



Color & Appearance (Gloss Report) Testing Program

Summary Report # 149 - 3rd Q 2009

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[Key to Tables and Graphs](#)

Analysis **Analysis Name**

[440](#) [Gloss 60 Degree \(Paint Chips\)](#)

[442](#) [Gloss 85 Degree \(Paint Chips\)](#)

[Instrument Code List](#)

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 three opaque color paint chips, selected from throughout the full color spectrum, consisting of a metameric and 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 50 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 (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).

Graph - 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.

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample G91			Sample G92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
1X5R6L		57.03	-0.23	-0.28	68.45	-0.14	-0.15	GN
23KAV8		56.73	-0.53	-0.65	68.80	0.21	0.22	GL
24751N		56.48	-0.78	-0.96	68.05	-0.54	-0.58	GN
2EYW4D		57.58	0.32	0.40	68.78	0.18	0.19	GL
2H16A4		56.70	-0.55	-0.68	67.78	-0.82	-0.87	GX
2NCFU5	*	56.35	-0.90	-1.12	66.48	-2.12	-2.25	GL
2UGF7F		57.50	0.25	0.31	69.65	1.06	1.12	XX
3LY2FQ	*	59.40	2.15	2.66	71.03	2.43	2.58	GK
3MVWEZ	X	51.82	-5.43	-6.73	62.35	-6.25	-6.62	MR
4ERZL8	X	59.75	2.50	3.10	72.33	3.73	3.96	GL
4S2CFF	*	54.80	-2.45	-3.04	65.75	-2.84	-3.01	GL
5NCHJD		57.88	0.62	0.77	69.00	0.41	0.43	XX
7N8HWJ		57.40	0.15	0.18	68.25	-0.34	-0.36	GQ
7VJYB6		57.20	-0.05	-0.06	68.43	-0.17	-0.18	GK
8H3RCJ		57.78	0.52	0.65	69.85	1.26	1.33	GL
8RMKCN		57.70	0.45	0.56	69.45	0.86	0.91	MN
8TS9CA		56.45	-0.80	-0.99	66.90	-1.69	-1.80	GK
91LNQV	X	36.75	-20.50	-25.42	35.33	-33.27	-35.28	GK
99KCJ7	X	59.38	2.12	2.63	69.85	1.26	1.33	GL
AGRAU4	X	55.80	-1.45	-1.80	68.95	0.36	0.38	GL
AJV7WJ		57.60	0.35	0.43	69.33	0.73	0.78	GK
AN6GR8		57.75	0.50	0.62	69.20	0.61	0.64	GK
AYNYJE		55.83	-1.43	-1.77	67.08	-1.52	-1.61	GL
B2HP96	*	58.13	0.87	1.08	68.45	-0.14	-0.15	GL
BED6ES		57.70	0.45	0.56	69.25	0.66	0.70	GL
BQELJP	X	54.03	-3.23	-4.00	65.50	-3.09	-3.28	GS
C8ICCM		57.63	0.37	0.46	69.08	0.48	0.51	GL
CENQHM		56.28	-0.98	-1.21	67.43	-1.17	-1.24	GL
CVSP24		57.28	0.02	0.03	68.88	0.28	0.30	GK
CWJTTR		56.98	-0.28	-0.34	68.45	-0.14	-0.15	GL
CXF11A		56.98	-0.28	-0.34	68.38	-0.22	-0.23	GN
D723XG		57.83	0.57	0.71	69.35	0.76	0.80	GL
DU1729		55.85	-1.40	-1.74	67.03	-1.57	-1.66	GK
F5YND9		57.60	0.35	0.43	68.70	0.11	0.11	GL
FHR9K5		56.35	-0.90	-1.12	66.80	-1.79	-1.90	GL
FN2S5X	*	58.95	1.70	2.11	69.80	1.21	1.28	GL
FSE18H		56.70	-0.55	-0.68	68.10	-0.49	-0.52	GB
GLDF6S	X	61.20	3.95	4.89	73.25	4.66	4.94	GL
H7WXAV		57.15	-0.10	-0.13	67.93	-0.67	-0.71	GL
HRA8LU		57.40	0.15	0.18	68.88	0.28	0.30	GL
JD6951		58.50	1.25	1.55	70.10	1.51	1.60	GZ
KJZ3ZM		58.18	0.92	1.14	69.25	0.66	0.70	GL
LC44ZR		56.65	-0.60	-0.75	67.85	-0.74	-0.79	RA
M69UM6		56.83	-0.43	-0.53	67.93	-0.67	-0.71	XX
MZR8BE	*	59.10	1.85	2.29	70.05	1.46	1.55	GL

