



Color & Appearance (Gloss Report) Testing Program

Summary Report # 147 - 1st Q 2009

[About the Color Program](#), [About CTS](#)

[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 E91			Sample E92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
12PP34		29.83	1.10	1.81	39.40	0.97	1.24	GL
184DGD		28.05	-0.67	-1.11	38.20	-0.23	-0.29	GK
1EULL6		29.05	0.33	0.54	38.98	0.55	0.70	GN
1K55QB		29.08	0.35	0.58	39.05	0.62	0.80	GL
1LTBLM		28.45	-0.27	-0.45	38.30	-0.13	-0.16	XX
1N1MHR		29.43	0.70	1.16	39.55	1.12	1.44	GK
1NHLFW		27.90	-0.82	-1.36	37.80	-0.63	-0.80	GN
1RF3VB	X	45.60	16.88	27.79	44.85	6.42	8.21	GL
2AMUAH		28.60	-0.12	-0.20	37.75	-0.68	-0.86	GL
3H4MCU		28.78	0.05	0.09	38.03	-0.40	-0.51	GB
3HGAJM		28.63	-0.10	-0.16	38.10	-0.33	-0.42	GL
3W66YS		28.58	-0.15	-0.24	38.23	-0.20	-0.26	GL
4TBQZB		27.95	-0.77	-1.27	37.40	-1.03	-1.31	GL
665SSV	*	30.35	1.63	2.68	40.50	2.07	2.65	SJ
6FC33C		28.98	0.25	0.41	38.50	0.07	0.09	GK
6S23UE		28.00	-0.72	-1.19	37.58	-0.85	-1.09	GL
73Y36J		27.55	-1.17	-1.93	37.25	-1.18	-1.50	GL
7LHSM6		28.83	0.10	0.17	38.55	0.12	0.16	GL
7TGG3A		28.63	-0.10	-0.16	38.50	0.07	0.09	GL
8SDZ1R		29.23	0.50	0.83	39.15	0.72	0.92	GL
935R4G		29.20	0.48	0.79	38.63	0.20	0.25	GK
94P6UA		28.85	0.13	0.21	38.83	0.40	0.51	GN
9E88KJ		29.38	0.65	1.07	39.00	0.57	0.73	GL
A1LN9P	*	29.73	1.00	1.65	40.28	1.85	2.36	GL
BBEUKT		27.43	-1.30	-2.14	36.83	-1.60	-2.05	GL
BDK1YK		28.30	-0.42	-0.70	37.85	-0.58	-0.74	GK
BKHCF4		28.73	0.00	0.00	38.55	0.12	0.16	GL
BXXFHZ		28.38	-0.35	-0.57	38.48	0.05	0.06	GL
CWK67D		29.18	0.45	0.74	38.50	0.07	0.09	XX
D4WZ5		28.65	-0.07	-0.12	38.23	-0.20	-0.26	BT
DDSDHS		28.88	0.15	0.25	38.85	0.42	0.54	GL
DFK5UY		28.93	0.20	0.33	38.83	0.40	0.51	GL
DKJJGN		28.85	0.13	0.21	38.35	-0.08	-0.10	GN
DXZJSU		29.50	0.78	1.28	39.70	1.27	1.63	GK
DZF7TT		29.75	1.03	1.69	39.58	1.15	1.47	MR
DZRNJG		28.30	-0.42	-0.70	38.15	-0.28	-0.35	DM
E2JBX1		28.50	-0.22	-0.37	38.33	-0.10	-0.13	HP
E2MVYA		28.28	-0.45	-0.74	37.58	-0.85	-1.09	GL
FJQNMX		28.33	-0.40	-0.66	37.53	-0.90	-1.15	XX
FLBJX5		28.20	-0.52	-0.86	38.28	-0.15	-0.19	GN
FQLCM4		28.35	-0.37	-0.61	37.68	-0.75	-0.96	GL
FUCNFE		28.55	-0.17	-0.28	38.25	-0.18	-0.23	GK
FULXUE	X	26.65	-2.07	-3.41	35.25	-3.18	-4.06	MR
G4STVP	X	27.80	-0.92	-1.52	36.30	-2.13	-2.72	GS
GEC55G		28.63	-0.10	-0.16	38.38	-0.05	-0.07	GK

