18.04	17.94	16.07	MV
DFPWYM		16.01	18.47	22.23	24.81	25.60	28.55	33.99	36.83*	29.72	22.54	19.13	17.44	17.15	18.30	18.07	16.24	CA
DPWMMJ	X	16.35	19.37X	22.97X	25.46	26.34X	29.25X	34.65X	36.96X	29.94*	23.01X	19.61X	17.84X	17.71X	18.78X	18.43X	16.46*	XO

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 D181																		
E328L3		15.75	18.35	21.80	24.31	25.18	28.04	33.15	35.55	28.94	22.15	18.72	17.14	16.89	17.90	17.47	15.79	XI
EYXJZL		15.59	18.57	22.09	24.54	25.44	28.25	33.60	35.95	29.32	22.42	19.00	17.28	17.06	17.98	17.76	16.15	AM
F9WJ3R		15.94	18.44	22.11	24.62	25.59	28.38	33.69	36.23	29.75	22.52	19.08	17.35	17.17	18.22	18.00	15.98	AS
FDEPTZ		15.80	18.50	22.10	24.60	25.50	28.40	33.70	36.30	29.70	22.50	19.10	17.40	17.20	18.40	18.00	15.90	AO
FVBFPT		15.59	18.28	22.00	24.53	25.28	28.20	33.71	36.39	29.42	22.22	18.83	17.21	16.96	18.12	17.93	16.14	MV
GFXBUL		15.80	18.50	22.10	24.63	25.55	28.42	33.73	36.26	29.70	22.57	19.09	17.38	17.18	18.22	17.98	16.03	AO
GXCMKQ		15.50	18.34	21.92	24.58	25.27	28.18	33.58	36.39	29.40	22.28	18.90	17.25	16.99	18.18	18.00	16.18	MV
GZLMPX		15.24	18.08	21.56	24.15	25.02	27.84	32.98	35.42	28.95	22.07	18.68	17.03	16.85	17.85	17.54	15.81	XI
HDLVZK		16.05	18.37	22.12	24.51	25.42	28.36	33.69	35.76	28.97	22.22	18.85	17.27	16.92	18.36	18.12	16.54*	HW
HR8YRP		15.71	18.38	22.03	24.60	25.49	28.20	33.54	36.25	29.60	22.45	19.01	17.28	17.06	18.11	17.81	16.04	AO
HUTWQF		15.49	18.20	21.79	24.27	25.19	28.12	33.31	35.67	29.15	22.30	18.77	17.16	16.93	17.97	17.73	15.98	MM
HVZENC		15.79	18.47	21.98	24.57	25.46	28.36	33.55	36.08	29.54	22.49	18.97	17.33	17.08	18.17	17.89	16.08	MM
JQ6XVH	X	16.28	19.26X	22.86X	25.47	26.34X	29.20X	34.27*	36.82*	30.20X	23.16X	19.63X	17.97X	17.76X	18.79X	18.37X	16.53*	XI
JUVR4K		15.44	18.03	21.51	24.09	24.98	27.78	32.94	35.33*	29.04	22.15	18.73	17.08	16.92	17.86	17.62	15.85	XH
JWYPCR		15.72	18.38	21.92	24.56	25.43	28.19	33.49	36.26	29.63	22.49	19.04	17.32	17.08	18.07	17.92	16.22	AJ
JXP3KC		15.64	18.34	21.92	24.50	25.43	28.27	33.61	36.09	29.66	22.51	19.10	17.33	17.17	18.29	18.02	15.94	AJ
K8TNEH		15.56	18.21	21.81	24.46	25.20	28.02	33.50	36.29	29.28	22.21	18.80	17.20	16.93	18.12	17.91	16.10	MV
K9637X		15.52	18.26	21.85	24.44	25.34	28.23	33.47	36.00	29.50	22.45	18.95	17.25	16.97	18.01	17.83	15.93	AE
KCJRF9		15.62	18.27	21.92	24.43	25.34	28.36	33.67	35.77	28.82*	21.98*	18.62	17.05	16.91	18.00	17.35*	15.85	XF
KFA2HM		15.72	18.25	21.95	24.46	25.33	28.21	33.49	36.16	29.61	22.47	19.05	17.32	17.08	18.04	17.81	16.11	AJ
KRYXJL		15.70	18.25	21.78	24.19	25.10	27.99	33.09	35.50	28.87	22.02	18.61	17.01	16.85	17.90	17.41*	15.71	XI
KYFGTM		15.99	18.04	21.48	24.43	25.53	28.58	33.17	34.99X	29.14	22.17	18.15X	16.91	16.84	17.94	17.76	17.02X	GD
LDCVTF		14.41X	17.21X	20.94X	23.63	24.52X	27.45X	32.76*	35.70	28.90	21.97*	18.85	17.16	16.89	17.98	17.86	15.97	CA
LRVTGG		15.85	18.44	22.02	24.67	25.50	28.20	33.52	36.23	29.64	22.49	19.06	17.32	17.09	18.06	17.86	16.19	AO
M9XR4Q		15.81	18.51	21.97	24.44	25.29	28.13	33.29	35.82	29.28	22.44	18.92	17.27	17.02	18.09	17.67	15.93	XI