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample G91			Sample G92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
NEQWBR		58.58	1.32	1.64	70.18	1.58	1.68	GK
NWXY7D		55.98	-1.28	-1.58	67.38	-1.22	-1.29	GL
NZY3VJ		56.45	-0.80	-0.99	67.88	-0.72	-0.76	GK
PVMEW8		57.30	0.05	0.06	68.80	0.21	0.22	DM
Q13FAY		57.83	0.57	0.71	69.00	0.41	0.43	GN
QKD8EL		56.50	-0.75	-0.93	68.58	-0.02	-0.02	GX
QS97Q7		57.73	0.47	0.59	69.18	0.58	0.62	GL
QUK3KC		56.98	-0.28	-0.34	68.43	-0.17	-0.18	GN
R4ZE69	M	56.75	-0.50	-0.62				MR
REJT7Q		57.00	-0.25	-0.31	68.45	-0.14	-0.15	GL
S9YWTT		57.78	0.52	0.65	69.05	0.46	0.49	MN
SF42QQ		57.30	0.05	0.06	68.13	-0.47	-0.50	HP
SRNFR7		57.15	-0.10	-0.13	69.10	0.51	0.54	MR
T2ZT22		57.70	0.45	0.56	69.18	0.58	0.62	GK
T5NEE4		56.65	-0.60	-0.75	67.80	-0.79	-0.84	BT
T842T9		56.50	-0.75	-0.93	67.15	-1.44	-1.53	GL
UDRKKK		57.45	0.20	0.25	68.80	0.21	0.22	GN
US422M		57.63	0.37	0.46	68.68	0.08	0.09	GL
VEJVXY		57.10	-0.15	-0.19	68.83	0.23	0.25	SJ
VMSD4B		57.83	0.57	0.71	69.08	0.48	0.51	GN
W377SD		57.80	0.55	0.68	69.03	0.43	0.46	GL
WC7ARA		57.98	0.72	0.90	69.45	0.86	0.91	GL
WDYJQD		56.40	-0.85	-1.06	67.98	-0.62	-0.66	GL
WFJE46		56.98	-0.28	-0.34	68.63	0.03	0.03	GL
WX5X1C		56.53	-0.73	-0.90	67.98	-0.62	-0.66	GL
XTM762		58.23	0.97	1.21	69.60	1.01	1.07	GK
XU395N		57.10	-0.15	-0.19	68.65	0.06	0.06	GL
YC5UUU		57.55	0.30	0.37	69.48	0.88	0.94	MR
YJSGQZ		56.23	-1.03	-1.27	68.03	-0.57	-0.60	GK
ZCWS8N		57.05	-0.20	-0.25	68.55	-0.04	-0.05	GL
ZRHMW6		57.75	0.50	0.62	69.45	0.86	0.91	GL

Summary Statistics

Grand Means

57.25 Gloss Units

68.59 Gloss Units

Std Dev Btwn Labs

0.81 Gloss Units

0.94 Gloss Units

Statistics based on 68 of 76 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

3MVWEZ(X) - Data for both samples are low. Inconsistent within the determinations for Sample G91.

4ERZL8(X) - Data for both samples are high. Possible systematic error.

91LNQV(X) - Apparently measured back of the samples.

99KCJ7(X) - Inconsistent in testing between samples.

AGRAU4(X) - Inconsistent in testing between samples and inconsistent within the determinations for Sample G91.

BQELJP(X) - Data for both samples are low. Possible systematic error.

GLDF6S(X) - Data for both samples are high. Inconsistent within the determinations for Sample G91.

R4ZE69(M) - Laboratory did not submit data for Sample G92.

