TECHNICAL ASSOCIATION OF THE
PULP AND PAPER INDUSTRY

COLLABORATIVE REFERENCE PROGRAM FOR PAPER

REPORT NO. 65G

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

NBS COLLABORATIVE REFERENCE PROGRAMS

TAPPI Paper and Board (6 times per year)

- Bursting strength
- Tearing strength
- Tensile breaking strength
- Elongation to break
- Tensile energy absorption
- Folding endurance
- Stiffness
- Air resistance
- Grammage
- Smoothness
- Surface pick strength
- K & N ink absorption
- Moisture content
- Opacity
- Blue reflectance (brightness)
- Specular gloss, 75°
- Thickness
- Concora (flat crush)
- Ring crush

FKBG-API Containerboard (48 times per year)

- Mullen burst of linerboard
- Concora test of medium

MCCA Color and Appearance (4 times per year)

- Gloss at 60°
- Color and color difference

CTS Rubber (4 times per year)

- Tensile strength, ultimate elongation and tensile stress
- Hardness
- Mooney viscosity
- Vulcanization properties

ASTM Cement (2 times per year)

- Chemical (11 chemical components)
- Physical (15 characteristics)

AASHTO Bituminous

- Asphalt cement (2 times per year)
- Cutbacks (once a year)

NBS Collaborative Reference Programs
A05 Technology Building
National Bureau of Standards
Washington, DC 20234

Rev. 10/79

TECHNICAL ASSOCIATION OF THE
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Report No. 65G

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NBSIR 80-1839

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

INTRODUCTION

Reports 65S and 65G comprise the fifth set of reports for the 79-80 program year. Participants in tests which involve strength properties of paper will receive only the S report; those in tests which measure other properties will receive only the G report.

Notes and comments to individual laboratories and "Best Values" applicable to a particular method are given following Table 1 for each method. See page 1 of this report for an explanation of "Best Values". Please do not confuse these Best Values with provisional values included with the samples to detect serious discrepancies at the time of test.

If there are any questions on the notes, the analyses, or the reports in general, contact Robert G. Powell or Jeffrey Horlick on 301/921-2946.

Jeffrey Horlick

Jeffrey Horlick, Administrator
NBS-TAPPI Collaborative Reference Program
Office of Testing Laboratory Evaluation Technology

September 3, 1980

TAPPI-NBS COLLABORATIVE REFERENCE PROGRAM

BACKGROUND AND PURPOSE

In 1969, the National Bureau of Standards and the Technical Association of the Pulp and Paper Industry established a collaborative reference program to provide a participating laboratory with a means to check periodically the level and uniformity of its testing in comparison with that of other laboratories.

The interchange of paper and board products and of the raw materials for these products requires agreement among raw material suppliers, paper and board producers, converters, distributors, retailers, commercial testing laboratories, user organizations and the ultimate consumer as to the meaning of test results, an agreement that cannot be achieved without accurate and precise testing. This program is designed to help assure agreement.

HOW THE PROGRAM WORKS

Participants Select the Tests in which they wish to participate. This choice is made on joining the program, but additional tests may be added at any time. Also new participants may enter the program at any time.

Test Samples are Distributed Bimonthly; i.e. every 2 months.

Provisional Values are Provided with the Samples for one or both of the test levels, depending on method. The provisional values permit serious discrepancies to be detected without delay. (It is left to the discretion of the laboratory supervisor as to whether these values should be known to the operator.)

Each Participant Tests the Samples, following instructions provided for each test method. The full check on a single instrument should normally take no more than 30 minutes. The test results are then sent to NBS for analysis. The participant is also asked to report other information relevant to an accurate analysis, such as test conditions and the instruments used.

Industry Means, Best Values and Other Statistics are developed from the data by NBS. The best values are estimates based on a careful examination of all data, both current and past, with special attention to results obtained by the National Bureau of Standards and other recognized reference laboratories in this and other countries.

A Quick Report is Prepared for each participating laboratory reporting data on time. This report shows the industry mean values, and the deviations of the laboratory's results from these values for each test method.

A Longer Summary Report, Showing the Data from all Participants, is also prepared. In the summary report, of which this report is an example, each laboratory is identified by a code number so that the information is maintained on a confidential basis. However, instruments are identified by type so participants can compare their results with those obtained on similar instruments of different manufacture. This report includes test averages, best values and standard deviations for individual participants and for the group as a whole. A participant should be able to readily determine the level and variability of his results in comparison with those of the other laboratories.

Repeatability and Reproducibility Statements such as Contained in ASTM, TAPPI and ISO Standards are included at the end of the report. Participants can check their performance level against the precision statement given in the test method or specification.

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Analyses In This Report

Analyses In The G Report

TABLE OF CONVERSION FACTORS TO METRIC (SI) UNITS

Physical Quantity	To Convert From	To	Multiply by
Bursting strength	psi	kPa	6.895
	kg/cm^2	kPa	98.07
	bar	kPa	100.00
Tearing strength	g	mN	9.807
Tensile strength	lb/in.	kN/m	.1751
	lb/0.5 in.	kN/m	.3502
	lb/15 mm	kN/m	.2965
	kg/15 mm	kN/m	.6538
	kg/25 mm	kN/m	.3923
	kg/mm	kN/m	9.807
Tensile energy absorption	$ft\text{-}lb/ft^2$	J/m^2	14.59
	$in.\text{-}lb/in.^2$	J/m^2	175.1
	$kg\text{-}m/m^2$	J/m^2	9.807
Bending stiffness	g·cm	μN·m	98.07
Flat-crush strength (Concora)	lb	N	4.448
Ring-crush (TAPPI)	lb	N	4.448
(ISO)	lb/6.00 in.	kN/m	0.0292
Thickness	mil	μm	25.40

KEY TO TABLES AND GRAPHS

MEAN - The average of individual TEST DETERMINATIONS. The number of TEST DETERMINATIONS in the mean is given in the upper right corner of the first table (TEST D.) and again at the bottom of this table.

GRAND MEAN - (GR. MEAN) The average of the individual laboratory MEANS, excluding laboratories flagged (see column F) with an X, #, or *. The GRAND MEAN is given in US customary units and, where applicable, in SI metric units.

SD OF MEANS - (SD MEANS) The standard deviation of the laboratory MEANS about the GRAND MEAN; an index of the among-laboratory precision.

DEV - The deviation or difference of the laboratory MEAN from the GRAND MEAN.

N. DEV - The normal deviate or ratio of the DEV to the SD OF MEANS; an indication of the degree of divergence of the laboratory MEAN from the GRAND MEAN. A N. DEV of more than 2 or less than -2 may indicate that the participant is not following the procedure considered standard for this analysis.

SDR - The standard deviation of repeated measurements; that is, of individual test determinations about their MEAN.

AVERAGE SDR - The average of the individual laboratory SDR's; an index of the within-laboratory precision of repeated measurements.

R. SDR - The relative standard deviation of repeated measurements; that is, the ratio of the SDR to the AVERAGE SDR; an indication of the ability of a participant to repeat his or her measurements relative to the average ability. The greater the number of TEST DETERMINATIONS the closer the R. SDR should be to unity. If R. SDR is outside the limits given below, the participant may not be following the procedure considered standard for this analysis:

No. of test Determinations	Lower limit for R. SDR	Upper limit for R. SDR
3	0.09	2.58
4	0.18	2.25
5	0.26	2.06
8	0.40	1.77
10	0.46	1.67
15	0.56	1.53
20	0.61	1.45
25	0.65	1.39

VAR - Code for instrument type or variation in condition, see second table.

F - Flag, with following meaning:

- blank - Included in grand mean and inside 95% error ellipse.
- * - Included in grand means but plotted point falls outside of the 95% error ellipse. The participant should take this as a warning to reexamine his or her testing procedure.
- X - Excluded because plotted point would fall outside of the 99% error ellipse, (see page 2 for explanation of Graph).
- # - Excluded because data were not understood or because of a non-coded variation reported by the laboratory. (See the notes following Table 1 for each method).
- * - Excluded from grand means because VAR was non-standard for the analysis.
- M - Excluded because data for one sample are missing.
- S - Included in grand mean but only after omission of one or more 'wild' values; that is test determinations more than 3 times AVERAGE SDR from the laboratory's MEAN. Not more than 20% of the test determination may be excluded in this manner without rejecting the laboratory.

Best values - Given at the end of Table 1 for each method for which sufficient information is available. These best values are estimates based on a careful examination of all data, both current and past, with special attention to results obtained by the National Bureau of Standards and other recognized reference laboratories in this and other countries. All participants using equipment that is standard for the analysis should be able to achieve results within the plus-minus (*/-) limits, when these are shown along with the best values.

COORDINATES - Distances along major and minor axes of error ellipse. If special additive or concurrent model of the measuring process applies to this method, the distance along the minor axis represents the random error within a laboratory while that along the major axis also includes a systematic laboratory component of error.

95% ELLIPSE - Lengths of the major and minor axes of the ellipse and the angle that the major axis makes with the horizontal axis.

AVG R. SDR - Average of the R. SDR for the two samples; an indication of the laboratory's precision of repeated measurements.

Graph - For each laboratory the MEAN for the second sample is plotted against the MEAN for the first sample, with each point representing a laboratory. The horizontal and vertical lines are the GRAND MEANS. The dashed line is drawn at 45 degrees. The solid sloping line, which may or may not lie close to the 45 degree line, is along the major axis of the error ellipse. The ellipse is drawn so that, on the average, it will include 95% of the points representing the laboratories.

Plotted symbols are as explained above (under F), except that an 'S' is plotted as an 'G'. A participant whose plotted point falls outside of the ellipse should carefully reexamine the testing procedure he or she is following.

The graph is plotted with an ellipse when there are 20 or more laboratories in the analysis. When there are 10 through 19 laboratories in the analysis, the graph is plotted but the ellipse is omitted. When there are fewer than 10 laboratories retained in the analysis, the graph is not plotted.

The International System of Units (SI) is used on the plots wherever possible to aid participants in familiarizing themselves with SI. Grand means in SI units are given at the top of the plot, and supplementary scales in SI units are drawn along the axes allowing the reader to compare means and variability in common units and SI units for the same data.

SUMMARY - (At end of report) In addition to several quantities already defined above, the summary shows the following values for each test method:

REPI CRF - The number of replicate test determinations used in this Collaborative Reference Program.

REPI TAPPI - The number of replicate test determinations in a test result required by the applicable TAPPI Official Test Method or assumed here if there is no TAPPI Official Test Method. This quantity is needed in the computation of TAPPI repeatability and reproducibility from the SD OF MEANS and the AVERAGE SDR. See TAPPI Official Test Method T1200 for definitions and computations.

REPEAT - TAPPI repeatability; a measure of the within-laboratory precision of a test result.

REPROD - TAPPI reproducibility; a measure of the between-laboratory precision of a test result.

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T40-1 TABLE 1
AIR RESISTANCE, GURLEY UNITS (SECONDS/100 CC)
TAPPI OFFICIAL TEST METHOD T460 OS-75, AIR RESISTANCE OF PAPER

LAB CODE	SAMPLE Z27 NEWSPRINT 58 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE G15 HEAT SET OFFSET BOOK 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.= 10 VAR	F	LAB
L106	41.5	2.7	.83	12.8	1.24	18.0	1.5	1.28	2.5	1.36	40D	6	L106
L107	36.2	-2.6	-.78	14.1	1.37	14.2	-2.3	-1.94	3.0	1.60	40D	6	L107
L121	38.9	.2	.06	3.3	.32	16.9	.4	.35	1.8	.97	40D	6	L121
L122	44.9	6.1	1.87	14.1	1.37	17.2	.7	.57	1.6	.87	40D	6	L122
L123	41.6	2.9	.88	9.8	.95	16.7	.2	.17	1.9	1.01	40D	6	L123
L124G	33.7	-5.1	-1.54	8.3	.80	17.8	1.3	1.12	1.5	.79	40D	6	L124G
L125	36.8	-2.0	-.60	9.8	.95	17.4	.9	.80	1.8	.95	40D	6	L125
L128	37.0	-1.8	-.53	16.2	1.57	16.2	-.3	-.24	1.7	.91	40D	6	L128
L141	37.3	-1.5	-.44	10.6	1.03	16.6	.1	.11	1.8	.95	40D	6	L141
L148	37.8	-1.0	-.29	12.2	1.18	16.2	-.3	-.24	2.3	1.21	40D	6	L148
L153	35.7	-3.1	-.93	11.7	1.13	17.0	.5	.45	1.7	.93	40D	6	L153
L158	39.3	.5	.17	12.7	1.23	18.2	1.7	1.45	2.5	1.34	40D	6	L158
L159	32.7	-6.1	-1.86	10.7	1.04	12.3	-4.2	-3.57	3.0	1.64	40D	X	L159
L163	44.5	5.7	1.75	17.3	1.68	17.8	1.3	1.12	1.6	.87	40D	6	L163
L166	39.4	.6	.19	14.8	1.43	16.6	.1	.12	1.4	.75	40D	6	L166
L174	35.8	-3.0	-.90	8.6	.83	17.4	1.0	.81	1.8	.98	40D	6	L174
L182G	36.2	-2.6	-.78	9.2	.89	14.7	-1.8	-1.53	1.2	.66	40D	6	L182G
L183	39.6	.8	.26	4.1	.40	15.4	-1.1	-.92	2.4	1.28	40D	6	L183
L212	39.6	.8	.26	14.1	1.36	14.9	-1.6	-1.35	2.6	1.38	40D	6	L212
L219	35.5	-3.3	-.99	12.4	1.20	15.4	-1.1	-.92	.8	.45	40D	6	L219
L223	43.4	4.6	1.41	8.2	.79	17.6	1.1	.95	2.3	1.22	40D	6	L223
L224	22.0	-16.8	-5.10	6.8	.66	8.3	-8.2	-6.94	1.1	.57	40D	#	L224
L228	40.8	2.0	.61	8.5	.83	17.3	.8	.67	2.4	1.27	40D	6	L228
L230G	32.8	-6.0	-1.81	2.4	.24	15.8	-.7	-.58	1.2	.66	40D	6	L230G
L232	39.6	.9	.27	7.0	.68	14.6	-1.9	-1.58	2.1	1.12	40D	6	L232
L238A	38.2	-.6	-.18	14.6	1.41	14.5	-1.9	-1.65	1.7	.90	40D	6	L238A
L241	37.3	-1.5	-.44	11.7	1.13	15.7	-.8	-.67	2.9	1.54	40D	6	L241
L242	39.6	.8	.26	5.4	.52	17.4	.9	.78	1.8	.95	40D	6	L242
L254	36.4	-2.4	-.72	10.4	1.00	18.4	1.9	1.62	2.5	1.34	40D	6	L254
L259	36.8	-2.0	-.60	8.2	.79	14.9	-1.5	-1.30	2.2	1.20	40D	6	L259
L261	36.6	-2.1	-.65	7.0	.68	16.3	-.2	-.18	1.6	.85	40D	6	L261
L262G	42.1	3.4	1.02	2.8	.27	17.4	.9	.76	.8	.42	40D	6	L262G
L265	36.5	-2.3	-.69	10.7	1.04	15.8	-.7	-.62	2.5	1.37	40D	6	L265
L274	38.4	-.3	-.10	7.7	.75	17.0	.5	.44	1.7	.94	40D	6	L274
L278	35.9	-2.8	-.87	7.9	.76	16.2	-.3	-.25	2.7	1.48	40D	6	L278
L285	40.6	1.8	.56	11.8	1.15	17.3	.8	.66	2.0	1.08	40D	6	L285
L301	43.7	4.9	1.50	11.3	1.10	15.7	-.8	-.67	1.5	.79	40D	6	L301
L313	37.9	-.9	-.27	15.0	1.46	15.6	-.9	-.77	1.6	.86	40D	6	L313
L320	41.6	2.8	.87	10.9	1.05	16.0	-.5	-.41	.9	.51	40D	6	L320
L321	45.3	6.5	1.99	12.9	1.25	15.4	-1.1	-.92	2.4	1.27	40D	*	L321
L324	42.5	3.8	1.15	10.4	1.00	16.3	-.2	-.13	1.5	.80	40D	6	L324
L326	43.6	4.8	1.47	9.8	.95	17.3	.8	.69	2.3	1.24	40D	6	L326
L328	39.0	.3	.09	4.7	.45	15.7	-.8	-.64	1.1	.57	40D	6	L328
L337	33.4	-5.3	-1.62	6.6	.64	14.3	-2.2	-1.83	1.3	.69	40D	6	L337
L339	31.1	-7.6	-2.31	9.0	.87	14.2	-2.3	-1.94	2.2	1.20	40D	*	L339
L344	36.7	-2.0	-.62	7.4	.72	16.7	.3	.22	2.4	1.28	40D	6	L344
L376	40.7	2.0	.59	16.6	1.61	17.4	.9	.76	2.6	1.41	40D	6	L376
L380	41.4	2.6	.80	8.7	.85	18.7	2.2	1.88	1.6	.88	40D	6	L380
L388	38.2	-.5	-.16	8.7	.84	15.6	-.9	-.73	2.0	1.08	40D	6	L388
L484	31.2	-7.5	-2.28	8.4	.82	14.8	-1.7	-1.46	1.8	.95	40D	6	L484
L567	40.0	1.2	.38	11.6	1.12	17.5	1.0	.83	1.2	.67	40D	6	L567
L576	41.4	2.7	.82	4.8	.46	18.7	2.2	1.86	1.2	.62	40D	6	L576
L585	38.4	-.3	-.11	15.3	1.48	16.6	.1	.09	1.0	.56	40D	6	L585
L616	44.5	5.7	1.75	6.1	.59	15.8	-.7	-.58	1.3	.71	40D	6	L616
L636	35.3	-3.5	-1.06	9.3	.90	16.2	-.3	-.26	2.2	1.16	40D	6	L636
L651	33.6	-5.2	-1.57	10.7	1.04	11.3	-5.2	-4.40	1.3	.72	40D	X	L651
L676	40.1	1.3	.41	15.6	1.51	17.5	1.0	.85	2.8	1.50	40D	6	L676
L697	35.8	-3.0	-.91	13.3	1.29	16.9	.4	.36	2.4	1.28	40D	6	L697
L702	39.9	1.1	.35	10.2	.99	17.1	.6	.53	1.6	.85	40D	6	L702
L715	38.7	-.0	-.01	15.8	1.53	18.2	1.7	1.46	1.9	1.02	40D	6	L715
L737	40.9	2.2	.66	17.2	1.67	17.1	.7	.56	1.8	.99	40D	6	L737
GR. MEAN =	38.8 GURLEY UNITS					GRAND MEAN =	16.5 GURLEY UNITS				TEST DETERMINATIONS = 10		
SD MEANS =	3.3 GURLEY UNITS					SD OF MEANS =	1.2 GURLEY UNITS				58 LABS IN GRAND MEANS		
	AVERAGE SDR =	10.3 GURLEY UNITS					AVERAGE SDR =	1.9 GURLEY UNITS					
L115	35.2	-3.6	-1.08	11.8	1.15	16.7	.2	.18	1.1	.57	40U	*	L115
L291	34.8	-4.0	-1.20	6.0	.58	18.8	2.3	1.96	2.6	1.41	40U	*	L291

TOTAL NUMBER OF LABORATORIES REPORTING = 63

Best values: Z27 38.8 ± 5.5 Gurley units
G15 16.6 ± 2.0 Gurley units

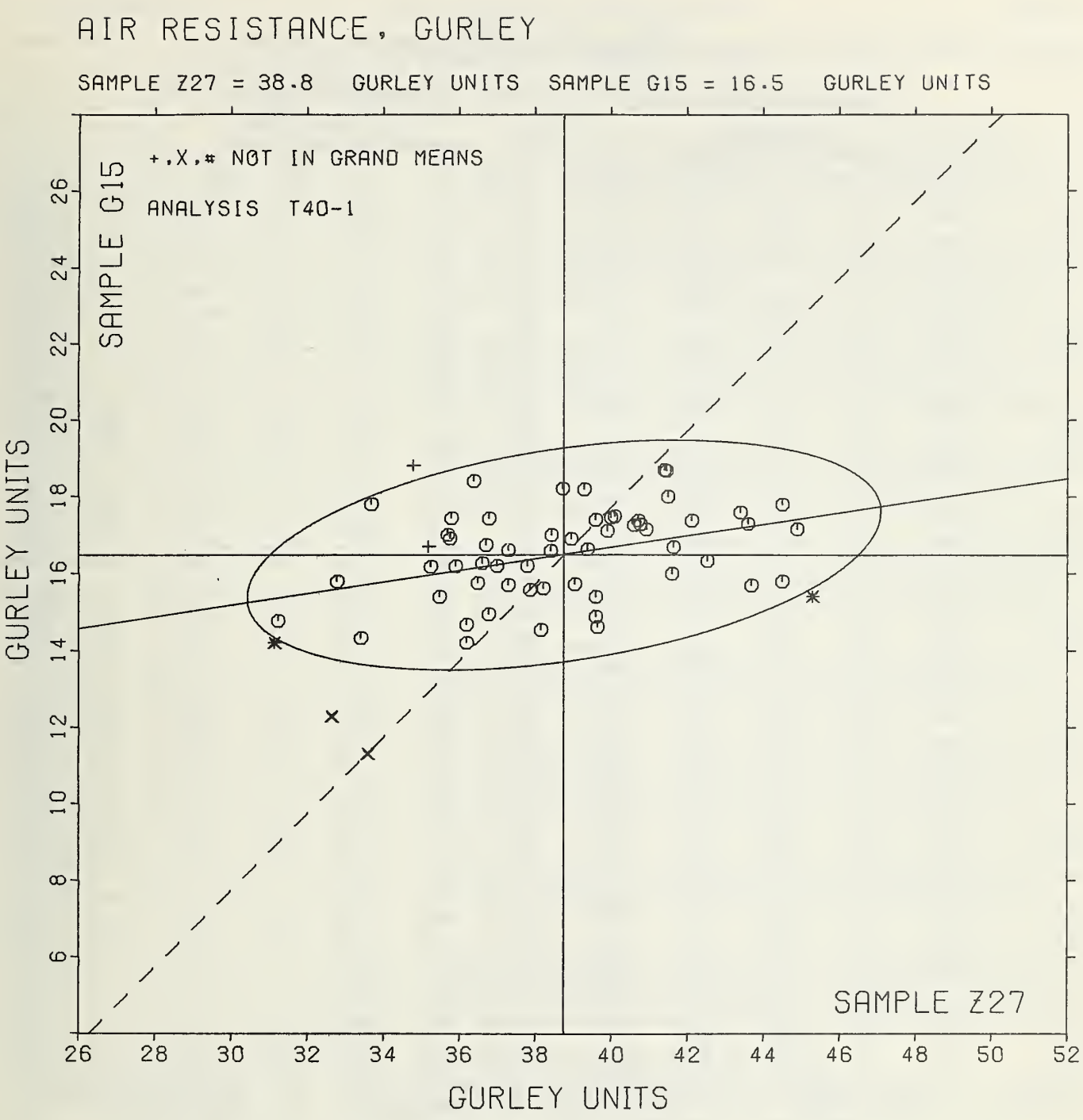
Data from the following laboratories appear to be off by a multiplicative factor: 224.

ANALYSIS T40-1 TABLE 2

AIR RESISTANCE, GURLEY UNITS (SECONDS/100 CC)

TAPPI OFFICIAL TEST METHOD T460 OS-75, AIR RESISTANCE OF PAPER

LAB CODE	F	MEANS Z27	MEANS G15	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L224	#	22.0	8.3	-17.8	-5.6	.62	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L339	*	31.1	14.2	-7.9	-1.1	1.03	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I4E4	O	31.2	14.8	-7.7	-.6	.88	40H	AIR RESISTANCE, REGMED-TYPE GURLEY DENSOMETER -OIL FLOTATION
L159	X	32.7	12.3	-6.7	-3.3	1.34	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I23?G	O	32.8	15.8	-6.0	.2	.45	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L337	O	33.4	14.3	-5.6	-1.3	.67	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
1651	X	33.6	11.3	-5.9	-4.4	.88	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I124G	O	33.?	17.8	-4.8	2.1	.80	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I291	+	34.8	18.8	-3.6	2.9	.99	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L115	+	35.2	16.7	-3.5	.7	.86	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L636	O	35.3	16.2	-3.5	.2	1.03	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L219	O	35.5	15.4	-3.4	-.6	.83	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L153	O	35.7	17.0	-2.9	1.0	1.03	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I69?	O	35.8	16.9	-2.9	.9	1.28	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
1?74	O	35.8	17.4	-2.8	1.4	.91	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I2?8	O	35.9	16.2	-2.9	.1	1.12	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I107	O	36.2	14.2	-2.9	-1.9	1.48	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L1?2G	O	36.2	14.7	-2.8	-1.4	.78	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L254	O	36.4	18.4	-2.0	2.2	1.17	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L265	O	36.5	15.8	-2.3	-.4	1.21	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L2?1	O	36.6	16.3	-2.2	.1	.76	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
1344	O	36.?	16.7	-2.0	.6	1.00	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L259	O	36.8	14.9	-2.2	-1.2	1.00	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L125	O	36.8	17.4	-1.8	1.2	.95	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I128	O	37.0	16.2	-1.8	-.0	1.24	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I141	O	37.3	16.6	-1.4	.3	.99	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L241	O	37.3	15.7	-1.6	-.6	1.34	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I148	O	37.8	16.2	-1.0	-.1	1.20	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I313	O	37.9	15.6	-1.0	-.8	1.16	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I238A	O	38.2	14.5	-.9	-1.8	1.16	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I388	O	38.2	15.6	-.7	-.8	.96	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L585	O	38.4	16.6	-.3	.2	1.02	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I2?4	O	38.4	17.0	-.2	.6	.84	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L715	O	38.?	18.2	.2	1.7	1.28	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L121	O	38.9	16.9	.3	.4	.64	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L328	O	39.0	15.7	.2	-.8	.51	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L158	O	39.3	18.2	.8	1.6	1.28	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I166	O	39.4	16.6	.6	.1	1.09	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L242	O	39.6	17.4	1.0	.8	.74	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L212	O	39.6	14.9	.6	-1.7	1.37	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L183	O	39.6	15.4	.7	-1.2	.84	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L232	O	39.6	14.6	.6	-2.0	.90	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L702	O	39.9	17.1	1.2	.4	.92	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L567	O	40.0	17.5	1.4	.8	.90	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L676	O	40.1	17.5	1.5	.8	1.51	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L285	O	40.6	17.3	1.9	.5	1.11	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L376	O	40.7	17.4	2.1	.6	1.51	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L228	O	40.8	17.3	2.1	.5	1.05	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L737	O	40.9	17.1	2.2	.3	1.33	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L380	O	41.4	18.7	2.9	1.8	.86	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L576	O	41.4	18.7	3.0	1.8	.54	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L1?6	O	41.5	18.0	2.9	1.1	1.30	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L32?	O	41.6	16.0	2.7	-.9	.78	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
I123	O	41.6	16.7	2.9	-.2	.98	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L262G	O	42.1	17.4	3.5	.4	.35	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L324	O	42.5	16.3	3.7	-.7	.90	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L223	O	43.4	17.6	4.8	.4	1.01	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L326	O	43.6	17.3	4.9	.1	1.10	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L3?1	O	43.7	15.7	4.8	-1.5	.95	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L616	O	44.5	15.8	5.6	-1.5	.65	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L163	O	44.5	17.8	5.9	.4	1.27	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
1122	O	44.9	17.2	6.2	-.2	1.12	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L321	*	45.3	15.4	6.3	-2.0	1.26	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
GMEANS:		38.8	16.5			1.00		
		95% ELLIPSE:		8.4	2.7	WITH GAMMA = 8 DEGREES		


AIR RESISTANCE, GURLEY
SAMPLE Z27 = 38.8 GURLEY UNITS SAMPLE G15 = 16.5 GURLEY UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T40-1
SAMPLE G15
GURLEY UNITS
6
8
10
12
14
16
18
20
22
24
26
SAMPLE Z27
26
28
30
32
34
36
38
40
42
44
46
48
50
52
GURLEY UNITS

