Collaborative Testing Services, Inc.

Color & Appearance Testing Program

Summary Report # 171 - 1st Qtr 2015

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:

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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 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.

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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

		CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
2D8G2C	A151	57.33	25.72	25.23	0.82	-0.68	-0.48	1.17	HW
	A152	58.15	25.04	24.76					
2KPAUM	A151	57.38	25.39	24.13	0.77	-0.57	-0.39	1.03	GQ
	A152	58.15	24.82	23.75					
2VMX2J	A151	57.49	25.84	25.37	0.85	-0.73	-0.51	1.23	HW
	A152	58.34	25.11	24.86					
36DQXG	A151	57.32	25.70	24.15	0.83	-0.85	-0.59	1.32	AE
	A152	58.15	24.85	23.56					
3VKP9Q	A151	57.61	25.86	25.47	0.81	-0.54	-0.41	1.05	HW
	A152	58.42	25.32	25.06					
6U3DPB	A151	57.08	25.79	25.12	0.82	-0.50	-0.36	1.02	XU
	A152	57.90	25.29	24.77					
7KAG3Z	A151	57.35	25.46	25.50	0.97	-0.41	-0.19	1.07	HW
	A152	58.31	25.05	25.31					
7QW8MB	A151	57.04	25.84	24.81	0.77	-0.51	-0.34	0.98	XZ
	A152	57.81	25.33	24.47					
82EB8F	A151	57.52	25.64	25.31	0.86	-0.58	-0.42	1.12	HW
	A152	58.38	25.06	24.90					
8H3JAJ	A151	57.29	25.76	25.11	0.82	-0.74	-0.57	1.24	HK
	A152	58.11	25.02	24.54					
8JEZKC	A151	57.63	25.98	25.51	0.84	-0.52	-0.35	1.04	HW
	A152	58.46	25.46	25.16					
AQ8939	A151	57.85	25.72	25.12	0.80	-0.82	-0.60	1.29	XD
	A152	58.65	24.91	24.52					
B7TXQA	A151	57.45	25.59	25.28	0.72	-0.39	-0.26	0.86	HW
	A152	58.17	25.20	25.02					
BC3FMG	A151	57.92	25.97	25.57	0.79	-0.52	-0.40	1.02	HW
	A152	58.71	25.45	25.17					

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
DUC8MP	A151	57.63	25.74	24.64	0.74	-0.50	-0.36	0.96	XZ
	A152	58.37	25.24	24.28					
FVHCDH	A151	57.19	25.82	25.04	0.78	-0.64	-0.42	1.09	XO
	A152	57.97	25.19	24.63					
GQ3YBA	A151	57.42	25.67	25.33	0.81	-0.67	-0.47	1.15	HW
	A152	58.23	25.00	24.86					
H2U86W	A151	57.44	25.91	25.02	0.91	-0.65	-0.47	1.20	XN
	A152	58.35	25.26	24.55					
HCCVYV	A151	57.70	25.66	24.92	0.88	-0.57	-0.36	1.10	XZ
	A152	58.58	25.10	24.56					
JV7KBC	A151	57.46	25.83	25.06	0.76	-0.47	-0.26	0.93	XO
	A152	58.22	25.36	24.81					
JVCYK7	A151	57.27	26.10	24.95	0.83	-0.40	-0.19	0.93	GH
	A152	58.09	25.70	24.76					
K976Q7	A151	57.21	25.77	24.45	0.87	-0.44	-0.28	1.01	XZ
	A152	58.08	25.34	24.17					
KKKZ6K	A151	57.46	25.80	25.48	0.86	-0.56	-0.40	1.10	HW
	A152	58.32	25.24	25.08					
LYKYU3	A151	57.26	25.66	24.75	0.67	-0.55	-0.32	0.93	XZ
	A152	57.94	25.11	24.43					
M4NJV6	A151	57.39	25.84	25.17	0.77	-0.53	-0.37	1.00	XM
	A152	58.16	25.31	24.80					
M8UPTY	A151	57.24	26.10	25.07	0.82	-0.57	-0.46	1.10	GB
	A152	58.06	25.53	24.61					
N6YTEP	A151	57.21	26.47	25.85	0.85	-0.65	-0.47	1.17	GA
	A152	58.05	25.82	25.38					
NCF7HU	A151	57.25	25.74	25.02	0.74	-0.40	-0.33	0.90	XO
	A152	57.99	25.34	24.69					

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
NX2WXE		A151	57.46	26.02	25.81	0.85	-0.70	-0.53	1.22	MG
		A152	58.30	25.33	25.27					
PXV9PY		A151	57.41	25.99	25.06	0.80	-0.52	-0.35	1.01	XK
		A152	58.21	25.47	24.71					
RER9YB		A151	57.67	25.86	25.26	0.82	-0.52	-0.35	1.03	GH
		A152	58.48	25.34	24.91					
RHU7A4	X	A151	59.90	26.66	24.08	0.77	-0.48	-0.35	0.97	TO
		A152	60.67	26.19	23.73					
RZBHRV		A151	57.03	25.81	24.76	0.90	-0.55	-0.43	1.14	HK
		A152	57.93	25.26	24.33					
TKFD6K		A151	57.32	26.01	25.23	0.88	-0.75	-0.55	1.28	XU
		A152	58.20	25.26	24.68					
VA8H4Q		A151	56.87	26.03	25.20	0.80	-0.78	-0.63	1.28	HY
		A152	57.67	25.25	24.57					
VATVR4		A151	56.77	25.83	24.80	0.91	-0.58	-0.39	1.14	XR
		A152	57.68	25.25	24.41					
VUXFJW		A151	57.93	26.06	25.61	0.88	-0.59	-0.43	1.14	HW
		A152	58.81	25.47	25.18					

Summary Statistics

Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*
Grand Means							
A151	57.38	25.83	25.08				
A152	58.20	25.25	24.68	0.82	-0.58	-0.41	1.09
Stnd Dev Btwn Labs							
A151	0.26	0.20	0.42				
A152	0.26	0.21	0.42	0.06	0.12	0.11	0.12

Statistics based on 36 of 37 reporting participants

Comments assigned on Data Flags for Test #408

RHU7A4(X) - High L* and a* values.

Interlaboratory Testing Program for Color & Appearance

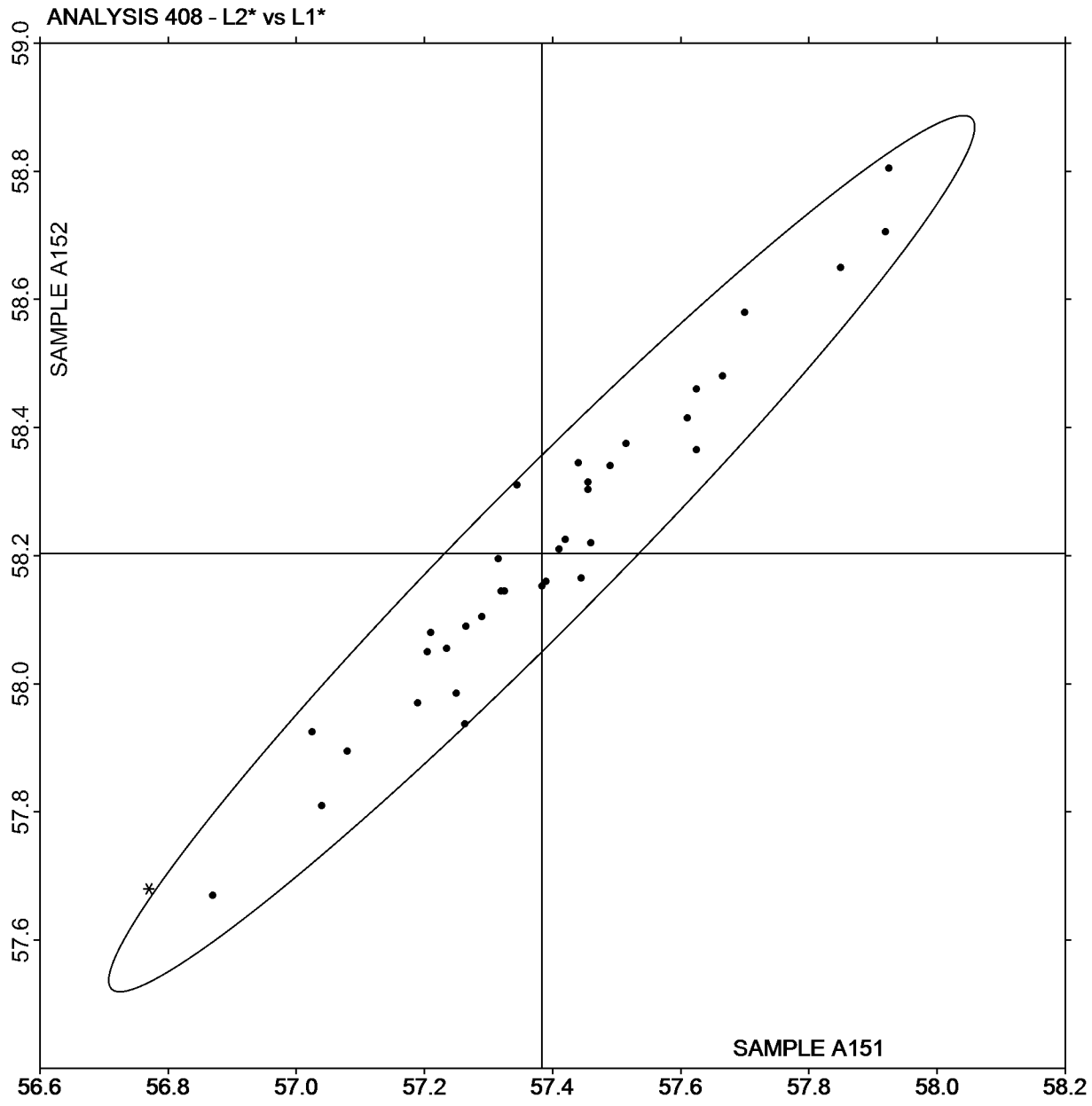
Analysis 408

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 A151 = 57.38 SAMPLE A152 = 58.20



