Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report # 172 - 2nd Qtr 2015

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 (GlossTests)

ABOUT THE 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.

If there are any questions on the report or testing program, please 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

(Toll-free fax within the U.S.: 1-866-fax-2cts)

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 mailed 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 mailed 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
*	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. 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 an X on individual wavelength values as follows:

X - The laboratory's mean for that wavelength is greater than a 95% deviation from the GRAND MEAN.

Key for Color Program (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 mailed 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.

Interlaboratory Testing Program for Color & Appearance

Analysis 408

Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
3EGV7E		B151	44.70	9.59	-26.90	0.93	0.04	-0.18	0.95	MG
		B152	45.62	9.63	-27.08					
4A4ECF		B151	44.60	8.70	-27.16	0.99	0.05	-0.21	1.01	XZ
		B152	45.59	8.75	-27.36					
4AJXVD		B151	44.87	8.92	-26.91	0.89	0.07	-0.25	0.92	GH
		B152	45.76	8.99	-27.15					
4UTVDN		B151	44.93	8.86	-27.04	0.83	0.08	-0.28	0.88	XU
		B152	45.76	8.94	-27.32					
623QN9		B151	44.91	8.60	-26.54	0.92	0.05	-0.25	0.95	GH
		B152	45.82	8.65	-26.79					
9FUMDB		B151	45.74	8.76	-26.86	0.81	0.08	-0.30	0.87	XZ
		B152	46.55	8.84	-27.16					
9H2XF7		B151	44.44	8.54	-26.32	0.95	-0.01	-0.18	0.97	HG
		B152	45.39	8.53	-26.50					
AHYMYU		B151	44.34	9.12	-26.75	0.93	0.07	-0.28	0.97	GH
		B152	45.27	9.19	-27.03					
ANF69V		B151	45.39	8.88	-27.10	0.85	0.05	-0.22	0.88	AE
		B152	46.24	8.93	-27.32					
CPNY2Z		B151	45.25	8.67	-26.82	0.91	0.04	-0.22	0.93	MA
		B152	46.16	8.71	-27.04					
CWNGER		B151	44.84	9.12	-27.07	0.88	0.09	-0.25	0.91	HW
		B152	45.71	9.20	-27.31					
CXJ26X		B151	44.71	9.17	-26.99	0.78	0.10	-0.28	0.83	XK
		B152	45.49	9.26	-27.26					
DZ2LPR		B151	45.13	8.87	-26.72	0.83	0.06	-0.28	0.87	XD
		B152	45.96	8.93	-27.00					
F9NC9P		B151	44.83	8.85	-26.82	0.96	0.08	-0.29	1.01	XM
		B152	45.79	8.92	-27.11					

Interlaboratory Testing Program for Color & Appearance

Analysis 408

Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
GHTTAU		B151	44.97	8.57	-26.81	0.75	0.11	-0.29	0.81	XZ
		B152	45.71	8.68	-27.11					
GU6XKW		B151	44.82	8.58	-26.66	0.89	0.07	-0.24	0.92	HK
		B152	45.71	8.64	-26.90					
HAVHEP		B151	44.44	8.97	-27.06	0.83	0.09	-0.24	0.86	HY
		B152	45.27	9.06	-27.30					
HND46A		B151	44.54	8.81	-26.69	1.11	0.14	-0.40	1.19	XU
		B152	45.65	8.94	-27.09					
K8WU9Y		B151	44.40	8.42	-27.53	0.87	0.06	-0.24	0.90	FA
		B152	45.27	8.48	-27.77					
KRM39E		B151	44.86	8.82	-26.64	0.85	0.10	-0.27	0.90	GE
		B152	45.71	8.92	-26.90					
LV4PHD		B151	44.79	8.80	-26.87	0.83	0.03	-0.20	0.85	HK
		B152	45.61	8.82	-27.07					
LX8K2G		B151	44.89	8.79	-27.04	0.92	0.09	-0.27	0.96	XU
		B152	45.80	8.87	-27.31					
M6Q7TZ		B151	45.28	8.62	-26.95	0.83	0.07	-0.23	0.86	MU
		B152	46.11	8.69	-27.18					
N7VXF7		B151	44.85	9.26	-27.01	0.76	0.09	-0.30	0.82	HW
		B152	45.60	9.34	-27.31					
NFHW6Q		B151	44.70	9.25	-26.99	0.84	0.10	-0.25	0.88	HW
		B152	45.54	9.34	-27.24					
NFYBAF		B151	44.96	9.27	-27.02	0.84	0.09	-0.28	0.88	HW
		B152	45.80	9.36	-27.30					
PNP7VG		B151	44.96	8.99	-27.08	0.89	0.13	-0.24	0.92	TO
		B152	45.85	9.11	-27.32					
R4UENF		B151	45.05	8.96	-27.04	0.92	0.07	-0.26	0.96	XO
		B152	45.97	9.03	-27.30					

Interlaboratory Testing Program for Color & Appearance

Analysis 408

Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
RD3Q4Y		B151	45.03	8.79	-26.53	0.82	-0.01	-0.24	0.85	GB
		B152	45.85	8.79	-26.77					
RJ63T4		B151	44.82	9.07	-26.88	1.01	0.06	-0.25	1.04	HW
		B152	45.83	9.13	-27.13					
TCR7UN		B151	44.75	8.62	-27.04	0.92	0.05	-0.21	0.94	XZ
		B152	45.66	8.67	-27.24					
U6L2B4		B151	44.66	9.20	-26.88	0.99	0.05	-0.21	1.01	HW
		B152	45.65	9.25	-27.09					
U8AQFG		B151	44.71	8.57	-26.90	0.93	0.10	-0.26	0.96	XR
		B152	45.64	8.66	-27.16					
UTRKL3		B151	45.20	9.05	-27.21	0.93	0.06	-0.27	0.97	XO
		B152	46.13	9.11	-27.48					
Y3Z24A	X	B151	96.91	2.48	-14.56	0.12	0.58	-2.02	2.10	HW
		B152	97.03	3.05	-16.58					
YLBT7C		B151	44.89	8.97	-27.01	0.83	0.08	-0.24	0.86	XO
		B152	45.71	9.05	-27.25					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
B151	44.86	8.88	-26.91				
B152	45.75	8.95	-27.16	0.88	0.07	-0.25	0.92
Stnd Dev Btwn Labs							
B151	0.29	0.26	0.22				
B152	0.27	0.27	0.23	0.08	0.03	0.04	0.07

Statistics based on 35 of 36 reporting participants

Comments assigned on Data Flags for Test #408

Y3Z24A(X) - Very High L* and b* values and very low a* values. Small DL values. Large Da, Db, and DE values.