Spectrophotometric Reflectance values (as %) at selected wavelengths

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
Sample D181																		
MARFLL		15.79	18.42	22.05	24.55	25.46	28.29	33.56	36.17	29.53	22.46	19.06	17.33	17.15	18.18	17.82	16.00	AJ
MCDDKC		18.04X	19.36X	22.81X	25.33	26.12X	28.87*	34.19*	36.59	29.77	22.57	19.09	17.32	17.15	18.22	17.92	16.15	AQ
MFGVCD		15.73	18.36	21.84	24.37	25.27	28.15	33.36	35.87	29.15	22.30	18.95	17.29	17.00	17.99	17.60	15.72	XZ
MFVM2N		15.67	18.29	21.86	24.40	25.28	28.15	33.33	35.89	29.33	22.38	18.87	17.26	17.05	18.09	17.84	16.04	MM
N6UJAZ		15.57	18.33	21.73	24.35	25.23	28.04	32.16X	35.71	29.19	22.32	18.90	17.23	17.06	18.11	17.81	16.21	XI
NH4WTL		15.71	18.40	21.93	24.63	25.50	28.26	33.57	36.18	29.56	22.49	18.99	17.29	17.09	18.09	17.94	16.09	AO
NX8KQE		15.08	18.02	21.49	24.13	25.00	27.79	32.97	35.49	29.03	22.11	18.68	17.05	16.90	17.88	17.50	15.73	XH
PHZRRH		15.65	18.23	21.84	24.25	25.20	28.04	33.43	35.69	28.94	22.08	18.67	17.07	16.92	17.92	17.69	15.98	XO
PNZ6HK		16.36	18.36	21.95	24.47	25.23	28.22	33.36	35.86	29.20	22.26	18.87	17.32	16.22X	17.53X	17.62	16.01	HP
QMM44P		15.80	18.60	22.30	24.80	25.70	28.50	33.80	36.40	29.80	22.60	19.20	17.50	17.30	18.40	18.00	16.10	AO
QU2RW7	X	16.51	19.64X	23.18X	25.84*	26.71X	29.61X	34.73X	37.19X	30.57X	23.44X	19.88X	18.16X	18.02X	18.97X	18.71X	16.88X	XH
R7JNKA		15.17	18.08	21.57	24.22	25.18	28.03	33.27	35.66	29.25	22.30	18.74	17.05	16.86	17.86	17.67	15.93	XH
R8BK8J		15.51	18.20	21.75	24.46	25.19	28.07	33.30	35.87	29.23	22.29	18.84	17.19	16.92	17.96	17.68	15.90	XB
R93WF4		15.66	18.37	21.94	24.49	25.34	28.23	33.42	36.04	29.41	22.41	18.89	17.23	17.00	18.07	17.86	16.05	MM
RWQBLB		15.67	18.31	22.00	24.43	25.36	28.46	33.75	35.89	29.00	22.14	18.68	17.07	16.90	17.96	17.77	16.04	XC
T9DAG6		15.72	18.42	22.04	24.54	25.46	28.27	33.56	36.26	29.69	22.54	19.11	17.37	17.15	18.26	17.94	16.00	AS
TUVCHW		15.63	18.36	22.00	24.57	25.44	28.34	33.52	35.99	29.34	22.34	18.89	17.28	17.09	18.11	17.79	16.01	XI
TYBPGX		15.76	18.47	22.10	24.64	25.52	28.34	33.60	36.26	29.71	22.51	19.11	17.35	17.16	18.25	17.95	15.96	AS
U3NZLD		15.60	18.30	21.90	24.50	25.25	28.10	33.50	36.05	29.25	22.25	18.85	17.15	16.95	18.05	17.80	16.00	MS
UMEVR8		15.92	18.42	21.75	24.48	25.31	28.26	33.51	36.02	29.34	22.28	18.78	17.20	16.96	17.98	17.79	16.03	GG
UVNMUB		15.97	18.26	21.97	24.55	25.47	28.37	33.72	36.30	29.56	22.44	19.06	17.33	17.13	18.19	17.89	16.05	AS
VC4APX		15.93	18.50	22.20	24.67	25.56	28.36	33.67	36.13	29.45	22.45	19.02	17.32	17.11	18.08	17.96	16.10	AQ
VEV7C7		15.34	17.83	21.50	24.11	24.93	27.78	33.15	36.00	29.03	21.95*	18.58	16.92	16.62*	17.79	17.57	15.76	CA
VF8VMV		15.53	18.28	21.76	24.30	25.22	28.10	33.21	35.66	29.20	22.26	18.85	17.19	17.01	17.98	17.69	15.97	XI
VJP3YC		15.69	18.20	21.88	24.51	25.36	28.27	33.68	36.56	29.44	22.29	18.90	17.22	16.93	18.12	17.90	16.07	CA

