



## Color & Appearance Testing Program

### Summary Spectrophotometric Report # 147 - 1st Q 2009

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

[Key to Tables and Graphs](#)

<b><u>Analysis</u></b>	<b><u>Analysis Name</u></b>
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<b>411</b>	<b>Spectrophotometric (Paint Chips) - Sphere</b>
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[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 Spectrophotometric Web Summary Report

<b>WebCode</b>	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.
<b>Grand Mean</b>	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.
<b>Between-Lab Standard Deviation</b>	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).
<b>Graphs</b>	For comparison purposes, a plot of spectrophotometric curves of single paint chip specimens is provided (courtesy of Hemmendinger Color Laboratory, Princeton, New Jersey).
<b>Inst Code</b>	A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section).
<b>Data Flag</b>	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	<b>CAUTION</b> - 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	<b>STOP</b> - immediate review of data and/or testing procedure is required. See specific notes following each table for more information on why the data is excluded.

In addition to the DATA FLAG column, it is also possible to have an X on individual wavelength values as follows:

- X - The laboratory's mean for that wavelength is greater than a 95% deviation from the GRAND MEAN.

Interlaboratory Testing Program for Color & Appearance

Analysis 411

Spectrophotometric - Sphere Geometry Instruments

Reflectance at 16 Selected Wavelengths

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
<b>Sample A91</b>																		
19Q8TK		12.08	13.10X	14.25	14.72	14.76X	15.31	16.51	18.01	21.15	30.28	40.43	44.30	45.33	46.73	49.15	51.97	AJ
1C76VA		11.73	12.80	13.95	14.47	14.47	15.10	16.29	17.87	20.96	30.17	40.22	44.45	45.46	46.69	49.05	51.40	AM
21UKLV		11.88	12.87	14.07	14.57	14.57	15.21	16.41	17.96	21.25	30.35	40.43	44.10	45.21	46.61	49.00	52.47	MM
2TDYK4		11.61	12.67	13.86	14.37	14.40	15.04	16.25	17.80	21.06	30.12	40.19	43.95	45.07	46.52	48.91	52.29	MM