ANALYSIS T40-2 TABLE 1

AIR RESISTANCE, SHEFFIELD UNITS (CC/MIN) FOR 0.442 SQ. IN (3/4 IN. DIA) ORIFICE

TAPPI USEFUL TEST METHOD UM 524, POROSITY BY RESISTANCE TO AIRFLOW

LAB CODE	SAMPLE Z27 NEWSPRINT 58 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE G15 HEAT SET OFFSET BOOK 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.* 10 VAR	F	LAB
L114	98.	5.	.68	25.	1.13	188.	20.	1.49	22.	1.31	40S	0	L114
L121	104.	11.	1.59	18.	.82	174.	7.	.51	9.	.55	40S	0	L121
L122S	94.	1.	.13	30.	1.35	171.	4.	.29	15.	.93	40S	0	L122S
L124S	87.	-7.	-.94	24.	1.07	182.	14.	1.04	19.	1.18	40S	0	L124S
L132	94.	1.	.15	17.	.78	177.	9.	.69	19.	1.16	40S	0	L132
L148	101.	7.	1.05	18.	.80	174.	6.	.46	18.	1.09	40S	0	L148
L150	100.	7.	1.01	21.	.97	188.	21.	1.54	24.	1.44	40S	0	L150
L155	78.	-15.	-2.11	22.	.97	151.	-16.	-1.19	14.	.85	40S	0	L155
L157	88.	-5.	-.73	19.	.86	169.	2.	.14	30.	1.81	40S	0	L157
L158	88.	-5.	-.67	26.	1.19	160.	-8.	-.56	20.	1.24	40S	0	L158
L173B	86.	-7.	-1.03	20.	.90	165.	-2.	-.15	23.	1.38	40S	0	L173B
L213	99.	6.	.83	23.	1.04	170.	2.	.16	14.	.88	40S	0	L213
L223	88.	-6.	-.79	23.	1.04	161.	-7.	-.52	12.	.76	40S	0	L223
L230S	94.	1.	.09	19.	.85	157.	-11.	-.81	18.	1.09	40S	0	L230S
L233	97.	4.	.54	20.	.93	163.	-4.	-.32	12.	.71	40S	0	L233
L241	99.	5.	.77	28.	1.26	180.	13.	.96	13.	.79	40S	0	L241
L249	93.	-0.	-.02	13.	.60	157.	-11.	-.79	8.	.47	40S	0	L249
L255	104.	10.	1.46	21.	.96	167.	-1.	-.05	13.	.78	40S	0	L255
L257A	101.	7.	1.04	24.	1.11	183.	16.	1.16	18.	1.10	40S	0	L257A
L257B	102.	8.	1.19	27.	1.24	203.	36.	2.64	18.	1.09	40S	*	L257B
L257C	104.	11.	1.52	15.	.68	162.	-5.	-.38	12.	.70	40S	0	L257C
L260	92.	-2.	-.22	15.	.70	192.	25.	1.83	13.	.82	40S	0	L260
L262S	89.	-4.	-.55	8.	.38	162.	-5.	-.38	7.	.46	40S	0	L262S
L288	103.	10.	1.41	42.	1.89	177.	10.	.71	14.	.84	40S	0	L288
L301	90.	-3.	-.47	23.	1.06	163.	-5.	-.37	12.	.73	40S	0	L301
L305	91.	-2.	-.35	19.	.87	141.	-26.	-1.95	14.	.84	40S	0	L305
L315	77.	-16.	-2.24	28.	1.28	143.	-24.	-1.79	20.	1.20	40S	0	L315
L318	88.	-5.	-.71	20.	.93	157.	-10.	-.77	20.	1.20	40S	0	L318
L352	92.	-1.	-.18	14.	.65	156.	-12.	-.86	18.	1.08	40S	0	L352
L354	109.	15.	2.18	31.	1.38	173.	5.	.39	22.	1.34	40S	0	L354
L360	89.	-4.	-.60	23.	1.05	163.	-4.	-.32	12.	.70	40S	0	L360
L390	97.	4.	.53	16.	.74	159.	-9.	-.64	17.	1.03	40S	0	L390
L562	91.	-2.	-.28	24.	1.10	168.	0.	.00	27.	1.65	40S	0	L562
L575	91.	-2.	-.30	28.	1.25	169.	1.	.09	14.	.88	40S	0	L575
L585	84.	-10.	-1.35	24.	1.11	182.	14.	1.05	22.	1.33	40S	0	L585
L626	93.	0.	.03	32.	1.46	142.	-26.	-1.92	9.	.52	40S	0	L626
L684	87.	-6.	-.83	7.	.34	146.	-22.	-1.63	9.	.58	40S	0	L684
L687	91.	-2.	-.33	19.	.88	173.	6.	.43	20.	1.21	40S	0	L687
L698	96.	3.	.40	34.	1.55	163.	-5.	-.34	23.	1.39	40S	0	L698
L704	90.	-3.	-.42	19.	.87	159.	-9.	-.66	9.	.56	40S	0	L704
L729	83.	-10.	-1.38	14.	.63	160.	-7.	-.52	14.	.83	40S	0	L729
L738	57.	-36.	-5.12	11.	.52	96.	-71.	-5.27	19.	1.17	40S	#	L738
L740	99.	6.	.85	30.	1.37	178.	10.	.75	22.	1.32	40S	0	L740
L753	86.	-7.	-.97	27.	1.21	175.	8.	.58	21.	1.25	40S	0	L753
L753	86.	-7.	-.97	27.	1.21	175.	8.	.58	21.	1.25	40S	0	L753
GP. MEAN =	93. SHEFF. UNITS			GRAND MEAN =		168. SHEFF. UNITS			TEST DETERMINATIONS =		10		
SD MEANS =	7. SHEFF. UNITS			SD OF MEANS =		13. SHEFF. UNITS			43 LABS IN GRAND MEANS				
	AVERAGE SDR =			22. SHEFF. UNITS		AVERAGE SDR =			16. SHEFF. UNITS				
L182B	364.	271.	38.27	84.	3.78	581.	413.	30.68	13.	.78	40B	*	L182B
L280	207.	114.	16.13	92.	4.15	382.	215.	15.93	53.	3.20	40B	*	L280
L312	103.	9.	1.33	31.	1.42	167.	-1.	-.04	22.	1.36	40T	*	L312
L333	317.	224.	31.69	131.	5.94	665.	497.	36.91	67.	4.07	40B	*	L333
L484	329.	236.	33.39	83.	3.77	790.	622.	46.19	77.	4.72	40B	*	L484

TOTAL NUMBER OF LABORATORIES REPORTING = 49

Best values: Z27 93 ± 12 Sheffield units
G15 167 ± 23 Sheffield units

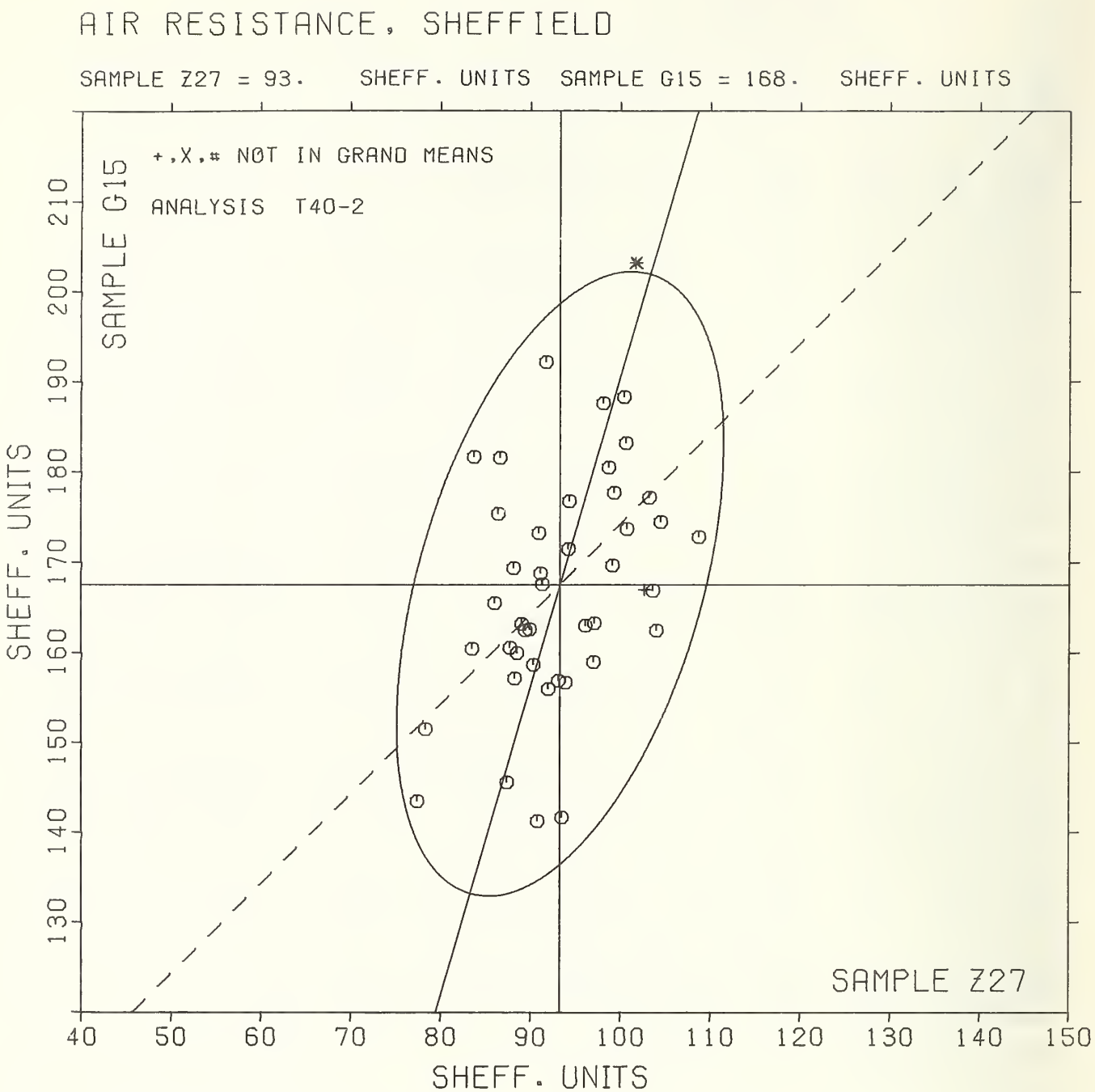
The following laboratories were omitted from the grand means because of extreme test results: 738.

ANALYSIS T40-2 TABLE 2

AIR RESISTANCE, SHEFFIELD UNITS (CC/MIN) FOR 0.442 SQ. IN (3/4 IN. DIA) ORIFICE

TAPPI USEFUL TEST METHOD UM 524, POROSITY BY RESISTANCE TO AIRFLOW

LAB CODE	F	MEANS Z27	MEANS G15	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L738	#	57.	96.	-78.	15.	.84	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L315	O	77.	143.	-28.	8.	1.24	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L155	O	78.	151.	-20.	10.	.91	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L729	O	83.	160.	-10.	7.	.73	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L585	O	84.	182.	11.	13.	1.22	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L173H	O	86.	165.	-4.	6.	1.14	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L753	O	86.	175.	6.	9.	1.23	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L124S	O	87.	182.	12.	10.	1.13	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L684	O	87.	146.	-23.	-1.	.46	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L223	O	88.	161.	-8.	3.	.90	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L157	O	88.	169.	0.	5.	1.34	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L318	O	88.	157.	-11.	2.	1.06	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L158	O	88.	160.	-9.	2.	1.22	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L360	O	89.	163.	-5.	3.	.88	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L262S	O	89.	162.	-6.	2.	.42	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L301	O	90.	163.	-6.	2.	.89	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L704	O	90.	159.	-9.	0.	.71	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L305	O	91.	141.	-26.	-5.	.86	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L687	O	91.	173.	5.	4.	1.04	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L575	O	91.	169.	1.	2.	1.06	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L562	O	91.	168.	-1.	2.	1.38	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L260	O	92.	192.	23.	8.	.76	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L352	O	92.	156.	-11.	-2.	.87	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L249	O	93.	157.	-10.	-3.	.54	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L626	O	93.	142.	-25.	-7.	.99	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L230S	O	94.	157.	-10.	-4.	.97	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L122S	O	94.	171.	4.	0.	1.14	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L132	O	94.	177.	9.	2.	.97	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L698	O	96.	163.	-4.	-4.	1.47	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L390	O	97.	159.	-7.	-6.	.89	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L233	O	97.	163.	-3.	-5.	.82	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L114	O	98.	188.	21.	1.	1.22	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L241	O	99.	180.	14.	-2.	1.03	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L213	O	99.	170.	4.	-5.	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L740	O	99.	178.	11.	-3.	1.34	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L150	O	100.	188.	22.	-1.	1.21	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L257A	O	101.	183.	17.	-3.	1.10	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L148	O	101.	174.	8.	-5.	.94	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L257B	*	102.	203.	37.	2.	1.17	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L312	*	103.	167.	2.	-9.	1.39	40T	AIR RESISTANCE, SHEFFIELD (3 INCH DIAMETER ORIFICE)
L288	O	103.	177.	12.	-7.	1.36	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L255	O	104.	167.	2.	-10.	.87	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L257C	O	104.	162.	-2.	-12.	.69	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L121	O	104.	174.	10.	-9.	.68	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L354	O	109.	173.	9.	-13.	1.36	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L280	*	207.	382.	238.	-50.	3.68	40H	AIR RESISTANCE, BENDTSEN, WG 150
L333	*	317.	665.	540.	-76.	5.00	40B	AIR RESISTANCE, BENDTSEN, WG 150
L484	*	329.	790.	664.	-53.	4.24	40B	AIR RESISTANCE, BENDTSEN, WG 150
L182H	*	364.	581.	473.	-144.	2.28	40H	AIR RESISTANCE, BENDTSEN, WG 150
GMEANS:		93.	168.			1.00		
		95% ELLIPSE:		36.	16.	WITH GAMMA = 73 DEGREES		


AIR RESISTANCE, SHEFFIELD
SAMPLE Z27 = 93. SHEFF. UNITS
SAMPLE G15 = 168. SHEFF. UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T40-2
SAMPLE G15
SHEFF. UNITS
130
140
150
160
170
180
190
200
210
SAMPLE Z27
40
50
60
70
80
90
100
110
120
130
140
150
SHEFF. UNITS

ANALYSIS T41-1 TABLE 1
AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB	SAMPLE B47	RELEASE BASE 82 GRAMS PER SQUARE METER				SAMPLE E64	BACKING 98 GRAMS PER SQUARE METER				TEST D.= 10		
CODE	MEAN	DEV	N.DEV	SDR	R.SDR	MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L122	1703.	161.	.86	529.	1.32	565.	17.	.20	105.	.91	41G	0	L122
L128	1498.	-44.	-.24	441.	1.10	524.	-24.	-.29	96.	.83	41G	0	L128
L134	1326.	-217.	-1.16	500.	1.25	595.	47.	.56	95.	.83	41G	0	L134
L166M	1786.	244.	1.30	292.	.73	645.	97.	1.16	138.	1.19	41G	0	L166M
L230	45360.	43818.	234.50	9453.	23.64	13900.	13352.	159.86	3165.	27.39	41G	#	L230
L259	1357.	-185.	-.99	381.	.95	460.	-88.	-1.05	87.	.76	41G	0	L259
L312	1382.	-160.	-.85	300.	.75	485.	-63.	-.75	104.	.90	41G	0	L312
L358	1788.	246.	1.32	590.	1.48	649.	101.	1.21	163.	1.41	41G	0	L358
L557	1707.	165.	.88	384.	.96	398.	-150.	-1.80	136.	1.17	41G	0	L557
L576	1510.	-32.	-.17	325.	.81	536.	-12.	-.15	87.	.75	41G	0	L576
L697	1364.	-178.	-.95	257.	.64	623.	75.	.90	145.	1.26	41G	0	L697
L732	382.	-1160.	-6.21	132.	.33	172.	-376.	-4.51	58.	.50	41G	#	L732

GP. MEAN = 1542. SEC/10 CC GRAND MEAN = 548. SEC/10 CC TEST DETERMINATIONS = 10
SD MEANS = 187. SEC/10 CC SD OF MEANS = 84. SEC/10 CC 10 LABS IN GRAND MEANS
AVERAGE SDR = 400. SEC/10 CC AVERAGE SDR = 116. SEC/10 CC
TOTAL NUMBER OF LABORATORIES REPORTING = 12

Best values: B47 1520 seconds per 10CC,
E64 550 mercury density, (direct reading)

The values reported here are the time in seconds required for the displacement of 10 ml of air through an area of 1.0 sq. in. of the specimen. The values are not converted to 100ml of air nor to oil density.

Data from the following laboratories appear to be off by a multiplicative factor: 230, 732.

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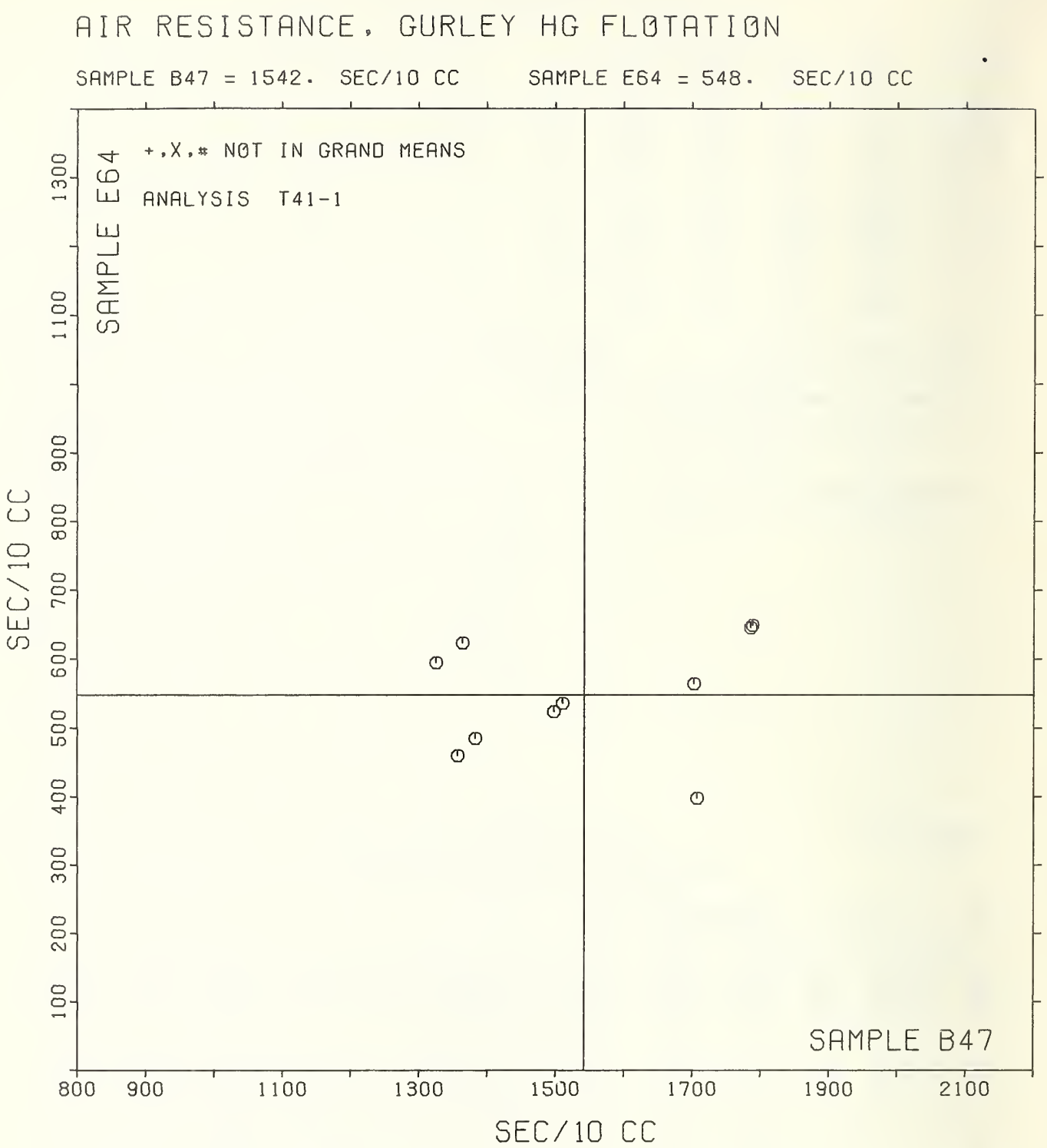
ANALYSIS T41-1 TABLE 2
AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB		MEANS		COORDINATES		AVG		
CODE	F	B47	E64	MAJOR	MINOR	R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L732	#	382.	172.	-1196.	-235.	.42	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L134	0	1326.	595.	-209.	72.	1.04	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L259	0	1357.	460.	-194.	-65.	.85	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L697	0	1364.	623.	-168.	96.	.95	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L312	0	1382.	485.	-166.	-43.	.83	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L128	0	1498.	524.	-47.	-19.	.97	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L576	0	1510.	536.	-33.	-8.	.78	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L122	0	1703.	565.	161.	-3.	1.12	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L557	0	1707.	398.	146.	-169.	1.07	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L166M	0	1786.	645.	254.	68.	.96	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L358	0	1788.	649.	256.	71.	1.44	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L230	#	45360.	13900.	45098.	8029.	25.52	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
GMEANS:		1542.	548.			1.00		
		95% ELLIPSE:		595.	257.	WITH GAMMA = 6 DEGREES		


AIR RESISTANCE, GURLEY HG FLØTATIØN
SAMPLE B47 = 1542. SEC/10 CC
SAMPLE E64 = 548. SEC/10 CC
+,X,* NØT IN GRAND MEANS
ANALYSIS T41-1
SAMPLE E64
SAMPLE B47
SEC/10 CC
SEC/10 CC
100
200
300
400
500
600
700
800
900
1100
1300
800
900
1100
1300
1500
1700
1900
2100

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ANALYSIS T44-1 TABLE 1

SMOOTHNESS, PARKER PRINTSURF

LAB CODE	SAMPLE G09 PRINTING 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE A40 WOVE ENVELOPE PAPER 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.* 10 VAR	F	LAB
L122	6.19	1.11	5.08	.11	.84	5.55	.78	3.32	.24	1.26	44P	#	L122
L182	5.40	.32	1.45	.14	1.06	5.03	.26	1.11	.21	1.09	44P	0	L182
L288	4.97	-.11	-.52	.13	.95	4.80	.03	.11	.25	1.35	44P	0	L288
L317	5.15	.07	.30	.11	.82	5.13	.36	1.51	.14	.75	44P	0	L317
L484	4.99	-.09	-.43	.14	1.04	4.67	-.10	-.45	.18	.94	44P	0	L484
L588	4.71	-.37	-1.71	.14	1.04	4.47	-.30	-1.30	.23	1.23	44P	0	L588
L669	5.18	.10	.45	.10	.72	4.71	-.06	-.26	.16	.86	44P	0	L669
L745	5.18	.10	.46	.18	1.38	4.60	-.17	-.72	.15	.79	44P	0	L745

GR. MEAN * 5.08 MICRONS GRAND MEAN * 4.77 MICRONS TEST DETERMINATIONS * 10

SD MEANS * .22 MICRONS SD OF MEANS * .23 MICRONS 7 LABS IN GRAND MEANS

AVERAGE SDR * .13 MICRONS AVERAGE SDR * .19 MICRONS

TOTAL NUMBER OF LABORATORIES REPORTING * 8

REPORT NO. 650 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T44-1 TABLE 2

SMOOTHNESS, PARKER PRINTSURF

LAB CODE	F	MEANS G09	A40	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L588	0	4.71	4.47	-.48	.08	1.13	44P	SMOOTHNESS, PARKER PRINTSURF
L288	0	4.97	4.80	-.06	.10	1.15	44P	SMOOTHNESS, PARKER PRINTSURF
L484	0	4.99	4.67	-.14	-.00	.99	44P	SMOOTHNESS, PARKER PRINTSURF
L317	0	5.15	5.13	.31	.19	.78	44P	SMOOTHNESS, PARKER PRINTSURF
L669	0	5.18	4.71	.02	-.11	.79	44P	SMOOTHNESS, PARKER PRINTSURF
L745	0	5.18	4.60	-.06	-.19	1.09	44P	SMOOTHNESS, PARKER PRINTSURF
L182	0	5.40	5.03	.40	-.06	1.07	44P	SMOOTHNESS, PARKER PRINTSURF
L122	#	6.19	5.55	1.32	-.31	1.05	44P	SMOOTHNESS, PARKER PRINTSURF
GMEANS:		5.08	4.77			1.00		
		95% ELLIPSE:		1.09	.49	WITH GAMMA = 48 DEGREES		

ANALYSIS T45-1 TABLE 1

SMOOTHNESS, SHEFFIELD UNITS

TAPPI USEFUL TEST METHOD UM 518, SMOOTHNESS OF PAPER (SHEFFIELD)

LAB CODE	SAMPLE G09 PRINTING 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE A40 WOVE ENVELOPE PAPER 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.° 15 VAR	F	LAB
L107	162.7	4.8	.57	17.1	1.09	116.0	-3.1	-.44	7.4	.68	45S	O	L107
L108	160.2	2.3	.28	8.3	.53	110.6	-8.5	-1.19	5.4	.50	45S	O	L108
L114	164.4	6.5	.78	11.5	.73	120.7	1.6	.23	10.5	.97	45S	O	L114
L115	157.4	-.5	-.06	17.7	1.13	126.6	7.5	1.05	8.4	.77	45S	O	L115
L121	158.3	.4	.05	7.2	.46	133.0	13.9	1.95	11.0	1.01	45S	O	L121
L122	154.5	-3.4	-.40	17.2	1.09	130.9	11.8	1.66	11.7	1.08	45S	O	L122
L123	157.9	-.0	-.00	14.7	.93	120.9	1.8	.25	19.1	1.76	45S	O	L123
L124	160.1	2.2	.27	22.3	1.42	110.1	-9.0	-1.27	10.9	1.00	45S	O	L124
L125	148.3	-9.6	-1.15	15.4	.98	118.0	-1.1	-.16	10.1	.94	45S	O	L125
L126	164.2	6.3	.76	20.2	1.29	115.9	-3.2	-.46	7.8	.72	45S	O	L126
L128	156.7	-1.2	-.15	14.2	.91	115.0	-4.1	-.58	8.7	.80	45S	O	L128
L132	179.6	21.7	2.61	30.7	1.95	119.7	.6	.09	9.8	.91	45S	*	L132
L139S	167.0	9.1	1.09	18.7	1.19	125.9	6.8	.95	14.4	1.32	45S	O	L139S
L148	161.0	3.1	.37	15.7	1.00	121.6	2.5	.35	15.5	1.43	45S	O	L148
L150	157.0	-.9	-.11	14.7	.94	117.1	-2.0	-.29	6.9	.64	45S	O	L150
L152	169.7	11.8	1.42	9.7	.62	125.0	5.9	.82	10.4	.95	45S	O	L152
L153	154.9	-3.0	-.36	15.8	1.01	116.7	-2.4	-.33	12.3	1.13	45S	O	L153
L155	144.0	-13.9	-1.67	14.9	.95	125.7	6.6	.92	11.5	1.06	45S	O	L155
L157	158.1	.2	.02	15.6	.99	119.3	.2	.02	12.7	1.17	45S	O	L157
L158	155.3	-2.6	-.31	14.9	.95	126.0	6.9	.97	12.1	1.12	45S	O	L158
L159	170.1	12.2	1.46	15.8	1.01	122.7	3.6	.51	7.4	.68	45S	O	L159
L162	150.8	-7.1	-.85	19.5	1.24	131.8	12.7	1.78	11.2	1.04	45S	*	L162
L166	141.1	-16.8	-2.02	14.5	.92	109.9	-9.2	-1.29	11.6	1.07	45S	O	L166
L167	164.7	6.8	.81	7.9	.50	126.3	7.2	1.01	9.2	.84	45S	O	L167
L173B	164.7	6.8	.81	23.3	1.49	119.3	.2	.03	18.9	1.74	45S	O	L173B
L183S	160.3	2.4	.28	16.4	1.05	113.9	-5.2	-.74	14.9	1.37	45S	O	L183S
L206	164.9	7.0	.84	23.1	1.47	112.5	-6.6	-.92	8.3	.76	45S	O	L206
L211	157.5	-.4	-.04	16.2	1.03	111.1	-8.0	-1.13	14.2	1.31	45S	O	L211
L213	151.2	-6.7	-.81	16.8	1.07	119.5	.4	.06	11.1	1.02	45S	O	L213
L219	153.9	-4.0	-.48	13.7	.87	115.4	-3.7	-.52	8.3	.77	45S	O	L219
L223	146.9	-11.0	-1.32	13.8	.88	110.9	-8.2	-1.16	12.2	1.13	45S	O	L223
L224	154.3	-3.6	-.43	10.1	.64	118.5	-.6	-.09	11.0	1.01	45S	O	L224
L226B	156.5	-1.4	-.16	25.7	1.64	117.2	-1.9	-.27	9.7	.90	45S	O	L226B
L228	162.9	5.0	.60	15.7	1.00	135.4	16.3	2.28	13.1	1.21	45S	O	L228
L230S	163.8	5.9	.71	20.3	1.30	115.4	-3.7	-.52	10.2	.94	45S	O	L230S
L231	161.9	4.0	.48	7.4	.47	121.3	2.2	.30	12.2	1.12	45S	O	L231
L232S	162.0	4.1	.49	8.2	.52	134.7	15.6	2.18	10.6	.98	45S	O	L232S
L233	145.9	-12.0	-1.44	6.6	.42	122.0	2.9	.40	15.0	1.38	45S	O	L233
L237	161.3	3.4	.41	16.6	1.06	118.7	-.4	-.06	8.5	.79	45S	O	L237
L241	140.2	-17.7	-2.13	14.8	.94	106.1	-13.0	-1.83	12.8	1.18	45S	O	L241
L249	168.7	10.8	1.30	24.2	1.54	118.7	-.4	-.05	11.9	1.10	45S	O	L249
L254	159.3	1.4	.17	10.7	.68	117.0	-2.1	-.30	9.0	.83	45S	O	L254
L255	155.7	-2.2	-.27	19.5	1.24	112.5	-6.6	-.93	8.5	.78	45S	O	L255
L257A	149.5	-8.4	-1.01	11.0	.70	124.5	5.4	.75	6.2	.57	45S	O	L257A
L257B	180.9	23.0	2.76	12.1	.77	133.3	14.2	1.98	11.7	1.08	45S	*	L257B
L257C	188.2	30.3	3.64	13.2	.84	134.5	15.4	2.15	16.7	1.54	45S	X	L257C
L259	174.3	16.4	1.98	20.1	1.28	128.3	9.2	1.29	9.6	.88	45S	O	L259
L260	160.6	2.7	.32	8.3	.53	130.4	11.3	1.58	9.1	.84	45S	O	L260
L261	148.3	-9.6	-1.15	12.7	.81	115.3	-3.8	-.53	10.9	1.01	45S	O	L261
L262	160.7	2.8	.33	5.6	.36	129.9	10.8	1.52	3.9	.36	45S	O	L262
L275	154.2	-3.7	-.44	10.6	.67	107.9	-11.2	-1.58	10.0	.93	45S	O	L275
L278	174.9	17.0	2.05	22.9	1.46	125.3	6.2	.87	12.7	1.17	45S	O	L278
L281	157.7	-.2	-.03	26.2	1.67	113.3	-5.8	-.81	10.7	.98	45S	O	L281
L285	142.0	-15.9	-1.91	9.2	.59	115.3	-3.8	-.53	9.5	.88	45S	O	L285
L288	161.6	3.7	.45	11.7	.74	125.4	6.3	.88	11.0	1.01	45S	O	L288
L290	149.8	-8.1	-.97	11.0	.70	111.0	-8.1	-1.14	11.9	1.10	45S	O	L290
L291S	165.1	7.2	.87	22.1	1.41	120.2	1.1	.15	14.1	1.30	45S	O	L291S
L301	156.5	-1.4	-.16	21.2	1.35	112.4	-6.7	-.94	4.9	.45	45S	O	L301
L305	157.5	-.4	-.04	14.5	.92	123.7	4.6	.64	9.9	.91	45S	O	L305
L312	158.6	.7	.08	17.3	1.10	120.1	1.0	.14	9.2	.85	45S	O	L312
L317	157.0	-.9	-.11	18.0	1.15	111.6	-7.5	-1.05	10.5	.97	45S	O	L317
L318	163.7	5.8	.70	23.6	1.50	118.1	-1.0	-.15	12.1	1.12	45S	O	L318
L321	125.7	-32.2	-3.88	7.8	.49	116.0	-3.1	-.44	8.7	.80	45S	X	L321
L323	168.7	10.8	1.29	16.6	1.06	123.0	3.9	.54	10.5	.97	45S	O	L323
L326	151.3	-6.6	-.80	13.8	.88	112.4	-6.7	-.94	8.5	.79	45S	O	L326