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 D181																		
WKYFBC		16.10	18.73	22.64*	24.79	25.63	28.49	33.87	36.29	29.51	22.55	19.01	17.40	17.05	18.74X	18.45X	16.67X	HH
WWDDFF		15.78	18.53	22.24	24.70	25.61	28.41	33.73	36.36	29.61	22.49	19.05	17.34	17.17	18.21	17.89	16.03	AJ
WX2ZJ3		15.57	18.27	21.95	24.59	25.41	28.31	33.69	36.21	29.56	22.39	18.95	17.25	17.02	18.13	17.91	16.10	MT
X7DHK2		15.42	18.14	21.62	24.15	25.11	27.95	33.01	35.46	29.13	22.21	18.74	17.10	16.91	17.86	17.65	15.93	MM
XK9266		15.88	18.72	22.23	24.69	25.58	28.50	33.66	36.12	29.54	22.66	19.16	17.54	17.31	18.26	17.96	16.23	XI
XNF8TR		15.52	18.25	21.91	24.46	25.38	28.13	33.46	35.94	29.35	22.32	18.89	17.21	17.04	17.98	17.74	15.97	AQ
XVFJVG		14.97	17.76	21.37*	24.12	25.08	28.06	33.47	36.04	29.18	22.18	18.79	17.10	16.85	17.88	17.57	15.63	MV
XW8HAE		15.61	18.32	21.94	24.49	25.37	28.27	33.42	35.86	29.25	22.37	19.00	17.30	17.01	17.98	17.73	16.11	XI
XZ9L22		15.65	18.46	22.11	24.69	25.57	28.41	33.76	36.35	29.77	22.58	19.17	17.37	17.20	18.26	18.14	15.95	AM
Y9J8KP	X	19.15X	22.19X	26.02X	28.31X	29.29X	32.29X	37.47X	39.82X	33.31X	27.03X	23.54X	21.98X	21.90X	22.87X	22.75X	20.97X	XO
YDEYV8		16.77*	18.37	22.02	24.53	25.48	28.30	33.68	36.42	29.79	22.58	19.16	17.41	17.22	18.19	17.97	16.29	AJ
Z2WWNZ		15.42	18.18	21.79	24.27	25.19	28.09	33.48	35.80	28.97	22.16	18.73	17.08	16.92	17.89	17.68	15.94	XM
ZYNUUN		15.76	16.63X	21.98	24.58	25.50	28.26	33.59	36.24	29.72	22.56	19.13	17.38	17.19	18.17	17.82	16.01	AJ

