



Color & Appearance (Gloss Report) Testing Program

Summary Report # 150 - 4th 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:

Collaborative Testing Services, Inc.
21331 Gentry Drive
Sterling, Virginia 20166 USA

+1-571-434-1925
FAX #: +1-571-434-1937
color@cts-interlab.com

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

Office Hours: 8:00 a.m. - 4:30 p.m. ET

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 H91			Sample H92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
1JQ87S		28.85	0.15	0.27	38.40	0.31	0.46	GL
1N5XG3		28.80	0.10	0.18	38.10	0.01	0.02	GN
1ZW8PW		29.78	1.08	1.93	38.80	0.71	1.05	MR
2FGWBA		28.85	0.15	0.27	38.05	-0.04	-0.05	GL
2VE4SM		28.55	-0.15	-0.27	38.18	0.09	0.13	GN
32DHZL		28.35	-0.35	-0.63	37.48	-0.61	-0.89	GL
3PL82C		28.80	0.10	0.18	38.73	0.64	0.94	GL
4CWRAF	*	27.38	-1.32	-2.38	36.35	-1.74	-2.54	GS
4KSXVQ		28.58	-0.12	-0.22	37.93	-0.16	-0.23	GN
5FF9XE		28.98	0.28	0.49	38.40	0.31	0.46	GL
6U2SRW		28.15	-0.55	-0.99	37.55	-0.54	-0.78	XX
78JXNG		29.73	1.03	1.84	39.18	1.09	1.60	GL
7XZCDT		29.00	0.30	0.54	38.48	0.39	0.57	GL
8B8KXP		28.25	-0.45	-0.81	37.03	-1.06	-1.55	GL
8K9XQJ		27.98	-0.72	-1.30	37.48	-0.61	-0.89	GL
8PBE8U		28.13	-0.57	-1.03	37.62	-0.47	-0.69	GL
98TJAN		28.63	-0.07	-0.13	37.73	-0.36	-0.53	GL
9JEASV		28.90	0.20	0.36	37.93	-0.16	-0.23	DM
9JHJBC		28.10	-0.60	-1.08	37.60	-0.49	-0.71	GL
AJT9UA		29.03	0.33	0.58	38.35	0.26	0.39	GX
BENGNG		28.33	-0.37	-0.67	37.95	-0.14	-0.20	GK
BKZ5MS		28.38	-0.32	-0.58	37.65	-0.44	-0.64	GL
BQTF27		29.73	1.03	1.84	38.88	0.79	1.16	GK
BXUY8T		27.70	-1.00	-1.79	36.55	-1.54	-2.25	MR
C2FTAD		28.68	-0.02	-0.04	38.10	0.01	0.02	GK
CEU9SQ		28.88	0.18	0.31	38.53	0.44	0.65	GL
CMN92S		28.20	-0.50	-0.90	37.78	-0.31	-0.45	GN
D9ZKP7		28.88	0.18	0.31	38.33	0.24	0.35	GK
DW35C2		28.33	-0.37	-0.67	37.43	-0.66	-0.97	XX