Interlaboratory Testing Program for Color & Appearance

Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample E91			Sample E92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
GG5XES		28.38	-0.35	-0.57	38.13	-0.30	-0.39	GL
GUB6X9	X	32.50	3.78	6.22	41.75	3.32	4.25	GL
H4W68H	*	27.55	-1.17	-1.93	36.50	-1.93	-2.46	GX
H754ZD		28.93	0.20	0.33	38.70	0.27	0.35	GL
HFEJS8		28.73	0.00	0.00	38.55	0.12	0.16	GK
JCYESH		29.30	0.58	0.95	39.13	0.70	0.89	GK
KK2Y75		28.13	-0.60	-0.98	37.85	-0.58	-0.74	GL
KSE5PU		28.28	-0.45	-0.74	38.03	-0.40	-0.51	GL
L6Y61E		28.58	-0.15	-0.24	37.93	-0.50	-0.64	GL
LB2FAN		29.95	1.23	2.02	39.90	1.47	1.88	GX
LYZKNG		29.20	0.48	0.79	38.70	0.27	0.35	GL
M2G155		28.50	-0.22	-0.37	37.90	-0.53	-0.67	MR
MN9QBH	X	28.18	-0.55	-0.90	36.28	-2.15	-2.75	GQ
N4QG8U		28.75	0.02	0.04	38.59	0.16	0.20	GL
NTE2M9		29.95	1.23	2.02	40.25	1.82	2.33	GK
PIV6GZ		28.65	-0.07	-0.12	38.35	-0.08	-0.10	GL
QE7K66		27.98	-0.75	-1.23	37.55	-0.88	-1.12	GK
RMYDMA		28.90	0.18	0.29	38.15	-0.28	-0.35	GN
RWJM4C		29.23	0.50	0.83	38.90	0.47	0.61	GK
SM4N8E		28.78	0.05	0.09	39.08	0.65	0.83	GL
SRD9W6		28.00	-0.72	-1.19	37.70	-0.73	-0.93	GQ
SVPH43		28.73	0.00	0.00	38.00	-0.43	-0.55	RA
T3UN1Z	X	26.78	-1.95	-3.21	37.63	-0.80	-1.02	MR
TDSND4		29.03	0.30	0.50	38.73	0.30	0.38	GL
UBHYRK		28.78	0.05	0.09	38.33	-0.10	-0.13	GN
UZ97EY		29.08	0.35	0.58	38.53	0.10	0.13	XX
WWYXA6	X	27.98	-0.75	-1.23	36.45	-1.98	-2.53	GL
XQ7BBH		29.00	0.28	0.46	38.85	0.42	0.54	GL
YSA7VL		27.45	-1.27	-2.10	36.90	-1.53	-1.95	GL

Summary Statistics

Grand Means

28.72 Gloss Units

38.43 Gloss Units

Std Dev Btwn Labs

0.61 Gloss Units

0.78 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

1RF3VB(X) - Apparently measured back of the samples.

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

G4STVP(X) - Inconsistent in testing between samples.

GUB6X9(X) - Data for both samples are high.

MN9QBH(X) - Low data for Sample E92 and inconsistent within the determinations for Sample E91.

T3UN1Z(X) - Low data for Sample E91 and inconsistent within the determinations for Sample E91.

WWYXA6(X) - Inconsistent in testing between samples.