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	15.72	18.29	21.91	24.53	25.35	28.21	33.48	36.03	29.37	22.35	18.90	17.22	17.01	18.07	17.80	16.03
SD Btwn Labs	0.45	0.32	0.27	0.59	0.22	0.24	0.30	0.33	0.27	0.18	0.19	0.20	0.16	0.17	0.18	0.21

Comments Assigned on Data Flags for Test #411

6RWZTY (X) - High % reflectance data for most wavelengths.
DPWMMJ (X) - High % reflectance data for most wavelengths.
JQ6XVH (X) - High % reflectance data for most wavelengths.
QU2RW7 (X) - High % reflectance data for most wavelengths.
Y9J8KP (X) - High % reflectance data at all wavelengths.

Key to Instrument Codes Reported by Participants

AE ACS-Datacolor 110	AH ACS-Datacolor 550	AJ ACS-Datacolor 600
AM ACS-Datacolor 600 Plus	AO ACS-Datacolor 650	AQ ACS-Datacolor 600X
AS ACS-Datacolor 800 Series	CA Cary 5000	GD BYK-Gardner spectro-guide sphere
GG BYK-Gardner TCS II	HF Hunter ColorFlex Diffuse	HH Hunter ColorQUEST XE
HP Hunter UltraScan PRO	HW Hunter UltraScan XE	MI Macbeth Color i5
MK Macbeth Color-Eye 7000 Spectrophotometer	MM Macbeth Color-Eye 7000a	MS Minolta CM-600d
MT Minolta CM-2600d	MV Minolta CM-3000d Series Spectrophotometer	SH SIMADZU UV 3101PC
XB X-Rite Ci7000 Series Benchtop Spectrophotometer	XC X-Rite Ci4200 Benchtop Spectrophotometer	XF X-Rite Ci6x Series Portable Spectrophotometer
XH X-Rite Color i5	XI X-Rite Color i7	XM X-Rite SP62
XO X-Rite SP64	XZ X-Rite	

WebCode	Data Flag	Sample H181 Lab Mean	Sample H181 Diff from Grand Mean	Sample H181 CPV	Sample H182 Lab Mean	Sample H182 Diff from Grand Mean	Sample H182 CPV	Instr Code
26PEA6		59.05	-0.65	-1.21	69.93	-0.27	-0.43	GL
2FQTFW		60.30	0.60	1.12	70.35	0.16	0.26	GL
2LVRQL		58.78	-0.92	-1.73	69.08	-1.12	-1.80	GK
36JJ44		59.75	0.05	0.10	70.80	0.61	0.98	GK
3Q8P62		59.10	-0.60	-1.12	69.63	-0.57	-0.91	GL
4EQMXT		59.85	0.15	0.28	70.40	0.21	0.34	GL
4FW2B2		59.28	-0.42	-0.79	70.18	-0.02	-0.03	GL
4GQPTW		59.78	0.08	0.14	70.25	0.06	0.09	GN
4L8YCU		60.10	0.40	0.75	70.45	0.26	0.42	GL
6KTUDW		60.26	0.56	1.05	70.76	0.56	0.91	GL
6LMNRR		59.20	-0.50	-0.93	69.88	-0.32	-0.51	GK
6LPCDC		59.73	0.03	0.05	69.68	-0.52	-0.83	GL
6M246T		59.73	0.03	0.05	69.93	-0.27	-0.43	GL
6QCBEK		59.38	-0.32	-0.61	69.90	-0.29	-0.47	GL
6RWZTY		59.83	0.13	0.24	70.25	0.06	0.09	RA
72QPUR		60.35	0.65	1.22	70.35	0.16	0.26	GL
74UHQC		59.40	-0.30	-0.56	70.00	-0.19	-0.31	GL
7CA29Q		59.65	-0.05	-0.09	69.85	-0.34	-0.55	GL
8C7YXC		59.95	0.25	0.47	70.25	0.06	0.09	GL
8MAZN4		59.65	-0.05	-0.09	70.38	0.18	0.30	GK
8NZCVM		59.83	0.13	0.24	70.20	0.01	0.01	GK
96NVEG		60.40	0.70	1.31	71.25	1.06	1.71	GN
9GG9NK		59.80	0.10	0.19	69.85	-0.34	-0.55	GL
ABURXG		59.65	-0.05	-0.09	69.98	-0.22	-0.35	GB
AMHXPP		60.48	0.78	1.45	71.13	0.93	1.51	GL
B9V96D		59.73	0.03	0.05	69.83	-0.37	-0.59	MW
C6D73E		59.65	-0.05	-0.09	70.18	-0.02	-0.03	GL
CCG86U		59.10	-0.60	-1.12	69.83	-0.37	-0.59	GL
CHGPFZ	X	60.80	1.10	2.06	70.33	0.13	0.22	GK
CRQZQC		59.38	-0.32	-0.61	70.03	-0.17	-0.27	GL