ANALYSIS T45-1 TABLE 1
SMOOTHNESS, SHEFFIELD UNITS
TAPPI USEFUL TEST METHOD UM 518, SMOOTHNESS OF PAPER (SHEFFIELD)

LAB CODE	SAMPLE G09 MEAN	PRINTING 75 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE A40 MEAN	WOVE ENVELOPE PAPER 75 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F 15 VAR	F	LAB
L328	160.0	2.1	.25	12.8	.81	131.9	12.8	1.79	9.3	.86	45S	O	L328
L333	147.7	-10.2	-1.22	10.7	.68	116.7	-2.4	-.33	8.7	.80	45S	O	L333
L349	140.5	-17.4	-2.09	8.8	.56	110.6	-8.5	-1.19	8.4	.77	45S	O	L349
L352	159.0	1.1	.13	17.2	1.10	122.0	2.9	.40	10.0	.92	45S	O	L352
L360	159.9	2.0	.24	16.5	1.05	116.0	-3.1	-.44	9.5	.88	45S	O	L360
L366	154.2	-3.7	-.44	16.1	1.02	122.7	3.6	.50	8.7	.80	45S	O	L366
L376	160.4	2.5	.30	16.7	1.06	134.4	15.3	2.14	12.1	1.11	45S	O	L376
L380	157.3	-.6	-.07	16.2	1.03	111.0	-8.1	-1.14	9.9	.91	45S	O	L380
L382	151.1	-6.8	-.81	14.5	.92	114.8	-4.3	-.61	12.6	1.16	45S	O	L382
L390	153.7	-4.2	-.51	15.5	.99	108.7	-10.4	-1.47	12.3	1.14	45S	O	L390
L562	159.9	2.0	.24	20.6	1.31	115.7	-3.4	-.47	13.3	1.22	45S	O	L562
L567	149.7	-8.2	-.99	11.6	.74	111.4	-7.7	-1.08	17.8	1.64	45S	O	L567
L571	162.0	4.1	.49	21.6	1.38	164.7	45.6	6.39	18.1	1.67	45S	#	L571
L575	165.7	7.8	.94	21.6	1.38	119.1	-.0	-.01	12.7	1.17	45S	O	L575
L585	153.0	-4.9	-.59	18.6	1.18	110.3	-8.8	-1.24	11.9	1.10	45S	O	L585
L604	152.0	-5.9	-.71	15.3	.98	116.0	-3.1	-.44	12.0	1.10	45S	O	L604
L626	145.5	-12.4	-1.49	12.9	.82	104.5	-14.6	-2.04	6.7	.62	45S	O	L626
L636	168.9	11.0	1.33	18.6	1.18	117.3	-1.8	-.26	9.5	.88	45S	O	L636
L651	151.0	-6.9	-.83	17.0	1.08	123.7	4.6	.64	15.3	1.41	45S	O	L651
L685	152.7	-5.2	-.63	14.0	.89	112.3	-6.8	-.95	13.3	1.23	45S	O	L685
L698	148.9	-9.0	-1.08	16.8	1.07	113.9	-5.2	-.73	8.9	.82	45S	O	L698
L702	147.7	-10.2	-1.23	17.9	1.14	107.7	-11.4	-1.61	13.3	1.23	45S	O	L702
L704	172.2	14.3	1.72	23.5	1.49	121.4	2.3	.32	6.6	.61	45S	O	L704
L729	150.0	-7.9	-.95	12.5	.80	122.7	3.6	.50	11.5	1.06	45S	O	L729
L738	91.7	-66.2	-7.96	14.7	.94	59.3	-59.8	-8.38	8.6	.80	45S	#	L738
L753	156.2	-1.7	-.20	21.8	1.39	119.3	.2	.02	9.4	.86	45S	O	L753
L760A	155.3	-2.6	-.31	8.1	.52	123.7	4.6	.65	11.0	1.01	45S	O	L760A
L760B	156.9	-1.0	-.12	19.2	1.22	116.5	-2.6	-.36	10.0	.93	45S	O	L760B
L760C	166.1	8.2	.98	20.1	1.28	119.5	.4	.06	15.8	1.45	45S	O	L760C
L760D	170.3	12.4	1.50	23.2	1.47	129.0	9.9	1.39	13.5	1.25	45S	O	L760D

GP. MEAN = 157.9 SHEFF. UNITS GRAND MEAN = 119.1 SHEFF. UNITS TEST DETERMINATIONS = 15
SD MEANS = 8.3 SHEFF. UNITS SD OF MEANS = 7.1 SHEFF. UNITS 91 LABS IN GRAND MEANS
AVERAGE SDR = 15.7 SHEFF. UNITS AVERAGE SDR = 10.8 SHEFF. UNITS
TOTAL NUMBER OF LABORATORIES REPORTING = 95

Best values: G09 158 ± 14 Sheffield units
A40 119 ± 12 Sheffield units

The following laboratories were omitted from the grand means because of extreme test results: 571.

Data from the following laboratories appear to be off by a multiplicative factor: 738.

ANALYSIS T45-1 TABLE 2
SMOOTHNESS, SHEFFIELD UNITS
TAPPI USEFUL TEST METHOD UM 518, SMOOTHNESS OF PAPER (SHEFFIELD)

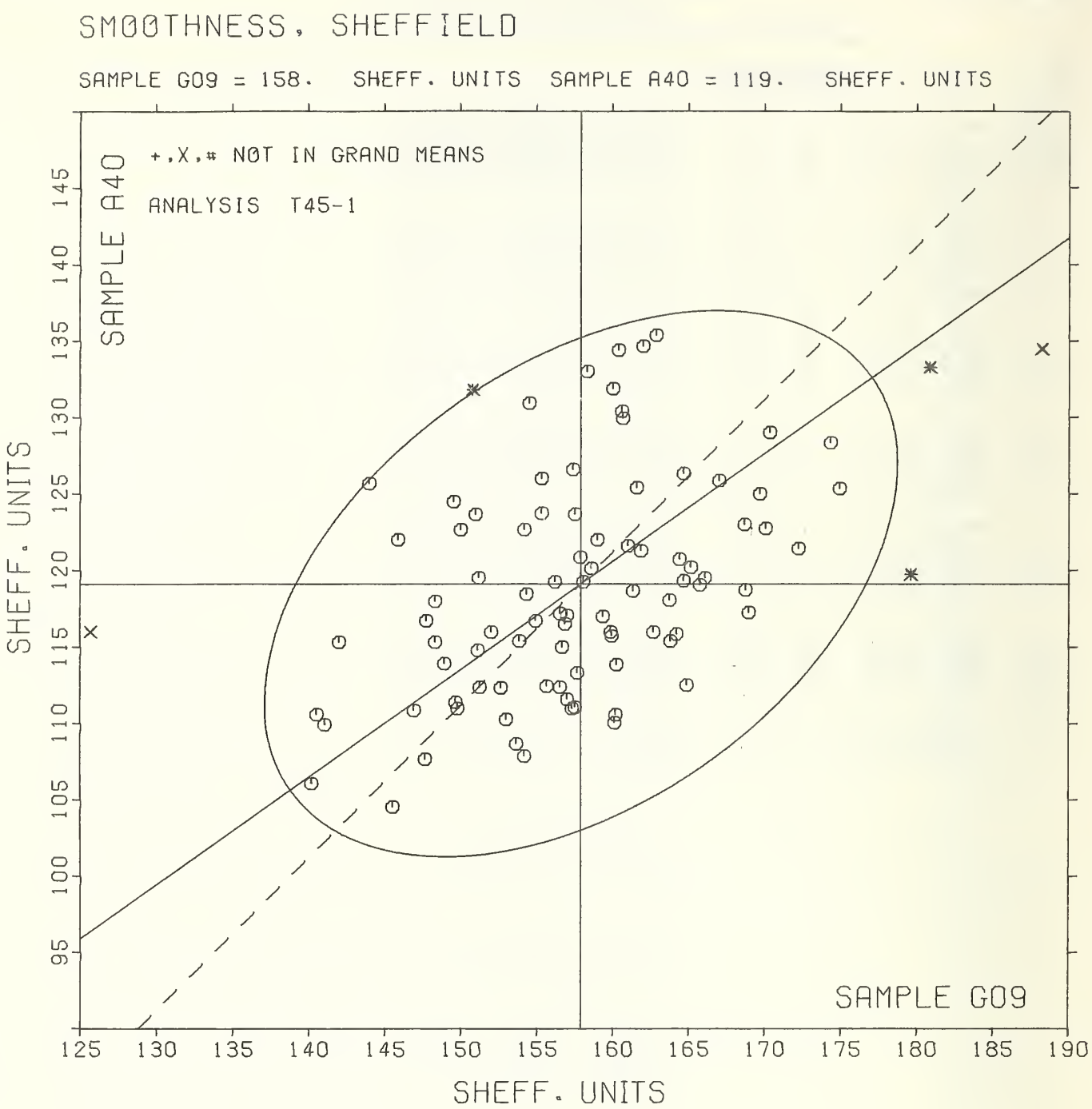
LAB CODE	F	MEANS G09	A40	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L738	#	91.7	59.3	-88.6	-10.7	.87	45S	SMOOTHNESS, SHEFFIELD
L321	X	125.7	116.0	-28.1	16.0	.65	45S	SMOOTHNESS, SHEFFIELD
L241	G	140.2	106.1	-22.0	-.5	1.06	45S	SMOOTHNESS, SHEFFIELD
L349	G	140.5	110.6	-19.1	3.0	.67	45S	SMOOTHNESS, SHEFFIELD
L166	G	141.1	109.9	-19.0	2.2	1.00	45S	SMOOTHNESS, SHEFFIELD
L285	G	142.0	115.3	-15.2	6.1	.73	45S	SMOOTHNESS, SHEFFIELD
L155	G	144.0	125.7	-7.6	13.4	1.00	45S	SMOOTHNESS, SHEFFIELD
L626	G	145.5	104.5	-18.5	-4.8	.72	45S	SMOOTHNESS, SHEFFIELD
L233	G	145.9	122.0	-8.1	9.3	.90	45S	SMOOTHNESS, SHEFFIELD
L223	G	146.9	110.9	-13.7	-.4	1.00	45S	SMOOTHNESS, SHEFFIELD
L702	G	147.7	107.7	-15.0	-3.5	1.19	45S	SMOOTHNESS, SHEFFIELD
L333	G	147.7	116.7	-9.7	3.9	.74	45S	SMOOTHNESS, SHEFFIELD
L261	G	148.3	115.3	-10.0	2.4	.91	45S	SMOOTHNESS, SHEFFIELD
L125	G	148.3	118.0	-8.5	4.6	.96	45S	SMOOTHNESS, SHEFFIELD
L698	G	148.9	113.9	-10.3	.9	.94	45S	SMOOTHNESS, SHEFFIELD
L257A	G	149.5	124.5	-3.8	9.2	.64	45S	SMOOTHNESS, SHEFFIELD
L567	G	149.7	111.4	-11.2	-1.6	1.19	45S	SMOOTHNESS, SHEFFIELD
L290	G	149.8	111.0	-11.3	-2.0	.90	45S	SMOOTHNESS, SHEFFIELD
L729	G	150.0	122.7	-4.4	7.5	.93	45S	SMOOTHNESS, SHEFFIELD
L162	*	150.8	131.8	1.5	14.5	1.14	45S	SMOOTHNESS, SHEFFIELD
L651	G	151.0	123.7	-3.0	7.7	1.25	45S	SMOOTHNESS, SHEFFIELD
L382	G	151.1	114.8	-8.0	.4	1.04	45S	SMOOTHNESS, SHEFFIELD
L213	G	151.2	119.5	-5.2	4.2	1.05	45S	SMOOTHNESS, SHEFFIELD
L326	G	151.3	112.4	-9.3	-1.7	.83	45S	SMOOTHNESS, SHEFFIELD
L604	G	152.0	116.0	-6.6	.9	1.04	45S	SMOOTHNESS, SHEFFIELD
L685	G	152.7	112.3	-8.2	-2.5	1.06	45S	SMOOTHNESS, SHEFFIELD
L585	G	153.0	110.3	-9.1	-4.4	1.14	45S	SMOOTHNESS, SHEFFIELD
L390	G	153.7	108.7	-9.5	-6.1	1.06	45S	SMOOTHNESS, SHEFFIELD
L219	G	153.9	115.4	-5.4	-.7	.82	45S	SMOOTHNESS, SHEFFIELD
L366	G	154.2	122.7	-1.0	5.0	.91	45S	SMOOTHNESS, SHEFFIELD
L275	G	154.2	107.9	-9.5	-7.1	.80	45S	SMOOTHNESS, SHEFFIELD
L224	G	154.3	118.5	-3.3	1.5	.83	45S	SMOOTHNESS, SHEFFIELD
L122	G	154.5	130.9	4.1	11.6	1.08	45S	SMOOTHNESS, SHEFFIELD
L153	G	154.9	116.7	-3.8	-.2	1.07	45S	SMOOTHNESS, SHEFFIELD
L760A	G	155.3	123.7	.6	5.3	.76	45S	SMOOTHNESS, SHEFFIELD
L158	G	155.3	126.0	1.9	7.1	1.03	45S	SMOOTHNESS, SHEFFIELD
L255	G	155.7	112.5	-5.7	-4.1	1.01	45S	SMOOTHNESS, SHEFFIELD
L753	G	156.2	119.3	-1.3	1.1	1.12	45S	SMOOTHNESS, SHEFFIELD
L301	G	156.5	112.4	-5.0	-4.7	.90	45S	SMOOTHNESS, SHEFFIELD
L226B	G	156.5	117.2	-2.2	-.8	1.27	45S	SMOOTHNESS, SHEFFIELD
L128	G	156.7	115.0	-3.4	-2.7	.85	45S	SMOOTHNESS, SHEFFIELD
L760B	G	156.9	116.5	-2.3	-1.5	1.07	45S	SMOOTHNESS, SHEFFIELD
L150	G	157.0	117.1	-1.9	-1.2	.79	45S	SMOOTHNESS, SHEFFIELD
L317	G	157.0	111.6	-5.1	-5.6	1.06	45S	SMOOTHNESS, SHEFFIELD
L380	G	157.3	111.0	-5.1	-6.3	.97	45S	SMOOTHNESS, SHEFFIELD
L115	G	157.4	126.6	3.9	6.4	.95	45S	SMOOTHNESS, SHEFFIELD
L211	G	157.5	111.1	-4.9	-6.4	1.17	45S	SMOOTHNESS, SHEFFIELD
L305	G	157.5	123.7	2.3	3.9	.92	45S	SMOOTHNESS, SHEFFIELD
L281	G	157.7	113.3	-3.5	-4.6	1.33	45S	SMOOTHNESS, SHEFFIELD
L123	G	157.9	120.9	1.0	1.4	1.35	45S	SMOOTHNESS, SHEFFIELD
L157	G	158.1	119.3	.2	.0	1.08	45S	SMOOTHNESS, SHEFFIELD
L121	G	158.3	133.0	8.4	11.1	.74	45S	SMOOTHNESS, SHEFFIELD
L312	G	158.6	120.1	1.2	.4	.98	45S	SMOOTHNESS, SHEFFIELD
L352	G	159.0	122.0	2.6	1.7	1.01	45S	SMOOTHNESS, SHEFFIELD
L254	G	159.3	117.0	-.0	-2.6	.76	45S	SMOOTHNESS, SHEFFIELD
L360	G	159.9	116.0	-.2	-3.7	.96	45S	SMOOTHNESS, SHEFFIELD
L562	G	159.9	115.7	-.3	-3.9	1.27	45S	SMOOTHNESS, SHEFFIELD
L329	G	160.0	131.9	9.1	9.2	.83	45S	SMOOTHNESS, SHEFFIELD
L124	G	160.1	110.1	-3.4	-8.7	1.21	45S	SMOOTHNESS, SHEFFIELD
L108	G	160.2	110.6	-3.0	-8.3	.51	45S	SMOOTHNESS, SHEFFIELD
L183S	G	160.3	113.9	-1.1	-5.7	1.21	45S	SMOOTHNESS, SHEFFIELD
L376	G	160.4	134.4	10.9	11.1	1.09	45S	SMOOTHNESS, SHEFFIELD
L260	G	160.6	130.4	8.7	7.7	.68	45S	SMOOTHNESS, SHEFFIELD
L262	G	160.7	129.9	8.5	7.2	.36	45S	SMOOTHNESS, SHEFFIELD
L148	G	161.0	121.6	4.0	.2	1.21	45S	SMOOTHNESS, SHEFFIELD

ANALYSIS T45-1 TABLE 2

SMOOTHNESS, SHEFFIELD UNITS

TAPPI USEFUL TEST METHOD UM 518, SMOOTHNESS OF PAPER (SHEFFIELD)

LAB CODE	F	MEANS G09	MEANS A40	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L237	A	161.3	118.7	2.5	-2.3	.92	45S	SMOOTHNESS, SHEFFIELD
L288	A	161.6	125.4	6.6	3.0	.88	45S	SMOOTHNESS, SHEFFIELD
L231	A	161.9	121.3	4.5	-.5	.80	45S	SMOOTHNESS, SHEFFIELD
L232S	A	162.0	134.7	12.3	10.3	.75	45S	SMOOTHNESS, SHEFFIELD
L571	*	162.0	164.7	29.6	30.9	1.52	45S	SMOOTHNESS, SHEFFIELD
L107	A	162.7	116.0	2.1	-5.3	.88	45S	SMOOTHNESS, SHEFFIELD
L228	A	162.9	135.4	13.4	10.4	1.11	45S	SMOOTHNESS, SHEFFIELD
L318	A	163.7	118.1	4.2	-4.2	1.31	45S	SMOOTHNESS, SHEFFIELD
L230S	A	163.8	115.4	2.7	-6.4	1.12	45S	SMOOTHNESS, SHEFFIELD
L126	A	164.2	115.9	3.3	-6.3	1.00	45S	SMOOTHNESS, SHEFFIELD
L114	A	164.4	120.7	6.2	-2.4	.85	45S	SMOOTHNESS, SHEFFIELD
L167	A	164.7	126.3	9.7	2.0	.67	45S	SMOOTHNESS, SHEFFIELD
L173B	A	164.7	119.3	5.7	-3.7	1.61	45S	SMOOTHNESS, SHEFFIELD
L206	A	164.9	112.5	1.9	-9.4	1.12	45S	SMOOTHNESS, SHEFFIELD
L291S	A	165.1	120.2	6.5	-3.3	1.36	45S	SMOOTHNESS, SHEFFIELD
L575	A	165.7	119.1	6.4	-4.6	1.27	45S	SMOOTHNESS, SHEFFIELD
L760C	A	166.1	119.5	6.9	-4.4	1.37	45S	SMOOTHNESS, SHEFFIELD
L139S	A	167.0	125.9	11.3	.3	1.26	45S	SMOOTHNESS, SHEFFIELD
L323	A	168.7	123.0	11.0	-3.0	1.01	45S	SMOOTHNESS, SHEFFIELD
L249	A	168.7	118.7	8.6	-6.6	1.32	45S	SMOOTHNESS, SHEFFIELD
L636	A	168.9	117.3	8.0	-7.9	1.03	45S	SMOOTHNESS, SHEFFIELD
L152	A	169.7	125.0	13.0	-2.0	.79	45S	SMOOTHNESS, SHEFFIELD
L159	A	170.1	122.7	12.0	-4.1	.84	45S	SMOOTHNESS, SHEFFIELD
L760D	A	170.3	129.0	15.9	.9	1.36	45S	SMOOTHNESS, SHEFFIELD
L704	A	172.2	121.4	13.0	-6.4	1.05	45S	SMOOTHNESS, SHEFFIELD
L259	A	174.3	128.3	18.7	-1.9	1.08	45S	SMOOTHNESS, SHEFFIELD
L278	A	174.9	125.3	17.5	-4.7	1.32	45S	SMOOTHNESS, SHEFFIELD
L132	*	179.6	119.7	18.1	-12.0	1.43	45S	SMOOTHNESS, SHEFFIELD
L257P	*	180.9	133.3	26.9	-1.7	.92	45S	SMOOTHNESS, SHEFFIELD
L257C	X	188.2	134.5	33.6	-4.9	1.19	45S	SMOOTHNESS, SHEFFIELD
GMEANS:		157.9	119.1			1.00		
		95% ELLIPSE:		23.4	14.3	WITH GAMMA = 35 DEGREES		


SMOOTHNESS, SHEFFIELD
SAMPLE G09 = 158. SHEFF. UNITS SAMPLE A40 = 119. SHEFF. UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T45-1
SAMPLE A40
SHEFF. UNITS
95 100 105 110 115 120 125 130 135 140 145
SAMPLE G09
125 130 135 140 145 150 155 160 165 170 175 180 185 190
SHEFF. UNITS

REPORT NO. 650 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS I45-2 TABLE 1

SMOOTHNESS, BEKK SECONDS

TAPPI SUGGESTED METHOD T479 SU-71, SMOOTHNESS OF PAPER (BEKK METHOD)

LAB CODE	SAMPLE G09 MEAN	PRINTING 75 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE A40 MEAN	WOVE ENVELOPE PAPER 75 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F. 15 VAR	F	LAB
L139B	32.9	4.5	1.52	2.6	.83	45.9	4.8	.72	5.5	.87	45K	O	L139B
I162	28.2	-.3	-.09	2.0	.64	42.3	1.2	.19	7.8	1.22	45K	O	L162
I182K	26.5	-1.9	-.65	1.8	.60	35.4	-5.7	-.86	6.9	1.09	45K	O	I182K
I230B	24.1	-4.3	-1.47	2.7	.86	31.9	-9.2	-1.38	4.6	.73	45K	O	I230B
I274K	26.7	-1.8	-.60	1.9	.63	49.4	8.3	1.26	3.5	.55	45K	O	L274K
I291K	30.3	1.9	.64	3.1	.99	47.0	5.9	.89	10.3	1.62	45K	O	I291K
L564	28.8	.3	.12	2.7	.88	42.9	1.8	.28	7.2	1.12	45K	O	L564
L581	25.5	-3.0	-1.01	2.6	.86	37.7	-3.4	-.51	5.9	.93	45K	O	L581
I625	32.9	4.4	1.51	8.0	2.59	31.2	-9.9	-1.50	3.9	.61	45K	O	L625
I697	28.5	.1	.03	3.5	1.13	47.2	6.1	.92	8.1	1.27	45K	O	L697
GR. MEAN =	28.5 BEKK SECONDS			GRAND MEAN =		41.1 BEKK SECONDS			TEST DETERMINATIONS =		15		
SD MEANS =	2.9 BEKK SECONDS			SD OF MEANS =		6.6 BEKK SECONDS			10 LABS IN GRAND MEANS				
	AVERAGE SDR =	3.1 BEKK SECONDS				AVERAGE SDR =	6.4 BEKK SECONDS						
I250M	26.8	-1.7	-.56	1.9	.63	37.0	-4.1	-.62	4.1	.64	45L	*	L250M

TOTAL NUMBER OF LABORATORIES REPORTING = 11

Best values: G09 28 Bekk seconds
A40 42 Bekk seconds

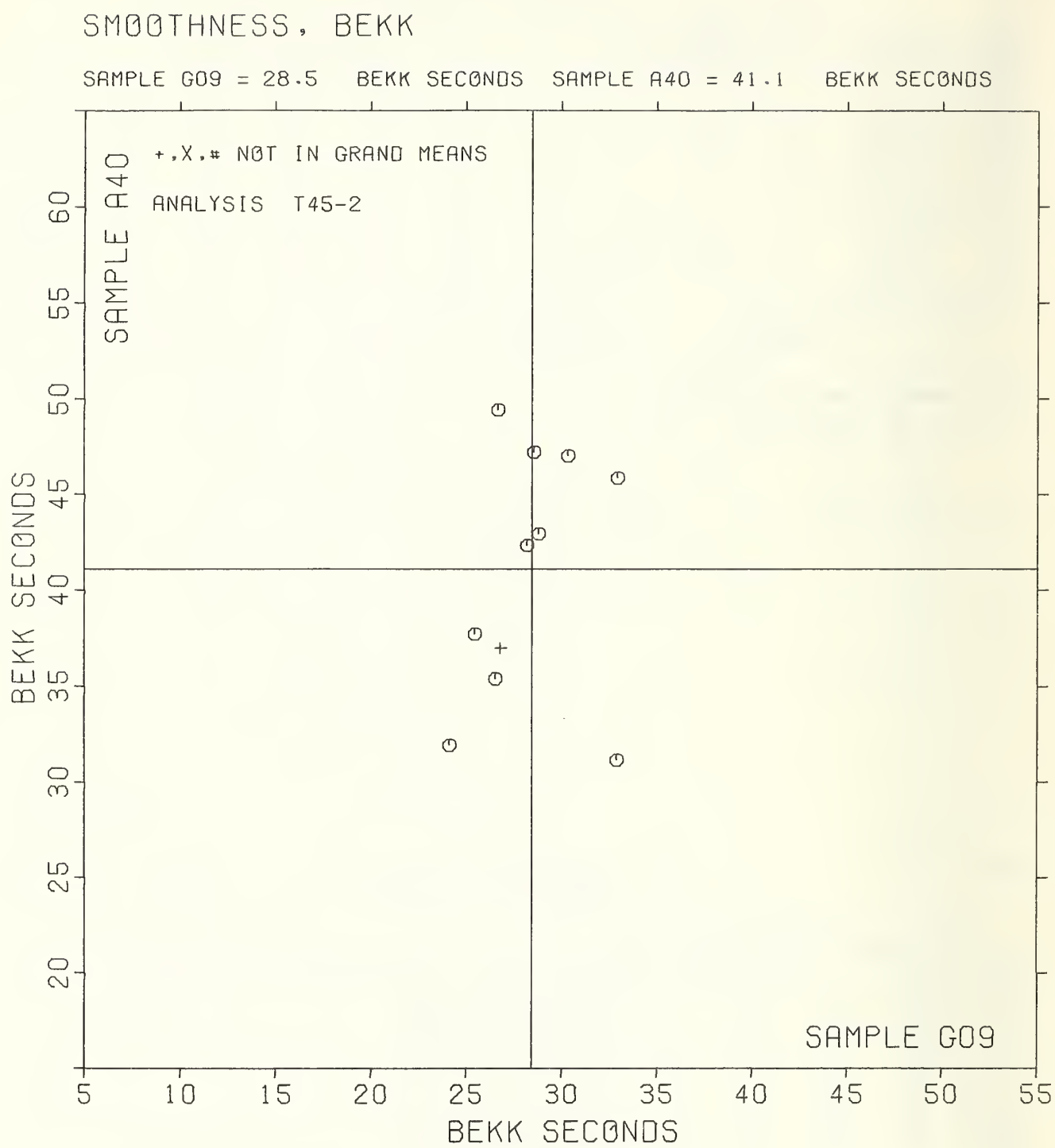
REPORT NO. 650 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS I45-2 TABLE 2

SMOOTHNESS, BEKK SECONDS

TAPPI SUGGESTED METHOD T479 SU-71, SMOOTHNESS OF PAPER (BEKK METHOD)

LAB CODE	F	MEANS G09	A40	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
I230B	O	24.1	31.9	-9.6	3.3	.79	45K	SMOOTHNESS, BEKK
L581	O	25.5	37.7	-3.7	2.6	.89	45K	SMOOTHNESS, BEKK
I182K	O	26.5	35.4	-5.9	1.3	.84	45K	SMOOTHNESS, BEKK
I274K	O	26.7	49.4	8.1	2.7	.59	45K	SMOOTHNESS, BEKK
I250M	*	26.8	37.0	-4.3	1.2	.64	45L	SMOOTHNESS, BEKK, 20 C, 65% RH
I162	O	28.2	42.3	1.2	.4	.93	45K	SMOOTHNESS, BEKK
L697	O	28.5	47.2	6.1	.6	1.20	45K	SMOOTHNESS, BEKK
I564	O	28.8	42.9	1.9	-.1	1.00	45K	SMOOTHNESS, BEKK
I291K	O	30.3	47.0	6.1	-1.2	1.31	45K	SMOOTHNESS, BEKK
I625	O	32.9	31.2	-9.4	-5.5	1.60	45K	SMOOTHNESS, BEKK
L139B	O	32.9	45.9	5.2	-3.9	.85	45K	SMOOTHNESS, BEKK
GMEANS:		28.5	41.1			1.00		
		95% ELLIPSE:		21.1	9.1	WITH GAMMA = 83 DEGREES		


