



Color & Appearance Testing Program

Summary Report #167 - 1st Qtr 2014

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[Key to Tables and Graphs \(Color Tests\)](#)

[Key to Tables and Graphs \(Spectro Test\)](#)

[Key to Tables and Graphs \(GlossTests\)](#)

<u>Analysis</u>	<u>Analysis Name</u>
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408	Color & Color Difference (Paint Chips) - 45-0
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409	Color & Color Difference (Paint Chips) Sphere
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411	Spectrophotometric (Paint Chips) - Sphere
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440	Gloss 60 Degree (Paint Chips)
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442	Gloss 85 Degree (Paint Chips)
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About The Color & Appearance Program

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

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

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

ABOUT CTS

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

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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:

<u>DATA FLAG</u>	<u>STATISTICALLY INCLUDED/EXCLUDED</u>	<u>ACTION REQUIRED</u>
*	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:

<u>DATA FLAG</u>	<u>STATISTICALLY INCLUDED/EXCLUDED</u>	<u>ACTION REQUIRED</u>
*	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 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:

<u>DATA FLAG</u>	<u>STATISTICALLY INCLUDED/EXCLUDED</u>	<u>ACTION REQUIRED</u>
*	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.



CTS Interlaboratory Testing Program for Color & Appearance Report #167
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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
2G2PTL		A141	71.44	29.99	26.74	0.42	-0.43	-0.57	0.83	GH
		A142	71.86	29.57	26.17					
2ZXF43		A141	71.64	29.74	26.75	0.59	-0.40	-0.54	0.89	XO
		A142	72.23	29.34	26.21					
3YFYER		A141	72.12	29.36	26.81	0.62	-0.49	-0.61	0.99	HW
		A142	72.73	28.87	26.20					
4AB6GV		A141	71.79	29.48	27.08	0.39	-0.29	-0.42	0.64	HW
		A142	72.18	29.19	26.66					
6JFHEP		A141	71.25	30.16	25.80	0.51	-0.27	-0.43	0.72	GU
		A142	71.76	29.89	25.37					
6YJ9K9		A141	71.74	29.82	26.61	0.50	-0.36	-0.52	0.80	XO
		A142	72.23	29.46	26.09					
72QJJX		A141	71.60	29.68	26.55	0.56	-0.39	-0.53	0.86	XM
		A142	72.16	29.30	26.03					
79UPAL		A141	71.62	29.92	26.78	0.42	-0.32	-0.46	0.69	XK
		A142	72.03	29.60	26.32					
8KFXCZ		A141	71.87	29.34	26.96	0.54	-0.43	-0.54	0.87	HW
		A142	72.41	28.92	26.43					
AKBPBW		A141	71.35	29.84	26.48	0.59	-0.40	-0.53	0.88	XU
		A142	71.94	29.45	25.95					
B7DWEM		A141	71.37	30.25	25.62	0.54	-0.38	-0.50	0.82	GU
		A142	71.90	29.87	25.12					
BLBB6M		A141	71.89	29.21	27.40	0.53	-0.42	-0.55	0.87	HW
		A142	72.42	28.79	26.85					
C3KKT8		A141	71.60	30.34	26.76	0.55	-0.44	-0.53	0.88	GE
		A142	72.15	29.90	26.23					
CPX8T6		A141	71.53	29.85	26.55	0.39	-0.28	-0.42	0.63	XV
		A142	71.92	29.58	26.14					
DKKMLJ		A141	71.72	29.54	26.11	0.57	-0.42	-0.59	0.92	HK
		A142	72.28	29.12	25.53					
DR3PFM		A141	72.78	29.72	27.25	0.59	-0.53	-0.67	1.03	HW
		A142	73.37	29.19	26.58					



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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
DYCUR7		A141	71.31	29.89	26.08	0.56	-0.44	-0.62	0.94	XR
		A142	71.87	29.45	25.46					
EUG73C	X	A141	73.48	28.98	26.98	0.55	-0.42	-0.54	0.88	MG
		A142	74.03	28.56	26.45					
F99NUU		A141	71.78	29.75	26.48	0.55	-0.44	-0.57	0.91	XO
		A142	72.33	29.31	25.91					
FZHT6C		A141	72.41	29.80	26.17	0.64	-0.42	-0.52	0.92	TN
		A142	73.05	29.39	25.65					
G9GZW7		A141	72.16	29.51	27.12	0.55	-0.49	-0.66	0.98	HW
		A142	72.71	29.02	26.46					
HQ9G9D		A141	71.50	29.86	26.59	0.42	-0.42	-0.57	0.82	XO
		A142	71.92	29.45	26.03					
HVLLDF	X	A141	72.13	28.61	24.94	-0.02	0.00	0.01	0.02	GE
		A142	72.11	28.61	24.95					
JPEYX6		A141	72.21	29.51	26.91	0.63	-0.46	-0.60	0.98	HW
		A142	72.83	29.06	26.31					
L7WGL3		A141	71.35	29.67	26.37	0.55	-0.39	-0.57	0.88	HY
		A142	71.90	29.28	25.80					
LCC9HU		A141	72.07	29.30	26.95	0.57	-0.44	-0.59	0.92	HW
		A142	72.64	28.86	26.36					
MYP9KD		A141	71.59	29.75	26.53	0.54	-0.37	-0.48	0.81	XU
		A142	72.13	29.38	26.05					
N7KRBL		A141	71.70	29.56	25.42	0.57	-0.47	-0.57	0.93	AE
		A142	72.27	29.09	24.85					
P4PJAV		A141	71.51	29.34	25.50	0.56	-0.46	-0.53	0.89	XX
		A142	72.07	28.89	24.97					
PN2XE6		A141	71.75	29.59	26.84	0.63	-0.50	-0.57	0.98	GD
		A142	72.38	29.10	26.28					
PPUXAV		A141	71.46	29.78	26.33	0.53	-0.43	-0.53	0.86	XV
		A142	71.99	29.35	25.81					
PUF3RX		A141	71.85	29.16	26.88	0.55	-0.41	-0.55	0.88	HW
		A142	72.40	28.76	26.33					



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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
RT7AXU		A141	71.78	29.21	25.73	0.63	-0.48	-0.53	0.94	GE
		A142	72.40	28.73	25.20					
RVYBLC		A141	71.75	30.48	26.87	0.53	-0.45	-0.58	0.90	GH
		A142	72.28	30.04	26.29					
UY3B7D	X	A141	75.66	27.32	24.23	1.06	-0.61	-0.66	1.38	XN
		A142	76.71	26.71	23.57					
YJZALE		A141	72.35	29.24	26.53	0.46	-0.37	-0.53	0.79	HK
		A142	72.81	28.87	26.00					

Summary Statistics								
Samples	L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
Grand Means								
A141	71.75	29.66	26.54					
A142	72.29	29.25	26.00	0.54	-0.41	-0.54	0.87	
Std Dev Btwn Labs								
A141	0.35	0.35	0.50					
A142	0.37	0.37	0.49	0.07	0.06	0.06	0.09	

Statistics based on 33 of 36 reporting participants

Comments Assigned on Data Flags for Test #408

EUG73C(X) - High L* values.

HVLLDF(X) - Low a* and b* values for Sample A141. Small DL, Da, Db, and DE values.

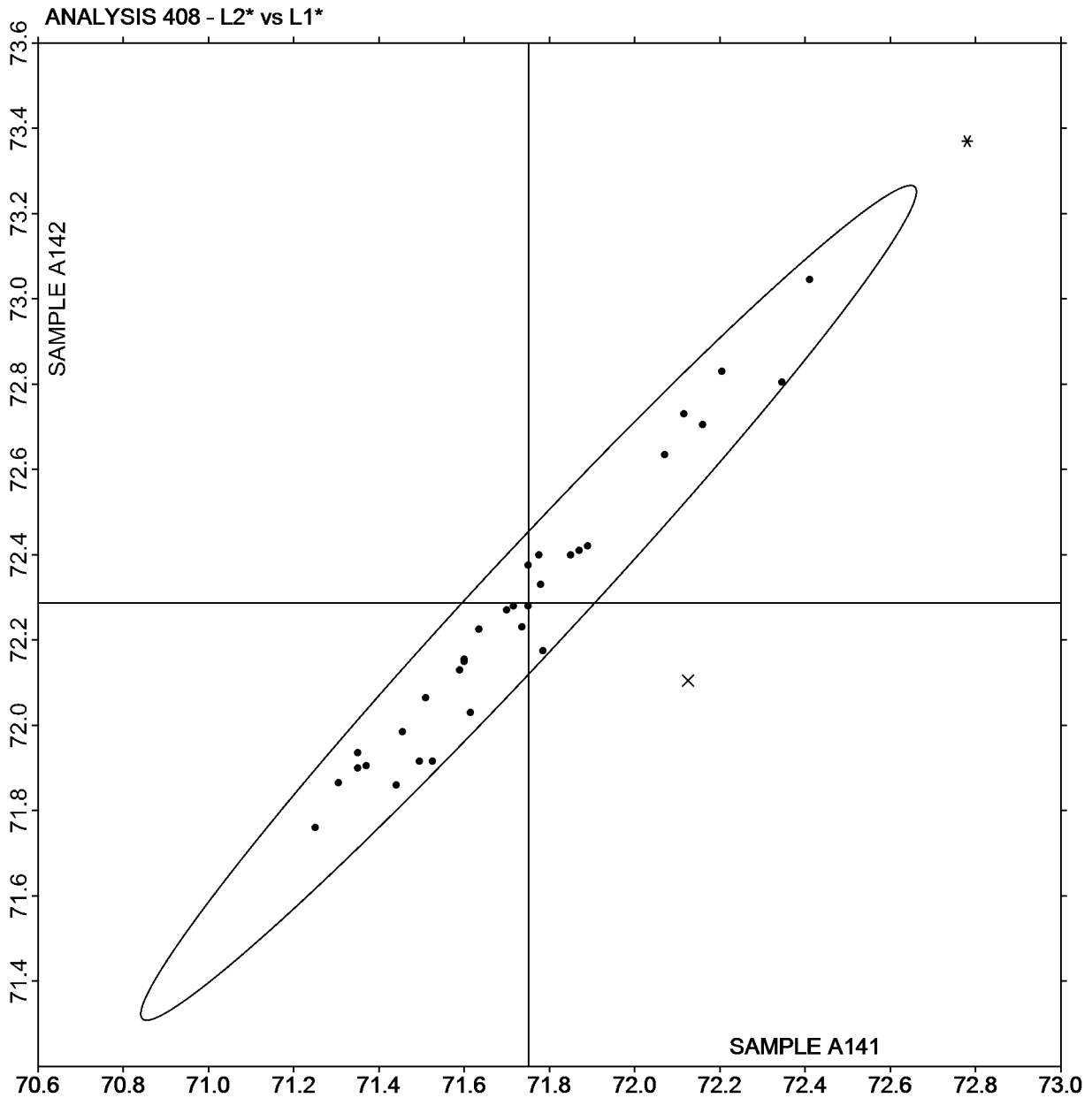
UY3B7D(X) - Low a*, b* values and high L* values. Large DL, Da, and DE values.