Interlaboratory Testing Program for Color & Appearance

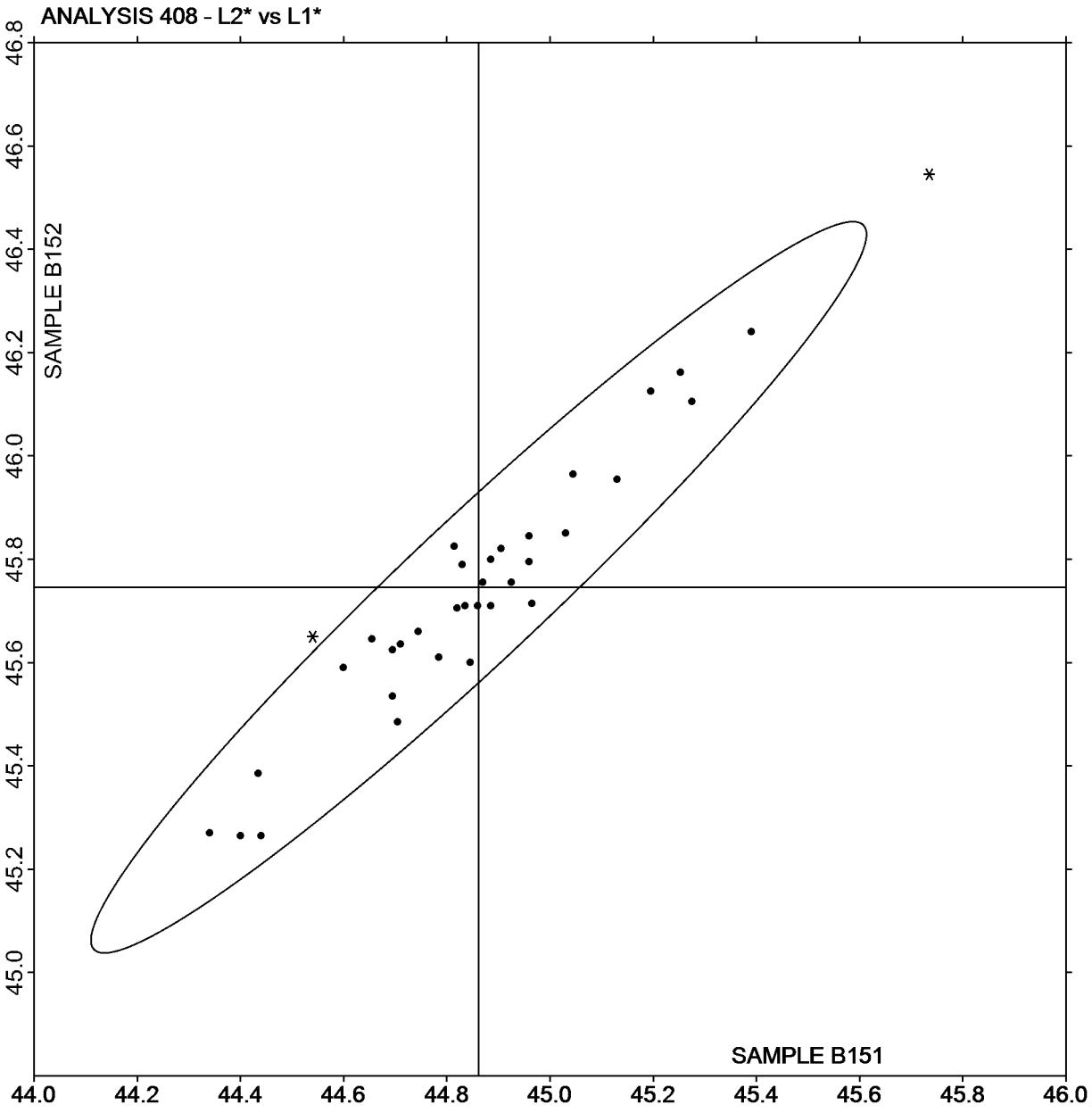
Analysis 408

Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

L2* vs L1*

SAMPLE B151 = 44.86 SAMPLE B152 = 45.75



Interlaboratory Testing Program for Color & Appearance

Analysis 408

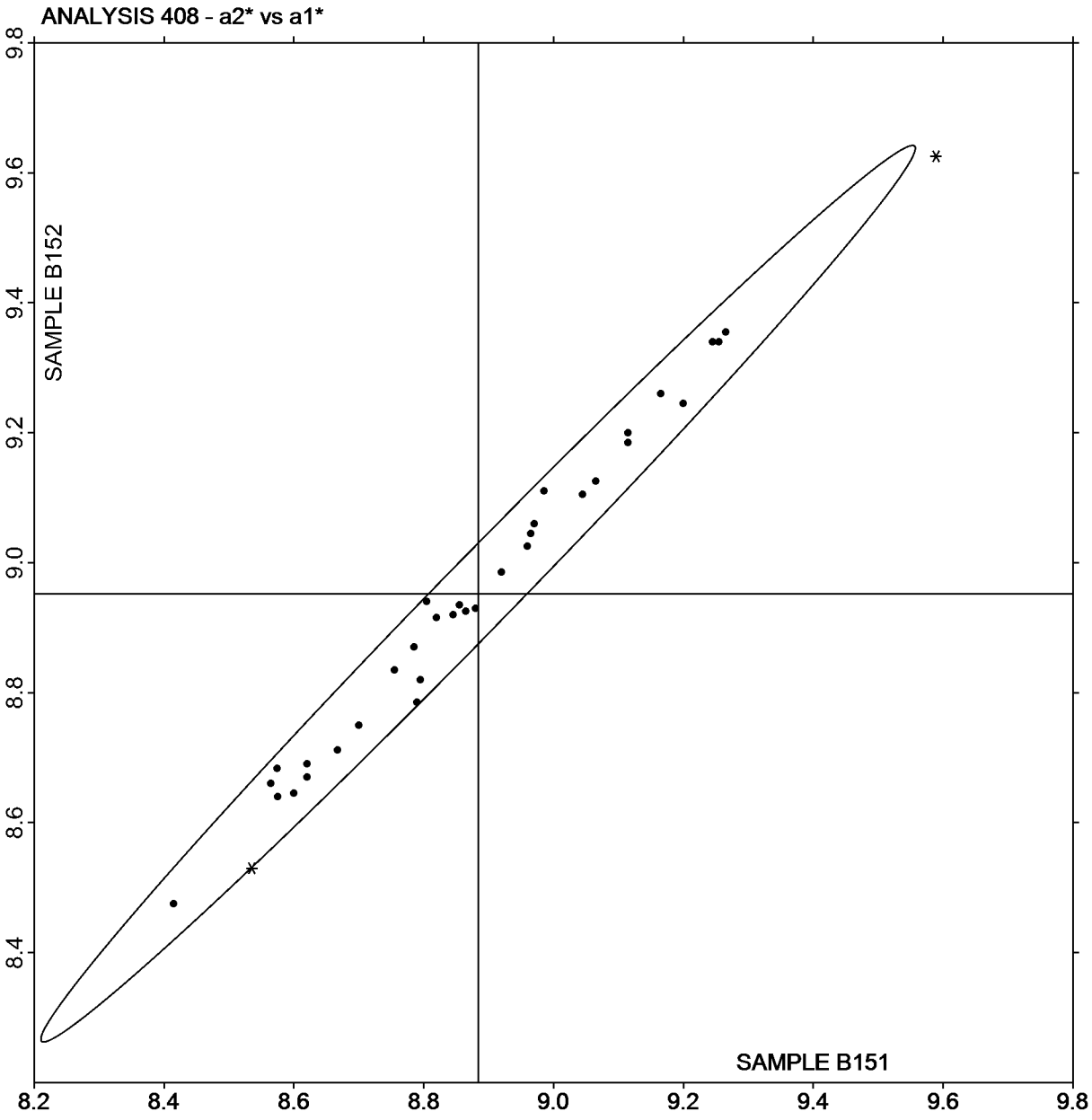
Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

a2* vs a1*

SAMPLE B151 = 8.88

SAMPLE B152 = 8.95



Interlaboratory Testing Program for Color & Appearance

Analysis 408

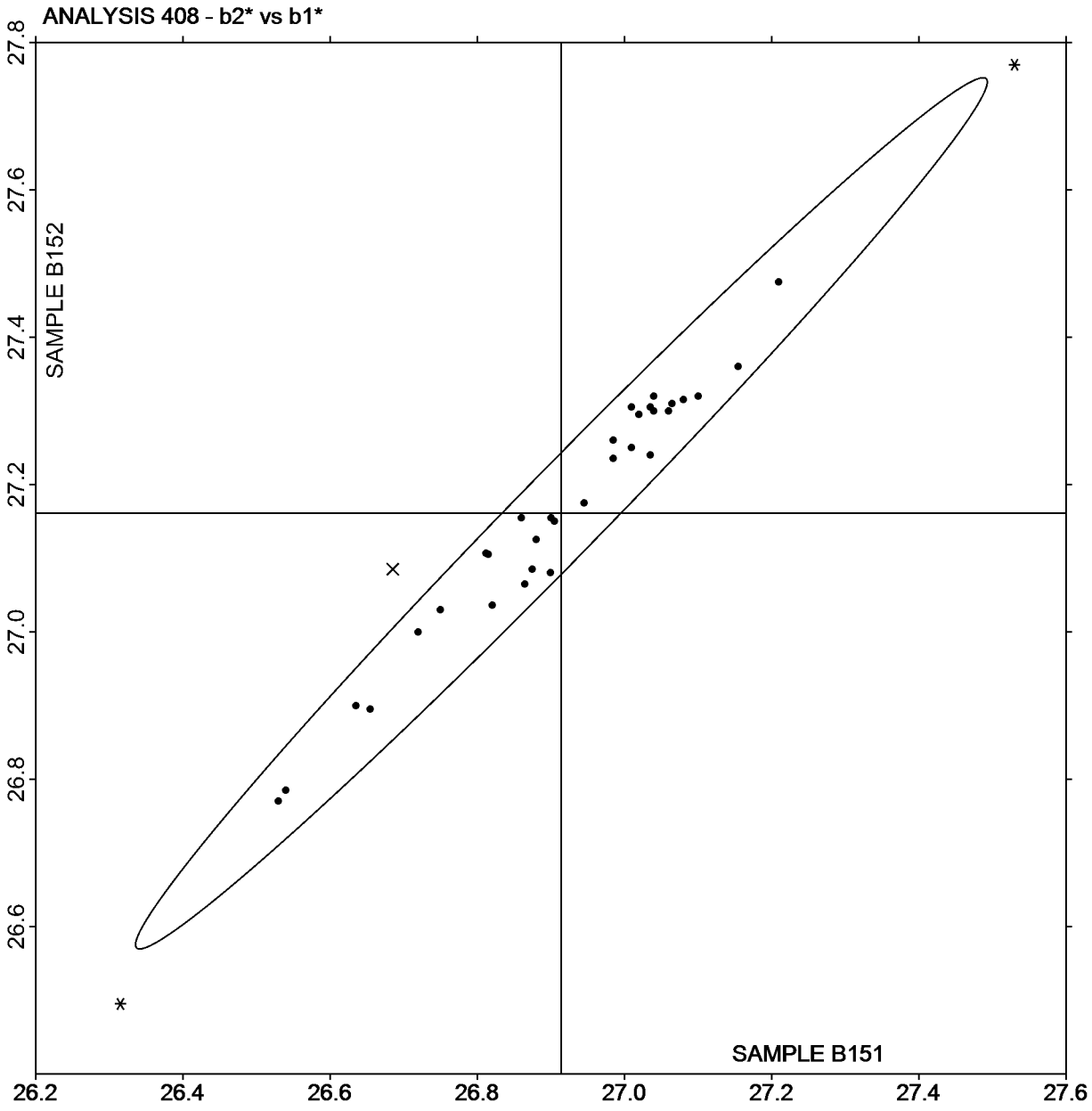
Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

b2* vs b1*

SAMPLE B151 = -26.91

SAMPLE B152 = -27.16



Plot created using absolute values.