EJ382L		28.68	-0.02	-0.04	38.55	0.46	0.68	GL
EUH3CE		28.75	0.05	0.09	38.25	0.16	0.24	GL
FREXMU		29.45	0.75	1.35	38.60	0.51	0.76	GL
G24K9E		29.10	0.40	0.72	38.58	0.49	0.72	GL
G5GFRK		28.68	-0.02	-0.04	37.90	-0.19	-0.27	BT
GCU2K3		28.65	-0.05	-0.09	37.98	-0.11	-0.16	GL
GWU8U2		28.90	0.20	0.36	38.03	-0.06	-0.09	GB
GZKWKE		28.88	0.18	0.31	38.85	0.76	1.12	GL
HQBQ22		28.35	-0.35	-0.63	37.53	-0.56	-0.82	GL
HQUZ7Z		27.50	-1.20	-2.15	36.65	-1.44	-2.10	GX
HX52V9		28.73	0.03	0.05	37.95	-0.14	-0.20	GN
J5ZWHK	*	30.28	1.58	2.83	39.43	1.34	1.97	XX
JJ6R6F		29.78	1.08	1.93	39.45	1.36	2.00	GL
K1QFYT		29.05	0.35	0.63	38.25	0.16	0.24	GL
K3G92P		28.83	0.13	0.23	38.15	0.06	0.10	GL
K4J39N	*	29.35	0.65	1.17	39.68	1.59	2.33	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample H91			Sample H92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
K6GLYP		28.15	-0.55	-0.99	37.55	-0.54	-0.78	GL
LFEECT		28.50	-0.20	-0.36	37.60	-0.49	-0.71	GL
LWG57C		29.25	0.55	0.99	39.35	1.26	1.86	GL
NY75J6		28.20	-0.50	-0.90	37.60	-0.49	-0.71	HP
PE9MVK		28.45	-0.25	-0.45	38.10	0.01	0.02	GK
PNXZRP		27.45	-1.25	-2.24	36.93	-1.16	-1.70	SJ
PZUE3T		29.30	0.60	1.08	38.73	0.64	0.94	XX
QLA3AF	X	26.13	-2.57	-4.62	34.18	-3.91	-5.74	MR
QZ4CLU		28.98	0.28	0.49	38.73	0.64	0.94	GK
RA3B17		28.88	0.18	0.31	38.13	0.04	0.06	GK
RK9AGV		28.15	-0.55	-0.99	37.45	-0.64	-0.93	GQ
S2PSAF		29.35	0.65	1.17	38.65	0.56	0.83	GZ
SRT2VQ		28.93	0.23	0.40	38.60	0.51	0.76	GK
ULU4XM		28.80	0.10	0.18	38.75	0.66	0.98	GN
VC2FXZ		28.60	-0.10	-0.18	37.70	-0.39	-0.56	GL
VFEXUL		28.00	-0.70	-1.26	37.43	-0.66	-0.97	GL
WD8T1X		28.93	0.23	0.40	38.03	-0.06	-0.09	RA
XER8DK		28.88	0.18	0.31	38.43	0.34	0.50	GL
XRYD4C		28.35	-0.35	-0.63	37.53	-0.56	-0.82	MR
Y63HYX		29.00	0.30	0.54	38.13	0.04	0.06	GL
YUXYLG		28.48	-0.22	-0.40	37.30	-0.79	-1.15	GL
Z5FRVC		28.80	0.10	0.18	38.65	0.56	0.83	GK

