



Color & Appearance (Gloss Report) Testing Program

Summary Report # 146 - 4th Q 2008

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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 H81			Sample H82			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
136LST		56.25	-1.55	-1.60	67.45	-0.85	-0.85	GL
262G87		58.63	0.82	0.85	68.65	0.35	0.34	SK
2RQ4R9		58.18	0.37	0.38	68.00	-0.30	-0.30	GL
2WKTFU		58.65	0.85	0.87	69.30	1.00	0.99	BT
324WX2		57.23	-0.58	-0.60	67.60	-0.70	-0.70	GL
36SED6		58.63	0.82	0.85	69.73	1.42	1.42	GK
3UGRP3		56.75	-1.05	-1.08	67.10	-1.20	-1.20	RA
5FHH3Y		57.73	-0.08	-0.08	68.05	-0.25	-0.25	GL
5K3KQC		55.58	-2.23	-2.29	66.10	-2.20	-2.20	GS
5YU5ML		59.13	1.32	1.36	69.70	1.40	1.39	GQ
61K9VP		57.43	-0.38	-0.39	67.88	-0.43	-0.43	GK
6BYQPA	*	56.10	-1.70	-1.75	66.03	-2.28	-2.27	GX
72PHKU	X	52.13	-5.68	-5.85	62.13	-6.18	-6.16	MR
72QHH9		58.03	0.22	0.23	68.50	0.20	0.19	GL
7JWVX6		58.03	0.22	0.23	68.38	0.07	0.07	GS
7RBUR2		56.60	-1.20	-1.24	67.38	-0.93	-0.93	MR
87CS3S		57.25	-0.55	-0.57	67.60	-0.70	-0.70	GK
8L3UA5		57.35	-0.45	-0.47	68.10	-0.20	-0.20	GL
8ZGUD4		57.40	-0.40	-0.42	67.98	-0.33	-0.33	GL
953417		57.80	0.00	0.00	67.83	-0.48	-0.48	HP
9SHWR6		57.85	0.05	0.05	68.88	0.57	0.57	GL
9XCLFQ		58.65	0.85	0.87	69.18	0.87	0.87	GK
AS7995		57.68	-0.13	-0.13	68.18	-0.13	-0.13	GK
BG46RT		57.75	-0.05	-0.05	67.43	-0.88	-0.88	SH
BW7L49		57.65	-0.15	-0.16	68.20	-0.10	-0.10	GL
C8V5ZR		57.75	-0.05	-0.05	68.40	0.10	0.10	XX
D3X3AG	*	60.25	2.45	2.52	70.80	2.50	2.49	HR
D4Z9TH		59.33	1.52	1.57	70.15	1.85	1.84	GK
DNSXHS		57.70	-0.10	-0.11	68.00	-0.30	-0.30	GL
DR693U		57.83	0.02	0.02	67.78	-0.53	-0.53	GL
E1EDBJ		58.43	0.62	0.64	69.05	0.75	0.74	GL
EXTWTY		57.13	-0.68	-0.70	67.23	-1.08	-1.08	GL
F3S6CR		58.05	0.25	0.25	68.40	0.10	0.10	GL
F5BGQP		59.78	1.97	2.03	69.88	1.57	1.57	GQ
FBQUEP		56.68	-1.13	-1.16	67.40	-0.90	-0.90	GL
FL7MFJ	X	57.40	-0.40	-0.42	127.68	59.37	59.21	XX
FYA4XL		58.00	0.20	0.20	68.68	0.37	0.37	GN
GCXCR6		57.35	-0.45	-0.47	67.75	-0.55	-0.55	GL
GGVETR		56.85	-0.95	-0.98	67.23	-1.08	-1.08	GM
GQY8MC		57.85	0.05	0.05	68.58	0.27	0.27	GZ
GTZAFU		58.53	0.72	0.74	69.18	0.87	0.87	GL
H1CM8L		59.23	1.42	1.46	69.55	1.25	1.24	GX
H2H98J		59.65	1.85	1.90	70.40	2.10	2.09	DM
HKSBYB		58.13	0.32	0.33	68.33	0.02	0.02	GK
HMG6JD		58.48	0.67	0.69	68.78	0.47	0.47	GN