Interlaboratory Testing Program for Color & Appearance

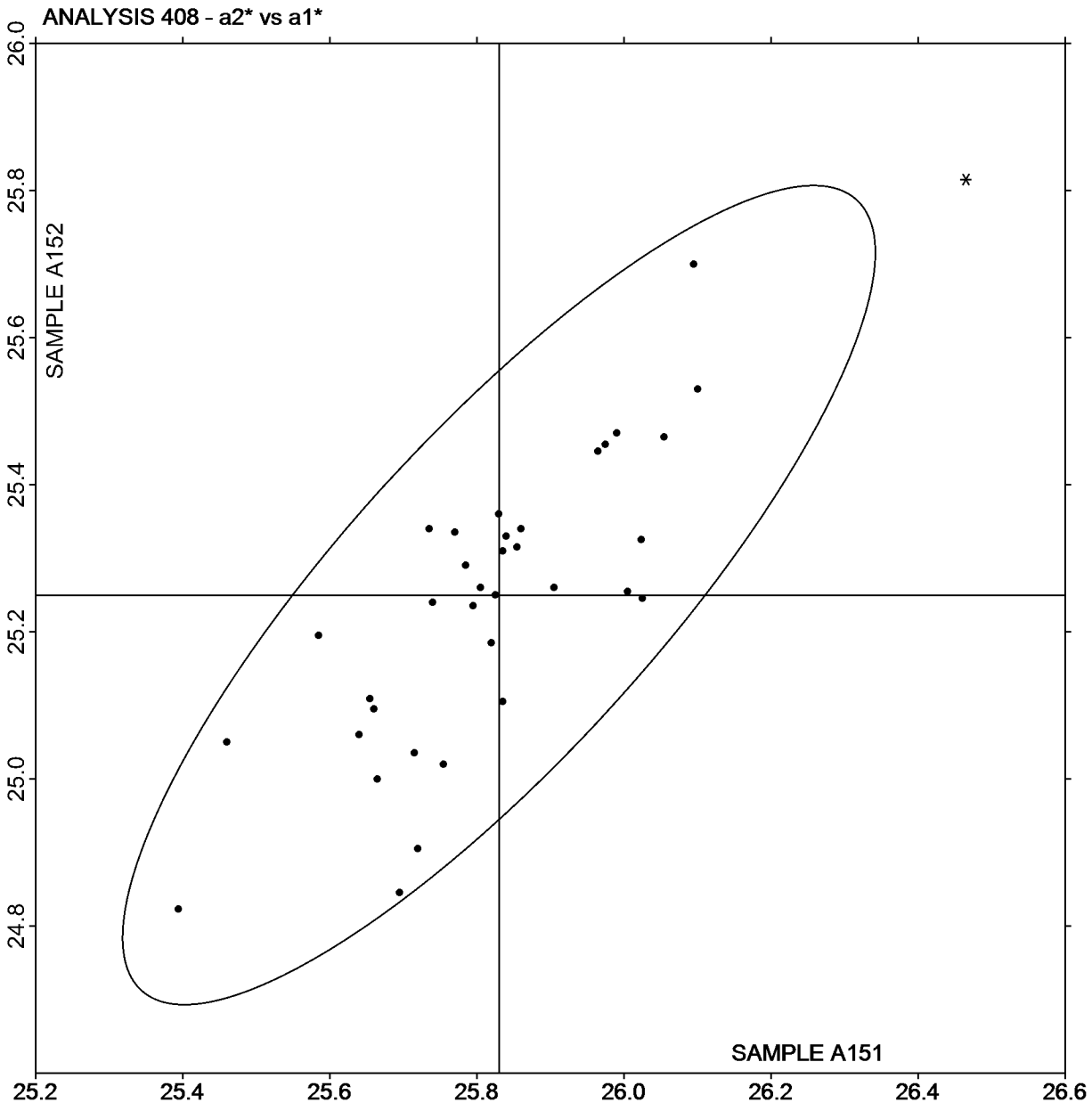
Analysis 408

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 A151 = 25.83 SAMPLE A152 = 25.25



Interlaboratory Testing Program for Color & Appearance

Analysis 408

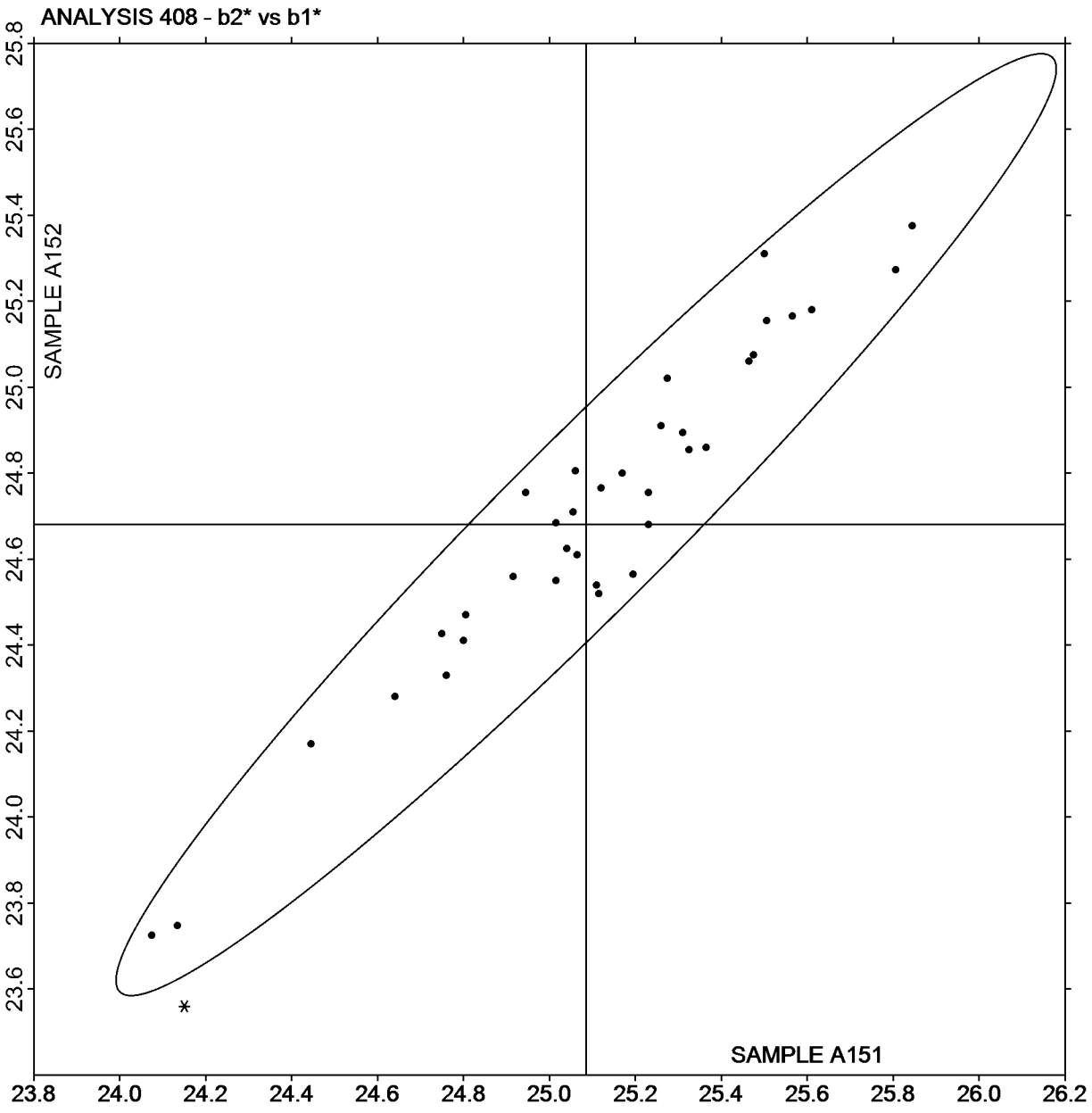
Color and Color Difference - Paint Chips - 45-0 Geometry Instruments

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

b2* vs b1*

SAMPLE A151 = 25.08

SAMPLE A152 = 24.68



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

		CIE L* a* b* Color Values			Color Difference Values				
WebCode	Flag Samples	L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	InstrCode
22FVVG	A151	57.30	25.87	24.40	0.86	-0.73	-0.54	1.25	AJ
	A152	58.16	25.14	23.86					
26TT6P	A151	57.25	25.58	24.21	0.80	-0.57	-0.41	1.06	MV
	A152	58.05	25.02	23.81					
27NEVU	A151	57.37	25.25	24.18	0.77	-0.42	-0.28	0.92	MM
	A152	58.14	24.83	23.90					
2JDBV8	A151	57.29	25.64	24.10	0.82	-0.41	-0.28	0.95	MV
	A152	58.10	25.23	23.83					
2KPAUM	A151	57.38	25.39	24.13	0.77	-0.57	-0.39	1.03	MM
	A152	58.15	24.82	23.75					
2LJVKT	A151	57.20	25.47	24.21	0.81	-0.29	-0.14	0.87	PE
	A152	58.01	25.18	24.08					
2QWE7F	A151	57.38	25.75	24.47	0.80	-0.69	-0.50	1.17	AJ
	A152	58.18	25.06	23.97					
2TXJGF	A151	57.03	25.30	24.28	0.83	-0.67	-0.52	1.18	MJ
	A152	57.86	24.63	23.76					
3PYPWJ	A151	57.15	25.80	24.60	0.86	-0.46	-0.29	1.02	XH
	A152	58.01	25.34	24.31					
44DDL8	A151	57.43	25.52	24.05	0.79	-0.42	-0.29	0.93	AO
	A152	58.21	25.10	23.76					
44V4WD	A151	57.35	25.70	24.56	0.79	-0.48	-0.33	0.98	XH
	A152	58.13	25.22	24.23					
4AXBE2	A151	57.41	25.71	24.54	0.85	-0.67	-0.46	1.17	XI
	A152	58.25	25.04	24.08					
4GHEJH	A151	57.40	25.70	24.01	0.80	-0.57	-0.41	1.06	AJ
	A152	58.20	25.13	23.60					
4K2NCG	A151	57.17	25.42	24.02	0.79	-0.66	-0.48	1.13	MM
	A152	57.96	24.77	23.54					

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
4U8D7E	X	A151	57.91	25.55	24.94	0.62	-0.43	-0.32	0.82	HW
		A152	58.53	25.12	24.62					
4X8JRC		A151	57.26	25.30	24.12	0.84	-0.50	-0.34	1.03	MM
		A152	58.09	24.81	23.78					
69MQ8D		A151	57.41	25.62	24.13	0.83	-0.54	-0.38	1.06	AJ
		A152	58.24	25.08	23.75					
6CZTRM		A151	57.49	25.30	24.74	0.83	-0.54	-0.38	1.06	XI
		A152	58.32	24.76	24.36					
6JLNQ7		A151	57.16	25.70	24.40	0.86	-0.76	-0.51	1.25	XI
		A152	58.02	24.95	23.89					
6U3DPB		A151	57.42	25.52	24.42	0.82	-0.54	-0.35	1.04	XI
		A152	58.24	24.99	24.07					
6UZGJL		A151	57.49	25.61	24.38	0.77	-0.75	-0.54	1.20	AJ
		A152	58.26	24.86	23.84					
7PMZNN		A151	57.13	25.28	24.46	0.84	-0.53	-0.36	1.05	XM
		A152	57.96	24.75	24.10					
82EB8F		A151	57.34	25.36	23.77	0.88	-0.68	-0.45	1.19	HP
		A152	58.21	24.68	23.33					
8MGWCR		A151	57.62	25.46	24.27	0.80	-0.53	-0.36	1.02	HF
		A152	58.42	24.94	23.91					
8T3YBH		A151	57.31	25.63	24.03	0.81	-0.58	-0.38	1.06	AJ
		A152	58.12	25.05	23.66					
97JC3H		A151	57.32	25.46	23.94	0.85	-0.52	-0.33	1.05	XX
		A152	58.17	24.94	23.61					
9FAUHB		A151	57.47	25.56	24.36	0.78	-0.43	-0.31	0.94	XI
		A152	58.25	25.14	24.05					
A7XBHC		A151	57.16	25.46	23.77	0.81	-0.58	-0.34	1.04	HP
		A152	57.97	24.88	23.43					