L2* vs L1*

SAMPLE A141 = 71.75

SAMPLE A142 = 72.29

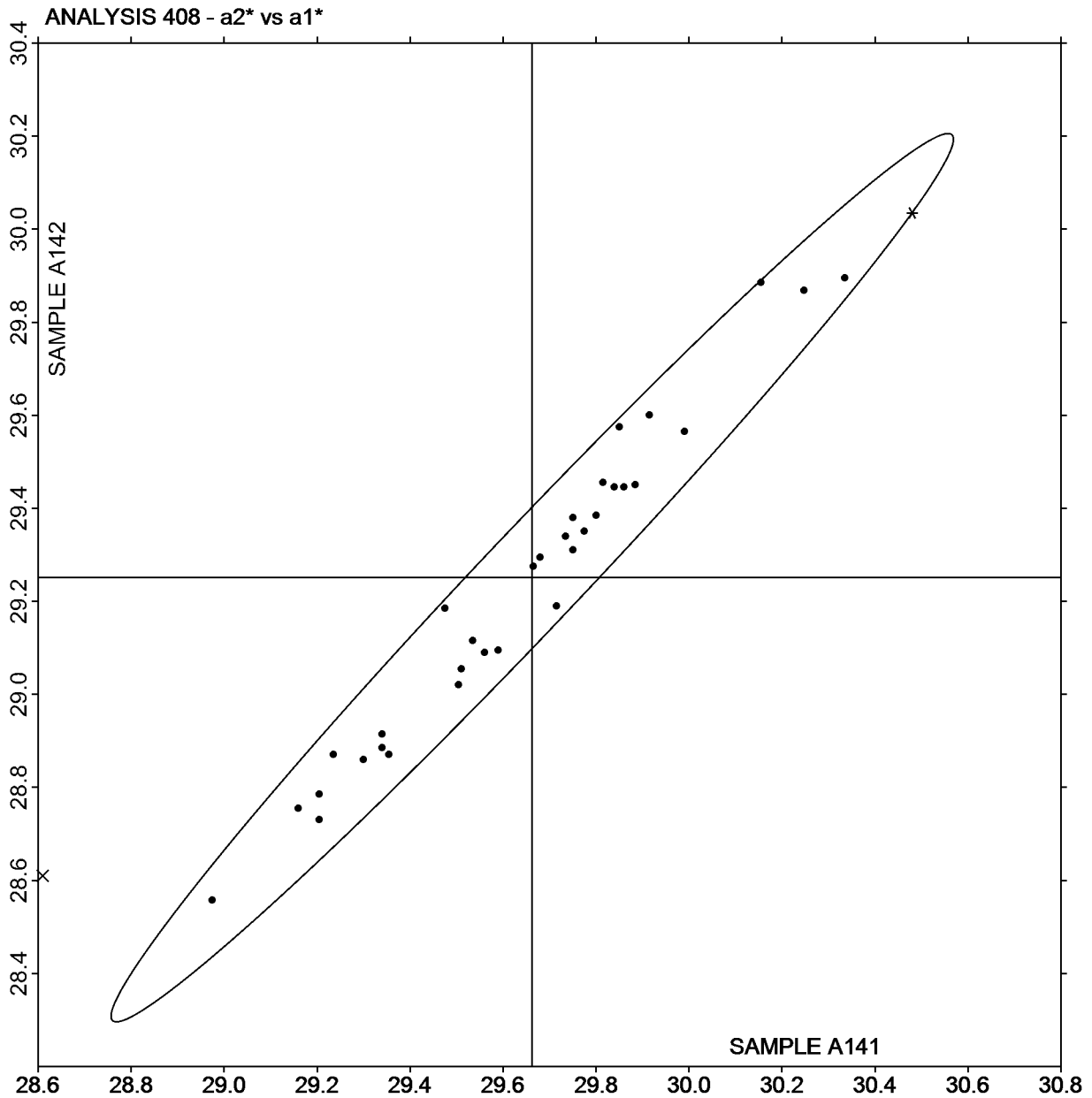




a2* vs a1*

SAMPLE A141 = 29.66

SAMPLE A142 = 29.25

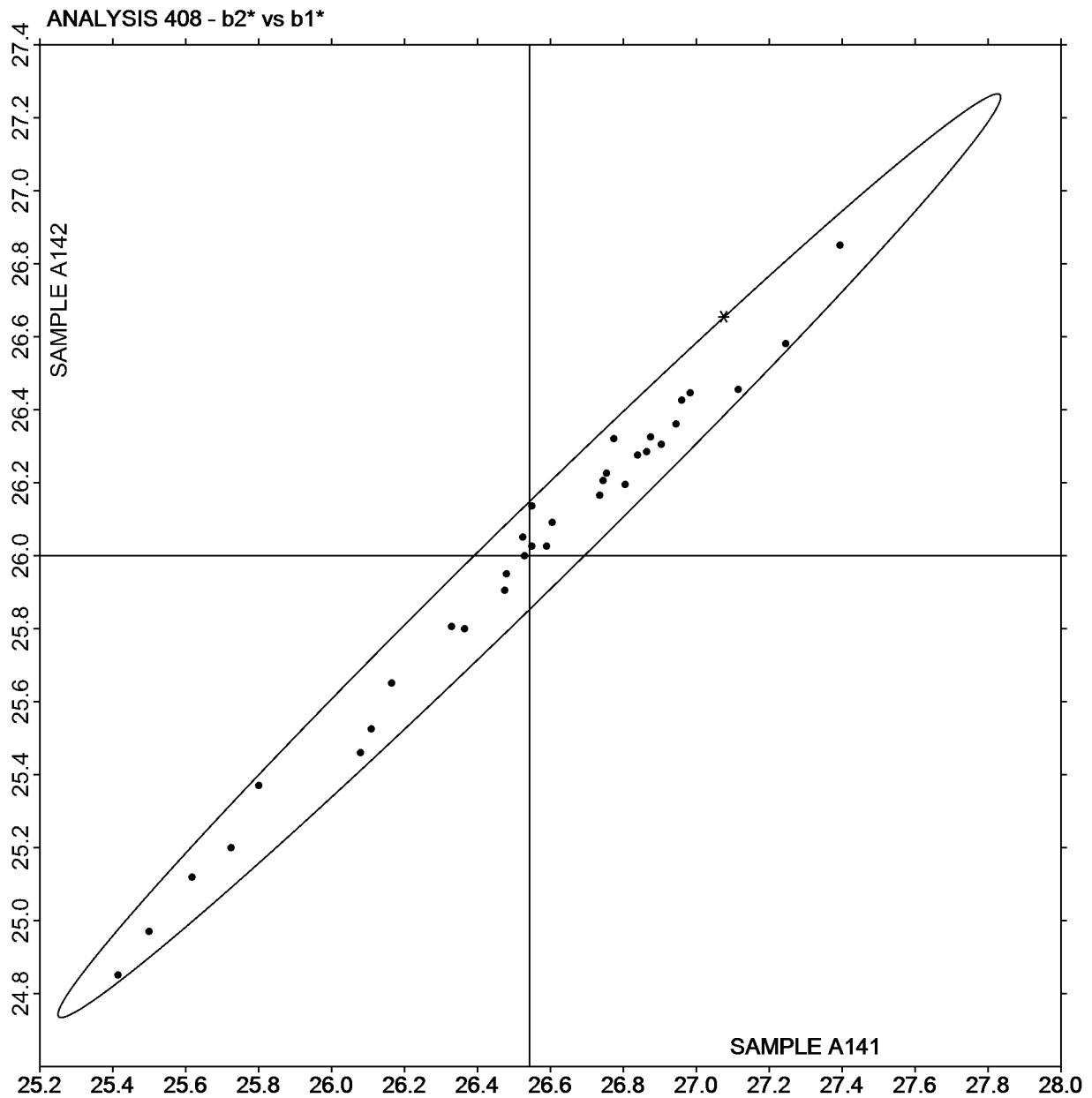




b2* vs b1*

SAMPLE A141 = 26.54

SAMPLE A142 = 26.00





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WebCode	Flag	Samples	CIE L* a* b* Color Values			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
26K2GZ	X	A141	71.50	29.23	24.98	0.63	-0.42	-0.56	0.94	HG
		A142	72.13	28.81	24.42					
2724JF		A141	71.62	29.49	25.18	0.61	-0.48	-0.56	0.95	AJ
	A142	72.23	29.02	24.62						
2EWBZZ		A141	71.49	29.28	25.55	0.59	-0.45	-0.56	0.92	XI
	A142	72.08	28.84	24.99						
2XZVU2		A141	71.32	29.13	25.45	0.57	-0.46	-0.57	0.93	MM
	A142	71.89	28.67	24.88						
33NXB7		A141	71.81	29.04	25.53	0.59	-0.51	-0.60	0.98	HF
	A142	72.39	28.53	24.93						
3LR23V		A141	71.77	29.35	25.26	0.58	-0.51	-0.63	0.99	AM
	A142	72.34	28.84	24.64						
3LTZLA		A141	71.71	29.29	25.73	0.60	-0.43	-0.54	0.91	XH
	A142	72.31	28.86	25.19						
3M4YUD		A141	71.70	29.46	25.31	0.63	-0.50	-0.63	1.02	AM
	A142	72.33	28.97	24.68						
3VZY4Y		A141	71.54	29.49	25.17	0.60	-0.46	-0.56	0.93	AJ
	A142	72.14	29.04	24.62						
3ZJE3C		A141	71.73	29.17	25.38	0.60	-0.47	-0.54	0.93	XH
	A142	72.33	28.70	24.84						
4FWE2V		A141	71.49	29.13	25.44	0.62	-0.46	-0.57	0.96	MM
	A142	72.11	28.67	24.87						
4XYNTK		A141	71.64	29.64	25.63	0.61	-0.51	-0.62	1.00	MV
	A142	72.25	29.13	25.02						
7Y7TA7		A141	71.61	29.34	25.48	0.58	-0.49	-0.59	0.96	MM
	A142	72.19	28.86	24.89						
8284XT		A141	71.85	29.38	25.30	0.58	-0.49	-0.59	0.95	AM
	A142	72.42	28.89	24.72						
86M7TK		A141	71.48	29.48	25.57	0.60	-0.51	-0.60	0.99	XX
	A142	72.07	28.97	24.97						
962UNK		A141	71.54	29.47	25.20	0.60	-0.47	-0.58	0.95	AQ
	A142	72.13	29.00	24.62						



