Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #183 - 1st Qtr 2018

About the Color Program, About CTS

Key to Tables and Graphs (Color Tests)

Key to Tables and Graphs (Spectro Test)

Key to Tables and Graphs (Gloss Tests)

Analysis	Analysis Name
408	Color & Color Difference (Paint Chips) - 45-0
409	Color & Color Difference (Paint Chips) Sphere
411	Spectrophotometric (Paint Chips) - Sphere
440	Gloss 60 Degree (Paint Chips)
442	Gloss 85 Degree (Paint Chips)

About The Color & Appearance Program

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

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

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

ABOUT CTS

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

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
2XQU62		A181	64.82	16.98	47.83	0.89	-0.39	-0.55	1.11	HK
		A182	65.71	16.59	47.28					
3LB64B		A181	65.32	17.22	48.41	0.88	-0.35	-0.40	1.03	GH
		A182	66.20	16.87	48.01					
4KV6L8		A181	65.72	16.19	48.70	0.53	-0.39	-0.53	0.84	HW
		A182	66.25	15.80	48.17					
4WVN88	X	A181	72.76	18.42	57.65	1.21	-0.61	-0.69	1.52	HW
		A182	73.97	17.82	56.96					
6BPX4C		A181	65.57	17.03	48.36	0.84	-0.34	-0.36	0.97	GH
		A182	66.40	16.69	48.00					
79DHAB		A181	65.40	17.12	48.28	0.91	-0.45	-0.53	1.14	XZ
		A182	66.31	16.67	47.75					
8Q7M84		A181	65.80	16.09	48.61	0.97	-0.27	-0.33	1.05	HW
		A182	66.77	15.82	48.29					
AGXMV9		A181	65.32	16.22	48.87	0.80	-0.56	-0.77	1.24	MG
		A182	66.12	15.66	48.10					
AVWUP4	X	A181	64.54	15.78	45.92	0.53	-0.14	0.37	0.65	XN
		A182	65.07	15.64	46.28					
BFFZRJ		A181	65.03	17.02	48.35	0.84	-0.49	-0.48	1.08	MU
		A182	65.87	16.53	47.87					
C8JRKX		A181	64.63	17.07	48.18	0.86	-0.42	-0.44	1.05	HY
		A182	65.49	16.65	47.74					
CL39WA		A181	65.08	17.07	48.17	0.84	-0.48	-0.50	1.09	XZ
		A182	65.92	16.59	47.67					
D4F6RU		A181	65.00	16.77	47.55	1.07	-0.21	0.26	1.12	XB
		A182	66.08	16.55	47.81					
DTHDZU		A181	65.26	17.25	48.06	1.04	-0.54	-0.25	1.19	GE
		A182	66.30	16.71	47.81					
EAY2LU		A181	65.34	16.92	48.36	0.79	-0.32	-0.35	0.92	XO
		A182	66.12	16.60	48.01					
GCEBNR		A181	65.35	16.85	48.33	0.87	-0.28	-0.27	0.95	XO
		A182	66.22	16.57	48.06					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
HFWHWQ	X	A181	64.92	17.43	49.63	1.19	-0.32	0.01	1.23	FA
		A182	66.11	17.12	49.64					
JJAU4R		A181	65.45	16.42	48.43	0.90	-0.28	-0.33	0.99	HW
		A182	66.34	16.14	48.11					
KUPUJL		A181	65.50	16.12	48.52	1.09	-0.48	-0.22	1.21	HW
		A182	66.59	15.64	48.30					
LJMZFM		A181	65.22	16.24	48.34	0.91	-0.29	-0.23	0.98	HW
		A182	66.12	15.96	48.12					
MLJ9YM		A181	65.00	16.89	47.48	0.92	-0.35	-0.40	1.06	XZ
		A182	65.91	16.54	47.08					
PKKKVH		A181	65.28	16.43	48.52	1.03	-0.57	-0.30	1.21	HW
		A182	66.31	15.86	48.22					
QLH67N		A181	65.43	16.37	48.00	0.88	-0.32	-0.35	1.00	HW
		A182	66.30	16.05	47.65					
QPE2KG		A181	65.21	17.29	48.29	1.04	-0.65	-0.46	1.31	GE
		A182	66.25	16.64	47.83					
R9P43M		A181	64.97	16.96	48.42	0.88	-0.40	-0.57	1.12	XU
		A182	65.85	16.56	47.85					
TFJTYG		A181	65.14	16.85	48.19	1.06	-0.45	-0.05	1.15	XM
		A182	66.20	16.40	48.14					
UQF3YB		A181	65.47	17.12	47.98	0.74	-0.39	-0.26	0.87	XD
		A182	66.21	16.73	47.72					
WGEPR8		A181	64.48	16.93	48.25	0.92	-0.42	-0.55	1.14	HY
		A182	65.39	16.51	47.70					
XG29GE		A181	65.04	16.94	48.60	0.93	-0.48	-0.62	1.21	XU
		A182	65.96	16.46	47.98					
Y3A2Y4		A181	64.96	16.91	48.53	0.84	-0.54	-0.64	1.18	XR
		A182	65.80	16.37	47.90					
YEQN86		A181	65.13	16.83	48.14	1.04	-0.37	0.06	1.10	XO
		A182	66.17	16.47	48.20					
YYDHW7		A181	65.28	16.39	48.28	1.00	-0.53	-0.44	1.21	HW
		A182	66.28	15.86	47.85					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
ZATN7E		A181	65.24	17.34	48.94	0.86	-0.52	-0.66	1.20	GB
		A182	66.10	16.83	48.28					
ZDAZ2A		A181	65.77	16.30	48.60	0.92	-0.39	-0.44	1.09	HW
		A182	66.68	15.91	48.16					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
A181	65.22	16.81	48.31	0.90	-0.41	-0.38	1.09
A182	66.13	16.40	47.92				
Stnd Dev Btwn Labs							
A181	0.30	0.51	0.32	0.11	0.10	0.21	0.11
A182	0.30	0.47	0.28				

Statistics based on 31 of 34 reporting participants

Comments Assigned on Data Flags for Test #408

4WVN88(X) - Extreme "L*" & "b*" values. High "a*" values.

AVWUP4(X) - Low "b*" values for both samples and low "L*" values for Sample A182. Large replication difference for "L*", "a*", and "b*" values for Sample A181.

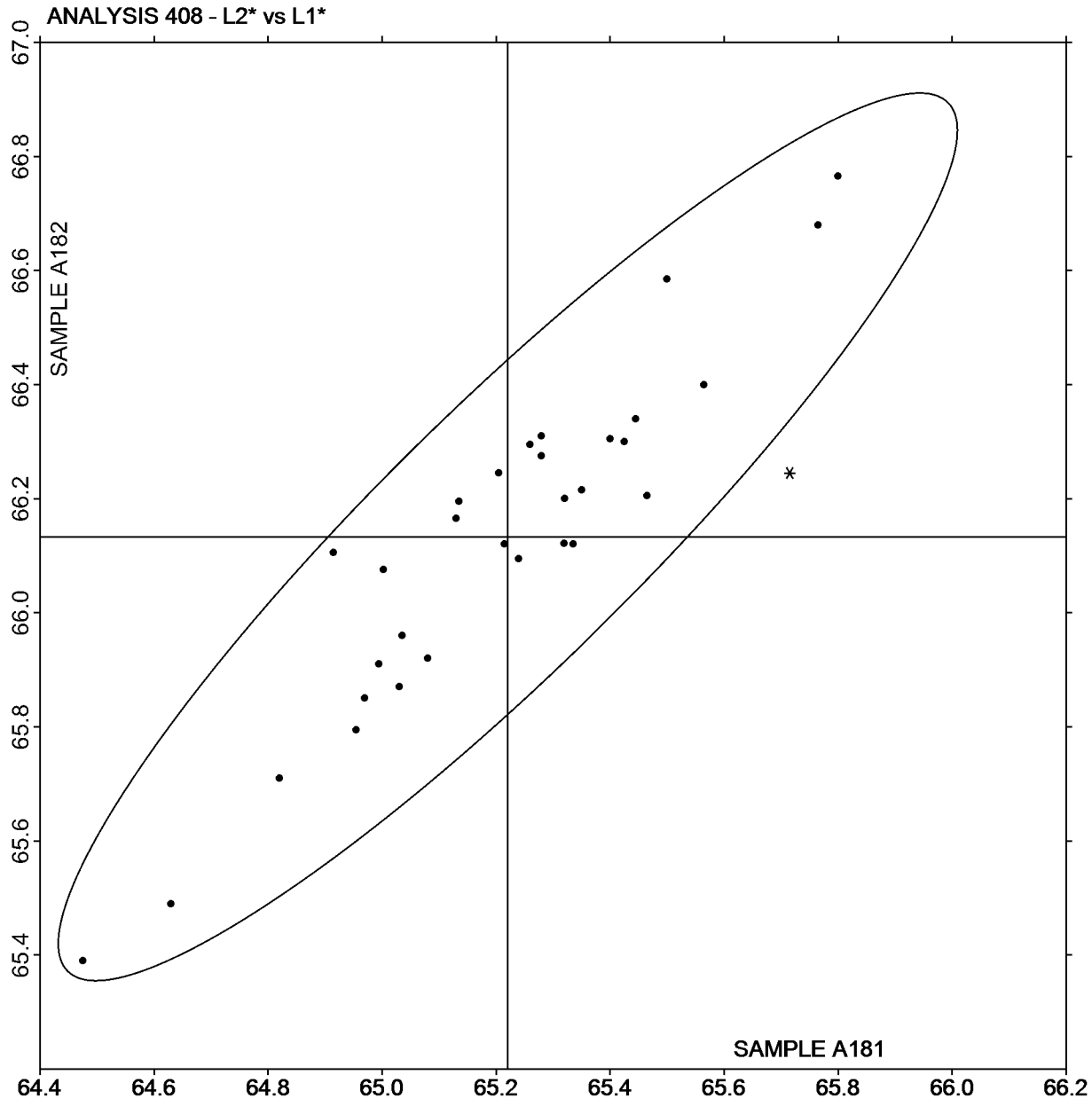
HFWHWQ(X) - High "b*" values. Large replication difference in "L*" values for Sample A181 and in "a*" values for Sample A182.