Interlaboratory Testing Program for Color & Appearance

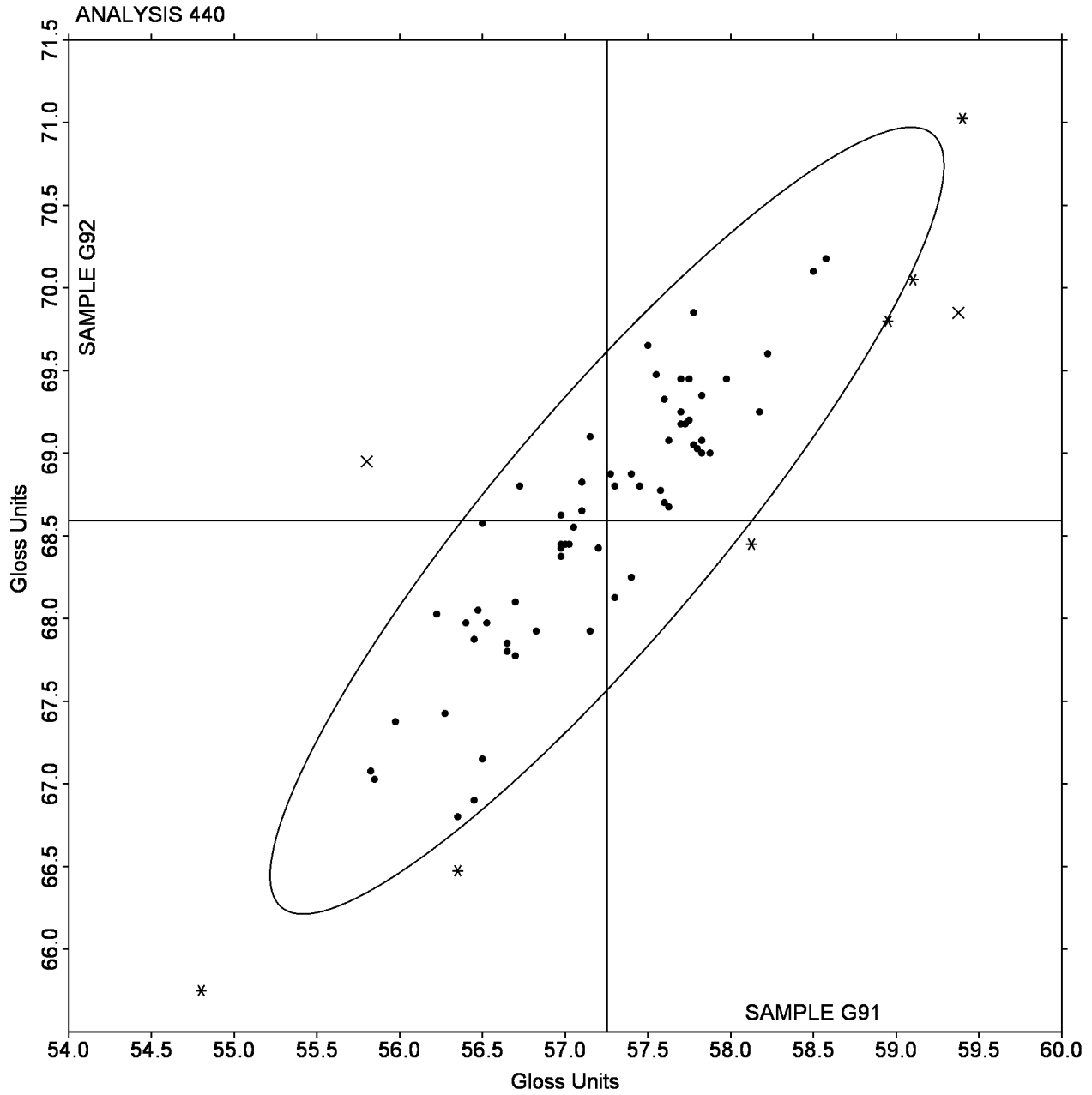
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE G91 = 57.25 Gloss Units

SAMPLE G92 = 68.59 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample L91			Sample L92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
8S3RKQ		16.03	0.02	0.02	20.05	-0.30	-0.37	GN
9BAFAT		16.75	0.74	1.01	20.70	0.35	0.43	GL
AE3YVX		16.00	-0.01	-0.01	19.93	-0.42	-0.52	GL
CJHU5T		16.73	0.72	0.98	20.80	0.45	0.56	GL
CMUXHP		15.70	-0.31	-0.42	19.70	-0.65	-0.80	GL
DPPJ3Y		15.90	-0.11	-0.15	21.30	0.95	1.17	GL
LCPB81		15.93	-0.08	-0.11	20.18	-0.17	-0.21	GN
M4518Z		16.20	0.19	0.26	20.75	0.40	0.49	GN
QCSE21		13.95	-2.06	-2.81	18.28	-2.07	-2.55	LA
QXUYSN		16.98	0.97	1.32	21.18	0.83	1.02	GN
RS3FCG		15.88	-0.13	-0.18	21.20	0.85	1.05	GL
YPAJ8R		16.13	0.12	0.16	20.43	0.08	0.09	GL
ZKKT4Z		15.95	-0.06	-0.08	20.05	-0.30	-0.37	GL

Summary Statistics

Grand Means	16.01 Gloss Units	20.35 Gloss Units
Std Dev Btwn Labs	0.73 Gloss Units	0.81 Gloss Units
Statistics based on 13 of 13 reporting participants		

Analysis Notes for Test #442

No "X" data flags were assigned for this analysis.