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WebCode	Flag	Samples	CIE L* a* b* Color Values			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
9APAN4		A141	71.65	29.69	25.69	0.60	-0.48	-0.61	0.97	PE
		A142	72.24	29.22	25.09					
9BPBM9		A141	71.75	29.34	25.12	0.57	-0.47	-0.58	0.93	AO
		A142	72.32	28.88	24.55					
9NDGCD		A141	71.64	29.14	25.39	0.59	-0.50	-0.59	0.97	MM
		A142	72.23	28.65	24.80					
9UXCL9		A141	71.86	29.38	25.50	0.58	-0.43	-0.57	0.91	AJ
		A142	72.44	28.95	24.93					
AB98CF		A141	71.35	29.41	24.97	0.59	-0.47	-0.54	0.92	HP
		A142	71.94	28.94	24.43					
AK8887		A141	71.68	29.12	25.44	0.57	-0.44	-0.54	0.89	XI
		A142	72.24	28.69	24.90					
B7NPAW		A141	71.41	29.52	25.61	0.60	-0.47	-0.56	0.94	MI
		A142	72.01	29.05	25.05					
B8KLYD		A141	71.45	29.37	25.02	0.57	-0.44	-0.55	0.91	HP
		A142	72.02	28.93	24.47					
BEH23H		A141	71.66	29.48	25.35	0.64	-0.53	-0.61	1.03	AM
		A142	72.30	28.96	24.74					
BELXUB		A141	71.59	29.47	25.52	0.54	-0.49	-0.56	0.92	CE
		A142	72.13	28.97	24.95					
BH4KH9		A141	71.64	29.26	25.35	0.57	-0.44	-0.56	0.91	XI
		A142	72.21	28.82	24.79					
BQQX4L		A141	71.49	29.49	25.18	0.59	-0.50	-0.57	0.96	AJ
		A142	72.08	28.99	24.62					
BTL4XY		A141	71.45	29.26	25.26	0.58	-0.45	-0.57	0.92	MM
		A142	72.03	28.81	24.70					
BUEZHM		A141	71.73	29.30	25.64	0.63	-0.48	-0.55	0.96	XH
		A142	72.35	28.82	25.09					
CDJP2G		A141	71.49	28.97	26.00	0.66	-0.52	-0.63	1.05	XM
		A142	72.15	28.45	25.37					
CUANBP		A141	71.72	29.38	25.31	0.59	-0.48	-0.58	0.95	AR
		A142	72.31	28.90	24.74					



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

WebCode	Flag	Samples	CIE L* a* b* Color Values			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
DAZRB7		A141	71.39	29.47	25.32	0.56	-0.52	-0.62	0.98	AJ
		A142	71.95	28.95	24.70					
DGNZRV		A141	71.54	29.05	25.44	0.59	-0.48	-0.57	0.94	MK
		A142	72.13	28.58	24.87					
DKYAHE		A141	71.59	29.54	25.26	0.59	-0.50	-0.54	0.94	MV
		A142	72.18	29.05	24.72					
EL9PFD		A141	71.56	29.35	25.21	0.64	-0.43	-0.55	0.94	AJ
		A142	72.19	28.92	24.66					
EQWA88	X	A141	72.17	28.91	25.80	0.58	-0.51	-0.60	0.98	XO
		A142	72.74	28.40	25.20					
EVDLDN	X	A141	71.57	29.08	25.21	0.54	-0.48	-0.55	0.91	HH
		A142	72.11	28.60	24.66					
EXXJFK		A141	71.56	29.27	25.32	0.60	-0.44	-0.56	0.93	MM
		A142	72.16	28.83	24.77					
FC3V9Q		A141	71.66	29.16	25.36	0.56	-0.43	-0.54	0.89	XX
		A142	72.23	28.73	24.82					
FMYAL9		A141	71.73	28.72	25.17	0.64	-0.47	-0.59	0.99	MJ
		A142	72.37	28.25	24.58					
FTGJUD		A141	71.58	29.13	25.33	0.60	-0.44	-0.54	0.92	MK
		A142	72.18	28.69	24.79					
FUHWUZ		A141	71.72	29.40	25.48	0.60	-0.52	-0.60	0.99	MM
		A142	72.32	28.88	24.88					
G68W8F		A141	71.79	29.31	25.39	0.58	-0.46	-0.59	0.94	AM
		A142	72.37	28.86	24.80					
G78JFE		A141	71.76	29.20	25.28	0.60	-0.51	-0.58	0.97	AJ
		A142	72.35	28.70	24.70					
GAAJNC		A141	71.82	29.21	25.10	0.62	-0.47	-0.62	0.99	AM
		A142	72.43	28.74	24.48					
GJZXWN		A141	71.65	29.38	25.88	0.60	-0.51	-0.61	0.99	GD
		A142	72.25	28.87	25.27					
GM8VHN		A141	71.59	29.10	25.38	0.57	-0.42	-0.53	0.89	MM
		A142	72.16	28.68	24.85					



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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
GMWEKW		A141	71.60	29.30	25.58	0.57	-0.45	-0.55	0.90	XI
		A142	72.16	28.85	25.04					
GNQE69		A141	71.69	29.47	25.21	0.59	-0.47	-0.57	0.94	AJ
		A142	72.28	29.00	24.64					
GVMTQN		A141	71.55	29.37	25.40	0.57	-0.40	-0.51	0.86	MK
		A142	72.12	28.98	24.89					
GVUA92		A141	71.55	29.53	25.53	0.58	-0.44	-0.55	0.91	MV
		A142	72.13	29.10	24.99					
HGM4X2		A141	71.70	29.45	25.19	0.62	-0.51	-0.57	0.98	AJ
		A142	72.32	28.94	24.62					
HU98DK		A141	71.53	29.06	25.41	0.58	-0.48	-0.58	0.94	XI
		A142	72.10	28.59	24.83					
JAV8F4		A141	71.84	28.97	25.63	0.56	-0.45	-0.56	0.91	HW
		A142	72.40	28.52	25.07					
JEE777		A141	71.71	29.47	25.43	0.62	-0.50	-0.63	1.01	AJ
		A142	72.33	28.97	24.80					
JWTCB	X	A141	71.65	28.84	25.67	0.62	-0.54	-0.60	1.01	XM
		A142	72.26	28.30	25.07					
K22482		A141	71.74	29.19	25.25	0.59	-0.45	-0.54	0.92	AQ
		A142	72.33	28.75	24.71					
KE8GJK		A141	71.85	28.95	25.97	0.61	-0.48	-0.58	0.96	XO
		A142	72.46	28.47	25.39					
KMVHEA		A141	71.79	29.31	25.39	0.58	-0.46	-0.59	0.94	AJ
		A142	72.37	28.86	24.80					
KTL4RB		A141	71.67	29.40	25.39	0.59	-0.40	-0.47	0.85	AM
		A142	72.26	29.00	24.92					
KVBYBQ		A141	71.84	28.95	25.29	0.59	-0.47	-0.57	0.94	GF
		A142	72.42	28.48	24.72					
L6ZHA4	X	A141	72.93	29.69	25.63	0.61	-0.49	-0.61	0.99	AR
		A142	73.54	29.20	25.02					
MDT2FP		A141	72.00	28.86	25.93	0.58	-0.46	-0.58	0.94	HW
		A142	72.57	28.40	25.35					



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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
MWALCE		A141	71.27	28.99	25.43	0.57	-0.42	-0.50	0.87	MG
		A142	71.84	28.57	24.92					
N3Y3Z		A141	71.69	29.45	25.27	0.59	-0.47	-0.58	0.95	AJ
		A142	72.28	28.98	24.70					
NDJ8P9		A141	71.69	29.04	25.97	0.55	-0.48	-0.58	0.93	XU
		A142	72.24	28.56	25.39					
NZPE6T	X	A141	74.86	21.98	30.68	0.55	-0.35	-0.63	0.90	AO
		A142	75.41	21.63	30.05					
P2HADR		A141	71.73	29.42	25.36	0.62	-0.49	-0.58	0.97	AO
		A142	72.34	28.93	24.78					
P3Y62L		A141	71.78	29.01	25.87	0.67	-0.52	-0.63	1.05	XM
		A142	72.45	28.49	25.25					
PHMKXQ		A141	71.56	29.51	25.79	0.59	-0.43	-0.50	0.88	MI
		A142	72.14	29.08	25.29					
PPFLMW		A141	71.57	29.35	25.54	0.59	-0.42	-0.56	0.91	XI
		A142	72.16	28.93	24.98					
PQ9G8K	X	A141	71.74	28.83	25.99	0.62	-0.55	-0.66	1.06	XO
		A142	72.36	28.29	25.33					
PRV4BU		A141	71.64	29.10	25.65	0.57	-0.46	-0.57	0.93	MK
		A142	72.21	28.65	25.08					
Q64A9R		A141	71.66	28.89	25.85	0.54	-0.38	-0.50	0.83	XU
		A142	72.20	28.51	25.36					
QCVQH4	X	A141	70.96	29.77	26.71	0.51	-0.35	-0.53	0.81	GC
		A142	71.47	29.42	26.18					
QG9BPP		A141	71.87	29.36	25.35	0.60	-0.41	-0.51	0.89	AO
		A142	72.47	28.95	24.84					
R9UZVP		A141	71.56	29.24	25.51	0.59	-0.42	-0.54	0.89	XI
		A142	72.14	28.82	24.97					
RJM7CV		A141	71.54	29.29	25.23	0.57	-0.41	-0.54	0.88	AM
		A142	72.11	28.89	24.69					
T2BEMQ	X	A141	73.10	28.71	27.39	0.64	-0.50	-0.67	1.05	MK
		A142	73.74	28.21	26.72					



CTS Interlaboratory Testing Program for Color & Appearance Report #167
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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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
TZUQZW		A141	71.65	29.19	25.60	0.59	-0.46	-0.56	0.93	XI
		A142	72.23	28.73	25.04					
UANAFJ		A141	71.68	29.26	25.37	0.59	-0.50	-0.59	0.97	XI
		A142	72.27	28.77	24.78					
UXUXZK		A141	71.44	29.36	25.47	0.54	-0.41	-0.52	0.85	XI
		A142	71.98	28.95	24.96					
V2JULY7	X	A141	71.74	30.31	26.72	0.54	-0.44	-0.55	0.88	GA
		A142	72.28	29.87	26.17					
V4VQCR		A141	71.40	29.27	25.54	0.61	-0.45	-0.55	0.94	MI
		A142	72.00	28.82	24.99					
VC2RED		A141	71.44	29.32	25.11	0.60	-0.46	-0.55	0.93	HP
		A142	72.03	28.86	24.57					
VEV24M		A141	71.62	29.50	25.26	0.57	-0.46	-0.56	0.92	AM
		A142	72.19	29.04	24.71					
VJAKDG		A141	71.58	29.14	25.22	0.57	-0.45	-0.55	0.92	MM
		A142	72.15	28.69	24.67					
VRXT6T		A141	71.60	29.18	25.50	0.57	-0.43	-0.52	0.88	MI
		A142	72.16	28.75	24.98					
VTRKAC		A141	71.64	29.37	25.59	0.58	-0.47	-0.59	0.95	XI
		A142	72.21	28.90	25.00					
W7XRA3		A141	71.43	29.24	25.19	0.60	-0.47	-0.57	0.95	XI
		A142	72.02	28.77	24.62					
WMPARM		A141	71.72	29.29	25.48	0.62	-0.48	-0.58	0.97	XH
		A142	72.33	28.81	24.90					
WP8ZVW		A141	71.77	29.39	25.40	0.59	-0.50	-0.62	0.98	AJ
		A142	72.36	28.90	24.79					
WQKKUX		A141	71.62	29.40	25.14	0.59	-0.45	-0.56	0.92	AO
		A142	72.21	28.96	24.59					
WQZX43		A141	71.59	29.25	25.47	0.61	-0.49	-0.58	0.97	AL
		A142	72.19	28.76	24.89					
WZJENW		A141	71.86	29.42	25.52	0.52	-0.49	-0.57	0.91	CA
		A142	72.38	28.93	24.95					