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
ABBQCA		A151	57.22	25.69	24.09	0.80	-0.67	-0.46	1.14	AM
		A152	58.02	25.02	23.64					
AC3YCD		A151	57.38	25.55	24.03	0.71	-0.34	-0.19	0.81	AM
		A152	58.09	25.21	23.84					
AJAHJJ		A151	57.26	25.67	24.34	0.79	-0.55	-0.40	1.04	MV
		A152	58.04	25.13	23.94					
AKJPJQ	X	A151	57.25	25.52	25.34	0.76	-0.53	-0.38	1.00	GC
		A152	58.01	24.99	24.96					
BBRBCE		A151	57.11	25.58	24.15	0.78	-0.75	-0.57	1.22	GD
		A152	57.89	24.83	23.58					
BJZ2V4		A151	57.24	25.84	24.62	0.88	-0.82	-0.55	1.31	GD
		A152	58.12	25.03	24.08					
BQHEU4		A151	57.47	25.59	24.18	0.77	-0.56	-0.40	1.03	AO
		A152	58.24	25.03	23.78					
BZAW9C	X	A151	58.39	25.67	25.51	0.70	-0.53	-0.38	0.95	MU
		A152	59.09	25.15	25.13					
DA96AU		A151	57.27	25.22	24.08	0.80	-0.37	-0.22	0.90	MM
		A152	58.06	24.85	23.86					
DGAG8C		A151	57.46	25.73	24.40	0.78	-0.58	-0.40	1.05	MV
		A152	58.24	25.15	24.00					
E9PZR8		A151	57.37	25.62	24.34	0.87	-0.52	-0.37	1.07	XI
		A152	58.23	25.10	23.98					
EB2DUH		A151	57.12	25.62	24.20	0.80	-0.53	-0.35	1.02	MI
		A152	57.92	25.10	23.85					
ENNMJ9		A151	57.20	25.34	23.86	0.88	-0.48	-0.33	1.05	AO
		A152	58.08	24.86	23.54					
F3HTNN		A151	57.44	25.60	24.45	0.83	-0.46	-0.30	0.99	AJ
		A152	58.27	25.14	24.15					

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
FFMRWU	X	A151	57.16	25.92	25.14	0.40	-0.36	-0.33	0.62	HG
		A152	57.55	25.57	24.82					
FVHCDH		A151	57.01	25.70	24.39	0.80	-0.56	-0.39	1.05	MI
		A152	57.81	25.14	24.00					
FWCX6N		A151	57.26	25.80	24.16	0.85	-0.46	-0.33	1.01	AJ
		A152	58.10	25.34	23.83					
FXL8WL		A151	57.55	25.60	24.39	0.83	-0.48	-0.27	1.00	AM
		A152	58.38	25.12	24.12					
G2N68D		A151	57.26	25.71	24.51	0.83	-0.49	-0.33	1.01	XH
		A152	58.09	25.22	24.18					
GFJMUQ		A151	57.42	25.56	24.10	0.82	-0.51	-0.37	1.03	AO
		A152	58.24	25.05	23.74					
GNY94U		A151	57.26	25.69	24.34	0.85	-0.66	-0.46	1.17	AL
		A152	58.11	25.03	23.88					
GRXK2F		A151	57.44	25.69	24.19	0.77	-0.62	-0.43	1.07	AJ
		A152	58.21	25.07	23.76					
H2U86W	X	A151	56.34	25.32	24.34	0.83	-0.61	-0.40	1.10	XO
		A152	57.17	24.71	23.94					
HFGE4H	X	A151	57.78	25.50	24.21	0.25	-0.41	-0.24	0.53	XI
		A152	58.03	25.09	23.97					
HKWR7Q		A151	57.37	25.71	24.18	0.84	-0.66	-0.51	1.18	AJ
		A152	58.20	25.05	23.67					
HMYMPU		A151	57.51	25.67	24.19	0.79	-0.39	-0.29	0.92	AO
		A152	58.30	25.29	23.90					
HP3LZM		A151	57.30	25.49	23.96	0.80	-0.51	-0.32	1.00	AM
		A152	58.10	24.98	23.65					
HWMLGY		A151	57.17	25.56	24.11	0.87	-0.68	-0.49	1.20	AJ
		A152	58.04	24.89	23.62					

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
HYQCME		A151	57.30	25.42	24.08	0.84	-0.58	-0.40	1.09	AM
		A152	58.14	24.84	23.68					
J44GWU		A151	57.25	25.51	24.28	0.87	-0.64	-0.44	1.16	XH
		A152	58.12	24.87	23.84					
J4X8X2		A151	57.39	25.62	24.22	0.75	-0.55	-0.40	1.01	AQ
		A152	58.14	25.07	23.82					
J83Q6A		A151	57.16	25.44	24.38	0.85	-0.44	-0.28	0.99	MG
		A152	58.01	25.00	24.10					
JLMBMH		A151	57.45	25.63	24.20	0.80	-0.51	-0.34	1.01	AJ
		A152	58.25	25.12	23.86					
JLY8U9		A151	57.11	25.49	24.11	0.77	-0.50	-0.34	0.98	XH
		A152	57.88	24.99	23.77					
JVCYK7		A151	57.19	25.41	24.45	0.79	-0.54	-0.38	1.02	GD
		A152	57.98	24.88	24.07					
JZJPKQ		A151	57.40	25.68	24.47	0.87	-0.71	-0.53	1.23	XI
		A152	58.26	24.98	23.94					
K2VLRG		A151	57.44	25.32	24.06	0.77	-0.43	-0.29	0.93	MM
		A152	58.21	24.90	23.77					
K4VUWR		A151	57.37	25.63	24.22	0.78	-0.74	-0.59	1.22	AJ
		A152	58.14	24.90	23.63					
KQ8PQF		A151	57.59	25.13	24.08	0.84	-0.43	-0.31	0.99	XI
		A152	58.43	24.70	23.77					
L4FVEM		A151	57.30	25.66	24.14	0.82	-0.66	-0.53	1.17	AJ
		A152	58.12	25.00	23.62					
LKHU3G		A151	57.52	25.55	24.31	0.84	-0.59	-0.45	1.12	XI
		A152	58.36	24.96	23.87					
MEQKTJ	X	A151	57.31	25.23	23.45	0.68	-0.52	-0.01	0.86	HP
		A152	57.99	24.71	23.44					

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
MH7E9F		A151	57.50	25.79	24.38	0.83	-0.63	-0.47	1.14	AQ
		A152	58.33	25.16	23.91					
MJM9CB		A151	57.26	25.58	24.04	0.84	-0.57	-0.40	1.08	AO
		A152	58.09	25.02	23.64					
MYDFZW		A151	57.30	25.60	24.23	0.84	-0.46	-0.30	1.00	MM
		A152	58.14	25.14	23.94					
N3BEUL		A151	57.27	25.29	24.11	0.84	-0.31	-0.18	0.91	MM
		A152	58.11	24.98	23.93					
NARTXQ		A151	57.34	25.55	24.72	0.84	-0.60	-0.46	1.13	GD
		A152	58.18	24.96	24.26					
P2X3UV		A151	57.36	25.70	24.28	0.80	-0.47	-0.30	0.97	AJ
		A152	58.15	25.23	23.98					
P4MB2C		A151	57.56	25.40	24.77	0.71	-0.64	-0.48	1.07	XO
		A152	58.27	24.76	24.30					
PW2DAH		A151	57.33	25.60	24.39	0.83	-0.67	-0.59	1.21	MK
		A152	58.16	24.93	23.80					
PWHGY4		A151	57.26	25.55	24.18	0.86	-0.71	-0.51	1.22	HP
		A152	58.12	24.85	23.68					
PXV9PY		A151	57.28	25.67	24.02	0.85	-0.73	-0.53	1.23	AO
		A152	58.13	24.94	23.50					
Q7HGW8	X	A151	57.62	25.06	24.16	0.78	-0.57	-0.43	1.06	GF
		A152	58.40	24.49	23.73					
QLYF4U		A151	57.35	25.74	24.37	0.80	-0.81	-0.59	1.28	XI
		A152	58.15	24.94	23.78					
QM8PVQ		A151	57.44	25.76	24.26	0.78	-0.54	-0.42	1.03	AO
		A152	58.22	25.23	23.84					
QWWH4G	X	A151	57.54	26.76	24.52	0.83	1.44	-0.38	1.70	MV
		A152	58.36	28.20	24.14					

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
R7JJDY		A151	57.34	25.72	24.48	0.86	-0.69	-0.51	1.22	CE
		A152	58.20	25.03	23.97					
RER9YB		A151	57.34	25.65	24.41	0.83	-0.45	-0.29	0.98	MV
		A152	58.17	25.21	24.12					
RHU7A4	X	A151	59.47	26.35	23.82	0.83	-0.43	-0.30	0.98	CA
		A152	60.30	25.93	23.53					
RPCHM4		A151	57.42	25.60	24.15	0.82	-0.71	-0.54	1.21	AO
		A152	58.24	24.90	23.61					
RQ774E		A151	56.96	25.72	24.49	0.87	-0.56	-0.41	1.11	XH
		A152	57.83	25.16	24.08					
RVHBFE	X	A151	57.32	24.96	24.06	0.85	-0.12	-0.45	0.96	MM
		A152	58.17	24.84	23.61					
TGDEQK		A151	57.30	25.66	24.17	0.71	-0.59	-0.40	1.00	AQ
		A152	58.00	25.07	23.78					
TJ4K9W	X	A151	57.21	25.92	25.13	0.88	-0.87	-0.67	1.40	XH
		A152	58.08	25.05	24.46					
TKA38R		A151	57.44	25.94	24.85	0.88	-0.63	-0.40	1.15	MH
		A152	58.32	25.31	24.45					
TKFD6K		A151	57.26	25.56	24.43	0.88	-0.69	-0.48	1.21	XI
		A152	58.14	24.87	23.95					
TVDBWQ		A151	57.47	25.36	24.64	0.81	-0.59	-0.43	1.08	XO
		A152	58.28	24.77	24.21					
UELV7Y		A151	57.44	25.62	24.17	0.88	-0.44	-0.31	1.03	AO
		A152	58.32	25.18	23.86					
UMFQJW	X	A151	56.37	27.22	22.63	0.84	-0.72	-0.58	1.25	HP
		A152	57.20	26.50	22.05					
UUWE36		A151	57.43	25.60	24.25	0.81	-0.47	-0.29	0.98	XI
		A152	58.24	25.13	23.96					