2XSWSR		12.40	13.21X	14.49X	14.77X	14.75	15.32	16.61X	18.06	21.00	30.69	40.91	44.15	44.95	46.17	48.67	51.90	HH
2ZAEQX		11.68	12.72	13.94	14.43	14.44	15.06	16.26	17.80	21.00	29.97	40.14	43.88	45.00	46.38	48.78	52.13	MM
37HLJD		11.54	12.63	13.86	14.32	14.30	14.96	16.27	17.84	21.26	30.15	39.96	43.51	44.73	46.20	48.68	51.95	XO
3WV2RV		11.47	12.63	13.79	14.28	14.32	14.91	16.17	17.63	20.88	29.72	39.69	43.65	44.80	46.14	48.52	51.23	AM
489WWS		11.82	12.94	14.11	14.54	14.55	15.16	16.44	17.93	21.27	30.46	40.59	44.50	45.46	46.88	49.36	51.83	AM
4M9L4L		11.77	12.85	14.05	14.53	14.57	15.10	16.34	17.87	21.03	30.01	40.07	44.13	45.23	46.71	49.13	52.03	AJ
4PS3KJ		12.00	12.68	13.99	14.49	14.38	15.16	16.30	17.66	20.87	30.05	40.10	43.99	44.97	46.31	48.71	51.77	MX
57NV5G		11.80	12.68	13.92	14.30	14.33	14.91	16.10	17.70	20.86	30.21	40.28	43.92	44.90	46.02	48.28	51.66	XQ
5VUBRB		11.83	12.65	13.86	14.31	14.31	14.97	16.26	17.79	21.40	30.51	40.35	43.69	44.36X	45.44X	48.06	51.25	HW
6RJF3E		11.86	12.76	14.11	14.55	14.59	15.23	16.51	18.06	21.85X	31.18	41.05	44.48	45.16	46.23	48.83	52.00	HU
6RX2CG		11.75	12.78	13.91	14.41	14.46	15.05	16.25	17.78	20.86	29.82	40.10	44.03	45.07	46.46	48.88	52.29	AJ
6VQAK4		11.77	12.78	13.95	14.41	14.46	15.12	16.31	17.83	20.98	29.85	39.96	44.03	45.09	46.63	49.10	52.24	AM
6XAMY	X	12.78X	13.66X	14.81X	15.21X	14.99X	15.50X	16.65X	18.01	21.14	30.36	40.43	43.89	44.57	45.72	47.92X	50.94X	MV
7A3VQE		11.72	12.70	13.96	14.41	14.42	15.06	16.33	17.78	21.06	30.32	40.51	44.09	45.01	46.42	48.82	52.21	MV
7C9DPA		11.86	12.90	14.03	14.50	14.50	15.11	16.33	17.84	21.05	30.02	40.13	44.07	45.20	46.59	48.94	52.36	AJ
91KFLA		11.44	12.62	13.66	14.30	14.30	14.85	16.11	17.63	20.75	29.18	38.99X	43.13X	44.35X	45.72	47.98X	51.16	MJ
9N1TFJ		11.99	12.80	13.97	14.51	14.50	15.15	16.39	17.92	21.17	30.25	40.26	44.12	45.17	46.62	48.94	52.37	AJ
9T89XK		13.08X	12.68	13.75	14.31	14.34	14.90	16.15	17.73	20.74	29.23	39.33	43.55	44.92	46.21	48.55	51.88	HG
9UH6EH		11.69	12.59	13.92	14.36	14.36	15.00	16.27	17.79	20.99	30.54	40.85	44.35	45.29	46.66	49.07	52.51	CA
A36Y52		11.78	12.71	14.05	14.73	14.60	15.25	16.56	17.96	20.98	30.22	41.14	44.97X	45.93X	47.18X	49.58	53.17X	MV
BEALDX		11.94	12.80	14.11	14.52	14.65	15.21	16.55	18.03	21.95X	31.15	40.98	44.46	45.13	46.16	48.89	51.92	HW

