Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report #202 - 4th Qtr 2022

About the Color Program, About CTS

Key to Tables and Graphs (Color Tests)

Key to Tables and Graphs (Spectro Test)

Key to Tables and Graphs (Gloss Tests)

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

About The Color & Appearance Program

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

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

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

ABOUT CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately - owned company that specializes in interlaboratory tests for a variety of sectors: including color, rubber, plastics, fasteners and metals, containerboard, paper, agriculture, hemp, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality assurance objectives. Labs from the U.S., as well as more than 100 countries, currently participate in the CTS programs.

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Key for Color Program Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Lab Mean — The average of the 2 test results obtained by the participant for CIE L*,a*,b* color space values.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value — An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Graphs — For each laboratory, the LAB MEAN for the first sample is plotted against the LAB MEAN for the second sample with each point representing a laboratory. The horizontal and vertical axes are the GRAND MEANS for each sample. For each test there are three plots: L*2 vs L*1, a*2 vs a*1 and b*2 vs b*1. The a* and b* plots are created using absolute values.

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	**CAUTION** - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse and one or more CPV are greater than critical value. See specific notes following each table for more information on why the data is excluded. It is also possible to have an "X" for individual color coordinate (L*, a* or b*) without overall "X" flag. It means that results fall outside the 99% ellipse for particular coordinate but have no CPV flags. Those results will not require any action.
M	EXCLUDED	**PROCEED** - lab was unable to report data for at least one sample. However, a lab receiving two of more M flags for a test may need to stop and review its testing procedures.

Key for Spectrophotometric Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. See specific notes following each table for more information on why the data is excluded.

In addition to the DATA FLAG column, it is also possible to have a flag on individual wavelength values as follows:

*	The laboratory's mean for that wavelength deviates from the GRAND MEAN by more than two BETWEEN-LAB STANDARD DEVIATIONS.
X	The laboratory's mean for that wavelength deviates from the GRAND MEAN by more than the critical limit determined by a 99.5% confidence interval.

Key for Gloss Web Summary Report

WebCode — Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Color Report published on the CTS web site. The Web Code for each analysis can be found in the Performance Analysis Report emailed to each participant.

Lab Mean — The average of the test results obtained by the participant.

Grand Mean — The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Difference from Grand Mean — The difference of the LAB MEAN from the GRAND MEAN.

Between-Lab Standard Deviation — An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value — An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Inst Code — A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).

Graphs — For each laboratory, the LAB MEAN for the first sample (x-axis) is plotted against the LAB MEAN for the second sample (y-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the GRAND MEANS for each sample. When 20 or more laboratories are in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained above.

Data Flag — DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	**CAUTION** - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse. See specific notes following each table for more information on why the data is excluded.
M	EXCLUDED	**PROCEED** - lab was unable to report data for at least one sample. However, a lab receiving two of more M flags for a test may need to stop and review its testing procedures.

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
24WF89		D221	60.40	-19.70	7.90	1.15	0.30	0.10	1.19	HW
		D222	61.55	-19.40	8.00					
283QHQ		D221	60.88	-19.74	8.14	1.01	0.26	0.03	1.04	HL
		D222	61.89	-19.48	8.16					
3K36WT		D221	60.34	-19.87	7.58	1.02	0.33	0.10	1.08	HW
		D222	61.37	-19.54	7.68					
6AV4D7		D221	60.75	-19.89	8.43	1.01	0.27	0.03	1.05	GA
		D222	61.76	-19.62	8.46					
7GB8ZY		D221	60.83	-20.06	8.14	0.98	0.32	0.07	1.03	XG
		D222	61.81	-19.74	8.21					
7UGX38		D221	60.20	-19.94	8.34	1.04	0.30	0.04	1.09	GG
		D222	61.25	-19.64	8.38					
8FV32Z		D221	60.49	-19.81	8.22	1.10	0.29	0.08	1.14	XU
		D222	61.59	-19.51	8.31					
97NPHC		D221	60.33	-20.00	8.20	1.01	0.31	0.11	1.06	MT
		D222	61.34	-19.69	8.31					
9F89VG	X	D221	61.70	-20.30	7.80	1.00	0.30	0.10	1.05	HW
		D222	62.70	-20.00	7.90					
A8PAK3		D221	60.76	-19.83	9.27	1.04	0.18	0.03	1.06	GE
		D222	61.81	-19.64	9.30					
AZ9TW9		D221	60.14	-19.90	8.27	0.97	0.34	0.04	1.03	GG
		D222	61.11	-19.56	8.31					
C86BHN		D221	60.73	-19.76	8.14	1.00	0.30	0.09	1.05	XM
		D222	61.73	-19.45	8.22					
D4KNJA		D221	59.99	-19.75	8.24	1.09	0.31	0.13	1.15	GG
		D222	61.08	-19.44	8.38					
DKA4UE		D221	60.34	-20.02	7.57	0.98	0.29	0.05	1.02	HW
		D222	61.32	-19.73	7.62					
EM8RGL		D221	60.51	-19.63	7.62	1.01	0.27	0.05	1.05	XH
		D222	61.52	-19.36	7.67					
FAWD42		D221	60.49	-20.39	8.72	1.04	0.31	0.09	1.09	BG
		D222	61.54	-20.08	8.81					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
FDJ64B		D221	60.18	-20.13	8.10	1.03	0.30	0.04	1.07	HX
		D222	61.21	-19.82	8.14					
FQH2DW		D221	60.53	-19.71	8.04	1.03	0.25	0.03	1.07	XO
		D222	61.57	-19.46	8.06					
GCYTU6		D221	60.46	-19.89	7.68	1.02	0.30	0.08	1.06	HW
		D222	61.48	-19.58	7.76					
JVNWFN	X	D221	63.27	-20.72	9.19	0.98	0.27	0.17	1.03	PR
		D222	64.25	-20.45	9.35					
K4VZX7		D221	60.70	-19.90	7.60	1.00	0.20	0.00	1.02	HW
		D222	61.70	-19.70	7.60					
KK2XMW		D221	60.24	-19.47	7.82	1.04	0.30	0.09	1.08	HK
		D222	61.28	-19.17	7.91					
KXTRX6		D221	60.33	-20.03	7.60	1.04	0.33	0.12	1.10	MG
		D222	61.37	-19.70	7.72					
LCJ6HQ		D221	60.51	-20.13	8.57	1.04	0.34	0.12	1.11	BG
		D222	61.56	-19.79	8.69					
MB47TZ		D221	60.80	-19.52	7.72	1.02	0.33	0.10	1.08	XX
		D222	61.82	-19.19	7.82					
MHMCP8		D221	60.47	-19.82	8.27	0.99	0.32	0.10	1.05	XU
		D222	61.46	-19.50	8.37					
MMGHVW		D221	60.76	-20.06	8.14	1.02	0.36	0.14	1.09	XC
		D222	61.77	-19.69	8.29					
MUJHJ6		D221	60.82	-19.89	8.39	1.07	0.34	0.13	1.12	XU
		D222	61.88	-19.55	8.51					
N6Y6E6		D221	60.70	-19.74	8.62	1.09	0.37	0.13	1.16	GE
		D222	61.79	-19.38	8.76					
NDPDQ3		D221	60.77	-19.92	8.47	1.03	0.29	0.08	1.08	GH
		D222	61.81	-19.62	8.55					
P9WT2C		D221	60.51	-20.11	7.68	1.01	0.30	0.05	1.06	HW
		D222	61.52	-19.81	7.73					
PAN2GZ	X	D221	63.22	-18.22	8.55	0.96	0.46	0.07	1.07	XP
		D222	64.18	-17.76	8.62					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
PE42P9	X	D221	53.54	-17.62	5.66	1.13	0.10	0.12	1.14	HW
		D222	54.67	-17.52	5.78					
PHWV99		D221	60.56	-19.92	8.23	1.03	0.32	0.11	1.08	XU
		D222	61.59	-19.60	8.34					
Q7KAFL		D221	60.71	-20.08	8.67	1.06	0.27	0.10	1.09	GE
		D222	61.77	-19.82	8.78					
Q8DG77		D221	60.69	-20.11	8.10	1.01	0.34	0.11	1.07	XW
		D222	61.70	-19.77	8.21					
QRF72T		D221	60.43	-19.84	8.45	1.02	0.32	0.08	1.07	MD
		D222	61.45	-19.52	8.53					
QXPA2U		D221	60.39	-19.82	8.36	0.94	0.26	0.05	0.98	XU
		D222	61.33	-19.57	8.42					
RGD2UY		D221	60.65	-20.10	7.70	1.05	0.30	0.05	1.09	HW
		D222	61.70	-19.80	7.75					
RGWV9T		D221	60.74	-19.79	8.52	0.99	0.27	0.05	1.03	GE
		D222	61.73	-19.51	8.57					
RZCLMX		D221	60.47	-19.96	8.33	1.08	0.36	0.12	1.14	XU
		D222	61.55	-19.61	8.45					
TNWG6M		D221	60.57	-19.79	8.31	1.03	0.32	0.11	1.08	XS
		D222	61.60	-19.47	8.42					
TXF4PN		D221	60.31	-19.44	7.60	1.02	0.27	0.07	1.06	XH
		D222	61.33	-19.17	7.67					
U8KFEQ		D221	60.43	-19.96	7.73	0.88	0.35	0.11	0.95	HW
		D222	61.30	-19.60	7.84					
ZK9HQQ		D221	60.85	-19.95	8.27	0.98	0.26	-0.01	1.01	XE
		D222	61.83	-19.69	8.26					
ZT6DQA		D221	60.76	-19.80	8.32	1.04	0.35	0.02	1.10	XD
		D222	61.80	-19.45	8.34					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D221	60.54	-19.89	8.17	1.02	0.30	0.08	1.07
D222	61.57	-19.59	8.25				
Stnd Dev Btwn Labs							
D221	0.22	0.20	0.41	0.05	0.04	0.04	0.05
D222	0.22	0.19	0.42				

Statistics based on 42 of 46 reporting participants

Comments Assigned on Data Flags for Test #408

9F89VG(X) - High "L*" values.

JVNWFN(X) - Very high "L*" values. Low "a*" values.

PAN2GZ(X) - Very high "L*" and "a*" values. Large replication difference for "a*" values on Sample D221. Large Delta a.