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
VJBGTR		A151	57.49	25.65	24.56	0.82	-0.31	-0.18	0.89	MU
		A152	58.30	25.35	24.38					
VY728U		A151	57.45	25.35	24.22	0.84	-0.54	-0.39	1.07	AJ
		A152	58.29	24.81	23.83					
VZ6ZQ3		A151	57.14	25.65	24.37	0.92	-0.72	-0.54	1.29	MI
		A152	58.06	24.93	23.83					
W4ZDNC	X	A151	57.17	25.18	24.06	0.00	-0.03	-0.02	0.03	AM
		A152	57.17	25.15	24.04					
WAHQKP		A151	57.37	25.53	24.11	0.85	-0.54	-0.36	1.07	MM
		A152	58.22	24.99	23.75					
WK6PCV		A151	57.21	25.86	24.73	0.86	-0.59	-0.38	1.11	XH
		A152	58.07	25.27	24.36					
Y9L32K		A151	57.43	25.37	24.10	0.79	-0.53	-0.39	1.03	MM
		A152	58.22	24.84	23.71					
YHAX3L		A151	57.23	25.57	24.18	0.83	-0.54	-0.35	1.05	AQ
		A152	58.06	25.03	23.83					
YRDXRM	X	A151	58.44	26.12	24.70	0.86	-0.58	-0.40	1.11	AR
		A152	59.30	25.54	24.31					
YWCAUE		A151	57.30	25.59	24.13	0.86	-0.56	-0.32	1.07	AM
		A152	58.16	25.04	23.81					
Z39L8M		A151	57.33	25.76	24.41	0.81	-0.74	-0.52	1.21	MU
		A152	58.14	25.02	23.90					
Z449FK		A151	57.34	25.65	24.26	0.71	-0.41	-0.29	0.87	AM
		A152	58.05	25.24	23.97					
ZMJD84		A151	57.40	25.40	24.15	0.81	-0.46	-0.29	0.98	XI
		A152	58.21	24.94	23.86					
ZW7CYA		A151	57.44	25.54	24.08	0.83	-0.51	-0.36	1.03	AJ
		A152	58.26	25.03	23.72					

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							
A151	57.33	25.57	24.26				
A152	58.15	25.01	23.88	0.82	-0.56	-0.39	1.07
Stnd Dev Btwn Labs							
A151	0.13	0.16	0.22				
A152	0.13	0.16	0.22	0.04	0.11	0.10	0.11

Statistics based on 97 of 112 reporting participants

Comments assigned on Data Flags for Test #409

4U8D7E(X) - High L* and b* values. Small DL value.

AKJPJQ(X) - High b* values.

BZAW9C(X) - High L* and b* values. Small DL value.

FFMRWU(X) - Low L* and high a* values for Sample A152. High b* values. Large replication difference for L*, a* and b* values. Small DL and DE values.

H2U86W(X) - Low L* values.

HFGE4H(X) - High L* values for Sample A151. Large replication difference for L* values for Sample A151. Small DL and DE values.

MEQKTJ(X) - Low b* values for Sample A151. Small DL and Db values.

Q7HGW8(X) - Low a* values.

QWWH4G(X) - High a* values. Large replication difference for a* values on Sample A151. Large Da and DE values.

RHU7A4(X) - High L* and a* values. Large replication difference for L* values on Sample A152.

RVHBFE(X) - Low a* values for Sample A151. Large replication difference for a* values for Sample A151. Small Da values.

TJ4K9W(X) - High b* values for Sample A151. Large Db, and DE values.

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

W4ZDNC(X) - Low L* values for Sample A152. Small DL, Da, Db, and DE values.

YRDXRM(X) - High L* and a* values.

Interlaboratory Testing Program for Color & Appearance

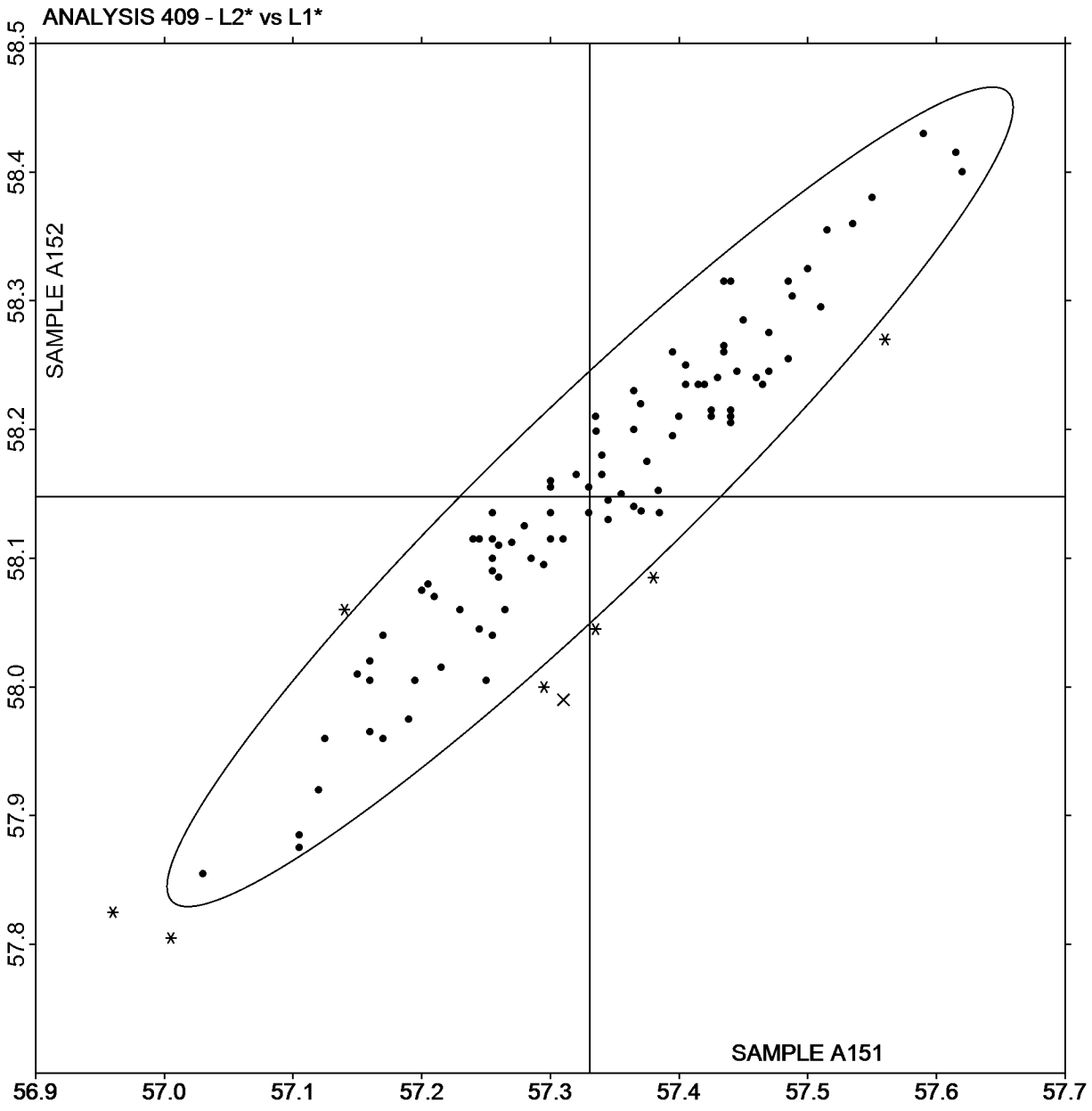
Analysis 409

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 A151 = 57.33 SAMPLE A152 = 58.15



Interlaboratory Testing Program for Color & Appearance

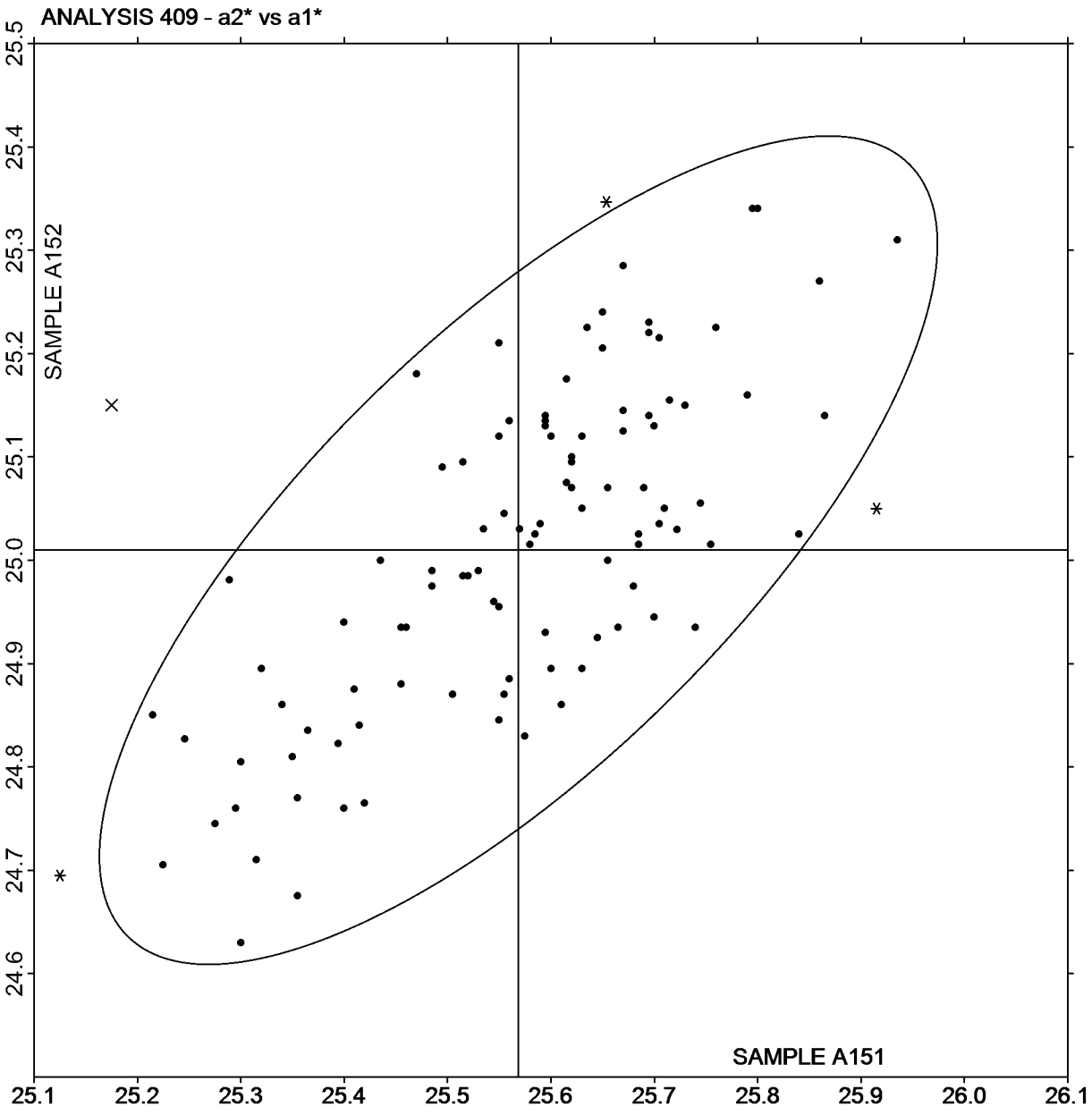
Analysis 409

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 A151 = 25.57 SAMPLE A152 = 25.01



