Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #191 - 1st Qtr 2020

About the Color Program, About CTS

Key to Tables and Graphs (Color Tests)

Key to Tables and Graphs (Spectro Test)

Key to Tables and Graphs (Gloss Tests)

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

About The Color & Appearance Program

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

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

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

ABOUT CTS

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

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
4PC36P		A201	60.88	23.52	19.62	0.68	-0.55	-0.54	1.03	HY
		A202	61.56	22.96	19.08					
64TTPJ		A201	61.07	23.10	19.64	0.67	-0.48	-0.54	0.99	XU
		A202	61.74	22.62	19.10					
6PDCKT		A201	61.03	22.95	19.06	0.73	-0.48	-0.49	1.00	XB
		A202	61.76	22.47	18.57					
6YDC2M		A201	61.22	23.14	20.03	0.71	-0.49	-0.52	1.01	MG
		A202	61.93	22.64	19.52					
7DZCNY		A201	61.23	23.01	19.33	0.69	-0.53	-0.55	1.03	XD
		A202	61.92	22.48	18.78					
7F2MBM		A201	61.48	23.21	19.74	0.72	-0.48	-0.50	1.00	HW
		A202	62.19	22.72	19.24					
8764AJ	X	A201	62.68	24.16	20.09	0.71	-0.57	-0.53	1.05	HK
		A202	63.38	23.59	19.56					
8XBYGH		A201	61.28	23.19	19.63	0.70	-0.57	-0.52	1.04	XO
		A202	61.99	22.62	19.10					
99E86U		A201	61.04	23.49	20.03	0.75	-0.47	-0.48	1.00	BG
		A202	61.78	23.03	19.56					
9EDK9C		A201	60.76	23.12	19.29	0.74	-0.53	-0.50	1.04	XU
		A202	61.49	22.59	18.78					
9EYCTN	X	A201	58.53	22.30	18.32	0.72	-0.58	-0.50	1.05	XE
		A202	59.25	21.72	17.83					
9PZWVG	X	A201	61.87	22.47	19.28	-0.76	0.50	0.52	1.04	HW
		A202	61.11	22.96	19.79					
9UUR2V		A201	60.76	23.01	19.29	0.73	-0.55	-0.50	1.05	XU
		A202	61.49	22.46	18.79					
AU6NJE		A201	60.99	23.19	19.57	0.63	-0.51	-0.51	0.96	XU
		A202	61.63	22.68	19.06					
B6JYFJ		A201	61.36	22.88	19.58	0.73	-0.46	-0.48	0.99	GH
		A202	62.09	22.42	19.10					
CT8LMF		A201	61.00	23.20	19.73	0.70	-0.48	-0.40	0.93	BG
		A202	61.69	22.72	19.33					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
CYQEMN		A201	61.55	23.12	19.83	0.71	-0.49	-0.49	0.99	HW
		A202	62.26	22.63	19.34					
ENJBHG	X	A201	57.23	25.10	21.28	0.86	4.35	-0.69	4.49	XX
		A202	58.09	29.45	20.59					
F6PFQ6		A201	60.74	23.51	19.56	0.76	-0.48	-0.47	1.01	HX
		A202	61.50	23.03	19.09					
FQ6KZG	X	A201	61.54	22.14	20.51	0.68	-0.59	-0.62	1.09	XU
		A202	62.21	21.55	19.89					
G6FKAC		A201	61.09	23.05	19.27	0.71	-0.49	-0.51	1.00	XE
		A202	61.81	22.56	18.76					
G8BCYV		A201	60.80	23.04	19.24	0.75	-0.54	-0.49	1.04	HK
		A202	61.55	22.50	18.75					
GER8EP		A201	61.00	23.58	19.60	0.75	-0.48	-0.52	1.03	GE
		A202	61.75	23.10	19.09					
GNE77V		A201	60.48	23.31	19.53	0.76	-0.58	-0.56	1.11	HY
		A202	61.24	22.73	18.97					
GTDMHP		A201	61.07	23.63	19.82	0.71	-0.50	-0.46	0.98	GA
		A202	61.79	23.14	19.36					
HCZ92R		A201	61.13	23.12	19.46	0.73	-0.49	-0.48	1.00	XS
		A202	61.86	22.63	18.98					
K2LX6E		A201	61.14	23.25	19.70	0.75	-0.58	-0.56	1.10	HW
		A202	61.90	22.67	19.14					
L8BBUY		A201	61.63	23.27	19.90	0.72	-0.55	-0.54	1.05	XX
		A202	62.35	22.72	19.36					
MRXAH9		A201	61.08	23.13	19.49	0.75	-0.57	-0.52	1.07	XM
		A202	61.83	22.56	18.97					
NVYHLJ	X	A201	61.74	22.86	19.58	0.05	-0.02	-0.01	0.06	HW
		A202	61.80	22.84	19.57					
P8JLX8		A201	61.09	23.64	19.62	0.73	-0.44	-0.45	0.96	GE
		A202	61.82	23.19	19.17					
PDPN64		A201	61.25	22.84	18.84	0.69	-0.52	-0.44	0.97	MU
		A202	61.94	22.32	18.40					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
QKHAGV		A201	60.56	23.60	19.96	0.72	-0.41	-0.44	0.93	MP
		A202	61.28	23.19	19.53					
RLDPF4		A201	61.14	23.03	18.80	0.72	-0.52	-0.50	1.02	AB
		A202	61.87	22.51	18.30					
TCJ4MB		A201	60.78	22.98	18.95	0.63	-0.44	-0.40	0.87	MF
		A202	61.41	22.54	18.55					
TGWCW3		A201	60.95	23.05	19.20	0.67	-0.46	-0.48	0.94	XZ
		A202	61.62	22.59	18.72					
TRDJVG		A201	61.12	23.60	19.69	0.70	-0.57	-0.52	1.04	GE
		A202	61.82	23.04	19.17					
VE7FK8		A201	61.08	23.36	19.31	0.80	-0.52	-0.58	1.12	TO
		A202	61.89	22.84	18.74					
VYA34P		A201	61.50	23.35	19.90	0.70	-0.55	-0.50	1.02	HW
		A202	62.20	22.80	19.40					
W2XA8T	X	A201	61.60	22.43	19.20	-0.01	-0.12	0.01	0.12	XN
		A202	61.59	22.32	19.20					
W4FNBU		A201	61.06	22.93	19.57	0.69	-0.43	-0.44	0.92	HW
		A202	61.75	22.51	19.12					
W99ZP6		A201	60.53	23.27	19.54	0.73	-0.40	-0.46	0.95	AB
		A202	61.26	22.87	19.08					
XCM8AA		A201	61.15	23.49	19.58	0.67	-0.49	-0.47	0.95	GE
		A202	61.81	23.00	19.11					
YC6QLU		A201	61.50	23.25	19.87	0.76	-0.48	-0.51	1.03	HW
		A202	62.25	22.77	19.36					
Z2HP7K		A201	61.60	23.29	19.83	0.70	-0.55	-0.55	1.05	HW
		A202	62.30	22.74	19.28					
Z9HTPX	X	A201	62.12	22.08	21.06	0.74	-0.53	-0.57	1.07	HW
		A202	62.85	21.55	20.50					
Z9MJ78		A201	60.48	22.98	19.53	0.73	-0.52	-0.52	1.03	XX
		A202	61.21	22.46	19.02					
ZMXTFW		A201	61.08	23.16	19.54	0.73	-0.50	-0.52	1.02	XO
		A202	61.81	22.66	19.02					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
A201	61.10	23.17	19.55	0.72	-0.50	-0.50	1.01
A202	61.82	22.66	19.05				
Stnd Dev Btwn Labs							
A201	0.34	0.37	0.31	0.03	0.04	0.04	0.05
A202	0.34	0.38	0.31				

Statistics based on 40 of 48 reporting participants

Comments Assigned on Data Flags for Test #408

8764AJ(X) - High "L*" values.

9EYCTN(X) - Very low "L*" & "b*" values. Large replication difference for both "L*" values.

9PZWVG(X) - Inconsistent in testing between the "L*", "a*" and "b*" values for both samples. Small Delta L. Large Delta a & b.

ENJBHG(X) - Extreme Data. Very low values for "L*". Very high values for "a*" and "b*". Large Delta L, a & E. Small Delta b.

FQ6KZG(X) - High "b*" values. Small Delta b

NVYHLJ(X) - Large replication difference for both "L*", "a*" and "b*" values. Small Delta L & E. Large Delta a & b.

W2XA8T(X) - Inconsistent in testing between the "L*", "a*" and "b*" values for both samples. Small Delta L & E. Large Delta a & b.