Interlaboratory Testing Program for Color & Appearance

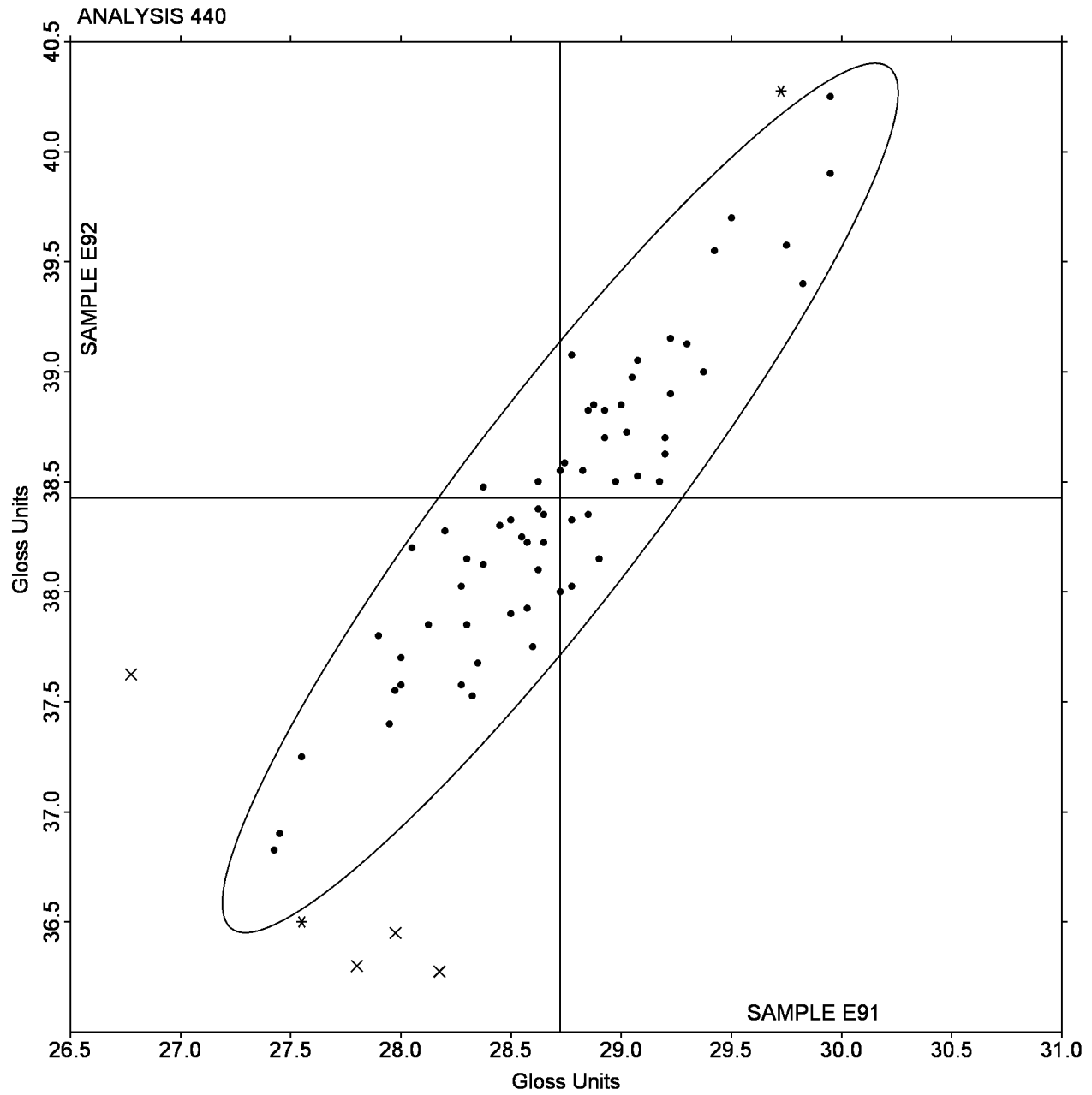
Analysis 440

60 Degree Gloss - Paint Chips

ASTM Method D 523

SAMPLE E91 = 28.72 Gloss Units

SAMPLE E92 = 38.43 Gloss Units



Interlaboratory Testing Program for Color & Appearance

Analysis 442

85 Degree Gloss - Paint Chips

ASTM Method D 523

WebCode	Data Flag	Sample J91			Sample J92			Instr Code
		Lab Mean	Difference from Grand Mean	Comparative Performance Value	Lab Mean	Difference from Grand Mean	Comparative Performance Value	
12V3ZJ		5.80	-0.06	-0.17	10.48	0.21	0.33	GN
2U7U1L		4.88	-0.99	-2.67	8.60	-1.67	-2.63	LA
3GCXCS		5.95	0.09	0.24	10.28	0.01	0.01	GN
7KP2FS		6.50	0.64	1.73	11.15	0.88	1.39	GL
9SUBHW		5.85	-0.01	-0.03	10.23	-0.04	-0.07	GN
DVUY39		5.28	-0.59	-1.59	9.30	-0.97	-1.53	HQ
FSJV53		6.05	0.19	0.51	10.53	0.26	0.40	GL
FWMK9J		6.03	0.16	0.44	10.55	0.28	0.44	GL
GXXR6K		6.03	0.16	0.44	10.60	0.33	0.52	GN
HP4DQ3		5.85	-0.01	-0.03	10.63	0.36	0.56	GL
JCRB2J		5.83	-0.04	-0.10	9.80	-0.47	-0.74	GL
JPSTY6		6.13	0.26	0.71	10.90	0.63	1.00	GL
MSEP39		5.93	0.06	0.17	10.55	0.28	0.44	GL
U6HCGP		5.90	0.04	0.10	10.28	0.01	0.01	GL
ZMZF4Z		5.95	0.09	0.24	10.18	-0.09	-0.15	GL

Summary Statistics

Grand Means

5.86 Gloss Units

10.27 Gloss Units

Std Dev Btwn Labs

0.37 Gloss Units

0.63 Gloss Units

Statistics based on 15 of 15 reporting participants

Analysis Notes for Test #442

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

Instrument Code List - Report# 147

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)
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)