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
22XQKC		B151	45.24	8.83	-26.59	0.82	0.06	-0.18	0.84	XO
		B152	46.06	8.89	-26.77					
2A9CA7		B151	45.06	8.85	-26.78	0.88	0.07	-0.25	0.92	XH
		B152	45.94	8.92	-27.02					
2FZJRF		B151	45.37	8.78	-27.06	0.85	0.08	-0.26	0.89	AJ
		B152	46.22	8.86	-27.32					
2WGUA8		B151	45.28	8.80	-27.03	0.77	0.09	-0.25	0.81	AQ
		B152	46.05	8.88	-27.28					
2YTA49		B151	45.39	8.81	-27.08	0.85	0.08	-0.25	0.88	AJ
		B152	46.24	8.88	-27.33					
3G3L94		B151	45.16	8.72	-26.89	0.84	0.05	-0.18	0.86	XI
		B152	45.99	8.76	-27.07					
3UDCVC		B151	45.03	8.68	-26.93	0.92	0.04	-0.24	0.95	XI
		B152	45.95	8.71	-27.17					
4AJXVD		B151	45.34	8.87	-26.92	0.85	0.07	-0.26	0.89	MV
		B152	46.18	8.93	-27.18					
4Q92E3		B151	44.98	8.83	-26.67	0.92	0.08	-0.26	0.95	XM
		B152	45.89	8.90	-26.93					
4UTVDN		B151	45.10	8.53	-26.97	0.85	0.09	-0.26	0.89	XI
		B152	45.95	8.61	-27.23					
623QN9	X	B151	45.17	7.92	-26.39	0.92	0.03	-0.22	0.95	GD
		B152	46.09	7.95	-26.61					
63CTDT		B151	45.07	8.91	-26.88	0.98	0.04	-0.22	1.00	XI
		B152	46.04	8.94	-27.10					
689BVE		B151	45.12	8.59	-26.69	0.79	0.08	-0.23	0.82	MJ
		B152	45.91	8.66	-26.92					
6C6YCL		B151	44.95	8.90	-26.76	0.89	0.07	-0.22	0.91	XH
		B152	45.84	8.97	-26.98					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
6PT2VD		B151	45.26	8.48	-26.63	0.84	0.07	-0.24	0.88	XI
		B152	46.10	8.55	-26.87					
6XAFZ4		B151	45.22	8.56	-26.89	0.79	0.08	-0.28	0.84	PE
		B152	46.01	8.63	-27.16					
794FPD		B151	45.12	8.39	-26.56	0.82	0.05	-0.24	0.86	GD
		B152	45.94	8.44	-26.80					
7ETTQ2		B151	45.14	8.87	-26.84	0.81	0.05	-0.24	0.84	MI
		B152	45.95	8.92	-27.08					
7GDMPM	X	B151	45.07	8.04	-26.59	0.89	0.09	-0.22	0.92	GD
		B152	45.96	8.13	-26.81					
7HMWCT		B151	45.27	8.56	-26.73	0.88	0.06	-0.27	0.92	MM
		B152	46.14	8.62	-27.00					
7XGEA4		B151	45.06	8.78	-26.80	0.89	0.04	-0.23	0.92	MI
		B152	45.95	8.82	-27.03					
8AB3U6		B151	45.34	8.74	-27.03	0.90	0.06	-0.23	0.93	MV
		B152	46.24	8.80	-27.26					
8FDBYC		B151	45.35	8.73	-27.00	0.81	0.07	-0.28	0.86	AQ
		B152	46.16	8.80	-27.28					
9D72TZ		B151	45.28	8.88	-26.83	0.78	0.11	-0.29	0.84	XI
		B152	46.06	8.98	-27.12					
9E2MJ7		B151	45.09	8.78	-26.89	0.94	0.05	-0.23	0.97	MK
		B152	46.03	8.83	-27.12					
9H2XF7		B151	45.12	8.76	-26.82	0.89	0.08	-0.26	0.92	XI
		B152	46.00	8.83	-27.08					
9JB3TU		B151	45.17	8.73	-26.88	0.93	0.09	-0.27	0.97	MU
		B152	46.10	8.82	-27.15					
9RJJE9	X	B151	44.17	13.91	-28.40	0.90	0.06	-0.20	0.92	MU
		B152	45.06	13.97	-28.60					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
A3ZM2Y		B151	45.35	8.77	-27.12	0.87	0.07	-0.26	0.91	AJ
		B152	46.22	8.84	-27.38					
A6AQXV		B151	45.14	8.82	-26.80	0.90	0.07	-0.24	0.93	XH
		B152	46.04	8.89	-27.03					
AC8H44		B151	45.27	8.65	-26.78	0.94	0.06	-0.24	0.98	MM
		B152	46.21	8.71	-27.01					
ACPENQ		B151	45.35	8.84	-27.03	0.87	0.05	-0.21	0.90	AJ
		B152	46.22	8.89	-27.24					
AKJE9B		B151	45.28	8.84	-26.91	0.83	0.07	-0.25	0.87	MK
		B152	46.11	8.91	-27.16					
APDA9X		B151	45.53	8.76	-27.11	0.89	0.06	-0.21	0.92	AO
		B152	46.42	8.82	-27.31					
BJ69MU		B151	45.37	8.76	-26.80	0.82	0.08	-0.24	0.86	MM
		B152	46.19	8.84	-27.04					
BNZ2HA		B151	45.31	8.76	-27.02	0.83	0.09	-0.24	0.87	MV
		B152	46.14	8.85	-27.26					
BU7X2A		B151	45.07	8.92	-26.83	0.89	0.07	-0.24	0.92	XH
		B152	45.96	8.98	-27.07					
CENALK	X	B151	45.13	8.15	-26.50	1.00	0.04	-0.24	1.02	HU
		B152	46.12	8.19	-26.74					
CFYDV3		B151	45.38	8.71	-27.00	0.87	0.10	-0.34	0.94	AJ
		B152	46.25	8.80	-27.34					
CPNY2Z		B151	45.25	8.67	-26.82	0.91	0.04	-0.22	0.93	MM
		B152	46.16	8.71	-27.04					
CXJ26X		B151	45.33	8.85	-27.22	0.88	0.10	-0.25	0.91	AO
		B152	46.21	8.95	-27.47					
DB33J3		B151	45.42	8.80	-27.03	0.87	0.04	-0.21	0.89	AO
		B152	46.28	8.84	-27.24					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
E2T2EU	X	B151	47.09	8.85	-27.48	0.91	0.09	-0.27	0.95	XI
		B152	48.00	8.94	-27.75					
E4VXZH		B151	45.31	8.69	-27.06	0.96	0.06	-0.24	0.99	AM
		B152	46.27	8.74	-27.30					
E7L4HT		B151	45.26	8.58	-26.74	0.90	0.07	-0.21	0.93	XI
		B152	46.16	8.65	-26.95					
EAJKT3		B151	45.23	8.93	-27.14	0.89	0.11	-0.32	0.95	AQ
		B152	46.12	9.03	-27.45					
EJQD73	X	B151	45.14	9.31	-27.02	0.80	0.07	-0.25	0.84	HP
		B152	45.94	9.38	-27.27					
ELD2H4		B151	45.33	8.71	-26.95	0.88	0.06	-0.29	0.93	MT
		B152	46.21	8.77	-27.23					
EUDEMD		B151	45.24	8.68	-26.69	0.85	0.05	-0.24	0.88	XH
		B152	46.09	8.73	-26.93					
GC6YG3		B151	45.29	8.83	-27.10	0.78	0.06	-0.22	0.81	AJ
		B152	46.07	8.88	-27.32					
GCNRBL	X	B151	45.25	8.58	-26.81	0.84	0.07	10.60	10.63	MM
		B152	46.09	8.65	-16.22					
GKKHZ3		B151	45.37	8.88	-27.25	0.80	0.05	-0.24	0.84	AQ
		B152	46.17	8.93	-27.49					
GPTZYV		B151	45.34	8.61	-26.65	0.84	0.07	-0.25	0.88	XI
		B152	46.18	8.68	-26.90					
H7TGER		B151	45.34	8.52	-26.59	0.79	0.06	-0.26	0.84	MM
		B152	46.13	8.58	-26.85					
HFMH2X		B151	45.31	8.88	-27.03	0.86	0.04	-0.24	0.89	AJ
		B152	46.17	8.92	-27.27					
HND46A		B151	45.29	8.56	-26.75	0.87	0.08	-0.32	0.93	XI
		B152	46.16	8.64	-27.07					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
HUY2PQ		B151	45.17	8.57	-26.69	0.84	0.03	-0.25	0.88	GD
		B152	46.01	8.60	-26.94					
HW87BR		B151	45.40	8.62	-27.03	0.91	0.03	-0.22	0.94	AM
		B152	46.31	8.65	-27.25					
JFBHAR		B151	45.15	8.56	-27.02	0.89	0.05	-0.21	0.91	HP
		B152	46.04	8.61	-27.22					
JMVECG		B151	45.26	8.94	-27.41	0.98	0.08	-0.29	1.02	AM
		B152	46.23	9.02	-27.70					
K7L34N		B151	45.38	8.89	-27.16	0.90	0.02	-0.20	0.92	AM
		B152	46.28	8.91	-27.36					
K7MZEK		B151	44.93	8.64	-26.70	1.00	0.05	-0.21	1.02	MU
		B152	45.93	8.69	-26.91					
KA8RN2		B151	45.28	8.77	-27.09	0.87	0.05	-0.20	0.89	MV
		B152	46.15	8.82	-27.29					
KHJVQU		B151	45.43	8.77	-27.05	0.90	0.07	-0.27	0.94	AJ
		B152	46.33	8.84	-27.32					
KZG7H4		B151	45.33	8.86	-27.24	0.90	0.06	-0.30	0.94	AJ
		B152	46.23	8.92	-27.54					
KZG7KN		B151	45.33	8.81	-26.90	0.90	0.06	-0.21	0.93	MM
		B152	46.23	8.87	-27.11					
L9P3W9		B151	45.54	8.77	-26.78	0.78	0.08	-0.25	0.82	HW
		B152	46.32	8.85	-27.03					
LAN33Z		B151	45.46	8.77	-27.05	0.85	0.06	-0.22	0.88	AJ
		B152	46.31	8.82	-27.26					
LCQBXX		B151	45.39	8.87	-27.20	0.85	0.07	-0.26	0.89	AO
		B152	46.24	8.94	-27.46					
LG44YN		B151	45.45	8.81	-27.11	0.80	0.05	-0.21	0.82	AO
		B152	46.25	8.85	-27.32					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
LJPTJ2		B151	45.22	8.58	-26.47	0.98	0.08	-0.26	1.02	XI
		B152	46.20	8.66	-26.73					
MQ4UGQ		B151	45.54	8.80	-27.00	0.89	0.03	-0.26	0.92	AM
		B152	46.43	8.83	-27.26					
MTU68J		B151	45.28	8.85	-26.73	0.88	0.08	-0.26	0.91	XO
		B152	46.16	8.93	-26.99					
MZW8FP		B151	45.27	8.63	-26.87	0.96	0.05	-0.24	0.98	XI
		B152	46.22	8.67	-27.10					
NPNY6H		B151	45.28	8.80	-27.07	0.88	0.08	-0.27	0.92	AM
		B152	46.16	8.88	-27.34					
NZ98RQ	X	B151	43.75	8.80	-26.84	2.42	0.09	-0.22	2.43	XI
		B152	46.17	8.88	-27.05					
NZMYHL		B151	45.54	8.68	-27.07	0.82	0.06	-0.25	0.86	AO
		B152	46.36	8.74	-27.32					
P7UDAJ		B151	45.28	8.97	-27.22	0.94	0.08	-0.25	0.97	AJ
		B152	46.22	9.04	-27.47					
PGU7GN		B151	45.29	8.84	-26.90	0.94	0.05	-0.24	0.97	AO
		B152	46.23	8.88	-27.13					
PNP7VG		B151	44.90	8.72	-27.21	0.87	0.07	-0.25	0.90	CA
		B152	45.77	8.79	-27.46					
PP7C9L	X	B151	46.60	8.92	-27.32	0.93	0.08	-0.26	0.97	AO
		B152	47.53	9.00	-27.58					
PXCEAC		B151	45.21	8.60	-27.09	0.85	0.07	-0.25	0.89	HP
		B152	46.06	8.67	-27.33					
Q2DGWT		B151	45.29	8.82	-27.13	0.91	0.07	-0.25	0.94	AM
		B152	46.20	8.89	-27.37					
QK8DAF		B151	45.24	8.87	-26.98	0.88	0.03	-0.21	0.91	MM
		B152	46.12	8.90	-27.19					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

WebCode	Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
QQC8CN		B151	45.30	8.76	-26.77	0.88	0.05	-0.23	0.91	XI
		B152	46.17	8.81	-27.00					
QU9XC9		B151	45.47	8.77	-27.22	0.85	0.08	-0.25	0.89	XX
		B152	46.32	8.84	-27.47					
QWLBG6		B151	45.41	8.73	-26.82	0.74	0.08	-0.26	0.79	MM
		B152	46.15	8.81	-27.08					
REDXXE		B151	45.19	8.67	-26.38	0.76	0.11	-0.79	1.10	MM
		B152	45.95	8.77	-27.16					
RR4M2Q		B151	45.30	8.77	-27.20	0.91	0.05	-0.22	0.93	AJ
		B152	46.20	8.82	-27.42					
RR4M4C	X	B151	45.14	8.65	-26.78	-0.01	-0.01	-0.01	0.02	XI
		B152	45.13	8.64	-26.79					
TG2M2R		B151	45.45	8.82	-27.21	0.80	0.10	-0.28	0.85	AO
		B152	46.25	8.91	-27.49					
TMMP33		B151	45.18	8.85	-27.53	0.96	0.04	-0.22	0.99	CA
		B152	46.14	8.89	-27.75					
TUM4N4	X	B151	46.08	8.98	-27.61	0.90	0.03	-0.23	0.92	AR
		B152	46.97	9.01	-27.84					
U9YWXT		B151	45.09	8.73	-27.04	0.89	0.08	-0.28	0.93	AL
		B152	45.97	8.81	-27.31					
UT6E33		B151	45.25	8.71	-26.86	0.93	0.07	-0.23	0.96	MM
		B152	46.18	8.77	-27.09					
UYWEMP		B151	45.09	8.66	-27.22	0.92	0.05	-0.21	0.94	AJ
		B152	46.01	8.70	-27.43					
VFBFN6		B151	45.00	8.77	-26.67	0.88	0.06	-0.25	0.92	XH
		B152	45.88	8.83	-26.92					
VTKXKE		B151	45.27	8.88	-26.92	1.03	0.07	-0.26	1.06	MU
		B152	46.29	8.95	-27.18					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

			CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag	Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
VXZJDL		B151	45.04	8.59	-26.79	0.84	0.08	-0.26	0.88	XH
		B152	45.87	8.67	-27.05					
W7AAFP		B151	45.44	8.69	-26.99	0.80	0.08	-0.27	0.85	AM
		B152	46.24	8.77	-27.25					
XD26QT		B151	45.35	8.89	-27.15	0.94	0.03	-0.25	0.97	AJ
		B152	46.29	8.92	-27.40					
XX7KCQ		B151	45.32	8.86	-27.13	0.92	0.05	-0.23	0.95	AJ
		B152	46.24	8.91	-27.36					
YJ69HC		B151	45.30	8.52	-26.67	0.83	0.06	-0.25	0.87	MM
		B152	46.13	8.58	-26.92					
YLBT7C	X	B151	45.48	8.92	-27.77	0.87	0.05	-0.24	0.90	MI
		B152	46.35	8.97	-28.01					
YRGPPC		B151	45.19	8.44	-26.74	0.92	0.04	-0.20	0.94	HF
		B152	46.10	8.48	-26.94					
YTC9RD		B151	45.51	8.78	-27.05	0.85	0.08	-0.26	0.89	AJ
		B152	46.36	8.85	-27.31					
ZLQEDT		B151	45.30	8.68	-26.70	0.90	0.05	-0.22	0.93	MM
		B152	46.20	8.73	-26.91					
ZMYQP3		B151	45.12	8.76	-26.99	0.88	0.02	-0.19	0.90	HP
		B152	46.00	8.77	-27.18					
ZX2366		B151	45.25	8.65	-26.31	0.86	0.09	-0.25	0.90	XI
		B152	46.11	8.74	-26.55					

Interlaboratory Testing Program for Color & Appearance

Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
B151	45.26	8.75	-26.94				
B152	46.13	8.81	-27.18	0.87	0.06	-0.25	0.91
Stnd Dev Btwn Labs							
B151	0.14	0.12	0.24				
B152	0.14	0.13	0.24	0.06	0.02	0.06	0.05

Statistics based on 97 of 109 reporting participants

Comments assigned on Data Flags for Test #409

623QN9(X) - Low a* values.

7GDMPM(X) - Low a* values. Large replication difference for L* values on Sample B151.

9RJJE9(X) - Low L* and b* values. High a* values.

CENALK(X) - Low a* values.

E2T2EU(X) - High L* values.

EJQD73(X) - High a* values.

GCNRBL(X) - High b* values for Sample B152. Also Large Db and DE values.

NZ98RQ(X) - Low L* values for Sample 151. Large replication difference for L* values for Sample 151. Also Large DL, and DE values.

PP7C9L(X) - High L* values. Large replication difference for L* value on Sample B151.

RR4M4C(X) - Low L* values for Sample B152. Also Small DL, Da, Db and DE values.

TUM4N4(X) - HIgh L* values. Low b* values for Sample B151.

YLBT7C(X) - Low b* values.

Interlaboratory Testing Program for Color & Appearance

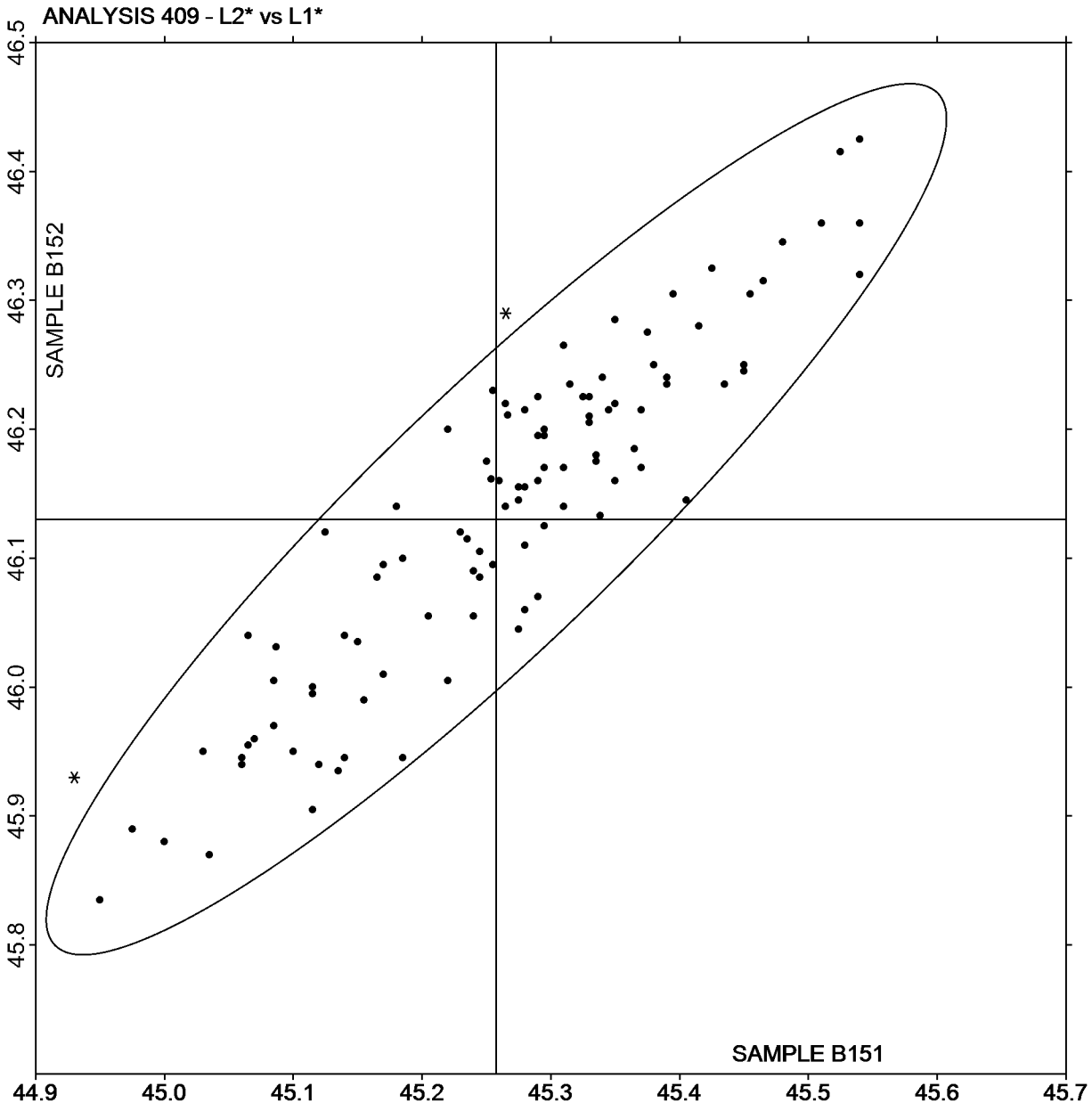
Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