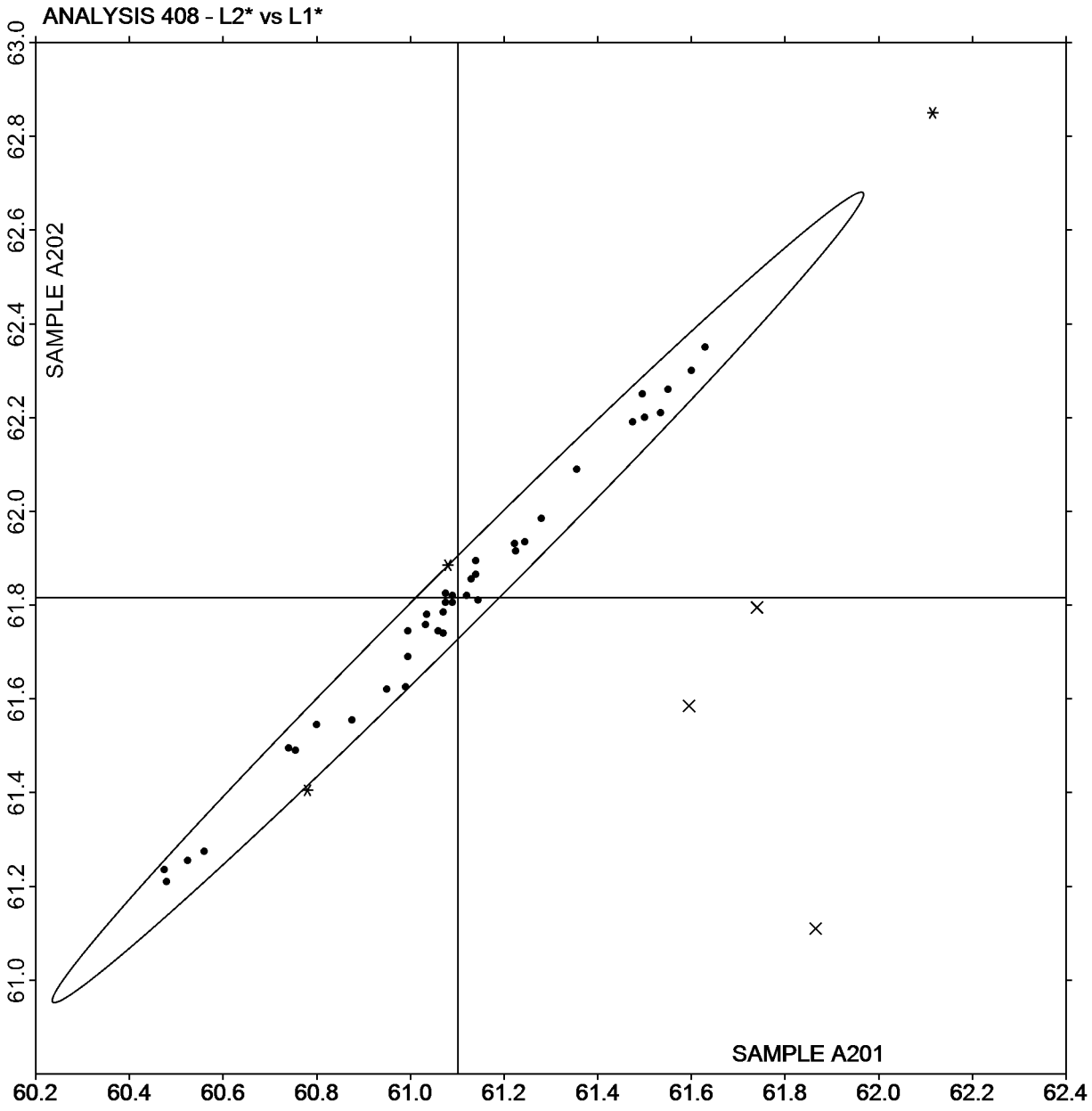
Z9HTPX(X) - High "b*" values.

Key to Instrument Codes Reported by Participants

AB	Data Color	BG	BYK Mac i
GA	BYK-Gardner	GE	BYK-Gardner spectro-guide (45/0)
GH	BYK-Gardner Color-View	HK	Hunter MiniScan XE (45/0)
HW	Hunter LabScan XE	HX	Hunter Color FlexEZ 45/0
HY	Hunter Color Flex 45/0	MF	Minolta FD Series
MG	Macbeth 1500/PLUS or 2025+ Color Eye	MP	Minolta CM-2500c Spectrophotometer
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
XS	X-Rite 962 Portable Spectrophotometer	XU	X-Rite 964 Portable Spectrophotometer
XX	Instrument make/model not specified by lab	XZ	X-Rite