Interlaboratory Testing Program for Color & Appearance

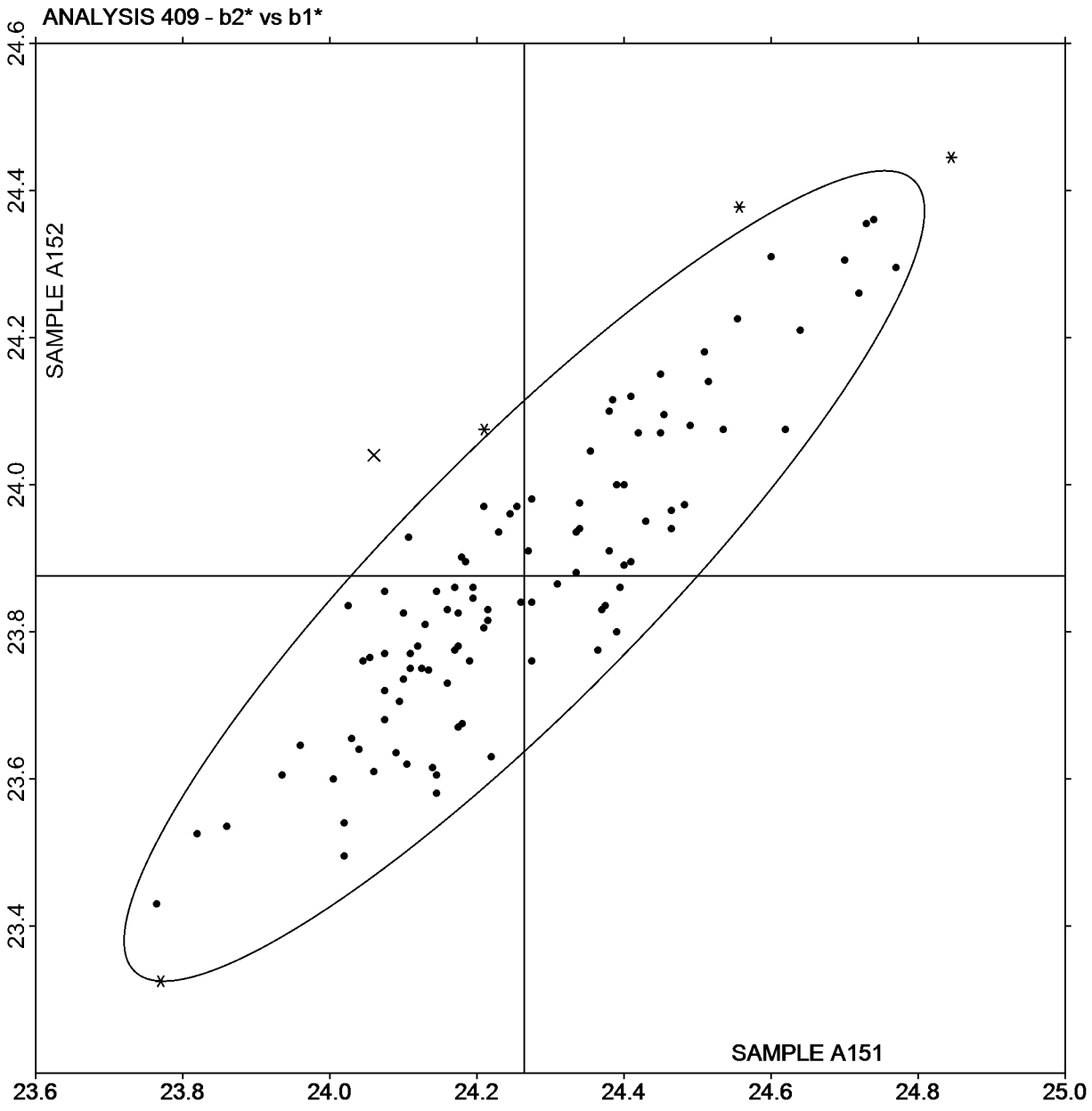
Analysis 409

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 A151 = 24.26 SAMPLE A152 = 23.88



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 A151																		
22FVVG		10.65	11.75	13.10	13.67	13.85	14.56	15.96	17.75	21.49	32.11	43.69	48.61	50.41	52.77	56.27	59.56	AJ
26TT6P		10.68	11.73	13.09	13.68	13.80	14.60	16.00	17.71	21.39	31.84	43.58	48.43	50.28	52.59	55.97	60.70	MV
27NEVU		10.75	11.87	13.16	13.79	13.97	14.76	16.13	17.97	21.79	31.88	43.37	48.35	50.36	52.68	55.93	60.45	MM
2JDBV8		10.89	11.83	13.16	13.80	13.89	14.65	16.09	17.78	21.43	31.88	43.67	48.49	50.36	52.70	56.18	60.89	MV
2KPAUM		10.81	11.93	13.18	13.84	13.99	14.75	16.17	17.92	21.73	31.88	43.55	48.50	50.53	52.87	56.29	60.95	MM
2LJVKT		10.69	11.70	13.06	13.69	13.82	14.61	16.04	17.77	21.33	31.74	43.51	48.32	50.23	52.49	55.85	60.49	PE
2TXJGF		11.28	11.75	12.85	13.54	13.69	14.46	15.89	17.61	21.62	31.70	42.74	47.66X	49.76X	52.05X	55.35X	59.73	MJ
3PYPWJ		10.52	11.63	12.86	13.46	13.61	14.39	15.78	17.52	21.59	32.14	43.43	48.15	50.10	52.33	55.78	60.46	XH
44DDL8		10.83	11.89	13.30	13.88	14.09	14.86	16.24	18.03	21.60	32.04	43.59	48.64	50.69	53.10	56.44	59.14	AO
44V4WD		10.60	11.75	13.02	13.65	13.79	14.60	15.97	17.76	21.75	32.10	43.57	48.28	50.08	52.60	56.02	60.56	XH
4AXBE2		10.60	11.76	13.05	13.67	13.85	14.68	16.08	17.86	21.76	32.18	43.72	48.66	50.67	53.13	56.72	61.34	XI
4GHEJH		10.84	12.00	13.27	13.88	14.07	14.75	16.17	17.92	21.61	32.01	43.61	48.81	50.71	53.16	56.71	60.71	AJ
4U8D7E		10.95	11.87	13.25	13.87	14.04	14.85	16.32	18.11	22.57	33.28X	44.68X	49.16	50.76	52.68	56.40	60.84	HW
4X8JRC		10.76	11.83	13.10	13.75	13.91	14.69	16.09	17.91	21.64	31.59	43.21	48.28	50.39	52.76	56.10	60.71	MM
69MQ8D		10.82	11.91	13.21	13.83	14.04	14.81	16.22	17.93	21.59	31.90	43.62	48.72	50.88	53.32	56.52	58.64X	AJ
6CZTRM		10.62	11.84	13.03	13.58	13.87	14.71	16.17	17.96	21.95	32.39	43.63	48.35	50.54	53.00	56.62	61.26	XI
6JLNQ7		10.56	11.65	12.95	13.56	13.71	14.48	15.89	17.75	21.53	31.74	43.30	48.23	50.37	52.71	56.24	61.02	XI
6U3DPB		10.64	11.79	13.09	13.73	13.94	14.77	16.14	17.96	21.80	32.12	43.56	48.58	50.60	52.94	56.36	60.92	XI
6UZGJL		10.75	11.90	13.19	13.80	14.02	14.73	16.16	17.97	21.75	32.15	43.79	48.87	50.85	53.20	56.77	60.56	AJ
7PMZNN		10.99	11.92	13.29	13.86	14.02	14.85	16.33	18.16	22.62X	33.07X	44.21	48.83	50.48	52.35	56.19	60.50	HW
82EB8F		10.81	12.03	13.30	13.95	14.08	14.88	16.28	18.02	21.47	31.38	43.46	48.56	50.52	52.82	56.49	61.01	HP
8MGWCR		10.78	11.99	13.33	13.89	14.14	14.77	16.34	18.10	22.05	32.20	43.95	48.89	51.01	53.36	57.05	61.05	HF
8T3YBH		10.77	11.90	13.18	13.81	14.01	14.74	16.14	17.91	21.41	31.85	43.40	48.56	50.63	53.09	56.66	59.83	AJ
97JC3H		10.81	11.90	13.23	13.88	14.08	14.79	16.21	17.97	21.64	31.73	43.17	48.55	50.58	53.06	56.70	60.67	XX
9FAUHB		10.84	11.92	13.15	13.79	13.97	14.49	16.18	17.84	22.37	32.29	43.72	48.55	50.60	52.97	56.51	61.18	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 A151																		
A7XBHC		10.84	11.80	13.25	13.76	13.97	14.73	16.15	17.85	21.38	31.24	43.20	48.48	50.27	52.49	55.85	60.46	HP
ABBQCA		10.83	11.79	13.09	13.73	13.90	14.65	16.05	17.78	21.56	31.63	43.27	48.57	50.68	53.13	56.74	60.56	AM
AC3YCD		11.42	11.98	13.21	13.84	14.05	14.78	16.20	17.97	21.55	31.92	43.47	48.60	50.64	53.11	56.86	61.04	AM
AJAHJJ		10.74	11.66	12.99	13.74	13.84	14.58	16.06	17.74	21.41	31.74	43.60	48.57	50.61	52.77	56.36	60.82	MV
BJZ2V4		11.74X	11.51	12.80	13.57	13.68	14.55	15.91	17.79	21.76	31.39	43.70	48.67	50.33	52.63	56.04	60.26	GD
BQHEU4		11.10	11.99	13.29	13.86	14.04	14.78	16.23	17.97	21.83	32.09	44.62X	48.68	50.74	53.19	56.81	61.20	AO
BZAW9C		10.90	11.90	13.20	13.90	14.00	14.80	16.40	17.90	21.75	32.50	44.10	48.80	50.65	52.85	56.10	60.45	MU
DA96AU		10.75	11.85	13.13	13.79	13.94	14.71	16.11	17.92	21.68	31.73	43.17	48.14	50.22	52.51	55.76	60.31	MM
DGAG8C		10.74	11.83	13.15	13.82	13.94	14.69	16.14	17.86	21.64	32.23	44.00	48.86	50.77	53.05	56.37	60.91	MV
E9PZR8		10.68	11.83	13.10	13.72	13.88	14.69	16.06	17.83	21.73	32.16	43.59	48.49	50.47	52.82	56.36	60.96	XI
EB2DUH		10.58	11.69	13.00	13.61	13.78	14.51	15.84	17.70	21.57	31.69	43.17	48.02	50.24	52.44	55.97	60.62	MI
ENNMJ9		10.79	11.86	13.16	13.82	14.04	14.79	16.18	17.95	21.46	31.49	42.86	48.24	50.54	52.93	56.10	58.84	AO
FFMRWU		10.61	11.35X	12.27X	13.36X	13.75	14.35	15.44X	17.39	21.71	32.10	43.30	48.55	50.41	53.10	55.35X	59.95	HG
FVHCDH		10.44	11.55	12.89	13.44	13.63	14.37	15.80	17.55	21.46	31.58	43.11	47.95	50.07	52.47	55.91	60.47	MI
FWCX6N		10.61	11.81	13.14	13.72	13.87	14.62	16.00	17.77	21.52	31.86	43.37	48.58	50.56	53.05	56.47	59.92	AJ
FXL8WL		10.97	11.86	13.17	13.85	14.08	14.82	16.26	18.08	21.78	32.35	43.90	48.89	50.80	53.25	56.93	61.02	AM
G2N68D		10.64	11.76	12.93	13.57	13.76	14.52	15.95	17.71	21.71	32.06	43.52	48.38	50.26	52.70	56.15	60.73	XH
GFJMUQ		10.84	11.94	13.19	13.88	14.06	14.78	16.19	17.97	21.73	31.96	43.58	48.64	50.57	53.04	56.46	60.76	AO
GNY94U		10.64	11.74	13.01	13.69	13.85	14.61	16.05	17.84	21.58	31.75	43.40	48.56	50.69	53.07	56.45	61.05	AL
GRXK2F		10.71	12.01	13.22	13.82	13.96	14.74	16.18	17.90	21.91	32.03	43.59	48.82	50.98	53.45	56.97	60.09	AJ
H2U86W	X	9.98X	11.23X	12.44X	13.01X	13.16X	13.94X	15.31X	17.11X	20.89	30.77X	41.90X	46.56X	48.70X	50.86X	54.37X	58.73X	XO
HFGE4H		10.65	11.85	13.08	13.69	13.91	14.65	16.07	17.82	21.67	32.02	43.37	48.19	50.18	52.59	56.18	60.75	XI
HKWR7Q		10.89	11.90	13.19	13.82	13.98	14.69	16.09	17.90	21.68	31.93	43.54	48.79	50.77	53.23	56.83	60.96	AJ
HMYMPU		10.85	11.95	13.25	13.88	14.08	14.82	16.24	17.98	21.64	32.28	43.94	48.79	50.82	53.12	56.44	59.20	AO
HWMLG		10.73	11.83	13.05	13.69	13.89	14.62	16.01	17.78	21.37	31.41	43.23	48.46	50.58	52.93	56.36	60.97	AJ