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	XB	X-Rite i1Basic Pro 2
XD	X-Rite 500 Series SpectroDensitometer	XM	X-Rite MA58 Multi-Angle Spectrophotometer
XN	X-Rite MA68 Multi-Angle Spectrophotometer	XO	X-Rite MA68 II Multi-Angle Spectrophotometer
XR	X-Rite 968 Portable Spectrophotometer	XU	X-Rite 964 Portable Spectrophotometer
XZ	X-Rite		

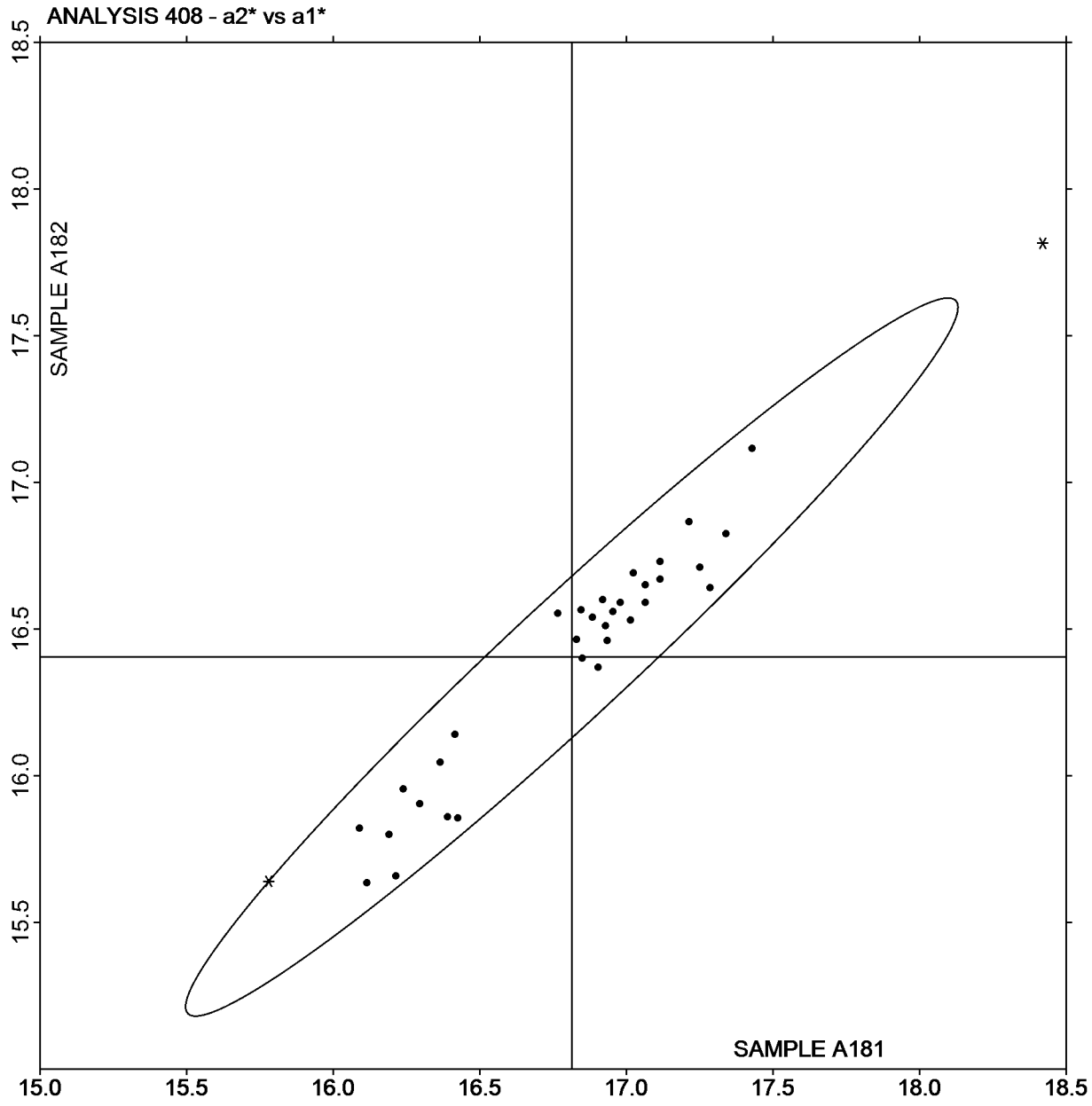
L2* vs L1*

SAMPLE A181 = 65.22 SAMPLE A182 = 66.13



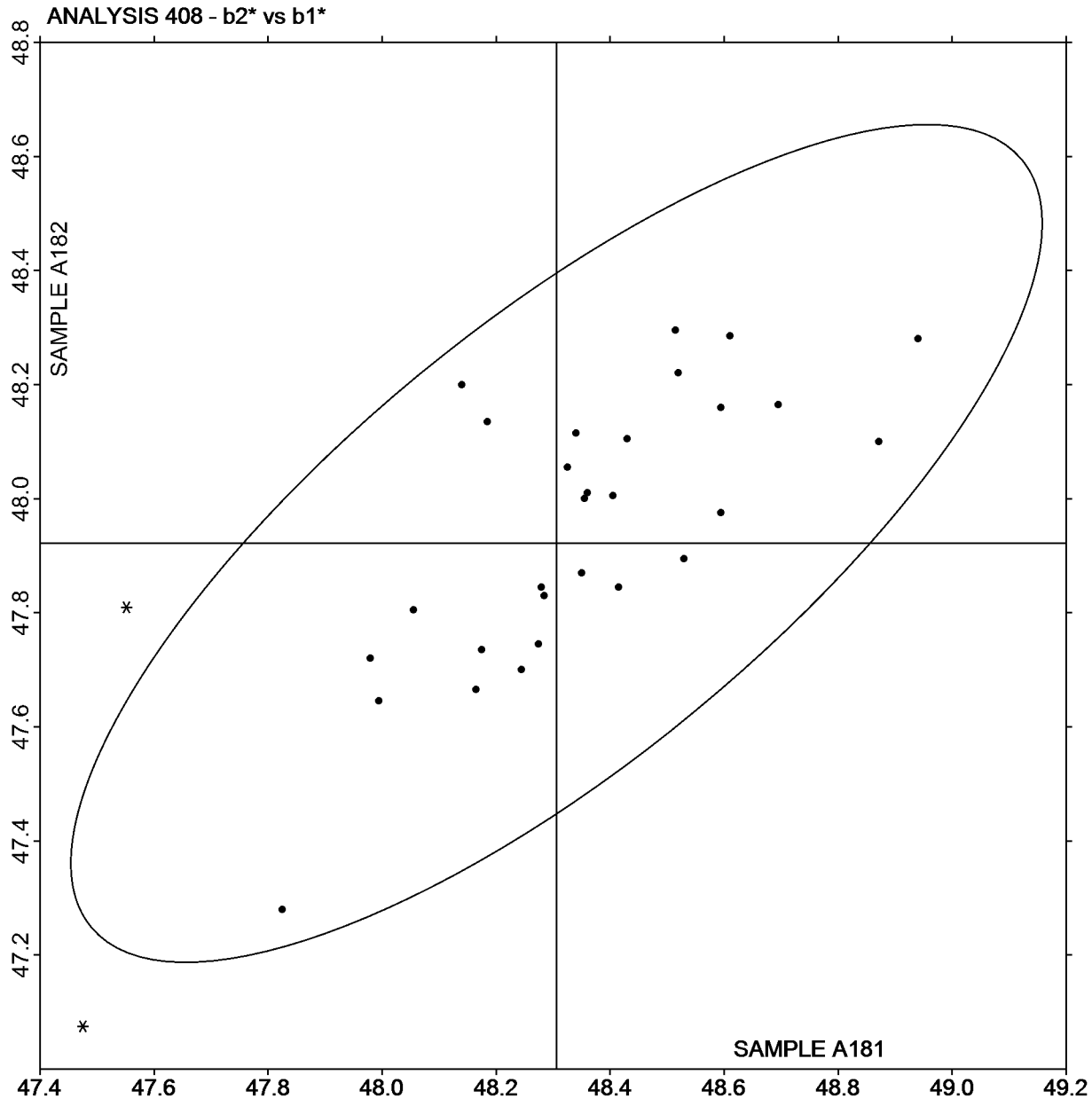
a2* vs a1*

SAMPLE A181 = 16.81 SAMPLE A182 = 16.40



b2* vs b1*

SAMPLE A181 = 48.31 SAMPLE A182 = 47.92



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
27NKUH		A181	65.05	17.24	47.24	0.91	-0.35	-0.49	1.08	AO
		A182	65.95	16.89	46.76					
2G8WA2		A181	65.13	16.85	46.98	1.01	-0.44	-0.18	1.11	XI
		A182	66.14	16.42	46.80					
2LVJWU		A181	65.22	16.86	48.06	0.89	-0.26	-0.24	0.96	MT
		A182	66.11	16.60	47.82					
2W2JD9		A181	64.75	17.12	47.37	1.03	-0.55	-0.29	1.20	XH
		A182	65.77	16.57	47.08					
37K3M8	X	A181	65.52	17.03	48.41	0.85	-0.42	-0.51	1.08	CA
		A182	66.37	16.61	47.90					
3KKW68		A181	65.22	16.33	47.76	1.11	-0.38	-0.12	1.17	XC
		A182	66.33	15.95	47.64					
3KZDYZ	X	A181	65.07	16.58	47.53	0.50	-0.39	-0.02	0.63	XO
		A182	65.57	16.19	47.51					
3MAE7T		A181	65.29	17.17	47.93	0.95	-0.47	-0.62	1.22	AJ
		A182	66.24	16.70	47.31					
4YZEAG		A181	65.07	17.25	47.42	0.90	-0.32	-0.46	1.06	AJ
		A182	65.97	16.94	46.96					
6BPX4C		A181	65.31	17.18	47.86	0.81	-0.54	-0.64	1.16	MV
		A182	66.11	16.64	47.22					
6P6V9D		A181	64.87	16.81	47.32	0.88	-0.45	-0.53	1.12	XI
		A182	65.75	16.37	46.79					
6ZPA7N	X	A181	64.97	16.82	48.51	0.86	-0.57	-0.65	1.22	GD
		A182	65.83	16.25	47.86					
7FYDBF		A181	65.04	16.74	47.45	0.90	-0.29	-0.36	1.01	XH
		A182	65.94	16.45	47.09					
7VBRTD		A181	65.20	17.04	47.32	0.87	-0.38	-0.40	1.03	AO
		A182	66.07	16.67	46.92					
8BEMHP		A181	65.15	17.10	47.45	0.93	-0.36	-0.30	1.04	AQ
		A182	66.08	16.74	47.15					
8G48L7		A181	65.03	17.18	47.29	0.89	-0.31	-0.33	0.99	AS
		A182	65.92	16.87	46.97					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
8MA467		A181	64.79	17.19	47.31	0.92	-0.31	-0.34	1.02	XH
		A182	65.70	16.88	46.97					
8TFQ4Z		A181	65.28	17.09	47.45	1.09	-0.39	-0.17	1.17	AM
		A182	66.37	16.70	47.28					
8ZG3ZX		A181	65.22	16.62	47.46	0.92	-0.36	-0.41	1.07	GG
		A182	66.14	16.26	47.05					
94RGYN		A181	65.11	16.23	47.43	0.87	-0.32	-0.27	0.96	XM
		A182	65.97	15.91	47.16					
9EDK43		A181	65.15	17.05	47.55	0.84	-0.37	-0.37	0.99	MV
		A182	65.99	16.68	47.18					
9V2RMU		A181	65.08	16.71	47.08	0.99	-0.56	-0.33	1.18	XI
		A182	66.07	16.15	46.75					
A96FC3		A181	65.15	16.67	46.97	1.07	-0.44	-0.17	1.16	XI
		A182	66.21	16.23	46.80					
AAXDHN		A181	65.07	17.01	47.16	0.93	-0.57	-0.30	1.13	MM
		A182	66.00	16.45	46.86					
AVWUP4	X	A181	63.96	15.99	46.12	0.89	-0.37	-0.27	1.00	XO
		A182	64.85	15.62	45.85					
B928LU		A181	65.17	16.95	47.51	1.00	-0.58	-0.40	1.22	XI
		A182	66.17	16.38	47.12					
BDBDDU	X	A181	7.51	14.14	12.53	0.06	0.04	0.49	0.49	MM
		A182	7.56	14.17	13.02					
BRRNM3	X	A181	95.86	1.48	-8.82	-0.07	-0.16	0.76	0.78	XH
		A182	95.79	1.32	-8.06					
C4MW9Q		A181	65.08	17.29	47.57	0.91	-0.30	-0.32	1.00	AS
		A182	65.99	16.99	47.26					
C8JRKX		A181	65.27	16.78	47.10	0.89	-0.29	-0.32	0.98	HP
		A182	66.15	16.50	46.78					
CGB7LJ		A181	64.88	16.77	47.19	0.88	-0.20	-0.17	0.92	AO
		A182	65.76	16.57	47.02					
CMFZM7		A181	65.18	17.10	47.49	0.87	-0.42	-0.48	1.07	AO
		A182	66.05	16.68	47.01					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
CR86FA		A181	65.14	17.01	47.21	0.89	-0.45	-0.60	1.16	AJ
		A182	66.03	16.57	46.61					
DCRBJQ		A181	65.05	16.91	47.39	0.93	-0.29	-0.26	1.00	AO
		A182	65.98	16.63	47.14					
DJCLE8		A181	65.15	17.06	47.55	0.97	-0.42	-0.47	1.15	AJ
		A182	66.11	16.64	47.08					
DVK9KJ	X	A181	-0.04	0.07	0.17	0.00	0.03	-0.03	0.04	AM
		A182	-0.04	0.09	0.14					
EEDCZY		A181	64.98	17.02	47.60	0.88	-0.32	-0.29	0.98	AJ
		A182	65.86	16.70	47.31					
EFPBWT		A181	65.15	16.77	47.67	1.11	-0.35	-0.06	1.17	AJ
		A182	66.26	16.42	47.61					
EWECV6		A181	65.13	16.97	47.62	0.89	-0.46	-0.60	1.16	AE
		A182	66.01	16.51	47.02					
FEDP7R		A181	65.04	17.22	47.22	0.94	-0.27	-0.16	0.99	AJ
		A182	65.98	16.95	47.07					
FZAN7V		A181	65.10	16.71	47.49	1.08	-0.31	-0.31	1.16	MM
		A182	66.18	16.41	47.18					
G6LQTQ		A181	65.07	16.87	47.06	1.06	-0.40	-0.05	1.13	MM
		A182	66.12	16.47	47.01					
GF3D3R		A181	64.89	16.85	47.49	1.10	-0.33	0.01	1.15	XH
		A182	65.99	16.52	47.50					
GGUK2V		A181	65.10	17.02	48.06	0.90	-0.32	-0.32	1.00	CA
		A182	66.00	16.70	47.74					