CTS Interlaboratory Testing Program for Color & Appearance **Report #167**
Analysis 409 **1st Qtr 2014**

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			Color Difference Values				InstrCode
			L*	a*	b*	ΔL^*	Δa^*	Δb^*	ΔE^*	
XL9WRF		A141	71.69	29.15	25.86	0.57	-0.46	-0.58	0.93	GD
		A142	72.26	28.69	25.29					
XLJVUC		A141	71.53	29.34	25.53	0.60	-0.47	-0.58	0.95	XI
		A142	72.12	28.87	24.95					
XNCPL		A141	71.67	29.36	25.80	0.60	-0.52	-0.61	1.00	GD
		A142	72.27	28.85	25.20					
XYDFM9	X	A141	71.57	29.24	26.17	0.59	-0.47	-0.60	0.96	XO
		A142	72.16	28.77	25.57					
Y3K2E7		A141	71.78	29.30	25.31	0.62	-0.53	-0.60	1.01	AM
		A142	72.39	28.77	24.71					
YGQE8W		A141	71.57	29.28	25.48	0.63	-0.46	-0.54	0.95	MM
		A142	72.20	28.83	24.94					
YJRDRG		A141	71.78	29.35	25.32	0.62	-0.51	-0.61	1.01	AO
		A142	72.40	28.84	24.71					
YNPPXE		A141	71.56	29.26	25.57	0.57	-0.52	-0.63	1.00	MK
		A142	72.13	28.74	24.94					
YRWPP2		A141	71.80	29.45	25.27	0.56	-0.49	-0.60	0.96	XX
		A142	72.36	28.96	24.67					
YUU3ZQ		A141	71.49	29.38	25.25	0.62	-0.45	-0.57	0.95	HP
		A142	72.11	28.94	24.68					
ZCBX4D		A141	71.87	28.93	25.45	0.57	-0.42	-0.54	0.88	GG
		A142	72.43	28.51	24.92					
ZLAW86		A141	71.56	29.29	25.39	0.63	-0.49	-0.60	1.00	XH
		A142	72.18	28.80	24.79					
ZLYB3W		A141	71.63	29.51	25.31	0.58	-0.41	-0.49	0.86	AM
		A142	72.21	29.11	24.82					



Summary Statistics							
<u>Samples</u>	<u>L*</u>	<u>a*</u>	<u>b*</u>	<u>ΔL*</u>	<u>Δa*</u>	<u>Δb*</u>	<u>ΔE*</u>
Grand Means							
A141	71.63	29.28	25.44				
A142	72.22	28.82	24.87	0.59	-0.46	-0.57	0.94
Std Dev Btwn Labs							
A141	0.13	0.19	0.22				
A142	0.14	0.19	0.22	0.03	0.03	0.03	0.04

Statistics based on 98 of 109 reporting participants

Comments Assigned on Data Flags for Test #409

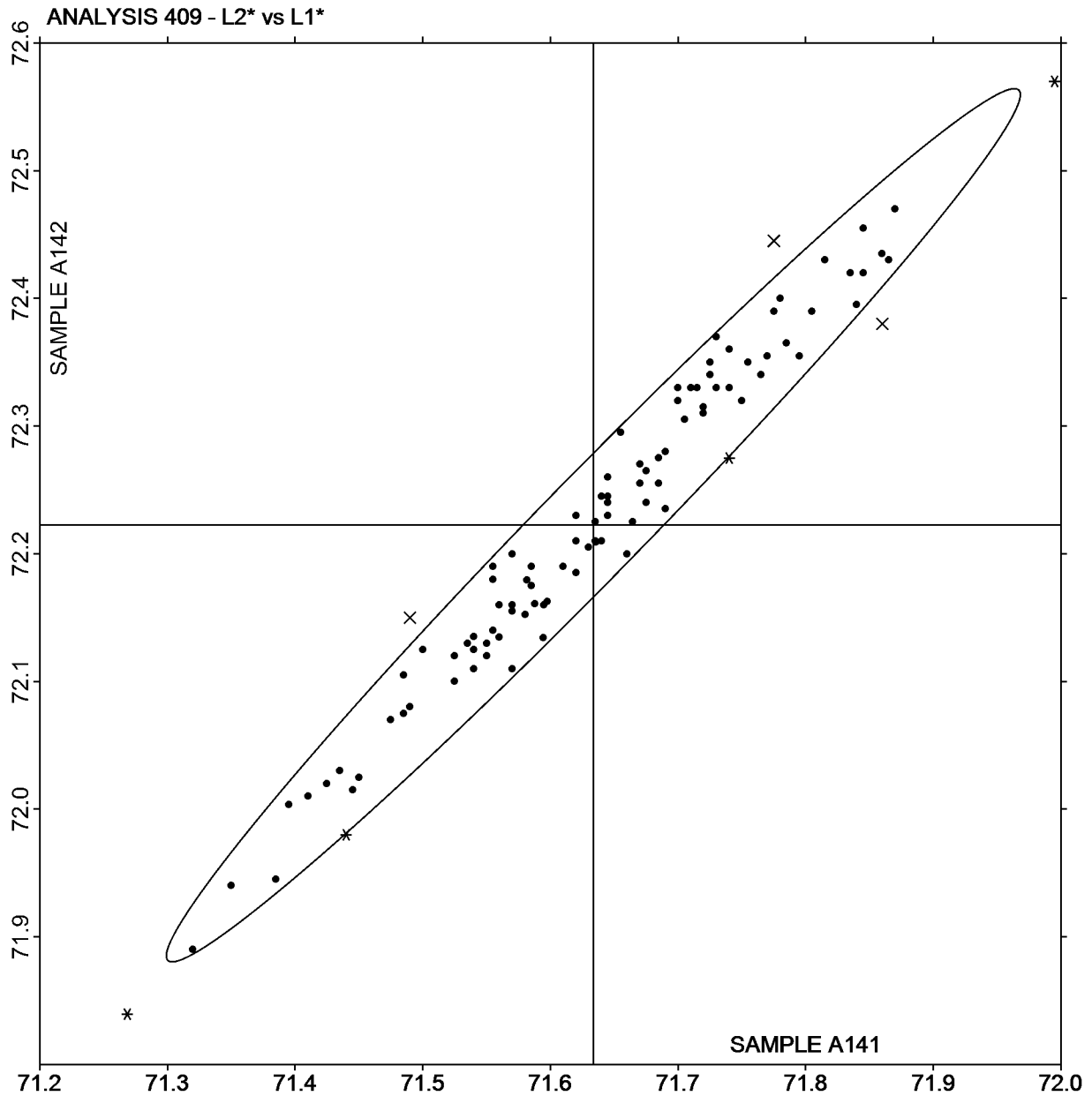
- EQWA88(X) - High L* values.
- JWTWCB(X) - Low a* value for Sample A142. Large replication difference for a* value on Sample A142.
- L6ZHA4(X) - High L* values.
- NZPE6T(X) - High L* and b* values. Low a* values. Small Da values.
- PQ9G8K(X) - High a* value for Sample A142. Large replication difference for a* value on Sample A141. Large Db value.
- QCVQH4(X) - Low L* values and high b* values. High a* values for Sample A142. Small DL, Da, and DE values.
- T2BEMQ(X) - High L* and b* values. Low a* values. Large Db value.
- V2ULY7(X) - High a* and b* values.
- XYDFM9(X) - High b* values.