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 A151																		
HYQCME		10.77	11.88	13.20	13.80	13.97	14.72	16.15	17.95	21.62	31.62	43.09	48.46	50.58	53.01	56.56	60.03	AM
J83Q6A		10.68	11.60	12.89	13.45	13.60	14.47	15.88	17.62	21.50	32.00	43.30	48.09	50.29	52.65	56.19	60.61	MG
JLMBMH		11.69X	11.96	13.19	13.82	14.04	14.81	16.22	17.98	21.70	32.08	43.64	48.80	50.77	53.26	56.93	61.10	AJ
JLY8U9		10.75	11.77	12.98	13.66	13.79	14.58	15.94	17.72	21.53	31.59	43.08	48.01	50.08	52.40	55.84	60.29	XH
JVCYK7		10.77	11.64	12.79	13.65	13.68	14.43	15.98	17.95	20.90	32.17	43.05	48.34	50.29	52.42	56.02	60.91	GD
JZJPKQ	X	4.25X	4.20X	4.20X	4.23X	4.24X	4.17X	4.07X	4.01X	4.00X	3.99X	4.02X	4.03X	4.13X	4.13X	4.19X	4.35X	XI
K2VLRG		10.86	11.98	13.25	13.88	14.08	14.82	16.24	18.07	21.92	32.04	43.50	48.41	50.42	52.74	56.04	60.61	MM
K4VUWR		10.84	11.91	13.16	13.75	13.96	14.72	16.14	17.87	21.63	32.07	43.62	48.60	50.56	53.00	56.24	59.28	AJ
KQ8PQF		10.91	12.11	13.31	14.01	14.16	14.94	16.38	18.14	22.00	32.27	43.65	48.46	50.52	52.80	56.20	60.65	XI
L4FVEM		10.84	11.82	13.14	13.76	13.95	14.71	16.08	17.87	21.55	31.83	43.32	48.64	50.70	53.14	56.76	60.69	AJ
LKHU3G		10.79	11.94	13.19	13.84	13.99	14.83	16.23	18.01	21.88	32.28	43.78	48.65	50.76	53.06	56.63	61.27	XI
MEQKTJ		10.87	11.79	13.10	13.75	13.88	14.67	16.11	17.86	21.42	31.07	43.00	48.37	50.46	52.85	56.23	60.94	HP
MH7E9F		11.23	11.96	13.19	13.81	14.01	14.72	16.19	17.99	21.73	32.15	43.87	49.04	50.95	53.48	57.00	61.34	AQ
MJM9CB		10.77	11.82	13.10	13.78	13.98	14.71	16.11	17.89	21.46	31.71	43.23	48.49	50.62	53.07	56.36	58.97	AO
MYDFZW		10.50	11.81	13.10	13.73	13.91	14.68	16.08	17.89	21.70	31.78	43.39	48.49	50.66	53.11	56.58	61.43	MM
N3BEUL		10.74	11.84	13.13	13.79	13.95	14.71	16.12	17.95	21.66	31.70	43.32	48.30	50.37	52.70	56.01	60.53	MM
NARTXQ		10.56	11.56	12.80	13.56	13.70	14.27X	15.92	17.66	21.06	32.80	43.30	48.63	50.12	52.38	55.72	60.10	GD
P2X3UV		10.68	11.79	13.11	13.76	13.98	14.73	16.13	17.93	21.55	31.90	43.55	48.74	50.82	53.40	56.69	59.87	AJ
P4MB2C		10.56	11.76	13.05	13.71	13.87	14.66	16.11	17.99	22.18	32.67	43.80	48.51	50.59	53.03	56.78	61.15	XO
PW2DAH		10.68	11.79	13.09	13.73	13.90	14.69	16.10	17.91	21.69	31.87	43.53	48.52	50.65	53.00	56.34	60.93	MK
PWHGY4		10.91	11.79	13.07	13.72	13.88	14.71	16.08	17.82	21.57	31.37	43.47	48.56	50.51	52.69	56.37	60.87	HP
PXV9PY		10.76	11.94	13.23	13.79	13.98	14.68	16.09	17.86	21.45	31.83	43.34	48.48	50.50	52.93	56.48	60.51	AO
QLYF4U		10.71	11.80	13.06	13.69	13.87	14.65	16.05	17.78	21.64	32.07	43.70	48.54	50.58	52.98	56.53	61.26	XI
QM8PVQ		10.79	11.86	13.15	13.82	14.03	14.78	16.18	17.93	21.54	32.07	43.79	48.94	51.03	53.40	56.45	59.16	AO
QWWH4		10.72	11.84	13.11	13.83	13.91	14.70	16.15	17.87	21.70	32.39	44.10	48.95	50.83	53.12	56.50	61.05	MV

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 A151																		
R7JJDY		10.65	11.68	13.03	13.64	13.81	14.64	16.06	17.83	21.45	31.98	43.88	48.71	50.65	52.87	56.21	60.84	CE
RER9YB		10.55	11.71	13.03	13.75	13.87	14.67	16.05	17.78	21.60	31.88	43.78	48.66	50.67	52.97	56.38	60.95	MV
RHU7A4	X	13.00X	13.61X	14.91X	15.40X	15.39X	16.13X	17.65X	19.45X	23.31X	34.68X	47.56X	52.83X	54.85X	57.59X	60.71X	65.70X	CA
RPCHM4		10.85	11.90	13.19	13.83	14.04	14.82	16.20	17.98	21.56	31.95	43.70	48.66	50.74	53.12	56.07	59.14	AO
RQ774E		10.36	11.50	12.70	13.43	13.56	14.41	15.78	17.52	21.31	31.43	43.05	48.08	50.09	52.37	55.72	60.34	XH
RVHBFE		10.87	11.92	13.19	13.79	13.96	14.74	16.16	17.96	21.71	31.75	43.37	48.38	50.50	52.83	56.16	60.73	MM
TGDEQK		11.89X	11.91	13.09	13.75	13.93	14.68	16.09	17.88	21.65	31.76	43.33	48.65	50.77	53.20	56.96	61.27	AQ
TJ4K9W		10.59	11.70	12.89	13.52	13.68	14.46	15.82	17.60	21.46	31.63	43.26	48.40	50.44	52.86	56.39	61.31	MM
TKA38R		10.56	11.61	12.94	13.59	13.78	14.56	16.05	17.83	21.55	32.27	43.95	49.17	51.41X	53.26	56.29	60.56	MH
TKFD6K		10.69	11.73	12.97	13.61	13.76	14.59	15.98	17.82	21.65	32.02	43.31	48.33	50.25	52.57	56.05	60.58	XI
TVDBWQ		10.64	11.77	13.06	13.67	13.88	14.65	16.11	17.93	22.12	32.44	43.89	48.30	50.41	52.56	56.06	60.46	XO
UELV7Y		10.80	11.89	13.23	13.84	14.04	14.80	16.24	17.99	21.56	32.08	43.73	48.73	50.75	53.16	56.38	59.10	AO
UMFQJW		10.85	11.80	13.10	13.71	13.85	14.68	15.85	16.21X	19.12X	29.83X	43.62	48.42	50.49	52.74	56.44	60.92	HP
UUWE36		10.80	11.93	13.20	13.77	13.98	14.75	16.11	17.91	21.78	32.29	43.69	48.50	50.44	52.96	56.44	61.09	XI
VJBGTR		10.43	11.70	13.02	13.86	13.92	14.79	16.13	17.94	21.64	32.19	43.93	48.95	50.92	53.20	56.66	61.39	MU
W4ZDNC		10.58	11.86	13.03	13.70	13.90	14.66	16.07	17.89	21.79	31.59	42.60X	48.03	50.24	52.51	55.82	59.53	AM
WAHQKP		10.84	11.92	13.19	13.83	13.98	14.76	16.17	17.98	21.74	31.84	43.50	48.54	50.67	53.10	56.55	61.42	MM
WK6PCV		10.45	11.58	12.88	13.46	13.61	14.40	15.82	17.52	21.51	32.07	43.71	48.43	50.41	52.66	56.23	60.87	XH
Y9L32K		10.66	11.93	13.25	13.86	14.02	14.82	16.22	18.04	21.83	32.06	43.56	48.40	50.38	52.67	55.94	60.48	MM
YHAX3L		10.62	11.79	13.08	13.71	13.91	14.64	16.06	17.78	21.60	31.74	43.25	48.41	50.44	52.83	56.28	60.46	AQ
YRDXRM	X	11.19	12.35X	13.73X	14.33X	14.53X	15.29X	16.77X	18.60X	22.61X	33.63X	45.61X	50.79X	52.82X	55.27X	58.90X	63.46X	AR
YWCAUE		10.65	11.82	13.16	13.76	13.94	14.67	16.10	17.84	21.69	31.79	43.55	48.53	50.51	52.95	56.62	60.33	AM
Z39L8M		10.59	11.74	13.02	13.72	13.86	14.60	16.07	17.77	21.49	31.89	43.82	48.72	50.73	52.96	56.63	61.27	MV
Z449FK		10.75	11.75	13.06	13.77	13.97	14.73	16.14	17.89	21.55	31.86	43.51	48.71	50.74	53.11	56.69	60.42	AM
ZMJD84		10.83	11.93	13.26	13.80	13.99	14.79	16.22	17.87	21.69	32.06	43.56	48.42	50.45	52.84	56.36	61.05	XI