GL34ZN		A181	65.17	17.02	47.47	0.81	-0.53	-0.60	1.13	XB
		A182	65.98	16.49	46.87					
GPPEH2		A181	65.28	16.56	47.24	0.83	-0.37	-0.43	1.00	XI
		A182	66.11	16.20	46.82					
GRU9TR		A181	65.13	17.04	47.45	0.93	-0.22	-0.27	0.99	AS
		A182	66.06	16.82	47.18					
H2C8YN		A181	65.07	16.45	47.76	0.85	-0.48	-0.61	1.15	XO
		A182	65.92	15.98	47.15					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
H2WQ7F		A181	65.28	16.75	47.28	0.85	-0.36	-0.36	0.98	XI
		A182	66.13	16.39	46.92					
H6ZGG2		A181	65.33	16.99	47.74	0.87	-0.46	-0.55	1.13	XB
		A182	66.20	16.53	47.19					
HGNQVU		A181	64.84	16.61	47.41	0.96	-0.20	-0.18	0.99	XH
		A182	65.80	16.41	47.23					
HH6VDT		A181	65.17	17.41	47.37	1.00	-0.63	-0.39	1.24	AO
		A182	66.17	16.78	46.98					
J9ACCP		A181	64.96	16.68	47.02	0.97	-0.24	-0.24	1.02	XI
		A182	65.93	16.44	46.78					
JFTMGD		A181	64.90	17.01	47.10	0.87	-0.43	-0.48	1.08	MM
		A182	65.77	16.59	46.62					
JHHL4N		A181	65.23	17.14	47.88	0.86	-0.41	-0.43	1.04	MU
		A182	66.09	16.74	47.46					
JJCCA3		A181	65.05	17.32	47.33	0.92	-0.39	-0.51	1.12	AJ
		A182	65.97	16.93	46.82					
KM3BTQ		A181	65.09	17.01	47.50	0.88	-0.43	-0.49	1.09	HP
		A182	65.97	16.59	47.01					
L6KPUL		A181	65.13	17.26	47.49	1.03	-0.52	-0.36	1.21	AS
		A182	66.16	16.74	47.13					
LBBY3Y		A181	65.14	16.92	47.47	0.91	-0.32	-0.42	1.05	MK
		A182	66.05	16.60	47.05					
LLRLCZ		A181	65.33	16.95	47.68	0.91	-0.43	-0.56	1.15	MV
		A182	66.24	16.52	47.13					
M7R9A9		A181	65.19	16.19	47.81	0.86	-0.45	-0.52	1.10	XM
		A182	66.05	15.74	47.29					
MKF7HY		A181	65.04	16.44	47.14	0.89	-0.38	-0.49	1.08	AM
		A182	65.93	16.06	46.66					
NJBFKF		A181	65.11	17.32	47.51	0.85	-0.49	-0.61	1.15	AJ
		A182	65.96	16.83	46.91					
PEV3FL		A181	64.94	16.97	47.17	0.94	-0.33	-0.44	1.08	HP
		A182	65.88	16.65	46.74					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
PPFC4E		A181	65.08	16.99	47.52	0.90	-0.55	-0.65	1.23	AQ
		A182	65.98	16.45	46.88					
QBBNBC	X	A181	65.07	15.46	47.65	1.06	0.61	-0.22	1.24	XO
		A182	66.13	16.07	47.43					
QPE2KG		A181	64.88	16.41	47.23	1.04	-0.59	-0.45	1.28	GD
		A182	65.92	15.83	46.78					
QT2LM6		A181	64.88	16.77	47.53	0.84	-0.40	-0.45	1.03	XH
		A182	65.72	16.37	47.09					
R9P43M		A181	64.94	16.92	47.24	0.96	-0.44	-0.58	1.20	XI
		A182	65.90	16.48	46.66					
RC7FXH		A181	65.00	16.70	47.65	0.80	-0.30	-0.45	0.97	MS
		A182	65.80	16.40	47.20					
RMZUXE		A181	65.14	17.17	47.57	1.08	-0.46	-0.15	1.18	AJ
		A182	66.22	16.72	47.43					
TB66EK	X	A181	95.93	3.21	-13.48	0.00	-0.07	0.27	0.28	XX
		A182	95.93	3.14	-13.21					
U6FVQ8		A181	65.12	17.10	47.28	1.02	-0.52	-0.36	1.20	AJ
		A182	66.14	16.58	46.92					
UTLJGF		A181	64.98	16.55	47.79	1.09	-0.48	-0.17	1.20	XM
		A182	66.06	16.07	47.62					
UTY9G8		A181	65.35	16.67	47.14	1.02	-0.59	-0.43	1.25	HW
		A182	66.37	16.08	46.72					
V7NAXD		A181	65.44	16.97	47.68	1.10	-0.55	-0.38	1.28	CA
		A182	66.54	16.42	47.30					
VAPBXB		A181	64.77	17.11	47.33	0.81	-0.47	-0.47	1.05	XH
		A182	65.58	16.64	46.86					
W336E9		A181	65.31	17.19	47.55	0.82	-0.53	-0.62	1.15	AQ
		A182	66.13	16.67	46.93					
WCBE79	X	A181	64.91	16.79	150.10	1.03	-0.53	2.44	2.70	MM
		A182	65.94	16.27	152.54					
WZYCKB		A181	65.02	16.88	47.34	1.10	-0.26	0.06	1.13	MV
		A182	66.12	16.62	47.40					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
X3D7XM	X	A181	65.45	16.45	46.19	0.85	-0.46	-0.48	1.07	HH
		A182	66.29	15.99	45.71					
X99ZX9		A181	65.23	16.69	46.89	0.92	-0.25	-0.12	0.95	XI
		A182	66.15	16.45	46.77					
XF3DPV		A181	65.05	17.35	47.43	0.86	-0.43	-0.48	1.07	AJ
		A182	65.90	16.92	46.95					
XG29GE		A181	65.07	16.83	47.12	0.92	-0.47	-0.69	1.24	XI
		A182	65.98	16.36	46.44					
XQJW88		A181	65.17	17.27	47.48	0.83	-0.47	-0.50	1.07	AS
		A182	66.00	16.81	46.98					
Y88MNL		A181	65.07	17.26	47.40	0.92	-0.45	-0.47	1.12	AO
		A182	65.99	16.82	46.93					
YB64ZF		A181	65.18	16.61	47.23	0.94	-0.34	-0.40	1.08	XI
		A182	66.12	16.27	46.83					
YEQN86		A181	65.17	16.86	47.48	1.06	-0.39	-0.11	1.13	MI
		A182	66.23	16.47	47.37					
YVBL36		A181	65.18	17.12	47.55	0.70	-0.45	-0.67	1.07	AJ
		A182	65.88	16.67	46.88					
YYUF7W		A181	65.11	17.29	47.32	0.92	-0.34	-0.41	1.06	AQ
		A182	66.03	16.95	46.91					
Z7TFZJ		A181	65.07	16.58	47.05	0.82	-0.46	-0.53	1.07	XI
		A182	65.89	16.13	46.53					
ZCF9D4		A181	65.09	16.92	47.41	1.01	-0.52	-0.21	1.15	XI
		A182	66.10	16.40	47.20					
ZUCTQH		A181	65.18	16.87	47.00	0.95	-0.19	-0.12	0.98	XI
		A182	66.13	16.68	46.88					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
A181	65.11	16.91	47.42	0.93	-0.40	-0.37	1.10
A182	66.04	16.51	47.05				
Stnd Dev Btwn Labs							
A181	0.15	0.27	0.25	0.09	0.10	0.17	0.09
A182	0.17	0.28	0.28				

