



Color & Appearance (Gloss Report) Testing Program

Summary Report # 148 - 2nd 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 F91			Sample F92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
1HCVDZ		41.78	-1.17	-1.77	51.80	-1.23	-1.73	GL
1ME8FE		42.48	-0.47	-0.71	52.68	-0.35	-0.50	GK
2G5DYN		42.15	-0.80	-1.20	52.80	-0.23	-0.32	GB
2XH814	X	4.38	-38.57	-58.37	5.33	-47.70	-67.51	GK
3AQPSC		42.50	-0.45	-0.67	52.63	-0.40	-0.57	GL
4J9XHM		42.93	-0.02	-0.03	52.78	-0.25	-0.35	HP
51LQHQ		43.78	0.83	1.26	53.85	0.82	1.17	GL
5CF2U3		43.98	1.03	1.56	53.88	0.85	1.20	GL
5P2RJZ		42.55	-0.40	-0.60	53.33	0.30	0.42	DM
6JK3UW		42.98	0.03	0.04	53.33	0.30	0.42	XX
6WLYR4	X	46.48	3.53	5.34	42.98	-10.05	-14.22	GL
6XM4SC		43.65	0.70	1.07	53.63	0.60	0.85	GL
7XSLVV		41.98	-0.97	-1.47	52.43	-0.60	-0.85	GQ
86TDH3		42.08	-0.87	-1.32	51.75	-1.28	-1.80	GL
8938QE	*	42.23	-0.72	-1.09	51.53	-1.50	-2.12	GL
8GKLPD	*	44.78	1.83	2.77	54.73	1.70	2.41	GL
8QG4B7		43.48	0.53	0.80	53.45	0.42	0.60	GK
9DVWKR		42.65	-0.30	-0.45	52.45	-0.58	-0.81	GN
ACTZHM		43.33	0.38	0.57	53.28	0.25	0.35	GL
ALW6T4		43.00	0.05	0.08	53.00	-0.03	-0.04	GN
ARKW88		42.70	-0.25	-0.37	52.33	-0.70	-0.99	GL
AY6B94		42.95	0.00	0.01	53.68	0.65	0.92	GL
CJKLGE		42.98	0.03	0.04	53.13	0.10	0.14	GX
CNKMQP		42.28	-0.67	-1.02	51.80	-1.23	-1.73	GL
CU4YDQ	X	40.30	-2.65	-4.00	50.40	-2.63	-3.72	GL
D9FQ1V		43.68	0.73	1.10	53.75	0.72	1.03	GL
DYR73N		42.85	-0.10	-0.14	53.25	0.22	0.32	GZ
EFMMS1		42.50	-0.45	-0.67	52.20	-0.83	-1.17	GL
ESLSWC		43.13	0.18	0.27	53.30	0.27	0.39	GL
F79JZK		42.78	-0.17	-0.26	52.88	-0.15	-0.21	GL
HFW3Q3		42.90	-0.05	-0.07	53.05	0.02	0.03	RA
HK775J		42.50	-0.45	-0.67	53.08	0.05	0.07	GK
HLN7J7		43.58	0.63	0.95	53.55	0.52	0.74	GL
HQ78V6		42.68	-0.27	-0.41	52.80	-0.23	-0.32	GL
HTR6DV		42.55	-0.40	-0.60	52.78	-0.25	-0.35	GL
HXPL5R		43.30	0.35	0.54	53.53	0.50	0.71	GL
KFJJCH		43.85	0.90	1.37	54.00	0.97	1.38	GK
KLQRKT		42.88	-0.07	-0.11	53.18	0.15	0.21	GN
LJ8GT8		42.10	-0.85	-1.28	51.88	-1.15	-1.63	GL
LL2S1Z		43.65	0.70	1.07	53.75	0.72	1.03	GL
LWMZ2A	*	44.33	1.38	2.09	53.75	0.72	1.03	GK
M43DG6	X	46.25	3.30	5.00	56.80	3.77	5.34	GK
M5KYCA	*	44.60	1.65	2.50	54.28	1.25	1.77	SJ
MCSL4W		43.78	0.83	1.26	54.13	1.10	1.56	MR
MNEYJ2		43.25	0.30	0.46	54.00	0.97	1.38	GL