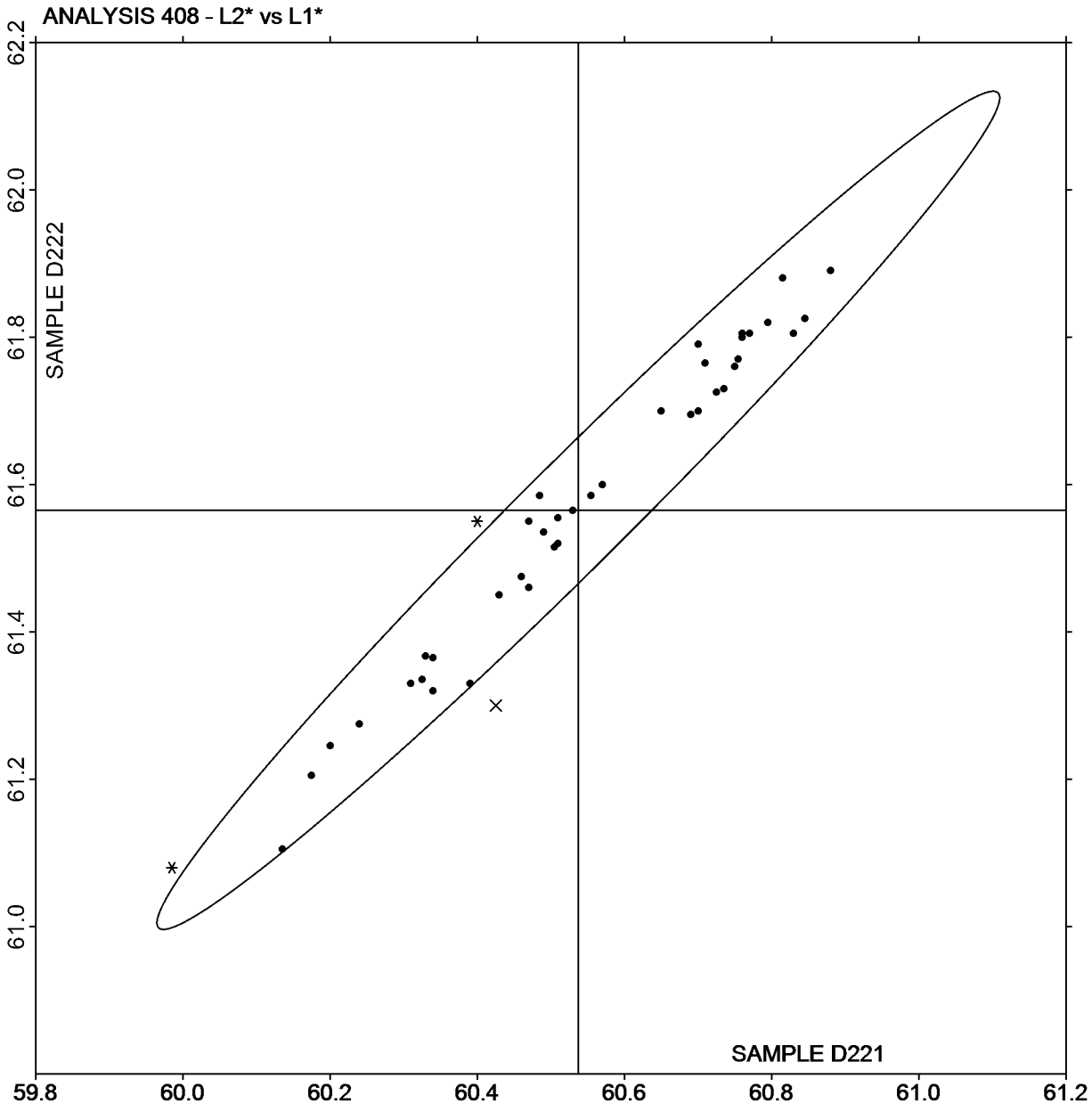
PE42P9(X) - Very low "L*" and "b*" values. Very high "a*" values. Small Delta a.

Key to Instrument Codes Reported by Participants

BG	BYK Mac i	GA	BYK-Gardner
GE	BYK-Gardner spectro-guide (45/0)	GG	BYK-Gardner spectro2-guide (45/0) gloss
GH	BYK-Gardner Color-View	HK	Hunter MiniScan XE (45/0)
HL	Hunter Agera	HW	Hunter LabScan XE
HX	Hunter Color FlexEZ 45/0	MD	Minolta FD 7
MG	Macbeth 1500/PLUS or 2025+ Color Eye	MT	Minolta CM-25cG Spectrophotometer
PR	PhotoResearch PR730	XC	X-Rite i1Basic Pro
XD	X-Rite 500 Series SpectroDensitometer	XE	X-Rite eXact Portable Spectrophotometer
XG	X-Rite i1 Pro 2	XH	X-Rite Color i5
XM	X-Rite MA58 Multi-Angle Spectrophotometer	XO	X-Rite MA68 II Multi-Angle Spectrophotometer
XP	X-Rite MA9 Multi-Angle Spectrophotometer	XS	X-Rite 962 Portable Spectrophotometer
XU	X-Rite 964 Portable Spectrophotometer	XW	X-Rite
XX	Instrument make/model not specified by lab		