Statistics based on 82 of 93 reporting participants

Comments Assigned on Data Flags for Test #409

37K3M8(X) - High "b*" values. High "L*" value of Sample A181. Large replication difference for "L*" replicates on both samples.

3KZDYZ(X) - Low "L*" value for Sample A182. Large replication difference for "L*" replicates on Sample A182.

6ZPA7N(X) - High "b*" values.

AVWUP4(X) - All values are low.

BDBDDU(X) - Extreme data

BRRNM3(X) - Apparently measured back of the samples.

DVK9KJ(X) - Extreme data

QBBNBC(X) - Low "a*" value for sample A181. Large replication difference for "a*" replicates on Sample A181.

TB66EK(X) - Apparently measured back of the samples.

WCBE79(X) - Extreme datum in second "b*" replicate for both samples.

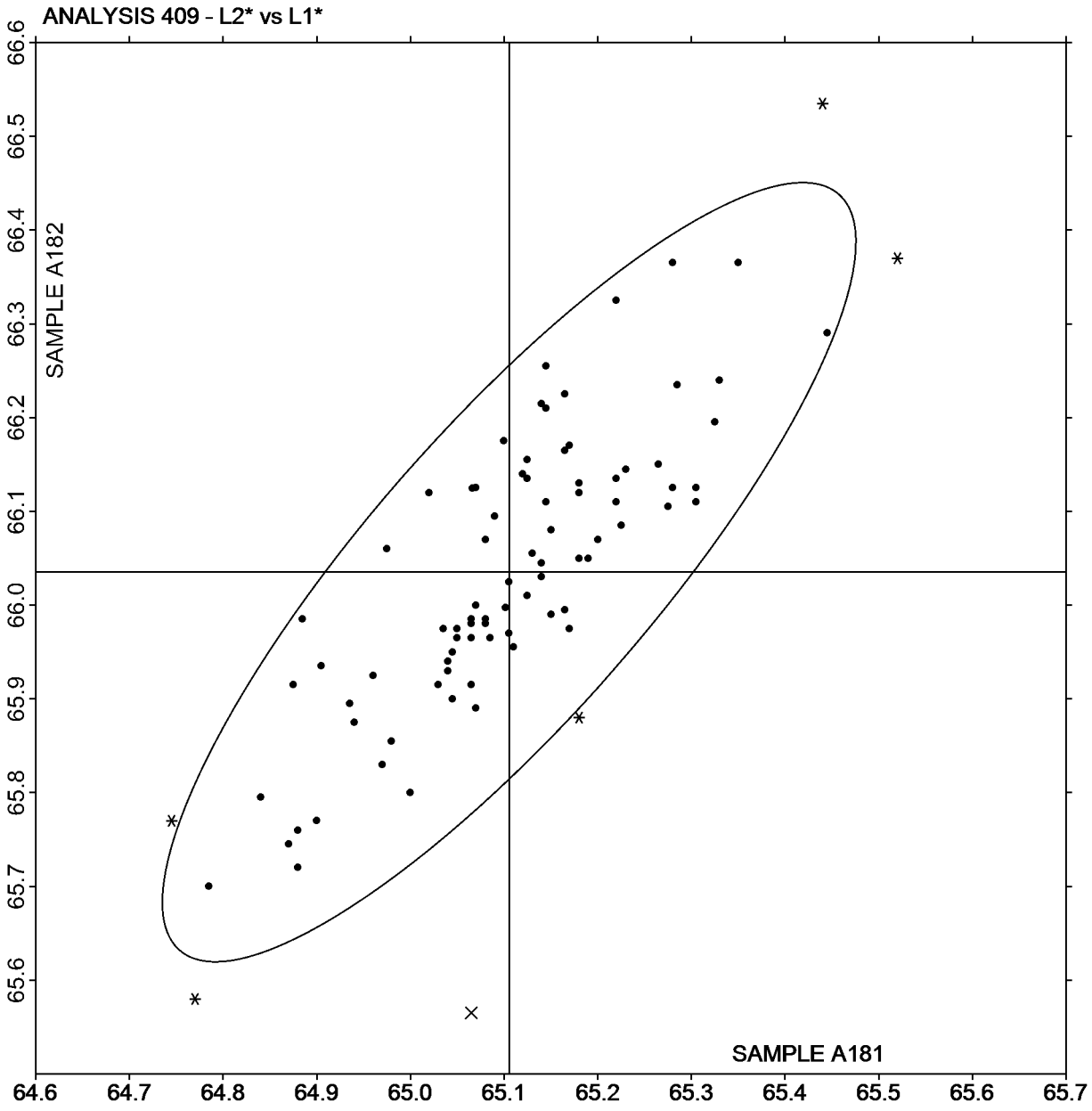
X3D7XM(X) - Low "b*" values.

