TECHNICAL ASSOCIATION OF THE
PULP AND PAPER INDUSTRY

NBSIR 80-1821

COLLABORATIVE REFERENCE PROGRAM FOR PAPER

REPORT NO. 61G

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)

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- Concora test of medium

MCCA Color and Appearance (4 times per year)

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- 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

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TECHNICAL ASSOCIATION OF THE
PULP AND PAPER INDUSTRY

COLLABORATIVE REFERENCE PROGRAM FOR PAPER

Report No. 61G

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NBSIR 80-1821

U.S. DEPARTMENT OF COMMERCE
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INTRODUCTION

Reports 61S and 61G comprise the first 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

February 1, 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 S 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

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:

0 - 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 95% 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. SDs 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 'S'. 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:

REPL CRP - The number of replicate test determinations used in this Collaborative Reference Program.

REPL 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 SD. See TAPPI Official Test Method T1206 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.

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 A61 KRAFT ENVELOPE 90 GRAMS PER SQUARE METER MEAN	DEV	No.DEV	SDR	Ro.SDR	SAMPLE A22 PRINTING 103 GRAMS PER SQUARE METER MEAN	DEV	No.DEV	SDR	Ro.SDR	TEST Do = 10 VAR	F	LAB
L106	20.2	-1.7	-1.04	3.7	1.03	44.4	-1.0	-.40	3.5	1.12	40D	6	L106
L107	23.1	1.2	.75	3.2	1.15	45.2	-.2	-.09	3.4	1.08	40D	6	L107
L121	21.2	-.7	-.44	2.4	.85	45.3	-2.2	-.83	2.9	.92	40D	6	L121
L123	23.8	1.9	1.17	2.9	1.03	45.6	-.4	-.16	4.8	1.53	40D	6	L123
L124G	19.2	-2.7	-1.64	3.0	1.07	41.9	-3.5	-1.34	2.0	.63	40D	6	L124G
L125	23.4	1.3	.80	2.3	.84	44.7	-.7	-.28	2.3	.74	40D	6	L125
L128	23.1	1.2	.75	1.7	.62	46.5	1.1	.40	3.2	1.04	40D	6	L128
L141	23.1	1.2	.72	2.0	.66	47.4	2.0	.75	3.4	1.09	40D	6	L141
L148	22.4	.6	.33	3.3	1.18	47.7	2.3	.87	3.0	.96	40D	6	L148
L153	21.1	-.3	-.17	2.7	.95	44.0	-1.4	-.55	3.7	1.18	40D	6	L153
L159	19.4	-2.3	-1.49	3.0	1.07	46.5	3.1	1.17	1.6	.51	40D	*	L159
L163	20.4	-1.3	-.88	3.0	1.05	47.0	1.5	.59	2.0	.64	40D	6	L163
L166	24.8	2.9	1.79	3.4	1.21	49.3	3.9	1.49	4.2	1.35	40D	6	L166
L174	21.9	.0	.02	3.2	1.13	45.8	.4	.15	3.9	1.27	40D	6	L174
L176	22.3	.4	.23	2.8	.91	49.3	3.8	1.47	6.9	2.20	40D	6	L176
L182G	21.8	-.1	-.06	1.7	.59	41.9	-3.5	-1.35	1.2	.38	40D	6	L182G