L2* vs L1*

SAMPLE B151 = 45.26 SAMPLE B152 = 46.13



Interlaboratory Testing Program for Color & Appearance

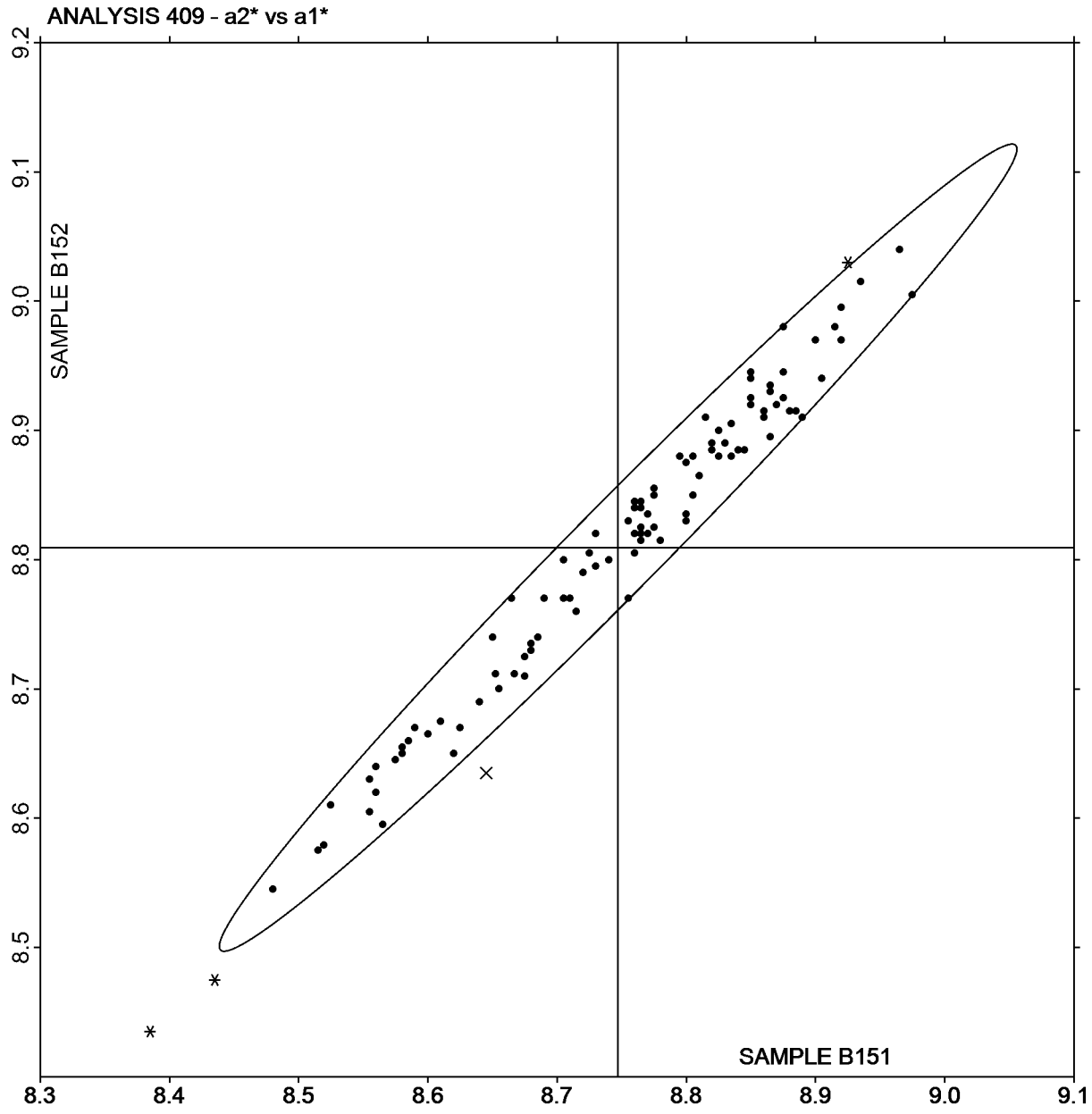
Analysis 409

Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

a2* vs a1*

SAMPLE B151 = 8.75 SAMPLE B152 = 8.81



Interlaboratory Testing Program for Color & Appearance

Analysis 409

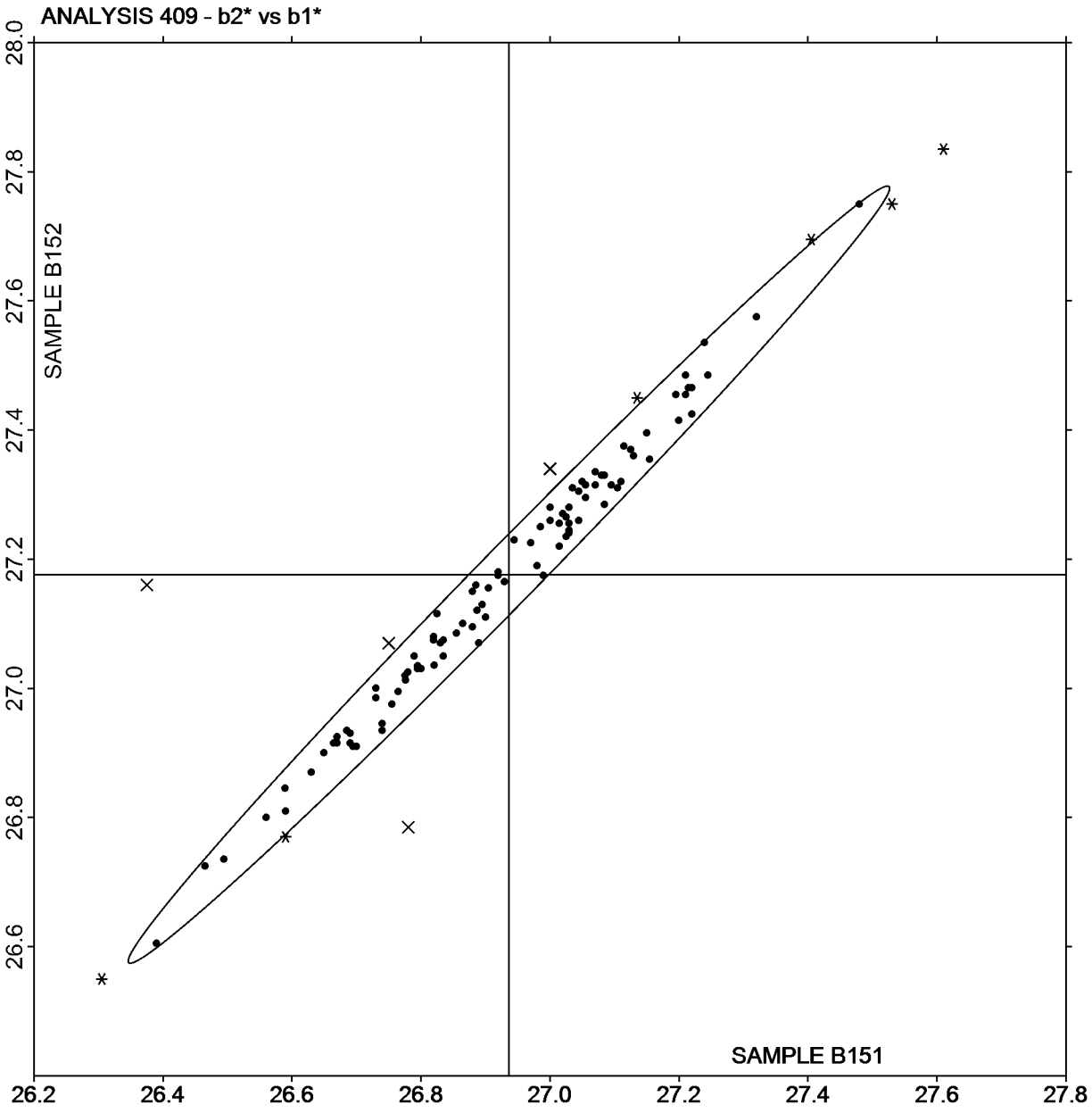
Color and Color Difference - Paint Chips - Sphere Geometry Instruments

CIE L*a*b* Color Space - Illuminant D65 - CIE 1964 (10 Degree) Observer

b2* vs b1*

SAMPLE B151 = -26.94

SAMPLE B152 = -27.18



Plot created using absolute values.

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

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 B151																		
22XQKC		25.13	30.08	31.10	29.65	24.71	19.83	15.17	12.53	10.41	11.68	13.59	13.86	16.07	18.67	16.82	15.32	XO
2A9CA7		24.42	29.99	30.81	29.56	24.74	19.72	15.14	12.41	10.35	11.48	13.44	13.78	16.36	18.52	16.69	15.36	XH
2WGUA8		24.93	30.39	31.15	29.96	25.01	20.04	15.32	12.52	10.42	11.51	13.59	13.74	16.35	18.61	16.77	15.49	AQ
2YTA49		25.21	30.64	31.31	30.03	25.19	20.19	15.39	12.66	10.45	11.54	13.69	13.91	16.46	18.72	16.28	15.32	AJ
3G3L94		24.72	30.22	30.98	29.71	24.94	19.90	15.27	12.45	10.38	11.46	13.53	13.74	16.36	18.56	16.56	15.27	XI
3UDCVC		24.53	30.05	30.88	29.61	24.82	19.79	15.18	12.42	10.31	11.33	13.40	13.67	16.21	18.35	16.63	15.11	XI
4AJXVD		24.98	30.60	31.28	30.01	25.09	20.02	15.28	12.55	10.44	11.57	13.83	13.76	16.47	18.97	17.08	15.38	MV
4Q92E3		26.10	30.41	31.18	29.74	24.74	19.88	15.21	12.51	10.52	11.86	13.72	13.68	16.76	19.26	17.47	15.79	HW
4UTVDN		24.81	30.25	30.96	29.70	24.86	19.95	15.27	12.48	10.35	11.41	13.36	13.62	16.14	18.40	16.71	15.32	XI
623QN9		27.85X	29.67	30.60	29.60	25.05	19.28X	15.70	12.15X	10.69X	11.61	12.93X	13.37	16.08	18.16	17.05	12.93X	GD
63CTDT		24.82	30.14	30.88	29.60	24.77	19.76	15.13	12.38	10.32	11.53	13.46	13.73	16.41	18.51	16.46	15.23	XI
689BVE		26.51	30.24	30.72	29.53	24.83	19.88	15.20	12.41	10.45	11.51	13.44	13.72	16.17	18.39	16.84	15.40	MJ
6C6YCL	X	16.72X	28.86X	30.28X	30.59X	27.26X	22.00X	17.34X	13.36X	11.33X	10.09X	12.94X	13.35	14.84X	17.77	17.91X	15.37	XH
6PT2VD		24.95	30.28	31.00	29.65	24.98	19.95	15.34	12.57	10.44	11.52	13.56	13.74	16.38	18.69	16.67	15.41	XI
6XAFZ4		25.18	30.28	31.02	29.93	24.95	19.95	15.23	12.56	10.40	11.43	13.63	13.62	16.24	18.74	16.90	15.21	PE
794FPD		25.79	29.53X	30.73	29.33	24.86	19.40X	15.58	11.85X	10.25	12.15X	12.71X	13.09X	16.31	18.71	17.31	15.85	GD
7ETTQ2		24.63	30.21	30.95	29.66	24.84	19.84	15.17	12.44	10.43	11.49	13.53	13.80	16.45	18.51	16.59	15.33	MI
7GDMPM		29.77X	29.35X	30.77	29.37	24.87	19.98	15.20	12.73	10.45	11.66	12.27X	13.03X	16.29	18.74	17.25	15.77	GD
7HMWCT		25.03	30.30	31.05	29.77	25.00	19.97	15.32	12.55	10.48	11.46	13.58	13.79	16.37	18.64	16.84	15.42	MM
8AB3U6		24.73	30.71	31.28	30.61X	25.13	20.13	15.36	12.57	10.37	11.54	13.72	13.77	15.60X	18.93	17.17	15.42	MV
8FDBYC		26.87	30.55	31.21	29.99	25.04	20.14	15.36	12.60	10.51	11.50	13.61	13.78	16.41	18.77	16.87	15.61	AQ
9D72TZ		24.83	30.29	31.14	29.79	25.01	19.92	15.29	12.54	10.46	11.65	13.61	13.92	16.55	18.67	16.65	15.39	XI
9E2MJ7		25.03	30.23	30.99	29.66	24.86	19.78	15.13	12.41	10.34	11.40	13.49	13.68	16.27	18.56	16.75	15.26	MK
9H2XF7		24.77	30.21	30.85	29.60	24.84	19.82	15.23	12.45	10.34	11.46	13.52	13.78	16.35	18.52	16.64	15.39	XI
9JB3TU		25.72	30.25	31.05	29.86	24.90	19.92	15.22	12.48	10.33	11.37	13.65	13.69	16.31	18.79	16.92	15.36	MU