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H81			Sample H82			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
HMWQ4B		56.63	-1.18	-1.21	67.45	-0.85	-0.85	GL
JPFY PJ		57.38	-0.43	-0.44	67.43	-0.88	-0.88	GL
JQQZHH		57.55	-0.25	-0.26	67.93	-0.38	-0.38	GL
JT83F2		59.10	1.30	1.34	69.00	0.70	0.69	SJ
K7J679		57.20	-0.60	-0.62	67.68	-0.63	-0.63	GN
KXA672		57.55	-0.25	-0.26	68.48	0.17	0.17	GL
LZCMZQ		58.75	0.95	0.97	69.00	0.70	0.69	GL
MA756H		57.33	-0.48	-0.49	68.10	-0.20	-0.20	GL
NMMRC3		58.45	0.65	0.67	68.95	0.65	0.64	GK
NRGPK7		57.88	0.07	0.07	68.55	0.25	0.24	GN
P2WUDP		57.38	-0.43	-0.44	68.18	-0.13	-0.13	XX
PSHUY8		57.58	-0.23	-0.23	68.35	0.05	0.05	GK
Q9RXLC		57.30	-0.50	-0.52	68.35	0.05	0.05	GK
QRVVW2		58.13	0.32	0.33	68.70	0.40	0.39	GL
RH79SH		56.70	-1.10	-1.14	67.25	-1.05	-1.05	GK
RRTBX6		57.98	0.17	0.18	68.28	-0.03	-0.03	GK
RW9MHE		56.98	-0.83	-0.85	66.85	-1.45	-1.45	GL
RZR1PN	*	55.20	-2.60	-2.68	65.88	-2.43	-2.42	GB
SESTGH		58.70	0.90	0.92	69.45	1.15	1.14	HR
SY3JVF		58.13	0.32	0.33	68.48	0.17	0.17	GL
T531N4		57.85	0.05	0.05	68.43	0.12	0.12	XX
T9QDXM	*	57.53	-0.28	-0.29	69.05	0.75	0.74	GX
TDW6G5		57.13	-0.68	-0.70	67.45	-0.85	-0.85	GL
TFHTAS		58.13	0.32	0.33	68.53	0.22	0.22	GN
TFJS87		58.70	0.90	0.92	69.30	1.00	0.99	GL
TJD82G		57.75	-0.05	-0.05	68.98	0.67	0.67	GL
UFN7WT		57.93	0.12	0.13	68.50	0.20	0.19	GN
UZJW2A		56.93	-0.88	-0.90	67.23	-1.08	-1.08	GK
V22DJ6		57.60	-0.20	-0.21	67.83	-0.48	-0.48	GL
W86B73		56.38	-1.43	-1.47	67.48	-0.83	-0.83	MR
WSUVWG	*	60.58	2.77	2.85	71.13	2.82	2.81	GK
XJYFAV		59.25	1.45	1.49	69.78	1.47	1.47	GK
XWFBBZ		57.18	-0.63	-0.65	67.20	-1.10	-1.10	GL
ZLR94N		56.88	-0.93	-0.96	67.60	-0.70	-0.70	GL

Summary Statistics

Grand Means

57.80 Gloss Units

68.30 Gloss Units

Std Dev Btwn Labs

0.97 Gloss Units

1.00 Gloss Units

Statistics based on 77 of 79 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

72PHKU(X) - Data for both samples are low. Possible systematic error.

FL7MFJ(X) - Extreme data for Sample H82.