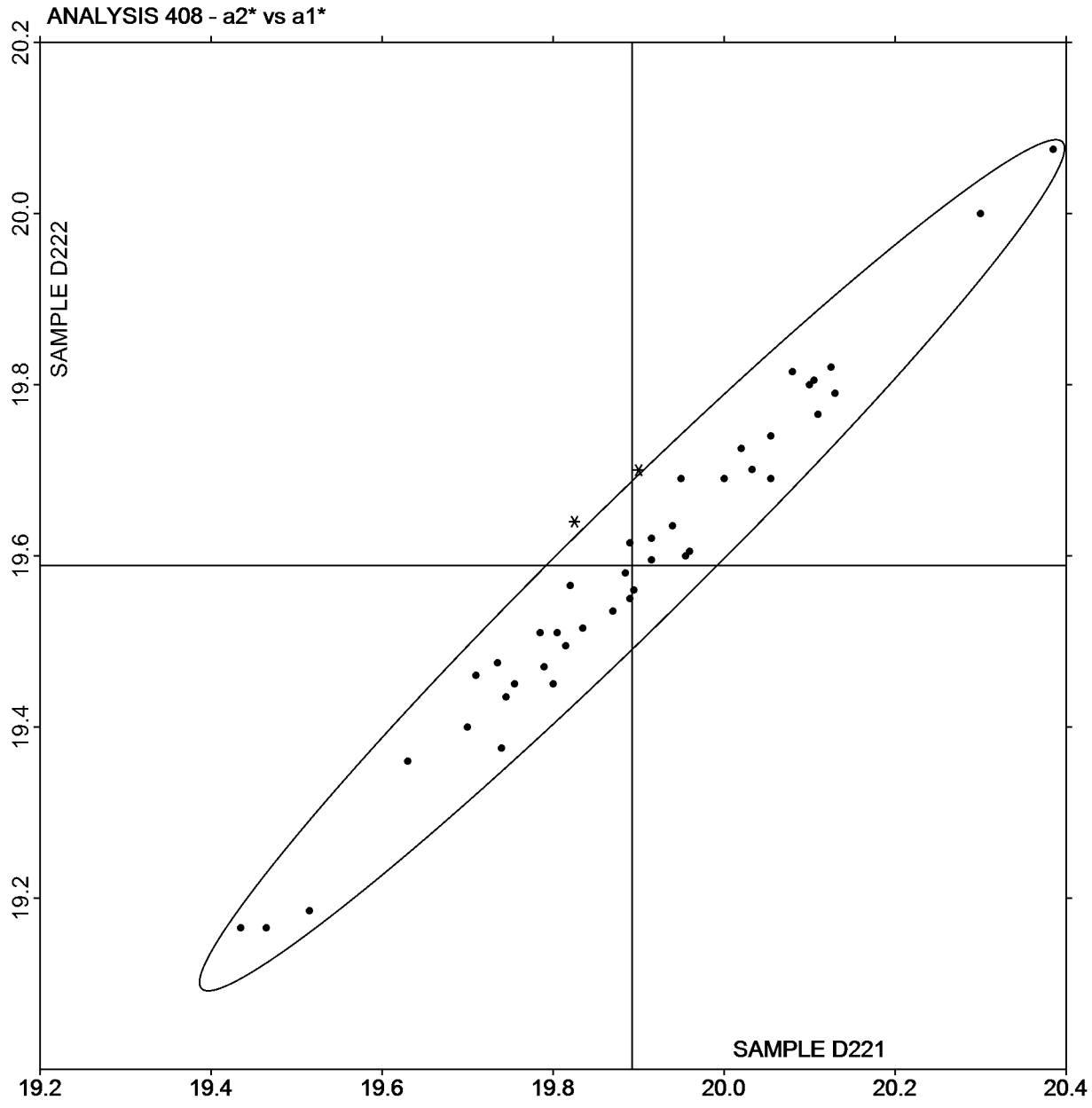
L2* vs L1*

SAMPLE D221 = 60.54 SAMPLE D222 = 61.57



a2* vs a1*

SAMPLE D221 = -19.89 SAMPLE D222 = -19.59

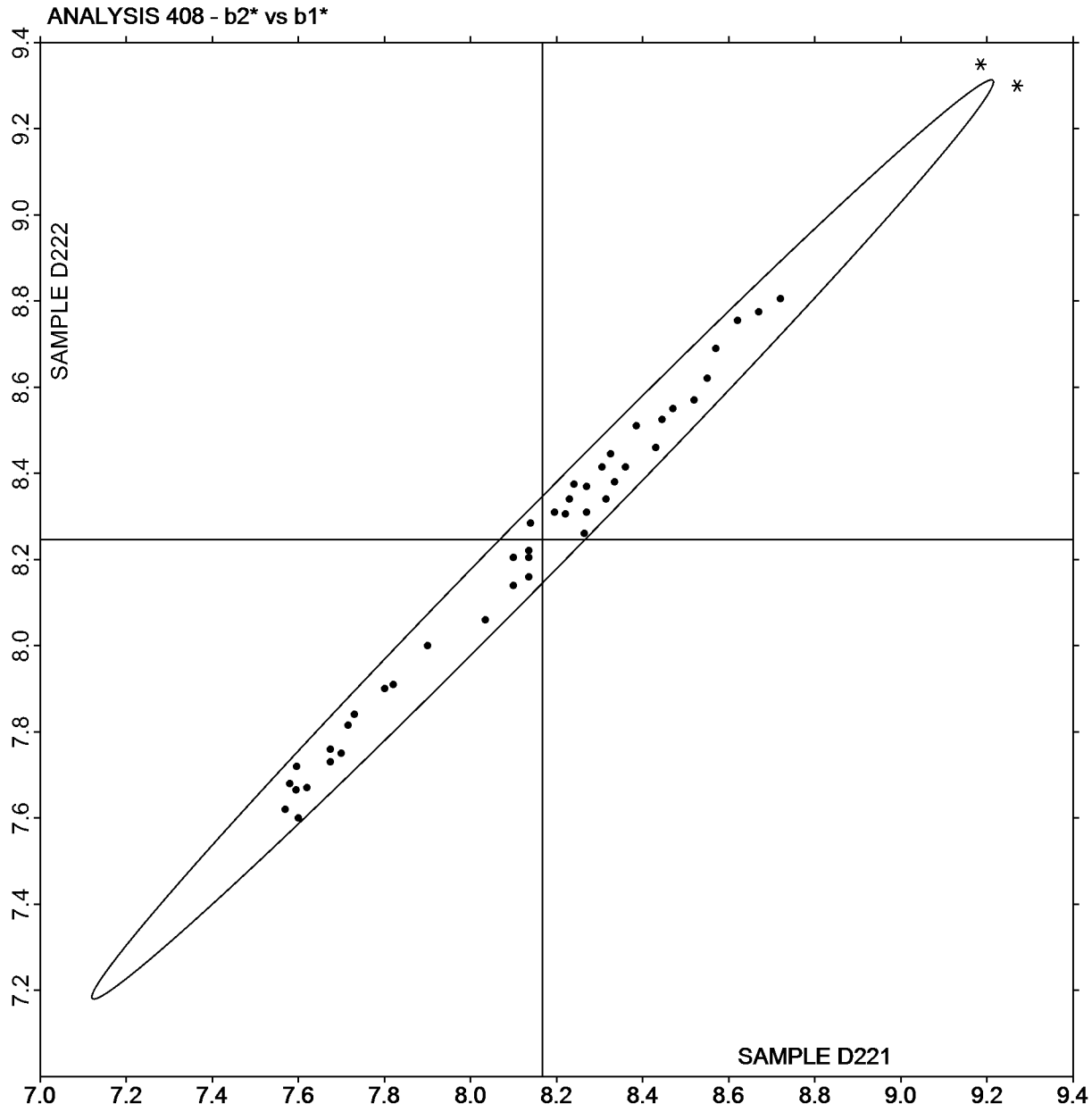


Plot created using absolute values.

b2* vs b1*

SAMPLE D221 = 8.17

SAMPLE D222 = 8.25



			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
2N8DPJ		D221	60.98	-19.82	7.85	0.98	0.31	0.12	1.03	AP
		D222	61.95	-19.51	7.97					
2R7NLJ		D221	60.93	-19.71	8.04	0.97	0.32	0.10	1.03	AJ
		D222	61.90	-19.39	8.14					
2RRZNY		D221	60.44	-19.81	7.49	1.01	0.33	0.10	1.07	XF
		D222	61.45	-19.48	7.59					
38C9Y2		D221	60.73	-19.79	7.96	0.98	0.28	0.05	1.03	MU
		D222	61.72	-19.51	8.01					
3CPKLM		D221	60.78	-19.66	7.83	1.00	0.34	0.03	1.06	AT
		D222	61.79	-19.32	7.86					
4WCYT6		D221	60.76	-19.62	7.76	0.99	0.27	0.06	1.03	XD
		D222	61.76	-19.35	7.82					
68HNTD		D221	60.86	-19.78	7.96	0.99	0.30	0.02	1.04	AJ
		D222	61.85	-19.47	7.97					
6AV4D7		D221	60.85	-19.54	7.98	1.01	0.27	0.02	1.04	AJ
		D222	61.85	-19.28	8.00					
6L8E2V		D221	60.96	-19.68	7.84	1.00	0.36	0.10	1.06	HP
		D222	61.95	-19.33	7.94					
6YX9DP		D221	60.81	-19.74	7.87	1.07	0.28	0.01	1.11	HP
		D222	61.88	-19.45	7.89					
79YTDW	X	D221	62.30	-19.43	7.17	-0.63	-0.27	-0.02	0.68	XO
		D222	61.67	-19.70	7.15					
7ABPM8		D221	60.62	-19.53	7.71	1.00	0.27	0.02	1.04	XD
		D222	61.62	-19.26	7.73					
7TPYPU	X	D221	60.62	-20.01	7.56	0.98	0.33	0.12	1.04	XC
		D222	61.60	-19.68	7.68					
7UGX38		D221	60.34	-19.67	8.02	1.05	0.31	0.02	1.09	GE
		D222	61.39	-19.36	8.04					
7WNHNL		D221	60.96	-19.68	7.83	1.02	0.32	0.08	1.07	AO
		D222	61.98	-19.36	7.91					
8V8LX8		D221	60.65	-19.53	7.61	1.04	0.29	0.06	1.08	XB
		D222	61.69	-19.25	7.67					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
8VNZ2B		D221	60.80	-19.74	7.82	1.05	0.29	0.09	1.09	AJ
		D222	61.85	-19.45	7.92					
97NPHC		D221	60.81	-19.92	7.84	1.04	0.33	0.08	1.09	XB
		D222	61.85	-19.59	7.92					
A8PAK3		D221	60.35	-19.59	7.82	1.01	0.25	0.02	1.05	GD
		D222	61.37	-19.34	7.84					
A97BLJ		D221	60.89	-19.70	7.82	1.02	0.25	0.03	1.05	HP
		D222	61.91	-19.45	7.84					
AEB8AP		D221	60.96	-19.55	7.67	0.98	0.30	0.04	1.03	HW
		D222	61.94	-19.25	7.71					
AWCVWH		D221	60.72	-19.87	8.01	0.91	0.24	0.02	0.94	MW
		D222	61.63	-19.63	8.02					
AXK6TL		D221	60.76	-19.65	7.63	1.02	0.30	0.07	1.07	MI
		D222	61.78	-19.35	7.70					
AZ9TW9		D221	60.48	-19.68	8.03	1.07	0.34	0.09	1.13	GE
		D222	61.55	-19.34	8.12					
BENYZL		D221	60.54	-19.70	7.72	1.05	0.30	0.09	1.09	XM
		D222	61.58	-19.40	7.82					
CCHVMP		D221	60.83	-19.66	7.94	1.01	0.37	0.10	1.08	AU
		D222	61.84	-19.29	8.05					
CWLTX6		D221	60.89	-19.63	7.96	1.01	0.31	0.09	1.06	AS
		D222	61.90	-19.33	8.06					
EEX6TR		D221	60.79	-19.51	7.67	1.03	0.28	0.06	1.07	MM
		D222	61.81	-19.23	7.73					
EM8RGL		D221	60.51	-19.62	7.63	1.02	0.25	0.04	1.06	XH
		D222	61.53	-19.37	7.66					
EMRBMT		D221	61.19	-19.93	7.89	1.01	0.27	0.02	1.05	CA
		D222	62.20	-19.66	7.91					
EQ2KJ4		D221	60.91	-19.73	7.94	1.06	0.34	0.03	1.11	MT
		D222	61.97	-19.39	7.97					
ETCM99		D221	60.61	-19.63	7.85	1.04	0.32	0.09	1.09	MQ
		D222	61.65	-19.31	7.94					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
F3YUV6		D221	60.68	-19.44	7.56	0.99	0.27	0.06	1.03	XI
		D222	61.67	-19.18	7.62					
F8UK42		D221	60.93	-19.70	7.85	0.96	0.29	0.04	1.00	AP
		D222	61.89	-19.41	7.89					
FAZ6PG		D221	60.50	-19.40	7.71	1.04	0.31	0.10	1.09	XG
		D222	61.54	-19.09	7.80					
G6WNZZ		D221	60.91	-19.77	7.75	1.07	0.30	0.04	1.12	AQ
		D222	61.98	-19.48	7.78					
GNYAWT		D221	60.79	-19.67	7.76	0.94	0.27	0.08	0.98	XI
		D222	61.73	-19.40	7.83					
GP8MDU		D221	60.86	-19.70	7.95	1.06	0.29	0.01	1.09	AT
		D222	61.92	-19.41	7.96					
GXZQDW	X	D221	61.09	-20.17	7.87	1.02	0.30	0.03	1.07	CA
		D222	62.11	-19.86	7.90					
H9W3DG		D221	60.87	-19.71	8.00	0.98	0.33	0.09	1.04	AS
		D222	61.85	-19.37	8.09					
HWLRN7		D221	60.78	-19.73	7.85	1.02	0.29	0.07	1.07	AS
		D222	61.80	-19.44	7.91					
J6B8Y9		D221	60.31	-19.58	7.79	1.08	0.36	0.08	1.14	XH
		D222	61.38	-19.21	7.88					
J77HM4		D221	60.75	-19.75	7.81	0.97	0.27	0.06	1.02	MK
		D222	61.73	-19.48	7.88					
JATVQF		D221	60.89	-19.65	7.78	0.95	0.27	-0.03	0.99	AJ
		D222	61.84	-19.38	7.75					
JD42VZ		D221	60.83	-19.61	8.03	1.02	0.31	0.06	1.07	AS
		D222	61.85	-19.30	8.10					
JGJRYA		D221	60.52	-19.65	7.93	1.03	0.32	0.04	1.08	MY
		D222	61.55	-19.32	7.98					
JTGRA8		D221	60.63	-19.63	7.70	0.96	0.30	0.01	1.01	XG
		D222	61.59	-19.32	7.72					
JVNWFN		D221	60.71	-19.90	7.79	0.96	0.34	0.10	1.02	CA
		D222	61.67	-19.56	7.89					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
JWZ7D8		D221	60.99	-19.67	8.04	0.98	0.32	0.04	1.03	AS
		D222	61.97	-19.36	8.07					
KD4AP7		D221	60.72	-19.60	7.81	1.05	0.34	0.02	1.10	MS
		D222	61.77	-19.26	7.83					
LN2M8G		D221	60.71	-19.78	7.87	1.00	0.30	0.07	1.05	MV
		D222	61.71	-19.48	7.94					
LZPNTQ		D221	60.83	-19.62	7.98	1.01	0.31	0.04	1.06	AS
		D222	61.84	-19.31	8.01					
MB47TZ		D221	60.80	-19.52	7.72	1.02	0.33	0.10	1.08	AJ
		D222	61.82	-19.19	7.82					
MBQHUU	X	D221	60.95	-19.80	7.99	1.02	0.30	0.33	1.12	AS
		D222	61.97	-19.50	8.33					
MCMTPW		D221	60.96	-19.66	7.99	1.01	0.34	0.08	1.06	AO
		D222	61.96	-19.32	8.07					
MUJHJ6		D221	60.77	-19.48	7.83	1.04	0.35	0.09	1.10	XI
		D222	61.81	-19.13	7.92					
N8KMXW		D221	60.77	-19.56	7.85	1.03	0.36	0.08	1.09	HP
		D222	61.80	-19.21	7.93					
NDPDQ3		D221	60.84	-19.82	8.05	0.98	0.28	0.05	1.03	MV
		D222	61.83	-19.54	8.10					
NDTY3A		D221	60.52	-19.71	7.61	0.99	0.27	0.04	1.03	XI
		D222	61.51	-19.44	7.64					
NPJUE4		D221	60.41	-19.63	7.66	1.00	0.30	0.07	1.05	XI
		D222	61.41	-19.32	7.72					
PAN2GZ		D221	60.48	-19.75	7.55	1.01	0.34	0.08	1.07	XF
		D222	61.48	-19.41	7.63					
PFBGXZ		D221	60.66	-19.69	7.67	1.02	0.32	0.08	1.08	XE
		D222	61.68	-19.38	7.76					
PHWV99		D221	60.55	-19.61	7.62	1.03	0.31	0.11	1.08	XI
		D222	61.58	-19.30	7.72					
Q3JAFP		D221	60.63	-19.44	7.72	0.99	0.27	0.05	1.03	XH
		D222	61.63	-19.17	7.77					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
Q8E2Q8		D221	60.39	-19.69	7.74	0.95	0.25	0.05	0.99	XM
		D222	61.34	-19.44	7.80					
QBP8VR		D221	60.63	-19.49	7.77	0.97	0.25	0.02	1.00	MM
		D222	61.59	-19.24	7.79					
QQ9AQ4		D221	60.73	-19.65	7.53	1.01	0.29	0.05	1.05	XB
		D222	61.74	-19.35	7.58					
QVLEHQ		D221	60.70	-19.84	7.72	1.04	0.29	0.03	1.08	AQ
		D222	61.74	-19.56	7.75					
QYJBC6		D221	60.64	-19.64	7.78	0.98	0.27	0.08	1.02	XD
		D222	61.62	-19.37	7.87					
RDXNUB		D221	60.69	-19.64	7.73	0.98	0.29	0.13	1.03	XB
		D222	61.67	-19.35	7.85					
RZCLMX		D221	60.69	-19.69	7.66	1.02	0.34	0.09	1.08	XE
		D222	61.71	-19.35	7.75					
TBRKLL		D221	60.87	-19.76	7.87	1.00	0.31	-0.04	1.05	AS
		D222	61.87	-19.45	7.83					
TNWG6M		D221	60.61	-19.71	7.97	1.06	0.33	0.07	1.11	AJ
		D222	61.67	-19.38	8.04					
TWJQ2V		D221	60.69	-19.69	8.06	0.97	0.27	0.04	1.01	MW
		D222	61.66	-19.42	8.09					
TWLF7T		D221	61.00	-19.76	7.73	1.08	0.53	0.07	1.21	AN
		D222	62.08	-19.23	7.79					
U2U4JU		D221	60.81	-19.64	7.91	1.02	0.27	0.04	1.05	AV
		D222	61.83	-19.38	7.94					
U7CA7W		D221	60.94	-19.91	7.89	1.01	0.34	0.11	1.07	AT
		D222	61.95	-19.57	8.01					
URTRB8		D221	60.62	-19.72	7.60	1.01	0.30	0.11	1.06	XD
		D222	61.63	-19.41	7.71					
UY79RZ		D221	60.93	-19.76	7.88	0.99	0.26	0.06	1.03	AT
		D222	61.93	-19.50	7.94					
V6UFPY		D221	60.51	-19.70	7.70	1.02	0.32	0.12	1.07	XH
		D222	61.52	-19.38	7.82					