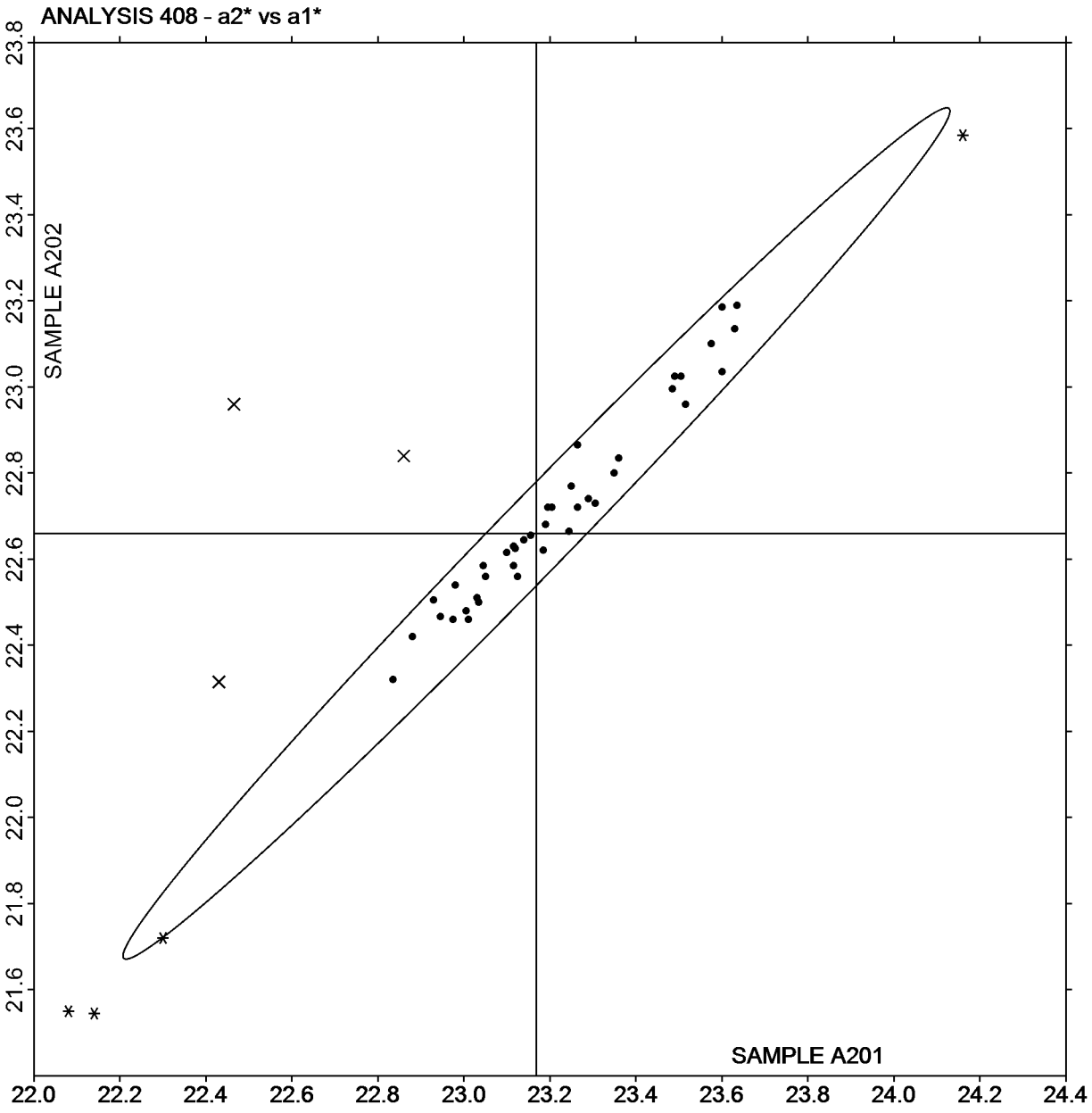
L2* vs L1*

SAMPLE A201 = 61.10 SAMPLE A202 = 61.82



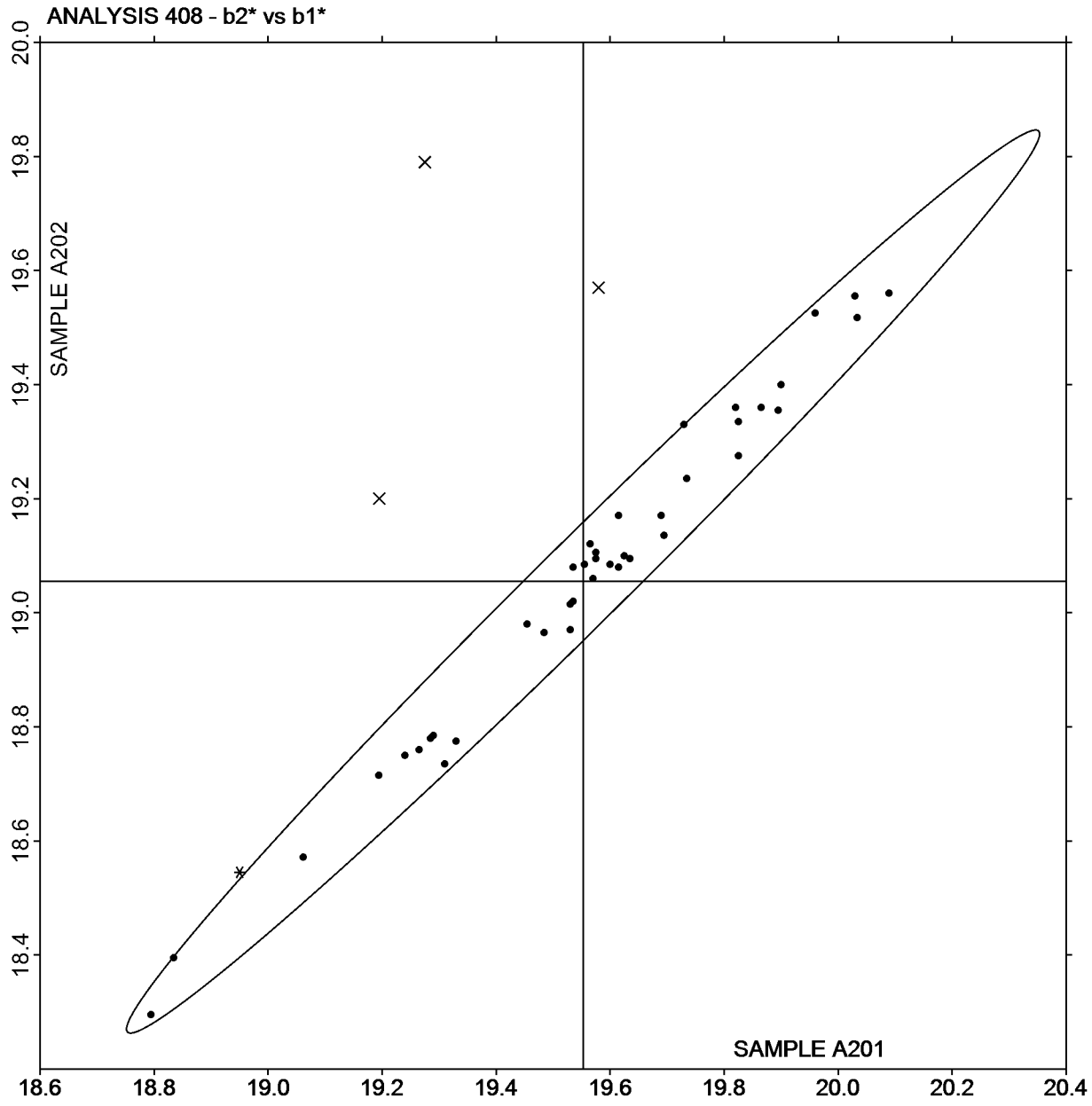
a2* vs a1*

SAMPLE A201 = 23.17 SAMPLE A202 = 22.66



b2* vs b1*

SAMPLE A201 = 19.55 SAMPLE A202 = 19.05



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
28Z4YP		A201	61.06	22.92	18.75	0.76	-0.52	-0.54	1.07	AS
		A202	61.82	22.40	18.20					
2P7WX6		A201	61.08	22.80	18.73	0.77	-0.45	-0.49	1.02	AM
		A202	61.85	22.35	18.24					
3TDDDT		A201	60.91	22.79	18.83	0.76	-0.45	-0.51	1.01	XI
		A202	61.67	22.35	18.32					
4F7QUM		A201	60.89	23.04	19.01	0.67	-0.47	-0.48	0.95	XH
		A202	61.56	22.57	18.53					
4K2REG		A201	61.10	22.92	18.84	0.70	-0.48	-0.47	0.97	MV
		A202	61.79	22.44	18.37					
4LELTV		A201	61.06	22.56	18.81	0.73	-0.42	-0.44	0.94	XI
		A202	61.78	22.14	18.37					
4U9QLW		A201	61.24	22.86	18.63	0.73	-0.50	-0.53	1.03	AJ
		A202	61.97	22.36	18.11					
62K8TW		A201	61.05	22.73	18.51	0.70	-0.44	-0.44	0.93	MM
		A202	61.75	22.29	18.07					
64FJYX		A201	61.01	22.77	18.81	0.74	-0.61	-0.58	1.12	XI
		A202	61.75	22.16	18.23					
64TTPJ		A201	61.35	22.63	18.72	0.68	-0.43	-0.45	0.92	XI
		A202	62.03	22.20	18.28					
6DBNAR	X	A201	67.62	24.74	20.82	0.81	-0.53	-0.54	1.11	XO
		A202	68.43	24.21	20.28					
72D3MT		A201	61.08	22.93	18.92	0.73	-0.52	-0.52	1.03	XB
		A202	61.81	22.41	18.40					
76ZYJP		A201	61.10	22.98	18.95	0.71	-0.61	-0.52	1.07	MT
		A202	61.81	22.37	18.43					
7M2XQR		A201	61.26	23.09	18.94	0.73	-0.53	-0.51	1.03	MV
		A202	61.99	22.56	18.43					
7MMBE6		A201	61.28	22.90	18.84	0.72	-0.50	-0.50	1.01	XH
		A202	62.00	22.40	18.35					
7TJXTR		A201	61.17	22.76	18.78	0.78	-0.50	-0.48	1.04	XI
		A202	61.95	22.26	18.30					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
7ZJGRG		A201	61.22	22.62	18.83	0.74	-0.47	-0.49	1.01	XI
		A202	61.96	22.15	18.34					
8HEACE	X	A201	61.13	22.41	19.67	0.71	-0.49	-0.49	0.99	XI
		A202	61.84	21.92	19.18					
8K9V8Q		A201	61.15	23.14	18.94	0.78	-0.55	-0.50	1.08	AJ
		A202	61.93	22.60	18.44					
8LHFZQ		A201	61.17	22.96	18.74	0.70	-0.51	-0.50	1.00	MM
		A202	61.88	22.45	18.25					
8N9G7E		A201	60.94	22.96	18.89	0.70	-0.48	-0.48	0.98	CA
		A202	61.64	22.48	18.40					
9QRVAF		A201	61.02	22.93	19.19	0.66	-0.45	-0.44	0.91	XH
		A202	61.68	22.48	18.75					
A3CGHN		A201	61.12	22.82	18.88	0.80	-0.60	-0.54	1.14	XI
		A202	61.92	22.21	18.34					
AEE7TP		A201	61.03	22.82	18.52	0.77	-0.51	-0.51	1.05	AS
		A202	61.80	22.31	18.01					
AU6NJE		A201	61.13	23.02	18.81	0.67	-0.55	-0.53	1.02	XI
		A202	61.80	22.47	18.28					
AUTB24		A201	61.07	22.81	18.67	0.73	-0.51	-0.52	1.03	AQ
		A202	61.79	22.30	18.15					
B6JYFJ		A201	61.30	22.92	19.00	0.71	-0.48	-0.49	0.99	MV
		A202	62.01	22.44	18.51					
BT7U9N		A201	61.03	22.84	18.59	0.77	-0.52	-0.52	1.06	AS
		A202	61.80	22.33	18.07					
BU2TRL		A201	60.98	22.66	18.60	0.74	-0.48	-0.47	1.00	MM
		A202	61.72	22.17	18.12					
BUXV9K	X	A201	62.17	22.80	18.37	0.71	-0.50	-0.51	1.01	CA
		A202	62.88	22.30	17.86					
C8NFJY		A201	61.11	22.91	18.53	0.72	-0.58	-0.64	1.12	AJ
		A202	61.83	22.33	17.89					
C8Q6PH		A201	60.97	22.72	19.11	0.72	-0.47	-0.50	0.99	XM
		A202	61.69	22.25	18.61					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
CUGNGR		A201	61.13	22.87	18.62	0.71	-0.51	-0.51	1.01	AS
		A202	61.84	22.36	18.11					
CWUYUX		A201	61.12	23.09	18.74	0.65	-0.57	-0.58	1.04	AH
		A202	61.77	22.51	18.16					
CYF34G		A201	61.12	22.88	18.58	0.72	-0.51	-0.52	1.02	AO
		A202	61.84	22.37	18.07					
DE3P4D		A201	61.36	23.26	19.15	0.70	-0.52	-0.51	1.01	CA
		A202	62.06	22.74	18.64					
DJXGAP		A201	61.24	22.85	18.93	0.69	-0.50	-0.49	0.98	XB
		A202	61.93	22.36	18.44					
DUHN9E		A201	61.24	22.88	18.93	0.66	-0.46	-0.46	0.93	MS
		A202	61.91	22.42	18.47					
DYTWHV		A201	60.88	23.21	19.00	0.78	-0.58	-0.54	1.11	XH
		A202	61.66	22.63	18.46					
EEKYR9		A201	60.97	22.78	18.39	0.65	-0.49	-0.45	0.93	HP
		A202	61.62	22.28	17.94					
EFVV7P		A201	61.01	22.90	18.67	0.74	-0.52	-0.54	1.05	XI
		A202	61.75	22.38	18.14					
ENJBHG	X	A201	57.23	25.10	21.28	0.86	-0.65	-0.69	1.28	MV
		A202	58.09	24.45	20.59					
EYZ32K		A201	61.13	22.68	18.74	0.73	-0.56	-0.53	1.06	MM
		A202	61.85	22.12	18.21					
FKKT8L		A201	61.17	22.66	18.64	0.75	-0.53	-0.50	1.05	MM
		A202	61.93	22.12	18.14					
G4LU7J		A201	61.06	22.93	18.79	0.73	-0.52	-0.48	1.02	XI
		A202	61.80	22.41	18.31					
G94CUL		A201	60.88	23.25	19.06	0.68	-0.58	-0.51	1.03	GD