L183	22.7	.8	.45	4.4	1.59	49.0	3.6	1.36	4.2	1.33	40D	6	L183
L190C	25.1	3.2	1.95	2.8	.90	45.8	.4	.14	1.5	.47	40D	6	L190C
L190R	21.7	-.2	-.13	3.0	1.09	42.5	-3.0	-1.13	1.9	.61	40D	6	L190R
L203	23.2	1.4	.81	3.1	1.10	49.8	4.3	1.66	3.9	1.25	40D	6	L203
L212	19.9	-1.9	-1.17	4.8	1.71	44.2	-1.2	-.47	4.2	1.34	40D	6	L212
L219	21.5	-.4	-.23	2.2	.78	45.3	-2.1	-.82	2.5	.79	40D	6	L219
L223	23.0	1.1	.69	3.2	1.13	48.1	2.7	1.02	3.3	1.07	40D	6	L223
L228	23.8	1.9	1.14	2.8	.97	49.2	3.8	1.44	1.6	.50	40D	6	L228
L230G	22.6	.7	.43	2.8	1.00	47.9	2.5	.94	4.3	1.36	40D	6	L230G
L241	17.7	-4.2	-2.62	2.3	.81	40.2	-5.2	-1.99	1.7	.53	40D	*	L241
L242	22.7	.8	.49	2.9	1.02	44.1	-1.3	-.51	3.2	1.02	40D	6	L242
L254	19.8	-2.0	-1.23	1.8	.66	40.9	1.5	.56	3.1	1.01	40D	6	L254
L259	21.2	-.6	-.38	2.4	.84	42.9	-2.5	-.97	3.1	1.00	40D	6	L259
L261	21.2	-.0	-.03	2.1	.76	45.7	.2	.08	3.9	1.26	40D	6	L261
L262G	23.4	1.6	.99	1.4	.51	46.3	.8	.32	2.8	.91	40D	6	L262G
L265	21.4	-.5	-.31	1.8	.66	45.6	.4	.14	2.7	.87	40D	6	L265
L278	22.8	1.0	.63	4.3	1.62	45.6	.2	.07	2.5	.80	40D	6	L278
L285	23.3	1.4	.88	2.4	.84	48.6	1.4	.52	2.8	.88	40D	6	L285
L301	21.8	-.1	-.04	2.8	.94	47.7	2.3	.88	3.2	1.03	40D	6	L301
L308	21.1	-.8	-.47	2.8	.92	46.8	1.4	.52	3.6	1.17	40D	6	L308
L313	19.3	-2.8	-1.58	2.8	.93	46.2	.8	.29	1.8	.56	40D	6	L313
L320	20.6	-1.3	-.76	2.3	.89	38.4	-7.0	-2.69	3.0	.95	40D	*	L320
L324	23.2	1.3	.77	3.3	1.25	47.1	1.6	.62	3.8	1.20	40D	6	L324
L326	22.4	.5	.31	3.3	1.17	46.4	1.0	.37	3.7	1.17	40D	6	L326
L328	20.4	-1.3	-.80	3.8	1.37	44.0	-1.4	-.53	4.4	1.41	40D	6	L328
L337	21.0	-.9	-.55	1.8	.68	43.3	-2.1	-.80	2.3	.74	40D	6	L337
L339	18.1	-3.8	-2.27	2.8	.99	36.7	-6.8	-2.59	2.4	.78	40D	*	L339
L344	21.7	-.2	-.11	1.4	.51	42.4	-3.0	-1.15	2.6	.82	40D	6	L344
L348	23.6	1.7	1.01	3.8	1.34	47.9	2.5	.94	2.7	.87	40D	6	L348
L376	23.8	1.9	1.14	4.8	1.43	47.5	2.0	.78	2.9	.91	40D	6	L376
L380	20.9	-1.0	-.59	2.3	.83	42.2	-3.2	-1.24	2.2	.71	40D	6	L380
L388	20.4	-1.3	-.80	4.4	1.58	48.2	2.6	1.05	2.3	.74	40D	6	L388
L396M	25.6	3.7	2.28	4.8	1.73	49.3	3.8	1.47	4.5	1.44	40D	6	L396M
L484	19.4	-2.3	-1.38	2.2	.80	42.7	-2.8	-1.06	3.5	1.11	40D	6	L484
L567	22.0	.1	.06	2.4	.88	44.9	-.6	-.21	3.3	1.07	40D	6	L567
L576	21.6	-.3	-.19	2.7	1.02	43.5	-1.9	-.73	2.4	.77	40D	6	L576
L585	21.7	-.2	-.13	1.9	.69	44.5	-.9	-.35	3.2	1.02	40D	6	L585
L597	23.3	1.4	.88	4.9	1.78	46.0	.6	.21	3.8	1.22	40D	6	L597
L616	21.9	.0	.01	.9	.31	46.2	.8	.29	1.1	.36	40D	6	L616
L636	20.0	-1.9	-1.19	1.8	.68	42.6	-2.8	-1.08	2.4	.78	40D	6	L636
L651	15.6	-6.3	-3.97	2.8	1.00	39.0	-6.4	-2.46	2.7	.87	40D	X	L651
L676	22.1	.2	.13	2.8	1.02	48.0	2.6	.98	2.8	.91	40D	6	L676
L697	24.0	2.2	1.39	2.3	.83	43.7	-1.7	-.65	5.2	1.65	40D	6	L697
L715	23.0	1.1	.69	2.1	.74	46.6	1.2	.45	2.3	.73	40D	6	L715