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
VFB3YZ		D221	60.73	-19.67	7.93	0.99	0.29	0.09	1.03	AJ
		D222	61.72	-19.38	8.02					
VME878		D221	60.63	-19.59	7.70	0.98	0.30	0.13	1.03	XI
		D222	61.61	-19.28	7.83					
VNARVR		D221	60.85	-19.64	7.90	1.06	0.36	0.10	1.12	AB
		D222	61.91	-19.29	8.00					
WHEKN3		D221	60.62	-19.59	7.72	0.97	0.30	0.11	1.02	XI
		D222	61.59	-19.29	7.83					
WHUUAN		D221	60.72	-19.65	7.66	0.99	0.30	0.08	1.04	XD
		D222	61.71	-19.34	7.74					
WRHNQR		D221	60.96	-19.78	7.99	1.02	0.26	0.04	1.06	AS
		D222	61.98	-19.53	8.03					
WU82GA		D221	60.68	-19.71	8.09	1.04	0.32	0.07	1.09	MW
		D222	61.72	-19.39	8.16					
X8R4C8		D221	60.70	-19.62	7.71	0.95	0.25	0.01	0.98	XD
		D222	61.64	-19.37	7.72					
Y4LR4K		D221	60.67	-19.59	7.68	0.99	0.26	0.03	1.02	XD
		D222	61.66	-19.33	7.71					
Y6Z4U3		D221	60.51	-19.58	7.58	0.95	0.28	0.13	1.00	XI
		D222	61.47	-19.30	7.71					
YUZMWK		D221	60.63	-19.62	7.92	1.03	0.30	0.08	1.08	MS
		D222	61.66	-19.32	8.00					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
D221	60.73	-19.67	7.81	1.01	0.30	0.06	1.06
D222	61.74	-19.37	7.87				
Stnd Dev Btwn Labs							
D221	0.18	0.11	0.14	0.03	0.04	0.04	0.04
D222	0.18	0.11	0.14				

Statistics based on 87 of 91 reporting participants

Comments Assigned on Data Flags for Test #409

79YTDW(X) - Very high "L*" values for Sample D221. Large replication difference for "L" values for both Samples. Low "a*" values for Sample D222. Low "b*" values. Small Delta L, a & E.

7TPYPU(X) - Low "a*" values.

GXZQDW(X) - Low "a*" values. Large replication difference for "a" values for both Samples.

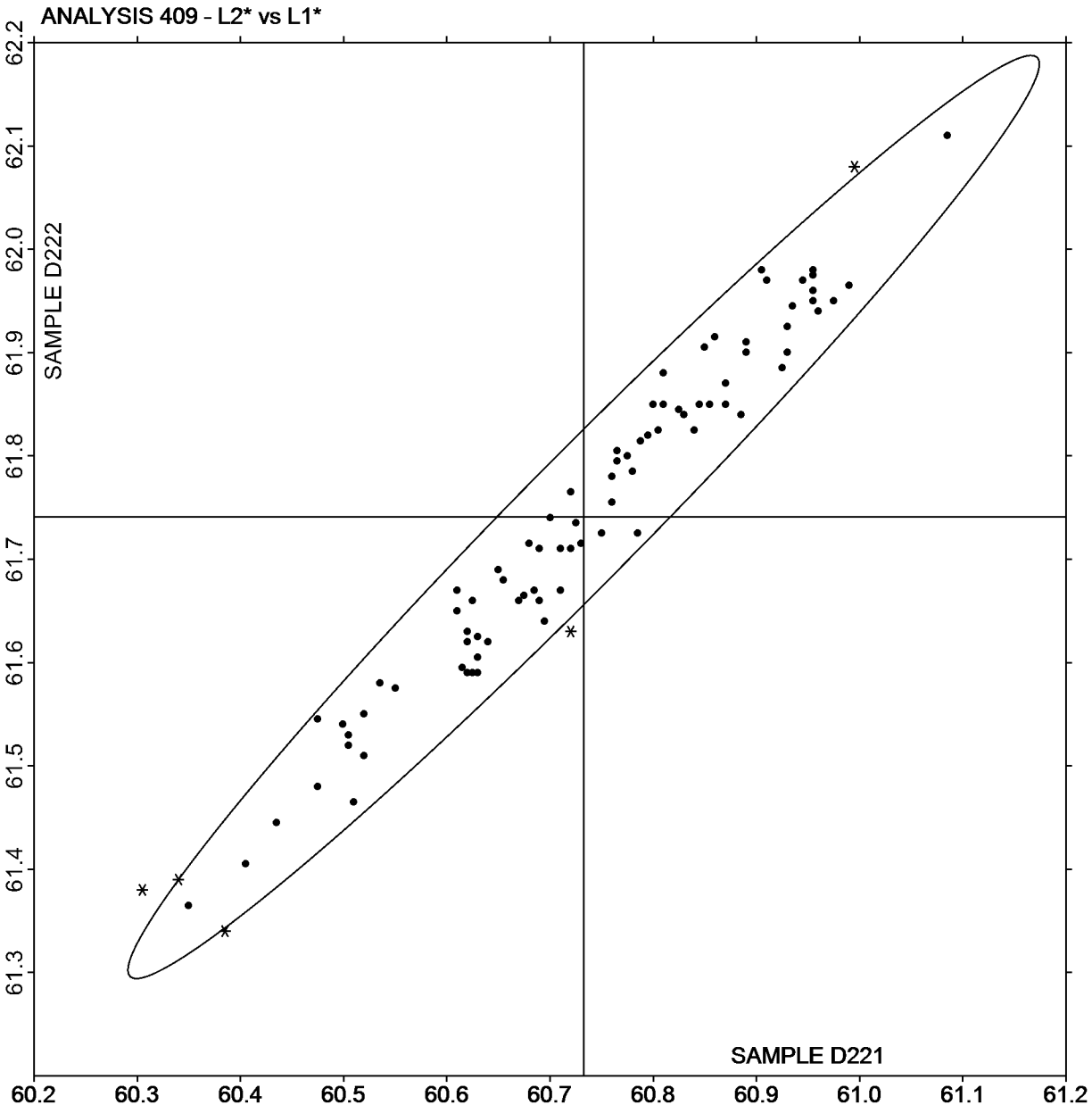
MBQHUU(X) - High "b*" values for Sample D222. Large replication difference for "b*" values on Sample D222. Large Delta b.