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample F91			Sample F92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
NB7BH9		41.85	-1.10	-1.66	52.13	-0.90	-1.27	MR
P7JRM Y		43.15	0.20	0.31	53.23	0.20	0.28	GK
PA73L4		43.10	0.15	0.23	52.85	-0.18	-0.25	GL
PWUCX9		42.78	-0.17	-0.26	52.68	-0.35	-0.50	GN
PZRER6		43.35	0.40	0.61	53.75	0.72	1.03	GK
QELQYE		42.58	-0.37	-0.56	52.95	-0.08	-0.11	BT
QT61X4		42.43	-0.52	-0.79	52.48	-0.55	-0.78	XX
R1MECZ		42.68	-0.27	-0.41	52.33	-0.70	-0.99	GK
RBF PBM		43.85	0.90	1.37	53.78	0.75	1.06	GL
RRGNSB		42.71	-0.24	-0.36	52.50	-0.53	-0.74	GL
RUSBXV		42.53	-0.42	-0.64	52.00	-1.03	-1.45	XX
RX7BTW		43.10	0.15	0.23	52.58	-0.45	-0.64	GK
SL6UAL		43.28	0.33	0.50	53.35	0.32	0.46	GN
SX458E		43.60	0.65	0.99	53.78	0.75	1.06	GX
T2BJ3B		41.95	-1.00	-1.51	52.20	-0.83	-1.17	GN
TBYJG1		43.50	0.55	0.84	53.68	0.65	0.92	GS
V3QCKQ		43.53	0.58	0.88	53.35	0.32	0.46	GL
VCYXVY		43.05	0.10	0.16	53.58	0.55	0.78	MR
VLJBE3		42.03	-0.92	-1.39	51.70	-1.33	-1.88	GL
WRX687		43.13	0.18	0.27	53.35	0.32	0.46	GN
X3MH2V		42.45	-0.50	-0.75	52.40	-0.63	-0.89	GL
X97K36		43.10	0.15	0.23	53.75	0.72	1.03	GL
XBVW2C		41.78	-1.17	-1.77	52.55	-0.48	-0.67	MR
XSK7PE		42.53	-0.42	-0.64	53.15	0.12	0.18	GL
YTUDN1		42.98	0.03	0.04	52.50	-0.53	-0.74	GL
ZJE458		42.40	-0.55	-0.83	52.85	-0.18	-0.25	XX

Summary Statistics

Grand Means

42.95 Gloss Units

53.03 Gloss Units

Std Dev Btwn Labs

0.66 Gloss Units

0.71 Gloss Units

Statistics based on 67 of 71 reporting participants

Comments on assigned Data Flags for Test #440

2XH814(X) - It appears that the data were off by a factor of 0.1.

6WLYR4(X) - High data for Sample F91. Low data for Sample F92.

CU4YDQ(X) - Data for both samples are low. Possible systematic error.

M43DG6(X) - Data for both samples are high. Possible systematic error.