SMOOTHNESS, BEKK
SAMPLE G09 = 28.5 BEKK SECONDS
SAMPLE A40 = 41.1 BEKK SECONDS
+,X,# NOT IN GRAND MEANS
ANALYSIS T45-2
SAMPLE A40
SAMPLE G09
BEKK SECONDS
BEKK SECONDS
5
10
15
20
25
30
35
40
45
50
55
60

REPORT NO. 650 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T47-1 TABLE 1

SMOOTHNESS, BENDTSEN (MILLILITERS/MINUTE)

TAPPI USEFUL TEST METHOD UM 535, SMOOTHNESS OF PAPER AND PAPERBOARD (BENDTSEN TESTER)

LAB	SAMPLE G09 PRINTING 75 GRAMS PER SQUARE METER					SAMPLE A40 WOVE ENVELOPE PAPER 75 GRAMS PER SQUARE METER					TEST D.F. 10		
CODE	MEAN	DEV	N.DEV	SDR	R.SDR	MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L182B	220.	20.	1.22	46.	1.25	163.	25.	.89	27.	1.40	47B	6	L182B
L242	204.	5.	.27	54.	1.48	151.	12.	.44	21.	1.09	47B	6	L242
L244	175.	-24.	-1.47	21.	.57	129.	-10.	-.35	25.	1.29	47B	6	L244
L280	196.	-3.	-.19	63.	1.72	86.	-52.	-1.87	15.	.75	47B	6	L280
L313	188.	-12.	-.70	15.	.40	150.	12.	.42	21.	1.08	47B	6	L313
L484	214.	14.	.86	21.	.57	152.	13.	.48	7.	.38	47B	6	L484

GP. MEAN = 200. ML/MIN GRAND MEAN = 138. ML/MIN TEST DETERMINATIONS = 10

SD MEANS = 17. ML/MIN SD OF MEANS = 28. ML/MIN 6 LABS IN GRAND MEANS

AVERAGE SDR = 37. ML/MIN AVERAGE SDR = 20. ML/MIN

TOTAL NUMBER OF LABORATORIES REPORTING = 6

REPORT NO. 650 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T47-1 TABLE 2

SMOOTHNESS, BENDTSEN (MILLILITERS/MINUTE)

TAPPI USEFUL TEST METHOD UM 535, SMOOTHNESS OF PAPER AND PAPERBOARD (BENDTSEN TESTER)

LAB		MEANS		COORDINATES		AVG		
CODE	F	G09	A40	MAJOR	MINOR	R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L244	6	175.	129.	-17.	20.	.93	47B	SMOOTHNESS, BENDTSEN, WG 150
L313	6	188.	150.	7.	15.	.74	47B	SMOOTHNESS, BENDTSEN, WG 150
L280	6	196.	86.	-50.	-14.	1.24	47B	SMOOTHNESS, BENDTSEN, WG 150
L242	6	204.	151.	13.	-0.	1.28	47B	SMOOTHNESS, BENDTSEN, WG 150
L484	6	214.	152.	17.	-9.	.47	47B	SMOOTHNESS, BENDTSEN, WG 150
L182B	6	220.	163.	30.	-11.	1.33	47B	SMOOTHNESS, BENDTSEN, WG 150
GMEANS:		200.	138.			1.00		
		95% ELLIPSE:		121.	60.	WITH GAMMA = 70 DEGREES		

REPORT NO. 65G TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS I53-1 TABLE 1

MOISTURE IN PAPER, PERCENT

TAPPI SUGGESTED METHOD T412 SU-69

LAB CODE	SAMPLE G41 WEB GLOSS 89 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE G51 COATED FINE PAPER 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.F. 10 VAR	F	LAB
L134	4.04	.48	1.33	.10	.52	5.35	.86	1.70	.05	.22	53M	6	L134
L141	3.78	.22	.60	.01	.07	4.65	.15	.31	.02	.10	53D	6	L141
L162	3.17	-.39	-1.08	.07	.36	3.95	-.54	-1.08	.11	.46	53M	6	L162
L213	4.20	.64	1.77	.14	.76	5.16	.67	1.33	.11	.46	53M	6	L213
L244	3.72	.16	.43	.12	.62	4.72	.23	.46	.07	.31	53D	6	L244
L291	3.83	.27	.76	.55	2.94	4.43	-.06	-.12	.72	3.08	53D	6	L291
L376	3.48	-.07	-.21	.73	3.91	4.23	-.27	-.53	.81	3.44	53D	6	L376
L442	3.14	-.42	-1.16	.08	.45	3.59	-.90	-1.79	.21	.88	53D	6	L442
L570	3.31	-.25	-.70	.11	.58	4.07	-.43	-.85	.42	1.77	53D	6	L570
L571	3.21	-.35	-.97	.16	.85	4.46	-.03	-.06	.13	.54	53M	6	L571
L592	3.21	-.35	-.97	.13	.69	4.41	-.08	-.16	.10	.42	53M	6	L592
L753	3.63	.07	.19	.05	.26	4.89	.40	.79	.07	.31	53M	6	L753

GR. MEAN = 3.56 PERCENT GRAND MEAN = 4.49 PERCENT TEST DETERMINATIONS = 10

SD MEANS = .36 PERCENT SD OF MEANS = .50 PERCENT 12 LABS IN GRAND MEANS

AVERAGE SDR = .19 PEPCENT AVERAGE SDR = .24 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 12

Best values: G41 3.6 ± 0.6 percent
G51 4.5 ± 0.9 percent

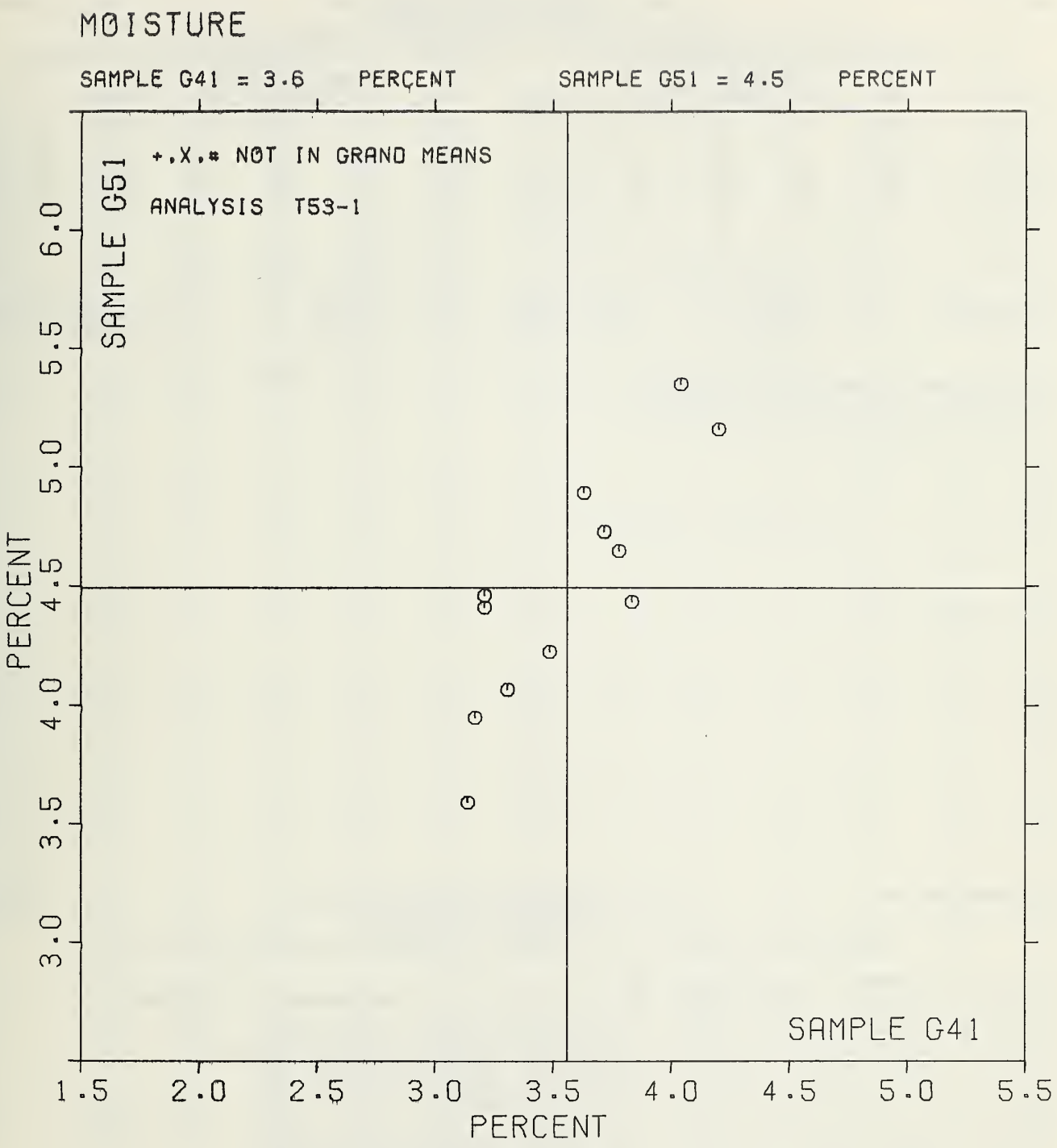
REPORT NO. 65G TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS I53-1 TABLE 2

MOISTURE IN PAPER, PERCENT

TAPPI SUGGESTED METHOD T412 SU-69

LAB CODE	F	MEANS G41	G51	COORDINATES MAJOR	MINOR	AVG P.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L442	6	3.14	3.59	-.98	-.16	.67	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L162	6	3.17	3.95	-.67	.02	.41	53M	MOISTURE CONTENT, MOISTREX
L592	6	3.21	4.41	-.26	.24	.56	53M	MOISTURE CONTENT, MOISTREX
L571	6	3.21	4.46	-.22	.27	.69	53M	MOISTURE CONTENT, MOISTREX
L570	6	3.31	4.07	-.50	-.03	1.17	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L376	6	3.48	4.23	-.26	-.09	3.67	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L753	6	3.63	4.89	.37	.16	.29	53M	MOISTURE CONTENT, MOISTREX
L244	6	3.72	4.72	.28	.00	.47	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L141	6	3.78	4.65	.25	-.09	.09	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L291	6	3.83	4.43	.10	-.26	3.01	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L134	6	4.04	5.35	.98	.08	.37	53M	MOISTURE CONTENT, MOISTREX
L213	6	4.20	5.16	.91	-.16	.61	53M	MOISTURE CONTENT, MOISTREX
GMEANS:		3.56	4.49			1.00		
		95% ELLIPSE:		1.79	.50	WITH GAMMA = 55 DEGREES		


MOISTURE
SAMPLE G41 = 3.6 PERCENT
SAMPLE G51 = 4.5 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T53-1
SAMPLE G51
PERCENT
6.0
5.5
5.0
4.5
4.0
3.5
3.0
SAMPLE G41
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
PERCENT

REPORT NO. 656 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T56-1 TABLE 1

K & N INK ABSORPTION

TAPPI USEFUL TEST METHOD UM 553, PRINTING INK METHOD AND BRITISH STANDARD 4574-70

LAB CODE	SAMPLE G22 M.F. RELEASE PAPER 73 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDP	R.SDR	SAMPLE A57 ENVELOPE 89 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.* 4 VAR	F	LAB
L126	53.2	-.5	-.12	.5	.38	60.1	-2.2	-.52	.4	.37	56K	@	L126
L149	54.0	.3	.07	1.4	1.21	60.7	-1.6	-.38	1.9	1.68	56K	@	L149
L182	54.5	.8	.20	.1	.11	64.8	2.5	.60	.4	.32	56K	@	L182
L291	60.5	6.8	1.79	1.6	1.35	66.3	4.0	.95	1.0	.89	56K	@	L291
L333	53.0	-.7	-.19	1.4	1.21	60.0	-2.3	-.56	1.6	1.45	56K	@	L333
L339	53.2	-.5	-.12	2.2	1.89	68.0	5.7	1.37	1.6	1.45	56K	@	L339
L616	47.5	-6.2	-1.63	1.0	.85	56.3	-6.1	-1.46	1.0	.85	56K	@	L616
L643	36.4	-17.3	-4.54	1.6	1.36	30.3	-32.0	-7.71	.6	.52	56K	#	L643
GR. MEAN *	53.7 K & N UNITS			GRAND MEAN *		62.3 K & N UNITS			TEST DETERMINATIONS *		4		
SD MEANS *	3.8 K & N UNITS			SD OF MEANS *		4.2 K & N UNITS			7 LABS IN GRAND MEANS				
	AVERAGE SDR *		1.2 K & N UNITS			AVERAGE SDR *		1.1 K & N UNITS					
L224	40.8	-12.9	-3.38	2.1	1.81	405.1	342.8	82.51	40.5	35.91	56H	*	L224

TOTAL NUMBER OF LABORATORIES REPORTING * 9

The following laboratories were omitted from the grand means because of extreme test results: 643.

REPORT NO. 656 TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T56-1 TABLE 2

K & N INK ABSORPTION

TAPPI USEFUL TEST METHOD UM 553, PRINTING INK METHOD AND BRITISH STANDARD 4574-70

LAB CODE	F	MEANS G22	A57	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L643	#	36.4	30.3	-35.5	-8.2	.94	56K	INK ABSORPTION, K&N INK TEST
L224	*	40.8	405.1	248.5	236.4	18.86	56H	INK ABSORPTION, HERCULES SIZE TESTER
L616	@	47.5	56.3	-8.7	.6	.85	56K	INK ABSORPTION, K&N INK TEST
L333	@	53.0	60.0	-2.2	-1.0	1.33	56K	INK ABSORPTION, K&N INK TEST
L126	@	53.2	60.1	-1.9	-1.1	.38	56K	INK ABSORPTION, K&N INK TEST
L339	@	53.2	68.0	3.9	4.1	1.67	56K	INK ABSORPTION, K&N INK TEST
L149	@	54.0	60.7	-1.0	-1.3	1.44	56K	INK ABSORPTION, K&N INK TEST
L182	@	54.5	64.8	2.4	1.1	.21	56K	INK ABSORPTION, K&N INK TEST
L291	@	60.5	66.3	7.5	-2.5	1.12	56K	INK ABSORPTION, K&N INK TEST
GMEANS:		53.7	62.3			1.00		
		95% ELLIPSE:		19.4	8.1	WITH GAMMA * 48 DEGREES		

ANALYSIS T60-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	SAMPLE A99 MEAN	REPROCOPY 78 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE A58 MEAN	WOVE ENVELOPE 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F 10 VAR	F	LAB
L105	90.11	.60	1.03	.81	.95	92.86	-.45	-1.07	.61	.96	60H	*	L105
L108	89.82	.31	.53	.66	.78	93.73	.42	.99	.62	.99	60B	@	L108
L115	90.08	.57	.98	.76	.90	93.07	-.24	-.57	.53	.84	60B	@	L115
L118	89.54	.03	.05	.69	.82	93.05	-.26	-.62	.46	.73	60B	@	L118
L122	89.76	.25	.43	.76	.90	93.57	.26	.61	.40	.63	60D	@	L122
L123	88.93	-.58	-1.00	1.01	1.19	92.68	-.63	-1.50	.56	.89	60W	@	L123
L124	89.11	-.40	-.69	.89	1.05	93.12	-.19	-.45	.64	1.02	60B	@	L124
L125	88.52	-.99	-1.71	.89	1.05	92.13	-1.18	-2.80	.55	.87	60H	*	L125
L132	89.28	-.23	-.40	.73	.86	93.05	-.26	-.62	.40	.63	60B	@	L132
L139	89.72	.21	.36	.66	.78	92.93	-.38	-.91	.84	1.33	60B	@	L139
L148H	89.32	-.19	-.33	.99	1.17	93.15	-.16	-.38	.71	1.12	60H	@	L148H
L152	89.50	-.01	-.02	.63	.74	93.18	-.13	-.31	.74	1.17	60B	@	L152
L157	90.50	.99	1.71	.62	.74	94.00	.69	1.63	.58	.91	60B	@	L157
L158	89.80	.29	.50	.59	.70	93.31	-.00	-.00	.37	.58	60D	@	L158
L162	90.00	.49	.84	.80	.95	93.34	.03	.07	.52	.82	60W	@	L162
L166	89.84	.33	.57	.59	.70	93.68	.37	.87	.68	1.07	60B	@	L166
L173A	89.24	-.27	-.47	1.07	1.27	92.99	-.32	-.76	.42	.66	60B	@	L173A
L206	89.56	.05	.09	.89	1.05	93.44	.13	.30	.67	1.06	60B	@	L206
L210B	90.23	.72	1.24	.62	.74	NO DATA REPORTED FOR SAMPLE A58					60B	M	L210
L210D	90.64	1.13	1.95	.53	.63	93.69	.38	.90	1.42	2.25	60D	@	L210D
L211S	89.59	.08	.14	1.01	1.19	93.34	.03	.07	.38	.61	60R	@	L211S
L212	89.93	.42	.72	.91	1.08	93.32	.01	.02	.49	.78	60H	@	L212
L213	89.75	.24	.41	.70	.82	94.11	.80	1.89	.65	1.02	60B	@	L213
L223B	89.79	.28	.48	.83	.97	93.39	.08	.19	.44	.70	60B	@	L223B
L225	90.05	.54	.93	.62	.73	93.24	-.07	-.17	.73	1.15	60B	@	L225
L226B	89.04	-.47	-.81	.70	.83	93.06	-.25	-.60	.73	1.15	60B	@	L226B
L228	89.17	-.34	-.59	.83	.98	92.76	-.55	-1.31	.62	.99	60H	@	L228
L230	88.91	-.60	-1.03	.86	1.01	93.21	-.10	-.24	.64	1.02	60B	@	L230
L238A	88.12	-1.39	-2.40	1.05	1.23	92.23	-1.08	-2.57	.37	.58	60R	*	L238A
L241	89.93	.42	.72	.98	1.16	93.49	.18	.42	.44	.70	60B	@	L241
L254	89.33	-.18	-.31	.60	.71	93.14	-.17	-.41	.61	.97	60H	@	L254
L259	89.80	.29	.50	.94	1.11	93.72	.41	.97	.39	.62	60B	@	L259
L262	90.25	.74	1.27	.39	.46	93.74	.43	1.02	.31	.48	60R	@	L262
L275	89.85	.34	.59	1.12	1.32	93.53	.22	.52	.55	.87	60R	@	L275
L278	89.25	-.26	-.45	1.39	1.64	93.40	.09	.21	.46	.73	60B	@	L278
L285D	89.35	-.16	-.28	.67	.79	93.13	-.18	-.43	1.07	1.69	60D	@	L285D
L285R	89.13	-.38	-.66	.76	.90	93.25	-.06	-.15	.62	.98	60R	@	L285R
L288	89.64	.13	.22	.75	.88	93.30	-.01	-.03	.51	.80	60D	@	L288
L301	88.70	-.81	-1.40	1.27	1.50	92.89	-.42	-1.00	.46	.72	60B	@	L301
L317	89.81	.30	.52	.76	.90	93.17	-.14	-.34	.94	1.48	60B	@	L317
L323	89.20	-.31	-.53	1.11	1.32	93.51	.20	.47	.69	1.08	60W	@	L323
L339	89.15	-.36	-.62	1.00	1.18	93.60	.29	.68	.84	1.33	60B	@	L339
L341	88.81	-.70	-1.21	.40	.47	92.88	-.43	-1.02	.71	1.12	60R	@	L341
L349	89.46	-.05	-.09	.96	1.14	93.59	.28	.66	.33	.52	60D	@	L349
L354	89.40	-.11	-.19	1.35	1.59	93.10	-.21	-.50	.88	1.38	60B	@	L354
L366	90.12	.61	1.05	.88	1.04	93.88	.57	1.35	.71	1.13	60B	@	L366
L390	88.80	-.71	-1.22	.49	.58	93.20	-.11	-.27	.46	.73	60B	@	L390
L543	90.35	.84	1.45	1.08	1.28	93.77	.46	1.09	.45	.72	60D	@	L543
L567	88.19	-1.32	-2.27	.88	1.04	92.57	-.74	-1.76	.64	1.01	60D	@	L567
L571	90.43	.92	1.58	1.19	1.40	94.55	1.24	2.94	.51	.80	60D	*	L571
L573	88.90	-.61	-1.05	1.22	1.44	93.13	-.18	-.43	.58	.92	60H	@	L573
L581	89.89	.38	.65	1.02	1.20	93.14	-.17	-.41	.85	1.35	60B	@	L581
L592	88.85	-.66	-1.14	1.31	1.55	90.05	-3.26	-7.73	.64	1.02	60W	#	L592
L594	90.48	.97	1.67	.63	.75	93.62	.31	.73	.53	.83	60D	@	L594
L608	91.94	2.43	4.19	.88	1.04	94.73	1.42	3.36	.52	.82	60D	X	L608
L636	89.64	.13	.22	.74	.87	91.23	-2.08	-4.94	.39	.62	60R	X	L636
L654	89.96	.45	.77	.92	1.08	93.95	.64	1.51	.73	1.15	60D	@	L654
L673R	89.89	.38	.65	.60	.71	93.33	.02	.04	.83	1.31	60B	@	L673R
L673T	89.29	-.22	-.38	1.11	1.31	93.70	.39	.92	.63	1.00	60B	@	L673T
L692	89.68	.17	.29	.81	.96	93.28	-.03	-.08	.49	.77	60D	@	L692
L698	88.38	-1.13	-1.95	.72	.85	92.65	-.66	-1.57	.73	1.15	60D	@	L698
L712	90.12	.61	1.05	.78	.92	93.75	.44	1.04	.79	1.25	60B	@	L712
L738	89.70	.19	.33	.87	1.03	93.28	-.03	-.08	.57	.90	60D	@	L738
L753	90.17	.66	1.14	1.01	1.19	93.81	.50	1.18	.73	1.15	60D	@	L753
L760A	89.88	-.63	-1.09	.98	1.16	93.23	-.08	-.19	.91	1.44	60D	@	L760A

ANALYSIS T60-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	SAMPLE A99 MEAN	REPROCOPY 78 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE A58 MEAN	WOVE ENVELOPE 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F. 10 VAR	F	LAB
L760B	88.90	-.61	-1.05	1.22	1.44	93.55	.24	.56	.80	1.26	60B	O	L760B
L760C	88.45	-1.06	-1.83	.76	.90	93.10	-.21	-.50	.74	1.17	60B	O	L760C
L760D	89.40	-.11	-.19	1.02	1.21	93.40	.09	.21	.74	1.17	60B	O	L760D
GR. MEAN =	89.51 PERCENT					GRAND MEAN =	93.31 PERCENT				TEST DETERMINATIONS =		10
SD MEANS =	.58 PERCENT					SD OF MEANS =	.42 PERCENT				64 LABS IN GRAND MEANS		
	AVERAGE SDR =	.85 PERCENT					AVERAGE SDR =	.63 PERCENT					
L224	89.55	.04	.07	.93	1.09	93.45	.14	.33	.64	1.02	60P	*	L224
L232	89.70	.19	.33	.42	.50	93.50	.19	.45	.33	.53	60P	*	L232
L249	88.86	-.65	-1.12	1.21	1.43	92.66	-.65	-1.55	.88	1.40	60P	*	L249
L256	88.47	-1.04	-1.79	.84	.99	93.08	-.23	-.55	.58	.91	60N	*	L256
L274P	89.30	-.21	-.36	.48	.57	92.85	-.46	-1.10	.41	.65	60P	*	L274P
L312	87.35	-2.16	-3.72	.82	.97	91.70	-1.61	-3.82	.59	.93	60P	*	L312
L380	88.70	-.81	-1.40	1.06	1.25	92.10	-1.21	-2.87	.32	.50	60P	*	L380
L564	88.40	-1.11	-1.91	1.07	1.27	92.30	-1.01	-2.40	.48	.76	60P	*	L564
L625	88.80	-.71	-1.22	.92	1.08	93.45	.14	.33	.44	.69	60P	*	L625
I685B	89.68	.17	.29	.66	.77	93.38	.07	.16	.54	.85	60P	*	I685B
L702	90.55	1.04	1.79	1.44	1.70	92.70	-.61	-1.45	.89	1.40	60P	*	L702
L704	88.20	-1.31	-2.26	.59	.69	92.33	-.98	-2.33	.80	1.27	60P	*	L704
L706	87.61	-1.90	-3.27	1.35	1.59	92.27	-1.04	-2.47	.44	.70	60X	*	L706

TOTAL NUMBER OF LABORATORIES REPORTING = 81

Best values: A99 89.5 ± 1.0 percent
A58 93.3 ± 0.7 percent

The following laboratories were omitted from the grand means because of extreme test results: 592.

ANALYSIS T60-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

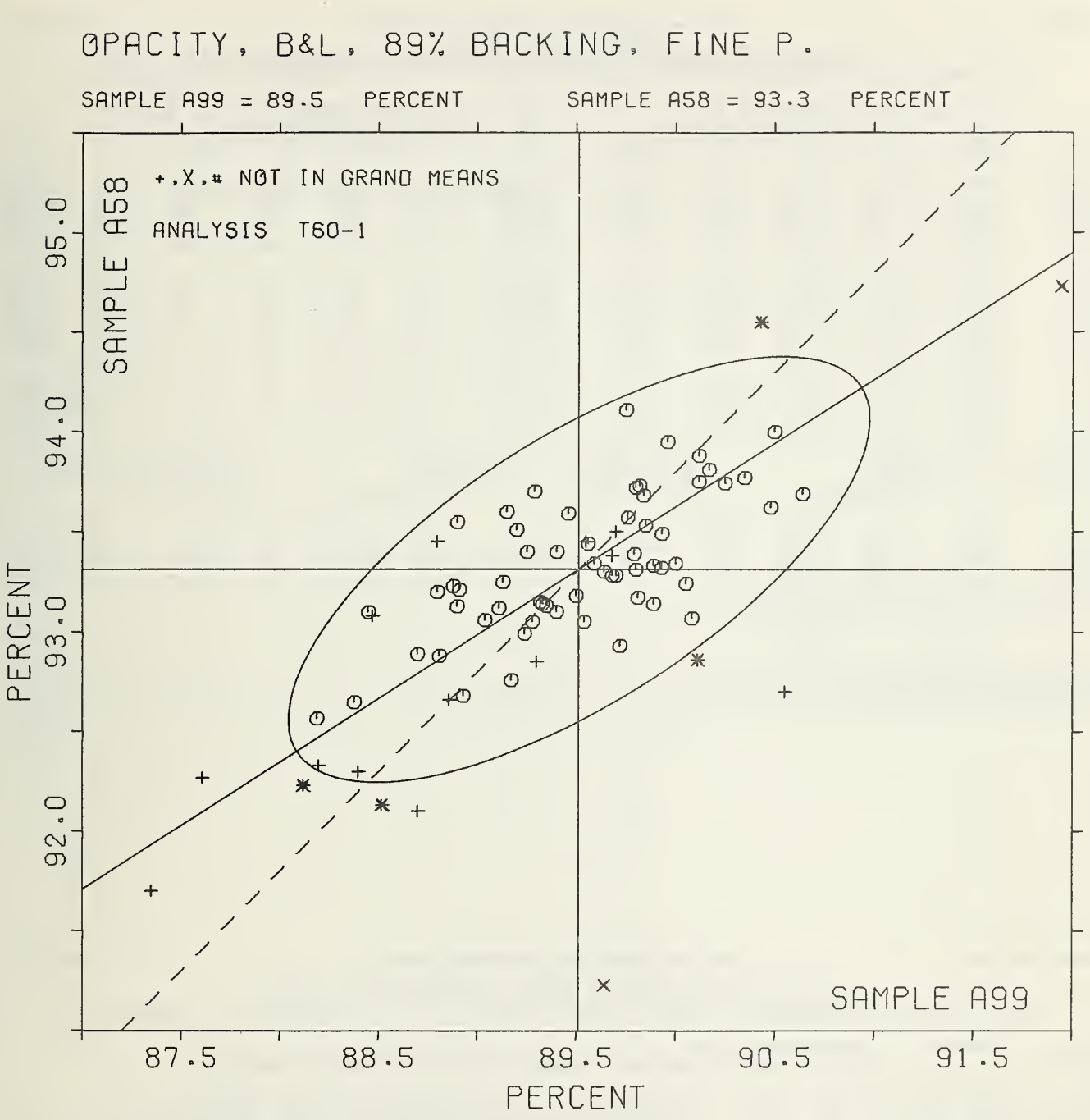
LAB CODE	F	MEANS A99	A58	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L312	*	87.35	91.70	-2.69	-.20	.95	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L706	*	87.61	92.27	-2.16	.15	1.14	60X	OPACITY, 82 TO 95%: GIVE INSTRUMENT MAKE, MODEL, BACKING
L239A	*	88.12	92.23	-1.75	-.16	.91	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L567	A	88.19	92.57	-1.51	.09	1.03	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L704	*	88.20	92.33	-1.63	-.12	.98	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L608	A	88.38	92.65	-1.31	.05	1.00	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L564	*	88.40	92.30	-1.48	-.25	1.02	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L760C	A	88.45	93.10	-1.01	.39	1.03	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L256	*	88.47	93.08	-1.00	.36	.95	60N	OPACITY (WHITE BACKING)82 TO 95%, BUNTER
L125	*	88.52	92.13	-1.47	-.46	.96	60B	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L371	A	88.70	92.89	-.91	.08	1.11	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L380	*	88.70	92.10	-1.34	-.58	.88	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L625	*	88.80	93.45	-.52	.50	.89	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L390	A	88.80	93.20	-.66	.29	.65	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L341	A	88.81	92.88	-.82	.01	.80	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L592	#	88.85	90.05	-2.31	-2.39	1.28	60W	OPACITY (WHITE BACKING)82 TO 95%, BUYGEN,DIGITAL
L249	*	88.86	92.66	-.90	-.20	1.42	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L760A	A	88.88	93.23	-.58	.27	1.30	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L760B	A	88.90	93.55	-.39	.53	1.35	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L573	A	88.90	93.13	-.61	.18	1.18	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L230	A	88.91	93.21	-.56	.24	1.02	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L123	A	88.93	92.68	-.83	-.22	1.04	60W	OPACITY (WHITE BACKING)82 TO 95%, BUYGEN,DIGITAL
L226B	A	89.04	93.06	-.53	.04	.99	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L124	A	89.11	93.12	-.44	.05	1.04	60B	OPACITY (WHITE BACKING)82 TO 95%, HAUSCH + LOMB
L285R	A	89.13	93.25	-.35	.15	.94	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L339	A	89.15	93.60	-.15	.44	1.26	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L228	A	89.17	92.76	-.58	-.28	.98	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L323	A	89.20	93.51	-.15	.33	1.20	60W	OPACITY (WHITE BACKING)82 TO 95%, BUYGEN,DIGITAL
L173A	A	89.24	92.99	-.40	-.13	.96	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L278	A	89.25	93.40	-.17	.21	1.18	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L132	A	89.28	93.05	-.34	-.10	.75	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L673T	A	89.29	93.70	.02	.45	1.15	60B	OPACITY (WHITE BACKING)82 TO 95%, HAUSCH + LOMB
L274P	*	89.30	92.85	-.43	-.28	.61	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L148H	A	89.32	93.15	-.25	-.03	1.15	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L254	A	89.33	93.14	-.24	-.05	.84	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L285D	A	89.35	93.13	-.23	-.07	1.24	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L760D	A	89.40	93.40	-.05	.13	1.19	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L354	A	89.40	93.10	-.21	-.12	1.49	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L349	A	89.46	93.59	.11	.26	.83	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L152	A	89.50	93.18	-.08	-.11	.95	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L118	A	89.54	93.05	-.12	-.24	.78	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L224	*	89.55	93.45	.11	.10	1.06	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L206	A	89.56	93.44	.11	.08	1.05	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L211S	A	89.59	93.34	.08	-.02	.90	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L636	X	89.64	91.23	-1.01	-1.82	.74	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L288	A	89.64	93.30	.10	-.08	.84	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L685B	*	89.68	93.38	.18	-.03	.81	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L692	A	89.68	93.28	.13	-.12	.86	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L738	A	89.70	93.28	.14	-.13	.96	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L232	*	89.70	93.50	.26	.06	.51	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L139	A	89.72	92.93	-.03	-.43	1.05	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L213	A	89.75	94.11	.63	.54	.92	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L122	A	89.76	93.57	.35	.08	.76	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L223B	A	89.79	93.39	.28	-.08	.84	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L158	A	89.80	93.31	.24	-.16	.64	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L259	A	89.80	93.72	.46	.19	.87	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L317	A	89.81	93.17	.18	-.28	1.19	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L108	A	89.82	93.73	.49	.19	.88	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L166	A	89.84	93.68	.48	.13	.88	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L275	A	89.85	93.53	.40	.00	1.09	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L673R	A	89.89	93.33	.33	-.19	1.01	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L581	A	89.89	93.14	.23	-.35	1.27	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L212	A	89.93	93.32	.36	-.22	.93	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L241	A	89.93	93.49	.45	-.08	.93	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L654	A	89.96	93.95	.72	.30	1.12	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2