Interlaboratory Testing Program for Color & Appearance

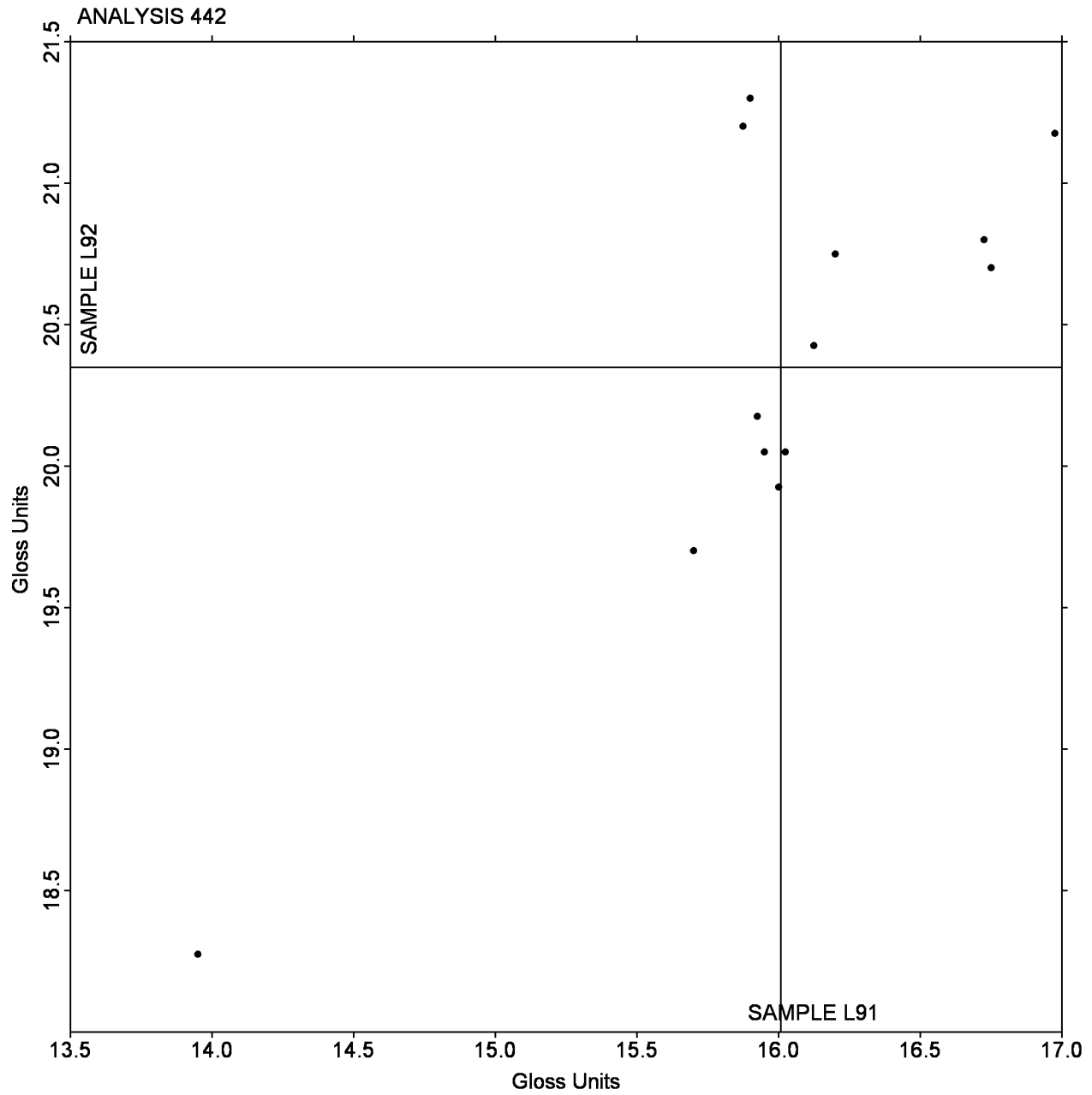
Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE L91 = 16.01 Gloss Units

SAMPLE L92 = 20.35 Gloss Units



Instrument Code List - Report# 149

Instrument information as provided by laboratories

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

Instrument code and description

BT	BYK-Chemie (was BYK-Labotron) Tri-Gloss
DM	Dr. Lange Refo 3
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
GS	BYK-Gardner Glossgard II
GX	BYK-Gardner (model not specified)
GZ	Gardco Statistical Novo-Gloss (60)
HP	Hunter PRO-3 Glossmeter
MN	Macbeth Novo-Gloss (60)
MR	Macbeth Novo-Gloss (20/60/85)
RA	Rhopoint Novo-Gloss Glossmeter
SJ	Sheen Minigloss 101
XX	Instrument make/model not specified by lab

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

GL	BYK-Gardner micro-TRI-gloss
GN	BYK-Gardner new micro-TRI-gloss
LA	Dr. Lange Reflectometer (85)