WebCode	Data Flag	Sample H181 Lab Mean	Sample H181 Diff from Grand Mean	Sample H181 CPV	Sample H182 Lab Mean	Sample H182 Diff from Grand Mean	Sample H182 CPV	Instr Code
CXQKQL		59.68	-0.02	-0.05	70.28	0.08	0.14	GL
D383R4	*	60.00	0.30	0.56	71.33	1.13	1.83	GL
DNMH8A		58.93	-0.77	-1.45	69.48	-0.72	-1.16	GL
DPWMMJ	*	58.30	-1.40	-2.61	69.20	-0.99	-1.60	RA
EV2VJE		59.60	-0.10	-0.19	70.35	0.16	0.26	GL
FVAC6Q		60.18	0.48	0.89	70.45	0.26	0.42	GN
GZLMPX	X	58.95	-0.75	-1.40	68.28	-1.92	-3.09	MM
HDLVZK		59.38	-0.32	-0.61	70.20	0.01	0.01	GK
JFRQ23	*	60.33	0.63	1.17	70.05	-0.14	-0.23	GK
JQ6XVH		60.25	0.55	1.03	70.75	0.56	0.90	GK
JUVR4K		59.20	-0.50	-0.93	69.58	-0.62	-0.99	GL
JXP3KC		59.90	0.20	0.38	70.68	0.48	0.78	GL
K9637X		59.73	0.03	0.05	69.93	-0.27	-0.43	GL
KCJRF9	X	56.15	-3.55	-6.63	67.38	-2.82	-4.55	GK
KFA2HM		59.20	-0.50	-0.93	69.73	-0.47	-0.75	GN
KYFGTM		59.45	-0.25	-0.47	69.35	-0.84	-1.36	GN
LDCVTF	*	61.08	1.38	2.57	71.80	1.61	2.60	GL
LRT4DK		59.70	0.00	0.00	69.70	-0.49	-0.79	GN
M9BFC4	*	58.25	-1.45	-2.71	68.70	-1.49	-2.41	EC
MARFLL		58.80	-0.90	-1.68	68.85	-1.34	-2.17	GL
MHARYM		60.25	0.55	1.03	70.65	0.46	0.74	GK
MMDZVG		60.08	0.38	0.70	70.70	0.51	0.82	GK
N6UJAZ		60.13	0.43	0.80	70.18	-0.02	-0.03	GL
NWHD93		59.38	-0.32	-0.61	69.53	-0.67	-1.08	GX
NX8KQE		59.88	0.18	0.33	70.50	0.31	0.50	GL
PHZRRH		58.68	-1.02	-1.91	68.85	-1.34	-2.17	MW
PTENWL		60.58	0.88	1.64	71.35	1.16	1.87	GN
QAM3QN	*	59.60	-0.10	-0.19	70.98	0.78	1.27	RA
QU2RW7		60.03	0.33	0.61	70.45	0.26	0.42	GL
R93WF4	X	55.78	-3.92	-7.33	66.50	-3.69	-5.96	EC