Interlaboratory Testing Program for Color & Appearance

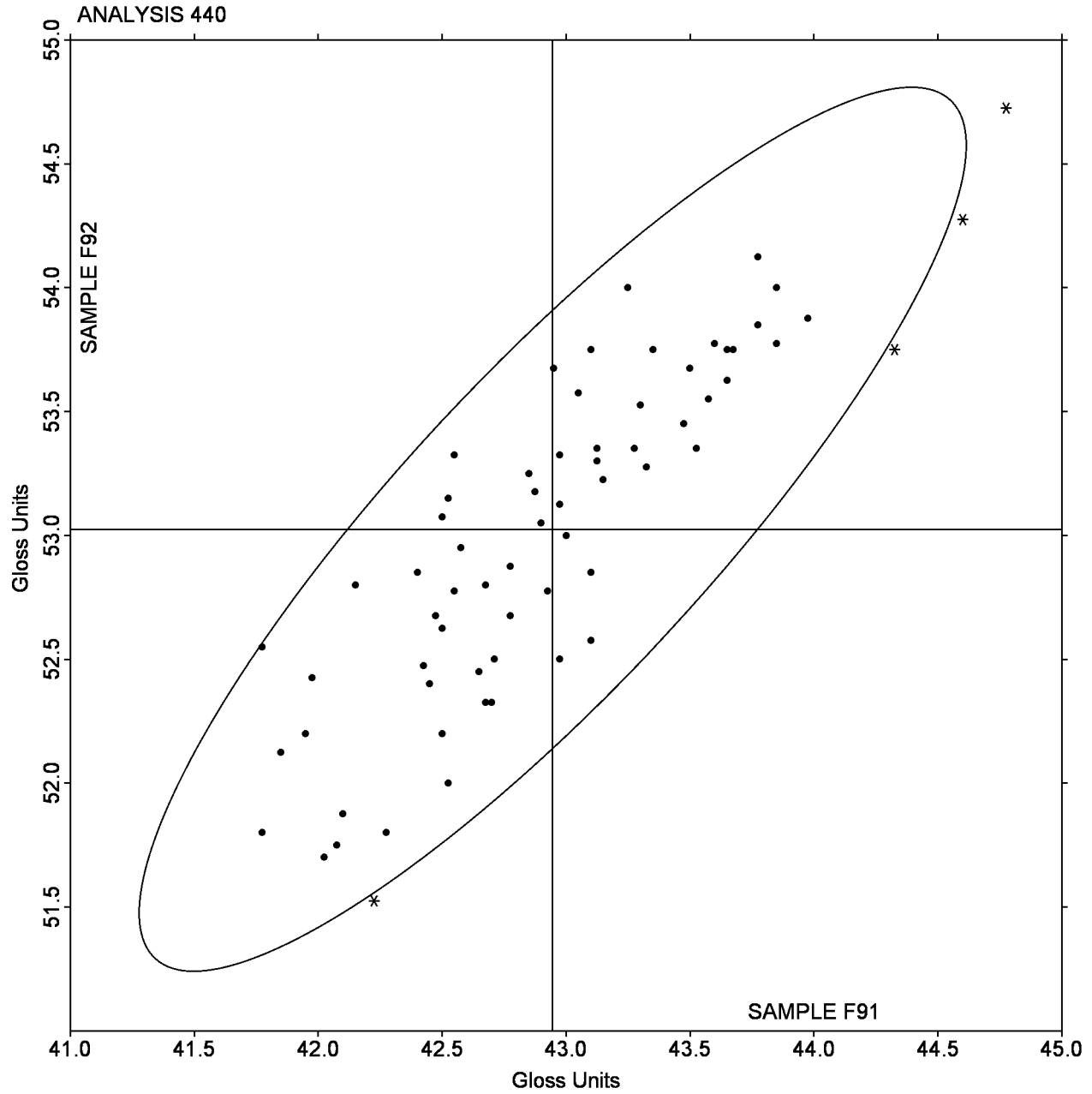
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE F91 = 42.95 Gloss Units

SAMPLE F92 = 53.03 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample K91			Sample K92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
2ERDWE		9.23	0.17	0.41	12.65	0.15	0.30	GL
6DGGC1		9.08	0.02	0.04	12.35	-0.15	-0.32	GL
82PUUG		9.55	0.49	1.22	12.85	0.35	0.72	GL
99HLJW		9.00	-0.06	-0.14	12.28	-0.23	-0.47	GL
9D8F3A		8.93	-0.13	-0.33	12.68	0.17	0.35	GN
BTPDVN		8.48	-0.58	-1.45	11.95	-0.55	-1.15	GN
EVXUK4		8.25	-0.81	-2.01	11.48	-1.03	-2.13	HQ
PZ5B54		9.50	0.44	1.10	13.13	0.62	1.28	GL
QS389P		9.35	0.29	0.72	13.18	0.67	1.39	GN
TY3YRR		8.75	-0.31	-0.77	12.23	-0.28	-0.58	GL
VNAXY1		9.35	0.29	0.72	12.63	0.12	0.25	GN
WVYGSS		9.25	0.19	0.48	12.68	0.17	0.35	GL

Summary Statistics

Grand Means	9.06	Gloss Units	12.50	Gloss Units
Std Dev Btwn Labs	0.40	Gloss Units	0.48	Gloss Units
Statistics based on 12 of 12 reporting participants				