Key to Instrument Codes Reported by Participants

AE	ACS-Datacolor 110	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	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	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	XX	Instrument make/model not specified by lab

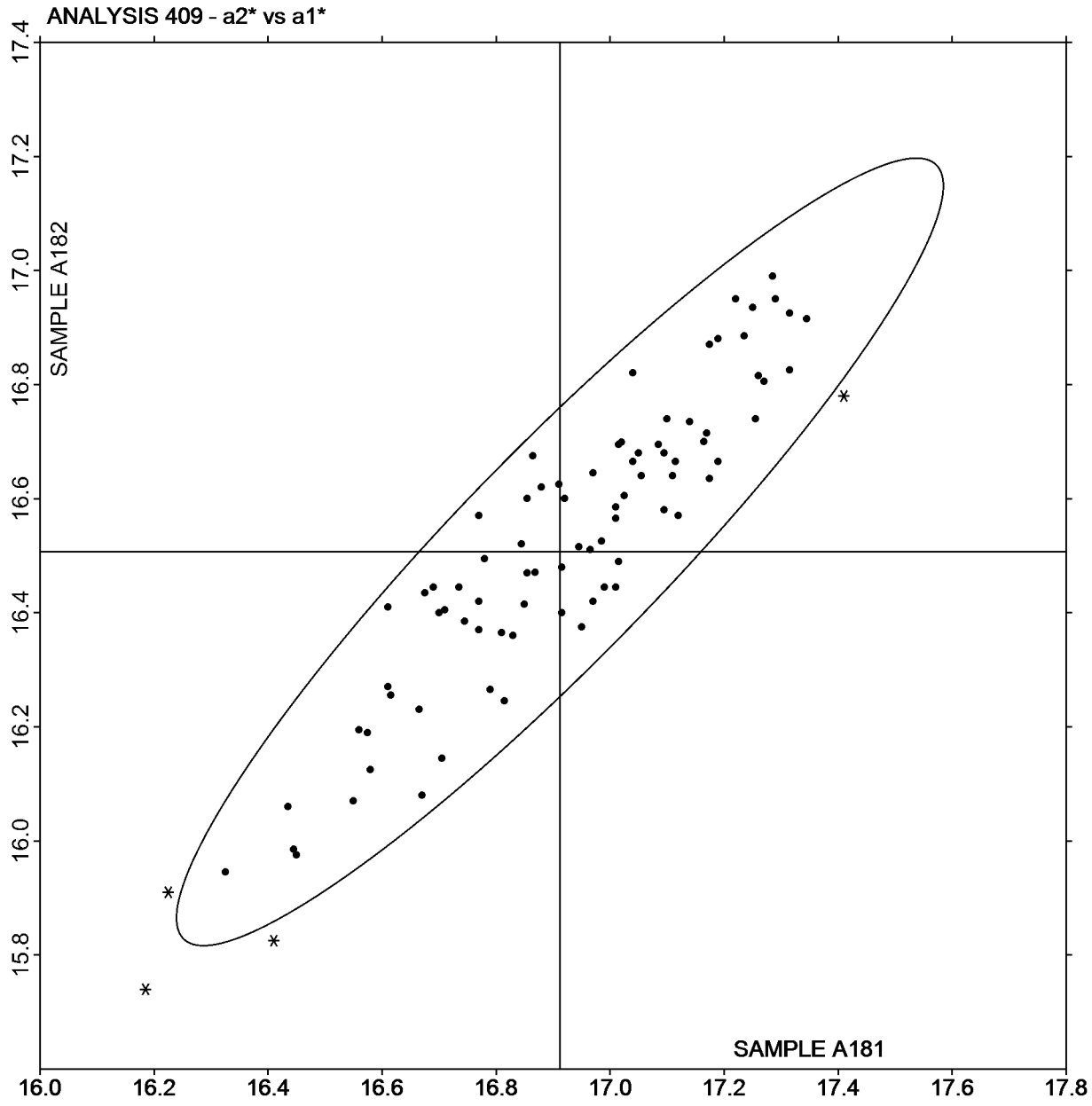
L2* vs L1*

SAMPLE A181 = 65.11 SAMPLE A182 = 66.04



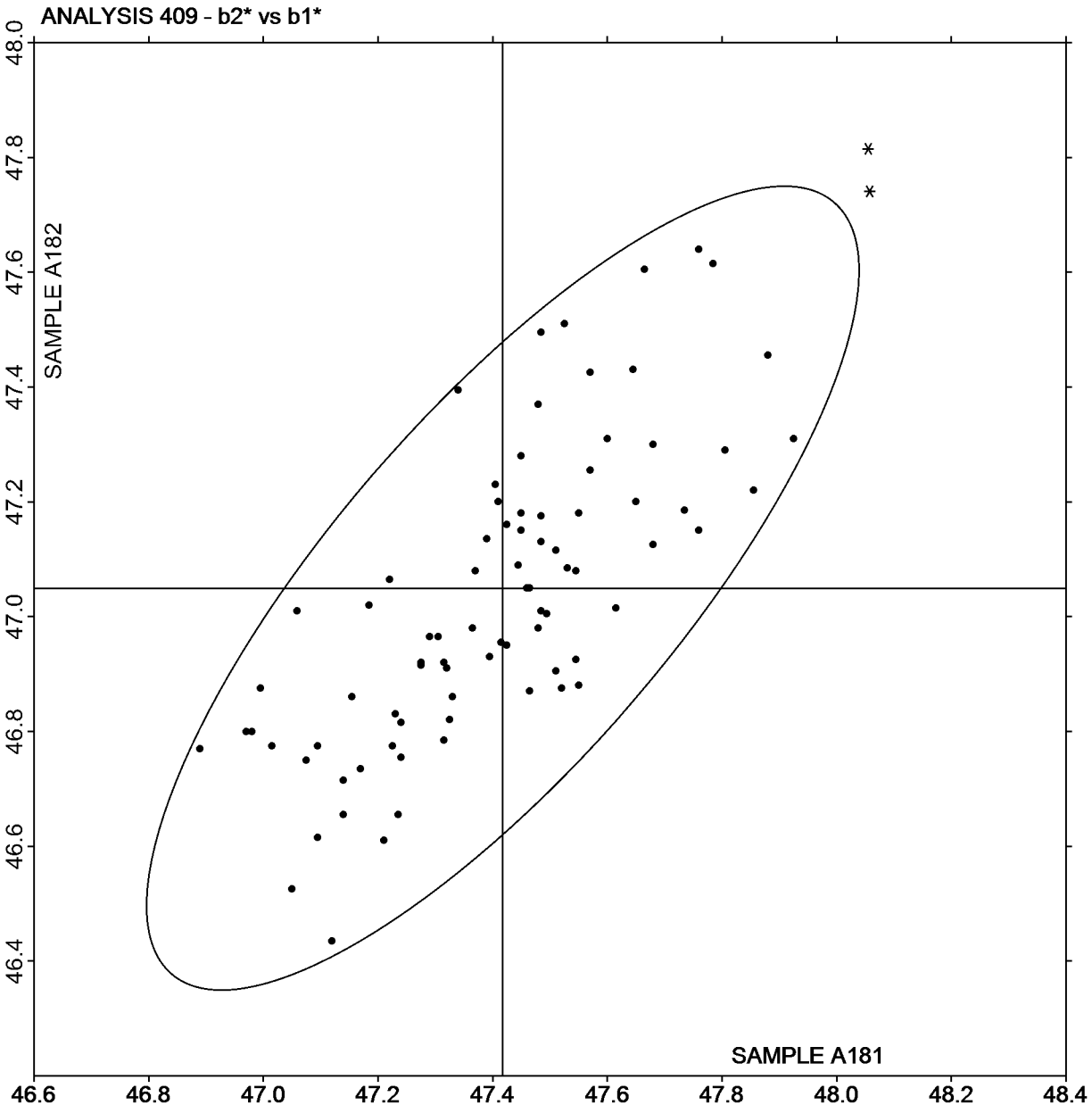
a2* vs a1*

SAMPLE A181 = 16.91 SAMPLE A182 = 16.51



b2* vs b1*

SAMPLE A181 = 47.42 SAMPLE A182 = 47.05



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 A181																		
27NKUH		6.63	7.31	9.23	10.46	11.03	12.98	18.18	28.85	42.71	50.83	51.40	49.72	48.75	49.11	50.95	53.83	AO
2G8WA2		6.70	7.55	9.34	10.56	11.16	13.26	18.48	29.09	42.81	50.75	51.25	49.49	48.48	48.88	50.54	53.65	XI
2LVJWU		6.36	7.10	9.02	10.36	10.96	13.01	18.42	29.08	43.27	51.16	51.50	49.73	48.75	49.04	50.77	54.21	MT
2W2JD9		6.58	7.27	9.00	10.22	10.79	12.89	18.07	28.52	42.20*	50.16	50.83	49.17	48.25	48.60	50.46	53.69	XH
37K3M8		6.62	7.36	9.28	10.52	11.07	13.16	18.44	29.44	43.89*	51.85X	51.92*	50.10	49.09	49.42	51.08	54.46	CA
3KKW68		6.53	7.28	9.15	10.30	10.92	13.08	18.56	29.42	43.23	50.66	50.98	49.22	48.46	48.75	50.40	53.74	XC
3KZDYZ		6.48	7.32	9.12	10.34	10.94	13.08	18.50	29.25	42.95	50.58	51.08	49.17	48.44	48.86	50.78	54.14	XO
3MAE7T		6.58	7.26	9.11	10.31	11.05	13.03	18.24	29.15	43.32	51.35	51.76	50.04	48.97	49.44	51.23	54.08	AJ
4YZEAG		6.74	7.31	9.14	10.39	11.02	13.02	18.13	28.72	42.86	50.94	51.41	49.73	48.75	49.10	50.97	53.68	AJ
6BPX4C		6.53	7.28	9.15	10.44	10.98	12.98	18.24	29.04	43.33	51.57*	51.88*	50.02	49.06	49.34	51.10	54.37	MV
6P6V9D		6.80	7.36	9.06	10.29	10.91	13.00	18.27	28.88	42.45	50.31	50.74	49.09	48.17	48.55	50.31	53.63	XI
6ZPA7N		7.21X	6.75X	8.70X	10.02X	10.58X	12.15X	18.82*	29.20	42.72	50.51	51.08	48.97	48.39	48.83	50.58	53.73	GD
7FYDBF		6.57	7.34	9.15	10.36	10.95	13.09	18.28	29.04	43.01	50.61	50.96	49.24	48.27	48.67	50.55	53.82	XH
7VBRTD		6.66	7.41	9.31	10.51	11.10	13.16	18.33	29.00	43.19	51.16	51.58	49.89	48.97	49.31	50.79	52.55*	AO
8BEMHP		6.66	7.41	9.24	10.41	11.02	13.05	18.30	28.94	43.17	51.01	51.43	49.72	48.76	49.19	51.00	53.99	AQ
8G48L7		6.62	7.41	9.19	10.40	11.06	13.04	18.23	28.67	42.88	50.82	51.29	49.65	48.77	49.21	50.60	52.33*	AS
8MA467		6.61	7.31	9.05	10.27	10.84	12.92	18.05	28.54	42.27*	50.29	50.89	49.31	48.35	48.78	50.56	54.04	XH
8TFQ4Z		6.76	7.52	9.30	10.47	11.04	13.12	18.57	29.12	43.13	51.18	51.68	49.91	48.98	49.37	51.15	53.19	AM
8ZG3ZX		6.59	7.20	9.15	10.61	11.09	13.20	18.49	29.35	43.15	50.89	51.24	49.66	48.68	48.90	50.62	53.83	GG
94RGYN		6.62	7.36	9.20	10.37	10.98	13.14	18.60	29.44	43.19	50.47	50.64	48.88*	48.04	48.48	50.14	53.42	XF
9V2RMU		6.77	7.55	9.32	10.46	11.07	13.19	18.42	29.19	42.82	50.67	50.99	49.26	48.30	48.79	50.58	53.95	XI
A96FC3	X	6.73	7.50	9.38	10.57	11.16	13.28	18.55	29.18	42.99	50.71	51.03	34.31X	48.44	48.85	50.71	54.00	XI
AAXDHN		6.74	7.43	9.25	10.47	11.06	13.18	18.33	28.93	42.78	50.73	51.25	49.55	48.60	49.00	50.75	54.04	MM