## Interlaboratory Testing Program for Color & Appearance

### Analysis 411

#### Spectrophotometric - Sphere Geometry Instruments

#### Reflectance at 16 Selected Wavelengths

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
<b>Sample A91</b>																		
BFEC9R		11.78	12.77	13.99	14.49	14.47	15.12	16.34	17.91	21.10	30.07	40.22	44.03	45.16	46.56	48.95	52.27	MM
BGR9D		11.61	12.60	13.78	14.29	14.32	14.94	16.17	17.68	20.92	30.04	40.16	43.91	44.91	46.28	48.65	52.02	AL
BHJ7KG	X	12.96X	13.72X	14.97X	15.41X	15.43X	16.02X	17.36X	18.96X	22.50X	32.33X	43.10X	47.10X	48.19X	49.77X	52.54X	55.89X	AO
BU1RGK		11.90	12.74	14.06	14.49	14.52	15.19	16.49	18.04	21.84X	31.20	40.92	44.34	45.06	46.14	48.76	51.91	HW
C5JLFK		11.77	12.86	14.04	14.51	14.52	15.09	16.37	17.86	21.14	30.26	40.26	44.13	45.08	46.47	48.83	51.84	AJ
C9YYEM		11.86	12.77	13.98	14.38	14.41	15.05	16.33	17.83	21.15	30.63	40.26	43.82	44.70	46.08	48.45	51.45	MG
CB9ZDS		11.70	12.80	13.97	14.44	14.49	15.05	16.29	17.82	20.91	29.84	39.98	43.85	44.94	46.39	48.85	51.66	AM
CNQW4		11.79	12.86	14.03	14.54	14.58	15.19	16.38	17.90	20.98	30.20	40.31	44.14	45.20	46.52	48.94	51.87	AM
DVAAK	X	23.34X	95.58X	121.83X	107.11X	100.20X	95.09X	90.90X	88.55X	87.90X	87.14X	86.98X	87.32X	87.91X	88.37X	88.04X	88.01X	AJ
EVXZKE		11.70	12.67	13.91	14.47	14.41	15.06	16.30	17.78	20.90	30.37	40.67	44.20	45.12	46.46	48.88	52.40	MV
EWZ2WJ		11.60	12.72	13.77	14.35	14.37	14.99	16.25	17.77	21.09	29.66	39.26	43.40	44.69	46.12	48.46	51.70	MJ
EZWNL1		11.58	12.72	13.75	14.37	14.38	15.01	16.26	17.78	21.13	29.92	39.61	43.51	44.60	45.98	48.32	51.57	MJ
F155BJ		11.62	12.66	13.86	14.37	14.41	15.01	16.23	17.83	21.03	29.88	39.89	43.82	45.01	46.40	48.81	52.17	MM
F4MHW7		11.88	12.91	14.10	14.53	14.57	15.22	16.47	17.99	21.32	30.45	40.48	44.17	45.23	46.68	48.99	51.57	AJ
FDWPY2		11.59	12.66	13.92	14.45	14.44	15.07	16.30	17.76	21.08	30.15	40.15	44.06	45.10	46.50	48.89	51.27	AM
FE49FA		12.61X	12.70	13.77	14.31	14.37	15.00	16.19	17.83	21.05	29.90	39.75	43.61	44.82	46.07	48.39	51.69	HG
FLRS1D		11.75	12.73	13.95	14.40	14.42	15.08	16.31	17.87	21.17	30.35	40.44	44.03	45.15	46.55	48.95	52.40	MK
FN4J8M		11.38	12.48	13.73	14.12X	14.20	14.81	16.03	17.54	20.92	29.97	39.92	43.51	44.42	45.85	48.21	51.64	MI
FRRXYH		11.63	12.80	14.00	14.48	14.52	15.11	16.36	17.84	21.13	30.13	40.39	44.11	45.12	46.52	48.98	51.57	AJ
FRTRT9		11.70	12.52	13.75	14.18	14.20	14.85	16.09	17.54	20.80	29.81	39.70	43.24	44.33X	45.68	48.05	51.33	MG
FWQQLS		11.71	12.74	13.89	14.43	14.43	15.03	16.31	17.76	21.04	29.91	40.09	44.07	45.17	46.60	48.98	51.66	AM
G1YA6J		11.67	12.87	14.03	14.46	14.49	15.11	16.36	17.84	21.24	30.26	40.27	44.16	45.28	46.63	49.13	51.22	AJ
G2XBDV		11.58	12.61	13.85	14.37	14.35	14.99	16.25	17.67	20.81	30.18	40.49	44.04	44.95	46.31	48.68	52.18	MV
H4HP9J		12.21	12.58	13.88	14.41	14.19	15.04	16.18	17.49X	20.81	30.26	39.78	43.86	44.91	46.10	48.65	51.56	MV
H5FQHW		11.69	12.66	13.89	14.35	14.36	15.00	16.25	17.77	21.01	30.29	40.45	43.96	44.99	46.35	48.74	52.13	MK