Key to Instrument Codes Reported by Participants

AB	Datacolor 100	AJ	Datacolor 600
AN	Datacolor 650	AO	Datacolor 650x
AP	Datacolor 750	AQ	Datacolor 600x
AS	Datacolor 800	AT	Datacolor 850
AU	Datacolor 1000	AV	Datacolor 700
CA	Cary 5000	GD	BYK-Gardner Spectro-Guide Sphere
GE	BYK-Gardner Spectro2-Guide Sphere Gloss	HP	Hunter UltraScan PRO
HW	Hunter UltraScan XE	MI	Macbeth Color i5
MK	Macbeth Color-Eye 7000	MM	Macbeth Color-Eye 7000a
MQ	Minolta CM-700d	MS	Minolta CM-600d
MT	Minolta CM-2600d	MU	Minolta
MV	Minolta CM-3000d Spectrophotometer	MW	Minolta CM 3700a Spectrophotometer
MY	Minolta Benchtop Spectrophotometer CM-3600a	XB	X-Rite Ci7000 Series Benchtop Spectrophotometer
XC	X-Rite Ci4200 Benchtop Spectrophotometer	XD	X-Rite Ci7800 Benchtop Spectrophotometer
XE	X-Rite Ci7600 Benchtop Spectrophotometer	XF	X-Rite Ci6x Portable Spectrophotometer
XG	X-Rite Ci7860 Benchtop Spectrophotometer	XH	X-Rite Color i5 Benchtop Spectrophotometer
XI	X-Rite Color i7 Benchtop Spectrophotometer	XM	X-Rite SP62 Portable Sphere Spectrophotometer
XO	X-Rite SP64 Portable Sphere Spectrophotometer		

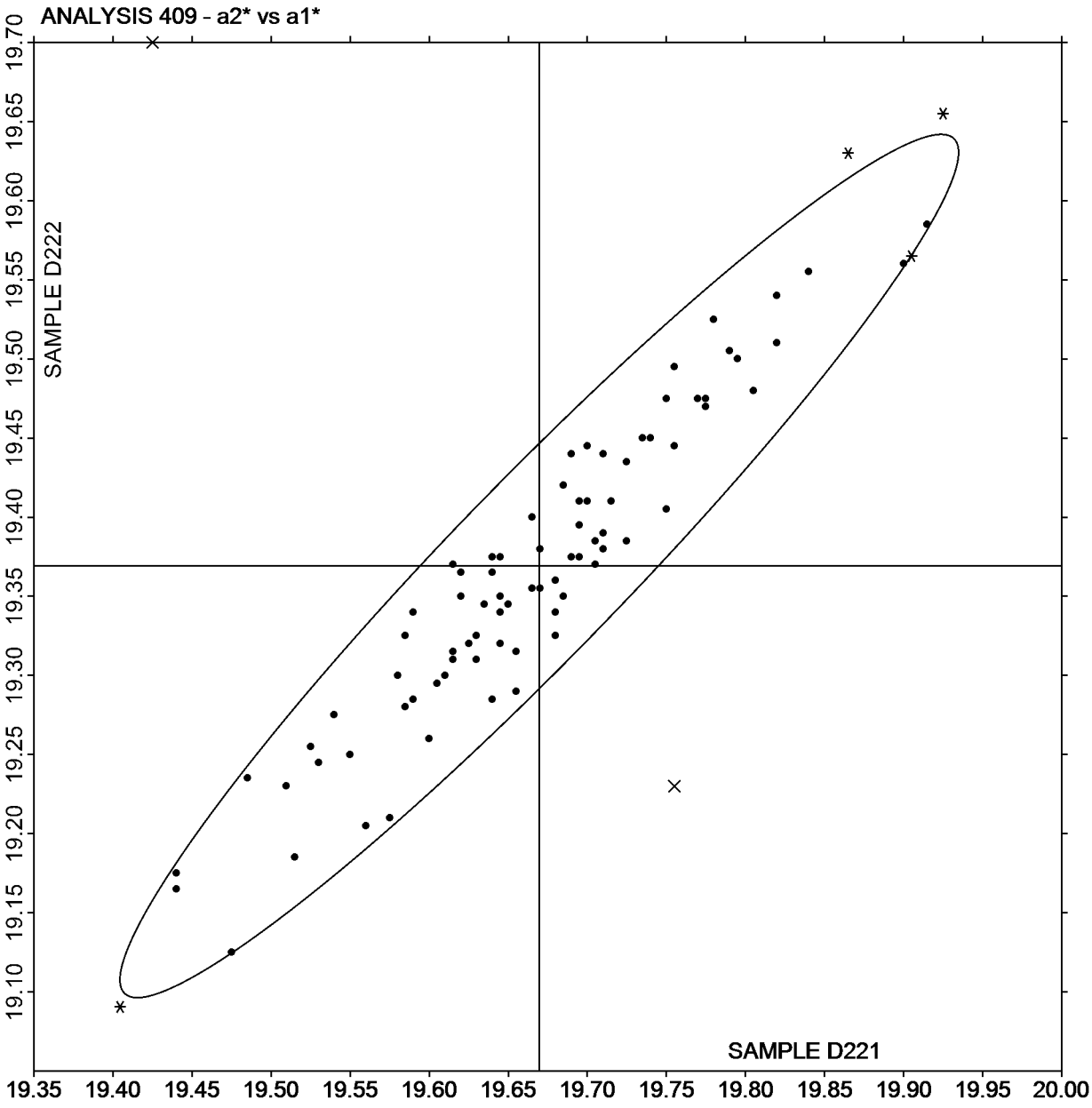
L2* vs L1*

SAMPLE D221 = 60.73 SAMPLE D222 = 61.74



a2* vs a1*

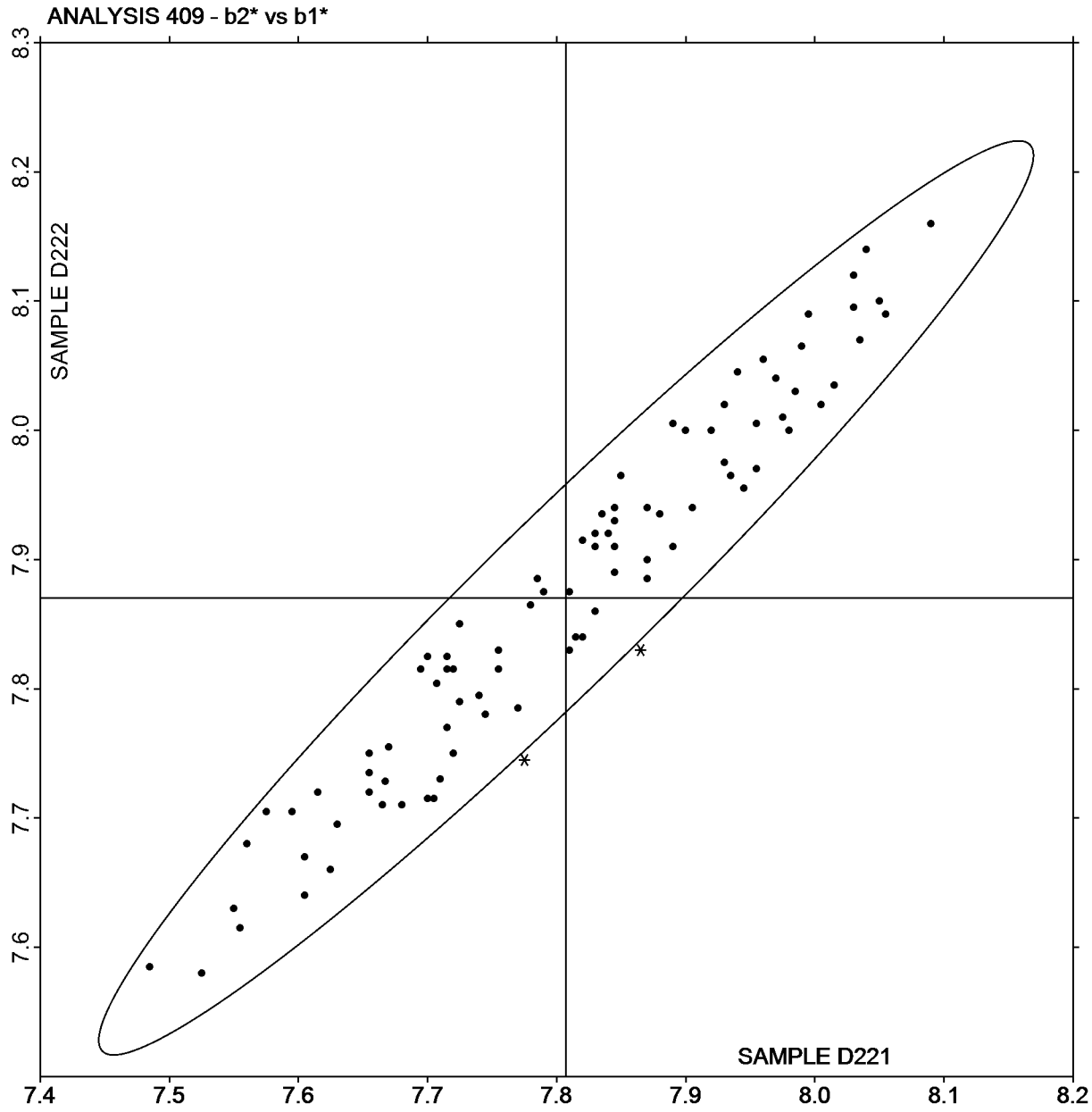
SAMPLE D221 = -19.67 SAMPLE D222 = -19.37