B928LU		6.70	7.42	9.20	10.41	11.00	13.15	18.38	29.09	43.10	50.91	51.34	49.67	48.75	49.18	51.06	54.40	XI
BDBDDU		6.65	7.41	9.29	10.47	11.08	13.26	18.55	29.46	43.43	51.18	51.38	49.69	48.77	49.26	51.05	54.62	MM

Spectrophotometric Reflectance values (as %) at selected wavelengths

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
Sample A181																		
C4MW9Q		6.60	7.31	9.10	10.37	11.00	13.01	18.17	25.71X	42.91	50.97	51.44	49.84	48.92	49.41	50.63	54.09	AS
CGB7LJ		6.51	7.33	9.16	10.34	10.94	13.04	18.28	28.80	42.58	50.27	50.77	49.26	48.44	48.62	49.95*	51.94X	AO
CMFZM7		6.59	7.43	9.19	10.42	11.02	13.08	18.25	28.85	43.23	51.13	51.59	49.83	48.97	49.27	50.78	52.62	AO
CR86FA		6.62	7.44	9.29	10.49	11.18	13.14	18.39	28.96	43.03	50.92	51.37	49.68	48.73	49.16	50.81	52.99	AJ
DCRBJQ		6.60	7.32	9.17	10.38	10.96	13.02	18.24	28.83	43.13	50.78	51.08	49.36	48.46	48.81	50.72	52.78	AO
DJCLE8		6.56	7.41	9.17	10.38	10.97	13.05	18.28	28.82	43.19	51.11	51.46	49.79	48.79	49.31	51.01	53.04	AJ
DVK9KJ		7.08*	7.22	9.02	10.29	10.90	12.96	18.11	28.72	43.02	50.88	51.40	49.69	48.72	49.13	50.77	53.91	AM
EFPBWT		6.58	7.38	9.10	10.31	11.06	13.09	18.44	29.27	42.96	50.75	51.34	49.66	48.80	49.09	50.90	53.75	AJ
EWECV6		6.58	7.33	9.14	10.35	10.97	13.07	18.32	29.08	42.94	50.85	51.33	49.63	48.61	48.96	50.65	53.81	AE
FZAN7V		6.58	7.33	9.18	10.41	11.00	13.11	18.33	29.08	42.91	50.85	51.23	49.57	48.64	49.01	50.76	54.11	MM
G6LQTQ		6.76	7.50	9.28	10.49	11.10	13.21	18.44	29.02	42.64	50.64	51.23	49.63	48.60	48.94	50.65	53.83	MM
GF3D3R		6.50	7.25	9.05	10.26	10.86	12.99	18.23	28.84	42.52	50.42	50.77	49.12	48.20	48.60	50.41	53.71	XH
GGUK2V		6.35	7.08*	8.99	10.22	10.79	12.85	18.07	28.94	43.14	51.12	51.36	49.58	48.53	48.88	50.57	53.81	CA
GL34ZN		6.64	7.41	9.21	10.41	11.03	13.14	18.40	29.09	42.94	50.91	51.36	49.75	48.81	49.25	51.01	54.46	XB
GPPEH2		6.73	7.53	9.35	10.54	11.13	13.34	18.69	29.42	43.25	50.88	51.20	49.52	48.65	49.06	50.91	54.24	XI
GRU9TR		6.59	7.41	9.21	10.37	11.10	13.07	18.28	28.79	43.28	50.99	51.38	49.61	48.68	49.03	50.58	52.32*	AS
H2C8YN		6.43	7.22	9.05	10.27	10.90	13.04	18.47	29.32	43.15	50.53	50.96	49.07	48.38	48.61	50.60	53.71	XO
H2WQ7F		6.82	7.54	9.32	10.53	11.15	13.29	18.62	29.34	43.22	50.94	51.35	49.69	48.87	49.20	51.05	54.41	XI
H6ZGG2		6.60	7.37	9.20	10.43	11.04	13.15	18.43	29.26	43.37	51.34	51.61	49.89	48.84	49.16	51.00	54.31	XB
HGNQVU		6.51	7.27	9.07	10.26	10.83	12.97	18.15	28.83	42.70	50.32	50.58*	48.89*	47.98*	48.33*	50.17	53.46	XH
HH6VDT		6.62	7.41	9.20	10.49	11.12	13.00	18.15	28.80	43.02	51.21	51.69	50.03	49.01	49.53	51.43*	54.17	AO
J9ACCP		6.62	7.42	9.26	10.45	11.08	13.17	18.29	28.98	42.72	50.47	50.85	49.17	48.24	48.68	50.42	53.80	XI
JFTMGD		6.68	7.38	9.17	10.42	10.97	13.06	18.18	28.72	42.40	50.48	51.02	49.40	48.48	48.90	50.57	53.88	MM
JHHL4N		6.50	7.24	9.07	10.40	10.93	12.93	18.20	28.96	43.25	51.39	51.69	49.85	48.86	49.17	51.01	54.29	MV
JJCCA3		6.65	7.43	9.16	10.40	11.06	12.99	18.11	28.82	42.61	50.95	51.56	49.91	48.96	49.30	50.95	54.17	AJ