		A202	61.56	22.66	18.55					
G9FW7C	X	A201	61.04	22.63	18.12	0.70	-0.35	-0.42	0.88	XI
		A202	61.74	22.29	17.70					
GER8EP		A201	60.88	22.75	18.86	0.74	-0.48	-0.46	0.99	GD
		A202	61.62	22.28	18.39					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
GTDMHP		A201	61.13	22.99	18.90	0.71	-0.46	-0.56	1.02	AJ
		A202	61.85	22.53	18.34					
HCZ92R		A201	60.99	22.83	18.82	0.73	-0.47	-0.46	0.99	AJ
		A202	61.72	22.36	18.36					
HE6H6C		A201	61.49	22.74	18.36	0.70	-0.47	-0.53	0.99	HH
		A202	62.18	22.27	17.83					
HZKD49		A201	60.76	23.02	18.91	0.74	-0.54	-0.49	1.04	XH
		A202	61.51	22.48	18.42					
JB76MB		A201	60.99	22.89	18.72	0.73	-0.47	-0.48	0.99	XH
		A202	61.72	22.42	18.25					
KDFEUE		A201	61.12	22.68	18.70	0.69	-0.41	-0.44	0.91	XI
		A202	61.81	22.26	18.26					
LEF36G		A201	61.17	22.94	18.88	0.77	-0.60	-0.52	1.11	XB
		A202	61.94	22.34	18.36					
LFQUCC		A201	61.19	22.90	18.91	0.67	-0.57	-0.53	1.03	XI
		A202	61.86	22.32	18.39					
M8PPG9		A201	61.15	22.69	18.76	0.67	-0.44	-0.45	0.92	XB
		A202	61.82	22.25	18.31					
M8VBBA		A201	61.28	22.72	18.45	0.61	-0.43	-0.45	0.87	AQ
		A202	61.89	22.28	18.01					
MHQCVQ		A201	61.07	22.96	18.74	0.75	-0.54	-0.52	1.06	AJ
		A202	61.82	22.41	18.22					
MKFQE9		A201	61.01	22.83	18.61	0.75	-0.59	-0.52	1.09	AS
		A202	61.76	22.24	18.09					
MLMVG6		A201	61.15	22.87	18.56	0.77	-0.54	-0.50	1.07	XI
		A202	61.93	22.33	18.07					
MNGPWE		A201	61.49	23.01	18.82	0.75	-0.43	-0.46	0.98	CA
		A202	62.24	22.58	18.36					
NMWW34		A201	61.20	22.92	18.75	0.72	-0.49	-0.51	1.01	AS
		A202	61.92	22.43	18.24					
NMZPQ4		A201	61.12	22.90	18.80	0.71	-0.43	-0.46	0.94	MK
		A202	61.83	22.47	18.35					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
P8JLX8		A201	61.41	22.84	19.08	0.72	-0.50	-0.48	1.00	MM
		A202	62.13	22.34	18.59					
PD3BAB		A201	61.04	22.67	18.98	0.71	-0.51	-0.48	1.00	XM
		A202	61.76	22.17	18.50					
PKQZ2Z		A201	61.29	22.86	18.83	0.73	-0.53	-0.53	1.04	XI
		A202	62.02	22.33	18.30					
PVUVK6		A201	61.30	22.79	18.70	0.65	-0.47	-0.47	0.93	XB
		A202	61.95	22.32	18.23					
Q4HVDD		A201	60.99	22.82	19.19	0.71	-0.55	-0.53	1.04	XO
		A202	61.70	22.28	18.66					
QELV6Z		A201	61.02	22.87	18.55	0.79	-0.55	-0.50	1.08	AS
		A202	61.81	22.33	18.05					
QK4XPH		A201	61.17	22.70	19.18	0.68	-0.46	-0.48	0.95	XU
		A202	61.85	22.24	18.70					
QKHAGV		A201	61.22	22.83	18.74	0.72	-0.43	-0.43	0.94	XB
		A202	61.94	22.39	18.30					
QX6LT6		A201	61.26	22.75	18.63	0.72	-0.48	-0.50	0.99	AO
		A202	61.98	22.28	18.14					
QZXBF7		A201	60.99	22.83	18.62	0.76	-0.54	-0.53	1.07	MM
		A202	61.75	22.29	18.09					
R2A3WK		A201	61.13	22.91	18.82	0.75	-0.55	-0.55	1.08	MM
		A202	61.88	22.36	18.27					
RWQHP6		A201	61.21	22.86	18.62	0.73	-0.50	-0.54	1.04	AJ
		A202	61.94	22.35	18.08					
T3YQU7		A201	61.08	22.95	18.78	0.77	-0.52	-0.49	1.05	MU
		A202	61.85	22.43	18.28					
TMMM7Z		A201	61.05	22.61	18.45	0.63	-0.47	-0.50	0.93	AJ
		A202	61.68	22.13	17.96					
U3922A		A201	61.09	22.77	18.57	0.72	-0.41	-0.43	0.94	AJ
		A202	61.82	22.35	18.13					
VE7FK8		A201	60.82	22.90	18.85	0.68	-0.39	-0.41	0.89	CA
		A202	61.50	22.51	18.43					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
VZJ39W		A201	61.08	23.19	18.93	0.72	-0.54	-0.52	1.03	MV
		A202	61.80	22.66	18.42					
W2XA8T	X	A201	61.78	22.15	18.59	-0.73	0.51	0.49	1.02	XO
		A202	61.05	22.66	19.08					
WKKVQV		A201	61.32	23.01	18.86	0.65	-0.58	-0.52	1.01	AJ
		A202	61.97	22.43	18.34					
X7EFNY		A201	61.08	22.91	18.62	0.73	-0.57	-0.51	1.06	HP
		A202	61.82	22.34	18.11					
XC7EPA		A201	61.13	22.87	18.77	0.69	-0.49	-0.52	0.99	AD
		A202	61.82	22.38	18.25					
XKJK8X		A201	61.10	23.01	19.01	0.62	-0.43	-0.46	0.88	XH
		A202	61.72	22.58	18.55					
YLMP9Y		A201	61.03	22.89	18.89	0.76	-0.52	-0.50	1.05	XI
		A202	61.79	22.37	18.39					
YMEP8V		A201	61.22	22.60	18.49	0.72	-0.52	-0.51	1.02	AO
		A202	61.94	22.09	17.98					
YYFZ8R		A201	61.00	22.92	18.63	0.70	-0.55	-0.52	1.03	AS
		A202	61.70	22.37	18.11					
Z9MJ78		A201	60.87	22.88	19.23	0.73	-0.52	-0.50	1.02	GD
		A202	61.60	22.36	18.73					
ZMXTFW		A201	61.26	22.94	18.74	0.80	-0.58	-0.52	1.12	MI
		A202	62.06	22.36	18.22					
ZX3M4V		A201	61.16	22.83	18.52	0.68	-0.43	-0.48	0.93	AO
		A202	61.84	22.40	18.04					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
A201	61.11	22.86	18.78	0.72	-0.50	-0.50	1.01
A202	61.83	22.36	18.28				
Stnd Dev Btwn Labs							
A201	0.14	0.14	0.19	0.04	0.05	0.04	0.06
A202	0.14	0.13	0.20				