L2* vs L1*

SAMPLE A141 = 71.63

SAMPLE A142 = 72.22

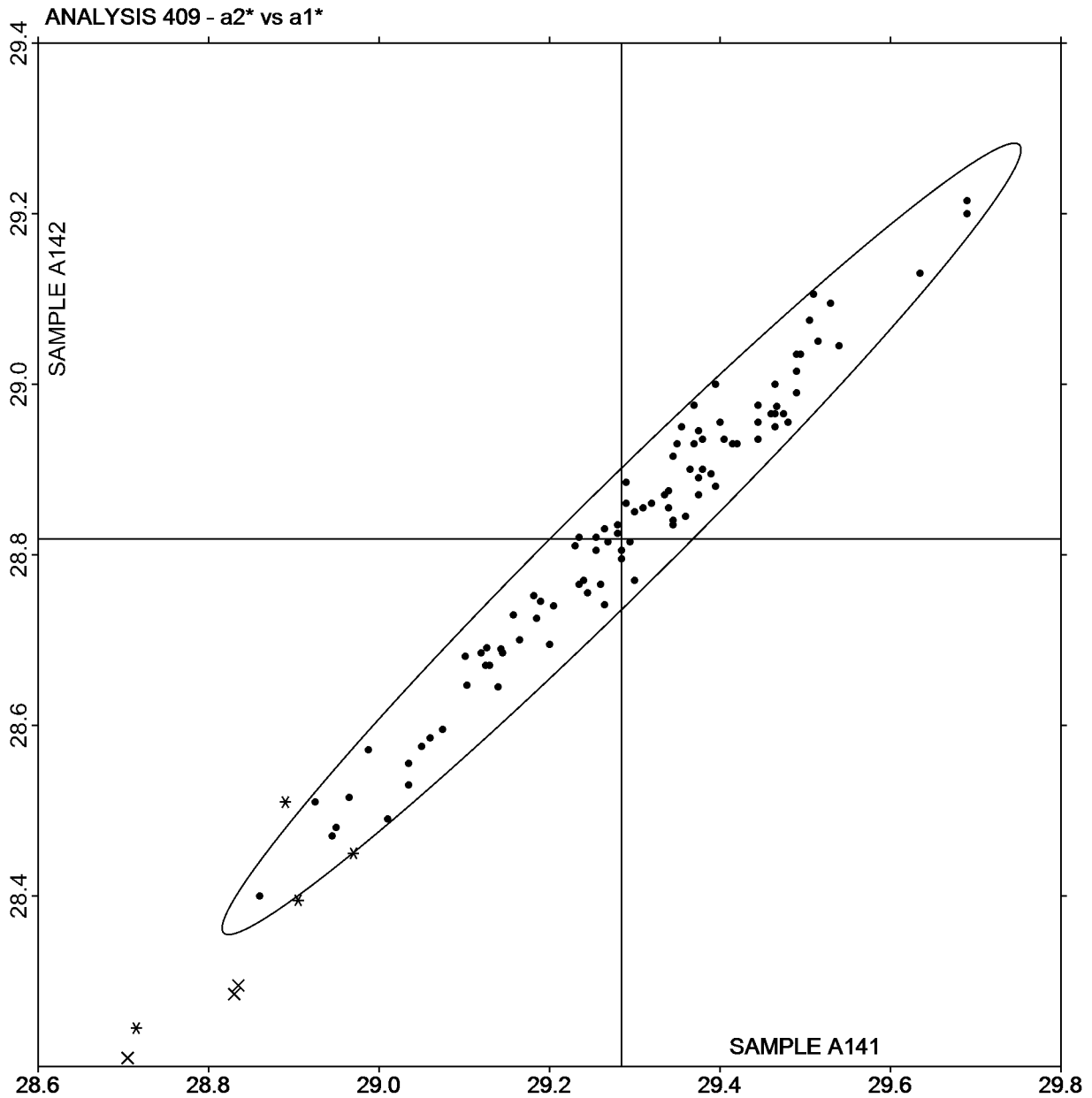




a2* vs a1*

SAMPLE A141 = 29.28

SAMPLE A142 = 28.82

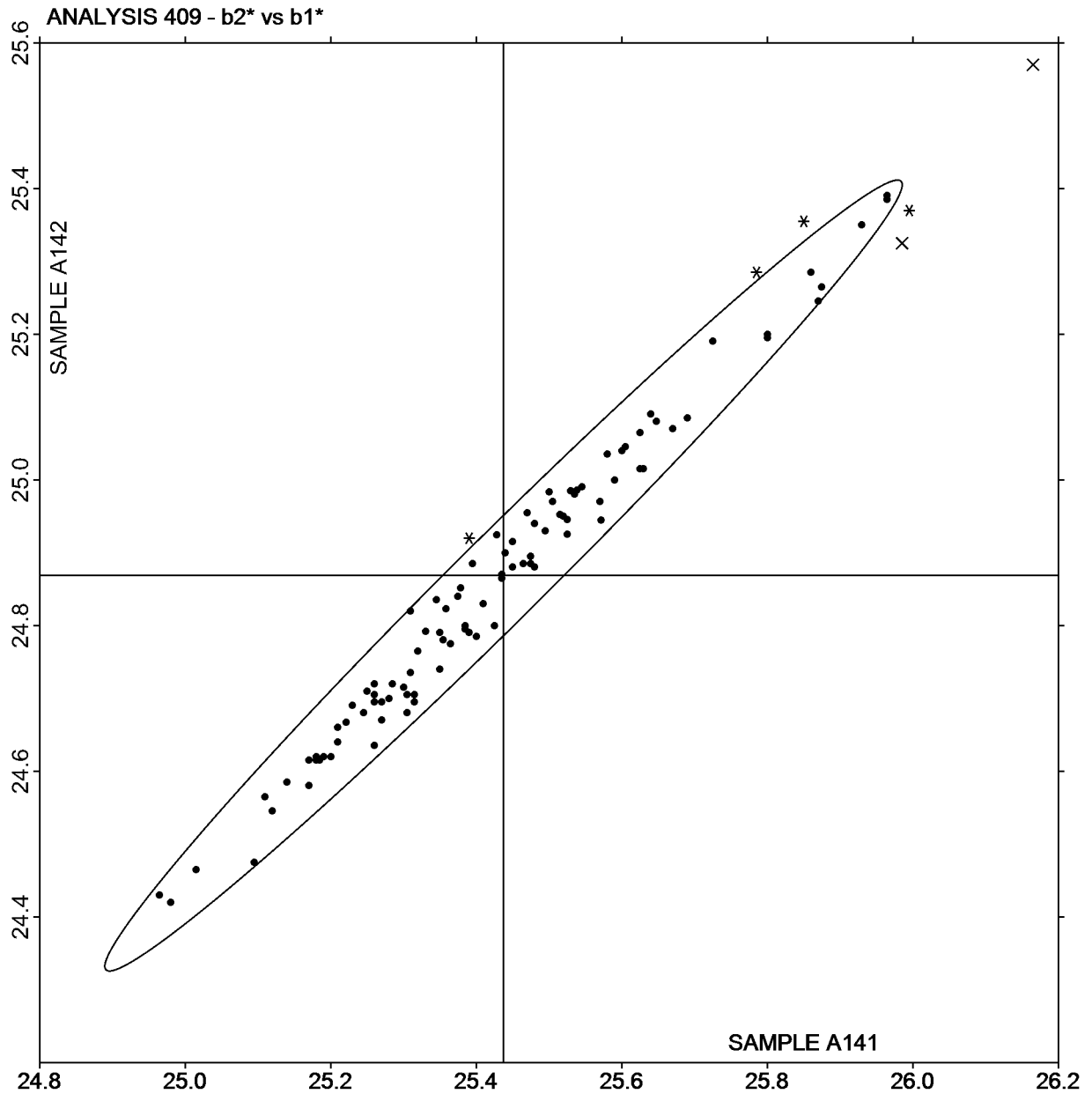




b2* vs b1*

SAMPLE A141 = 25.44

SAMPLE A142 = 24.87



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 A141																		
2724JF		22.16	24.64	25.11	25.01	24.55	24.90	26.22	28.55	38.89	61.13	74.07	75.67	75.38	75.32	75.99	77.33	AJ
2EWBZZ		21.76	24.21	24.79	24.69	24.20	24.67	25.94	28.45	39.22	60.99	73.55	75.12	74.66	74.71	75.46	77.11	XI
2XZVU2		21.76	24.15	24.73	24.59	24.06	24.58	25.79	28.26	38.86	60.65	73.26	74.80	74.30	74.36	75.00	76.70	MM
33NXB7		22.02	24.80	25.00	25.05	24.56	25.11	26.38	28.81	39.61	61.39	74.22	75.76	75.34	75.19	76.24	77.77	HF
3LTZLA		21.73	24.36	24.87	24.83	24.31	24.79	26.04	28.58	39.71	61.66	74.03	75.39	75.03	74.89	75.69	77.47	XH
3M4YUD		22.01	24.73	25.13	25.02	24.47	24.91	26.22	28.53	39.41	61.29	73.97	75.79	75.34	75.41	76.05	77.04	AM
3VZY4Y		21.94	24.62	25.08	24.94	24.43	24.87	26.14	28.51	38.88	60.80	73.92	75.59	75.17	75.27	75.89	77.63	AJ
3ZJE3C		21.85	24.55	25.12	25.05	24.59	25.05	26.34	28.83	39.56	61.07	73.95	75.67	75.24	75.24	76.11	77.69	XH
4FWE2V		21.89	24.31	24.88	24.73	24.24	24.74	25.99	28.44	38.94	60.87	73.61	75.10	74.66	74.77	75.38	77.12	XX
4XYNTK		21.82	24.40	24.92	24.80	24.25	24.78	25.99	28.17	38.95	61.57	74.61	75.90	75.38	75.45	75.93	77.70	MV
7Y7TA7		22.02	24.36	24.99	24.83	24.33	24.85	26.13	28.59	39.22	61.13	73.93	75.47	75.05	75.11	75.72	77.41	MM
8284XT		22.20	24.79	25.35	25.18	24.63	25.10	26.40	28.74	39.67	61.67	74.41	75.91	75.42	75.49	76.15	77.22	AM
86M7TK		22.40	24.26	24.80	24.64	24.08	24.70	25.98	28.05	38.75	61.31	74.09	75.29	74.76	74.85	75.54	77.36	XX
962UNK		22.02	24.63	25.05	24.87	24.40	24.85	26.12	28.52	38.96	60.72	73.81	75.61	75.14	75.25	76.05	77.56	AJ
9APAN4		22.10	24.26	24.91	24.78	24.24	24.77	26.07	28.25	38.50	61.68	74.87	76.11	75.60	75.58	76.26	78.03	PE
9BPBM9		22.24	24.82	25.23	25.24	24.73	25.12	26.40	28.75	39.26	61.24	74.20	75.75	75.31	75.44	76.14	77.54	AO
9NDGCD		22.13	24.50	25.06	24.92	24.42	24.91	26.20	28.64	39.15	61.08	73.96	75.50	75.09	75.23	75.91	77.75	MM
9UXCL9		22.00	24.74	25.26	25.00	24.53	25.03	26.37	28.73	39.94	61.74	74.38	75.96	75.54	75.68	76.25	77.20	AJ
AB98CF		22.34	24.46	25.08	24.90	24.40	24.88	26.18	28.35	38.03	59.84	73.87	75.47	74.97	75.15	75.53	77.31	HP
AK8887		21.98	24.42	25.03	24.95	24.46	24.96	25.92	28.72	39.48	61.35	73.79	75.27	74.88	74.89	75.63	77.32	XI
B7NPAW		21.21	24.13	24.67	24.58	24.03	24.60	25.88	28.29	38.90	60.60	73.75	75.35	74.95	75.02	75.65	77.39	MI
B8KLYD		22.82	24.47	25.08	24.94	24.37	24.96	26.23	28.48	37.76	60.27	74.03	75.46	75.05	74.95	75.76	77.42	HP
BEH23H		21.91	24.59	25.12	24.92	24.44	24.89	26.18	28.52	39.28	61.21	74.32	75.71	75.14	75.34	76.11	77.21	AM
BELXUB		22.14	24.29	24.95	24.80	24.31	24.82	26.12	28.32	38.59	61.52	74.34	75.60	75.04	75.43	75.60	77.26	CE
BH4KH9		22.02	24.48	25.07	24.98	24.45	24.96	26.24	28.66	39.26	61.10	73.87	75.45	75.12	75.13	75.86	77.56	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 A141																		
BQQX4L		21.75	24.51	25.05	24.87	24.40	24.84	26.07	28.35	38.78	60.93	73.71	75.44	74.95	75.10	75.71	76.77	AJ
BTL4XY		21.99	24.38	24.95	24.83	24.30	24.78	26.05	28.44	38.69	60.52	73.73	75.38	74.97	75.01	75.65	77.34	MM
BUEZHM		21.94	24.46	24.98	24.86	24.38	24.85	26.15	28.64	39.63	61.63	74.08	75.54	75.04	75.15	75.81	77.52	XH
CDJP2G		21.70	24.07	24.58	24.38	24.04	24.54	25.87	28.43	39.56	60.91	73.45	74.61	74.62	74.59	75.53	77.27	XM
DAZRB7		21.75	24.24	24.80	24.70	24.18	24.62	25.90	28.26	38.68	60.89	73.53	74.96	74.64	74.55	75.10	76.36	AJ
DKYAHE		22.79	24.60	25.07	24.95	24.35	24.88	26.11	28.21	38.72	61.52	74.41	75.53	74.98	75.10	75.87	77.71	MV
EL9PFD		22.10	24.61	25.03	24.95	24.50	24.90	26.16	28.48	38.64	60.75	74.02	75.63	75.29	75.40	75.98	77.69	AJ
EQWA88		22.62	24.82	25.40	25.18	24.72	25.28	26.58	29.28X	40.62	62.39	74.86	76.14	75.67	75.99	76.76X	78.30	XO
EXXJFK		22.09	24.44	25.02	24.88	24.36	24.87	26.15	28.61	39.14	60.89	73.74	75.29	74.92	74.96	75.60	77.26	MM
FC3V9Q		22.21	24.54	25.13	24.96	24.43	24.92	26.21	28.63	39.22	61.16	74.04	75.53	75.11	75.13	75.74	77.41	MM
FMYAL9		23.62	24.86	25.19	25.16	24.65	25.20	26.48	28.94	39.94	60.99	73.37	75.07	74.80	74.85	75.41	76.98	MJ
FTGJUD		22.09	24.46	25.05	24.90	24.36	24.88	26.14	28.56	39.08	60.94	73.81	75.36	74.92	74.98	75.52	77.23	MK
FUHWUZ		22.14	24.52	25.09	24.95	24.43	24.94	26.21	28.68	39.37	61.39	74.24	75.74	75.30	75.31	75.92	77.75	MM
G68W8F		22.49	24.53	25.14	25.08	24.67	25.12	26.43	28.79	39.18	61.58	74.37	75.80	75.36	75.48	76.33	77.84	AM
G78JFE		22.27	24.77	25.33	25.06	24.56	25.03	26.37	28.65	39.18	61.48	74.21	75.85	75.38	75.42	76.19	77.21	AJ
GAAJNC		22.38	24.94	25.30	25.24	24.82	25.16	26.52	28.93	39.19	61.47	74.09	75.74	75.41	75.50	76.26	77.89	AM
GJZXWN		20.29X	23.96	24.76	24.64	24.16	24.46	26.51	27.46X	39.15	62.43	74.18	75.47	75.12	75.06	75.83	77.35	GD
GM8VHN		21.95	24.43	25.02	24.90	24.37	24.87	26.17	28.63	39.09	60.88	73.80	75.41	75.00	75.07	75.74	77.28	MM
GMWEK		21.82	24.31	24.89	24.76	24.26	24.76	26.04	28.51	39.38	61.26	73.83	75.27	74.84	74.88	75.57	77.37	XI
GNQE69		22.19	24.68	25.13	25.05	24.63	25.06	26.37	28.69	38.61	61.32	74.26	75.82	75.42	75.55	75.97	76.75	AJ
GVMTQN		22.00	24.37	24.98	24.81	24.32	24.82	26.08	28.52	39.04	60.96	73.85	75.36	74.99	75.08	75.79	77.61	MM
GVUA92		21.69	24.41	24.83	24.78	24.25	24.73	26.01	28.15	38.82	61.18	74.46	75.56	75.03	75.00	75.79	77.45	MV
HGM4X2		22.29	24.76	25.22	25.06	24.58	24.99	26.31	28.62	38.90	61.53	74.19	75.63	75.22	75.31	75.80	76.48	AJ
HU98DK		21.78	24.34	24.91	24.81	24.31	24.76	25.99	28.48	39.18	61.08	73.56	75.01	74.61	74.68	75.31	77.01	XI
JEE777		22.06	24.57	25.06	24.96	24.55	24.99	26.28	28.58	39.00	61.54	74.34	75.80	75.35	75.38	75.60	76.07	AJ