WebCode	Data Flag	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
		Spectrophotometric Reflectance values (as %) at selected wavelengths																
		Sample A181																
KM3BTQ		6.74	7.32	9.11	10.39	10.98	13.10	18.33	28.97	42.88	50.79	51.47	49.78	48.71	48.86	50.81	54.00	HP
L6KPUL		6.62	7.32	9.16	10.39	11.02	13.04	18.17	28.78	43.10	51.07	51.49	49.82	48.90	49.29	50.86	52.63	AS
LBBY3Y		6.59	7.37	9.18	10.42	10.99	13.13	18.39	29.13	42.91	50.89	51.26	49.60	48.66	49.01	50.67	53.97	MK
LLRLCZ	X	6.60	7.35	9.26	25.50X	11.01	13.07	18.41	29.15	43.52	51.51	51.65	49.86	48.87	49.21	50.97	54.31	MV
M7R9A9		6.55	7.30	9.11	10.31	10.94	13.13	18.59	29.53	43.41	50.64	50.83	49.08	48.14	48.61	50.34	53.58	XF
MKF7HY		6.56	7.48	9.23	10.44	11.10	13.21	18.63	29.28	42.74	50.41	50.82	49.13	48.11	48.42	50.06*	52.45*	AM
NJBFKF		6.52	7.43	9.15	10.36	11.05	12.98	18.13	28.68	43.14	51.06	51.47	49.85	48.87	49.35	50.90	52.99	AJ
PEV3FL		6.64	7.31	9.21	10.36	10.99	13.10	18.35	28.84	42.29*	50.53	51.14	49.54	48.39	48.74	50.48	53.59	HP
PPFC4E		6.51	7.28	9.14	10.34	11.00	12.99	18.33	28.89	43.10	50.85	51.22	49.52	48.65	48.93	50.66	53.66	AQ
QBBNBC		6.49	7.26	9.09	10.29	10.92	13.08	18.49	29.42	43.01	50.59	50.97	49.12	48.19	48.84	50.56	53.73	XO
QPE2KG		6.18*	7.11	8.79*	10.39	11.50X	13.24	18.88*	29.29	42.02X	50.14*	50.57*	48.81*	48.32	48.91	50.62	53.26	GD
QT2LM6		6.56	7.30	9.04	10.23	10.81	12.93	18.11	28.84	42.75	50.46	50.69	48.90	48.04	48.38*	50.16	53.57	XH
R9P43M		6.72	7.43	9.14	10.36	10.94	13.04	18.18	28.86	42.71	50.43	50.91	49.29	48.35	48.71	50.50	53.64	XI
RC7FXH		6.60	7.30	9.10	10.30	10.85	12.90	18.25	28.95	42.90	50.65	50.95	49.20	48.20	48.60	50.35	53.65	MS
TB66EK	X	27.46X	05.53X	124.16X	107.81X	100.70X	94.67X	90.10X	87.75X	87.95X	86.77X	86.39X	86.22X	87.11X	87.72X	87.51X	87.35X	AH
U6FVQ8		7.28X	7.43	9.23	10.44	11.13	13.09	18.27	28.93	42.94	50.90	51.41	49.75	48.72	49.14	50.82	53.80	AJ
UTLJGF		6.77	7.47	9.38	10.51	11.13	13.30	18.97X	29.74	43.55	51.19	51.34	49.57	48.50	48.74	50.80	53.81	HW
V7NAXD		6.65	7.38	9.28	10.53	11.08	13.15	18.42	29.33	43.66*	51.67*	51.87*	50.07	49.05	49.37	51.11	54.38	CA
VAPBXB		6.47	7.28	8.99	10.26	10.86	12.94	18.06	28.61	42.26*	50.15	50.88	49.27	48.23	48.58	50.23	53.45	XH
W336E9		7.04*	7.46	9.29	10.45	11.11	13.07	18.35	29.14	43.34	51.31	51.72	50.05	49.10	49.54	51.26	54.33	AQ
WCBE79		6.60	7.35	9.15	10.33	10.92	13.07	18.23	28.84	42.56	50.43	50.83	49.21	48.29	48.68	50.36	53.63	MM
WZYCKB		6.38	7.23	9.18	10.47	11.00	13.01	18.15	28.79	43.05	50.92	51.09	49.28	48.24	48.59	50.31	53.67	MV
X3D7XM		7.24X	7.97X	9.97X	10.91X	11.44X	13.49*	18.78*	29.81	43.45	51.16	51.48	49.72	48.53	48.80	50.63	53.70	HH
X99ZX9		6.84	7.57	9.46	10.65*	11.25	13.38	18.54	29.22	43.23	50.89	51.17	49.47	48.53	48.98	50.82	54.14	XI
XF3DPV		6.62	7.34	9.14	10.38	10.99	13.03	18.15	28.62	42.74	50.88	51.50	49.80	48.96	49.27	50.38	52.59	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 A181																		
XG29GE		6.62	7.45	9.26	10.48	11.08	13.18	18.40	29.03	42.84	50.61	51.08	49.47	48.43	48.75	50.48	53.71	XI
XQJW88	X	46.10X	81.90X	84.16X	84.73X	84.94X	84.86X	83.97X	82.97X	81.88X	81.02X	80.72X	80.74X	81.22X	82.13X	83.48X	84.15X	AS
Y88MNL		6.62	7.41	9.11	10.42	11.00	13.01	18.24	28.76	42.80	50.87	51.38	49.79	48.82	49.26	50.95	53.92	AO
YB64ZF		6.71	7.48	9.29	10.49	11.13	13.24	18.50	29.34	43.16	50.70	51.10	49.37	48.49	48.85	50.77	54.08	XI
YEQN86		6.68	7.40	9.19	10.41	10.98	13.14	18.38	29.11	42.94	50.71	51.25	49.53	48.53	48.95	50.81	54.15	MI
YVBL36		6.62	7.33	9.17	10.42	11.02	13.09	18.25	28.89	43.23	51.16	51.48	49.79	48.84	49.30	50.80	53.04	AJ
YYUF7W		6.57	7.42	9.18	10.47	11.08	13.05	18.23	28.80	42.85	50.95	51.54	49.84	49.03	49.24	51.11	53.86	AQ
Z7TFZJ		6.78	7.47	9.30	10.48	11.07	13.22	18.45	29.09	42.95	50.62	50.90	49.29	48.33	48.76	50.67	53.93	XI
ZUCTQH		6.88	7.62	9.37	10.56	11.18	13.26	18.48	29.19	43.05	50.77	51.25	49.62	48.74	48.99	50.75	54.19	XI

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	6.64	7.36	9.18	10.40	11.01	13.08	18.35	28.99	42.97	50.82	51.24	49.53	48.60	48.97	50.70	53.70
SD Btwn Labs	0.18	0.14	0.15	0.11	0.13	0.16	0.19	0.46	0.34	0.34	0.32	0.32	0.29	0.29	0.29	0.56

Comments Assigned on Data Flags for Test #411

A96FC3 (X) - Extreme data for 620 nm wavelength.

LLRLCZ (X) - Extreme data for 460 nm wavelength.

TB66EK (X) - High % reflectance data at all wavelengths.

XQJW88 (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	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	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
XO	X-Rite SP64				

WebCode	Data Flag	Sample E181 Lab Mean	Sample E181 Diff from Grand Mean	Sample E181 CPV	Sample E182 Lab Mean	Sample E182 Diff from Grand Mean	Sample E182 CPV	Instr Code
2W2JD9		29.40	-0.61	-1.04	40.63	-0.36	-0.53	GL
2XQU62		29.75	-0.26	-0.44	40.98	-0.01	-0.01	GL
33ZAC4		29.63	-0.38	-0.65	40.83	-0.16	-0.23	GL
3KZDYZ	X	31.93	1.92	3.29	42.53	1.54	2.30	RA
3LB64B		30.43	0.42	0.72	41.58	0.59	0.89	GK
4YZEAG		30.15	0.14	0.25	40.95	-0.03	-0.05	GN
6P6V9D		29.55	-0.46	-0.78	40.48	-0.51	-0.75	MH
6VD4R3		30.03	0.02	0.03	40.85	-0.13	-0.20	PA
73PVE7	X	47.60	17.59	30.16	40.55	-0.43	-0.64	GK
79DHAB		30.10	0.09	0.16	40.38	-0.61	-0.90	RA
7FYDBF		30.18	0.17	0.29	41.25	0.27	0.40	GK
8BEMHP		29.75	-0.26	-0.44	41.15	0.17	0.25	PC
8MA467		30.05	0.04	0.08	41.48	0.49	0.74	GL
94RGYN	*	28.65	-1.36	-2.32	39.23	-1.76	-2.62	GK
9EDK43		29.88	-0.13	-0.22	40.50	-0.48	-0.72	GN
AVWUP4		29.80	-0.21	-0.35	40.80	-0.18	-0.27	GL
B928LU		29.88	-0.13	-0.22	41.43	0.44	0.66	GL
CL39WA		30.88	0.87	1.49	41.65	0.67	1.00	GN
DCRBJQ		30.23	0.22	0.38	40.93	-0.06	-0.08	GK
DJCLE8		29.58	-0.43	-0.74	40.93	-0.06	-0.08	GL
DTHDZU		30.28	0.27	0.46	41.63	0.64	0.96	GK
EEDCZY		30.83	0.82	1.40	41.93	0.94	1.41	GL
EWECV6		29.70	-0.31	-0.52	40.60	-0.38	-0.57	GL
EXMMQM		31.25	1.24	2.13	42.50	1.52	2.27	GL
FGGKPU	*	28.38	-1.63	-2.79	39.13	-1.86	-2.77	GN
FNCRZM		29.98	-0.03	-0.05	40.65	-0.33	-0.49	GL
FZAN7V		29.98	-0.03	-0.05	40.80	-0.18	-0.27	RA
GCEBNR		30.60	0.59	1.02	41.38	0.39	0.59	GL
GPPEH2		30.68	0.67	1.15	41.75	0.77	1.15	GL
GQZG7L		29.93	-0.08	-0.14	40.98	-0.01	-0.01	GN