GR. MEAN = 21.9 GURLEY UNITS GRAND MEAN = 45.4 GURLEY UNITS TEST DETERMINATIONS = 10

SD MEANS = 1.7 GURLEY UNITS SD OF MEANS = 2.6 GURLEY UNITS 59 LABS IN GRAND MEANS

AVERAGE SDR = 2.8 GURLEY UNITS AVERAGE SDR = 3.1 GURLEY UNITS

L115	21.6	-.3	-.17	1.8	.68	46.0	.4	.17	1.6	.59	40U	*	L115
L291	25.5	3.6	2.28	2.3	.88	46.3	.7	.29	3.2	1.24	40U	*	L291

TOTAL NUMBER OF LABORATORIES REPORTING = 62

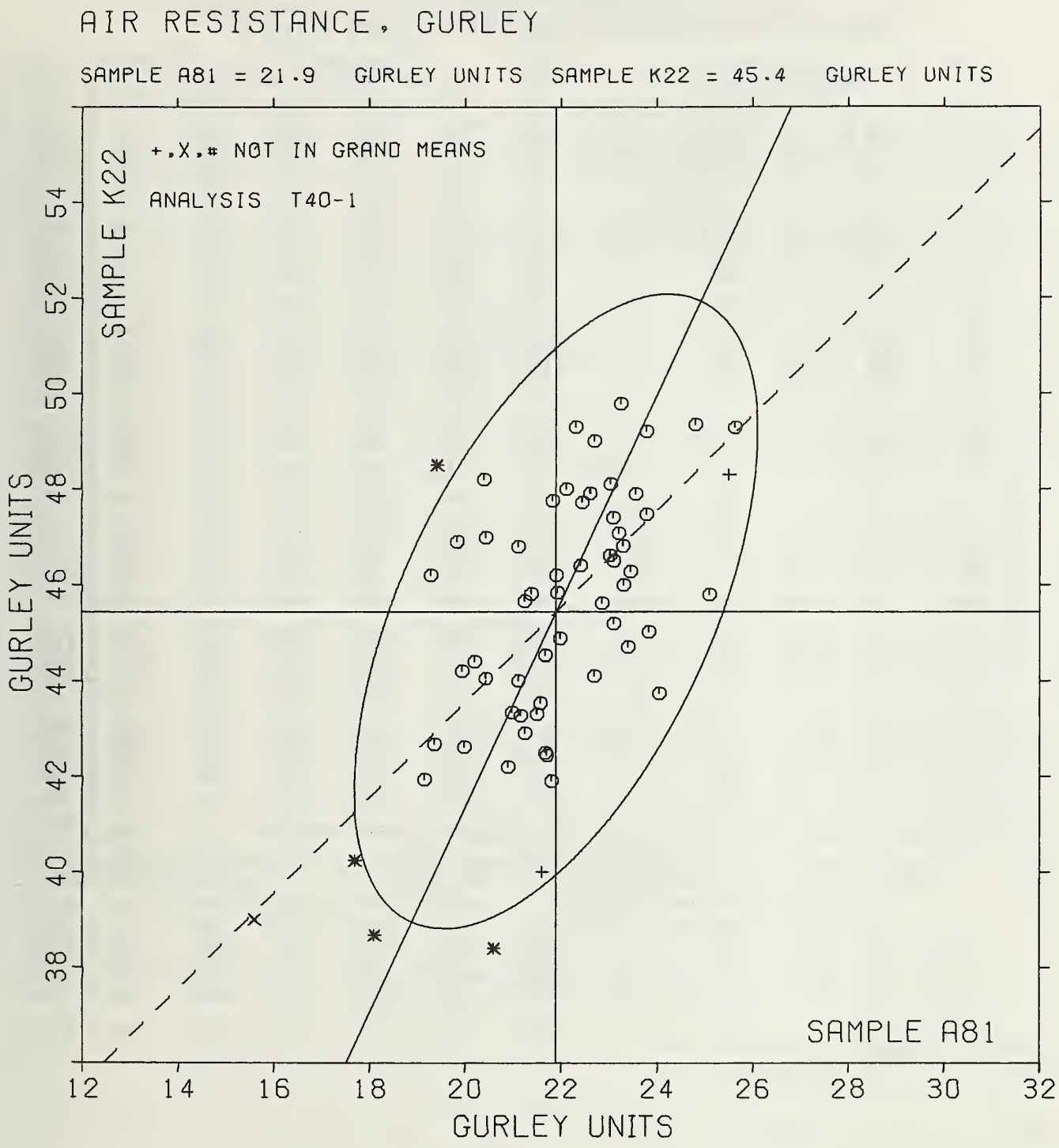
Best values: A81 22.0 ± 2.4 Gurley units
K22 45.3 ± 3.9 Gurley units