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

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 B151																		
9RJJE9		24.55	30.70	31.20	30.00	25.00	20.15	15.10	12.60	10.50	11.60	13.65	13.80	16.35	18.90	17.00	15.35	MU
A3ZM2Y		25.23	30.68	31.30	30.03	25.19	20.16	15.39	12.64	10.43	11.48	13.62	13.83	16.39	18.80	16.38	15.47	AJ
A6AQXV		24.83	30.19	30.89	29.66	24.85	19.82	15.21	12.47	10.45	11.47	13.56	13.79	16.41	18.58	16.81	15.45	XH
AC8H44		24.98	30.33	31.11	29.82	24.98	19.94	15.33	12.54	10.48	11.49	13.61	13.80	16.38	18.69	16.93	15.42	MM
AKJE9B		25.12	30.40	31.15	29.83	24.99	19.96	15.30	12.56	10.49	11.57	13.64	13.84	16.43	18.74	16.94	15.45	MK
APDA9X		25.45	30.79	31.49	30.24	25.48	20.35	15.50	12.70	10.51	11.63	13.82	13.87	16.54	19.02	16.36	15.36	AO
BJ69MU		25.36	30.47	31.20	29.81	25.06	20.01	15.39	12.64	10.57	11.62	13.68	13.93	16.50	18.72	16.93	15.54	MM
BNZ2HA		24.64	30.66	31.27	30.05	25.07	20.13	15.31	12.55	10.35	11.54	13.69	13.75	16.41	18.86	17.04	15.51	MV
BU7X2A		24.61	30.06	30.86	29.59	24.78	19.73	15.13	12.40	10.32	11.54	13.48	13.77	16.36	18.53	16.57	15.23	XH
CENALK		23.78	29.89	30.64	29.56	24.65	20.20	15.19	12.51	10.49	11.16	13.51	13.66	15.99	18.50	17.06	15.33	HU
CFYDV3		25.54	30.60	31.33	30.11	25.10	20.10	15.36	12.57	10.44	11.53	13.60	13.77	16.40	18.67	16.84	15.49	AJ
CPNY2Z		25.30	30.40	31.11	29.81	24.99	19.97	15.32	12.53	10.45	11.48	13.59	13.79	16.32	18.69	17.05	15.58	MM
CXJ26X		25.14	30.61	31.37	30.04	25.28	20.14	15.33	12.59	10.43	11.52	13.56	13.84	16.40	18.66	16.80	15.40	AO
DB33J3		25.38	30.70	31.31	29.99	25.31	20.21	15.43	12.64	10.49	11.58	13.76	13.84	16.48	19.03	16.59	15.44	AO
E2T2EU		24.83	30.33	31.02	29.73	24.97	20.03	15.40	12.59	10.50	11.58	13.59	13.88	16.49	18.61	16.66	15.41	XI
E4VXZH		24.88	30.55	31.15	29.94	25.19	20.14	15.37	12.58	10.46	11.42	13.62	13.73	16.33	18.73	16.77	15.50	AM
E7L4HT		24.84	30.23	30.99	29.75	24.96	19.99	15.33	12.56	10.50	11.52	13.56	13.79	16.38	18.55	16.62	15.37	XI
EJQD73		26.52	30.54	31.26	29.72	24.58	19.71	15.03	12.44	10.33	11.71	13.62	13.76	16.43	18.63	16.70	15.24	HP
ELD2H4		24.60	30.47	31.29	30.08	25.07	20.10	15.33	12.59	10.45	11.48	13.70	13.80	16.40	18.90	17.02	15.47	MT
GC6YG3		25.21	30.67	31.24	29.91	25.08	20.03	15.31	12.58	10.47	11.49	13.56	13.80	16.33	18.75	16.49	15.40	AJ
GCNRBL		24.93	30.35	31.10	29.80	24.98	19.94	15.31	12.55	10.47	11.42	13.57	13.76	16.29	18.62	16.92	15.40	MM
GKKHZ3		26.42	30.72	31.41	30.17	25.13	20.17	15.40	12.63	10.46	11.53	13.64	13.82	16.43	18.65	16.78	15.50	AQ
H7TGER		24.95	30.30	31.06	29.75	24.99	19.99	15.36	12.59	10.55	11.53	13.62	13.90	16.40	18.67	17.02	15.54	MM
HFMH2X		25.15	30.64	31.22	29.85	25.10	20.05	15.31	12.57	10.47	11.51	13.66	13.82	16.42	18.74	16.23	15.39	AJ
HND46A		24.54	30.27	31.00	29.81	25.02	20.06	15.39	12.59	10.46	11.54	13.57	13.79	16.42	18.67	16.70	15.42	XI

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

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 B151																		
HW87BR		24.96	30.75	31.47	30.04	25.25	20.17	15.42	12.64	10.51	11.46	13.63	13.79	16.36	18.76	16.90	15.33	AM
JFBHAR		25.25	30.36	31.02	29.83	24.74	19.90	15.21	12.51	10.40	11.17	13.61	13.46	15.99	19.05	16.91	15.21	HP
JMVECG		25.13	30.81	31.44	30.14	25.10	20.08	15.32	12.50	10.41	11.46	13.56	13.83	16.32	17.96	16.67	15.14	AM
K7L34N		25.52	30.77	31.39	30.12	25.09	20.16	15.38	12.62	10.47	11.56	13.59	13.91	16.44	18.81	16.78	15.57	AM
K7MZEK		24.39	29.98	30.63	29.38	24.56	19.68	15.02	12.33	10.27	11.30	13.39	13.55	16.11	18.54	16.83	15.26	MU
KA8RN2		26.52	30.64	31.24	30.03	25.07	20.11	15.30	12.54	10.32	11.48	13.68	13.73	16.35	18.90	16.94	15.45	MV
KHJVQU		25.35	30.70	31.33	30.06	25.25	20.22	15.44	12.65	10.50	11.55	13.73	13.86	16.46	18.66	16.39	15.39	AJ
KZG7H4		25.22	30.82	31.37	30.11	25.02	20.07	15.33	12.58	10.46	11.46	13.57	13.74	16.30	18.59	16.78	15.58	AJ
KZG7KN		25.21	30.44	31.22	29.87	25.09	20.01	15.34	12.60	10.53	11.55	13.67	13.89	16.47	18.76	17.01	15.53	MM
L9P3W9		26.12	30.68	31.50	30.09	25.15	20.18	15.49	12.66	10.64	11.84	13.84	13.77	16.73	19.27	17.38	15.73	HW
LAN33Z		25.38	30.78	31.38	30.06	25.31	20.27	15.47	12.69	10.47	11.58	13.74	13.86	16.50	18.93	16.45	15.53	AJ
LCQBXX		25.45	30.71	31.44	30.16	25.14	20.17	15.38	12.61	10.45	11.57	13.64	13.81	16.43	18.67	16.85	15.59	AO
LG44YN		25.51	30.79	31.39	30.12	25.38	20.27	15.43	12.66	10.50	11.58	13.74	13.90	16.47	18.90	16.49	15.36	AO
LJPTJ2		24.60	30.07	30.77	29.59	24.81	19.88	15.25	12.50	10.43	11.59	13.59	13.82	16.43	18.56	16.60	15.32	XI
MQ4UGQ		25.74	30.77	31.44	30.18	25.40	20.29	15.48	12.75	10.56	11.64	13.78	14.01	16.61	19.05	16.97	15.58	AM
MTU68J		25.24	30.31	31.15	29.70	24.91	19.82	15.22	12.56	10.47	11.66	13.67	13.84	16.52	18.70	16.90	15.34	XO
MZW8FP		24.90	30.34	31.09	29.81	25.06	20.00	15.37	12.52	10.46	11.54	13.54	13.81	16.40	18.55	16.44	15.25	XI
NPNY6H		24.99	30.55	31.24	29.91	24.88	20.12	15.30	12.54	10.47	11.46	13.62	13.81	16.34	18.69	16.90	15.32	AM
NZ98RQ		24.89	30.35	31.11	29.85	24.97	19.97	15.25	12.48	10.37	11.60	13.60	13.76	16.55	18.74	16.74	15.42	XI
NZMYHL		25.05	30.82	31.50	30.21	25.47	20.35	15.53	12.75	10.55	11.61	13.76	13.90	16.52	18.90	16.49	15.42	AO
P7UDAJ		25.00	30.83	31.42	29.96	24.97	20.07	15.30	12.52	10.48	11.52	13.60	13.84	16.42	18.46	16.72	15.13	AJ
PGU7GN		24.97	30.40	31.07	29.80	25.04	20.06	15.28	12.57	10.39	11.54	13.67	13.79	16.43	18.91	16.32	15.39	AO
PNP7VG		24.90	30.09	30.78	29.71	24.80	19.74	14.98	12.32	10.14X	11.21	13.41	13.36	16.01	18.55	16.67	14.97	CA
PP7C9L	X	26.54	32.38X	32.97X	31.64X	26.63X	21.36X	16.32X	13.41X	11.14X	12.22X	14.52X	14.71X	17.53X	20.49X	17.59	16.45X	AO
PXCEAC		26.10	30.59	31.16	29.98	24.97	20.01	15.32	12.53	10.36	11.24	13.66	13.54	16.08	18.96	16.92	15.25	HP

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

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 B151																		
Q2DGWT		26.25	30.50	31.20	29.95	25.15	20.07	15.34	12.56	10.36	11.47	13.62	13.73	16.36	18.73	16.73	15.57	AM
QK8DAF		25.27	30.42	31.18	29.83	24.98	19.93	15.27	12.54	10.44	11.51	13.61	13.81	16.41	18.71	16.91	15.42	MM
QQC8CN		25.04	30.30	31.06	29.79	24.97	19.97	15.33	12.56	10.48	11.60	13.64	13.89	16.51	18.64	16.65	15.38	XI
QU9XC9		25.36	30.91	31.52	30.20	25.35	20.24	15.50	12.70	10.56	11.57	13.66	13.89	16.41	18.69	16.86	15.72	XX
QWLBG6		25.54	30.49	31.25	29.91	25.13	20.08	15.42	12.66	10.59	11.62	13.67	13.96	16.52	18.75	16.97	15.56	MM
RR4M2Q		25.02	30.66	31.36	30.04	25.22	20.14	15.34	12.57	10.46	11.48	13.60	13.78	16.38	18.71	16.83	15.17	AJ
RR4M4C		24.69	30.17	30.87	29.58	24.85	19.84	14.48X	12.49	10.42	11.45	13.45	13.70	16.31	14.48X	14.01X	15.26	XI
TG2M2R		25.38	30.83	31.45	30.29	25.29	20.27	15.44	12.65	10.50	11.56	13.71	13.84	16.44	18.86	17.05	15.62	AO
TMMP33		25.58	30.69	31.40	30.32	25.27	20.13	15.32	12.64	10.43	11.51	13.69	13.68	16.35	18.90	17.01	15.36	CA
TUM4N4	X	26.53	31.82X	32.59X	31.26X	26.04X	20.84X	15.94X	13.07X	10.81X	11.93X	14.01	14.36X	17.01X	19.26	17.44	16.15	AR
U9YWXT		24.77	30.26	30.97	29.76	24.90	19.91	15.21	12.43	10.35	11.32	13.49	13.64	16.15	18.59	16.91	15.19	AL
UT6E33		25.11	30.32	31.07	29.80	25.06	19.98	15.34	12.55	10.46	11.48	13.59	13.84	16.41	18.69	16.89	15.47	MM
UYWEMP		24.83	30.39	31.11	29.92	25.07	19.95	15.20	12.39	10.30	11.19	13.40	13.62	16.08	18.56	16.84	15.46	AJ
VFBFN6		24.35	29.92	30.71	29.46	24.64	19.63	15.11	12.32	10.30	11.39	13.44	13.71	16.31	18.48	16.67	15.29	XH
VTKXKE		24.78	30.63	31.15	29.94	25.04	19.94	15.26	12.51	10.38	11.47	13.79	13.76	16.42	18.91	17.04	15.39	MV
VXZJDL		24.13	30.00	30.67	29.56	24.79	19.86	15.18	12.38	10.34	11.31	13.40	13.67	16.25	18.55	16.76	15.36	XH
W7AAFP		25.08	30.66	31.37	30.00	25.25	20.22	15.47	12.69	10.56	11.56	13.74	13.89	16.50	18.84	16.94	15.33	AM
XD26QT		25.26	30.81	31.33	30.04	25.21	20.13	15.36	12.59	10.47	11.53	13.65	13.86	16.40	18.81	16.93	15.48	AJ
XX7KCQ		25.04	30.67	31.28	29.94	25.12	20.09	15.32	12.57	10.46	11.47	13.63	13.78	16.37	18.77	16.78	15.53	AJ
YJ69HC		25.01	30.31	31.07	29.76	24.97	19.99	15.37	12.58	10.52	11.49	13.58	13.86	16.36	18.58	16.97	15.50	MM
YLBT7C		25.96	31.60X	32.03X	30.66X	25.55	20.36	15.54	12.67	10.51	11.57	13.60	13.87	16.42	18.56	16.72	15.37	MI
YRGPPC		25.03	30.38	30.98	29.58	25.00	20.13	15.22	12.42	10.46	11.34	13.57	13.64	16.10	18.94	17.01	15.76	HF
YTC9RD		26.97	30.91	31.46	30.08	25.32	20.28	15.50	12.73	10.60	11.59	13.73	13.96	16.56	18.96	16.98	15.61	AJ
ZLQEDT		25.16	30.31	31.10	29.76	24.97	19.96	15.32	12.56	10.47	11.54	13.64	13.87	16.48	18.73	16.90	15.49	MM
ZMYQP3		25.67	30.33	31.06	29.85	24.78	19.83	15.17	12.43	10.41	11.24	13.64	13.55	16.14	18.79	16.87	15.25	HP

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

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 B151																
ZX2366		25.11	30.19	30.84	29.28	24.70	19.77	15.29	12.51	10.47	11.69	13.59	13.87	16.52	18.59	16.52	15.24	XI

Summary Statistics

Grand Means															
25.25	30.43	31.14	29.87	25.02	20.00	15.30	12.54	10.44	11.51	13.58	13.76	16.36	18.66	16.77	15.38
Stnd Dev Btwn Labs															
0.77	0.32	0.24	0.25	0.20	0.19	0.15	0.12	0.09	0.14	0.20	0.15	0.16	0.47	0.36	0.29

Comments assigned on Data Flags for Test #411

6C6YCL (X) - High and low % reflectance data at various wavelengths.