ANALYSIS I60-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	F	MEANS A99	A58	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L162	A	90.00	93.34	.43	-.24	.88	60W	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN,DIGITAL
L225	A	90.05	93.24	.42	-.35	.94	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L115	A	90.08	93.07	.35	-.51	.87	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L105	*	90.11	92.86	.26	-.70	.96	60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L712	A	90.12	93.75	.75	.04	1.09	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
I366	A	90.12	93.88	.82	.15	1.08	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L753	A	90.17	93.81	.82	.06	1.17	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
I210B	M	90.23				.74	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L262	A	90.25	93.74	.85	-.04	.47	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L543	A	90.35	93.77	.95	-.07	1.00	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
I571	*	90.43	94.55	1.44	.55	1.10	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L594	A	90.48	93.62	.98	-.26	.79	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L157	A	90.50	94.00	1.20	.05	.82	60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L702	*	90.55	92.70	.55	-1.08	1.55	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L210D	A	90.64	93.69	1.16	-.29	1.44	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L608	X	91.94	94.73	2.81	-.11	.93	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
GMEANS:		89.51	93.31			1.00		
		95% ELLIPSE:		1.69	.66	WITH GAMMA = 32 DEGREES		


OPACITY, B&L, 89% BACKING, FINE P.
SAMPLE A99 = 89.5 PERCENT
SAMPLE A58 = 93.3 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T60-1
SAMPLE A58
PERCENT
95.0
94.0
93.0
92.0
87.5
88.5
89.5
90.5
91.5
PERCENT
SAMPLE A99

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ANALYSIS T60-2 TABLE 1

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T519 OS-78, DIFFUSE OPACITY OF PAPER - ILLUMINANT C, ELREPHO TYPE

LAB CODE	SAMPLE A99 MEAN	REPROCOPY 78 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE A58 MEAN	WOVE ENVELOPE 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L182E	90.65	-.30	-.87	.53	.74	94.85	.05	.23	.66	1.32	60J	@	L182E
L233	90.48	-.47	-1.36	.68	.96	94.89	.09	.43	.50	1.00	60J	@	L233
L242	91.72	.77	2.22	1.05	1.47	94.88	.08	.38	.38	.75	60J	@	L242
L250T	90.77	-.18	-.52	.69	.97	94.79	-.01	-.07	.47	.94	60J	@	L250T
L309	90.77	-.18	-.52	.99	1.40	94.78	-.02	-.12	.33	.65	60J	@	L309
L313	91.05	.10	.29	.65	.92	95.00	.20	.97	.34	.69	60J	@	L313
L360	90.78	-.17	-.49	.16	.23	94.87	.07	.33	.41	.82	60F	@	L360
L446	90.82	-.13	-.38	1.25	1.75	94.95	.14	.71	.36	.73	60J	@	L446
L484	93.45	2.50	7.22	.63	.89	95.82	1.02	5.05	.32	.63	60F	#	L484
L575	91.05	.10	.29	.51	.71	94.71	-.09	-.47	.52	1.05	60J	@	L575
L598	91.00	.05	.14	.49	.69	94.49	-.31	-1.56	.53	1.06	60J	@	L598
L678	91.47	.52	1.50	.55	.77	95.07	.27	1.32	.25	.51	60J	@	L678
L685A	90.85	-.10	-.29	1.00	1.40	94.37	-.43	-2.16	1.24	2.48	60F	@	L685A
GR. MEAN = 90.95 PERCENT						GRAND MEAN = 94.80 PERCENT					TEST DETERMINATIONS = 10		
SD MEANS = .35 PERCENT						SD OF MEANS = .20 PERCENT					12 LABS IN GRAND MEANS		
		AVERAGE SDR = .71 PERCENT					AVERAGE SDR = .50 PERCENT						
L118	90.93	-.02	-.06	.70	.98	94.15	-.65	-3.25	.53	1.06	60C	+	L118
L274A	90.40	-.55	-1.59	.52	.72	93.10	-1.70	-8.47	.57	1.14	60C	+	L274A
L543	90.94	-.01	-.03	1.10	1.55	93.77	-1.03	-5.14	.67	1.34	60V	+	L543
L626	89.75	-1.20	-3.47	.98	1.37	93.30	-1.50	-7.47	.59	1.18	60Q	+	L626

TOTAL NUMBER OF LABORATORIES REPORTING = 17

Best values: A99 90.9 ± 0.6 percent
A58 94.8 ± 0.4 percent

The following laboratories were omitted from the grand means because of extreme test results: 484.

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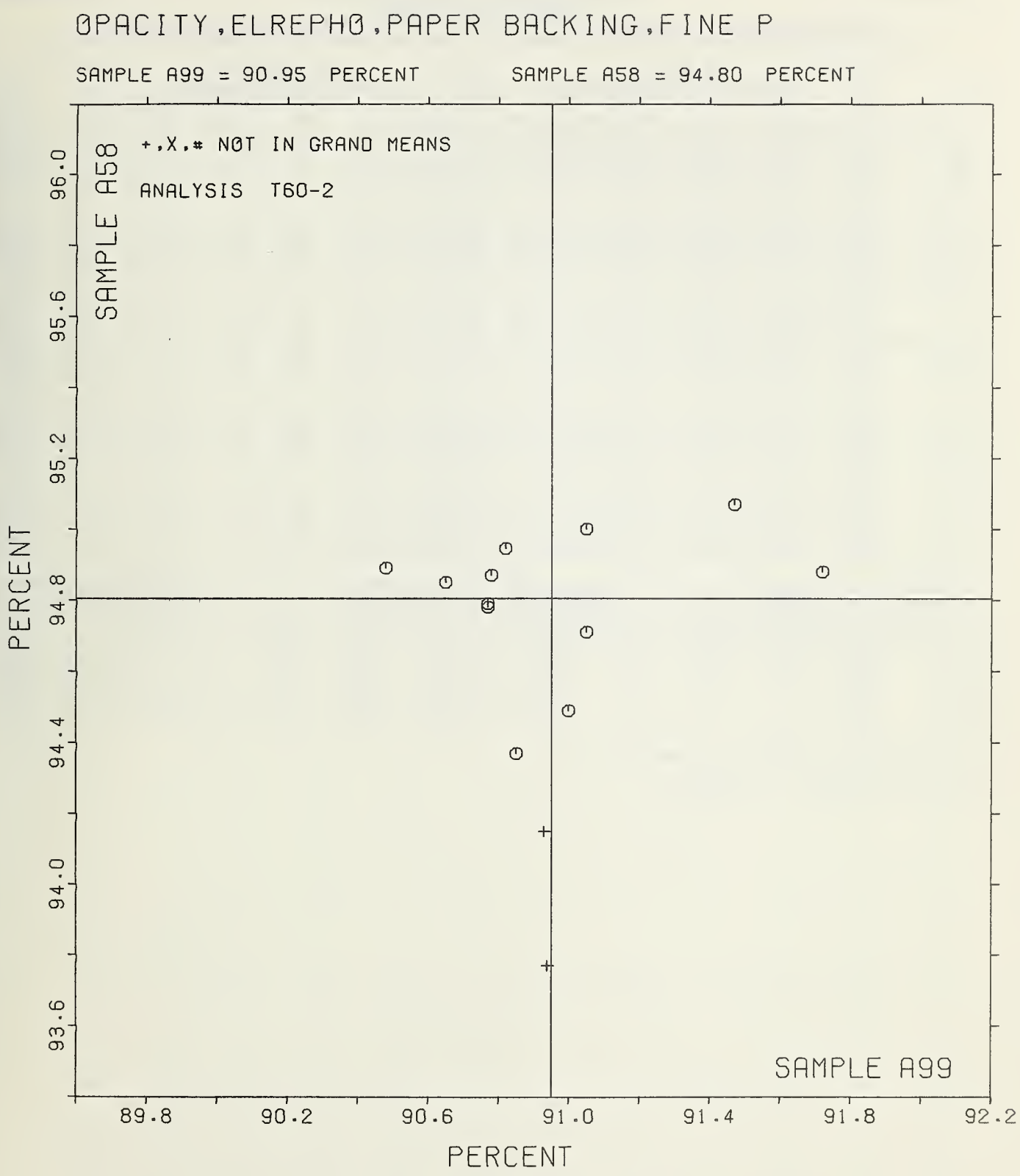
ANALYSIS T60-2 TABLE 2

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY FINE PAPERS

TAPPI OFFICIAL TEST METHOD T519 OS-78, DIFFUSE OPACITY OF PAPER - ILLUMINANT C, ELREPHO TYPE

LAB CODE	F	MEANS A99	A58	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L626	+	89.75	93.30	-1.44	-1.27	1.27	60Q	OPACITY (PAPER BACKING)82 TO 95%, PHOTOVOLT
L274A	+	90.40	93.10	-.84	-1.58	.93	60C	OPACITY (PAPER BACKING)82 TO 95%, BAUSCH + LOMB
L233	@	90.48	94.89	-.45	.17	.98	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L182E	@	90.65	94.85	-.29	.10	1.03	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L250T	@	90.77	94.79	-.18	.02	.96	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L309	@	90.77	94.78	-.18	.01	1.02	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L360	@	90.78	94.87	-.16	.09	.52	60F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L446	@	90.82	94.95	-.10	.16	1.24	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L685A	@	90.85	94.37	-.17	-.41	1.94	60F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L118	+	90.93	94.15	-.13	-.64	1.02	60C	OPACITY (PAPER BACKING)82 TO 95%, BAUSCH + LOMB
L543	+	90.94	93.77	-.19	-1.02	1.45	60V	OPACITY (PAPER BACKING)82 TO 95%, DIANO/BNL
L598	@	91.00	94.49	-.01	-.32	.87	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L313	@	91.05	95.00	.13	.18	.80	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L575	@	91.05	94.71	.08	-.11	.88	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L678	@	91.47	95.07	.56	.17	.64	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L242	@	91.72	94.88	.77	-.06	1.11	60J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L484	#	93.45	95.82	2.64	.57	.76	60F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
GMEANS:		90.95	94.80			1.00		
95% ELLIPSE:				1.05	.59	WITH GAMMA = 9 DEGREES		


0PACITY,ELREPH0,PAPER BACKING,FINE P
SAMPLE A99 = 90.95 PERCENT
SAMPLE A58 = 94.80 PERCENT
+,X,* NØT IN GRAND MEANS
ANALYSIS T60-2
SAMPLE A58
SAMPLE A99
PERCENT
PERCENT
96.0
95.6
95.2
94.8
94.4
94.0
93.6
89.8
90.2
90.6
91.0
91.4
91.8
92.2

ANALYSIS T61-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY NEWS, DIRECTORY, AND CATALOG

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	SAMPLE G43 MEAN	100% RAG 54 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE Z07 MEAN	M.F. SULFITE 36 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F. = 10 VAR	F	LAB
L121	68.46	-.48	-.54	.45	.78	59.75	-.15	-.14	1.29	1.51	61B	O	L121
L122	68.18	-.76	-.85	.55	.95	59.74	-.16	-.15	1.01	1.18	61D	O	L122
L131	67.90	-1.04	-1.17	.32	.55	59.20	-.70	-.65	.42	.49	61R	O	L131
L134	70.85	1.91	2.15	.87	1.50	61.63	1.73	1.61	.79	.93	61R	O	L134
L150B	68.45	-.49	-.55	.50	.86	58.90	-1.00	-.93	.61	.72	61B	O	L150B
L159	68.44	-.50	-.56	.57	.99	59.40	-.50	-.46	.47	.55	61R	O	L159
L210B	69.91	.97	1.10	.59	1.03	60.28	.38	.35	.90	1.06	61B	O	L210B
L210D	70.80	1.86	2.10	.46	.81	61.91	2.01	1.87	.84	.98	61D	O	L210D
L255	67.82	-1.12	-1.26	.56	.96	59.27	-.63	-.59	1.28	1.49	61B	O	L255
L261	69.40	.46	.52	.61	1.07	59.90	.00	.00	.70	.82	61B	O	L261
L281	70.21	1.27	1.43	.74	1.29	60.89	.99	.92	.99	1.16	61D	O	L281
L305	68.22	-.72	-.81	.47	.82	57.44	-2.46	-2.29	.65	.76	61B	*	L305
L315	68.67	-.27	-.30	.45	.79	59.91	.01	.01	.59	.69	61D	O	L315
L317	68.33	-.61	-.68	.33	.58	59.50	-.40	-.37	1.27	1.49	61B	O	L317
L318	69.05	.11	.13	.83	1.44	61.10	1.20	1.12	1.26	1.48	61B	O	L318
L326	69.04	.10	.12	.63	1.10	60.85	.95	.89	.69	.81	61B	O	L326
L328	69.65	.71	.80	.82	1.42	61.20	1.30	1.21	1.69	1.97	61B	O	L328
L333	68.54	-.40	-.45	.42	.73	59.50	-.40	-.37	.93	1.09	61B	O	L333
L352	68.62	-.32	-.36	.36	.62	59.44	-.46	-.43	.49	.58	61P	O	L352
L581	69.27	.33	.38	1.02	1.77	59.79	-.11	-.10	.67	.78	61B	O	L581
L599	69.50	.56	.63	.75	1.29	61.15	1.25	1.17	1.23	1.43	61B	O	L599
L713	68.48	-.46	-.51	.24	.42	59.32	-.58	-.54	.39	.45	61P	O	L713
L738	69.23	.29	.33	.75	1.30	59.47	-.43	-.40	.87	1.02	61D	O	L738
L756	67.46	-1.48	-1.66	.43	.74	58.04	-1.86	-1.73	.27	.31	61R	O	L756
GR. MEAN =	68.94 PERCENT					GRAND MEAN =	59.90 PERCENT				TEST DETERMINATIONS =		10
SD MEANS =	.89 PERCENT					SD OF MEANS =	1.07 PERCENT				24 LABS IN GRAND MEANS		
		AVERAGE SDR =		.58 PERCENT				AVERAGE SDR =		.85 PERCENT			
L150J	71.99	3.05	3.43	.62	1.08	59.66	-.24	-.23	.49	.57	61J	*	L150J
L153	70.34	1.40	1.58	.97	1.69	61.08	1.18	1.10	.80	.94	61C	*	L153
L244	71.63	2.69	3.03	.37	.64	59.50	-.40	-.37	.31	.36	61J	*	L244
L260	68.61	-.33	-.37	.27	.47	59.72	-.18	-.17	.34	.39	61P	*	L260
L687	68.95	.01	.02	.44	.76	60.45	.55	.51	3.21	3.75	61P	*	L687
L743	75.57	6.63	7.46	.51	.89	63.38	3.48	3.24	.52	.61	61G	*	L743

TOTAL NUMBER OF LABORATORIES REPORTING = 30

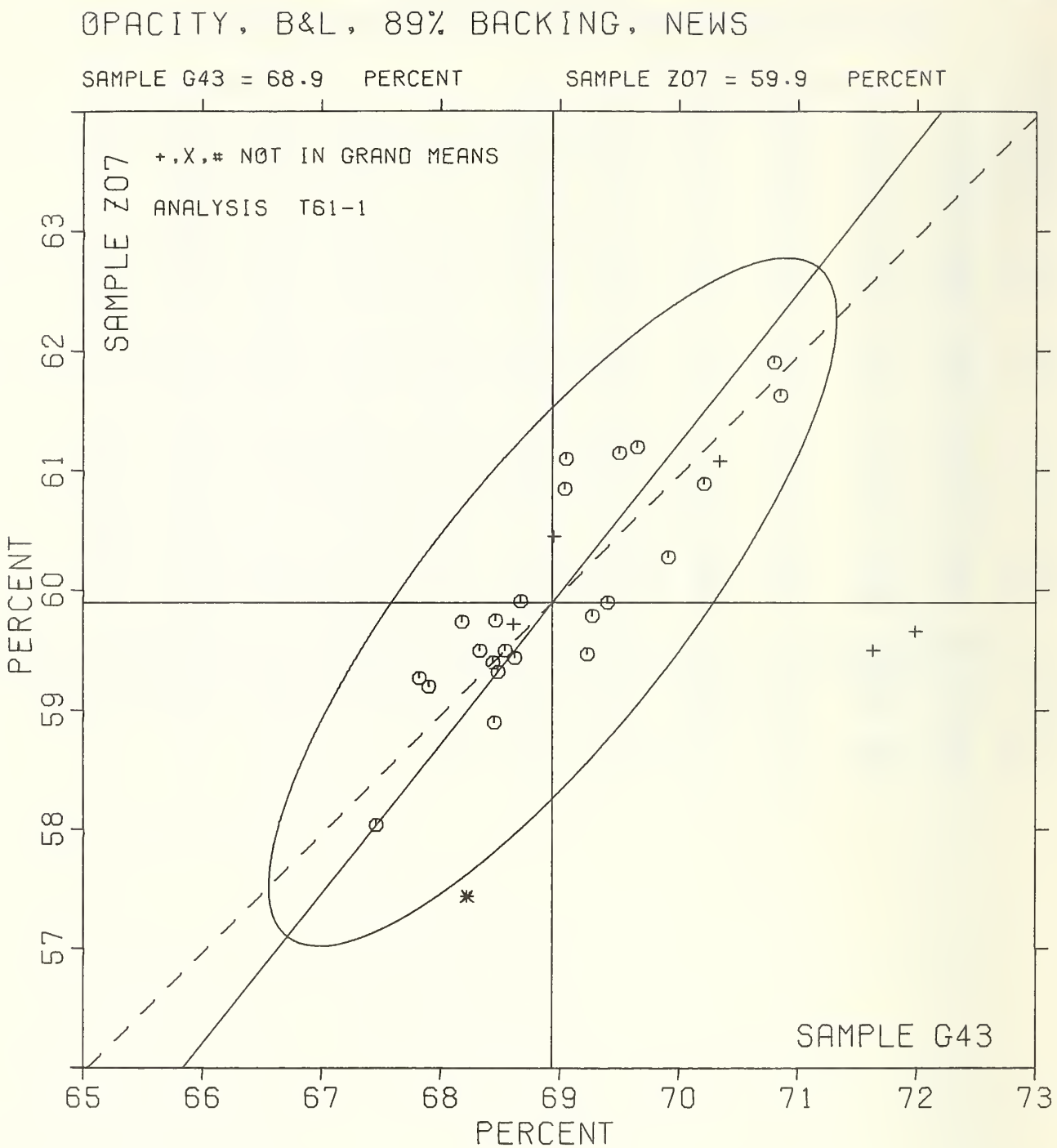
Best values: G43 68.8 ± 1.5 percent
Z07 59.8 ± 1.8 percent

ANALYSIS T61-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY NEWS, DIRECTORY, AND CATALOG

TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	F	MEANS G43	MEANS Z07	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L756	O	67.46	58.04	-2.37	-.00	.53	61R	OPACITY (WHITE BACKING)70 TO 90%, TBWING-ALBERT (WAS SRL)
L255	O	67.82	59.27	-1.19	.48	1.23	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L131	O	67.90	59.20	-1.19	.38	.52	61R	OPACITY (WHITE BACKING)70 TO 90%, TBWING-ALBERT (WAS SRL)
L122	O	68.18	59.74	-.60	.49	1.07	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L305	*	68.22	57.44	-2.37	-.97	.79	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L317	O	68.33	59.50	-.69	.23	1.03	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L159	O	68.44	59.40	-.70	.08	.77	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L150B	O	68.45	58.90	-1.08	-.24	.79	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L121	O	68.46	59.75	-.41	.28	1.14	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L713	O	68.48	59.32	-.74	-.00	.43	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L333	O	68.54	59.50	-.56	.06	.91	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L260	*	68.61	59.72	-.34	.14	.43	61P	OPACITY (WHITE BACKING)70 TO 90%, PHOTOVOLT
L352	O	68.62	59.44	-.56	-.04	.60	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L315	O	68.67	59.91	-.16	.22	.74	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L687	*	68.95	60.45	.44	.33	2.26	61P	OPACITY (WHITE BACKING)70 TO 90%, PHOTOVOLT
L326	O	69.04	60.85	.81	.51	.96	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L318	O	69.05	61.10	1.01	.66	1.46	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L738	O	69.23	59.47	-.15	-.50	1.16	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L581	O	69.27	59.79	.12	-.33	1.27	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L261	O	69.40	59.90	.29	-.36	.94	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L599	O	69.50	61.15	1.33	.34	1.36	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L328	O	69.65	61.20	1.46	.25	1.70	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L210B	O	69.91	60.28	.90	-.52	1.04	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L281	O	70.21	60.89	1.57	-.38	1.23	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L153	*	70.34	61.08	1.80	-.36	1.31	61C	OPACITY (PAPER BACKING)70 TO 90%, BAUSCH + LOMB
L210D	O	70.80	61.91	2.73	-.21	.89	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L134	O	70.85	61.63	2.55	-.42	1.22	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L244	*	71.63	59.50	1.36	-2.36	.50	61J	OPACITY (PAPER BACKING)70 TO 90%, Z.ELREPHO,FMY-C(10) FILTER
L150J	*	71.99	59.66	1.71	-2.54	.82	61J	OPACITY (PAPER BACKING)70 TO 90%, Z.ELREPHO,FMY-C(10) FILTER
L743	*	75.57	63.38	6.85	-3.02	.75	61G	OPACITY (OWN METHOD)45 TO 90%, Z.ELREPHO, FILTER 8
GMEANS:		68.94	59.90			1.00		
		95% ELLIPSE:		3.58	1.09	WITH GAMMA = 51 DEGREES		


OPACITY, B&L, 89% BACKING, NEWS
SAMPLE G43 = 68.9 PERCENT
SAMPLE Z07 = 59.9 PERCENT
+,X,# NOT IN GRAND MEANS
ANALYSIS T61-1
SAMPLE Z07
PERCENT
63
62
61
60
59
58
57
SAMPLE G43
65
66
67
68
69
70
71
72
73
PERCENT

ANALYSIS T65-1 TABLE 1

DIRECTIONAL BLUE REFLECTANCE IN PERCENT

TAPPI STANDARD T452 OS-77, 'BRIGHTNESS'; MARTIN SWEETS (ACBT & GE) IS STANDARD FOR THIS ANALYSIS

LAB CODE	SAMPLE A56 AIR MAIL ENVELOPE 49 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE E78 HIGH BRIGHTNESS PRINTING 116 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L108	78.56	-.06	-.14	.27	1.43	95.76	-.24	-.60	.12	.94	65N	@	L108
L115	78.64	.01	.03	.11	.56	96.25	.25	.62	.11	.84	65N	@	L115
L122	78.21	-.41	-.93	.04	.19	95.77	-.23	-.56	.21	1.62	65N	@	L122
L132	78.22	-.40	-.90	.17	.88	95.81	-.19	-.47	.14	1.07	65N	@	L132
L158	78.37	-.25	-.56	.13	.67	95.65	-.35	-.88	.09	.73	65N	@	L158
L176A	77.76	-.86	-1.94	.05	.27	93.79	-2.21	-5.54	.25	2.00	65A	#	L176A
L210M	78.75	.13	.28	.16	.84	95.80	-.20	-.50	.14	1.12	65M	@	L210M
L210N	79.07	.45	1.02	.18	.92	95.89	-.11	-.28	.06	.51	65N	@	L210N
L211	75.90	-2.72	-6.15	.13	.69	92.59	-3.41	-8.54	1.44	11.35	65N	#	L211
L223	77.91	-.71	-1.61	.08	.44	95.80	-.20	-.50	.11	.84	65N	@	L223
L225	78.90	.28	.62	.24	1.26	95.96	-.04	-.10	.19	1.52	65N	@	L225
L275	78.07	-.55	-1.24	.44	2.30	95.52	-.48	-1.19	.12	.92	65M	@	L275
L285	79.34	.71	1.61	.16	.84	95.45	-.55	-1.38	.16	1.26	65N	@	L285
L288	78.56	-.06	-.14	.07	.39	96.10	.10	.25	.09	.73	65N	@	L288
L315	78.57	-.05	-.11	.74	3.91	96.70	.70	1.75	.08	.60	65N	@	L315
L317	78.20	-.42	-.96	.09	.49	95.54	-.46	-1.16	.07	.59	65M	@	L317
L543	78.94	.31	.71	.07	.39	96.26	.26	.66	.16	1.26	65N	@	L543
L598	79.15	.53	1.19	.08	.40	96.50	.50	1.25	.19	1.46	65N	@	L598
L636A	78.62	.00	.00	.18	.92	96.17	.17	.44	.10	.82	65M	@	L636A
L636B	75.87	-2.75	-6.20	.09	.47	92.49	-3.51	-8.79	.20	1.54	65M	#	L636B
L636C	79.02	.40	.91	.09	.47	95.96	-.04	-.10	.09	.72	65M	@	L636C
L673R	77.77	-.85	-1.92	.58	3.04	96.52	.52	1.31	.07	.56	65N	@	L673R
L692	79.14	.51	1.16	.12	.63	96.67	.67	1.69	.16	1.25	65N	@	L692
L738	79.24	.61	1.38	.11	.56	96.50	.50	1.25	.13	1.03	65N	@	L738
L753	78.44	-.19	-.42	.09	.48	95.40	-.60	-1.50	.21	1.63	65N	@	L753
GR. MEAN = 78.62 PERCENT						GRAND MEAN = 96.00 PERCENT					TEST DETERMINATIONS = 8		
SD MEANS = .44 PERCENT						SD OF MEANS = .40 PERCENT					22 LABS IN GRAND MEANS		
	AVERAGE SDR = .19 PERCENT					AVERAGE SDR = .13 PERCENT							
L105	78.31	-.31	-.70	.04	.19	97.06	1.06	2.66	.07	.59	65T	*	L105
L213	78.45	-.17	-.39	.09	.49	93.82	-2.18	-5.44	.07	.56	65T	*	L213
L219	79.00	.38	.85	.00	.00	97.00	1.00	2.50	.00	.00	65P	*	L219
L224	82.45	3.83	8.63	.08	.40	95.86	-.14	-.35	.09	.72	65H	*	L224
L241	78.70	.08	.17	.13	.69	95.90	-.10	-.25	.12	.94	65I	*	L241
L249	79.00	.38	.85	.00	.00	95.92	-.08	-.19	.10	.82	65P	*	L249
L256	76.87	-1.75	-3.95	.48	2.51	96.86	.86	2.16	.09	.72	65H	*	L256
L259	77.99	-.64	-1.44	.10	.52	95.34	-.66	-1.66	.09	.72	65H	*	L259
L260	79.12	.50	1.13	.09	.47	97.09	1.09	2.72	.10	.78	65P	*	L260
L278	78.97	.35	.79	.05	.24	96.82	.82	2.06	.21	1.62	65P	*	L278
L301	78.49	-.14	-.31	.06	.34	96.61	.61	1.53	.08	.66	65G	*	L301
L312	78.94	.31	.71	.18	.93	97.37	1.37	3.44	.23	1.83	65P	*	L312
L321	80.37	1.75	3.95	.23	1.22	98.00	2.00	5.00	.00	.00	65P	*	L321
L328	80.25	1.63	3.67	.46	2.44	99.81	3.81	9.54	.37	2.93	65P	*	L328
L339	81.00	2.38	5.36	.00	.00	99.00	3.00	7.50	.00	.00	65P	*	L339
L380	80.00	1.38	3.11	.00	.00	95.75	-.25	-.63	.71	5.58	65P	*	L380
L442	78.24	-.39	-.87	.07	.39	97.44	1.44	3.59	.07	.59	65T	*	L442
L456	77.84	-.79	-1.77	.22	1.16	90.77	-5.23	-13.07	.05	.36	65P	*	L456
L562	82.00	3.38	7.62	.00	.00	95.00	-1.00	-2.50	.00	.00	65P	*	L562
L564	79.12	.50	1.13	.35	1.86	96.25	.25	.62	.46	3.65	65P	*	L564
L591	77.36	-1.26	-2.85	.07	.39	96.59	.59	1.47	.08	.66	65H	*	L591
L617	80.29	1.66	3.75	.12	.66	96.61	.61	1.53	.24	1.86	65G	*	L617
L625	80.00	1.38	3.11	.00	.00	94.81	-1.19	-2.97	.26	2.04	65P	*	L625
L626	80.00	1.38	3.11	.00	.00	97.31	1.31	3.28	.26	2.04	65P	*	L626
L643	75.90	-2.72	-6.15	.26	1.38	93.85	-2.15	-5.38	.19	1.52	65P	*	L643
L684	78.15	-.47	-1.07	.41	2.16	78.12	-17.88	-44.72	.23	1.83	65H	*	L684
L695	78.13	-.50	-1.13	.35	1.86	95.94	-.06	-.16	.18	1.39	65P	*	L695
L698	78.90	.28	.62	.13	.69	95.05	-.95	-2.38	.33	2.60	65I	*	L698
L702	79.06	.44	.99	.18	.93	96.87	.87	2.19	.23	1.83	65P	*	L702
L704	80.56	1.94	4.37	.32	1.69	93.44	-2.56	-6.41	.18	1.39	65P	*	L704
L706	78.25	-.37	-.84	.05	.28	95.49	-.51	-1.28	.08	.66	65X	*	L706
L711	80.52	1.90	4.29	1.78	9.35	96.96	.96	2.41	.11	.84	65P	*	L711
L757	78.75	.13	.28	.09	.49	97.87	1.87	4.69	.14	1.10	65H	*	L757