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H181 Lab Mean	Sample H181 Diff from Grand Mean	Sample H181 CPV	Sample H182 Lab Mean	Sample H182 Diff from Grand Mean	Sample H182 CPV	Instr Code
T7AEX3		60.20	0.50	0.94	70.50	0.31	0.50	GL
U3NZLD		59.63	-0.07	-0.14	70.20	0.01	0.01	GK
UE2ZH8	X	57.03	-2.67	-4.99	67.13	-3.07	-4.95	GN
UFTC2D		59.88	0.18	0.33	70.45	0.26	0.42	GL
V3MFHB		59.75	0.05	0.10	70.20	0.01	0.01	GN
VC4APX		59.38	-0.32	-0.61	69.98	-0.22	-0.35	GL
VJ86R7		59.60	-0.10	-0.19	70.45	0.26	0.42	GL
W4U776		60.33	0.63	1.17	70.85	0.66	1.06	GN
WHVKR9		60.15	0.45	0.84	70.73	0.53	0.86	GL
WKYFBC	*	60.93	1.23	2.29	71.98	1.78	2.88	RA
X6HTAT		59.35	-0.35	-0.65	70.25	0.06	0.09	GL
X89ZR4		60.00	0.30	0.56	70.40	0.21	0.34	GK
XDDR69		59.28	-0.42	-0.79	69.70	-0.49	-0.79	PA
XW8HAE		59.30	-0.40	-0.75	70.05	-0.14	-0.23	GL
Y9J8KP		59.58	-0.12	-0.23	69.75	-0.44	-0.71	GL
ZYNUUN		59.73	0.03	0.05	70.05	-0.14	-0.23	GK

Summary Statistics

Grand Means

59.70 Gloss Units — 70.19 Gloss Units

Stnd Dev Btwn Labs

0.54 Gloss Units — 0.62 Gloss Units

Statistics based on 71 of 76 reporting participants

Comments on Assigned Data Flags for Test #440

CHGPFZ(X) - Inconsistent in testing between samples.

GZLMPX(X) - Low data for Sample H182.

KCJRF9(X) - Data for both samples are extremely low. Possible systematic error.