Statistics based on 86 of 92 reporting participants

Comments Assigned on Data Flags for Test #409

6DBNAR(X) - Extreme Data. Very high values for "L*", "a" & "b".

8HEACE(X) - Low "a*" values. High "b*" values.

BUXV9K(X) - Very high "L*" values.

ENJBHG(X) - Extreme Data. Very low values for "L*". Very high values for "a*" and "b*". Large Delta L & E. Small Delta a & b.

G9FW7C(X) - Low "b*" values.

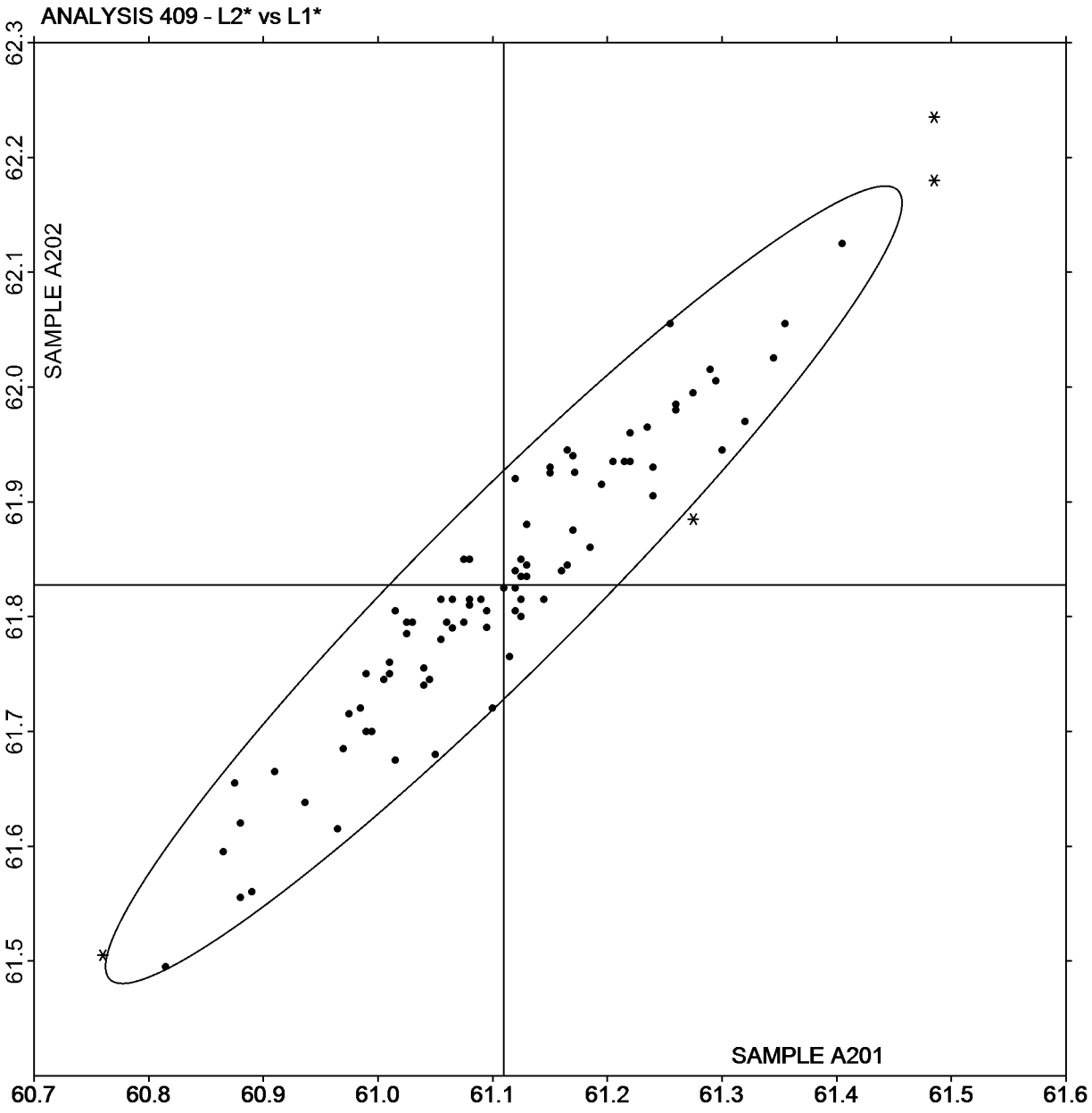
W2XA8T(X) - High "L*" A201 value & low "L*" A202 value. Low "a*" A201 value. High "b*" A202 value. Small Delta L. Large Delta a & b.