TOTAL NUMBER OF LABORATORIES REPORTING = 58

Best values: A56 78.6 ± 0.8 percent
E78 96.0 ± 0.7 percent

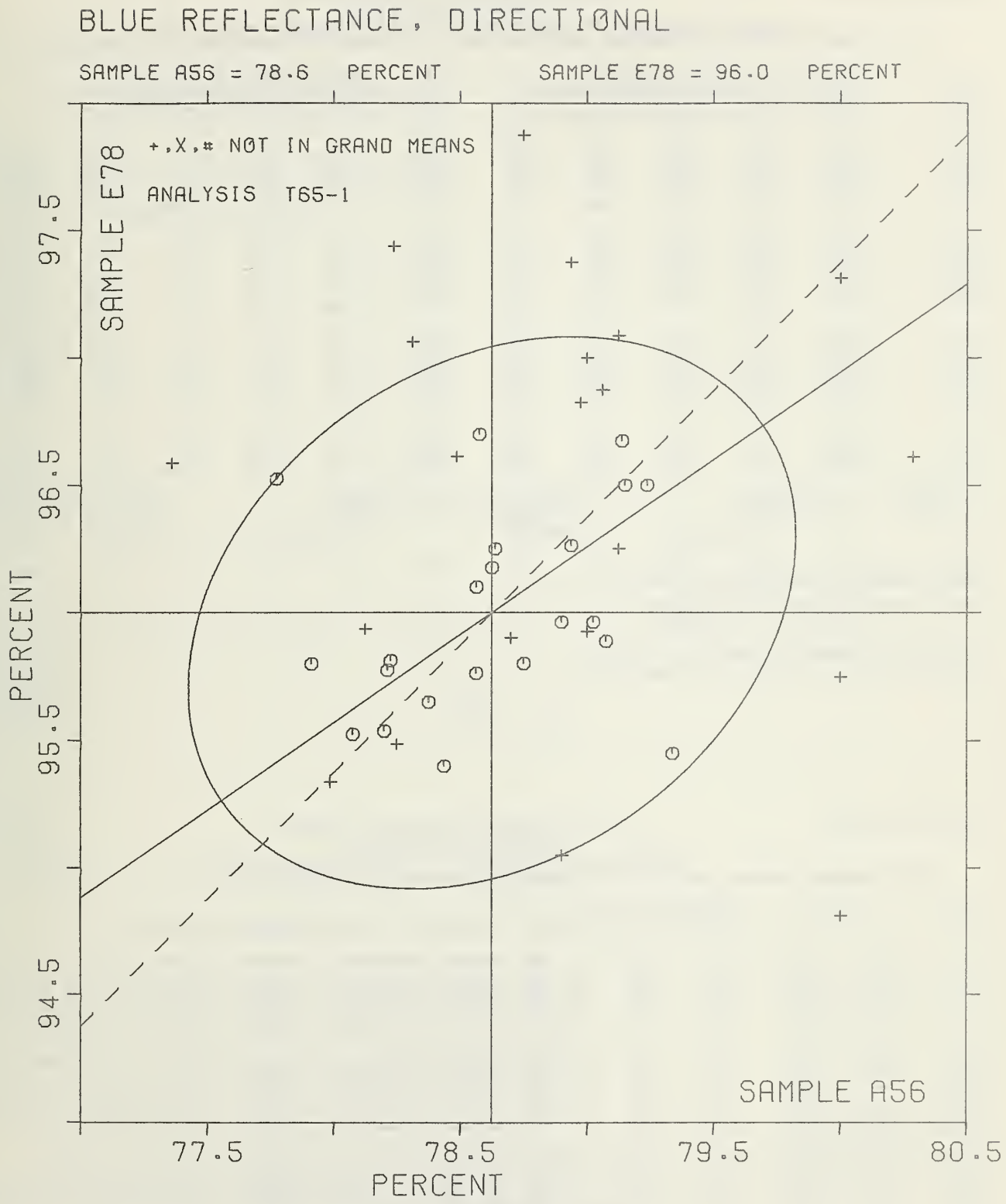
The following laboratories were omitted from the grand means because of extreme test results: 176A, 211, 636B.

ANALYSIS T65-1 TABLE 2

DIRECTIONAL BLUE REFLECTANCE IN PERCENT

TAPPI STANDARD T452 OS-77, 'BRIGHTNESS'; MARTIN SWEETS (ACBT & GE) IS STANDARD FOR THIS ANALYSIS

LAB CODE	F	MEANS A56	E78	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L636B	#	75.87	92.49	-4.26	-1.34	1.01	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L643	*	75.90	93.85	-3.46	-.23	1.45	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L211	#	75.90	92.59	-4.18	-1.27	6.02	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L256	*	76.87	96.86	-.95	1.70	1.62	65B	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
L591	*	77.36	96.59	-.71	1.20	.52	65H	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
L176A	#	77.76	93.79	-1.96	-1.34	1.13	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L673R	O	77.77	96.52	-.40	.91	1.60	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L456	*	77.84	90.77	-3.61	-3.86	.76	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L223	O	77.91	95.80	-.70	.24	.64	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L259	*	77.99	95.34	-.90	-.19	.62	65H	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
L275	O	78.07	95.52	-.72	-.08	1.61	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L665	*	78.13	95.94	-.45	.23	1.63	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L684	*	78.15	78.12	-10.52	-14.46	1.99	65H	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
L317	O	78.20	95.54	-.61	-.14	.54	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L122	O	78.21	95.77	-.47	.05	.90	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L132	O	78.22	95.81	-.44	.07	.97	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L442	*	78.24	97.44	.50	1.40	.49	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L706	*	78.25	95.49	-.60	-.21	.47	65X	BLUE REFLECTANCE:GIVE INSTR.( )DIFFUSE,( )DIRECTNL,TRAP?,BASE?
L105	*	78.31	97.06	.35	1.05	.39	65T	BLUE REFLECTANCE (DIRECTIONAL), BUNTER D25D2M
L158	O	78.37	95.65	-.40	-.15	.70	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L753	O	78.44	95.40	-.49	-.39	1.06	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L213	*	78.45	93.82	-1.38	-1.69	.52	65T	BLUE REFLECTANCE (DIRECTIONAL), BUNTER D25D2M
L301	*	78.49	96.61	.23	.58	.50	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L108	O	78.56	95.76	-.19	-.16	1.18	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L288	O	78.56	96.10	.01	.12	.56	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L315	O	78.57	96.70	.36	.60	2.25	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L636A	O	78.62	96.17	.10	.14	.87	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L115	O	78.64	96.25	.15	.20	.70	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L241	*	78.70	95.90	.01	-.13	.82	65I	BLUE REFLECTANCE (DIRECTIONAL), BUNTER D25D2A
L757	*	78.75	97.87	1.17	1.47	.79	65H	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
I210M	O	78.75	95.80	-.01	-.24	.98	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L698	*	78.90	95.05	-.31	-.94	1.64	65I	BLUE REFLECTANCE (DIRECTIONAL), BUNTER D25D2A
L225	O	78.90	95.96	.21	-.19	1.39	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L543	O	78.94	96.26	.41	.04	.83	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L312	*	78.94	97.37	1.04	.95	1.38	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L278	*	78.97	96.82	.76	.48	.93	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L249	*	79.00	95.92	.27	-.28	.41	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L219	*	79.00	97.00	.88	.61	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L636C	O	79.02	95.96	.31	-.26	.59	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L702	*	79.06	96.87	.86	.47	1.38	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L210N	O	79.07	95.89	.31	-.35	.71	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L260	*	79.12	97.09	1.03	.61	.62	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L564	*	79.12	96.25	.55	-.08	2.76	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L692	O	79.14	96.67	.81	.26	.94	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L598	O	79.15	96.50	.72	.11	.93	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L738	O	79.24	96.50	.79	.06	.80	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L285	O	79.34	95.45	.28	-.86	1.05	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L380	*	80.00	95.75	.99	-.99	2.79	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L625	*	80.00	94.81	.46	-1.76	1.02	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L626	*	80.00	97.31	1.88	.30	1.02	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L328	*	80.25	99.81	3.50	2.22	2.68	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L617	*	80.29	96.61	1.72	-.44	1.26	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L321	*	80.37	98.00	2.58	.66	.61	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L711	*	80.52	96.96	2.11	-.28	5.09	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L704	*	80.56	93.44	.15	-3.21	1.54	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L339	*	81.00	99.00	3.66	1.13	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L562	*	82.00	95.00	2.21	-2.74	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L224	*	82.45	95.86	3.07	-2.28	.56	65H	BLUE REFLECTANCE (DIRECTIONAL), BUNTER
GMEANS:		78.62	96.00			1.00		
		95% ELLIPSE:		1.30	.96	WITH GAMMA = 34 DEGREES		


BLUE REFLECTANCE, DIRECTIONAL
SAMPLE A56 = 78.6 PERCENT
SAMPLE E78 = 96.0 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T65-1
SAMPLE E78
97.5
96.5
95.5
94.5
PERCENT
SAMPLE A56
77.5
78.5
79.5
80.5
PERCENT

ANALYSIS T65-2 TABLE 1

DIFFUSE BLUE REFLECTANCE IN PERCENT (GLOSS TRAP)

TAPPI SUGGESTED METHOD T525 SU-72, BRIGHTNESS OF PULP (DIFFUSE ILLUMINATION AND 0 DEG. OBSERVATION)

LAB CODE	SAMPLE A56 MEAN	AIR MAIL ENVELOPE 49 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE E78 MEAN	HIGH BRIGHTNESS PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.= 8 VAR	F	LAB
L121	79.70	1.27	1.74	.31	3.32	96.81	1.49	1.81	.16	1.75	65K	O	L121
L150	77.02	-1.41	-1.92	.03	.28	95.16	-.16	-.19	.04	.40	65Q	O	L150
L155	80.82	2.39	3.28	.86	9.17	94.23	-1.09	-1.33	.18	2.03	65Q	#	L155
L170	78.80	.37	.50	.00	.00	95.19	-.14	-.16	.04	.40	65B	O	L170
L182	78.10	-.33	-.45	.00	.00	94.80	-.52	-.63	.05	.60	65F	O	L182
L210K	79.49	1.06	1.45	.06	.68	95.39	.06	.08	.04	.40	65K	O	L210K
L242	77.45	-.98	-1.34	.11	1.14	94.67	-.65	-.79	.24	2.68	65F	O	L242
L244	77.77	-.66	-.90	.05	.49	94.09	-1.24	-1.50	.08	.94	65F	O	L244
L250T	78.34	-.09	-.13	.05	.55	95.95	.63	.76	.14	1.59	65F	O	L250T
L280	78.09	-.34	-.47	.06	.68	94.86	-.46	-.56	.13	1.47	65Q	O	L280
L313	78.54	.11	.15	.05	.55	94.92	-.40	-.48	.07	.80	65K	O	L313
L325	78.62	.19	.27	.27	2.83	94.74	-.59	-.71	.11	1.20	65F	O	L325
L349	77.79	-.64	-.88	.06	.68	95.22	-.10	-.12	.09	1.09	65K	O	L349
L446	77.94	-.49	-.67	.06	.69	94.71	-.61	-.74	.10	1.18	65F	O	L446
L573	78.91	.48	.66	.32	3.39	96.90	1.58	1.91	.05	.60	65F	O	L573
L575	78.46	.03	.04	.05	.55	94.54	-.79	-.95	.07	.84	65F	O	L575
L598	78.92	.49	.68	.05	.49	96.16	.84	1.02	.05	.58	65K	O	L598
L680	79.37	.94	1.29	.07	.75	96.36	1.04	1.26	.05	.58	65Q	O	L680
GR. MEAN = 78.43 PERCENT						GRAND MEAN = 95.32 PERCENT					TEST DETERMINATIONS = 8		
SD MEANS = .73 PERCENT						SD OF MEANS = .82 PERCENT					17 LABS IN GRAND MEANS		
		AVERAGE SDR = .09 PERCENT					AVERAGE SDR = .09 PERCENT						
L289	78.40	-.03	-.04	.05	.57	93.49	-1.84	-2.23	.16	1.85	65O	+	L289

TOTAL NUMBER OF LABORATORIES REPORTING = 19

Best values: A56 78.4 ± 1.3 percent
E78 95.2 ± 1.4 percent

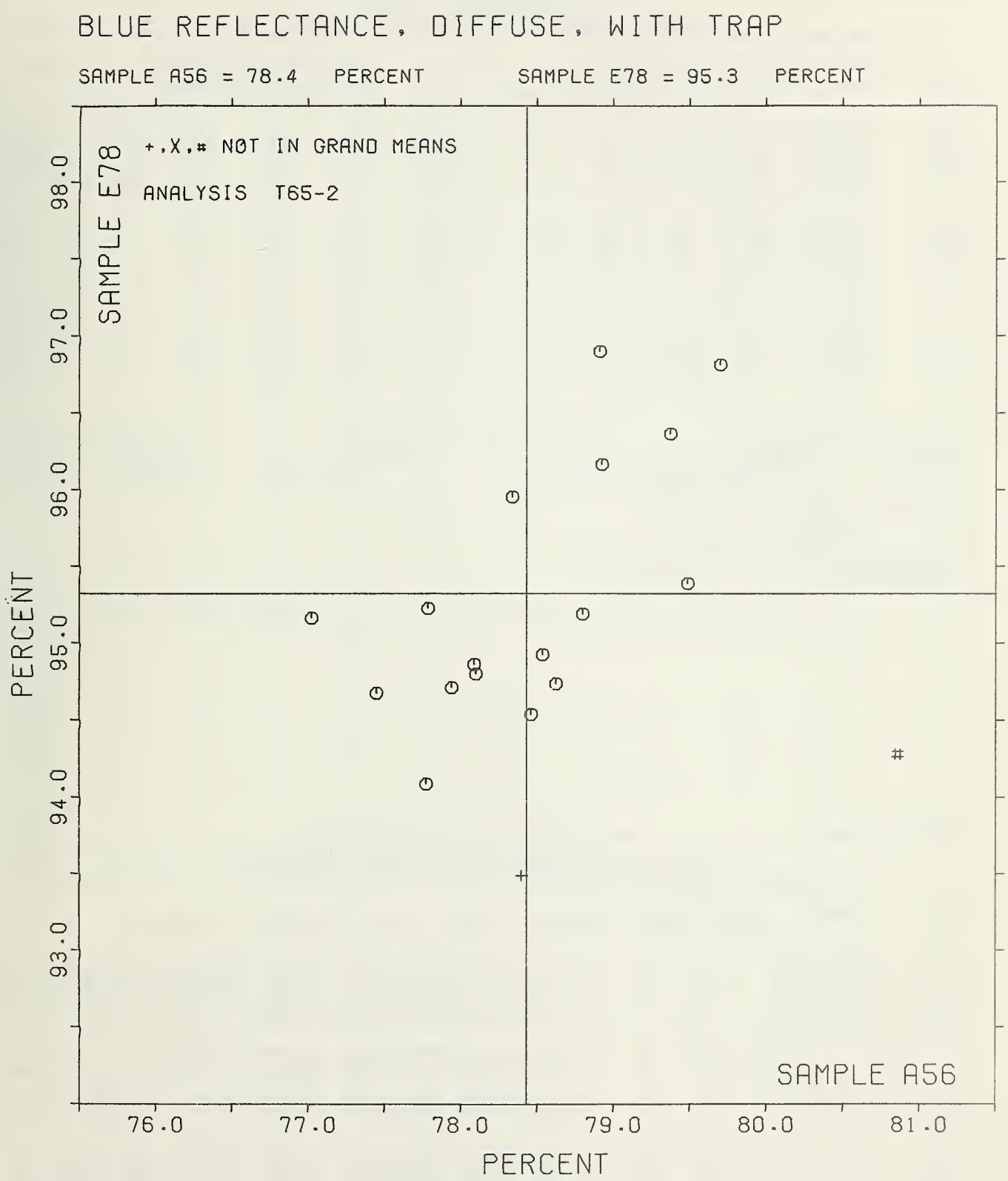
The following laboratories were omitted from the grand means because of extreme tests results: 155.

ANALYSIS T65-2 TABLE 2

DIFFUSE BLUE REFLECTANCE IN PERCENT (GLOSS TRAP)

TAPPI SUGGESTED METHOD T525 SU-72, BRIGHTNESS OF PULP (DIFFUSE ILLUMINATION AND 0 DEG. OBSERVATION)

LAB CODE	F	MEANS A56	E78	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L150	O	77.02	95.16	-1.02	.98	.34	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L242	O	77.45	94.67	-1.13	.34	1.91	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L244	O	77.77	94.09	-1.37	-.28	.72	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L349	O	77.79	95.22	-.49	.43	.84	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L446	O	77.94	94.71	-.78	-.01	.89	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L280	O	78.09	94.86	-.57	-.03	1.08	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L182	O	78.10	94.80	-.61	-.08	.30	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L250T	O	78.34	95.95	.42	.47	1.07	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L289	+	78.40	93.49	-1.43	-1.15	1.21	65O	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, SPECIFIC CALIBRATION
L575	O	78.46	94.54	-.58	-.53	.69	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L313	O	78.54	94.92	-.24	-.34	.67	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L325	O	78.62	94.74	-.33	-.52	2.01	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L170	O	78.80	95.19	.13	-.37	.20	65B	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NBS ABSOLUTE BASE
L573	O	78.91	96.90	1.52	.64	2.00	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L598	O	78.92	96.16	.96	.16	.54	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L680	O	79.37	96.36	1.40	-.06	.67	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L210K	O	79.49	95.39	.72	-.77	.54	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L121	O	79.70	96.81	1.96	-.03	2.53	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L155	#	80.82	94.23	.69	-2.54	5.60	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
GMEANS:		78.43	95.32			1.00		
95% ELLIPSE:				2.80	1.29	WITH GAMMA = 50 DEGREES		


BLUE REFLECTANCE, DIFFUSE, WITH TRAP
SAMPLE A56 = 78.4 PERCENT
SAMPLE E78 = 95.3 PERCENT
+,X,# NOT IN GRAND MEANS
ANALYSIS T65-2
SAMPLE E78
PERCENT
98.0
97.0
96.0
95.0
94.0
93.0
SAMPLE A56
76.0
77.0
78.0
79.0
80.0
81.0
PERCENT

REPORT NO. 65G TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T65-3 TABLE 1

DIFFUSE BLUE REFLECTANCE IN PERCENT (NO GLOSS TRAP)

TAPPI SUGGESTED METHOD T525 SU-72, BRIGHTNESS OF PULP (DIFFUSE ILLUMINATION AND 0 DEG. OBSERVATION)

LAB CODE	SAMPLE A56 MEAN	AIR MAIL ENVELOPE 49 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE E78 MEAN	HIGH BRIGHTNESS PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.* 8 VAR	F	LAB
L152	79.02	-.17	-.27	.07	.88	95.51	.08	.08	.06	.86	65E	O	L152
L157	80.35	1.15	1.80	.05	.66	97.26	1.83	2.01	.05	.69	65E	O	L157
L161	79.00	-.20	-.31	.06	.74	95.31	-.13	-.14	.08	1.04	65E	O	L161
L173A	78.95	-.25	-.38	.08	.94	94.84	-.60	-.66	.05	.69	65E	O	L173A
L194	78.05	-1.15	-1.79	.05	.66	93.80	-1.64	-1.80	.11	1.43	65E	O	L194
L219	79.47	.28	.43	.07	.88	96.11	.68	.74	.08	1.11	65E	O	L219
L238A	79.62	.43	.67	.05	.57	94.76	-.67	-.74	.05	.69	65E	O	L238A
L241	80.17	.98	1.52	.07	.88	96.35	.91	1.00	.16	2.14	65E	O	L241
L255	79.54	.34	.53	.07	.92	94.95	-.49	-.53	.05	.71	65D	O	L255
L309	79.07	-.12	-.19	.07	.88	94.85	-.59	-.64	.05	.71	65J	O	L309
L360	79.27	.08	.12	.21	2.63	96.01	.58	.63	.15	1.95	65E	O	L360
L384	78.69	-.51	-.79	.14	1.68	96.09	.65	.72	.04	.47	65S	O	L384
L484	82.59	3.39	5.28	.04	.44	97.45	2.01	2.21	.08	1.01	65E	#	L484
L565	78.75	-.45	-.70	.08	.94	94.92	-.51	-.56	.05	.62	65W	O	L565
L685	79.72	.53	.82	.09	1.10	96.35	.91	1.00	.05	.71	65E	O	L685
L734	78.25	-.95	-1.48	.05	.66	94.42	-1.01	-1.11	.09	1.18	65E	O	L734

GP. MEAN = 79.20 PERCENT GRAND MEAN = 95.44 PERCENT TEST DETERMINATIONS = 8

SD MEANS = .64 PERCENT SD OF MEANS = .91 PERCENT 15 LABS IN GRAND MEANS

AVERAGE SDR = .08 PERCENT AVERAGE SDR = .07 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 16

Best values: A56 79.1 ± 1.1 percent
E78 95.4 ± 1.6 percent

The following laboratories were omitted from the grand means because of extreme test results: 484.

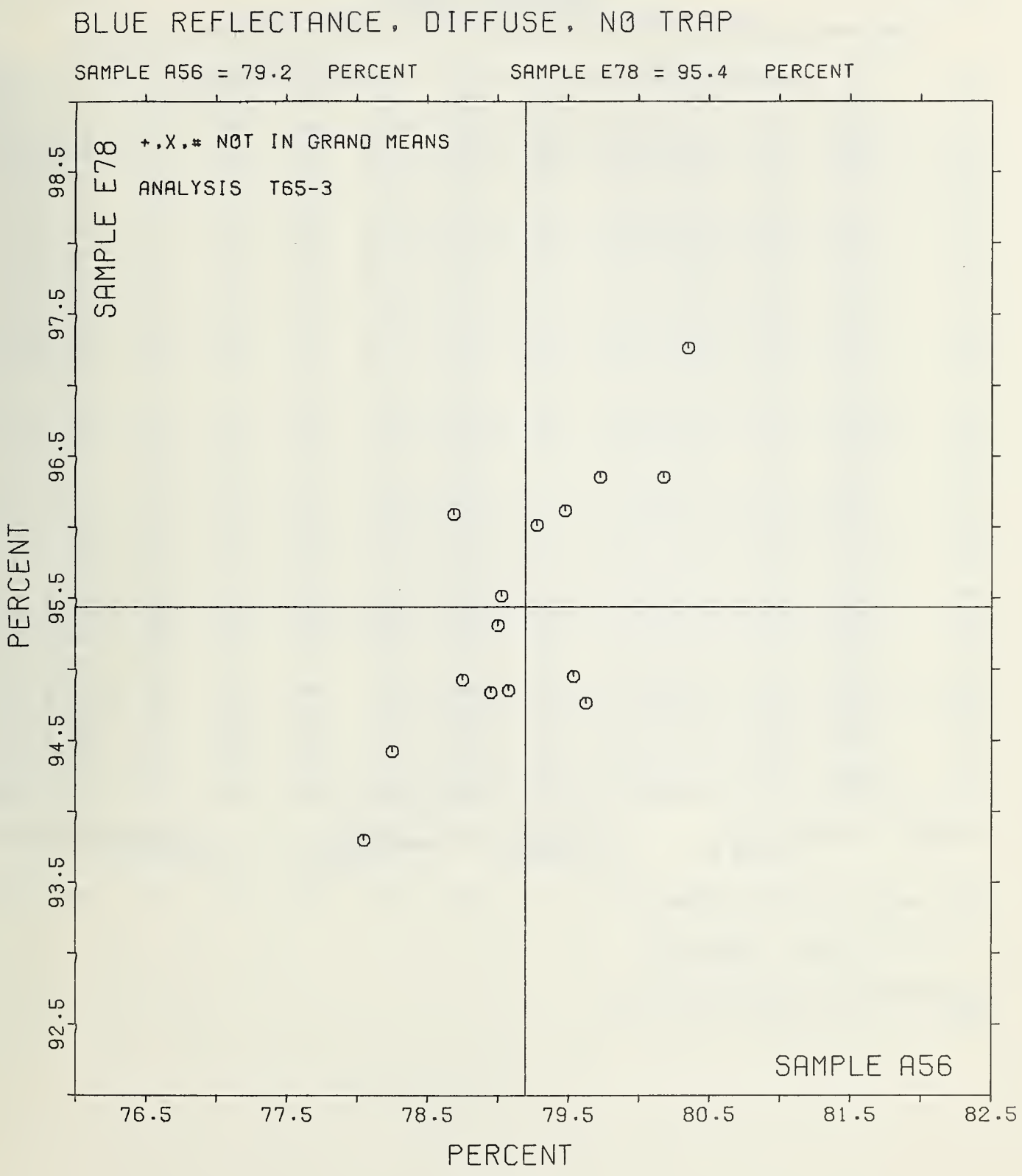
REPORT NO. 65G TAPPI COLLABORATIVE REFERENCE PROGRAM APRIL 1980

ANALYSIS T65-3 TABLE 2

DIFFUSE BLUE REFLECTANCE IN PERCENT (NO GLOSS TRAP)

TAPPI SUGGESTED METHOD T525 SU-72, BRIGHTNESS OF PULP (DIFFUSE ILLUMINATION AND 0 DEG. OBSERVATION)

LAB CODE	F	MEANS A56	E78	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L194	O	78.05	93.80	-2.00	.09	1.04	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L734	O	78.25	94.42	-1.36	.26	.92	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L384	S	78.69	96.09	.28	.78	1.08	65S	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, ABSOLUTE-UNKNOWN BASE
L565	O	78.75	94.92	-.67	.10	.78	65W	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBS MGO BASE
L173A	O	78.95	94.84	-.64	-.11	.81	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L161	O	79.00	95.31	-.22	.10	.89	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L152	O	79.02	95.51	-.03	.19	.87	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L309	O	79.07	94.85	-.56	-.21	.79	65J	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBS ABSOLUTE
L360	O	79.27	96.01	.53	.24	2.29	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L219	O	79.47	96.11	.72	.13	.99	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L255	O	79.54	94.95	-.23	-.55	.82	65D	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NRC-PTB ABSOLUTE
L238A	O	79.62	94.76	-.34	-.72	.63	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L685	O	79.72	96.35	1.05	.04	.91	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L241	O	80.17	96.35	1.30	-.34	1.51	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L157	O	80.35	97.26	2.16	.01	.68	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L484	#	82.59	97.45	3.52	-1.78	.72	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
GMEANS:		79.20	95.44			1.00		
		95% ELLIPSE:		3.02	1.03	WITH GAMMA = 57 DEGREES		