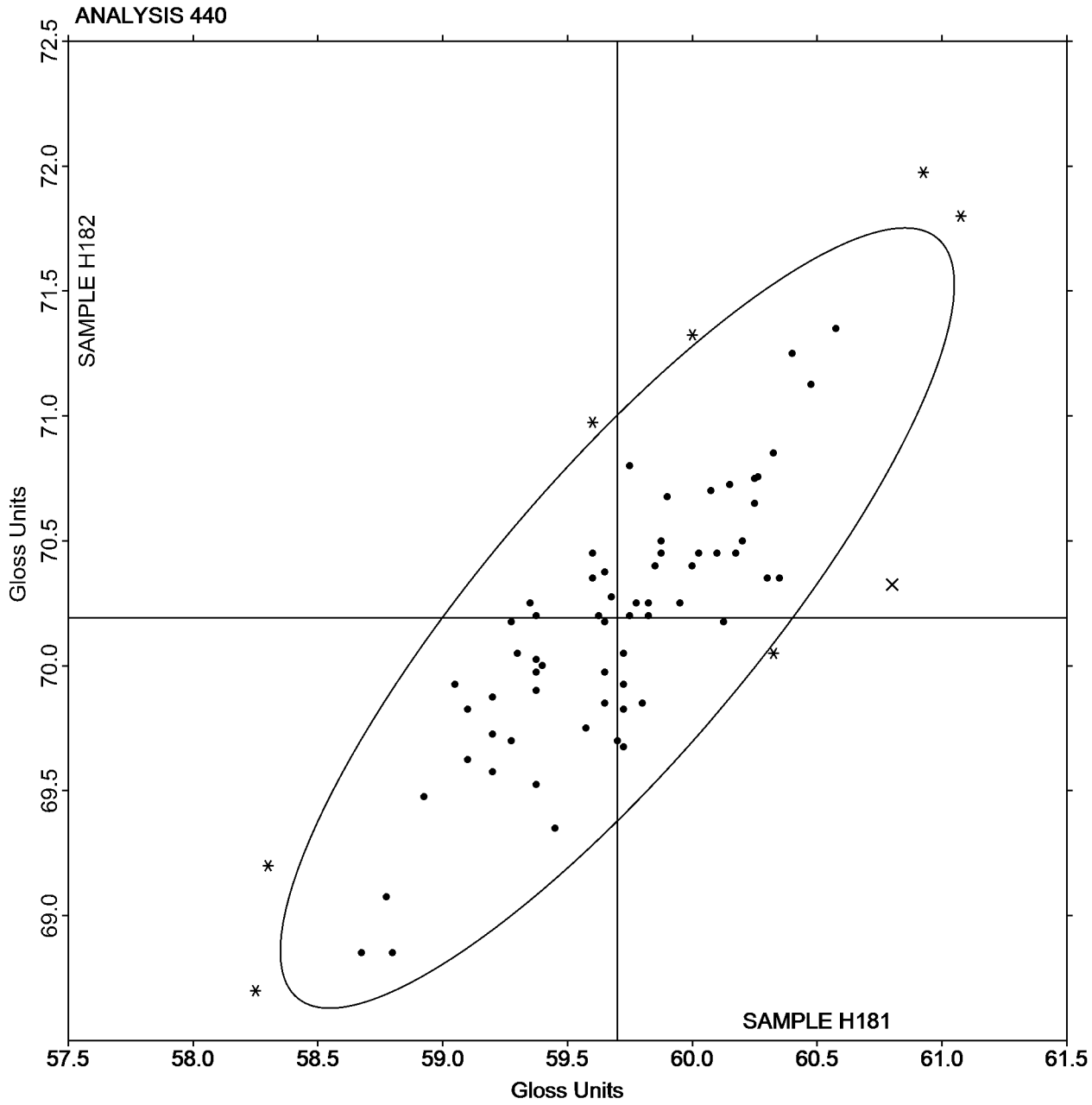
R93WF4(X) - Data for both samples are extremely low. Possible systematic error.

UE2ZH8(X) - Data for both samples are low. Possible systematic error.

Key to Instrument Codes Reported by Participants

EC	Elcometer	GB	BYK Gardner Spectro - Guide Sphere Gloss
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)
MM	Macbeth Lab-Gloss	MW	Minolta Multi-Gloss 268
PA	Photovolt micto-TRI-gloss G3	RA	Rhopoint Novo-Gloss Glossmeter

SAMPLE H181 = 59.70 Gloss Units SAMPLE H182 = 70.19 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample M181 Lab Mean	Sample M181 Diff from Grand Mean	Sample M181 CPV	Sample M182 Lab Mean	Sample M182 Diff from Grand Mean	Sample M182 CPV	Instr Code
4FW2B2		4.40	0.05	0.33	8.73	0.13	0.51	GL
9GG9NK		4.35	0.00	0.02	8.55	-0.05	-0.19	GL
AMHXPP		4.50	0.15	0.96	9.00	0.40	1.61	GN
C6D73E		4.35	0.00	0.02	8.53	-0.07	-0.29	GL
CXQKQL		4.35	0.00	0.02	8.63	0.03	0.11	GL
D383R4		4.43	0.08	0.49	8.65	0.05	0.21	GL
KFA2HM		3.98	-0.37	-2.34	8.10	-0.50	-1.99	GN
KYFGTM		4.43	0.08	0.49	8.60	0.00	0.01	GN