PP7C9L (X) - High % reflectance data for most wavelengths.

TUM4N4 (X) - High % reflectance data for most wavelengths.

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

		Sample F151			Sample F152			
WebCode	Data Flag	Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	Instr Code
22XQKC	X	50.13	-5.19	-4.74	61.95	-4.68	-4.75	MR
2YTA49		54.85	-0.46	-0.42	66.13	-0.51	-0.51	MW
39C7HE		55.60	0.29	0.26	66.68	0.04	0.05	GK
3UDCVC		56.65	1.34	1.22	68.28	1.64	1.67	MH
4A4ECF		57.53	2.21	2.02	68.23	1.59	1.62	GK
4Q92E3		55.60	0.29	0.26	66.58	-0.06	-0.06	GK
4UTVDN		56.88	1.56	1.43	67.45	0.82	0.83	GL
623QN9		55.45	0.14	0.13	67.00	0.37	0.38	GN
63CTDT		53.68	-1.64	-1.49	64.65	-1.98	-2.01	GL
68B8XW	X	55.03	-0.29	-0.26	68.08	1.44	1.47	GN
6C6YCL		54.90	-0.41	-0.38	65.98	-0.66	-0.67	GL
6PBXEZ		54.60	-0.71	-0.65	66.68	0.04	0.05	GL
794FPD		54.68	-0.64	-0.58	66.58	-0.06	-0.06	GB
7ETTQ2		55.33	0.01	0.01	66.90	0.27	0.27	GL
7GDMPM		55.35	0.04	0.03	66.58	-0.06	-0.06	GB
7HMWCT		55.13	-0.19	-0.17	66.75	0.12	0.12	GL
8JF3D6		57.15	1.84	1.68	68.10	1.47	1.49	GL
8Y8M97		54.80	-0.51	-0.47	65.98	-0.66	-0.67	GX
9D72TZ		55.83	0.52	0.48	67.50	0.87	0.88	GL
9H2XF7		54.83	-0.49	-0.44	66.33	-0.31	-0.31	GL
9JB3TU		55.58	0.26	0.24	66.45	-0.18	-0.18	GL
A3ZM2Y		54.23	-1.08	-0.99	66.20	-0.43	-0.44	GK
A6AQXV		56.08	0.76	0.70	67.53	0.89	0.91	GL
AC8H44		56.38	1.06	0.97	67.28	0.64	0.65	GL
ACPENQ		55.58	0.26	0.24	67.13	0.49	0.50	GL
B32XG3		55.05	-0.26	-0.24	66.90	0.27	0.27	GL
B7YEQB		55.90	0.59	0.54	67.38	0.74	0.76	GK
BJ69MU		55.93	0.61	0.56	66.60	-0.03	-0.03	RA
BU7X2A		55.53	0.21	0.19	66.93	0.29	0.30	GK
C2HFQ2		54.58	-0.74	-0.67	66.35	-0.28	-0.28	GL
CXJ26X		54.78	-0.54	-0.49	65.78	-0.86	-0.87	GQ
CXJ38H		56.08	0.76	0.70	67.20	0.57	0.58	GK
EAJKT3		54.93	-0.39	-0.35	66.50	-0.13	-0.13	PC
EJQD73		54.35	-0.96	-0.88	66.33	-0.31	-0.31	GL
F9NC9P		55.48	0.16	0.15	66.43	-0.21	-0.21	GL
GCNRBL		55.71	0.39	0.36	66.97	0.33	0.34	GL
GKKHZ3		54.13	-1.19	-1.08	65.50	-1.13	-1.15	GK
GPTZYV		55.03	-0.29	-0.26	66.15	-0.48	-0.49	GL
GU6XKW		55.18	-0.14	-0.13	66.60	-0.03	-0.03	GK
H7TGER		55.50	0.19	0.17	66.55	-0.08	-0.08	GL
HND46A		56.45	1.14	1.04	67.35	0.72	0.73	GN
HUY2PQ	X	52.55	-2.76	-2.52	63.10	-3.53	-3.59	GB
JFBHAR		54.80	-0.51	-0.47	66.90	0.27	0.27	XX
K7L34N		55.63	0.31	0.29	67.88	1.24	1.26	GL
K7MZEK		53.03	-2.29	-2.09	64.73	-1.91	-1.94	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample F151 Lab Mean	Sample F151 Difference from Grand Mean	Sample F151 Comparative Performance Value	Sample F152 Lab Mean	Sample F152 Difference from Grand Mean	Sample F152 Comparative Performance Value	Instr Code
K8WU9Y		55.35	0.04	0.03	66.78	0.14	0.15	GL
KA8RN2		54.88	-0.44	-0.40	65.78	-0.86	-0.87	RA
KRM39E		55.13	-0.19	-0.17	66.55	-0.08	-0.08	GA
L9P3W9		55.88	0.56	0.51	67.63	0.99	1.01	GL
LAN33Z		55.50	0.19	0.17	65.83	-0.81	-0.82	GN
LTEHXG		55.13	-0.19	-0.17	66.98	0.34	0.35	GK
LV4PHD		55.20	-0.11	-0.10	67.00	0.37	0.38	GL
LX8K2G		53.53	-1.79	-1.63	64.65	-1.98	-2.01	RA
M6Q7TZ	X	59.80	4.49	4.10	70.88	4.24	4.31	GK
MTU68J		56.75	1.44	1.31	66.93	0.29	0.30	GN
PNP7VG	*	52.28	-3.04	-2.77	63.73	-2.91	-2.95	GL
QQC8CN		56.18	0.86	0.79	67.53	0.89	0.91	GL
R4UENF		55.33	0.01	0.01	67.00	0.37	0.38	GL
RD3Q4Y		53.20	-2.11	-1.93	64.50	-2.13	-2.16	GB
RLUBZJ	X	60.28	4.96	4.53	67.43	0.79	0.81	GK
TCR7UN		55.58	0.26	0.24	66.93	0.29	0.30	GL
U9YWXT		55.58	0.26	0.24	66.63	-0.01	-0.01	GL
UJGLQ7	*	58.58	3.26	2.98	68.93	2.29	2.33	GT
VFBFN6		55.03	-0.29	-0.26	67.25	0.62	0.63	GL
VTKXKE	*	53.15	-2.16	-1.97	63.98	-2.66	-2.70	GL
XU7LTK	*	57.90	2.59	2.36	68.15	1.52	1.54	EC
XX7KCQ		55.60	0.29	0.26	66.85	0.22	0.22	GN
YLBT7C		54.78	-0.54	-0.49	66.40	-0.23	-0.23	GL
ZX2366		54.85	-0.46	-0.42	66.50	-0.13	-0.13	GK

Summary Statistics

	Sample F151	Sample F152
Grand Means	55.31 Gloss Units	66.63 Gloss Units
Stnd Dev Btwn Labs	1.10 Gloss Units	0.98 Gloss Units

Statistics based on 64 of 69 reporting participants

Comments on assigned Data Flags for Test #440

22XQKC(X) - Data for both samples are low.

68B8XW(X) - Inconsistent in testing between samples.

HUY2PQ(X) - Inconsistent in testing between samples, data for Sample F152 are low.

M6Q7TZ(X) - Data for both samples are high.

RLUBZJ(X) - Inconsistent in testing between samples, data for Sample F151 are high. Also Inconsistent in testing within Sample F151.