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 A151																
ZW7CYA		10.84	11.93	13.25	13.87	14.08	14.86	16.26	17.99	21.53	32.09	43.56	48.69	50.68	53.05	56.65	59.44	AJ

Summary Statistics

Grand Means															
10.78	11.81	13.09	13.74	13.91	14.67	16.09	17.85	21.62	31.94	43.53	48.53	50.54	52.89	56.34	60.54
Stnd Dev Btwn Labs															
0.24	0.13	0.15	0.12	0.13	0.13	0.15	0.22	0.36	0.41	0.33	0.26	0.25	0.29	0.35	0.65

Comments assigned on Data Flags for Test #411

H2U86W (X) - Low % reflectance data at all wavelengths.

JZJPKQ (X) - Extreme data for all wavelengths.

RHU7A4 (X) - High % reflectance data at all wavelengths.

YRDXRM (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 E151			Sample E152			
WebCode	Data Flag	Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	Instr Code
27NEVU		50.00	0.08	0.13	60.53	0.07	0.13	GL
2JDBV8		50.83	0.90	1.52	61.70	1.25	2.13	RA
2QWE7F		49.35	-0.57	-0.96	59.85	-0.60	-1.02	MW
3JQ8ZC		49.58	-0.35	-0.58	60.50	0.05	0.08	GK
3PYPWJ		50.00	0.08	0.13	60.00	-0.45	-0.77	GL
44V4WD		50.10	0.18	0.30	60.43	-0.03	-0.04	GK
4AXBE2		50.80	0.88	1.48	61.03	0.58	0.99	GL
4DWPY7		51.13	1.20	2.03	61.38	0.92	1.57	GK
4FLZRJ	X	51.68	1.75	2.95	60.95	0.50	0.85	EM
4U8D7E		49.98	0.05	0.09	60.88	0.42	0.72	GL
6CZTRM		49.58	-0.35	-0.58	59.63	-0.83	-1.41	GK
6JLNQ7		49.73	-0.20	-0.33	60.43	-0.03	-0.04	MH
6U3DPB		49.63	-0.30	-0.50	60.45	0.00	0.00	GN
6ZAYFU		50.80	0.88	1.48	61.48	1.02	1.74	GL
7PMZNN		49.13	-0.80	-1.34	60.28	-0.18	-0.30	GK
7QW8MB		50.25	0.33	0.55	60.60	0.15	0.25	GK
8H3JAJ		50.30	0.38	0.64	61.33	0.87	1.49	GK
8T3YBH		49.43	-0.50	-0.83	59.75	-0.70	-1.19	GK
9FAUHB		48.90	-1.02	-1.72	59.48	-0.98	-1.66	GL
A7XBHC		50.40	0.48	0.81	60.83	0.37	0.64	XX
AJAHJJ		51.18	1.25	2.11	61.45	1.00	1.70	GL
BBRBCE	X	43.63	-6.30	-10.60	53.68	-6.78	-11.54	GB
BJZ2V4		49.20	-0.72	-1.21	59.53	-0.93	-1.58	GB
DFEWG7		49.40	-0.52	-0.88	59.63	-0.83	-1.41	GL
DUC8MP		50.33	0.41	0.68	60.53	0.08	0.13	GL
EB2DUH		50.18	0.25	0.43	61.15	0.70	1.19	GL
FFMRWU		50.63	0.70	1.19	61.30	0.85	1.44	GL
FVHCDH		49.75	-0.17	-0.29	60.43	-0.03	-0.04	GL
GNY94U		49.55	-0.37	-0.62	60.35	-0.10	-0.17	GL
H2U86W		50.15	0.23	0.39	61.03	0.57	0.98	GL
H8PYGZ		49.85	-0.07	-0.12	60.23	-0.23	-0.39	GL
HP3LZM	X	47.35	-2.57	-4.33	57.33	-3.13	-5.32	GK
J4X8X2		50.53	0.60	1.02	61.05	0.60	1.02	PC
JLY8U9		50.00	0.08	0.13	59.98	-0.48	-0.81	GL
JV7KBC		49.68	-0.25	-0.41	60.38	-0.08	-0.13	GL
JVCYK7		50.15	0.23	0.39	60.90	0.45	0.76	GN
K2VLRG	*	49.18	-0.75	-1.26	58.93	-1.53	-2.60	RA
KEEBJ7		49.25	-0.67	-1.13	59.95	-0.50	-0.85	GK
KJQEDE		50.15	0.23	0.39	60.98	0.52	0.89	GL
L4FVEM		49.55	-0.37	-0.62	60.33	-0.13	-0.22	GN
LKHU3G		50.40	0.48	0.81	60.68	0.22	0.38	GL
M4NJV6		49.93	0.00	0.01	59.85	-0.60	-1.02	GL
M8UPTY	X	47.80	-2.12	-3.57	57.85	-2.60	-4.43	GB
MEQKTJ		49.58	-0.35	-0.58	60.35	-0.10	-0.17	GL
MH7E9F		48.95	-0.97	-1.63	59.63	-0.83	-1.41	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample E151 Lab Mean	Sample E151 Difference from Grand Mean	Sample E151 Comparative Performance Value	Sample E152 Lab Mean	Sample E152 Difference from Grand Mean	Sample E152 Comparative Performance Value	Instr Code
N3BEUL		50.05	0.13	0.22	60.08	-0.38	-0.64	GL
N6YTEP		51.00	1.08	1.82	61.58	1.12	1.91	GX
NARTXQ		48.88	-1.05	-1.76	60.03	-0.43	-0.73	GB
P2X3UV		50.03	0.10	0.18	60.18	-0.28	-0.47	MW
P4MB2C	X	46.57	-3.35	-5.64	56.59	-3.86	-6.57	MR
PXV9PY		49.93	0.00	0.01	60.85	0.40	0.68	GQ
Q7HGW8		50.00	0.08	0.13	60.55	0.10	0.17	GL
RHU7A4		49.65	-0.27	-0.46	60.33	-0.13	-0.22	GL
RZBHRV		48.98	-0.95	-1.59	60.18	-0.28	-0.47	GL
TJ4K9W	X	47.75	-2.17	-3.66	57.63	-2.83	-4.81	GL
TKA38R		48.63	-1.30	-2.18	59.78	-0.68	-1.15	GL
TKEFYV		50.08	0.15	0.26	60.25	-0.20	-0.34	GK
TKFD6K		49.83	-0.10	-0.16	60.73	0.27	0.47	GL
TVDBWQ	*	51.05	1.13	1.90	60.68	0.22	0.38	GN
URRTCK		50.28	0.35	0.60	60.98	0.52	0.89	GK
VY728U		50.68	0.75	1.27	61.20	0.75	1.27	GL
WK6PCV		49.60	-0.32	-0.54	60.30	-0.15	-0.26	GL
WMA9GH		49.75	-0.17	-0.29	59.93	-0.53	-0.90	GL
WTE8UT		50.05	0.13	0.22	60.10	-0.35	-0.60	GX
YDXZML		49.80	-0.12	-0.20	60.10	-0.35	-0.60	GK
Z39L8M		49.15	-0.77	-1.30	60.03	-0.43	-0.73	GL
ZW7CYA		50.40	0.48	0.81	60.65	0.20	0.34	XX

Summary Statistics

	Sample E151		Sample E152	
Grand Means	49.92	Gloss Units	60.45	Gloss Units
Stnd Dev Btwn Labs	0.59	Gloss Units	0.59	Gloss Units

Statistics based on 61 of 67 reporting participants

Comments on assigned Data Flags for Test #440

4FLZRJ(X) - Inconsistent in testing between samples, data for Sample E151 are high.

BBRBCE(X) - Data for both samples are low.

HP3LZM(X) - Data for both samples are low. Also Inconsistent in testing within both samples.

M8UPTY(X) - Data for both samples are low. Also Inconsistent in testing within both samples.

P4MB2C(X) - Data for both samples are low. Also Inconsistent in testing within both samples.

TJ4K9W(X) - Data for both samples are low.