Summary Statistics

Grand Means

4.35 Gloss Units — 8.60 Gloss Units

Stnd Dev Btwn Labs

0.16 Gloss Units — 0.25 Gloss Units

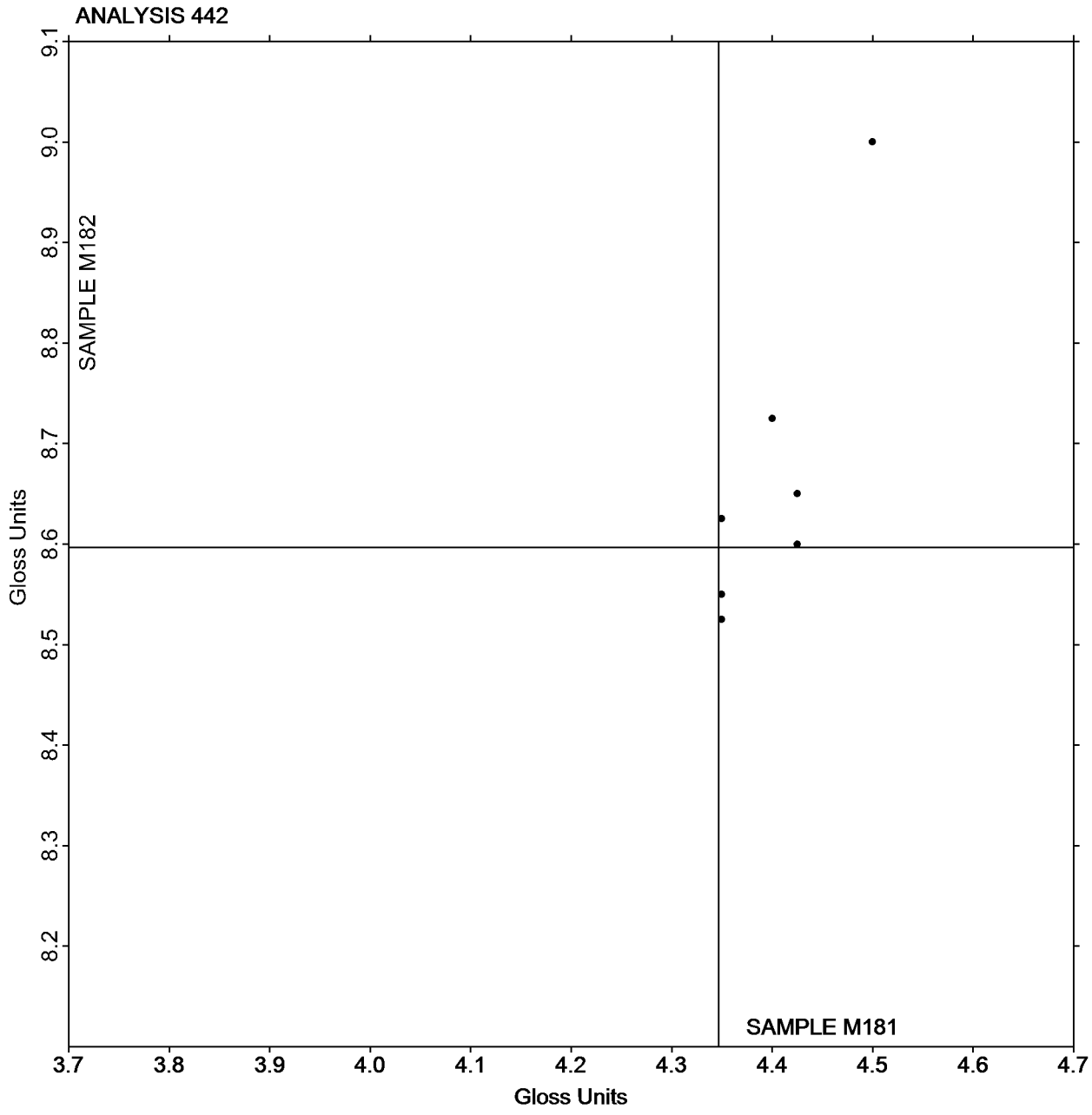
Statistics based on 8 of 8 reporting participants

Key to Instrument Codes Reported by Participants

GL BYK-Gardner micro-TRI-gloss

GN BYK-Gardner new micro-TRI-gloss

SAMPLE M181 = 4.35 Gloss Units SAMPLE M182 = 8.60 Gloss Units



-End of Report-