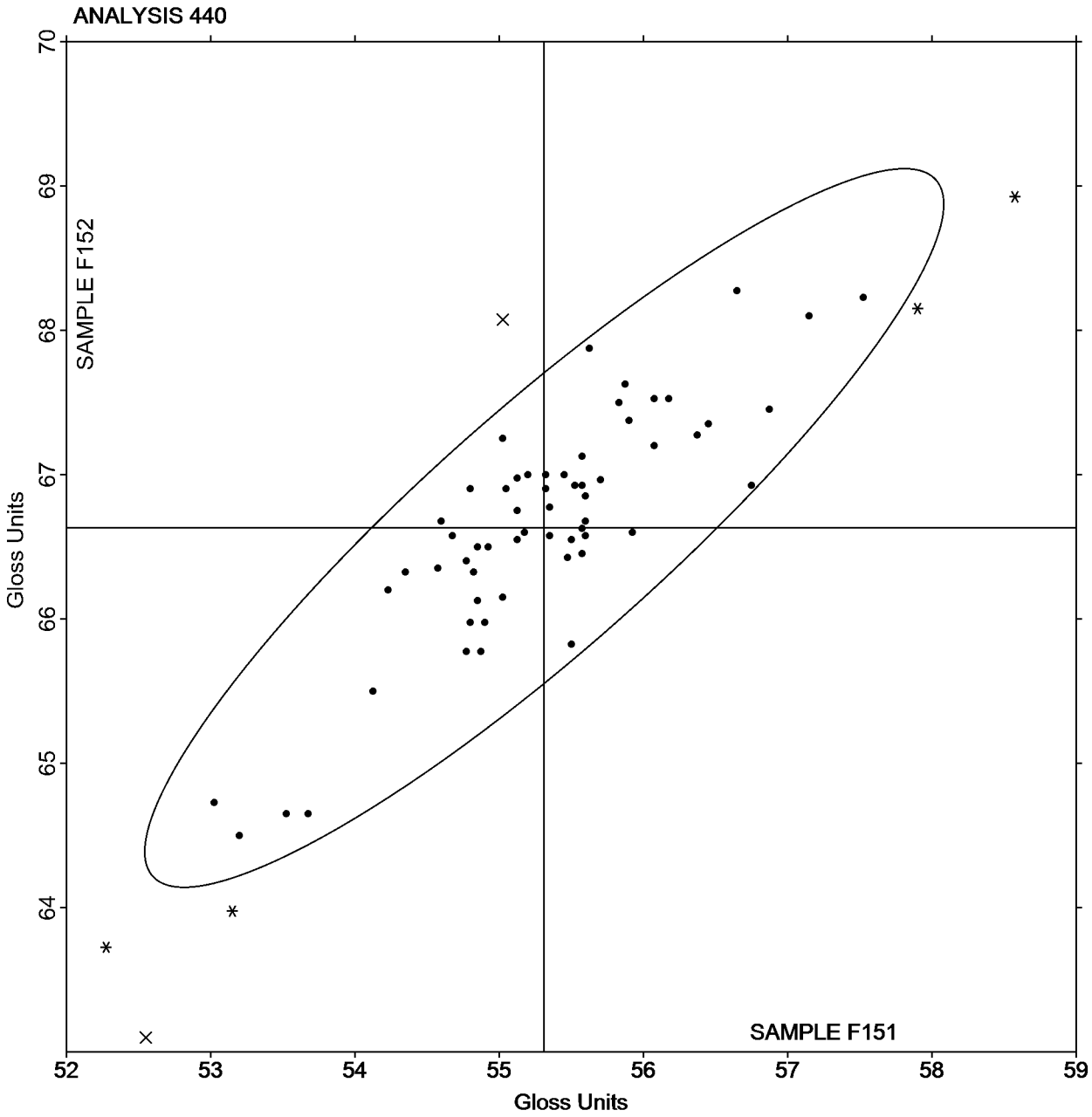
Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE F151 = 55.31 Gloss Units SAMPLE F152 = 66.63 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample K151 Lab Mean	Sample K151 Difference from Grand Mean	Sample K151 Comparative Performance Value	Sample K152 Lab Mean	Sample K152 Difference from Grand Mean	Sample K152 Comparative Performance Value	Instr Code
4UTVDN		11.95	0.20	0.53	15.33	-0.10	-0.20	GL
623QN9		12.15	0.40	1.06	15.73	0.30	0.56	GN
63CTDT		11.80	0.05	0.14	15.48	0.05	0.09	GL
6C6YCL		11.65	-0.10	-0.26	15.40	-0.03	-0.05	GL
7HMWCT		12.05	0.30	0.79	15.73	0.30	0.56	GL
9H2XF7		11.03	-0.72	-1.90	14.20	-1.23	-2.34	GL
9JB3TU		11.65	-0.10	-0.26	15.65	0.22	0.42	GL
H7TGER		11.50	-0.25	-0.65	14.80	-0.63	-1.20	GN
HND46A		11.80	0.05	0.14	15.45	0.02	0.04	GL
MTU68J		12.48	0.73	1.91	16.43	1.00	1.90	GN
PNP7VG		11.20	-0.55	-1.44	15.20	-0.23	-0.44	GL
VTKXKE		11.73	-0.02	-0.06	15.43	0.00	-0.01	GL
XX7KCQ		11.75	0.00	0.01	15.78	0.35	0.66	GN

Summary Statistics

	Sample K151	Sample K152
Grand Means	11.75 Gloss Units	15.43 Gloss Units
Stnd Dev Btwn Labs	0.38 Gloss Units	0.53 Gloss Units

Statistics based on 13 of 13 reporting participants

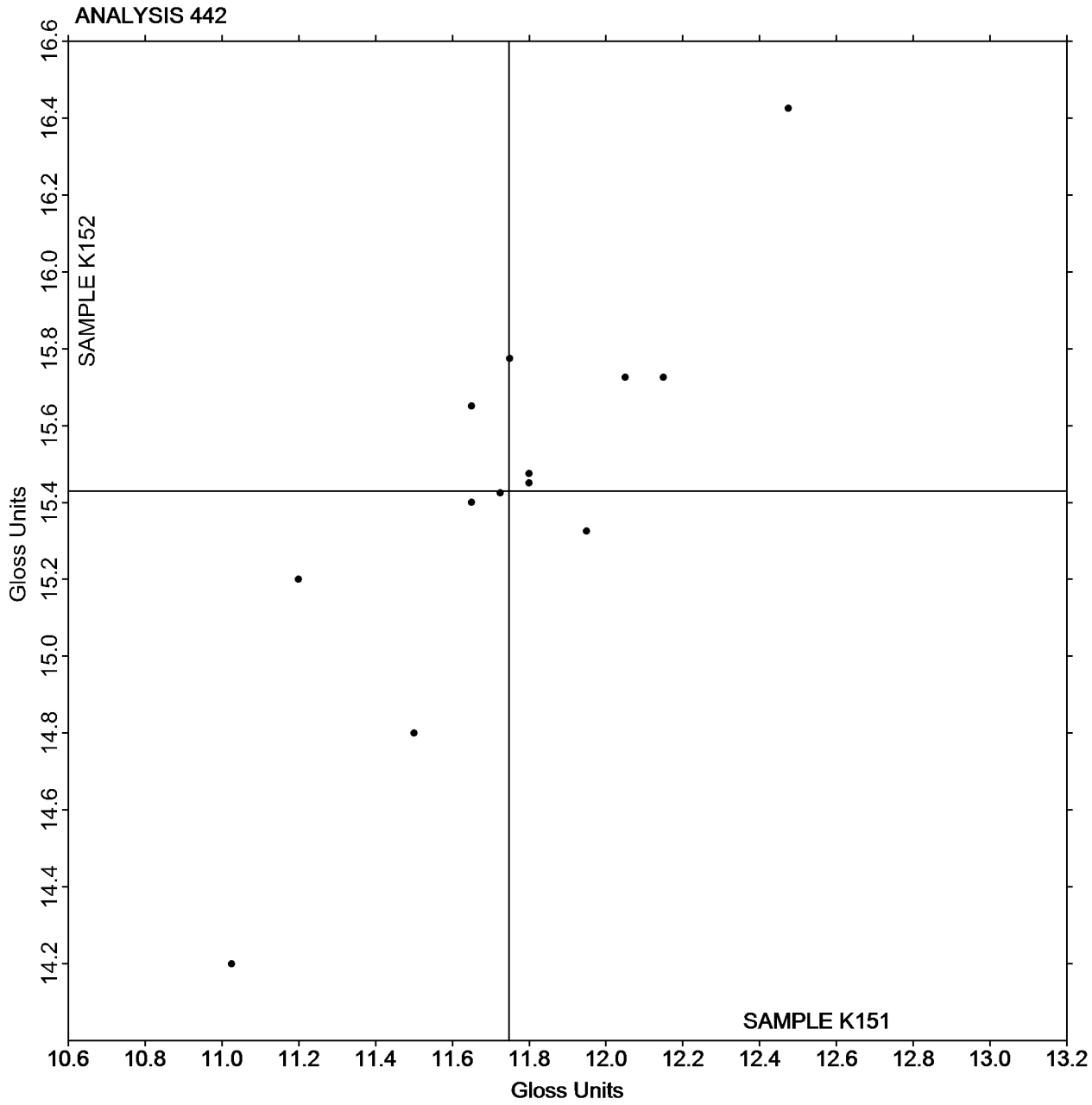
Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE K151 = 11.75 Gloss Units SAMPLE K152 = 15.43 Gloss Units



Instrument Code List - Report# 172

Instrument information as provided by laboratories

Analysis	Analysis Name
440	Gloss 60 Degree (Paint Chips)

Instrument code and description

EC	Elcometer
GA	BYK Gardner Color - Guide Gloss
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
GQ	BYK-Gardner haze-gloss
GT	Gardco Novo-Gloss (20/60/85)
GX	BYK-Gardner (model not specified)
MH	X-Rite/Macbeth Color-Eye XTH
MR	Macbeth Novo-Gloss (20/60/85)
MW	Minolta Multi-Gloss 268
PC	Picogloss 503 Erichson
RA	Rhopoint Novo-Gloss Glossmeter
XX	Instrument make/model not specified by lab

442	Gloss 85 Degree (Paint Chips)

Instrument code and description

GL	BYK-Gardner micro-TRI-gloss
GN	BYK-Gardner new micro-TRI-gloss

Instrument Code List - Report# 172

Instrument information as provided by laboratories

Analysis Analysis Name

408 Color & Color Difference (Paint Chips) - 45-0

Instrument code and description

AE	ACS Chroma-Sensor CS-3
FA	BYK Mac
GB	BYK-Gardner spectro-guide sphere gloss
GE	BYK-Gardner spectro-guide (45/0)
GH	BYK-Gardner Color-View
HG	Hunter ColorQUEST
HK	Hunter MiniScan XE (45/0)
HW	Hunter LabScan XE
HY	Hunter Color Flex 45/0
MA	Macbeth
MG	Macbeth 1500/PLUS or 2025+ Color Eye
MU	Minolta
TO	Topcon SR-3 Spectroradiometer
XD	X-Rite 500 Series SpectroDensitometer
XK	X-Rite MA100 Multi-Angle SpectroPhotometer
XM	X-Rite MA58 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

409 Color & Color Difference (Paint Chips) Sphere

Instrument code and description

AJ	ACS-Datacolor 600
AL	ACS-Datacolor Intl. Dataflash 100
AM	ACS-Datacolor 600 Plus
AO	ACS-Datacolor 650X
AQ	ACS-Datacolor 600X
AR	Datacolor 400
CA	Cary 5000
GD	BYK-Gardner spectro-guide sphere
HF	Hunter ColorFlex Diffuse
HP	Hunter UltraScan PRO
HU	Hunter UltraScan
HW	Hunter UltraScan XE
MI	Macbeth Color i 5
MJ	Macbeth Color-Eye 3000
MK	Macbeth Color-Eye 7000
MM	Macbeth Color-Eye 7000a
MT	Minolta CM-2600d
MU	Minolta
MV	Minolta CM-3000d Series Spectrophotometer
PE	Perkin Elmer Spectrophotometer
XH	X-Rite Color i5
XI	X-Rite Color i7
XM	X-Rite SP62 Portable Sphere Spectrophotometer
XO	X-Rite SP64 Portable Sphere Spectrophotometer
XX	Instrument make/model not specified by lab

Instrument Code List - Report# 172

Instrument information as provided by laboratories

Analysis	Analysis Name
411	Spectrophotometric (Paint Chips) - Sphere

Instrument code and description

A J	ACS-Datacolor 600
A L	ACS-Datacolor Intl. Dataflash 100
AM	ACS-Datacolor 600 Plus
AO	ACS-Datacolor 650
AQ	ACS-Datacolor 600X
A R	Datacolor 400
CA	Cary 5000
GD	BYK-Gardner spectro-guide sphere
H F	Hunter ColorFlex Diffuse
H P	Hunter UltraScan PRO
HU	Hunter UltraScan
HW	Hunter UltraScan XE
M I	Macbeth Color i5
M J	Macbeth Color-Eye 3000 Spectrophotometer
MK	Macbeth Color-Eye 7000 Spectrophotometer
MM	Macbeth Color-Eye 7000a
MT	Minolta CM-2600d
MU	Minolta
MV	Minolta CM-3000d Series Spectrophotometer
P E	Perkin Elmer Spectrophotometer
X H	X-Rite Color i5
X I	X-Rite Color i7
XO	X-Rite SP64
X X	Instrument make/model not specified by lab