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 A141																		
JWTWCB		21.95	24.43	24.79	24.70	24.19	24.78	26.05	28.78	39.78	61.30	73.62	74.61	74.59	74.28	75.61	76.95	XM
K22482		22.05	24.74	25.29	25.09	24.55	24.99	26.31	28.65	39.56	61.35	74.09	75.61	75.34	75.28	76.15	77.33	AQ
KE8GJK		21.99	24.32	24.87	24.85	24.36	24.88	26.23	28.82	40.35	61.76	74.31	75.32	75.30	75.11	76.17	77.57	XO
KMVHEA		23.95X	24.67	25.13	24.99	24.57	24.96	26.27	28.61	38.98	61.40	74.16	75.76	75.42	75.53	76.28	77.85	AJ
KTL4RB		22.18	24.61	25.10	24.92	24.39	24.89	26.17	28.59	39.35	61.34	74.07	75.57	75.11	75.19	75.94	77.45	AM
L6ZHA4	X	23.27	25.68X	26.22X	26.12X	25.60X	26.03X	27.40X	29.87X	40.98X	64.05X	77.09X	78.62X	78.38X	78.29X	79.04X	80.61X	AR
MDT2FP		22.50	24.41	25.12	24.97	24.51	25.03	26.39	28.91	40.71X	62.33	74.37	75.51	74.99	75.28	75.94	77.63	HW
MWALCE		21.91	24.12	24.67	24.51	24.04	24.56	25.85	28.16	38.78	60.58	72.94X	74.26X	74.03X	74.08X	74.63X	76.14	MG
N3YY3Z		22.04	24.60	25.10	25.03	24.62	25.03	26.32	28.55	38.87	61.46	74.27	75.66	75.30	75.31	75.45	75.62X	AJ
NDJ8P9		22.24	24.16	24.76	24.61	24.20	24.77	26.17	28.62	39.80	60.91	74.16	75.35	74.95	75.08	75.83	77.54	XU
NZPE6T		22.24	24.63	25.12	25.04	24.64	25.08	26.34	28.66	38.88	61.50	74.40	75.68	75.35	75.34	75.58	75.38X	AO
P2HADR		22.23	24.59	25.08	25.02	24.64	25.04	26.32	28.62	38.85	61.61	74.40	75.69	75.36	75.35	75.54	75.36X	AM
P3Y62L		22.57	24.27	24.95	24.73	24.29	24.85	26.21	28.87	41.04X	52.65X	74.28	75.32	74.79	74.85	75.67	77.28	HW
PHMKXQ		21.66	24.21	24.74	24.58	24.17	24.65	25.90	28.36	39.23	61.24	74.11	75.42	74.95	75.07	75.86	77.52	MI
PPFLMW		21.85	24.27	24.88	24.78	24.30	24.78	26.08	28.51	39.18	61.10	73.92	75.37	74.88	74.96	75.67	77.33	XI
PQ9G8K		21.67	24.11	24.82	24.71	24.19	24.79	26.09	28.84	40.15	61.59	73.92	75.08	74.90	74.96	75.76	77.56	XO
Q64A9R		22.10	24.15	24.75	24.69	24.24	24.84	26.24	28.60	39.77	60.86	73.87	75.09	74.74	75.00	75.74	77.39	XU
QG9BPP		22.30	24.75	25.27	25.22	24.87	25.25	26.54	28.83	39.01	61.82	74.70	75.95	75.60	75.58	75.80	75.94	AO
R9UZVP		21.69	24.29	24.87	24.78	24.29	24.78	26.05	28.57	39.25	61.03	73.75	75.17	74.73	74.77	75.54	77.22	XI
RJM7CV		21.78	24.60	25.05	24.89	24.36	24.86	26.16	28.55	39.25	60.81	73.60	75.29	74.96	74.89	75.50	76.81	AM
T2BEMQ		22.50	25.00	25.50	25.00	24.50	25.30	26.50	28.50	40.50	63.50	75.50X	76.00	75.80	76.00	76.50	78.50	MM
TZUQZW		22.03	24.38	24.93	24.81	24.31	24.77	26.04	28.50	39.33	61.47	73.99	75.37	74.86	74.91	75.62	77.26	XI
UANAFJ		21.95	24.62	25.07	24.95	24.45	24.93	26.23	28.69	39.39	61.28	73.93	75.42	75.07	75.12	75.81	77.53	XI
UXUXZK		21.76	24.22	24.78	24.68	24.16	24.66	25.93	28.37	38.96	60.83	73.58	75.04	74.64	74.81	75.53	77.30	XI
V2ULY7	X	20.79	24.75	24.08X	24.57	23.40X	24.12X	25.96	27.66X	38.61	60.87	75.59X	78.52X	76.62X	77.66X	77.54X	77.40	MH

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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 A141																		
V4VQCR		21.57	24.16	24.72	24.62	24.05	24.52	25.84	28.24	38.96	60.66	73.46	75.07	74.80	74.93	75.71	77.34	MI
VC2RED		22.46	24.43	25.02	24.88	24.37	24.91	26.15	28.49	38.51	60.19	73.84	75.54	75.07	75.09	75.70	77.49	HP
VEV24M		22.17	24.57	25.10	24.94	24.42	24.93	26.17	28.48	39.11	61.18	74.07	75.55	75.12	75.19	75.97	77.33	AM
VJAKDG		22.01	24.53	25.12	24.97	24.46	24.93	26.21	28.60	38.99	60.80	73.82	75.47	75.03	75.08	75.79	77.56	MM
VRXT6T		21.65	24.36	24.93	26.85X	24.33	24.81	26.07	28.59	39.19	60.90	74.03	75.45	74.98	75.12	75.63	77.59	MI
VTRKAC		21.58	24.32	24.89	24.85	24.31	24.87	26.15	28.58	39.25	61.24	73.97	75.65	75.15	75.25	75.94	77.61	XI
W7XRA3		21.92	24.38	24.89	24.81	24.44	24.87	26.14	28.46	38.52	60.70	73.73	74.90	74.61	74.78	75.42	76.59	XI
WQKKU		22.17	24.67	25.15	25.03	24.59	24.98	26.27	28.61	38.75	61.11	73.98	75.48	75.17	75.20	75.86	77.18	AO
WQZX43		21.75	24.38	24.92	24.84	24.36	24.84	26.10	28.49	39.05	60.98	73.93	75.54	75.16	75.17	75.82	77.53	AL
WZJENW		22.66	24.78	25.28	25.06	24.49	24.97	26.27	28.50	38.88	62.09	75.18X	76.42	75.90	75.85	76.43	78.19	CA
XL9WRF		22.92	24.13	24.75	24.71	24.28	24.43	26.45	28.47	38.57	61.98	73.92	76.09	75.03	75.00	75.68	77.16	GD
XLJVUC		21.74	24.32	24.85	24.73	24.24	24.72	25.94	28.49	39.32	61.00	73.63	75.35	74.82	74.87	75.73	77.44	XI
XNCPL		25.74X	24.07	24.82	24.68	24.17	24.79	25.72	28.13	39.78	61.23	74.16	76.14	75.06	75.01	75.80	77.29	GD
XYDFM9		22.04	24.17	24.44X	24.51	23.80X	24.45	25.69	28.04	39.26	62.49	73.49	74.83	74.48	74.38	75.20	77.07	XO
Y3K2E7		22.97	24.81	25.22	25.05	24.58	25.04	26.37	28.71	39.20	61.29	74.26	76.03	75.57	75.60	76.54	77.73	AM
YGQE8W		21.84	24.33	24.93	24.77	24.33	24.81	26.12	28.61	39.24	60.94	73.76	75.36	74.99	75.08	75.73	77.59	MM
YJRDRG		22.20	24.67	25.18	25.09	24.71	25.15	26.44	28.72	38.96	61.75	74.39	75.74	75.38	75.39	75.62	75.07X	AO
YNPPXE		21.99	24.28	24.89	24.72	24.24	24.74	26.02	28.46	38.95	61.24	73.97	75.33	74.94	74.96	75.64	77.38	MK
YRWPP2		22.34	24.77	25.23	25.13	24.68	25.07	26.36	28.72	39.18	61.63	74.35	75.94	75.50	75.64	76.36	77.75	XX
YUU3ZQ		22.04	24.51	24.92	24.84	24.29	24.84	26.17	28.47	38.53	60.30	74.11	75.55	75.11	75.05	75.84	77.80	HP
ZCBX4D		22.50	24.60	25.15	25.24	24.63	25.13	26.35	28.94	39.77	61.74	74.07	75.66	75.19	75.01	75.69	77.30	GG
ZLAW86		21.98	24.40	24.93	24.66	24.37	24.84	26.09	28.56	39.23	60.86	73.78	75.34	74.92	75.05	75.83	77.43	XH
ZLYB3W		22.07	24.54	25.01	24.96	24.55	24.96	26.23	28.52	38.76	61.27	74.25	75.69	75.33	75.38	76.09	77.20	AM

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	
Sample A141																

Summary Statistics

Grand Means	22.12	24.47	25.00	24.90	24.39	24.87	26.17	28.54	39.19	61.15	74.03	75.49	75.08	75.13	75.80	77.27
Stnd Dev Btwn Labs	0.57	0.22	0.19	0.27	0.19	0.18	0.19	0.24	0.52	1.02	0.38	0.35	0.31	0.33	0.33	0.58

Comments assigned on Data Flags for Test #411

L6ZHA4 (X) - High % reflectance data at all wavelengths.