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	HH	Hunter ColorQUEST XE
HP	Hunter UltraScan PRO	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	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	XU	X-Rite Color Premier 8200 Spectrophotometer

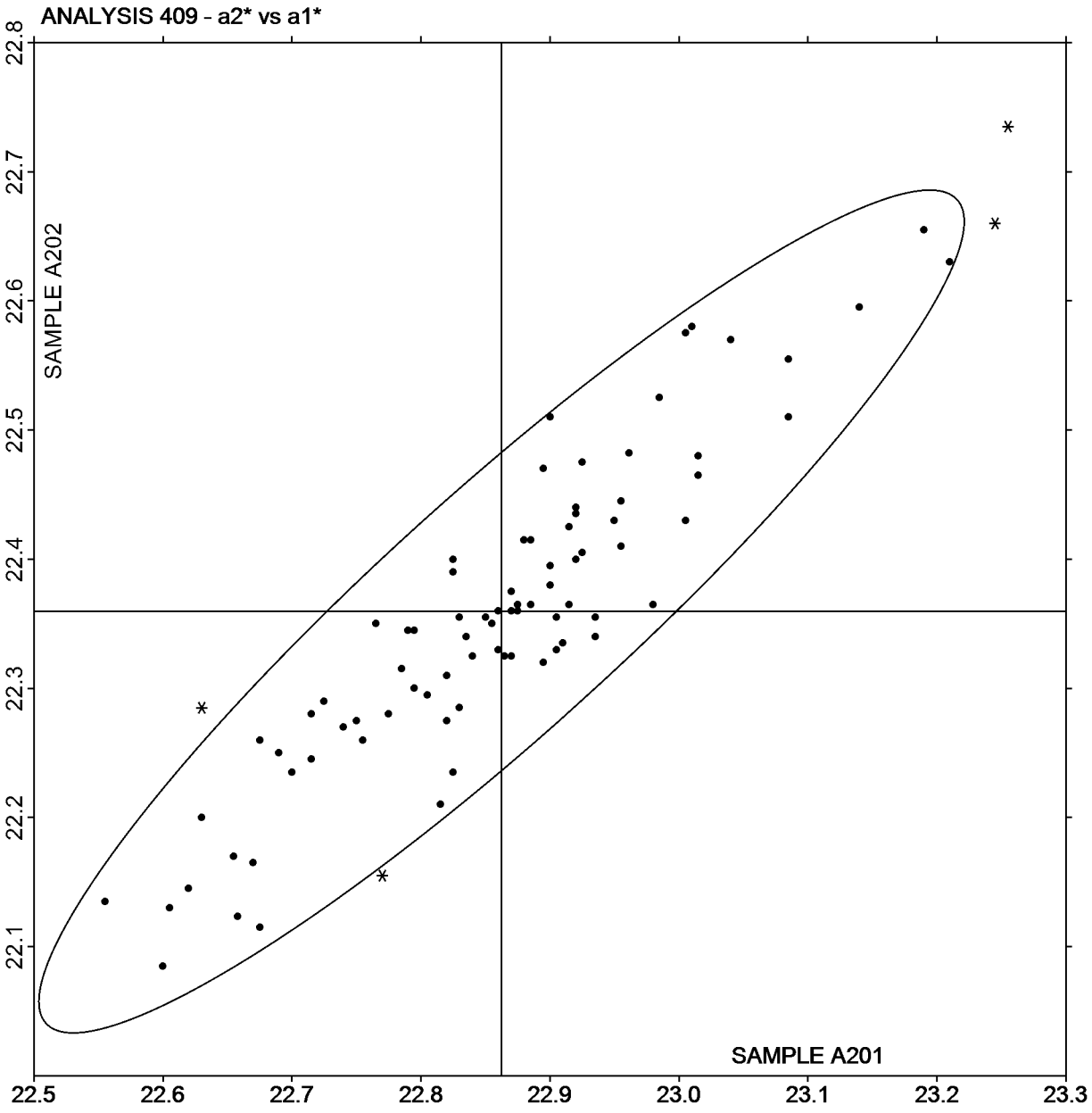
L2* vs L1*

SAMPLE A201 = 61.11 SAMPLE A202 = 61.83



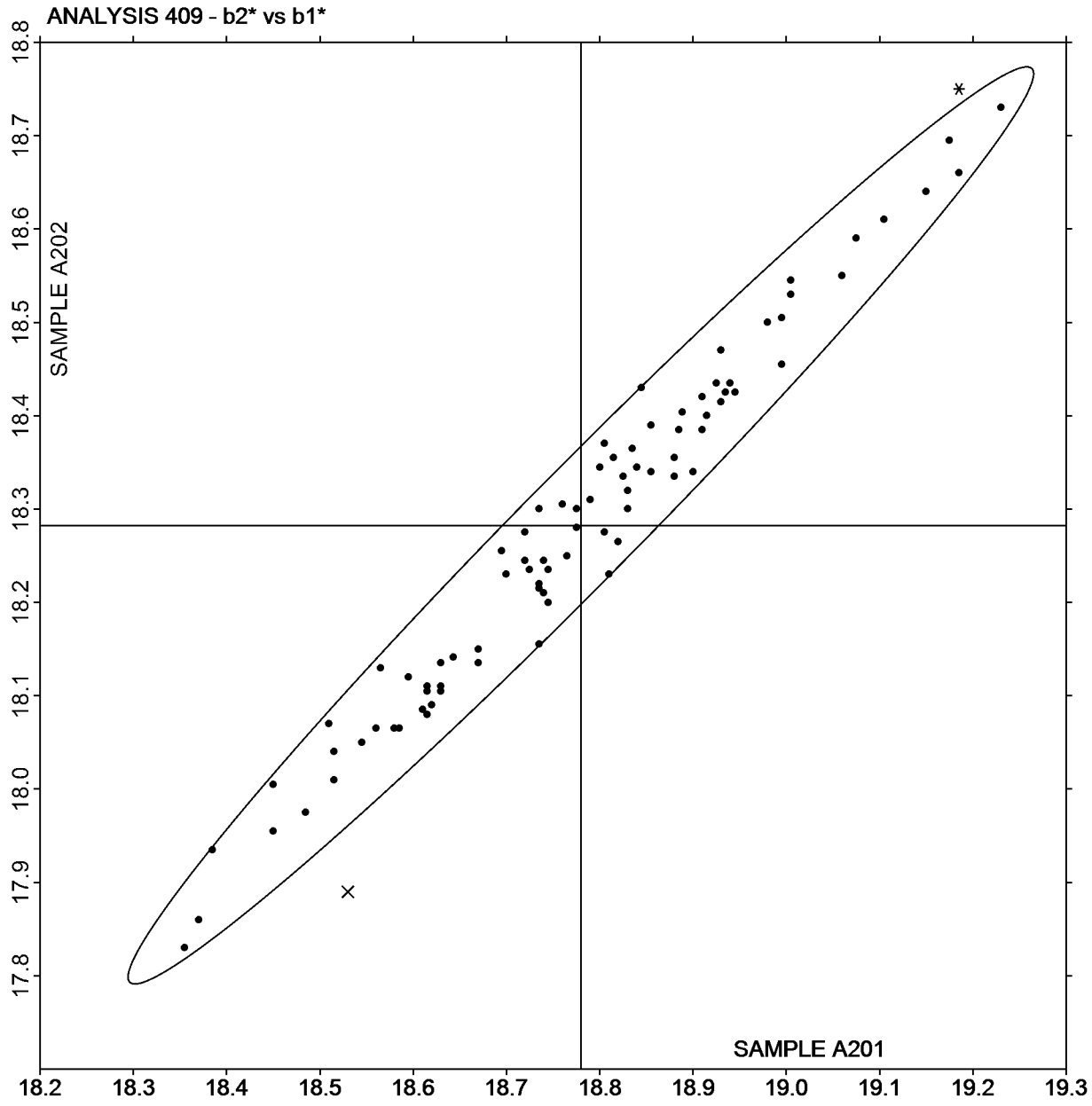
a2* vs a1*

SAMPLE A201 = 22.86 SAMPLE A202 = 22.36



b2* vs b1*

SAMPLE A201 = 18.78 SAMPLE A202 = 18.28



WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
								Sample A201										
28Z4YP		15.59	17.20	18.44	18.94	19.07	19.63	20.66	21.97	25.29	35.53	46.97	51.93	53.85	56.11	59.71	63.24	AS
2P7WX6		15.36	17.27	18.52	18.95	19.09	19.61	20.67	21.99	25.37	35.50	46.93	51.95	53.76	55.98	59.54	62.92	AM
3TDDDT		14.92	16.98	18.25	18.84	18.87	19.45	20.48	21.82	25.34	35.47	46.68	51.39	53.31	55.43	58.67	62.64	XI
4LELTV		15.09	17.16	18.42	18.94	19.01	19.54	20.61	21.97	25.54	35.71	46.76	51.47	53.25	55.45	58.67	62.68	XI
4U9QLW		17.06X	17.41	18.65	19.18	19.25	19.80	20.85	22.13	25.65	35.73	47.13	52.17	54.05	56.33	59.65	63.60	AJ
62K8TW		15.26	17.27	18.52	19.10	19.12	19.69	20.74	22.08	25.41	35.24	46.81	51.78	53.76	55.93	58.94	63.07	MM
64FJYX		15.30	17.20	18.40	18.90	18.90	19.45	20.50	21.90	25.40	35.70	46.80	51.55	53.40	55.65	58.90	62.95	XI
64TTPJ		15.38	17.40	18.67	19.26	19.29	19.89	20.92	22.27	25.89	36.08	47.26	52.00	53.78	55.83	58.95	63.02	XI
6DBNAR	X	19.37X	21.91X	23.34X	24.10X	24.10X	24.82X	26.26X	27.98X	32.77X	46.10X	60.09X	65.79X	68.35X	71.18X	75.12X	80.19X	XO
72D3MT		15.20	17.14	18.37	18.91	18.92	19.50	20.59	21.97	25.51	35.69	46.97	51.84	53.79	56.00	59.11	63.31	XB
76ZYJP		14.93	17.03	18.35	18.98	19.02	19.56	20.65	21.93	25.30	35.52	47.20	52.18	54.08	56.23	59.37	63.59	MT
7M2XQR		15.11	17.21	18.53	19.06	19.04	19.68	20.72	21.95	25.41	36.04	47.77	52.33	53.90	56.27	59.20	63.36	MV
7MMBE6		15.32	17.37	18.57	19.11	19.10	19.70	20.74	22.15	25.73	36.07	47.25	52.08	53.96	56.26	59.42	63.72	XH
7TJXTR		15.28	17.32	18.52	19.03	19.06	19.68	20.73	22.08	25.60	35.86	47.07	51.78	53.56	55.74	58.93	62.86	XI
7ZJGRG		15.58	17.36	18.52	19.10	19.09	19.68	20.73	22.08	25.70	36.09	47.05	51.75	53.54	55.66	58.86	62.81	XI
8HEACE		14.60*	16.81*	17.97*	18.61*	18.72	18.42X	20.54	21.98	25.79	36.27	47.13	51.42	52.69X	54.32X	57.54X	61.50*	XI
8K9V8Q		15.54	17.11	18.40	18.98	19.06	19.58	20.67	21.95	25.29	35.87	47.41	52.22	54.04	56.34	59.88*	63.39	AJ
8LHFZQ		15.35	17.28	18.53	19.08	19.10	19.67	20.69	22.04	25.51	35.72	47.32	52.04	53.86	56.00	59.16	63.30	MM
8N9G7E		15.11	16.95	18.26	18.82	18.85	19.45	20.52	21.80	25.07	35.35	47.12	33.83X	53.68	55.80	58.79	62.96	CA
9QRVAF		14.85	16.93	18.21	18.73	18.77	19.38	20.38	21.71	25.44	35.89	47.11	51.65	53.51	55.55	58.80	62.83	XH
AEE7TP		15.35	17.26	18.53	19.04	19.14	19.67	20.72	22.02	25.19	35.39	46.79	51.86	53.71	55.99	59.71	62.00	AS
AU6NJE		15.29	17.24	18.46	19.02	18.96	19.54	20.56	21.97	25.52	35.90	47.12	51.93	53.75	55.87	59.08	63.15	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 A201																		
AUTB24		15.23	17.20	18.49	19.05	19.13	19.65	20.72	21.95	25.45	35.53	46.92	51.84	53.61	55.78	58.91	62.66	AQ
B6JYFJ		15.28	17.23	18.52	19.08	19.12	19.71	20.79	22.04	25.60	35.99	47.68	52.23	54.10	56.08	59.25	63.35	MV
BT7U9N		16.58X	17.25	18.49	19.00	19.10	19.70	20.71	22.02	25.26	35.32	46.78	51.92	53.79	56.08	59.29	63.14	AS
BU2TRL		15.25	17.20	18.44	19.00	19.01	19.59	20.61	21.96	25.31	35.20	46.72	51.65	53.58	55.79	58.84	62.96	MM
BUXV9K	X	16.57X	18.31X	19.59X	20.15X	20.10X	20.65X	21.73X	23.02X	26.36X	37.00X	49.02X	53.67	55.31X	57.81X	60.07*	63.99	CA
C8NFJY		15.39	17.44	18.60	19.16	19.23	19.75	20.80	22.10	25.24	35.33	46.87	52.16	54.12	56.46	59.73	62.35	AJ
C8Q6PH		15.70	17.25	18.55	19.05	19.10	19.70	20.80	22.20	26.30X	36.60X	47.70	52.20	53.75	55.50	58.95	62.80	HW
CUGNGR		15.37	17.33	18.60	19.12	19.21	19.75	20.80	22.10	25.38	35.65	47.09	52.16	54.04	56.30	58.30*	61.88	AS
CWUYUX		15.43	17.28	18.48	19.03	19.10	19.60	20.62	21.93	25.36	35.83	47.27	52.05	53.83	56.10	59.56	63.08	AH
CYF34G		15.42	17.35	18.61	19.09	19.18	19.78	20.77	22.06	25.26	35.59	47.09	52.01	53.87	56.21	59.36	61.88	AO
DE3P4D		15.44	17.25	18.60	19.15	19.17	19.76	20.82	22.13	25.50	36.22	48.05*	52.55	54.25	56.36	59.41	63.62	CA
DUHN9E		15.20	17.25	18.50	19.05	19.05	19.60	20.70	22.10	25.60	35.90	47.45	52.10	53.95	55.95	59.15	63.35	MS
DYTWHV		14.96	17.00	18.17	18.67	18.72	19.27	20.31*	21.60	25.26	35.49	47.11	51.67	53.49	55.66	58.82	62.73	XH
EEKYR9		15.85	17.27	18.53	19.10	19.09	19.68	20.70	21.99	24.89*	34.92*	46.86	51.80	53.67	55.77	58.97	63.05	HP
EFVV7P		15.24	17.30	18.41	18.94	18.98	19.53	20.55	21.89	25.35	35.64	46.89	51.62	53.47	55.65	58.91	62.97	XI
ENJBHG	X	11.41X	13.03X	14.31X	14.93X	14.92X	15.45X	16.57X	17.77X	21.08X	31.10X	43.07X	47.90	49.72X	51.72X	54.98X	59.01X	MV
EYZ32K		15.31	17.32	18.51	19.04	19.03	19.62	20.68	22.06	25.62	35.55	46.88	51.85	53.84	55.99	59.03	63.05	MM
FKKT8L		15.43	17.38	18.58	19.12	19.19	19.72	20.76	22.12	25.61	35.51	46.99	51.95	53.90	56.08	59.22	63.36	MM
G4LU7J		15.32	17.26	18.43	18.92	18.94	19.52	20.56	21.92	25.45	35.79	46.99	51.66	53.53	55.84	59.06	63.05	XI
G94CUL		15.83	16.79*	18.02*	18.70	18.71	19.08*	20.21*	21.87	24.87*	35.78	46.69	52.06	53.57	54.69X	58.93	62.99	GD
G9FW7C		15.37	17.52	18.70	19.23	19.21	19.71	20.70	22.00	25.44	35.42	46.69	51.64	53.68	56.04	59.32	63.49	XI
GER8EP		15.84	16.95	18.11	18.78	18.89	19.48	20.42	21.86	24.83*	35.56	46.40	51.66	53.50	55.65	58.66	62.92	GD