Plot created using absolute values.

b2* vs b1*

SAMPLE D221 = 7.81 SAMPLE D222 = 7.87



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 D221																		
2N8DPJ		15.73	18.84	23.06	25.89	26.93	30.02	35.60	38.26	31.50	24.10	20.49	18.58	18.35	19.38	19.23	16.87	AP
2R7NLJ		15.63	18.71	22.69	25.80	26.82	29.83	35.40	38.13	31.59	24.17	20.51	18.61	18.34	19.39	19.06	17.22	AJ
38C9Y2		15.35	18.63	22.68	25.70	26.54	29.59	35.45	38.06	31.25	23.80	20.23	18.40	18.14	19.27	19.16	17.18	MV
3CPKLM		15.58	18.60	22.87	25.70	26.69	29.68	35.29	37.95	31.28	23.97	20.36	18.48	18.29	19.43	19.01	16.97	AT
4WCYT6		15.82	18.84	22.91	25.64	26.69	29.83	35.30	37.91	31.11	24.01	20.35	18.51	18.22	19.30	18.94	17.00	XD
68HNTD		15.59	18.72	22.86	25.68	26.71	29.82	35.45	38.09	31.36	24.04	20.43	18.47	18.27	19.43	19.19	16.99	AJ
6L8E2V		15.95	18.94	23.03	25.86	26.89	30.01	35.53	38.27	31.46	24.24	20.49	18.54	18.16	19.36	19.18	17.20	HP
79YTDW	X	17.33X	21.08X	25.35X	28.32X	29.18X	32.19X	38.25X	40.87X	33.62X	25.92X	22.20X	21.24X	20.09X	21.27X	20.90X	18.78X	XO
7ABPM8		15.73	18.79	22.80	25.57	26.55	29.50	35.09	37.70	30.94	23.87	20.26	18.39	18.16	19.19	18.92	16.99	XD
7TPYPU		15.53	18.68	22.90	25.57	26.65	29.95	35.53	37.73	30.72	23.63	20.01	18.25	18.11	19.20	18.92	17.05	XC
7UGX38		15.20	18.12X	22.49*	25.05X	26.20X	29.34*	34.88*	37.33*	30.72	23.60*	19.95*	18.15*	17.92*	18.95*	18.83	17.04	GE
7WNHNL		15.80	18.95	23.00	25.80	26.85	30.00	35.50	38.20	31.50	24.15	20.40	18.60	18.40	19.60*	19.10	17.00	AN
8V8LX8		15.81	18.85	22.95	25.64	26.63	29.76	35.29	37.82	30.90	23.82	20.25	18.46	18.20	19.31	18.94	16.87	XB
8VNZ2B		15.58	18.66	22.89	25.72	26.68	29.79	35.39	37.97	31.26	23.95	20.35	18.47	18.23	19.27	19.00	16.98	AJ
97NPHC		15.62	18.74	22.88	25.69	26.75	29.86	35.45	38.19	31.16	23.91	20.27	18.43	18.09	19.18	18.87	16.79	XB
A8PAK3		15.59	18.18X	22.27X	25.38	26.62	29.66	34.73X	37.08X	31.02	23.85	19.84X	17.87X	18.06	19.08	18.93	17.05	GD
A97BLJ		16.04	18.94	22.97	25.84	26.83	29.95	35.57	38.18	31.35	24.16	20.42	18.48	18.15	19.24	19.11	17.22	HP
AXK6TL		15.69	18.84	22.97	25.78	26.79	29.96	35.33	37.94	31.01	23.84	20.40	18.52	18.25	19.28	19.06	17.16	MI
AZ9TW9		15.29	18.24X	22.58	25.20*	26.35	29.52	35.07	37.51	30.88	23.71	20.05	18.29	18.05	19.09	18.92	17.12	GE
BENYZL		15.36	18.59	22.77	25.47	26.48	29.66	35.35	37.69	30.73	23.71	20.09	18.27	18.09	19.10	18.86	17.01	XM
CCHVMP		15.82	18.67	22.89	25.65	26.68	29.79	35.34	37.97	31.39	24.04	20.43	18.50	18.30	19.36	19.59X	17.27	AU
CWLTX6		15.89	18.78	22.86	25.69	26.79	29.82	35.41	38.06	31.48	24.11	20.51	18.55	18.39	19.50	19.55X	17.41*	AS

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths 400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	Instr Code
Sample D221																		
EEX6TR		15.72	18.90	23.00	25.77	26.83	29.95	35.39	37.88	31.23	24.07	20.34	18.53	18.26	19.24	19.07	17.20	MM
EM8RGL		15.66	18.71	22.73	25.54	26.48	29.53	35.08	37.55	30.73	23.70	20.08	18.33	18.07	19.12	18.76	16.81	XH
EMRBMT		15.88	18.89	23.21*	26.11*	27.04*	30.22*	35.96X	38.92X	31.64	24.22	20.58	18.69	18.38	19.58	19.35	17.39*	CA
EQ2KJ4		15.40	18.68	22.96	25.84	26.80	29.94	35.59	38.23	31.47	24.10	20.42	18.54	18.28	19.40	19.19	17.28	MT
ETCM99		15.53	18.60	22.68	25.57	26.48	29.57	35.24	37.82	30.99	23.81	20.17	18.35	18.09	19.19	18.96	17.08	MQ
F3YUV6		15.84	18.93	22.94	25.73	26.71	29.81	35.30	37.75	30.96	23.86	20.30	18.53	18.30	19.33	18.95	17.01	XI
F8UK42		15.62	18.83	23.01	25.83	26.82	29.89	35.50	38.15	31.49	24.12	20.49	18.58	18.37	19.68*	19.16	17.04	AP
FAZ6PG		15.63	18.70	22.72	25.43	26.42	29.52	34.93	37.54	30.85	23.79	20.19	18.35	18.08	19.09	18.77	16.93	XD
G6WNZZ		16.74X	18.77	23.03	25.89	26.93	29.96	35.60	38.12	31.32	24.06	20.43	18.53	18.33	19.33	19.03	17.18	AQ
GNYAWT		15.64	18.86	22.91	25.73	26.73	29.87	35.33	37.89	31.23	24.01	20.31	18.52	18.27	19.31	18.92	17.07	XI
GP8MDU		15.72	18.77	22.87	25.66	26.72	29.88	35.47	38.14	31.41	24.01	20.42	18.50	18.31	19.41	18.92	16.95	AT
GXZQDW		15.92	18.88	23.21*	26.06*	26.99	30.17*	35.93X	38.79X	31.49	24.08	20.47	18.59	18.28	19.50	19.26	17.29	CA
H9W3DG		15.94	18.67	22.81	25.72	26.76	29.78	35.38	38.08	31.40	24.08	20.47	18.55	18.33	19.38	19.09	17.17	AS
HWLRN7		15.84	18.70	22.87	25.65	26.69	29.78	35.32	37.97	31.21	23.93	20.38	18.45	18.25	19.34	19.03	17.16	AS
J77HM4		15.51	18.69	22.83	25.66	26.66	29.84	35.30	37.92	31.15	23.97	20.23	18.43	18.19	19.25	19.02	17.12	MK
JATVQF		15.77	18.87	23.05	25.78	26.81	29.84	35.42	38.12	31.41	24.09	20.46	18.56	18.33	19.35	18.92	16.95	AJ
JD42VZ		15.44	18.52	22.76	25.62	26.66	29.72	35.27	37.95	31.42	24.11	20.44	18.54	18.34	19.44	19.04	17.02	AS
JGJRYA		15.23	18.43	22.57	25.49	26.32*	29.28X	34.99	37.89	30.98	23.69	20.07	18.25	17.97*	19.12	18.97	17.11	MY
JTGRA8		15.67	18.76	22.82	25.57	26.59	29.69	35.18	37.71	30.92	23.83	20.22	18.42	18.17	19.22	18.88	16.99	XG
JVNWFN		15.62	18.56	22.82	25.70	26.56	29.71	35.37	38.25	31.11	23.73	20.17	18.32	18.02	19.20	18.99	17.05	CA
JWZ7D8		15.69	18.72	22.81	25.80	26.84	29.89	35.50	38.24	31.56	24.25	20.56	18.69	18.43	19.51	19.45*	16.90	AS
KD4AP7		15.52	18.71	22.78	25.66	26.62	29.69	35.35	37.94	31.13	23.96	20.32	18.45	18.19	19.26	19.06	17.23	MS