BLUE REFLECTANCE, DIFFUSE, NØ TRAP
SAMPLE A56 = 79.2 PERCENT
SAMPLE E78 = 95.4 PERCENT
+,X,* NØT IN GRAND MEANS
ANALYSIS T65-3
SAMPLE E78
SAMPLE A56
PERCENT
PERCENT
98.5
97.5
96.5
95.5
94.5
93.5
92.5
76.5
77.5
78.5
79.5
80.5
81.5
82.5

ANALYSIS T75-1 TABLE 1

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS - HIGH RANGE

TAPPI OFFICIAL TEST METHOD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB	SAMPLE	CAST COATED				SAMPLE	HIGH GLOSS C1S				TEST D.= 10		
	Z29	211 GRAMS PER SQUARE METER				Z30	182 GRAMS PER SQUARE METER						
CODE	MEAN	DEV	N.DEV	SDR	R.SDR	MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L108	70.12	.27	.15	.96	.65	89.77	-.05	-.03	.68	.88	75H	@	L108
L121	69.75	-.10	-.05	2.00	1.34	90.16	.34	.24	.81	1.04	75H	@	L121
L122	68.90	-.95	-.52	1.05	.70	88.72	-1.10	-.75	1.29	1.65	75H	@	L122
L132	72.49	2.64	1.44	2.16	1.45	90.15	.33	.23	1.20	1.54	75G	@	L132
L189	69.60	-.25	-.14	.97	.65	87.95	-1.87	-1.27	1.04	1.33	75P	@	L189
L206	70.82	.97	.53	1.50	1.00	89.91	.09	.06	.98	1.25	75H	@	L206
L210	69.84	-.01	-.00	1.40	.94	90.98	1.16	.80	1.15	1.46	75H	@	L210
L211	67.47	-2.38	-1.30	1.16	.78	88.16	-1.66	-1.13	.75	.96	75H	@	L211
L230	69.76	-.09	-.05	1.83	1.23	90.77	.95	.65	.86	1.10	75H	@	L230
L253P	69.01	-.84	-.46	1.41	.95	89.57	-.25	-.17	.58	.74	75G	@	L253P
L255	70.25	.40	.22	1.90	1.28	91.25	1.43	.98	.35	.45	75G	@	L255
L256	72.52	2.67	1.46	1.34	.90	91.28	1.46	1.00	1.14	1.46	75H	@	L256
L262	71.20	1.35	.74	1.03	.69	90.10	.28	.19	.52	.66	75K	@	L262
L274	70.15	.30	.16	2.53	1.70	90.70	.88	.60	1.18	1.51	75P	@	L274
L278	67.92	-1.93	-1.05	2.71	1.82	92.78	2.96	2.02	.51	.65	75G	*	L278
L279	68.90	-.95	-.52	.99	.67	89.50	-.32	-.22	.71	.90	75G	@	L279
L291	71.30	1.45	.79	1.18	.80	88.97	-.85	-.58	.51	.65	75H	@	L291
L301	71.09	1.24	.68	.97	.65	91.27	1.45	.99	.61	.77	75H	@	L301
L317	70.00	.15	.08	1.89	1.27	90.40	.58	.40	.52	.66	75H	@	L317
L321	69.80	-.05	-.03	2.04	1.37	88.50	-1.32	-.90	1.27	1.62	75G	@	L321
L323	65.48	-4.37	-2.39	2.14	1.44	89.22	-.60	-.41	.71	.91	75H	@	L323
L339	74.10	4.25	2.32	3.57	2.40	88.50	-1.32	-.90	3.37	4.31	75P	*	L339
L349	71.49	1.64	.90	.79	.53	90.44	.62	.43	.21	.26	75H	@	L349
L388	62.45	-7.40	-4.04	1.21	.81	85.00	-4.82	-3.29	1.33	1.70	75P	#	L388
L483	68.54	-1.31	-.71	1.65	1.11	89.78	-.04	-.02	.33	.42	75H	@	L483
L564	69.40	-.45	-.24	2.22	1.49	96.20	6.38	4.36	.63	.81	75P	X	L564
L573	68.60	-1.25	-.68	1.90	1.27	85.90	-3.92	-2.67	.88	1.12	75G	*	L573
L574	67.70	-2.15	-1.17	1.34	.90	86.30	-3.52	-2.40	.67	.86	75G	@	L574
L583	71.86	2.01	1.10	.84	.56	91.16	1.34	.92	.44	.57	75H	@	L583
L592	68.62	-1.23	-.67	1.40	.94	90.86	1.04	.71	.19	.24	75H	@	L592
L598	65.66	-4.19	-2.29	1.53	1.03	88.56	-1.26	-.86	.34	.44	75H	@	L598
L643	71.07	1.22	.67	1.49	1.00	90.93	1.11	.76	.63	.81	75H	@	L643
L654	70.71	.86	.47	1.51	1.02	89.75	-.07	-.04	1.19	1.52	75H	@	L654
L670	70.87	1.02	.56	1.73	1.16	89.81	-.01	-.00	1.06	1.35	75H	@	L670
L697	61.40	-8.45	-4.62	1.19	.80	83.53	-6.29	-4.29	1.80	2.30	75H	#	L697
L704	69.40	-.45	-.24	1.96	1.31	91.80	1.98	1.35	1.55	1.98	75G	@	L704
L738	64.00	-5.85	-3.20	2.36	1.58	84.58	-5.24	-3.57	1.16	1.48	75B	#	L738

GP. MEAN = 69.85 GLOSS UNITS GRAND MEAN = 89.82 GLOSS UNITS TEST DETERMINATIONS = 10

SD MEANS = 1.83 GLOSS UNITS SD OF MEANS = 1.46 GLOSS UNITS 33 LABS IN GRAND MEANS

AVERAGE SDR = 1.49 GLOSS UNITS AVERAGE SDR = .78 GLOSS UNITS

L250	67.10	-2.75	-1.50	1.20	.80	85.40	-4.42	-3.01	1.51	1.92	75Q	* L250

TOTAL NUMBER OF LABORATORIES REPORTING = 38

Best values: Z29 69.8 ± 3.1 gloss units
Z30 89.9 ± 2.5 gloss units

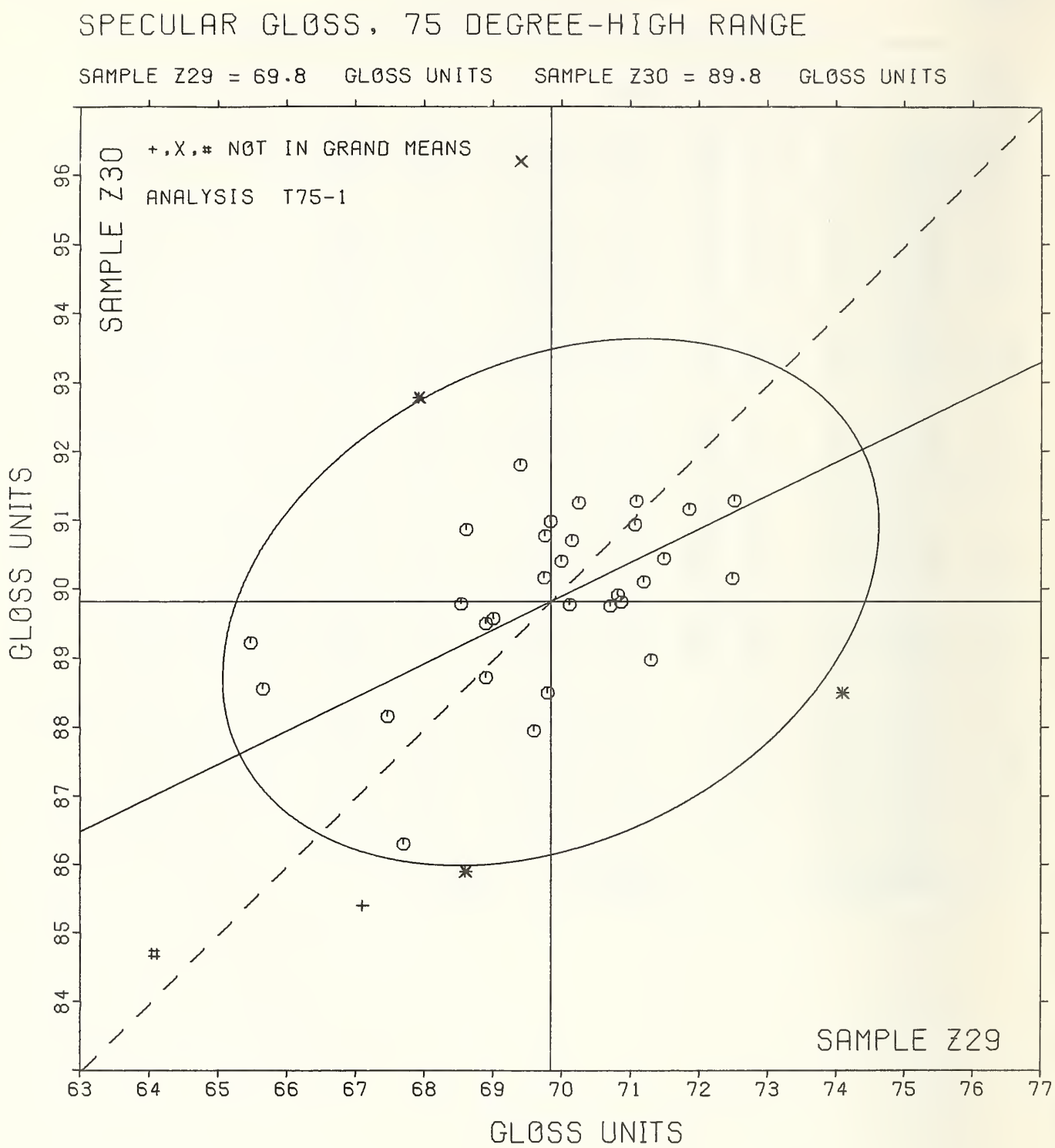
The following laboratories were omitted from the grand means because of extreme test results: 388, 697.

ANALYSIS T75-1 TABLE 2

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS - HIGH RANGE

TAPPI OFFICIAL TEST METHOD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB CODE	F	MEANS Z29	MEANS Z30	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L697	#	61.40	83.53	-10.35	-1.95	1.55	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L368	#	62.45	85.00	-8.76	-1.09	1.26	75P	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L738	#	64.00	84.58	-7.55	-2.15	1.53	75B	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, BAUSCH + LOMB
L323	G	65.48	89.22	-4.19	1.38	1.18	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L598	G	65.66	88.56	-4.32	.70	.73	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L250	*	67.10	85.40	-4.40	-2.77	1.36	75Q	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT,20C,65%RH
L211	G	67.47	88.16	-2.86	-.45	.87	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L574	G	67.70	86.30	-3.47	-2.22	.88	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L278	*	67.92	92.78	-.44	3.51	1.23	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L483	G	68.54	89.78	-1.19	.54	.76	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L573	*	68.60	85.90	-2.84	-2.97	1.20	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L592	G	68.62	90.86	-.65	1.48	.59	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L122	G	68.90	88.72	-1.33	-.57	1.18	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L279	G	68.90	89.50	-.99	.13	.79	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L253P	G	69.01	89.57	-.86	.15	.84	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L704	G	69.40	91.80	.47	1.98	1.65	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L564	X	69.40	96.20	2.39	5.94	1.15	75P	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L189	G	69.60	87.95	-1.04	-1.57	.99	75P	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L121	G	69.75	90.16	.06	.35	1.19	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L230	G	69.76	90.77	.34	.90	1.17	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L321	G	69.80	88.50	-.62	-1.16	1.50	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L210	G	69.84	90.98	.50	1.05	1.20	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L317	G	70.00	90.40	.39	.46	.96	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L108	G	70.12	89.77	.22	-.16	.76	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L274	G	70.15	90.70	.66	.66	1.61	75P	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L255	G	70.25	91.25	.99	1.11	.87	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L654	G	70.71	89.75	.75	-.44	1.27	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L276	G	70.82	89.91	.92	-.34	1.13	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L670	G	70.87	89.81	.92	-.45	1.26	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L643	G	71.07	90.93	1.59	.47	.90	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L381	G	71.09	91.27	1.75	.76	.71	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L262	G	71.20	90.10	1.34	-.34	.68	75K	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GAERTNER (K-C TYPE)
L291	G	71.30	88.97	.94	-1.40	.72	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L349	G	71.49	90.44	1.75	-.16	.40	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L583	G	71.86	91.16	2.40	.33	.56	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L132	G	72.49	90.15	2.52	-.85	1.49	75G	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L256	G	72.52	91.28	3.04	.15	1.18	75H	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L339	*	74.10	88.50	3.25	+3.04	3.36	75P	SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
GMEANS:		69.85	89.82			1.00		
		95% ELLIPSE:		5.04	3.48	WITH GAMMA = 25 DEGREES		


SPECULAR GLOSS, 75 DEGREE-HIGH RANGE
SAMPLE Z29 = 69.8 GLOSS UNITS
SAMPLE Z30 = 89.8 GLOSS UNITS
+,X,# NOT IN GRAND MEANS
ANALYSIS T75-1
SAMPLE Z30
GLOSS UNITS
SAMPLE Z29
GLOSS UNITS
84
85
86
87
88
89
90
91
92
93
94
95
96
63
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ANALYSIS T76-1 TABLE 1

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS - LOW RANGE

TAPPI OFFICIAL TEST METHOD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB CODE	SAMPLE E48 COATED GLOSS 91 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE B67 COATED OFFSET BOOK 75 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.F = 10 VAR	F	LAB
L122	62.9	-1.3	-.71	1.1	.74	60.6	-1.2	-.63	2.9	1.37	76H	O	L122
L128	61.0	-3.2	-1.73	1.6	1.07	64.5	2.8	1.51	1.6	.74	76G	O	L128
L134	64.7	.6	.31	1.7	1.16	62.3	.6	.32	1.3	.60	76H	O	L134
L149	51.9	-12.3	-6.70	2.3	1.60	51.7	-10.0	-5.45	1.3	.59	76G	#	L149
L153	66.4	2.3	1.24	1.3	.86	62.9	1.2	.64	3.1	1.46	76G	O	L153
L162	66.2	2.0	1.12	1.0	.70	63.4	1.7	.94	.9	.44	76G	O	L162
L173A	61.2	-3.0	-1.62	1.2	.84	58.9	-2.8	-1.54	1.9	.87	76G	O	L173A
L182	65.5	1.3	.71	1.8	1.20	59.6	-2.1	-1.14	2.4	1.11	76H	O	L182
L210	64.9	.8	.42	1.4	.97	62.1	.3	.18	2.0	.94	76H	O	L210
L213	65.0	.8	.46	1.4	.98	63.3	1.5	.84	1.7	.79	76H	O	L213
L223	62.5	-1.7	-.92	2.0	1.38	63.5	1.8	.98	1.9	.87	76H	O	L223
L226	61.8	-2.3	-1.27	1.6	1.10	58.1	-3.6	-1.95	3.9	1.81	76H	O	L226
L259	65.6	1.4	.77	1.0	.67	60.7	-1.0	-.56	1.5	.69	76H	O	L259
L288	66.0	1.8	1.01	1.5	1.03	62.7	1.0	.54	2.5	1.18	76H	O	L288
L317	64.4	.2	.12	1.5	1.03	62.1	.4	.20	2.8	1.33	76H	O	L317
L328	63.1	-1.1	-.59	.3	.22	93.1	31.4	17.05	.7	.35	76H	#	I328
L456	64.4	.2	.10	1.8	1.26	61.1	-.6	-.32	1.7	.80	76H	O	L456
L713	62.0	-2.2	-1.18	2.1	1.46	47.0	-14.8	-8.03	2.1	1.00	76H	#	L713
GP. MEAN =	64.2 GLOSS UNITS					GRAND MEAN =	61.7 GLOSS UNITS				TEST DETERMINATIONS =		10
SD MEANS =	1.8 GLOSS UNITS					SD OF MEANS =	1.8 GLOSS UNITS				15 LABS IN GRAND MEANS		
	AVERAGE SDR =	1.5 GLOSS UNITS				AVERAGE SDR =	2.1 GLOSS UNITS						
L250	65.6	1.4	.78	1.6	1.13	61.2	-.5	-.29	2.3	1.05	76Q	+	L250

TOTAL NUMBER OF LABORATORIES REPORTING = 19

Best values: E48 64 ± 3 gloss units
B67 62 ± 3 gloss units

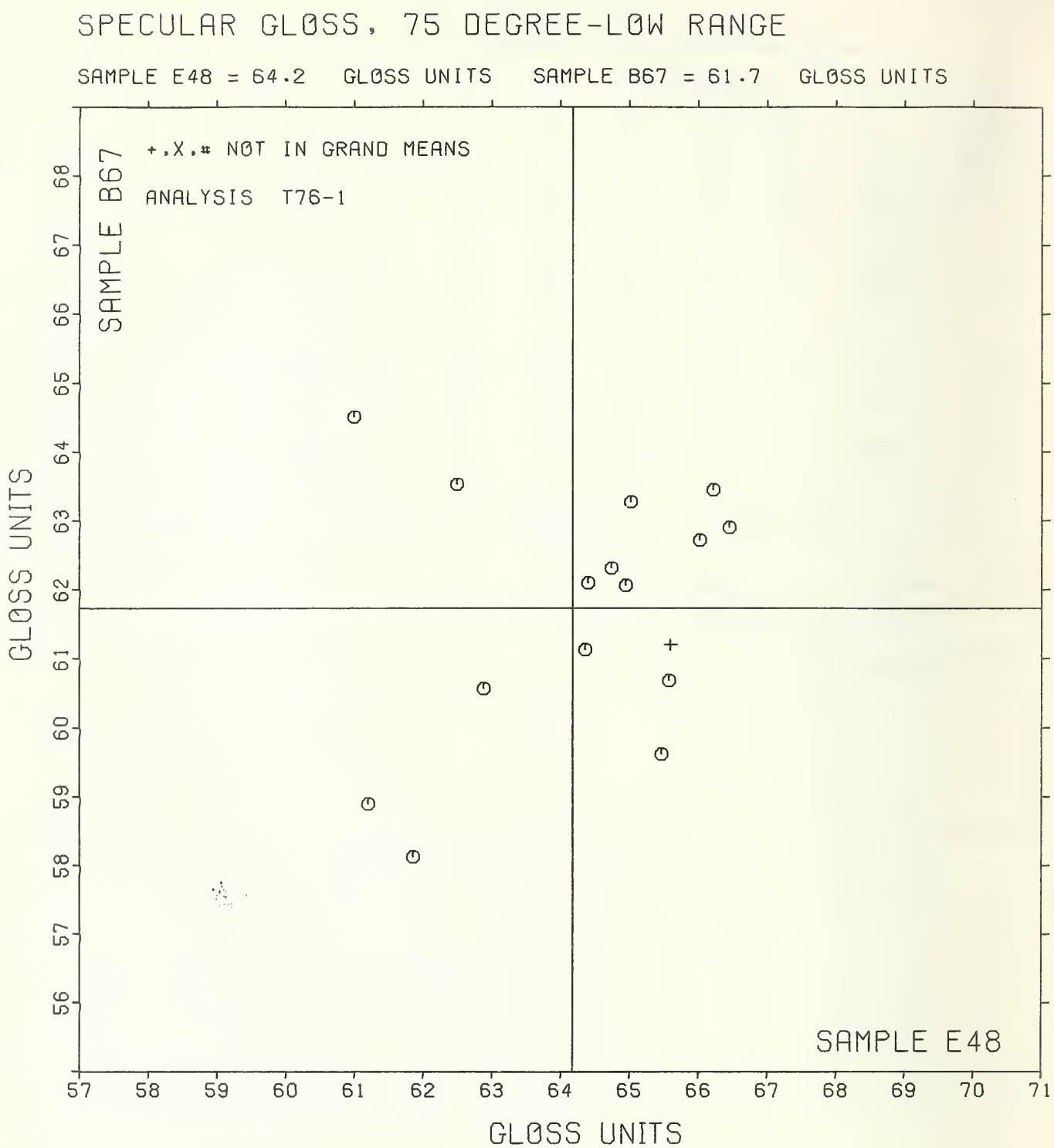
Data from the following laboratories appear to be off by a multiplicative factor: 149, 328, 713.

ANALYSIS T76-1 TABLE 2

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS - LOW RANGE

TAPPI OFFICIAL TEST METHOD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB CODE	F	MEANS E48	B67	COORDINATES MAJOR	MINOR	AVG P.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L149	#	51.9	51.7	-15.8	1.7	1.09	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L128	O	61.0	64.5	-.2	4.2	.91	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L173A	O	61.2	58.9	-4.1	.1	.85	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L226	O	61.8	58.1	-4.2	-.9	1.45	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L713	#	62.0	47.0	-12.0	-8.8	1.23	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L223	O	62.5	63.5	.1	2.5	1.13	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L122	O	62.9	60.6	-1.7	.1	1.06	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L328	#	63.1	93.1	21.6	22.8	.28	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L456	O	64.4	61.1	-.3	-.5	1.03	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L317	O	64.4	62.1	.4	.1	1.18	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L134	O	64.7	62.3	.8	.0	.88	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L210	O	64.9	62.1	.8	-.3	.95	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L213	O	65.0	63.3	1.7	.5	.88	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L182	O	65.5	59.6	-.6	-2.4	1.16	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L259	O	65.6	60.7	.2	-1.7	.68	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L250	+	65.6	61.2	.6	-1.4	1.09	76Q	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, PHOTOVOLT,20C,65%RH
L288	O	66.0	62.7	2.0	-.6	1.10	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L162	O	66.2	63.4	2.7	-.2	.57	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L153	O	66.4	62.9	2.4	-.8	1.16	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
GMEANS:		64.2	61.7			1.00		
		95% ELLIPSE:		5.9	4.5	WITH GAMMA = 45 DEGREES		


SPECULAR GLOSS, 75 DEGREE-LOW RANGE
SAMPLE E48 = 64.2 GLOSS UNITS
SAMPLE B67 = 61.7 GLOSS UNITS
+,X,# NOT IN GRAND MEANS
ANALYSIS T76-1
SAMPLE B67
SAMPLE E48
GLOSS UNITS
GLOSS UNITS
56
57
58
59
60
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62
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64
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66
67
68
57
58
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60
61
62
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ANALYSIS T90-1 TABLE 1
THICKNESS (CALIPER), THOUSANDTHS OF AN INCH
TAPPI OFFICIAL TEST METHOD T411 OS-76

LAB CODE	SAMPLE G54 KRAFT ENVELOPE 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE G07 WRITING 59 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.* 10 VAR	F	LAB
L105	4.731	-.015	-.16	.033	.70	3.074	.018	.25	.021	.58	90Q	@	L105
L118	4.791	.045	.48	.050	1.05	3.099	.043	.60	.031	.88	90Q	@	L118
L122	4.804	.058	.62	.053	1.10	3.118	.062	.87	.023	.64	90V	@	L122
L123F	4.900	.154	1.65	.062	1.30	3.225	.169	2.36	.026	.75	90F	@	L123F
I125	4.819	.073	.78	.082	1.70	3.093	.037	.52	.028	.80	90T	@	I125
L128	4.786	.040	.43	.037	.76	3.082	.026	.36	.030	.86	90T	@	L128
L134	4.736	-.010	-.11	.027	.57	3.021	-.035	-.49	.034	.97	90Q	@	L134
L141	4.670	-.076	-.81	.063	1.32	3.040	-.016	-.22	.070	1.98	90T	@	L141
I153	4.315	-.431	-4.61	.065	1.36	2.771	-.285	-3.97	.036	1.01	90T	@	L153
L158	4.800	.054	.58	.033	.69	3.040	-.016	-.22	.039	1.12	90T	@	I158
L159	4.800	.054	.58	.053	1.10	3.125	.069	.96	.035	1.00	90T	@	I159
L162	4.813	.067	.72	.030	.62	3.055	-.001	-.01	.031	.88	90V	@	L162
L166	4.700	-.046	-.49	.047	.98	3.036	-.020	-.28	.027	.77	90T	@	L166
L173B	4.756	.010	.11	.041	.85	3.042	-.014	-.19	.035	.98	90F	@	L173B
L174	4.630	-.116	-1.24	.048	1.01	2.960	-.096	-1.33	.052	1.46	90T	@	I174
L182	4.732	-.014	-.15	.043	.90	3.042	-.014	-.20	.017	.47	90I	@	I182
L183	4.846	.100	1.07	.037	.76	3.092	.036	.50	.035	1.00	90T	@	I183
L185	4.890	.144	1.54	.032	.66	3.146	.090	1.26	.025	.71	90G	@	I185
I212	4.824	.078	.83	.036	.74	3.077	.021	.29	.025	.71	90T	@	L212
L213	4.810	.064	.68	.074	1.54	3.120	.064	.89	.042	1.19	90T	@	L213
L223	4.630	-.116	-1.24	.034	.72	2.962	-.094	-1.31	.022	.62	90V	@	I223
L224	4.550	-.196	-2.10	.085	1.77	2.910	-.146	-2.03	.032	.89	90T	@	L224
L228	4.760	.014	.15	.052	1.08	3.080	.024	.34	.042	1.19	90T	@	L228
L233	4.806	.060	.64	.037	.77	3.131	.075	1.05	.036	1.02	90Q	@	L233
I238A	4.774	.028	.30	.047	.97	3.034	-.022	-.30	.036	1.01	90T	@	L238A
L241	4.734	-.012	-.13	.045	.93	3.038	-.018	-.25	.040	1.12	90T	@	I241
L242@	4.917	.171	1.83	.036	.75	3.109	.053	.74	.022	.63	90@	@	L242@
L242P	4.870	.124	1.32	.059	1.24	3.117	.061	.85	.039	1.11	90P	@	I242P
L249	4.766	.020	.21	.025	.53	3.088	.032	.45	.032	.89	90T	@	L249
I257	4.850	.104	1.11	.053	1.10	3.170	.114	1.59	.048	1.37	90T	@	I257
L259	4.858	.112	1.20	.036	.76	3.163	.107	1.49	.031	.87	90Q	@	I259
L260	4.746	-.000	-.00	.041	.86	3.087	.031	.43	.026	.73	90T	@	L260
I261	4.738	-.008	-.09	.029	.60	3.039	-.017	-.23	.024	.67	90T	@	L261
L262	4.840	.094	1.00	.039	.82	3.115	.059	.82	.034	.95	90T	@	L262
L274D	4.840	.094	1.00	.052	1.08	2.970	-.086	-1.20	.048	1.37	90D	X	L274D
I285	5.000	.254	2.72	.067	1.39	3.330	.274	3.82	.067	1.91	90T	X	I285
I291	4.668	-.078	-.83	.073	1.53	3.060	.004	.06	.028	.80	90T	@	L291
I305	4.685	-.061	-.65	.058	1.21	3.100	.044	.62	.047	1.33	90T	@	I305
L309	4.800	.054	.58	.047	.98	3.000	-.056	-.78	.047	1.33	90T	@	L309
L315	4.800	.054	.58	.067	1.39	3.140	.084	1.17	.084	2.39	90T	@	L315
I318	4.606	-.140	-1.50	.041	.86	2.893	-.163	-2.27	.025	.69	90T	@	I318
L320	4.765	.019	.20	.047	.99	3.115	.059	.82	.034	.95	90T	@	L320
L323	4.590	-.156	-1.67	.057	1.18	2.930	-.126	-1.75	.048	1.37	90T	@	L323
L324	4.715	-.031	-.33	.034	.70	3.130	.074	1.03	.026	.73	90T	@	L324
L326	4.805	.059	.63	.050	1.04	3.080	.024	.34	.035	.99	90T	@	L326
L328	4.778	.032	.34	.050	1.03	3.086	.030	.42	.049	1.39	90T	@	L328
L339	4.610	-.136	-1.46	.088	1.83	2.960	-.096	-1.33	.046	1.30	90T	@	L339
L341	4.868	.122	1.30	.032	.66	3.096	.040	.56	.037	1.03	90T	@	I341
L352	4.688	-.058	-.62	.029	.60	3.018	-.038	-.53	.028	.79	90Q	@	L352
L356	4.661	-.085	-.91	.055	1.15	2.975	-.081	-1.13	.041	1.16	90T	@	L356
L358	4.553	-.193	-2.06	.022	.46	2.954	-.102	-1.42	.036	1.03	90T	@	L358
L376	4.630	-.116	-1.24	.082	1.72	2.970	-.086	-1.20	.049	1.37	90T	@	L376
L380	4.750	.004	.04	.053	1.10	3.000	-.056	-.78	.000	.00	90T	@	L380
L382	4.728	-.018	-.19	.066	1.38	3.061	.005	.07	.032	.90	90T	@	L382
L390	4.780	.034	.36	.040	.83	3.094	.038	.53	.028	.80	90T	@	L390
L442	4.953	.207	2.21	.047	.98	3.191	.135	1.88	.036	1.03	90V	@	L442
L556	4.681	-.065	-.70	.022	.46	3.014	-.042	-.58	.017	.48	90T	@	L556
L557	4.630	-.116	-1.24	.063	1.32	2.935	-.121	-1.68	.047	1.34	90T	@	L557
L567	4.800	.054	.58	.067	1.39	3.050	-.006	-.08	.053	1.49	90V	@	L567
L571	4.640	-.106	-1.13	.070	1.46	2.930	-.126	-1.75	.048	1.37	90T	@	L571
L575	4.837	.091	.97	.023	.48	3.130	.074	1.03	.035	.98	90Q	@	L575
I576	4.738	-.008	-.09	.052	1.09	3.113	.057	.80	.040	1.13	90T	@	I576
L581	4.840	.094	1.00	.039	.82	3.115	.059	.82	.047	1.34	90T	@	L581
L625	4.585	-.161	-1.72	.034	.70	3.000	-.056	-.78	.019	.55	90T	@	L625
L626	4.550	-.196	-2.10	.053	1.10	2.955	-.101	-1.40	.030	.84	90T	@	I626