Summary Statistics

Grand Means	28.70	Gloss Units	38.09	Gloss Units
Std Dev Btwn Labs	0.56	Gloss Units	0.68	Gloss Units
Statistics based on 66 of 67 reporting participants				

Comments on assigned Data Flags for Test #440

QLA3AF(X) - Data for both samples are low.

Interlaboratory Testing Program for Color & Appearance

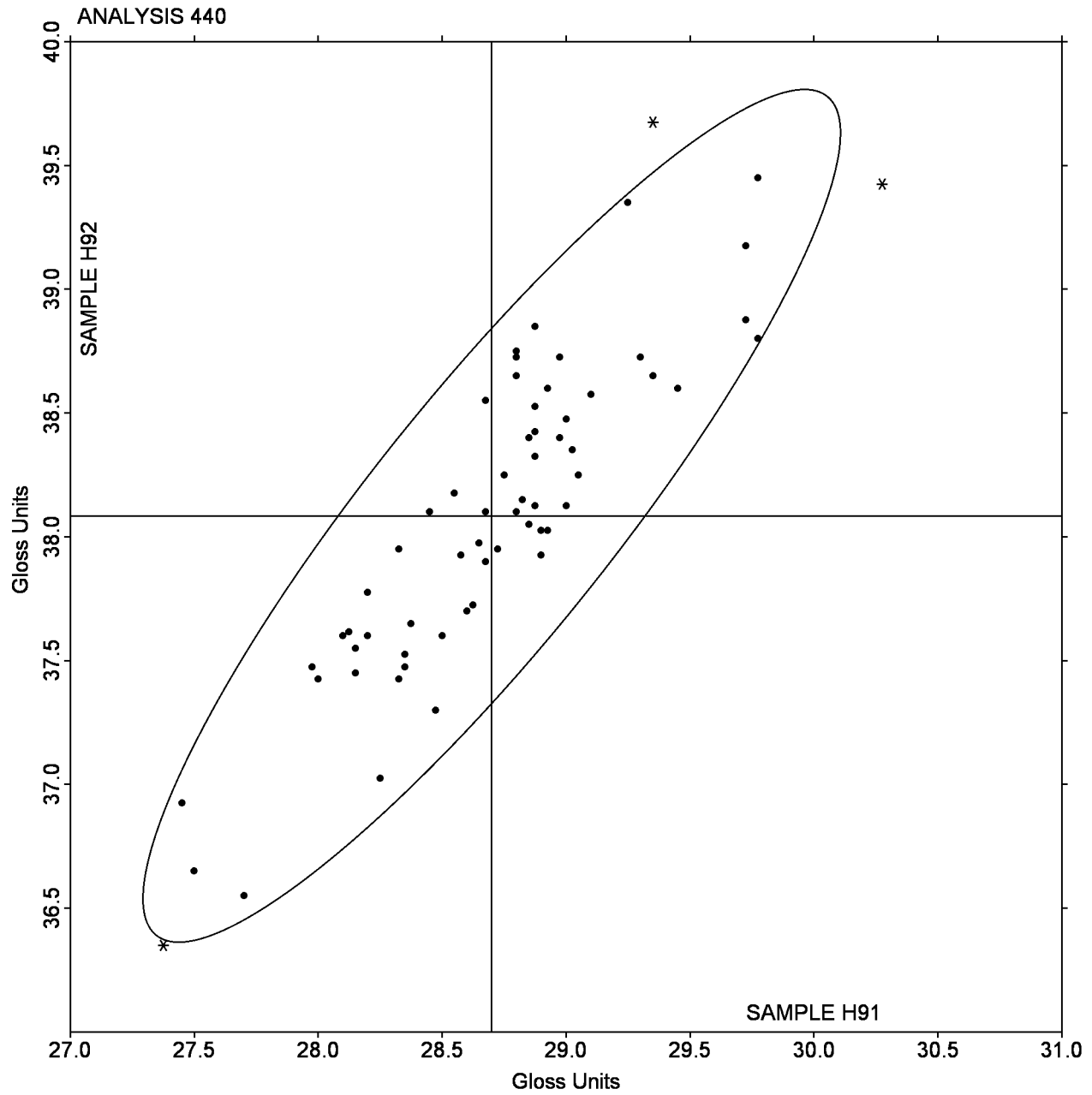
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE H91 = 28.70 Gloss Units

SAMPLE H92 = 38.09 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample M91			Sample M92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
IJ7F2N		7.35	0.84	1.77	12.00	1.22	1.69	GN
3GBLMJ		6.73	0.21	0.45	11.20	0.42	0.58	GL
6QTR3R		5.43	-1.09	-2.30	9.15	-1.63	-2.27	LA
D6WRPG		6.63	0.11	0.23	11.00	0.22	0.31	GL
FDH9VZ		6.65	0.14	0.29	11.00	0.22	0.31	GN
GTH8QN		6.75	0.24	0.50	11.28	0.49	0.69	GN
H1TDUE		5.93	-0.59	-1.25	9.80	-0.98	-1.36	HQ
L7KA86		6.88	0.36	0.76	11.58	0.79	1.10	GL
QNWYRX		6.80	0.29	0.60	10.90	0.12	0.17	GN
SLNP6H		6.73	0.21	0.45	10.38	-0.41	-0.56	GL
TTEMXQ		6.00	-0.51	-1.09	10.38	-0.41	-0.56	GL
WZTNWS		6.50	-0.01	-0.03	10.83	0.04	0.06	GL
XCZEAP		6.48	-0.04	-0.08	10.98	0.19	0.27	GL
YRSMG5		6.38	-0.14	-0.29	10.48	-0.31	-0.42	GL