## Interlaboratory Testing Program for Color & Appearance

### Analysis 411

#### Spectrophotometric - Sphere Geometry Instruments

#### Reflectance at 16 Selected Wavelengths

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
<b>Sample A91</b>																		
HL8EU6		11.66	12.66	13.88	14.28	14.37	14.99	16.28	17.84	21.42	30.64	40.59	43.92	45.07	46.47	48.93	52.03	XL
HYR9PH		11.81	12.66	13.90	14.48	14.43	15.03	16.33	17.76	20.91	30.13	40.43	44.12	45.11	46.40	48.88	52.20	MV
JC21KG		11.90	12.59	13.74	14.25	14.31	14.98	16.33	17.77	21.14	29.92	40.10	43.62	44.78	46.33	48.79	52.12	XU
JDDHZF		11.71	12.81	14.04	14.48	14.53	15.08	16.32	17.84	21.01	30.63	40.69	44.26	45.20	46.60	49.06	51.98	AO
JZ39JS		11.75	12.79	13.97	14.44	14.45	15.06	16.32	17.83	21.10	30.13	40.15	44.04	45.06	46.51	48.90	51.67	AM
K6HXEZ		11.67	12.64	13.85	14.35	14.35	14.99	16.25	17.79	21.12	30.30	40.27	43.83	44.92	46.20	48.47	51.81	MM
K6W3N3		11.71	12.75	13.99	14.51	14.47	15.05	16.33	17.83	21.08	30.45	40.68	44.26	45.13	46.56	48.83	52.37	PE
KAYYFJ		11.58	12.65	13.83	14.32	14.34	15.00	16.22	17.78	21.11	30.30	40.32	43.90	45.02	46.33	48.65	52.03	MM
KDC1GB		12.14	12.78	14.01	14.45	14.52	15.16	16.43	17.93	21.42	31.05	40.38	44.13	45.23	46.57	49.08	52.35	XR
KFHT74		11.72	12.71	13.95	14.40	14.40	15.05	16.28	17.83	21.15	30.37	40.41	43.98	45.01	46.36	48.71	52.10	MM
KFLPZT		11.85	12.67	13.90	14.48	14.47	15.04	16.28	17.81	21.03	29.84	39.82	43.99	45.15	46.66	48.99	51.55	AJ
KPHK2X		11.49	12.78	13.94	14.40	14.45	15.10	16.32	17.87	21.20	30.53	40.43	44.16	45.18	46.48	48.99	51.60	AM
KV71P9		11.73	12.88	14.01	14.53	14.61	15.25	16.47	18.09	21.67	30.57	40.23	44.12	45.30	46.65	49.03	52.34	MK
KYVC37		11.73	12.72	13.93	14.40	14.40	15.02	16.27	17.80	21.02	30.08	40.20	43.89	44.98	46.33	48.67	52.06	MM
LHQGS6		11.54	12.75	13.97	14.45	14.47	15.11	16.36	17.95	21.26	30.49	40.56	44.16	45.27	46.68	49.08	52.55	MK
LPWAL2		11.23	12.87	13.68	14.24	14.24	14.87	16.16	17.92	21.32	31.97X	40.94	44.03	44.92	46.37	48.72	52.06	XX
LS5DV6		11.72	12.71	13.92	14.45	14.44	15.07	16.28	17.77	20.61	29.19	39.58	43.75	44.89	46.18	48.47	51.79	HP
M265WJ		11.75	12.81	14.02	14.46	14.51	15.09	16.35	17.82	21.14	30.16	40.17	43.99	45.08	46.37	48.75	51.40	AJ
M44TR7		11.50	12.69	13.87	14.36	14.38	15.01	16.30	17.80	21.31	30.26	40.02	43.80	45.05	46.25	49.11	52.37	XP
MRPLBN		11.78	12.85	13.99	14.55	14.58	15.13	16.38	17.89	21.10	30.27	40.41	44.22	45.21	46.68	49.05	52.11	AO
N1TS6E		11.84	12.83	13.97	14.48	14.50	15.10	16.35	17.82	21.20	30.41	40.34	44.24	45.28	46.79	49.11	51.46	AM
N3LJHL		11.78	12.81	13.98	14.43	14.44	15.05	16.26	17.76	20.98	30.03	40.09	43.93	44.97	46.34	48.66	52.03	AJ
NJEPQ1		11.85	12.79	13.40X	14.48	14.57	15.18	16.43	17.95	21.39	30.59	40.76	44.53	45.20	46.40	49.17	52.38	HF
NNB4L3		11.84	12.84	14.01	14.51	14.50	15.13	16.33	17.86	21.04	30.12	40.27	44.00	45.06	46.40	48.71	52.06	MM
NUX6H7		11.89	12.80	13.99	14.47	14.48	15.14	16.33	17.78	20.52	29.41	39.89	43.89	44.78	45.94	48.45	51.88	HP