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 A201																		
HE6H6C		16.18*	18.16X	19.58X	19.89X	19.88X	20.46X	21.48X	23.55X	25.73	36.77X	48.10*	52.64	54.21	55.84	58.20*	62.52	HH
HZKD49		14.75	16.93	18.07	18.67	18.67*	19.23	20.28*	21.62	25.19	35.18	46.64	51.40	53.32	55.51	58.70	62.72	XH
JB76MB		15.26	17.20	18.40	18.94	18.89	19.45	20.51	21.87	25.43	35.57	46.82	51.57	53.37	55.62	58.77	62.87	XH
KDFEUE		15.30	17.29	18.50	19.06	19.04	19.66	20.71	22.05	25.59	35.81	46.82	51.55	53.54	55.64	58.87	62.80	XI
LEF36G		15.42	17.24	18.47	18.98	19.04	19.61	20.68	22.06	25.56	35.83	47.18	51.97	53.91	56.17	59.31	63.50	XB
M8PPG9		15.26	17.26	18.49	19.04	19.10	19.68	20.74	22.12	25.61	35.71	46.89	51.74	53.68	55.85	58.87	62.95	XB
M8VBBA		16.65X	17.59	18.72	19.31	19.36	19.92	20.94	22.23	25.68	35.65	47.04	52.20	54.08	56.30	59.62	63.38	AQ
MHQCVQ		15.26	17.21	18.45	19.00	19.07	19.63	20.67	21.98	25.31	35.52	47.03	52.00	53.90	56.23	59.46	62.24	AJ
MKFQE9		15.23	17.20	18.44	18.98	19.09	19.69	20.67	21.97	25.29	35.34	46.70	51.85	53.87	55.85	59.16	61.60*	AS
MLMVG6		15.49	17.45	18.60	19.12	19.14	19.69	20.74	22.01	25.52	35.79	47.15	51.77	53.64	55.89	59.06	63.18	XI
MNGPWE		15.62	17.44	18.77	19.31	19.34	19.91	20.98	22.30	25.64	36.15	48.01*	52.74	54.53X	56.62*	59.74	63.90	CA
NMZPQ4		15.18	17.19	18.45	19.01	19.08	19.64	20.67	22.04	25.48	35.64	47.19	51.95	53.81	55.92	58.96	63.06	MK
P8JLX8		15.49	17.36	18.64	19.09	19.10	19.71	20.78	22.17	25.88	36.46*	47.73	52.13	53.97	56.07	59.16	63.23	MM
PD3BAB		15.01	17.07	18.32	18.85	18.89	19.46	20.56	21.99	25.61	35.54	46.91	51.60	53.58	55.64	58.94	63.03	XM
PKQZ2Z		15.20	17.34	18.58	19.14	19.18	19.73	20.78	22.18	25.72	36.01	47.42	52.04	53.88	56.05	59.34	63.37	XI
PVUVK6		15.49	17.42	18.66	19.21	19.23	19.80	20.84	22.21	25.76	35.99	47.28	52.05	53.91	56.01	59.07	63.28	XB
Q4HVDD		15.08	16.94	18.16	18.74	18.75	19.35	20.48	21.82	25.57	35.74	47.15	51.56	53.50	55.49	58.89	62.78	XO
QELV6Z		15.44	17.26	18.55	18.99	19.13	19.71	20.70	21.98	25.14	35.35	46.85	51.89	53.80	56.12	59.51	61.82	AS
QK4XPH		15.36	17.09	18.31	18.85	18.97	19.55	20.72	22.00	25.67	35.54	47.32	51.77	53.69	55.91	59.12	63.17	XU
QKHAGV		15.36	17.32	18.58	19.11	19.17	19.74	20.82	22.15	25.54	35.85	47.32	51.95	53.66	55.76	58.96	63.03	XB
QX6LT6		15.50	17.50	18.70	19.20	19.30	19.90	20.90	22.10	25.40	35.75	47.30	52.15	54.05	56.25	59.30	61.60*	AO
QZXBF7		15.18	17.18	18.42	19.00	19.02	19.58	20.64	21.96	25.37	35.27	46.80	51.75	53.69	55.87	58.91	63.06	MM

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 A201																
R2A3WK		15.24	17.20	18.45	19.00	19.04	19.64	20.67	22.01	25.50	35.72	47.23	51.90	53.75	55.91	59.00	63.23	MM
RWQHP6		15.39	17.39	18.66	19.14	19.27	19.82	20.81	22.08	25.42	35.88	47.24	52.05	53.72	55.95	59.20	62.11	AJ
T3YQU7		15.09	17.22	18.41	19.04	19.06	19.57	20.68	21.91	25.27	35.50	47.29	52.04	53.84	55.82	59.14	63.22	MV
TMMM7Z		15.38	17.35	18.56	19.11	19.20	19.78	20.77	22.04	25.21	35.34	46.68	51.79	53.71	56.01	59.50	62.01	AJ
U3922A		15.33	17.28	18.53	19.10	19.15	19.73	20.79	22.08	25.34	35.44	46.79	51.47	53.83	56.05	58.90	61.66*	AJ
VE7FK8		14.90	16.81*	18.13	18.71	18.74	19.33	20.39	21.69	24.94*	35.23	46.93	51.55	53.29	55.35	58.38	62.47	CA
VZJ39W		15.17	17.15	18.37	18.95	18.89	19.47	20.54	21.76	25.18	35.80	47.56	52.09	53.76	55.88	58.97	63.18	MV
W2XA8T		15.11	16.96	18.26	18.82	18.83	19.42	20.51	21.94	25.59	35.77	46.80	51.48	53.49	55.65	58.69	62.71	XO
WKKVQV		15.49	17.38	18.65	19.11	19.22	19.77	20.84	22.16	25.62	36.03	47.56	52.43	54.08	56.37	59.78	63.37	AJ
XC7EPA		15.17	17.22	18.46	19.02	19.10	19.68	20.72	22.04	25.48	35.58	47.06	51.99	53.86	56.01	59.06	63.21	AB
XKJK8X		15.27	17.15	18.35	18.88	18.89	19.45	20.53	21.91	25.54	35.94	47.20	51.85	53.58	55.68	58.93	63.05	XH
YLMP9Y		15.14	17.14	18.30	18.90	18.91	19.51	20.51	21.83	25.47	35.84	48.36X	51.62	53.45	55.65	58.85	62.84	XI
YMEP8V		15.40	17.40	18.80	19.20	19.30	19.90	20.90	22.20	25.40	35.55	46.95	52.10	54.00	56.30	59.50	61.60*	AO
YYFZ8R		15.28	17.21	18.47	18.98	19.06	19.59	20.64	21.93	25.15	35.42	46.85	51.83	53.81	56.00	59.33	61.48*	AS
Z9MJ78		14.84	16.71*	18.06	18.58*	18.67*	19.26	20.33	21.70	25.22	35.47	46.71	51.56	53.50	55.68	58.77	62.78	GD
ZMXTFW		15.29	17.31	18.64	19.13	19.18	19.73	20.75	22.11	25.73	35.78	47.36	52.25	53.97	56.19	59.18	63.33	MI
ZX3M4V		15.40	17.42	18.60	19.21	19.24	19.74	20.80	22.10	25.50	35.52	47.04	52.00	53.82	56.07	59.24	63.07	AO

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	15.35	17.23	18.47	19.01	19.06	19.61	20.68	22.02	25.45	35.69	47.11	51.68	53.75	55.90	59.08	62.87
SD Btwn Labs	0.37	0.20	0.21	0.18	0.19	0.23	0.18	0.22	0.24	0.32	0.36	2.04	0.27	0.35	0.38	0.56

6DBNAR (X) - High % reflectance data at all wavelengths.

BUXV9K (X) - High % reflectance data for almost all wavelengths.

ENJBHG (X) - Low % reflectance data for almost all wavelengths.

Key to Instrument Codes Reported by Participants

AB ACS-Datacolor 100
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
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
XH X-Rite Color i5
XI X-Rite Color i7
XM X-Rite SP62
XO X-Rite SP64
XU X-RiteColor Premier 8200 Spectrophotometer

WebCode	Data Flag	Sample E201 Lab Mean	Sample E201 Diff from Grand Mean	Sample E201 CPV	Sample E202 Lab Mean	Sample E202 Diff from Grand Mean	Sample E202 CPV	Instr Code
27B9KN	*	28.75	-1.46	-2.52	39.35	-0.77	-1.21	GN
2E2TQL		30.70	0.49	0.84	40.88	0.75	1.17	GN
3TDDDT		29.63	-0.59	-1.01	39.80	-0.32	-0.50	MM
4F7QUM		30.06	-0.16	-0.27	39.73	-0.40	-0.62	GL
4K2REG	X	29.68	-0.54	-0.93	37.65	-2.47	-3.85	GN
4LELTV		29.63	-0.59	-1.01	39.20	-0.92	-1.44	GT
62K8TW		30.88	0.66	1.14	40.15	0.03	0.04	RA
64TTPJ		30.35	0.14	0.24	40.50	0.38	0.59	GL
6DBNAR		30.00	-0.21	-0.37	39.20	-0.92	-1.44	MW
7MMBE6		30.00	-0.21	-0.37	40.30	0.18	0.27	GL
8XBYGH		30.80	0.59	1.01	40.23	0.10	0.16	GL
99E86U		29.95	-0.26	-0.45	40.15	0.03	0.04	GL
9EDK9C		29.63	-0.59	-1.01	39.33	-0.80	-1.24	GL
9QRVAF		30.55	0.34	0.58	40.50	0.38	0.59	GL
9UUR2V		30.15	-0.06	-0.11	39.83	-0.30	-0.47	GK
A3CGHN		30.20	-0.01	-0.02	40.55	0.43	0.66	GL
AU6NJE		29.43	-0.79	-1.36	40.05	-0.07	-0.12	GL
BCN4M2		30.75	0.54	0.93	40.23	0.10	0.16	GK
BMHCPK	X	30.03	-0.19	-0.32	38.43	-1.70	-2.65	RA
BU2TRL		29.38	-0.84	-1.44	39.83	-0.30	-0.47	GL
C8NFJY		29.10	-1.11	-1.92	38.78	-1.35	-2.10	GK
C8Q6PH		29.58	-0.64	-1.10	39.63	-0.50	-0.78	GK
D6D27P		31.05	0.84	1.44	40.85	0.73	1.13	GN
DJXGAP		30.38	0.16	0.28	40.13	0.00	0.00	GL
DUHN9E		29.75	-0.46	-0.80	39.48	-0.65	-1.01	GK
ENJBHG		30.63	0.41	0.71	40.28	0.15	0.23	GL
ETEAPK		30.25	0.04	0.06	39.53	-0.60	-0.93	GL
FKKT8L		30.60	0.39	0.67	40.70	0.58	0.90	GL
G6FKAC		30.70	0.49	0.84	40.05	-0.07	-0.12	RA
G8BCYV		29.83	-0.39	-0.67	39.58	-0.55	-0.86	GL