Interlaboratory Testing Program for Color & Appearance

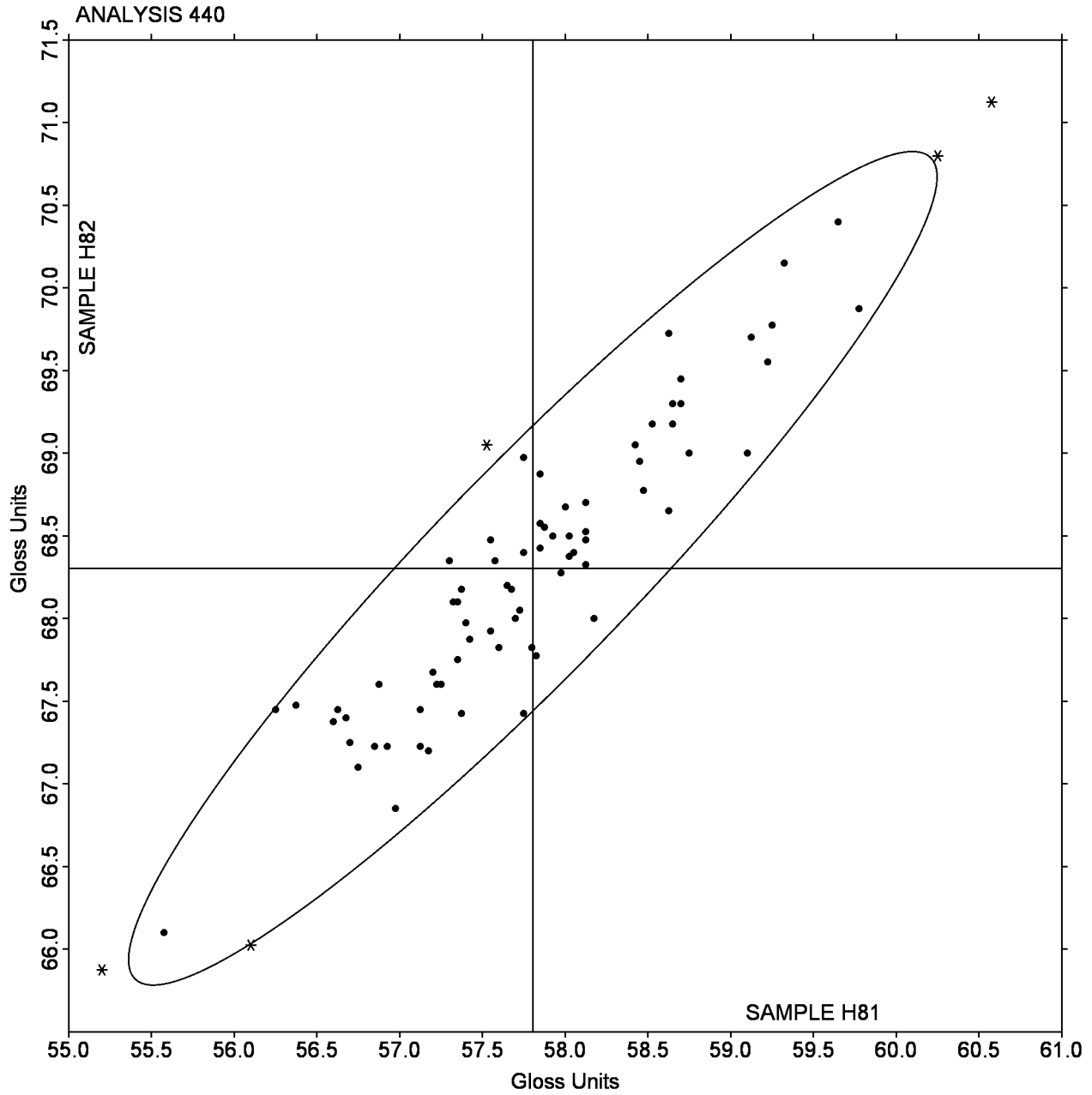
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE H81 = 57.80 Gloss Units

SAMPLE H82 = 68.30 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample M81			Sample M82			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
4RRYWW		12.93	0.41	0.52	17.53	0.56	0.56	GN
6WLEY3		11.43	-1.09	-1.38	15.95	-1.01	-1.01	GL
7371P7		12.75	0.23	0.29	17.05	0.09	0.09	GL
78115N		12.08	-0.44	-0.56	16.50	-0.46	-0.46	GL
BJYYXX		12.63	0.11	0.14	17.15	0.19	0.19	GL
G74F2E		12.38	-0.14	-0.18	16.83	-0.14	-0.14	GL
GH6EQL		12.48	-0.04	-0.05	16.63	-0.34	-0.34	GL
H36DER		11.05	-1.47	-1.85	15.28	-1.69	-1.69	LA
HHYBE1		12.55	0.03	0.04	17.15	0.19	0.19	GL
N5BSNR		11.80	-0.72	-0.90	16.48	-0.49	-0.49	GN
PLU3Q7	*	14.50	1.98	2.50	19.90	2.94	2.94	RA
QWACFX		12.95	0.43	0.55	17.25	0.29	0.29	GN
U9XZUM		12.50	-0.02	-0.02	16.80	-0.16	-0.16	GL
YJLGEW		12.65	0.13	0.17	16.53	-0.44	-0.44	GL
ZXW2Y2		13.10	0.58	0.74	17.43	0.46	0.46	GL