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 A81	MEANS K22	COORDINATES MAJOR	COORDINATES MINOR	AVG DEVIATION	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L651	X	15.6	39.0	-8.5	3.0	.93	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L241	*	17.7	40.2	-6.5	1.0	.07	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L339	*	18.1	38.7	-7.7	.6	.88	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L124G	G	19.2	41.9	-4.3	1.0	.85	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L313	G	19.3	46.2	-.4	2.7	.74	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L484	G	19.4	42.7	-3.6	1.1	.95	40H	AIR RESISTANCE, REGMED-TYPE GURLEY DENSOMETER -OIL FLOTATION
L159	*	19.4	48.5	1.7	3.5	.79	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L254	G	19.8	46.9	.5	2.5	.03	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L212	G	19.9	44.2	-1.9	1.2	1.02	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L636	G	20.0	42.6	-3.4	.5	.70	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L106	G	20.2	44.4	-1.7	1.1	1.23	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L388	G	20.4	48.2	1.9	2.5	1.15	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L163	G	20.4	47.0	.8	2.0	.05	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L328	G	20.4	44.0	-1.9	.7	1.09	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L32C	*	20.0	38.4	-6.9	-1.8	.92	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L380	G	20.9	42.2	-3.4	-.5	.77	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L337	G	21.0	43.3	-2.3	-.1	.65	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L308	G	21.1	46.8	.9	1.3	1.04	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L153	G	21.1	44.0	-1.6	.1	1.06	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L121	G	21.2	43.3	-2.3	-.3	.88	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L261	G	21.2	45.7	-.1	.7	1.01	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L259	G	21.2	42.9	-2.8	-.5	.92	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L265	G	21.4	45.8	.1	.6	.76	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L219	G	21.5	43.3	-2.1	-.6	.73	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L576	G	21.6	43.5	-1.9	-.5	.90	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L115	*	21.6	40.0	-5.1	-2.0	.53	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L190R	G	21.7	42.5	-2.8	-1.0	.85	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L585	G	21.7	44.5	-.9	-.2	.85	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L344	G	21.7	42.4	-2.8	-1.1	.87	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L182G	G	21.8	41.9	-3.2	-1.4	.49	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L301	G	21.8	47.7	2.1	1.0	.99	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L616	G	21.9	46.2	.7	.3	.94	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L174	G	21.9	45.8	.4	.1	1.21	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L567	G	22.0	44.9	-.5	-.3	.96	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L676	G	22.1	48.0	2.4	.9	.96	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L176	G	22.3	49.3	3.7	1.2	1.36	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L326	G	22.4	46.4	1.1	-.1	1.17	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L148	G	22.4	47.7	2.3	.5	1.07	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L230G	G	22.6	47.9	2.5	.4	1.18	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L242	G	22.7	44.1	-.9	-1.3	1.02	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L183	G	22.7	49.0	3.0	.8	1.46	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L278	G	22.8	45.6	.6	-.8	1.21	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L715	G	23.0	46.6	1.5	-.5	.73	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L223	G	23.0	48.1	2.9	.1	1.10	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L141	G	23.1	47.4	2.3	-.3	1.04	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L107	G	23.1	45.2	.3	-1.2	1.11	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L128	G	23.1	46.5	1.5	-.7	.93	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L324	G	23.2	47.1	2.0	-.5	1.23	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L203	G	23.2	49.8	4.5	.6	1.16	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L285	G	23.3	46.8	1.0	-.7	.86	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L597	G	23.3	46.0	1.1	-1.0	1.49	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L125	G	23.4	44.7	-.0	-1.7	.79	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L262G	G	23.4	46.3	1.4	-1.1	.71	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L348	G	23.6	47.9	2.9	-.5	1.11	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L376	G	23.8	47.5	2.6	-.9	1.17	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L228	G	23.8	49.2	4.2	-.1	.86	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L123	G	23.8	45.0	.4	-1.9	1.26	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L697	G	24.0	43.7	-.6	-2.7	1.27	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L166	G	24.8	49.3	4.8	-1.0	1.28	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L190C	G	25.1	45.8	1.7	-2.8	.89	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L291	*	25.5	48.3	4.1	-2.1	.90	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L396M	G	25.6	49.3	5.1	-1.8	1.04	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
GMEANS:		21.9	45.4			1.00		
		95% ELLIPSE:		7.2	3.2	WIDE GAMMA = 65 DEGREES		