Analysis Notes for Test #442

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

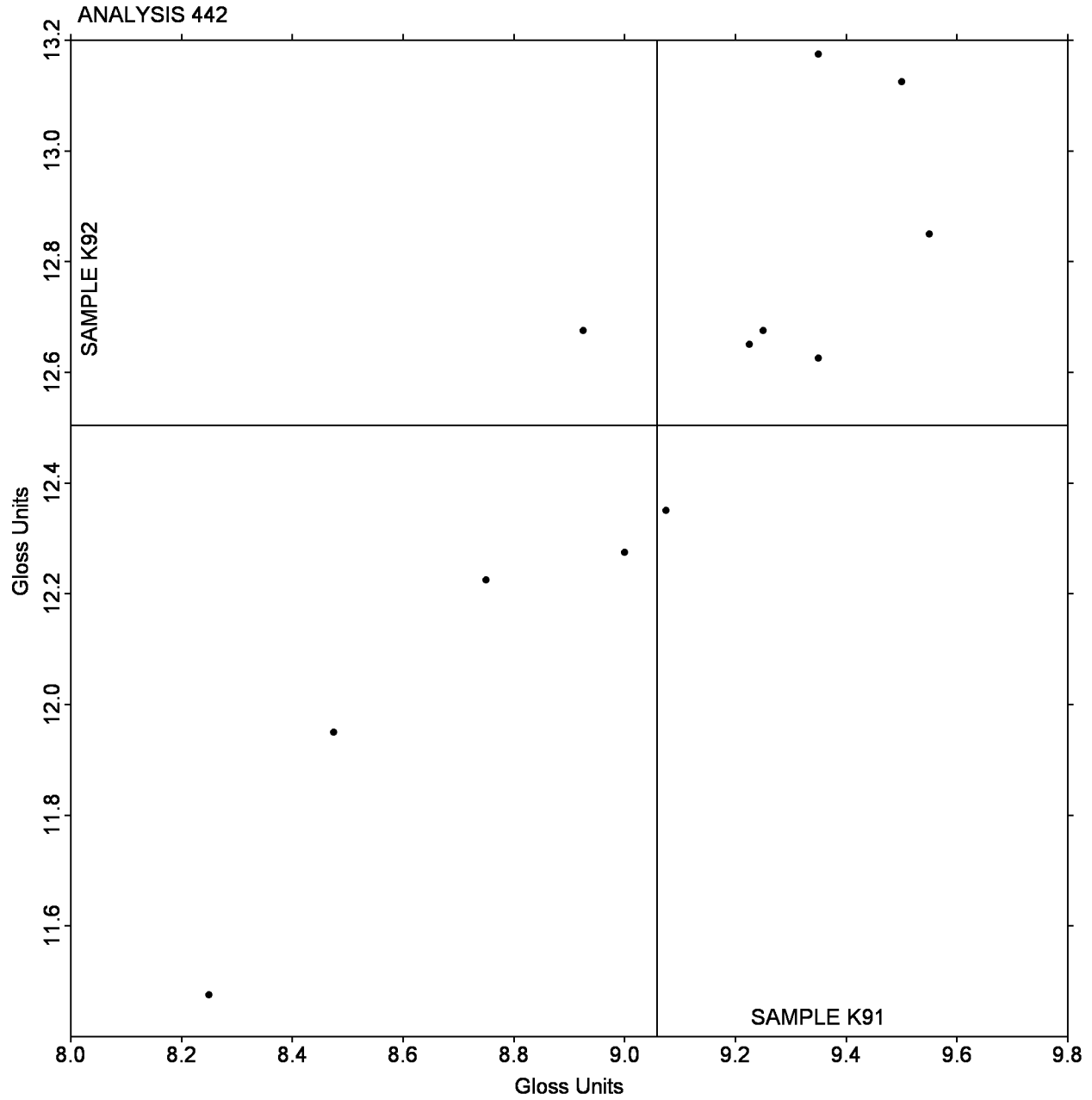
Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips ASTM Method D 523

SAMPLE K91 = 9.06 Gloss Units

SAMPLE K92 = 12.50 Gloss Units



Instrument Code List - Report# 148

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)