## Interlaboratory Testing Program for Color & Appearance Analysis 411

### Spectrophotometric - Sphere Geometry Instruments Reflectance at 16 Selected Wavelengths

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths															Instr Code	
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680		700
<b>Sample A91</b>																		
PHYNKY		11.95	12.89	14.07	14.57	14.56	15.20	16.42	18.11	21.57	30.97	40.70	44.21	45.10	46.55	48.97	52.34	MZ
PQZZLF		12.00	12.94	14.08	14.52	14.51	15.11	16.33	17.86	21.00	29.90	40.06	44.06	45.18	46.61	48.93	52.35	AJ
QFTHNJ		11.85	12.89	14.13	14.57	14.64	15.22	16.44	17.98	21.15	30.37	40.58	44.37	45.25	46.81	49.21	52.42	AO
R4WXX4		11.60	12.62	13.90	14.37	14.37	15.02	16.25	17.70	20.63	30.54	40.50	44.24	45.10	46.48	48.96	52.43	MV
R98LVE		11.69	12.76	13.95	14.52	14.51	15.10	16.33	17.82	21.02	29.85	40.08	44.13	45.16	46.50	48.90	51.62	AJ
RB2D45		11.55	12.68	13.91	14.35	14.45	15.01	16.26	17.76	20.79	29.79	39.79	43.82	44.93	46.26	48.75	51.50	AM
RBAMK		11.64	12.80	13.96	14.49	14.51	15.11	16.38	17.86	21.11	30.11	40.34	44.25	45.35	46.74	49.27	51.88	AJ
RMVZQ2		11.64	12.80	13.95	14.44	14.45	15.07	16.37	17.87	21.18	30.20	40.25	44.23	45.28	46.72	49.11	52.12	AJ
RSE9PY		11.74	12.72	14.01	14.50	14.46	15.09	16.35	17.82	21.08	29.97	40.07	44.14	45.25	46.60	49.06	51.91	AJ
RV3QBC		11.55	12.55	13.79	14.34	14.32	14.95	16.22	17.71	20.92	30.34	40.59	44.15	45.04	46.37	48.75	52.44	MT
T4ZYE9		10.91X	12.48	13.56	14.23	14.15	14.82	16.03	17.56	20.85	30.50	40.67	43.97	44.75	46.14	48.46	51.65	GD
TBT7MT		11.21	12.70	13.89	14.33	14.41	14.98	16.31	17.75	21.10	30.19	40.27	44.13	45.09	46.55	48.92	51.76	AJ
TLMT75		11.92	12.74	13.99	14.51	14.49	15.09	16.31	17.75	20.76	30.12	40.66	44.33	45.17	46.54	48.82	52.25	MV
TPPRHX		11.73	12.75	13.95	14.43	14.44	15.05	16.28	17.81	21.00	29.99	40.21	43.96	45.08	46.46	48.81	52.23	MK
TXQSBX		11.90	12.70	13.97	14.44	14.40	15.03	16.28	17.70	20.79	30.09	40.40	44.07	45.04	46.42	48.79	52.24	MV
U1DE6Y		11.35	12.58	13.81	14.28	14.29	14.95	16.18	17.72	20.97	30.01	40.07	43.70	44.80	46.18	48.54	51.92	MM
UAFY66		11.76	12.81	13.85	14.42	14.42	15.03	16.26	17.76	21.02	29.66	39.33	43.31	44.53	45.92	48.23	51.49	MJ
UN7N3R		11.90	12.71	13.99	14.47	14.42	15.14	16.35	17.77	20.86	29.74	40.16	44.13	45.05	46.14	48.69	52.04	HP
US9YJ5		11.70	12.79	13.97	14.46	14.51	15.06	16.33	17.86	21.06	30.27	40.40	44.21	45.21	46.61	49.07	52.07	AJ
UVQ4FE		11.65	12.65	13.88	14.36	14.41	15.04	16.27	17.82	21.09	30.14	40.23	44.00	45.11	46.49	48.87	52.39	MM
V16Q56		11.78	12.93	14.10	14.57	14.62	15.24	16.48	17.95	21.23	30.43	40.29	44.05	45.10	46.42	48.86	51.41	AJ
V65GSF		11.72	12.68	13.92	14.40	14.42	15.03	16.27	17.81	21.02	30.01	40.12	43.94	45.05	46.49	48.85	52.30	MM
W3XRUZ		11.76	12.74	13.93	14.41	14.41	15.04	16.26	17.79	20.93	29.83	39.93	43.75	44.90	46.27	48.62	52.02	MK
W7R5M		11.65	12.70	13.88	14.29	14.40	15.04	16.29	17.83	21.48	30.69	40.64	43.93	45.02	46.30	48.87	52.03	XO
W8RL2Z		11.52	12.68	13.68	14.33	14.41	15.03	16.31	17.89	21.51	30.91	40.56	44.01	45.05	46.50	49.12	52.36	XO