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 D221																		
LN2M8G		15.34	18.61	22.79	25.67	26.47	29.65	35.30	38.17	31.12	23.78	20.22	18.38	18.10	19.33	19.13	17.20	MV
LZPNTQ		15.56	18.67	22.85	25.66	26.68	29.73	35.35	37.95	31.37	24.07	20.46	18.55	18.33	19.50	19.31	17.01	AS
MB47TZ		15.74	18.83	22.99	25.74	26.74	29.80	35.35	37.95	31.31	24.00	20.40	18.49	18.30	19.33	18.96	17.06	AJ
MBQHUU		15.57	18.70	22.93	25.77	26.65	29.94	35.54	38.19	31.53	24.09	20.50	18.56	18.37	19.44	19.18	16.97	AS
MCMTPW		15.75	18.90	22.90	25.85	26.90	29.90	35.50	38.20	31.60	24.20	20.50	18.60	18.40	19.40	19.15	17.10	AN
MUJHJ6		15.49	18.81	22.77	25.71	26.70	29.73	35.17	37.75	31.80*	24.07	20.39	18.54	18.31	19.36	18.97	17.15	XI
N8KMXW		15.87	18.87	22.91	25.69	26.66	29.73	35.12	37.94	31.35	24.01	20.40	18.32	18.11	19.07	19.01	17.19	HP
NDPDQ3		15.34	18.60	22.77	25.74	26.62	29.76	35.55	38.19	31.42	23.94	20.33	18.49	18.26	19.37	19.25	17.24	MV
NDTY3A		15.56	18.69	22.77	25.52	26.50	29.62	35.11	37.57	30.74	23.70	20.04	18.26	18.06	19.09	18.70	16.74	XI
NPJUE4		15.32	18.54	22.56	25.41	26.42	29.50	34.86*	37.36	30.66	23.64	20.01	18.21	17.96*	19.03	18.64	16.82	XI
PAN2GZ		15.39	18.57	22.83	25.09X	26.51	29.63	35.25	37.46	30.58*	23.54*	19.95*	18.18	18.03	19.06	18.83	16.91	XR
PFBGXZ		15.77	18.76	22.87	25.61	26.65	29.77	35.28	37.79	30.87	23.81	20.23	18.44	18.18	19.29	18.91	17.01	XE
PHWV99		15.68	18.75	22.78	25.57	26.54	29.63	35.09	37.56	30.88	23.76	20.12	18.36	18.10	19.11	18.79	16.89	XI
Q3JAFP		15.65	18.77	22.82	25.58	26.57	29.64	35.15	37.77	30.97	23.88	20.25	18.46	18.25	19.31	18.86	16.90	XH
Q8E2Q8		16.00	18.80	23.10	25.80	26.80	30.00	35.50	37.70	30.80	23.80	20.25	18.50	18.15	19.55	19.40*	17.70X	HW
QBP8VR		15.69	18.67	22.75	25.59	26.54	29.65	35.03	37.74	31.11	23.91	20.19	18.38	18.14	19.21	18.95	17.07	MM
QQ9AQ4		15.87	18.97	23.02	25.75	26.76	29.87	35.35	37.80	31.01	23.92	20.25	18.44	18.18	19.23	18.81	16.89	XB
QVLEHQ		15.44	18.62	22.87	25.63	26.69	29.76	35.39	37.88	31.02	23.82	20.20	18.36	18.18	19.13	18.88	16.99	AQ
QYJBC6		15.60	18.72	22.76	25.52	26.58	29.72	35.21	37.71	30.93	23.87	20.25	18.44	18.18	19.21	18.87	16.92	XD
RDXNUB		16.29	18.80	22.86	25.59	26.63	29.76	35.23	37.77	31.03	23.92	20.27	18.42	18.16	19.17	18.87	17.00	XB
RZCLMX		15.81	18.80	22.97	25.61	26.64	29.81	35.36	37.78	30.93	23.91	20.24	18.42	18.16	19.26	18.88	16.80	XB
TBRKLL		15.68	18.68	22.96	25.75	26.77	29.83	35.41	38.11	31.37	24.02	20.40	18.51	18.30	19.37	19.11	16.94	AS

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 D221																		
TWJQ2V		15.23	18.57	22.55	25.62	26.45	29.45	35.26	37.98	31.33	23.84	20.24	18.36	18.12	19.22	19.14	17.19	MW
TWLF7T		17.41X	18.99	23.09	25.96	26.99	29.97	35.60	38.30	31.50	24.16	20.49	18.56	18.35	19.38	19.17	17.30	AN
U7CA7W		15.62	18.76	22.98	25.77	26.84	29.97	35.59	38.27	31.43	24.03	20.42	18.53	18.30	19.43	19.09	17.10	AT
URTRB8		15.73	18.81	22.90	25.59	26.63	29.79	35.28	37.69	30.85	23.77	20.16	18.38	18.13	19.18	18.88	16.92	XD
UY79RZ		15.73	18.81	22.96	25.83	26.88	29.95	35.58	38.17	31.45	24.10	20.46	18.57	18.37	19.61*	19.43*	16.88	AT
V6UFPY		15.62	18.66	22.66	25.47	26.47	29.53	35.07	37.58	30.79	23.67	20.07	18.28	18.06	19.10	18.85	16.88	XH
VFB3YZ		15.39	18.61	22.74	25.62	26.62	29.64	35.23	38.01	31.29	23.95	20.28	18.38	18.13	19.13	18.88	16.82	AJ
VME878		15.68	18.77	22.80	25.58	26.57	29.64	35.11	37.73	30.97	23.86	20.23	18.41	18.14	19.19	18.83	16.93	XI
VNARVR		15.49	18.78	22.87	25.73	26.75	29.84	35.37	37.96	31.38	24.14	20.45	18.55	18.24	19.31	19.14	17.18	AB
WHEKN3		15.66	18.75	22.78	25.58	26.56	29.63	35.10	37.72	30.99	23.85	20.22	18.41	18.13	19.18	18.82	16.92	XI
WHUUAN		15.78	18.85	22.96	25.68	26.67	29.82	35.35	37.89	30.94	23.91	20.29	18.50	18.24	19.31	18.88	16.97	XD
WRHNQR		15.56	18.70	22.93	25.79	26.84	29.95	35.54	38.18	31.53	24.09	20.50	18.56	18.38	19.45	19.18	16.98	AS
WU82GA		15.20	18.50	22.50*	25.60	26.40	29.40*	35.25	37.95	31.30	23.85	20.25	18.35	18.05	19.15	19.15	17.15	MW
X8R4C8		15.70	18.72	22.92	25.62	26.64	29.77	35.23	37.84	30.93	23.93	20.26	18.47	18.21	19.37	18.93	16.94	XD
Y4LR4K		16.45*	18.78	22.88	25.63	26.64	29.78	35.30	37.85	30.96	23.85	20.23	18.44	18.19	19.27	18.92	16.99	XD
Y6Z4U3		15.79	18.78	22.79	25.51	26.49	29.62	34.97	37.45	30.86	23.76	20.08	18.28	18.04	19.07	18.64	16.77	XI
YUZMWK		15.46	18.59	22.61	25.54	26.49	29.56	35.21	37.83	31.05	23.86	20.19	18.38	18.12	19.21	19.01	17.12	MS

Summary Statistics

	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700
Grand Means	15.68	18.72	22.85	25.66	26.66	29.76	35.32	37.92	31.16	23.93	20.29	18.44	18.20	19.29	19.02	17.05
SD Btwn Labs	0.32	0.16	0.16	0.17	0.16	0.18	0.21	0.29	0.28	0.16	0.16	0.13	0.12	0.15	0.19	0.16

79YTDW (X) - High % reflectance data at all wavelengths.

Key to Instrument Codes Reported by Participants

AB Datacolor 100
AJ Datacolor 600
AN Datacolor 650
AP Datacolor 750
AQ Datacolor 600x
AS Datacolor 800
AT Datacolor 850
AU Datacolor 1000
CA Cary 5000
GD BYK-Gardner Spectro-Guide Sphere
GE BYK-Gardner Spectro2-Guide Sphere Gloss
HP Hunter UltraScan PRO
HW Hunter UltraScan XE
MI Macbeth Color i5
MK Macbeth Color-Eye 7000
MM Macbeth Color-Eye 7000a
MQ Minolta CM-700d
MS Minolta CM-600d
MT Minolta CM-2600d
MV Minolta CM-3000d Spectrophotometer
MW Minolta CM 3700a Spectrophotometer
MY Minolta Benchtop Spectrophotometer CM-3600a
XB X-Rite Ci7000 Series Benchtop Spectrophotometer
XC X-Rite Ci4200 Benchtop Spectrophotometer
XD X-Rite Ci7800 Benchtop Spectrophotometer
XE X-Rite Ci7600 Benchtop Spectrophotometer
XG X-Rite Ci7860 Benchtop Spectrophotometer
XH X-Rite Color i5 Benchtop Spectrophotometer
XI X-Rite Color i7 Benchtop Spectrophotometer
XM X-Rite SP62 Sphere Spectrophotometer
XO X-Rite SP64 Sphere Spectrophotometer
XR X-Rite

WebCode	Data Flag	Sample H221 Lab Mean	Sample H221 Diff from Grand Mean	Sample H221 CPV	Sample H222 Lab Mean	Sample H222 Diff from Grand Mean	Sample H222 CPV	Instr Code
2R7NLJ		52.68	1.47	1.63	64.88	1.03	0.97	NH
2TGBER	*	48.98	-2.23	-2.46	60.88	-2.97	-2.79	GK
38C9Y2		51.95	0.75	0.83	64.68	0.83	0.78	GL
3W99U9		50.95	-0.25	-0.28	63.50	-0.34	-0.32	GN
3Y79LU		51.15	-0.05	-0.06	63.25	-0.59	-0.56	GK
4FLWCZ		50.85	-0.35	-0.39	63.65	-0.19	-0.18	GL
68HNTD		49.03	-2.18	-2.40	61.53	-2.32	-2.18	GL
6AV4D7		50.58	-0.63	-0.69	63.45	-0.39	-0.37	GK
6YX9DP		52.38	1.17	1.30	64.40	0.56	0.52	GL
79YTDW		52.15	0.95	1.05	64.20	0.36	0.33	MW
7XUUGG		52.18	0.97	1.08	65.00	1.16	1.09	ST
8FV32Z	*	53.13	1.92	2.12	66.83	2.98	2.80	GK
8V8LX8		49.15	-2.05	-2.26	62.00	-1.84	-1.73	GL
97NPHC		52.23	1.02	1.13	64.80	0.96	0.90	ZA
9U9XU3	*	50.08	-1.13	-1.24	61.40	-2.44	-2.29	PA
A8PAK3		51.03	-0.18	-0.19	63.65	-0.19	-0.18	GN
A8RZPY		51.13	-0.08	-0.08	64.00	0.16	0.15	GL
AEB8AP		52.05	0.85	0.94	64.45	0.61	0.57	GL
AH8YDF		51.70	0.50	0.55	65.13	1.28	1.20	GL
AWCVWH		51.80	0.60	0.66	65.10	1.26	1.18	GN
AXK6TL		51.75	0.55	0.61	64.43	0.58	0.55	GL
AZ9TW9		50.68	-0.53	-0.58	63.85	0.01	0.01	GL
C86BHN		51.23	0.02	0.03	63.28	-0.57	-0.53	GL
CKPM67		50.80	-0.40	-0.44	62.65	-1.19	-1.12	XX
CLZPQ6		51.03	-0.18	-0.19	63.83	-0.02	-0.02	GL
D4KNJA		51.00	-0.20	-0.22	64.58	0.73	0.69	GD
DXUNCL		51.23	0.02	0.03	64.50	0.66	0.62	GK
EEX6TR		52.45	1.25	1.38	64.65	0.81	0.76	GL
EHRDMZ		51.15	-0.05	-0.06	63.95	0.11	0.10	GL
EM8RGL		51.53	0.32	0.36	64.18	0.33	0.31	GL