WebCode	Data Flag	Sample E201 Lab Mean	Sample E201 Diff from Grand Mean	Sample E201 CPV	Sample E202 Lab Mean	Sample E202 Diff from Grand Mean	Sample E202 CPV	Instr Code
G94CUL		29.78	-0.44	-0.75	40.15	0.03	0.04	GK
G9FW7C		30.33	0.11	0.19	40.60	0.48	0.74	GN
GER8EP		30.28	0.06	0.11	40.33	0.20	0.31	GN
GTDMHP		29.58	-0.64	-1.10	39.13	-1.00	-1.56	GK
HCZ92R		30.43	0.21	0.37	40.43	0.30	0.47	GL
HE6H6C		30.03	-0.19	-0.32	39.00	-1.12	-1.75	RA
HZ9UTH		31.08	0.86	1.49	40.73	0.60	0.94	XX
JB76MB		30.10	-0.11	-0.19	40.13	0.00	0.00	GL
KDFEUE		30.16	-0.06	-0.10	40.09	-0.04	-0.06	GL
LFQUCC		30.80	0.59	1.01	40.83	0.70	1.09	GL
MHQCVQ	*	31.78	1.56	2.69	41.68	1.55	2.42	MW
MRXAH9		29.68	-0.54	-0.93	39.48	-0.65	-1.01	GL
P8JLX8		29.98	-0.24	-0.41	40.42	0.29	0.46	GL
PDPN64		30.95	0.74	1.27	40.83	0.70	1.09	GK
PTM8ZY		30.30	0.09	0.15	39.85	-0.27	-0.43	GK
Q4HVDD		31.25	1.04	1.79	41.38	1.25	1.95	GN
QK4XPH		30.95	0.74	1.27	41.30	1.18	1.83	GK
QKHAGV		30.43	0.21	0.37	40.60	0.48	0.74	ZA
QZXBF7		29.83	-0.39	-0.67	39.45	-0.67	-1.05	RA
T3YQU7		28.93	-1.29	-2.22	39.05	-1.07	-1.67	GL
TGWCW3		31.03	0.81	1.40	41.48	1.35	2.10	GN
TMMM7Z		29.85	-0.36	-0.63	39.55	-0.57	-0.89	GL
TRDJVG		30.40	0.19	0.32	40.08	-0.05	-0.08	GK
U3922A	X	37.83	7.61	13.12	28.28	-11.85	-18.45	GL
VE7FK8		30.48	0.26	0.45	39.98	-0.15	-0.23	GL
X7EFNY		30.83	0.61	1.06	40.38	0.25	0.39	GL
XC7EPA		30.03	-0.19	-0.32	40.03	-0.10	-0.15	GL
XCM8AA		30.45	0.24	0.41	41.10	0.98	1.52	GN
XKJK8X		30.58	0.36	0.62	40.80	0.68	1.05	GK
XURHG2		30.18	-0.04	-0.07	40.03	-0.10	-0.15	GL

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

Report #191
1st Qtr 2020

WebCode	Data Flag	Sample E201 Lab Mean	Sample E201 Diff from Grand Mean	Sample E201 CPV	Sample E202 Lab Mean	Sample E202 Diff from Grand Mean	Sample E202 CPV	Instr Code
YVZWEU		29.85	-0.36	-0.63	40.15	0.03	0.04	GK
YYFZ8R		29.80	-0.41	-0.71	40.25	0.13	0.20	GK
ZMXTFW		30.08	-0.14	-0.24	39.50	-0.62	-0.97	GL

Summary Statistics

	Sample E201	Sample E202
Grand Means	30.21 Gloss Units	40.12 Gloss Units
Stnd Dev Btwn Labs	0.58 Gloss Units	0.64 Gloss Units

Statistics based on 60 of 63 reporting participants

Comments on Assigned Data Flags for Test #440

4K2REG(X) - Low data for Sample E202. Inconsistent within the determinations for Sample E202.

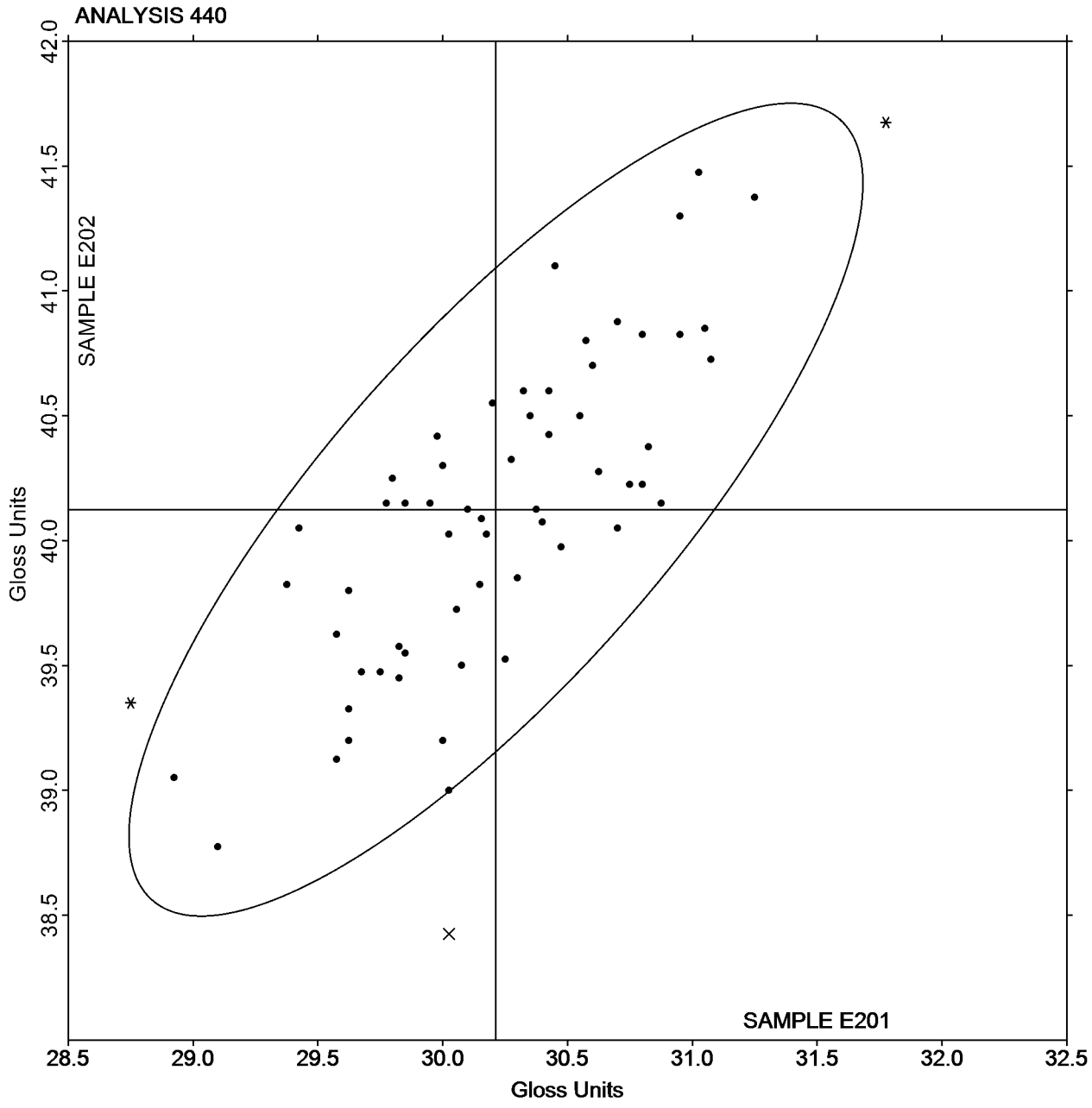
BMHCPK(X) - Inconsistent in testing between samples.

U3922A(X) - Extreme data.

Key to Instrument Codes Reported by Participants

GK	BYK-Gardner micro-gloss (60)	GL	BYK-Gardner micro-TRI-gloss
GN	BYK-Gardner new micro-TRI-gloss	GT	Gardco Novo-Gloss (20/60/85)
MM	Macbeth Lab-Gloss	MW	Minolta Multi-Gloss 268
RA	Rhopoint Novo-Gloss Glossmeter	XX	Instrument make/model not specified by lab
ZA	Zehntner ZGM Series		

SAMPLE E201 = 30.21 Gloss Units SAMPLE E202 = 40.12 Gloss Units



-End of Report-