WebCode	Data Flag	Sample E181 Lab Mean	Sample E181 Diff from Grand Mean	Sample E181 CPV	Sample E182 Lab Mean	Sample E182 Diff from Grand Mean	Sample E182 CPV	Instr Code
H2C8YN		30.45	0.44	0.76	41.48	0.49	0.74	GN
H2WQ7F		29.58	-0.43	-0.74	40.48	-0.51	-0.75	GL
H6ZGG2		30.15	0.14	0.25	41.48	0.49	0.74	GL
HB3VUQ		29.03	-0.98	-1.68	39.70	-1.28	-1.91	GN
HFWHWQ		29.90	-0.11	-0.18	40.85	-0.13	-0.20	GL
HGNQVU		29.93	-0.08	-0.14	41.10	0.12	0.18	GL
HGPBTV		30.08	0.07	0.12	41.43	0.44	0.66	GL
J9ACCP		30.45	0.44	0.76	41.75	0.77	1.15	GK
JFTMGD		30.93	0.92	1.58	41.88	0.89	1.33	GL
JHHL4N		29.55	-0.46	-0.78	40.40	-0.58	-0.87	GL
KTBRBR		29.18	-0.83	-1.42	40.65	-0.33	-0.49	GK
MH6BUL		30.18	0.17	0.29	41.13	0.14	0.21	GL
MT7YLH		30.28	0.27	0.46	41.15	0.17	0.25	GK
NJBFKF		30.13	0.12	0.21	41.13	0.14	0.21	GK
PE2BRF	X	36.98	6.97	11.95	38.10	-2.88	-4.30	GL
QBBNBC	*	29.73	-0.28	-0.48	39.85	-1.13	-1.69	MW
QPE2KG		30.31	0.30	0.51	41.24	0.26	0.39	GN
QT2LM6		30.28	0.27	0.46	41.10	0.12	0.17	GL
R9P43M		29.58	-0.43	-0.74	40.45	-0.53	-0.79	GL
RC7FXH		30.20	0.19	0.33	40.55	-0.43	-0.64	GK
RCJ8NE		30.78	0.77	1.32	41.55	0.57	0.85	GL
RMZUXE		30.08	0.07	0.12	41.18	0.19	0.29	MW
TFJTYG		29.30	-0.71	-1.21	40.40	-0.58	-0.87	GL
UTLJGF		29.65	-0.36	-0.61	40.65	-0.33	-0.49	GK
UTY9G8		30.38	0.37	0.63	41.75	0.77	1.15	GL
W336E9		30.00	-0.01	-0.01	40.98	-0.01	-0.01	GK
X3D7XM		29.90	-0.11	-0.18	40.20	-0.78	-1.16	RA
XF3DPV		29.00	-1.01	-1.72	40.28	-0.71	-1.05	GL
XG29GE		29.75	-0.26	-0.44	40.88	-0.11	-0.16	GL
YEQN86		30.43	0.42	0.72	41.10	0.12	0.18	GL

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample E181 Lab Mean	Sample E181 Diff from Grand Mean	Sample E181 CPV	Sample E182 Lab Mean	Sample E182 Diff from Grand Mean	Sample E182 CPV	Instr Code
YL6J3D		29.88	-0.13	-0.22	41.13	0.14	0.21	GK
YVBL36	*	31.63	1.62	2.78	42.73	1.74	2.60	MW
ZATN7E		29.23	-0.78	-1.34	39.95	-1.03	-1.54	GB
ZCF9D4		29.98	-0.03	-0.05	41.13	0.14	0.21	GL
ZUCTQH		31.08	1.07	1.83	41.88	0.89	1.33	GL

Summary Statistics

	Sample E181	Sample E182
Grand Means	30.01 Gloss Units	40.98 Gloss Units
Stnd Dev Btwn Labs	0.58 Gloss Units	0.67 Gloss Units

Statistics based on 62 of 65 reporting participants

Comments on Assigned Data Flags for Test #440

3KZDYZ(X) - High data for Sample E181

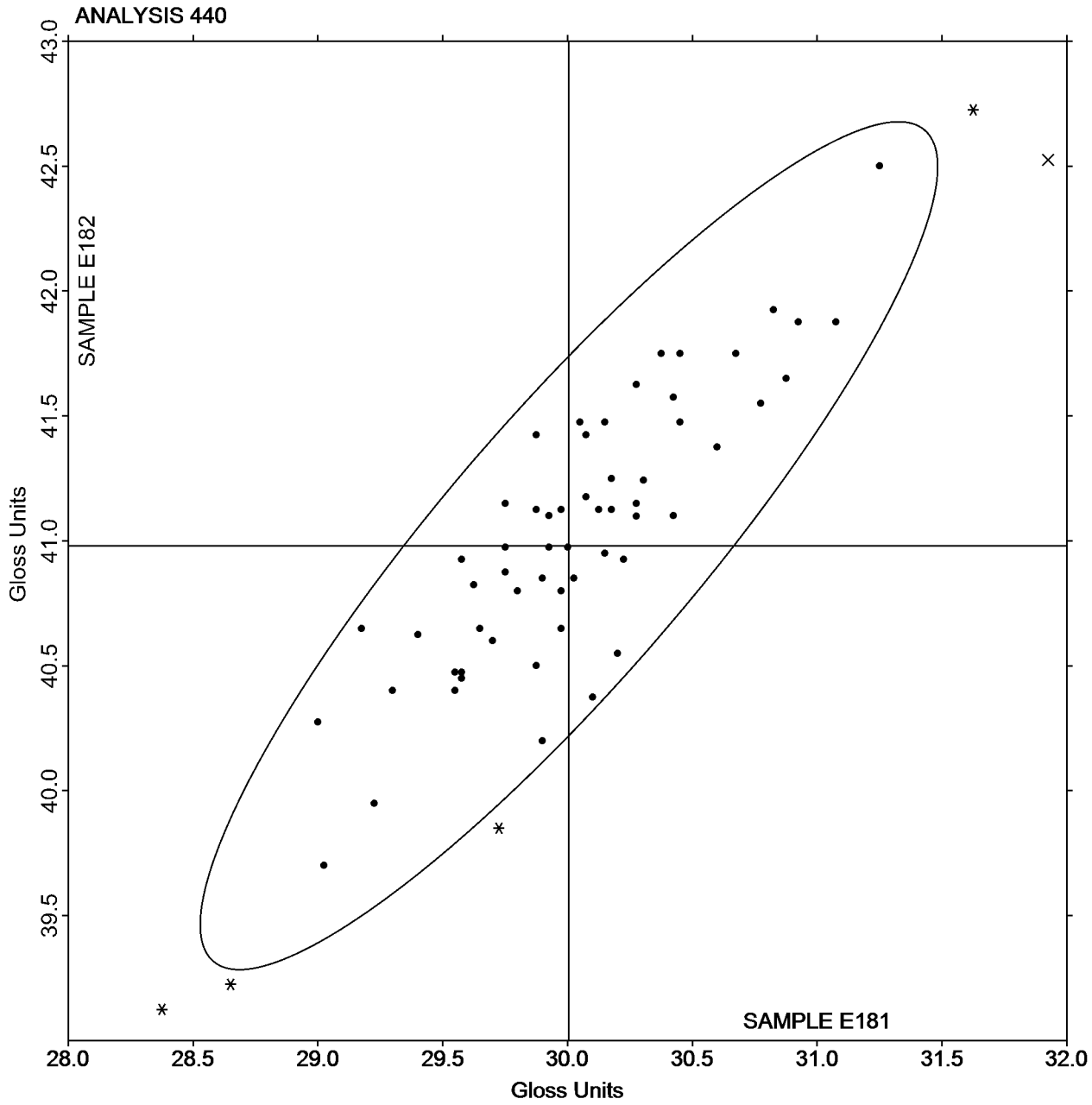
73PVE7(X) - Very high data for Sample E181.

PE2BRF(X) - Inconsistent in testing between samples and inconsistent within the determinations for both samples. Data very high for Sample E181 and low for Sample E182

Key to Instrument Codes Reported by Participants

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
MH	X-Rite/Macbeth Color-Eye XTH	MW	Minolta Multi-Gloss 268
PA	Photovolt micto-TRI-gloss G3	PC	Picogloss 503 Erichson
RA	Rhopoint Novo-Gloss Glossmeter		

SAMPLE E181 = 30.01 Gloss Units SAMPLE E182 = 40.98 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

Report #183
1st Qtr 2018

WebCode	Data Flag	Sample J181 Lab Mean	Sample J181 Diff from Grand Mean	Sample J181 CPV	Sample J182 Lab Mean	Sample J182 Diff from Grand Mean	Sample J182 CPV	Instr Code
4YZEAG		10.90	0.03	0.19	14.70	0.23	0.74	GN
H2C8YN	X	10.88	0.00	0.03	10.75	-3.72	-11.97	GN
H2WQ7F		10.85	-0.02	-0.13	14.35	-0.12	-0.38	GL
JFTMGD		10.83	-0.05	-0.29	14.35	-0.12	-0.38	GL
JHHL4N		10.78	-0.10	-0.62	14.38	-0.09	-0.30	GL
QPE2KG		11.07	0.19	1.26	14.67	0.20	0.64	GN
QT2LM6		11.05	0.18	1.18	14.89	0.42	1.36	GL
ZUCTQH		10.63	-0.25	-1.59	13.95	-0.52	-1.67	GL

Summary Statistics

Grand Means

10.87 Gloss Units — 14.47 Gloss Units

Stnd Dev Btwn Labs

0.15 Gloss Units — 0.31 Gloss Units

Statistics based on 7 of 8 reporting participants

Comments on Assigned Data Flags for Test #442

H2C8YN(X) - Low data for Sample J182

Key to Instrument Codes Reported by Participants

GL BYK-Gardner micro-TRI-gloss

GN BYK-Gardner new micro-TRI-gloss

SAMPLE J181 = 10.87 Gloss Units SAMPLE J182 = 14.47 Gloss Units