Summary Statistics

Grand Means

12.52 Gloss Units

16.96 Gloss Units

Std Dev Btwn Labs

0.79 Gloss Units

1.00 Gloss Units

Statistics based on 15 of 15 reporting participants

Analysis Notes for Test #442

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

Interlaboratory Testing Program for Color & Appearance

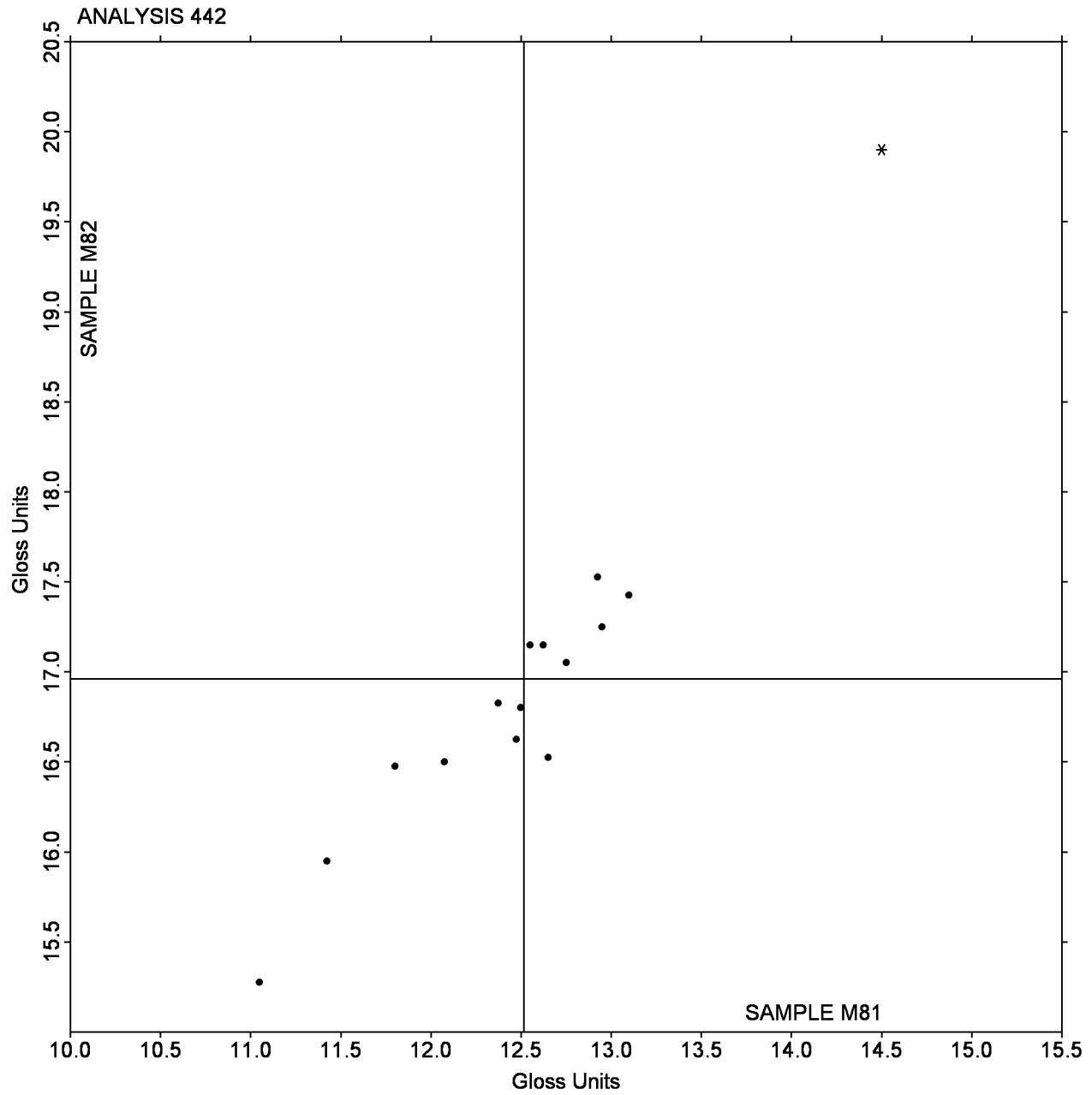
Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE M81 = 12.52 Gloss Units

SAMPLE M82 = 16.96 Gloss Units



Instrument Code List - Report# 146

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
GM	BYK-Gardner Multiangle Glossmeter
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
HR	Hunter PRO-60 Glossmeter
MR	Macbeth Novo-Gloss (20/60/85)
RA	Rhopoint Novo-Gloss Glossmeter
SH	Sheen Microgloss 160
SJ	Sheen Minigloss 101
SK	Sheen Tri-Glossmaster 260
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)
RA	Rhopoint Novo-Gloss Glossmeter