V2ULY7 (X) - High and low % reflectance data at various wavelengths.

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample E141			Sample E142			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
28UY43		55.90	-0.22	-0.39	65.68	-0.15	-0.27	GL
2CQA63		56.83	0.71	1.25	66.55	0.72	1.29	GN
2EWZMW		55.90	-0.22	-0.39	65.45	-0.38	-0.68	GL
3LBEMR		56.55	0.43	0.76	65.90	0.07	0.13	GQ
449ZUR		56.73	0.61	1.07	66.10	0.27	0.49	GK
44ZZPH		56.65	0.53	0.94	66.68	0.85	1.51	GL
4BBV3R	*	55.73	-0.39	-0.70	66.53	0.70	1.25	GK
4CAHU9		57.15	1.03	1.82	66.48	0.65	1.16	GL
4YRL2R		57.25	1.13	2.00	67.00	1.17	2.09	RA
4ZF38T	X	57.70	1.58	2.79	65.60	-0.23	-0.41	GK
72GJP3		56.23	0.11	0.19	65.93	0.10	0.17	GN
7EE2FV		55.88	-0.24	-0.43	65.48	-0.35	-0.63	GN
84BWRR		55.58	-0.54	-0.96	65.55	-0.28	-0.50	GK
8AD422		55.55	-0.57	-1.01	65.40	-0.43	-0.77	GL
9WHCNA		56.75	0.63	1.11	66.68	0.85	1.51	BT
ATK2H3		56.13	0.01	0.01	66.13	0.30	0.53	GL
B33993		55.85	-0.27	-0.48	65.43	-0.40	-0.72	GK
B7RDNU		56.28	0.16	0.27	65.45	-0.38	-0.68	GK
BCVVM2		56.45	0.33	0.58	66.25	0.42	0.75	ER
BFBXM6		56.48	0.36	0.63	65.35	-0.48	-0.86	XX
C4XTGA	X	52.73	-3.39	-6.00	63.95	-1.88	-3.36	GB
CALNWX		57.05	0.93	1.64	67.00	1.17	2.09	GL
CD2ZWW		56.73	0.61	1.07	66.65	0.82	1.47	GL
CWJZ3J		55.40	-0.72	-1.27	65.40	-0.43	-0.77	PA
CY4UYK		56.50	0.38	0.67	65.88	0.05	0.08	GQ
D9LYA2		55.98	-0.14	-0.26	65.20	-0.63	-1.12	GK
DYMBDD		55.98	-0.14	-0.26	65.58	-0.25	-0.45	GK
ECEFWG		56.57	0.45	0.80	66.16	0.33	0.58	GL
EEAMAZ		56.98	0.86	1.51	66.23	0.40	0.71	GL
EPANWW		54.85	-1.27	-2.24	64.65	-1.18	-2.11	GK
G37KUN		55.65	-0.47	-0.83	64.78	-1.05	-1.88	GL
G3HEEU		55.15	-0.97	-1.71	65.40	-0.43	-0.77	GL
G8YHMK		56.38	0.26	0.45	65.75	-0.08	-0.14	GL
GT3APW		55.80	-0.32	-0.56	64.98	-0.85	-1.53	GL
GVT6CY		55.98	-0.14	-0.26	65.63	-0.20	-0.36	GL
GXBVAA		55.60	-0.52	-0.92	65.73	-0.10	-0.18	GK
GYB33B		56.28	0.16	0.27	66.18	0.35	0.62	GL
HHUBB3		56.90	0.78	1.38	66.23	0.40	0.71	GK
HPWCMP		56.43	0.31	0.54	66.43	0.60	1.07	GL
J4TGGR		56.50	0.38	0.67	65.73	-0.10	-0.18	GK
K8UQBU	X	56.03	-0.09	-0.17	67.15	1.32	2.36	GN
KYFJHP		56.55	0.43	0.76	66.20	0.37	0.66	GL
KZ7NXP		55.45	-0.67	-1.18	65.55	-0.28	-0.50	GN
LANQC3	X	51.63	-4.49	-7.94	60.25	-5.58	-9.97	MR
LVJXHY		55.78	-0.34	-0.61	65.83	0.00	-0.01	GL

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample E141			Sample E142			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
NEWMF3		56.65	0.53	0.94	66.08	0.25	0.44	GL
P6J44H	X	51.20	-4.92	-8.69	61.13	-4.70	-8.41	GL
PARM93	*	55.90	-0.22	-0.39	66.60	0.77	1.38	GL
PBCNKR		55.63	-0.49	-0.87	65.95	0.12	0.22	GK
PQMVG2		56.00	-0.12	-0.21	65.68	-0.15	-0.27	XX
QBB9RR		56.33	0.21	0.36	66.25	0.42	0.75	GL
QEX7JA	X	59.03	2.91	5.13	65.58	-0.25	-0.45	GX
QGHLRB	X	53.43	-2.69	-4.76	62.73	-3.10	-5.55	EM
QVJBRH		55.68	-0.44	-0.79	65.95	0.12	0.22	GK
RXXXNE		56.88	0.76	1.33	66.23	0.40	0.71	GN
TFCRKU		56.63	0.51	0.89	66.43	0.60	1.07	GK
TLJ6VY		55.63	-0.49	-0.87	65.48	-0.35	-0.63	MW
TLRX3M		56.25	0.13	0.23	65.30	-0.53	-0.94	GK
U2TBNA		56.30	0.18	0.32	65.95	0.12	0.22	MW
UZ4Q87		56.00	-0.12	-0.21	65.83	0.00	-0.01	GK
W7PRRL		55.48	-0.64	-1.14	65.70	-0.13	-0.23	GL
W9YXBF		56.35	0.23	0.41	65.98	0.15	0.26	GL
WEKY3E		56.33	0.21	0.36	65.58	-0.25	-0.45	GL
WL9JLM		55.25	-0.87	-1.54	64.83	-1.00	-1.79	GL
WUK2E2	*	54.43	-1.69	-2.99	64.25	-1.58	-2.82	HA
X3UFM2		55.75	-0.37	-0.65	65.30	-0.53	-0.94	GB
XBA2UK		55.45	-0.67	-1.18	65.08	-0.75	-1.35	GB
XJU7AH		55.50	-0.62	-1.09	65.53	-0.30	-0.54	GL
XT4GTV		56.65	0.53	0.94	66.25	0.42	0.75	GL
Y2FDE9		55.90	-0.22	-0.39	65.63	-0.20	-0.36	GN
YT9HQV		56.70	0.58	1.03	65.50	-0.33	-0.59	GN
YWJQKK		55.83	-0.29	-0.52	65.45	-0.38	-0.68	GB
ZQE76E		56.50	0.38	0.67	66.75	0.92	1.65	GL
ZYKND7		55.80	-0.32	-0.56	65.93	0.10	0.17	GL

Summary Statistics

Grand Means

56.12 Gloss Units

65.83 Gloss Units

Std Dev Btwn Labs

0.57 Gloss Units

0.56 Gloss Units

Statistics based on 67 of 74 reporting participants

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

Comments on assigned Data Flags for Test #440

4ZF38T(X) - Inconsistent in testing between samples, data for Sample E141 are high.

C4XTGA(X) - Data for both samples are low.

K8UQBU(X) - Inconsistent in testing between samples and Inconsistent in testing within Sample E141.

LANQC3(X) - Data for both samples are low. Also Inconsistent in testing within Sample E141.

P6J44H(X) - Data for both samples are low. Also Inconsistent in testing within Sample E142.

QEX7JA(X) - Inconsistent in testing between samples, data for Sample E141 are high. Also Inconsistent in testing within Sample E141.

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

Interlaboratory Testing Program for Color & Appearance

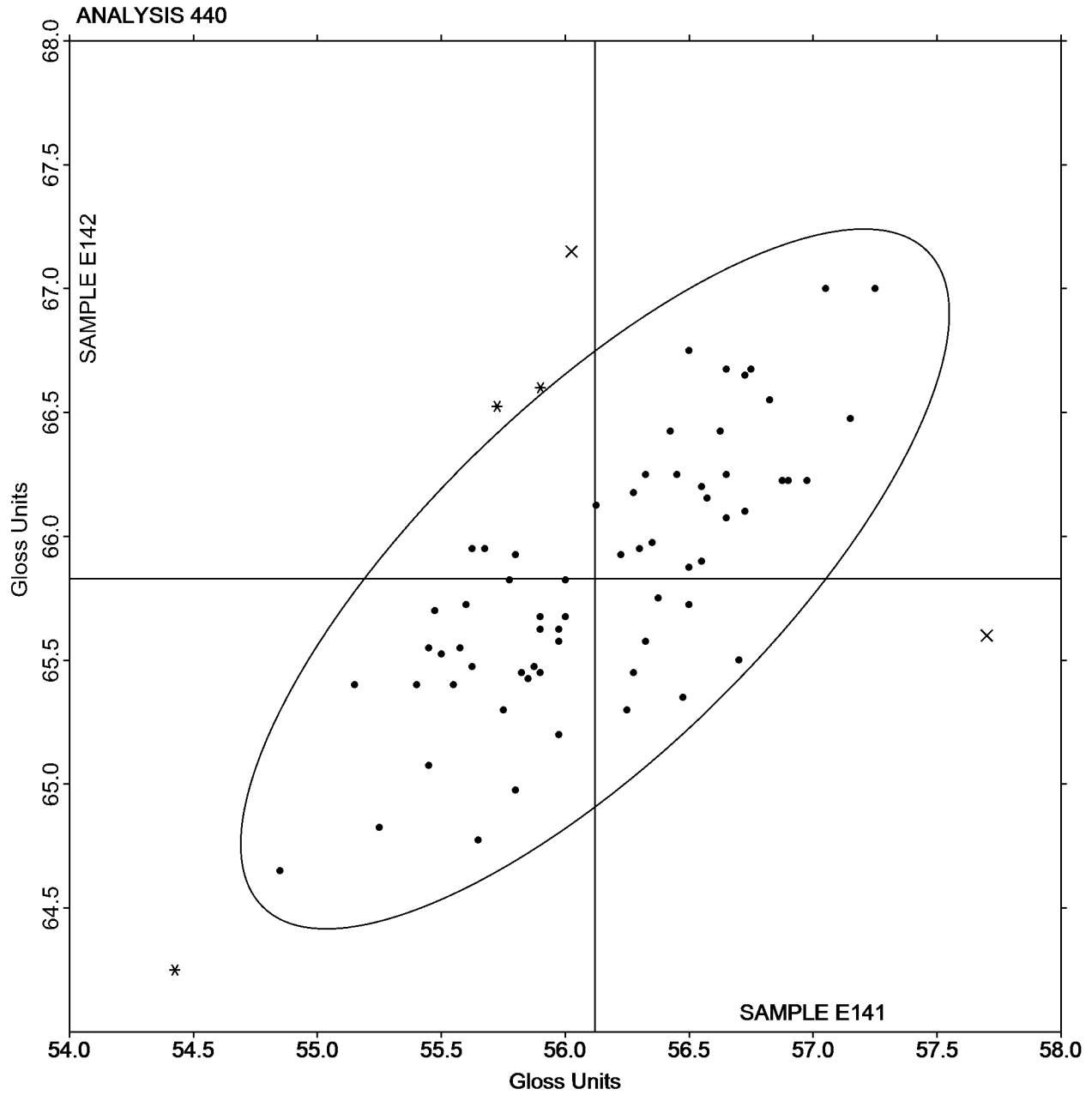
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE E141 = 56.12 Gloss Units