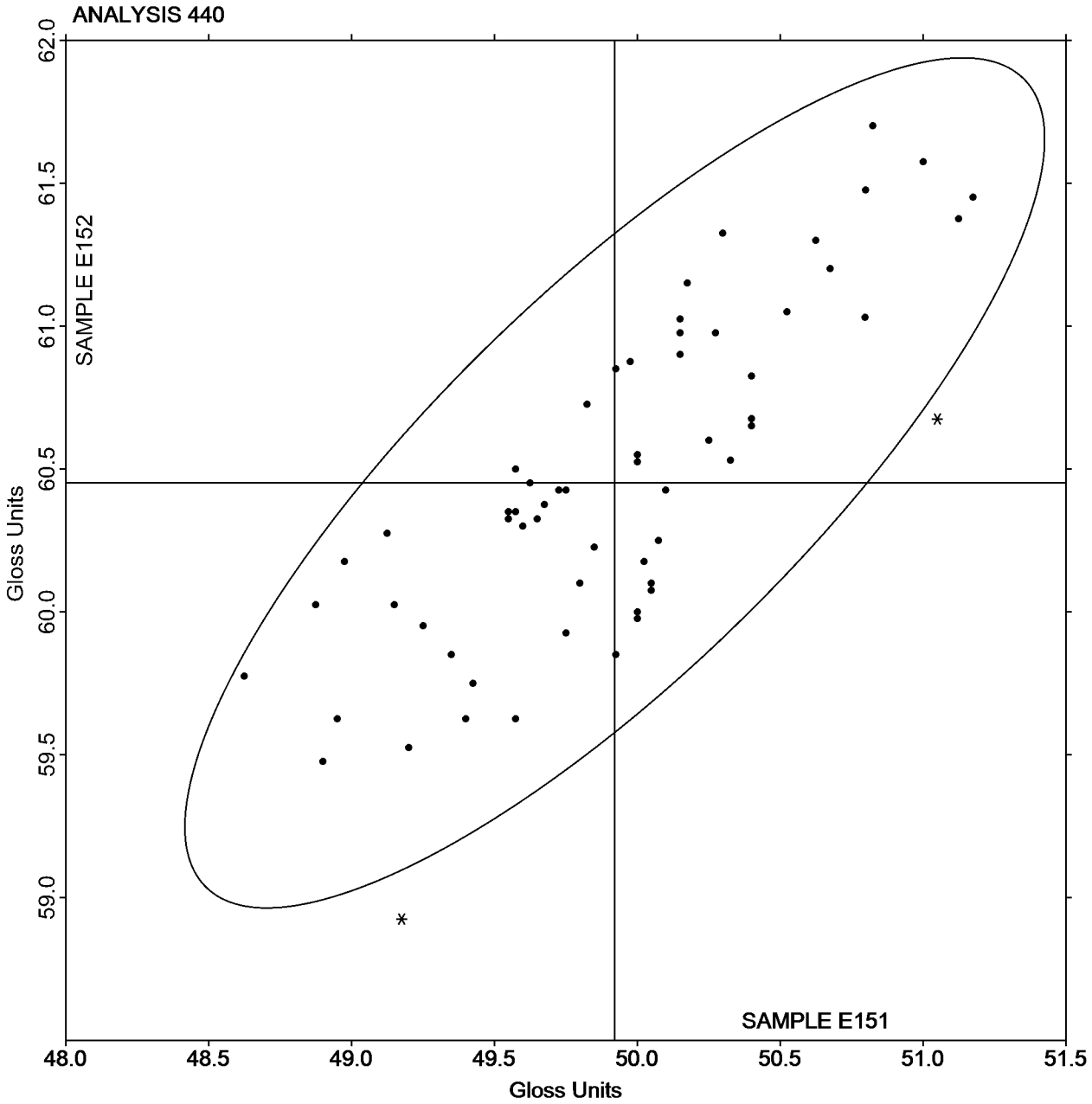
Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE E151 = 49.92 Gloss Units SAMPLE E152 = 60.45 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample J151 Lab Mean	Sample J151 Difference from Grand Mean	Sample J151 Comparative Performance Value	Sample J152 Lab Mean	Sample J152 Difference from Grand Mean	Sample J152 Comparative Performance Value	Instr Code
27NEVU		4.93	0.00	-0.02	9.10	0.03	0.09	GN
3PYPWJ		5.00	0.07	0.61	9.00	-0.07	-0.19	GL
6U3DPB		4.88	-0.05	-0.44	8.83	-0.24	-0.70	GL
9FAUHB		4.85	-0.08	-0.65	8.93	-0.14	-0.41	GL
AJAHJJ		4.83	-0.10	-0.85	8.85	-0.22	-0.62	GL
FFMRWU		4.83	-0.10	-0.85	8.83	-0.24	-0.70	GL
JVCYK7		5.20	0.27	2.29	9.80	0.73	2.10	GN
L4FVEM		4.93	0.00	-0.02	8.98	-0.09	-0.27	GN
RHU7A4		4.73	-0.20	-1.69	8.40	-0.67	-1.92	GL
TKA38R		5.00	0.07	0.61	9.33	0.26	0.74	GL
TKFD6K		4.93	0.00	-0.02	9.08	0.01	0.02	GL
TVDBWQ		5.05	0.12	1.03	9.35	0.28	0.81	GN
Z39L8M		4.93	0.00	-0.02	9.43	0.36	1.03	GL

Summary Statistics

	Sample J151		Sample J152	
Grand Means	4.93	Gloss Units	9.07	Gloss Units
Stnd Dev Btwn Labs	0.12	Gloss Units	0.35	Gloss Units

Statistics based on 13 of 13 reporting participants

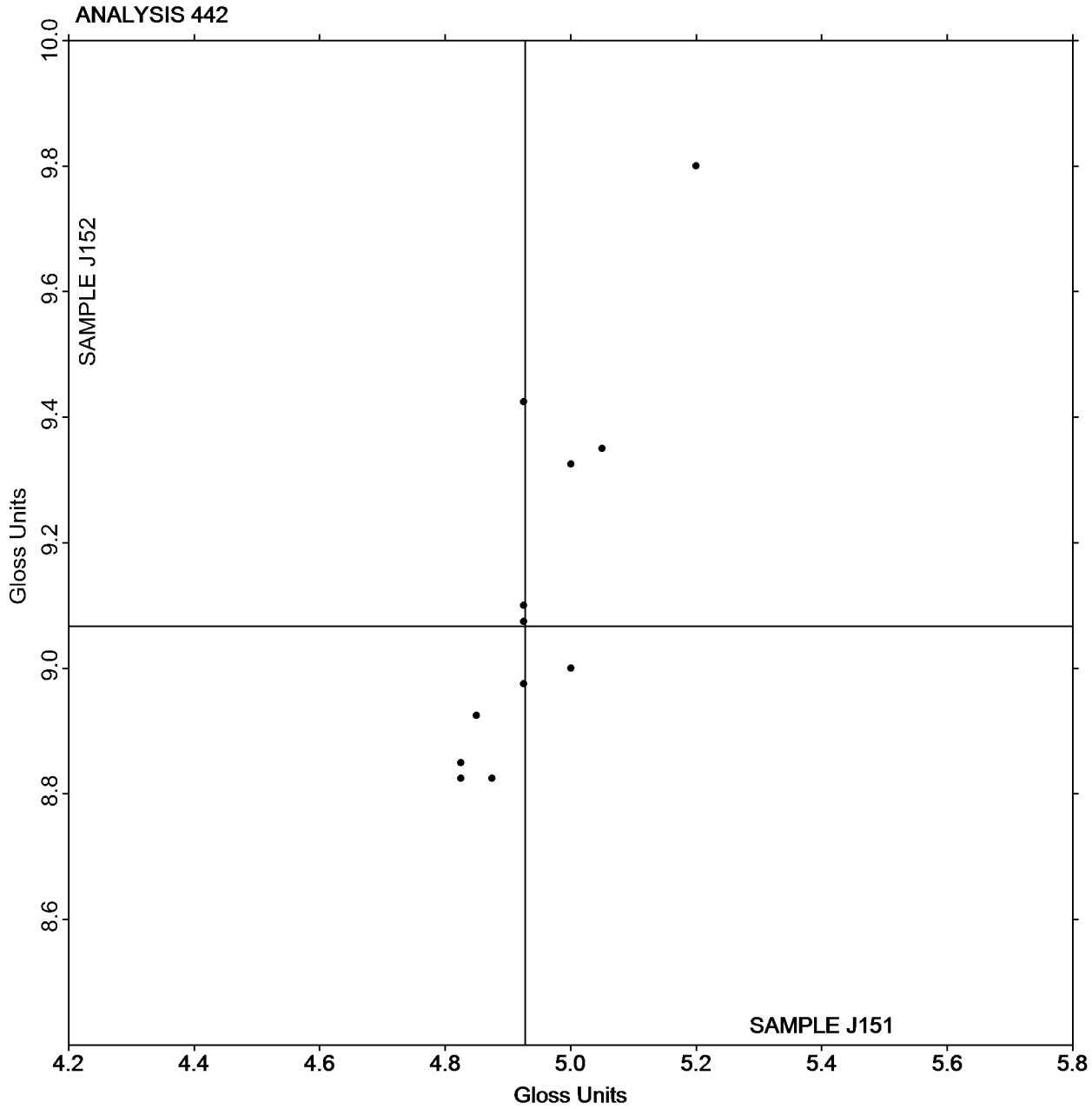
Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE J151 = 4.93 Gloss Units SAMPLE J152 = 9.07 Gloss Units



Instrument Code List - Report# 171

Instrument information as provided by laboratories

Analysis	Analysis Name
440	Gloss 60 Degree (Paint Chips)

Instrument code and descript

EM	Elcometer 400 Novo-curve
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
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 descript

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

Instrument Code List - Report# 171

Instrument information as provided by laboratories

Analysis Analysis Name

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

Instrument code and descript

AE ACS Chroma-Sensor CS-3
GA BYK-Gardner Color Guide (45/0)
GB BYK-Gardner spectro-guide sphere gloss
GH BYK-Gardner Color-View
GQ Gretag SpectroMat
HK Hunter MiniScan XE (45/0)
HW Hunter LabScan XE
HY Hunter Color Flex 45/0
MG Macbeth 1500/PLUS or 2025+ Color Eye
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
XN X-Rite MA68 Multi-Angle SpectroPhotometer
XO X-Rite MA68 II Multi-Angle SpectroPhotometer
XR X-Rite 968 Portable SpectroPhotometer
XU X-Rite 964 Portable SpectroPhotometer
XZ X-Rite

409 Color & Color Difference (Paint Chips) Sphere

Instrument code and descript

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
CE Cary 500
GC BYK-Gardner color-sphere
GD BYK-Gardner spectro-guide sphere
GF BYK-Gardner The Color Sphere (TCS)
HF Hunter ColorFlex Diffuse
HG Hunter ColorQUEST
HP Hunter UltraScan PRO
HW Hunter UltraScan XE
MG Macbeth 2180 Color Eye
MH Macbeth Color-Eye XTH
MI Macbeth Color i 5
MJ Macbeth Color-Eye 3000
MK Macbeth Color-Eye 7000
MM Macbeth Color-Eye 7000a
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# 171

Instrument information as provided by laboratories

Analysis	Analysis Name
411	Spectrophotometric (Paint Chips) - Sphere

Instrument code and descript

AJ	ACS-Datacolor 600
AL	ACS-Datacolor Intl. Dataflash 100
AM	ACS-Datacolor 600 Plus
AO	ACS-Datacolor 650
AQ	ACS-Datacolor 600X
AR	Datacolor 400
CA	Cary 5000
CE	Cary 500
GD	BYK-Gardner spectro-guide sphere
HF	Hunter ColorFlex Diffuse
HG	Hunter ColorQUEST
HP	Hunter UltraScan PRO
HW	Hunter UltraScan XE
MG	Macbeth 2180 Color Eye
MH	Macbeth Color-Eye XTH
MI	Macbeth Color i5
MJ	Macbeth Color-Eye 3000 Spectrophotometer
MK	Macbeth Color-Eye 7000 Spectrophotometer
MM	Macbeth Color-Eye 7000a
MU	Minolta
MV	Minolta CM-3000d Series Spectrophotometer
PE	Perkin Elmer Spectrophotometer
XH	X-Rite Color i5
XI	X-Rite Color i7
XO	X-Rite SP64
XX	Instrument make/model not specified by lab