Summary Statistics

Grand Means

6.51 Gloss Units

10.78 Gloss Units

Std Dev Btwn Labs

0.47 Gloss Units

0.72 Gloss Units

Statistics based on 14 of 14 reporting participants

Analysis Notes for Test #442

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

Interlaboratory Testing Program for Color & Appearance

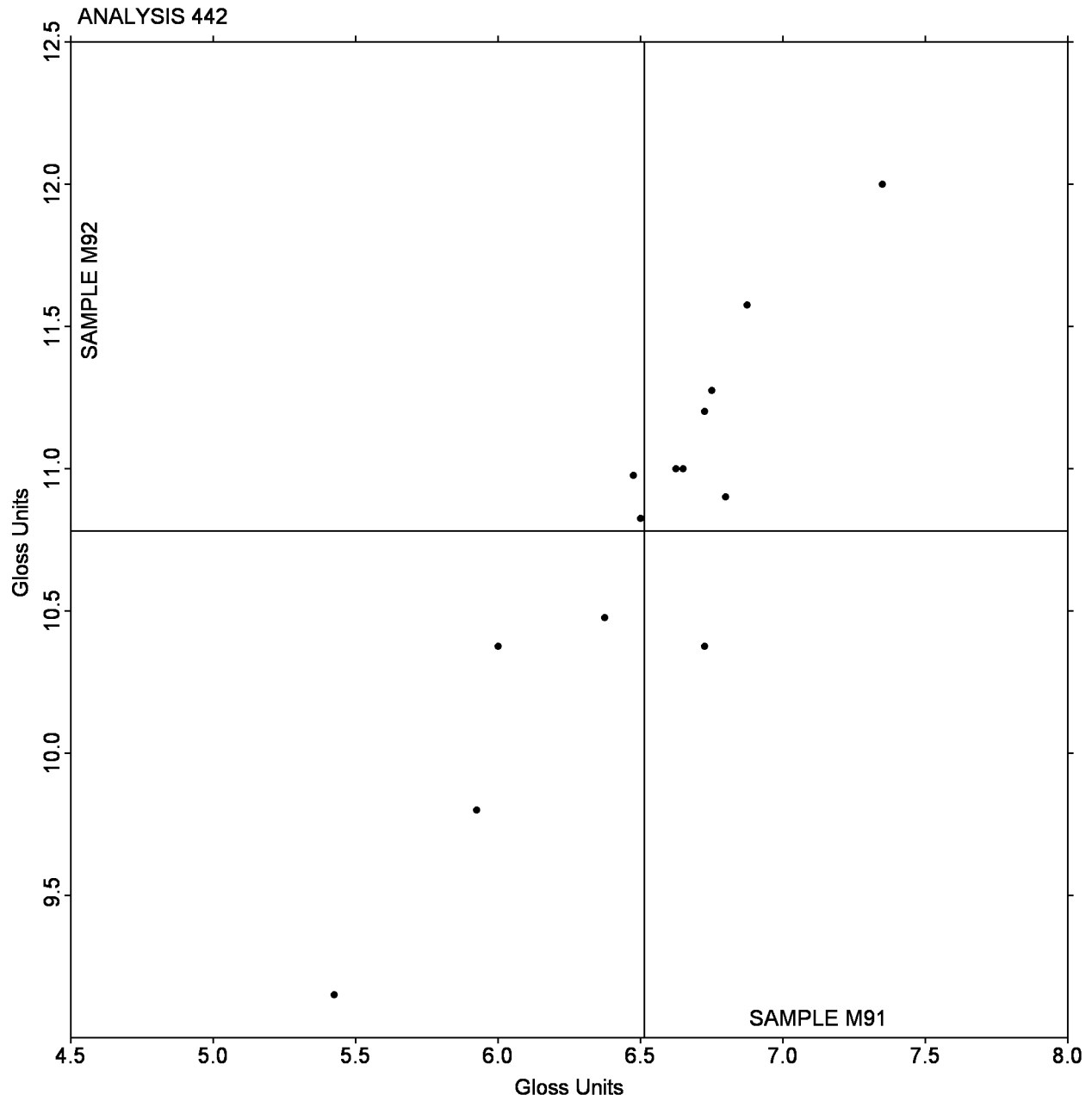
Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE M91 = 6.51 Gloss Units

SAMPLE M92 = 10.78 Gloss Units



Instrument Code List - Report# 150

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
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
HQ	Hunter D48 Glossmeter (85)
LA	Dr. Lange Reflectometer (85)