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T90-1 TABLE 1
THICKNESS (CALIPER), THOUSANDTHS OF AN INCH
TAPPI OFFICIAL TEST METHOD T411 OS-76

LAB CODE	SAMPLE G54 KRAFT ENVELOPE 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE G07 WRITING 59 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.F 10 VAR	F	LAB
L693	4.697	-.049	-.52	.037	.76	3.053	-.003	-.04	.044	1.26	90T	G	L693
L704	4.422	-.324	-3.46	.083	1.74	2.810	-.246	-3.42	.032	.89	90T	X	L704
L713	4.736	-.010	-.11	.031	.65	3.008	-.048	-.67	.023	.66	90T	G	L713
L737	4.710	-.036	-.39	.074	1.54	3.040	-.016	-.22	.052	1.46	90T	G	L737
L753	4.686	-.060	-.64	.065	1.35	2.960	-.096	-1.33	.031	.88	90T	G	L753
L756	4.580	-.166	-1.78	.063	1.32	3.150	.094	1.31	.053	1.49	90T	X	L756

GR. MEAN = 4.746 MILS — GRAND MEAN = 3.056 MILS — TEST DETERMINATIONS = 10
SD MEANS = .094 MILS — SD OF MEANS = .072 MILS — 66 LABS IN GRAND MEANS
AVERAGE SDR = .048 MILS — AVERAGE SDR = .035 MILS
GR. MEAN = 120.55 MICROMETER — GRAND MEAN = 77.62 MICROMETER

L106	4.780	.034	.36	.063	1.32	2.980	-.076	-1.06	.042	1.19	90C	*	L106
L108	4.500	-.246	-2.63	.078	1.63	2.700	-.356	-4.96	.091	2.58	90C	*	L108
L274C	4.840	.094	1.00	.052	1.08	2.950	-.106	-1.47	.053	1.49	90C	*	L274C
L333	4.670	-.076	-.81	.042	.88	2.970	-.086	-1.20	.026	.73	90B	*	L333
L342	4.652	-.094	-1.01	.040	.84	2.972	-.084	-1.17	.059	1.67	90U	*	L342
L344	4.808	.062	.66	.066	1.39	3.098	.042	.59	.056	1.59	90U	*	L344
L484	4.713	-.033	-.36	.027	.55	3.004	-.052	-.72	.027	.75	90E	*	L484
L563	4.860	.114	1.22	.052	1.08	3.100	.044	.62	.082	2.31	90U	*	L563
L574	4.655	-.091	-.97	.029	.60	2.973	-.083	-1.15	.030	.85	90B	*	L574
L616	4.810	.064	.68	.292	6.09	3.030	-.026	-.36	.048	1.37	90C	*	L616
L684	4.800	.054	.58	.047	.98	3.070	.014	.20	.048	1.37	90U	*	L684
L702	4.610	-.136	-1.46	.057	1.18	2.980	-.076	-1.06	.042	1.19	90X	*	L702
L706	4.760	.014	.15	.070	1.46	3.050	-.006	-.08	.053	1.49	90X	*	L706

TOTAL NUMBER OF LABORATORIES REPORTING = 84

Best values: G54 4.75 ± 0.16 mils
G07 3.06 ± 0.12 mils

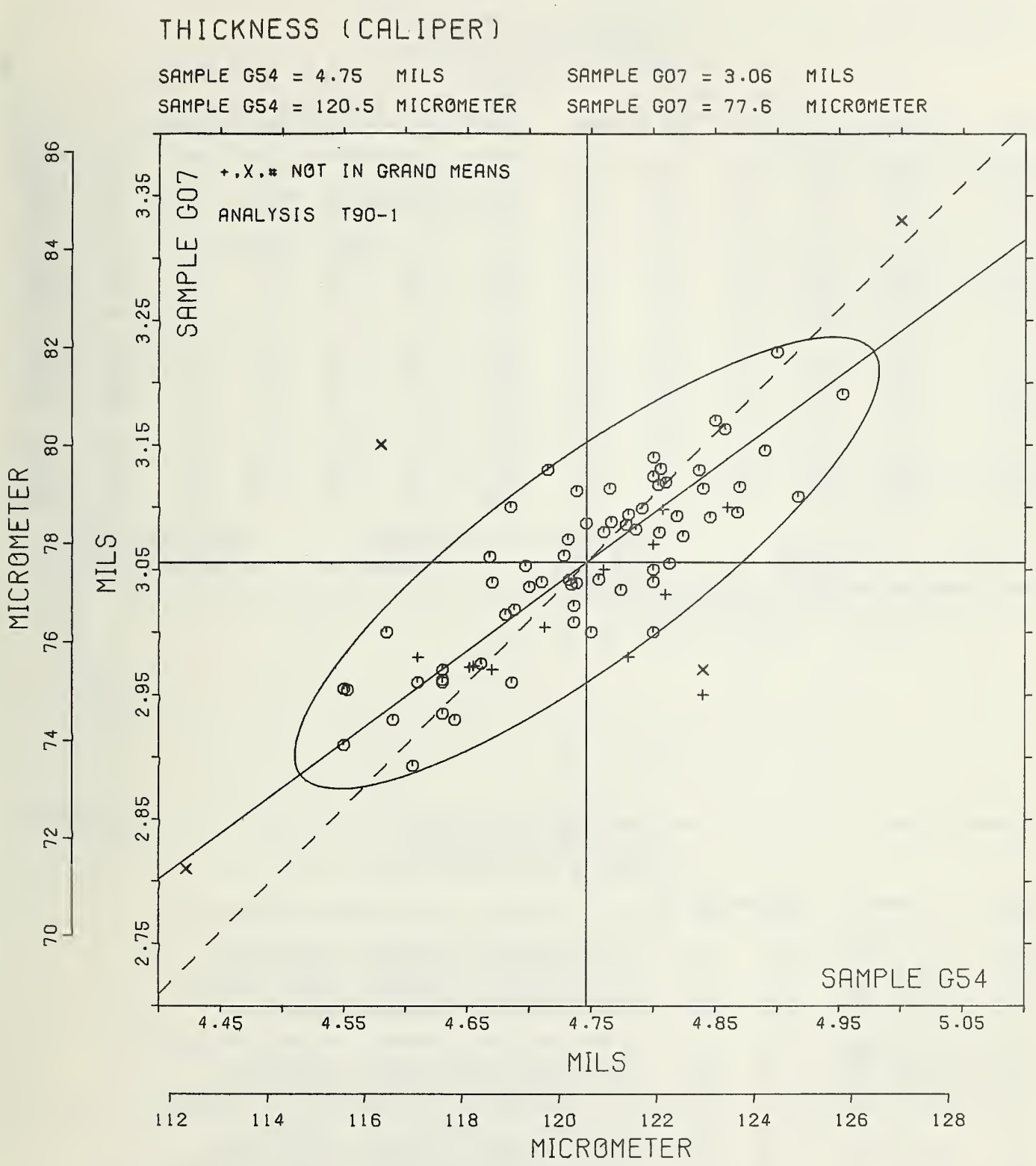
The following laboratories were omitted from the grand means because of extreme test results: 153.

ANALYSIS T90-1 TABLE 2
THICKNESS (CALIPER), THOUSANDTHS OF AN INCH
TAPPI OFFICIAL TEST METHOD T411 OS-76

LAB CODE	F	MEANS G54	MEANS G07	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L153	#	4.315	2.771	-.516	.025	1.18	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L704	X	4.422	2.810	-.407	-.007	1.32	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L108	*	4.500	2.700	-.409	-.142	2.11	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L626	G	4.550	2.955	-.218	.035	.97	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L224	G	4.550	2.910	-.244	-.002	1.33	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L358	G	4.553	2.954	-.216	.032	.74	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L756	X	4.580	3.150	-.078	.174	1.40	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L625	G	4.585	3.000	-.163	.050	.63	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L323	G	4.590	2.930	-.200	-.009	1.28	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L318	G	4.606	2.893	-.209	-.049	.78	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L339	G	4.610	2.960	-.166	.003	1.56	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L702	*	4.610	2.980	-.155	.019	1.19	90X	THICKNESS (CALIPER): GIVE INSTR. MAKE+MODEL.( )MOTOR,( )HAND
L557	G	4.630	2.935	-.165	-.029	1.33	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L376	G	4.630	2.970	-.144	-.001	1.54	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L223	G	4.630	2.962	-.149	-.007	.67	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L174	G	4.630	2.960	-.150	-.009	1.23	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L571	G	4.640	2.930	-.160	-.039	1.41	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L342	*	4.652	2.972	-.125	-.012	1.25	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L574	*	4.655	2.973	-.122	-.013	.73	90B	THICKNESS (CALIPER), AMTHOR, HAND DRIVEN
L356	G	4.661	2.975	-.116	-.015	1.15	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L291	G	4.668	3.060	-.060	.050	1.16	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L333	*	4.670	2.970	-.112	-.024	.80	90B	THICKNESS (CALIPER), AMTHOR, HAND DRIVEN
L141	G	4.670	3.040	-.071	.032	1.65	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L556	G	4.681	3.014	-.077	.005	.47	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L305	G	4.685	3.100	-.023	.072	1.27	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L753	G	4.686	2.960	-.105	-.042	1.12	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L352	G	4.688	3.018	-.069	.004	.70	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L693	G	4.697	3.053	-.041	.027	1.01	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L166	G	4.700	3.036	-.049	.011	.88	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L737	G	4.710	3.040	-.038	.009	1.50	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L484	*	4.713	3.004	-.058	-.022	.65	90E	THICKNESS (CALIPER), SCHOPPER, HAND DRIVEN
L324	G	4.715	3.130	.019	.078	.72	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L382	G	4.728	3.061	-.012	.015	1.14	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L105	G	4.731	3.074	-.001	.024	.64	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L182	G	4.732	3.042	-.020	-.003	.69	90L	THICKNESS (CALIPER), L + W, MOTOR DRIVEN
L241	G	4.734	3.038	-.020	-.007	1.03	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L134	G	4.736	3.021	-.029	-.022	.77	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L713	G	4.736	3.008	-.036	-.033	.66	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L576	G	4.738	3.113	.027	.051	1.11	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L261	G	4.738	3.039	-.016	-.009	.64	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L260	G	4.746	3.087	.018	.025	.80	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L380	G	4.750	3.000	-.030	-.047	.55	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L173B	G	4.756	3.042	-.000	-.017	.92	90F	THICKNESS (CALIPER), FEDERAL, MOTOR DRIVEN
L706	*	4.760	3.050	.008	-.013	1.47	90X	THICKNESS (CALIPER): GIVE INSTR. MAKE+MODEL.( )MOTOR,( )HAND
L228	G	4.760	3.080	.026	.011	1.13	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L320	G	4.765	3.115	.050	.037	.97	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L249	G	4.766	3.088	.035	.014	.71	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L238A	G	4.774	3.034	.010	-.034	.99	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L328	G	4.778	3.086	.044	.005	1.21	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L106	*	4.780	2.980	-.017	-.081	1.26	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L390	G	4.780	3.094	.050	.011	.82	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L128	G	4.786	3.082	.048	-.003	.81	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L118	G	4.791	3.099	.062	.008	.97	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L158	G	4.800	3.040	.034	-.045	.91	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L159	G	4.800	3.125	.084	.024	1.05	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L315	G	4.800	3.140	.093	.036	1.89	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L664	*	4.800	3.070	.052	-.020	1.17	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L309	G	4.800	3.000	.010	-.077	1.16	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L567	G	4.800	3.050	.040	-.037	1.44	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L122	G	4.804	3.118	.083	.016	.87	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L326	G	4.805	3.080	.062	-.015	1.01	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L233	G	4.806	3.131	.093	.025	.89	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L344	*	4.808	3.098	.075	-.003	1.49	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L616	*	4.810	3.030	.036	-.059	3.73	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L213	G	4.810	3.120	.090	.014	1.37	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN

ANALYSIS T90-1 TABLE 2
THICKNESS (CALIPER), THOUSANDTHS OF AN INCH
TAPPI OFFICIAL TEST METHOD T411 OS-76

LAB CODE	F	MEANS G54	MEANS G07	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L162	O	4.813	3.055	.053	-.040	.75	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L125	O	4.819	3.093	.081	-.013	1.25	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L212	O	4.824	3.077	.075	-.029	.72	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L575	O	4.837	3.130	.117	.006	.73	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L262	O	4.840	3.115	.111	-.008	.89	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L581	O	4.840	3.115	.111	-.008	1.08	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L274D	X	4.840	2.970	.025	-.125	1.22	90D	THICKNESS (CALIPER), CADY, MOTOR DRIVEN
L274C	+	4.840	2.950	.013	-.141	1.28	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L183	O	4.846	3.092	.102	-.030	.88	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L257	O	4.850	3.170	.151	.031	1.23	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L259	O	4.858	3.163	.154	.020	.81	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L563	+	4.860	3.100	.118	-.032	1.69	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L341	O	4.868	3.096	.122	-.040	.85	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L242P	O	4.870	3.117	.136	-.024	1.17	90P	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, ISO R534
L185	O	4.890	3.146	.169	-.012	.68	90G	THICKNESS (CALIPER), AUTHOR, MOTOR DRIVEN
L123F	O	4.900	3.225	.224	.045	1.02	90F	THICKNESS (CALIPER), FEDERAL, MOTOR DRIVEN
L242O	O	4.917	3.109	.169	-.059	.69	90O	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, BS3983
L442	O	4.953	3.191	.247	-.013	1.01	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L285	X	5.000	3.330	.367	.071	1.65	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
GMEANS:		4.746	3.056			1.00		
		95% ELLIPSE:		.287	.079	WITH GAMMA = 36 DEGREES		


THICKNESS (CALIPER)
SAMPLE G54 = 4.75 MILS
SAMPLE G54 = 120.5 MICROMETER
SAMPLE G07 = 3.06 MILS
SAMPLE G07 = 77.6 MICROMETER
+,X,* NOT IN GRAND MEANS
ANALYSIS T90-1
SAMPLE G07
MICROMETER
MILS
SAMPLE G54
MILS
MICROMETER

ANALYSIS T95-1 TABLE 1
GRAMMAGE (MASS PER UNIT AREA)
TAPPI OFFICIAL TEST METHOD T410 OS-79

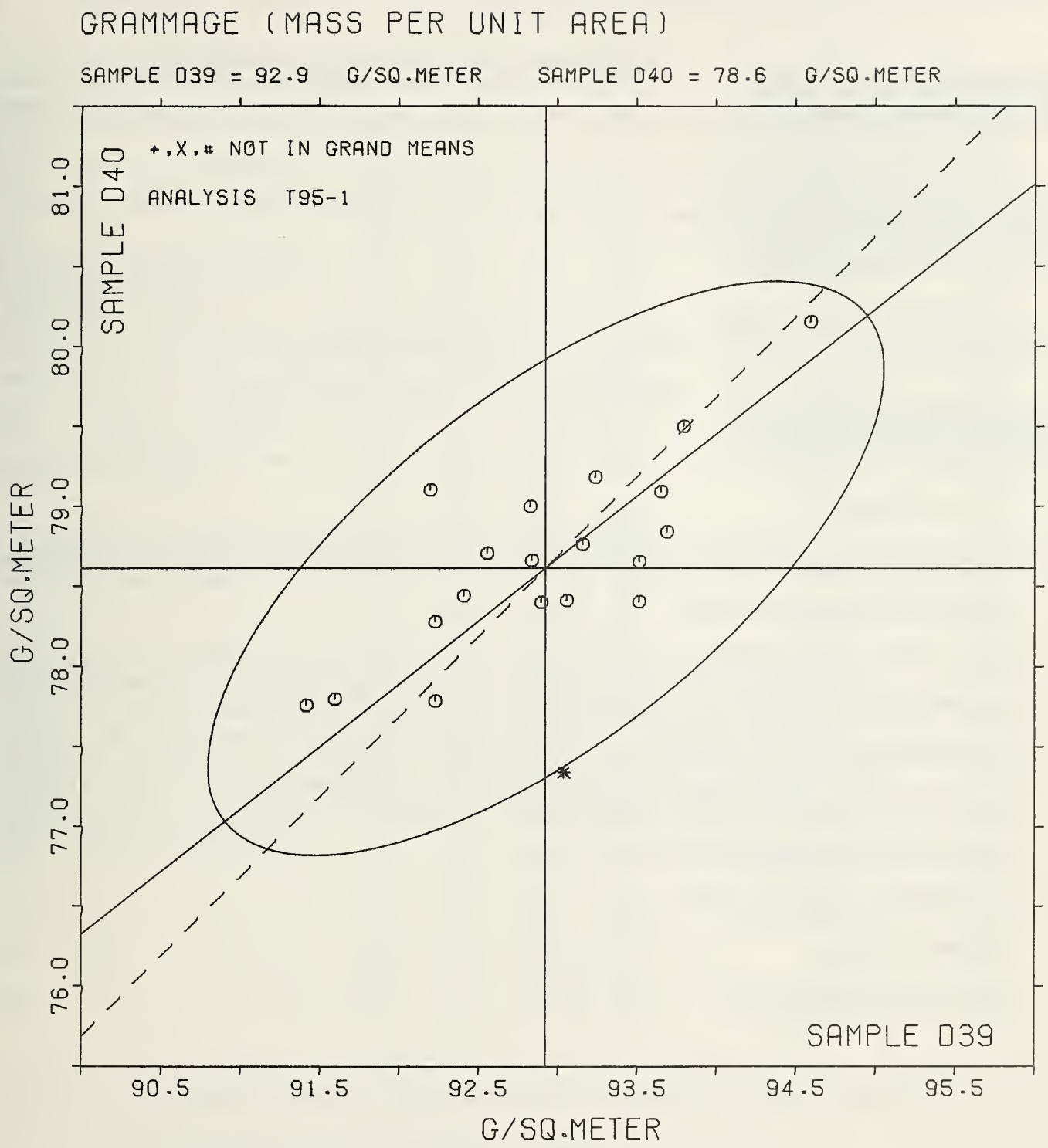
LAB CODE	SAMPLE D39 MEAN	OFFSET PRINTING 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE D40 MEAN	BOND 79 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.= 10 VAR	F	LAB
L121	93.06	.14	.17	.80	1.14	78.41	-.20	-.31	.45	1.37	95B	@	L121
L162	92.23	-.69	-.89	.68	.96	78.28	-.33	-.51	.23	.70	95K	@	L162
L213	92.56	-.37	-.47	.90	1.29	78.71	.09	.14	.60	1.83	95F	@	L213
L233	92.23	-.69	-.89	1.04	1.49	77.79	-.83	-1.26	.28	.85	95T	@	L233
L244	93.04	.12	.15	.26	.38	77.34	-1.27	-1.94	.10	.30	95T	*	L244
L249	92.90	-.02	-.03	1.06	1.51	78.40	-.21	-.33	.34	1.04	95I	@	L249
L274	92.20	-.72	-.93	.63	.90	79.10	.49	.74	.57	1.74	95B	@	L274
L280	92.84	-.08	-.11	.65	.93	78.66	.05	.07	.35	1.06	95T	@	L280
L285	93.24	.32	.41	.74	1.06	79.18	.57	.87	.00	.00	95X	@	L285
L305	93.52	.59	.76	.13	.19	78.65	.04	.06	.14	.44	95T	@	L305
L339	93.79	.87	1.12	.20	.28	79.50	.89	1.35	.21	.65	95T	@	L339
L344	92.83	-.09	-.12	.11	.15	79.00	.38	.59	.03	.11	95T	@	L344
L442	93.16	.24	.30	.24	.34	78.76	.15	.22	.14	.44	95K	@	L442
L557	93.51	.59	.76	1.55	2.21	78.40	-.21	-.32	.63	1.92	95D	@	L557
L567	92.41	-.51	-.66	.66	.94	78.44	-.17	-.26	.37	1.13	95E	@	L567
L625	91.60	-1.32	-1.71	.70	1.00	77.80	-.81	-1.24	.42	1.29	95T	@	L625
L626	91.42	-1.50	-1.94	.60	.86	77.76	-.85	-1.30	.18	.56	95E	@	L626
L693	94.59	1.67	2.15	.78	1.11	80.16	1.54	2.36	.32	.97	95G	@	L693
L704	93.65	.73	.94	.80	1.15	79.09	.48	.73	.19	.57	95T	@	L704
L756	93.69	.77	.99	1.05	1.49	78.84	.23	.35	.76	2.32	95C	@	L756

GP. MEAN = 92.92 G/SQ.METER GRAND MEAN = 78.61 G/SQ.METER TEST DETERMINATIONS = 10
SD MEANS = .78 G/SQ.METER SD OF MEANS = .65 G/SQ.METER 20 LABS IN GRAND MEANS
AVERAGE SDR = .70 G/SQ.METER AVERAGE SDR = .33 G/SQ.METER
TOTAL NUMBER OF LABORATORIES REPORTING = 20

Best values: D39 92.9 ± 1.3 grams per square meter
D40 78.6 ± 1.1 grams per square meter

ANALYSIS T95-1 TABLE 2
GRAMMAGE (MASS PER UNIT AREA)
TAPPI OFFICIAL TEST METHOD T410 OS-79

LAB CODE	F	MEANS D39	D40	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L626	@	91.42	77.76	-1.71	.25	.71	95E	BASIS WEIGHT (GRAMMAGE), GUILLOTINE TYPE CUTTER
L625	@	91.60	77.80	-1.54	.17	1.14	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L274	@	92.20	79.10	-.27	.83	1.32	95B	BASIS WEIGHT (GRAMMAGE), CONCORA CUTTER
L162	@	92.23	78.28	-.75	.16	.83	95K	BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L233	@	92.23	77.79	-1.05	-.22	1.17	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L567	@	92.41	78.44	-.51	.18	1.04	95E	BASIS WEIGHT (GRAMMAGE), GUILLOTINE TYPE CUTTER
L213	@	92.56	78.71	-.23	.30	1.56	95F	BASIS WEIGHT (GRAMMAGE), FOUR-SQUARE CUTTER
L344	@	92.83	79.00	.16	.36	.13	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L280	@	92.84	78.66	-.04	.09	.99	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L249	@	92.90	78.40	-.15	-.15	1.27	95I	BASIS WEIGHT (GRAMMAGE), INGENTO PAPER CUTTER
L244	*	93.04	77.34	-.69	-1.07	.34	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L121	@	93.06	78.41	-.02	-.24	1.26	95B	BASIS WEIGHT (GRAMMAGE), CONCORA CUTTER
L442	@	93.16	78.76	.28	-.03	.39	95K	BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L285	@	93.24	79.18	.60	.25	.53	95X	BASIS WEIGHT (GRAMMAGE): SHEET CUT BY WHAT DEVICE?
L557	@	93.51	78.40	.33	-.53	2.07	95D	BASIS WEIGHT (GRAMMAGE), DIE CUT
L305	@	93.52	78.65	.49	-.33	.32	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L704	@	93.65	79.09	.87	-.07	.86	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L756	@	93.69	78.84	.74	-.29	1.91	95C	BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
L339	@	93.79	79.50	1.23	.16	.46	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L693	@	94.59	80.16	2.26	.19	1.04	95G	BASIS WEIGHT (GRAMMAGE), PRECISION CUTTER
GMEANS:		92.92	78.61			1.00		
95% ELLIPSE:				2.56	1.08	WITH GAMMA = 38 DEGREES		


GRAMMAGE (MASS PER UNIT AREA)
SAMPLE D39 = 92.9 G/SQ.METER
SAMPLE D40 = 78.6 G/SQ.METER
+,X,* NOT IN GRAND MEANS
ANALYSIS T95-1
SAMPLE D40
G/SQ.METER
81.0
80.0
79.0
78.0
77.0
76.0
SAMPLE D39
90.5
91.5
92.5
93.5
94.5
95.5
G/SQ.METER

SUMMARY TABLE

TEST METHOD	SAMPLE CODE	GRAND MEAN	SD OF MEAN	AVER SDR	REPL CRP	LABS INCL	LABS PARTIC	REPL TAPPI	REPEAT	REPROD
AIR RESISTANCE, GURLEY	Z27	38.8	3.3	10.3	10	58	63	10	9.0	9.1
T40-1 GURLEY UNITS	G15	16.5	1.2	1.9					1.6	3.3
AIR RESISTANCE, SHEFFIELD	Z27	93.	7.	22.	10	43	49	10	19.	20.
T40-2 SHEFF. UNITS	G15	168.	13.	16.					14.	37.
AIR RESISTANCE, GURLEY HG FLOTATION	B47	1542.	187.	400.	10	10	12	10	350.	518.
T41-1 SEC/10 CC	E64	548.	84.	116.					101.	231.
SMOOTHNESS, PARKER PRINTSURF	G09	5.08	.22	.13	10	7	8	10	.12	.60
T44-1 MICRONS	A40	4.77	.23	.19					.17	.65
SMOOTHNESS, SHEFFIELD	G09	157.9	8.3	15.7	15	91	95	10	13.8	24.4
T45-1 SHEFF. UNITS	A40	119.1	7.1	10.8					9.5	20.5
SMOOTHNESS, BEKK	G09	28.5	2.9	3.1	15	10	11	5	3.8	8.7
T45-2 BEKK SECONDS	A40	41.1	6.6	6.4					7.9	19.5
SMOOTHNESS, BENDTSEN	G09	200.	17.	37.	10	6	6	10	32.	46.
T47-1 ML/MIN	A40	138.	28.	20.					17.	77.
MOISTURE	G41	3.56	.36	.19	10	12	12	2	.37	1.05
T53-1 PERCENT	G51	4.49	.50	.24					.46	1.45
K & N INK ABSORPTION	G22	53.7	3.8	1.2	4	7	9	2	2.3	10.7
T56-1 K & N UNITS	A57	62.3	4.2	1.1					2.2	11.6
OPACITY, B&L, 89% BACKING, FINE P.	A99	89.51	.58	.85	10	64	81	5	1.05	1.77
T60-1 PERCENT	A58	93.31	.42	.63					.78	1.29
OPACITY,ELREPHO,PAPER BACKING,FINE P	A99	90.95	.35	.71	10	12	17	5	.88	1.14
T60-2 PERCENT	A58	94.80	.20	.50					.62	.71
OPACITY, B&L, 89% BACKING, NEWS	G43	68.94	.89	.58	10	24	30	5	.71	2.51
T61-1 PERCENT	Z07	59.90	1.07	.85					1.06	3.07
BLUE REFLECTANCE, DIRECTIONAL	A56	78.62	.44	.19	8	22	58	5	.24	1.24
T65-1 PERCENT	E78	96.00	.40	.13					.16	1.11
BLUE REFLECTANCE, DIFFUSE, WITH TRAP	A56	78.43	.73	.09	8	17	19	5	.12	2.02
T65-2 PERCENT	E78	95.32	.82	.09					.11	2.28
BLUE REFLECTANCE, DIFFUSE, NO TRAP	A56	79.20	.64	.08	8	15	16	5	.10	1.78
T65-3 PERCENT	E78	95.44	.91	.07					.09	2.52
SPECULAR GLOSS, 75 DEGREE-HIGH RANGE	Z29	69.85	1.83	1.49	10	33	38	5	1.84	5.23
T75-1 GLOSS UNITS	Z30	89.82	1.46	.78					.97	4.12
SPECULAR GLOSS, 75 DEGREE-LOW RANGE	E48	64.2	1.8	1.5	10	15	19	5	1.8	5.2
T76-1 GLOSS UNITS	B67	61.7	1.8	2.1					2.6	5.4
THICKNESS (CALIPER)	G54	4.746	.094	.048	10	66	84	10	.042	.259
T90-1 MILS	G07	3.056	.072	.035					.031	.199
GRAMMAGE (MASS PER UNIT AREA)	D39	92.92	.78	.70	10	20	20	3	1.12	2.35
T95-1 G/SQ.METER	D40	78.61	.65	.33					.52	1.87

NBS-114A (REV. 9-78)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. TAPPI CRP 65G	2. Gov't. Accession No.	3. Recipient's Accession No.

4. TITLE AND SUBTITLE

Technical Association of the Pulp and Paper Industry Collaborative Reference Program for Paper Report #65G

5. Publication Date

Sept. 3, 1980

6. Performing Organization Code

7. AUTHOR(S)

R. G. Powell, J. Horlick

8. Performing Organ. Report No.

NBSIR 80-1839

9. PERFORMING ORGANIZATION NAME AND ADDRESS

NATIONAL BUREAU OF STANDARDS
DEPARTMENT OF COMMERCE
WASHINGTON, DC 20234

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS *(Street, City, State, ZIP)*

Collaborative Testing Services, Inc., 8343-A Greensboro Drive, McLean, VA 22102 and Technical Association of the Pulp and Paper Industry

13. Type of Report & Period Covered

FINAL

14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

Collaborative Reference Programs provide participating laboratories with the means for checking periodically the level and uniformity of their testing in comparison with that of other participating laboratories. An important by-product of the programs is the provision of realistic pictures of the state of the testing art. This is one of the periodic reports showing averages for each participant, within and between laboratory variability, and other information for participants and standards committees.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)*

Collaborative reference program; Laboratory evaluation; Paper; Precision; Reference samples; Testing calibration

18. AVAILABILITY

☐ Unlimited

☒ For Official Distribution. Do Not Release to NTIS

☐ Order From Sup. of Doc., U.S. Government Printing Office, Washington, DC 20402, SD Stock No. SN003-003-

☐ Order From National Technical Information Service (NTIS), Springfield, VA. 22161

19. SECURITY CLASS (THIS REPORT)	21. NO. OF PRINTED PAGES
UNCLASSIFIED	58
20. SECURITY CLASS (THIS PAGE)	**22. Price**
UNCLASSIFIED	

USCOMM-DC