SAMPLE E142 = 65.83 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

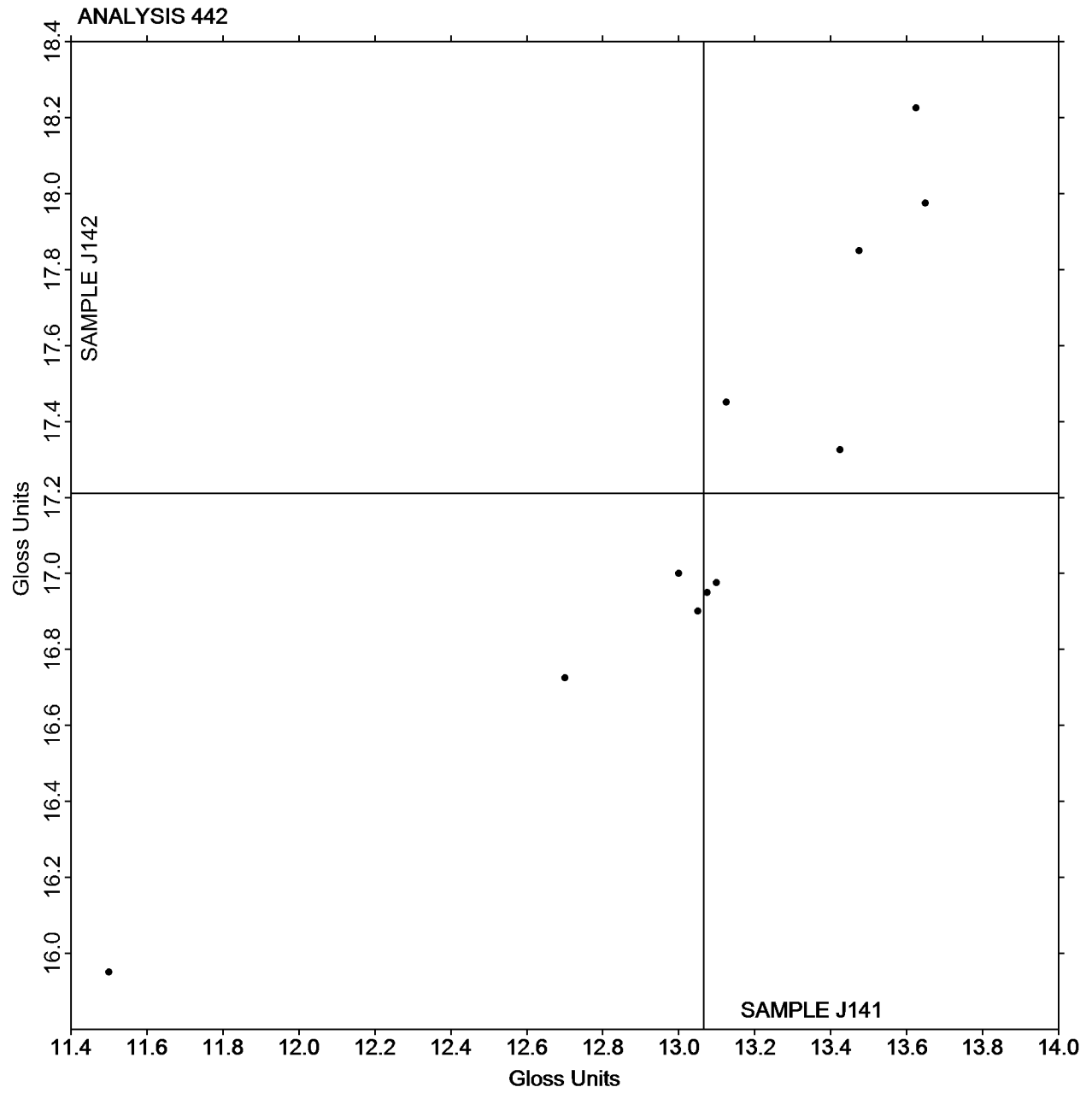
WebCode	Data Flag	Sample J141			Sample J142			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
42F4A6		13.43	0.36	0.60	17.33	0.11	0.18	GL
68FGBE		13.08	0.01	0.02	16.95	-0.26	-0.40	GL
7GL7TA		13.00	-0.07	-0.11	17.00	-0.21	-0.33	GL
8D7EKD		13.63	0.56	0.94	18.23	1.01	1.57	GN
94B9WZ		13.48	0.41	0.69	17.85	0.64	0.99	GN
B3B2TY		13.65	0.58	0.98	17.98	0.76	1.18	GN
BJKKUB		13.13	0.06	0.10	17.45	0.24	0.37	GL
LZ6J78		13.10	0.03	0.06	16.98	-0.24	-0.37	GL
MLMKRJ		13.05	-0.02	-0.03	16.90	-0.31	-0.48	GL
VHNGUG		12.70	-0.37	-0.61	16.73	-0.49	-0.75	GL
YBBV69		11.50	-1.57	-2.63	15.95	-1.26	-1.95	GL

Summary Statistics

Grand Means	13.07	Gloss Units	17.21	Gloss Units
Std Dev Btwn Labs	0.60	Gloss Units	0.65	Gloss Units
Statistics based on 11 of 11 reporting participants				

SAMPLE J141 = 13.07 Gloss Units

SAMPLE J142 = 17.21 Gloss Units



Instrument Code List - Report# 167

Instrument information as provided by laboratories

<u>Analysis</u>	<u>Analysis Name</u>
440	Gloss 60 Degree (Paint Chips)

Instrument code and descript

BT	BYK-Chemie (was BYK-Labotron) Tri-Gloss
EM	Elcometer 400 Novo-curve
ER	Erichsen Glossmaster
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)
HA	Horiba 60 Degree Glossmeter
MR	Macbeth Novo-Gloss (20/60/85)
MW	Minolta Multi-Gloss 268
PA	Photovolt micro-TRI-gloss G3
RA	Rhopoint Novo-Gloss Glossmeter
XX	Instrument make/model not specified by lab

442	Gloss 85 Degree (Paint Chips)
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Instrument code and descript

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

Instrument Code List - Report# 167

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
GD BYK-Gardner The Color Machine
GE BYK-Gardner spectro-guide (45/0)
GH BYK-Gardner Color-View
GU Gretag Spectrolino Spectrophotometer
HK Hunter MiniScan XE (45/0)
HW Hunter LabScan XE
HY Hunter Color Flex 45/0
MG Macbeth 1500/PLUS or 2025+ Color Eye
TN Topcon SR-1 Spectroradiometer
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
XV X-Rite 939 SpectroDensitometer
XX Instrument make/model not specified by lab

409 Color & Color Difference (Paint Chips) Sphere

Instrument code and descript

AJ	ACS-Datacolor 600	XH	X-Rite Color i5
AL	ACS-Datacolor Intl. Dataflash 100	XI	X-Rite Color i7
AM	ACS-Datacolor 600 Plus	XM	X-Rite SP62 Portable Sphere Spectrophotometer
AO	ACS-Datacolor 650X	XO	X-Rite SP64 Portable Sphere Spectrophotometer
AQ	ACS-Datacolor 600X	XU	X-Rite Color Premier 8200 Spectrophotometer
AR	Datacolor 400	XX	Instrument make/model not specified by lab
CA	Cary 5000		
CE	Cary 500		
GA	BYK Gardner Color-Guide Gloss		
GC	BYK-Gardner color-sphere		
GD	BYK-Gardner spectro-guide sphere		
GF	BYK-Gardner The Color Sphere (TCS)		
GG	BYK-Gardner TCS II		
HF	Hunter ColorFlex Diffuse		
HP	Hunter UltraScan PRO		
HW	Hunter UltraScan XE		
MG	Macbeth 2180 Color Eye		
MI	Macbeth Color i 5		
MJ	Macbeth Color-Eye 3000		
MK	Macbeth Color-Eye 7000		
MM	Macbeth Color-Eye 7000a		
MV	Minolta CM-3000d Series Spectrophotometer		
PE	Perkin Elmer Spectrophotometer		

Instrument Code List - Report# 167

Instrument information as provided by laboratories

Analysis Analysis Name

411 Spectrophotometric (Paint Chips) - Sphere

Instrument code and descript

A J	ACS-Datcolor 600
A L	ACS-Datcolor Intl. Dataflash 100
A M	ACS-Datcolor 600 Plus
A O	ACS-Datcolor 650
A Q	ACS-Datcolor 600X
A R	Datcolor 400
C A	Cary 5000
C E	Cary 500
G D	BYK-Gardner spectro-guide sphere
G G	BYK-Gardner TCS II
H F	Hunter ColorFlex Diffuse
H P	Hunter UltraScan PRO
H W	Hunter UltraScan XE
M G	Macbeth 2180 Color Eye
M H	Macbeth Color-Eye XTH
M I	Macbeth Color i 5
M J	Macbeth Color-Eye 3000 Spectrophotometer
M K	Macbeth Color-Eye 7000 Spectrophotometer
M M	Macbeth Color-Eye 7000a
M V	Minolta CM-3000d Series Spectrophotometer
P E	Perkin Elmer Spectrophotometer
X H	X-Rite Color i5
X I	X-Rite Color i7
X M	X-Rite SP62
X O	X-Rite SP64
X U	X-RiteColor Premier 8200 Spectrophotometer
X X	Instrument make/model not specified by lab