WebCode	Data Flag	Sample H221 Lab Mean	Sample H221 Diff from Grand Mean	Sample H221 CPV	Sample H222 Lab Mean	Sample H222 Diff from Grand Mean	Sample H222 CPV	Instr Code
ETCM99		51.53	0.32	0.36	63.95	0.11	0.10	MX
EVDPYA		51.03	-0.18	-0.19	63.30	-0.54	-0.51	RQ
EX8EG7		53.00	1.80	1.99	65.05	1.21	1.13	GK
F3W4PM		51.23	0.02	0.03	63.33	-0.52	-0.49	GN
FAWD42		49.60	-1.60	-1.77	61.68	-2.17	-2.04	GL
FQH2DW		51.53	0.32	0.36	63.78	-0.07	-0.06	GL
GNEN2G		51.58	0.37	0.41	64.10	0.26	0.24	RB
HBZ6QY		51.63	0.42	0.47	64.00	0.16	0.15	GL
J6B8Y9		51.93	0.73	0.80	64.34	0.49	0.46	GL
JATVQF		49.98	-1.23	-1.35	61.73	-2.12	-1.99	GL
JVNWFN		50.43	-0.78	-0.86	62.28	-1.57	-1.47	GL
KD4AP7		51.00	-0.20	-0.22	63.93	0.08	0.08	GK
KK2XMW		49.45	-1.75	-1.93	62.15	-1.69	-1.59	GL
KWFPX6		51.43	0.22	0.25	64.75	0.91	0.85	GL
LEAMXC		49.30	-1.90	-2.10	61.28	-2.57	-2.41	XX
LX2A72		51.40	0.20	0.22	64.05	0.21	0.19	GL
LZPNTQ		50.93	-0.28	-0.30	63.43	-0.42	-0.39	GK
MB47TZ		51.10	-0.10	-0.11	63.25	-0.59	-0.56	GL
MBQHUU		50.48	-0.73	-0.80	63.98	0.13	0.12	GK
MUJHJ6		51.90	0.70	0.77	64.50	0.66	0.62	GN
N6Y6E6		50.48	-0.73	-0.80	63.18	-0.67	-0.63	GD
NDTY3A		51.04	-0.16	-0.17	64.54	0.69	0.65	GL
NPJUE4		51.05	-0.15	-0.17	64.13	0.28	0.26	MM
P9WT2C		50.75	-0.45	-0.50	63.60	-0.24	-0.23	GL
PAN2GZ		51.05	-0.15	-0.17	63.90	0.06	0.05	GL
PHWV99		50.88	-0.33	-0.36	64.20	0.36	0.33	GL
Q3JAFP		51.53	0.32	0.36	64.73	0.88	0.83	GL
Q7KAFL		52.20	1.00	1.10	65.08	1.23	1.16	GN
Q8DG77		51.25	0.05	0.05	63.55	-0.29	-0.28	GN
Q8E2Q8		50.75	-0.45	-0.50	63.23	-0.62	-0.58	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H221 Lab Mean	Sample H221 Diff from Grand Mean	Sample H221 CPV	Sample H222 Lab Mean	Sample H222 Diff from Grand Mean	Sample H222 CPV	Instr Code
QBP8VR		51.55	0.35	0.39	64.52	0.67	0.63	GL
QXPA2U		51.70	0.50	0.55	63.60	-0.24	-0.23	GL
RGWV9T		51.75	0.55	0.60	64.51	0.66	0.62	GL
RZCLMX		51.58	0.37	0.41	64.80	0.96	0.90	GL
TEN29M		52.48	1.27	1.41	64.50	0.66	0.62	XX
TNCRTU		49.98	-1.23	-1.35	62.98	-0.87	-0.82	GD
TNWG6M		52.43	1.22	1.35	64.65	0.81	0.76	GL
TWJQ2V		50.00	-1.20	-1.33	62.68	-1.17	-1.10	GT
TWLF7T		49.55	-1.65	-1.82	62.45	-1.39	-1.31	GK
U2U4JU		51.58	0.37	0.41	65.53	1.68	1.58	GL
U2WTNR		50.53	-0.68	-0.75	63.98	0.13	0.12	GL
UAA4B6		51.40	0.20	0.22	64.50	0.66	0.62	GK
V6UFPY		52.30	1.10	1.21	64.50	0.66	0.62	GK
V8XG4X		52.08	0.87	0.96	64.58	0.73	0.69	RA
VNARVR		51.75	0.55	0.61	64.75	0.91	0.85	GL
WRHNQR		50.38	-0.83	-0.91	64.05	0.21	0.19	GL
X8R4C8		51.95	0.75	0.83	64.55	0.71	0.66	GL
Y4LR4K		51.40	0.20	0.22	63.18	-0.67	-0.63	RA
ZK9HQQ	X	52.50	1.30	1.43	63.18	-0.67	-0.63	RQ

Summary Statistics

Grand Means

51.20 Gloss Units — 63.84 Gloss Units

Stnd Dev Btwn Labs

0.91 Gloss Units — 1.07 Gloss Units

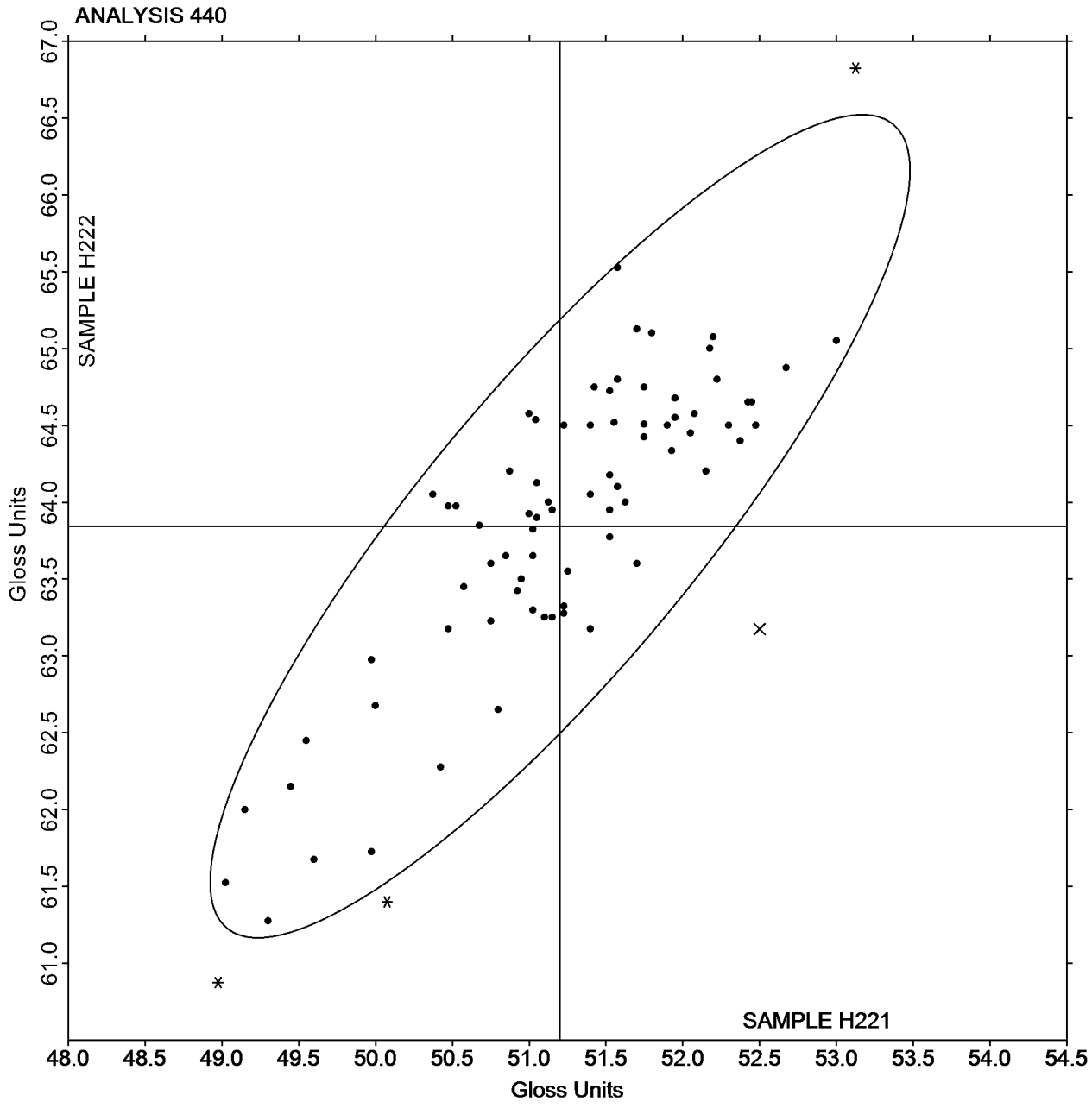
Statistics based on 78 of 79 reporting participants

Comments on Assigned Data Flags for Test #440

ZK9HQQ(X) - Inconsistent in testing between samples and inconsistent within the determinations for Sample H222.

Key to Instrument Codes Reported by Participants			
GD	BYK Gardner Spectro2Guide 45/0	GK	BYK-Gardner micro-gloss (60)
GL	BYK-Gardner micro-TRI-gloss	GN	BYK-Gardner new micro-TRI-gloss
GT	Gardco Novo-Gloss (20/60/85)	MM	Macbeth Lab-Gloss
MW	Minolta Multi-Gloss 268	MX	Minolta Multi-Gloss 268 Plus
NH	3nh NHG268 Multi-angle Precise Gloss Meter	PA	Photovolt micto-TRI-gloss G3
RA	Rhopoint Novo-Gloss Glossmeter	RB	Rhopoint Novo-Gloss LITE Glossmeter
RQ	Rhopoint IQ Goniophotometer 20/60/85°	ST	Sheen Tri-Glossmaster
XX	Instrument make/model not specified by lab	ZA	Zehntner ZGM Series

SAMPLE H221 = 51.20 Gloss Units SAMPLE H222 = 63.84 Gloss Units



-End of Report-