## Interlaboratory Testing Program for Color & Appearance Analysis 411

### Spectrophotometric - Sphere Geometry Instruments Reflectance at 16 Selected Wavelengths

WebCode	Data Flag	Spectrophotometric Reflectance values (as %) at selected wavelengths																Instr Code
		400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	
<b>Sample A91</b>																		
WYFSL6		11.87	12.83	14.00	14.46	14.50	15.10	16.38	17.84	21.14	30.12	40.17	44.08	45.17	46.54	49.01	52.10	AJ
XAWLH		11.55	12.51	13.74	14.34	14.34	15.00	16.22	17.77	20.80	29.64	39.78	43.68	44.82	46.07	48.39	51.68	HX
XB8YM		11.75	12.88	14.02	14.54	14.58	15.21	16.48	17.98	21.38	30.57	40.79	44.35	45.42	46.73	49.18	51.81	AJ
XHXMB		12.19	12.69	13.71	14.29	14.29	14.92	16.17	17.64	21.06	29.91	39.52	43.32	44.53	45.92	48.23	51.53	MJ
XRSS5S		11.72	12.76	13.80	14.35	14.34	14.97	16.24	17.73	21.18	30.06	39.66	43.44	44.57	45.95	48.21	51.46	MJ
XWLP7Q		11.69	12.79	13.91	14.41	14.40	15.03	16.22	17.70	20.89	29.77	39.90	43.85	44.97	46.33	48.81	51.40	AM
Y2RH2L		11.89	12.84	14.04	14.79X	14.73	15.38X	16.59	18.17X	21.49	30.71	40.58	44.20	45.19	46.48	48.81	52.13	GG
YA5ZGJ		11.73	12.56	13.81	14.24	14.32	14.96	16.25	17.79	21.27	30.35	40.17	43.82	45.23	46.35	48.81	52.19	XO
YBUVM	X	21.14X	96.73X	122.52X	106.12X	99.72X	94.53X	90.42X	88.33X	87.81X	87.08X	86.88X	87.21X	87.86X	88.38X	88.16X	88.31X	AG
YFTDXS		11.76	12.76	13.95	14.42	14.44	15.05	16.28	17.81	21.01	29.94	40.07	43.81	44.94	46.32	48.66	52.03	MK
YJFSPN		11.79	12.89	14.06	14.54	14.59	15.21	16.44	17.95	21.11	30.32	40.31	44.21	45.28	46.69	49.09	52.26	AO
YYB554		11.66	12.71	13.91	14.43	14.44	15.07	16.36	17.87	21.11	30.04	40.03	43.94	45.06	46.46	48.82	51.47	AJ
Z7GSQV		11.73	12.82	13.92	14.37	14.39	15.02	16.22	17.75	20.99	30.11	40.12	43.92	44.99	46.39	48.76	52.12	AJ
ZP4QYW		11.68	12.77	13.83	14.34	14.43	15.01	16.24	17.84	21.18	30.09	39.81	43.82	44.99	46.37	48.79	51.70	AJ
ZQ517R		11.69	12.69	13.92	14.37	14.40	15.05	16.27	17.80	21.15	30.56	40.65	44.09	45.04	46.38	48.70	52.08	MM

#### Summary Statistics

<b>Grand Means</b>	11.75	12.74	13.92	14.42	14.44	15.06	16.31	17.82	21.09	30.20	40.23	44.00	45.04	46.39	48.80	51.95
<b>Std Dev Btwn Labs</b>	0.25	0.11	0.14	0.11	0.11	0.10	0.11	0.12	0.24	0.41	0.38	0.29	0.24	0.27	0.28	0.37

**Interlaboratory Testing Program for Color & Appearance  
Analysis 411**

**Spectrophotometric - Sphere Geometry Instruments  
Reflectance at 16 Selected Wavelengths**

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**Comments assigned on Data Flags for Test #411**

6XAMYU (X) - High and low data at various wavelengths.

BHJ7KG (X) - High data at all wavelengths.

DVAAKE (X) - Apparently measured back of the sample.

YBUVMT (X) - Apparently measured back of the sample.

## Instrument Code List - Report# 147

### Instrument information as provided by laboratories

<u>Analysis</u>	<u>Analysis Name</u>
411	Spectrophotometric (Paint Chips) - Sphere

#### Instrument code and description

AG	ACS-DataColor Intl. Spectraflash 450	XO	X-Rite SP64
AJ	ACS-Datacolor Intl. Spectraflash 600	XP	X-Rite SP88
AL	ACS-Datacolor Intl. Dataflash 100	XQ	X-Rite SP68 Portable Sphere SpectroPhotometer
AM	ACS-Datacolor Intl. Spectraflash 600 Plus	XR	X-Rite SP78 Portable Sphere Spectrophotometer
AO	ACS-Datacolor Intl. Spectraflash 650X	XU	X-RiteColor Premier 8200 Spectrophotometer
CA	Cary 5000	XX	Instrument make/model not specified by lab
GD	BYK-Gardner spectro-guide sphere		
GG	BYK-Gardner TCS II		
HF	ColorFlex Diffuse		
HG	Hunter ColorQUEST		
HH	Hunter ColorQUEST XE		
HP	Hunter UltraScan PRO		
HU	Hunter UltraScan		
HW	Hunter UltraScan XE		
HX	Hitachi C-2000S Spectrophotometer		
MG	Macbeth 2180 Color Eye		
MI	Macbeth Color i 5		
MJ	Macbeth Color-Eye 3000 Spectrophotometer		
MK	Macbeth Color-Eye 7000 Spectrophotometer		
MM	Macbeth Color-Eye 7000a		
MT	Minolta CM-2600		
MV	Minolta CM-3000d Series Spectrophotometer		
MX	Minolta CM-508d Spectrophotometer		
MZ	Minolta CM-2002 Spectrophotometer		
PE	Perkin Elmer Spectrophotometer		
XL	X-Rite SP60 Spectrophotometer		