AIR RESISTANCE, GURLEY
SAMPLE A81 = 21.9 GURLEY UNITS SAMPLE K22 = 45.4 GURLEY UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T40-1
SAMPLE K22
GURLEY UNITS
38
40
42
44
46
48
50
52
54
12
14
16
18
20
22
24
26
28
30
32
GURLEY UNITS
SAMPLE A81

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 A81 MEAN	KRAFT ENVELOPE 90 GRAMS PER SQUARE METER DEV	No. DEV	SDR	R. SDR	SAMPLE K22 MEAN	PRINTING 103 GRAMS PER SQUARE METER DEV	No. DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L114	137.8	3.0	.30	8.9	.68	66.5	7.4	.97	3.6	.71	40S	G	L114
L121	134.0	19.8	1.90	12.0	.92	92.5	13.4	1.76	4.9	.96	40S	G	L121
L122S	142.4	8.2	.81	14.0	1.13	99.3	20.2	2.66	12.6	2.50	40S	*	L122S
L124S	138.3	4.1	.44	10.4	1.26	78.8	-.3	-.04	2.6	.52	40S	G	L124S
L132	131.2	-3.0	-.29	10.0	1.23	74.3	-4.8	-.64	3.7	.72	40S	G	L132
L148	143.4	9.2	.91	15.0	1.10	60.8	1.7	.22	3.6	.72	40S	G	L148
L150	144.7	10.5	1.04	21.0	1.06	76.8	-2.3	-.31	6.7	1.33	40S	G	L150
L157	120.5	-13.7	-1.35	9.0	.74	75.5	-3.6	-.48	5.0	.99	40S	G	L157
L158	132.5	-1.7	-.17	12.3	.95	77.5	-1.6	-.21	5.9	1.17	40S	G	L158
L190C	137.5	3.3	.33	18.9	1.46	63.0	3.9	.51	4.2	.84	40S	G	L190C
L213	136.1	1.9	.19	17.0	1.36	74.5	-4.6	-.61	3.1	.61	40S	G	L213
L223	132.1	-2.1	-.20	20.0	1.59	70.2	-8.9	-1.18	4.0	.80	40S	G	L223
L230S	154.9	20.7	2.05	18.0	1.39	127.3	48.2	6.35	4.6	.91	40S	#	L230S
L233	119.9	-14.3	-1.41	9.6	.74	74.7	-4.4	-.58	3.6	.71	40S	G	L233
L241	140.3	6.1	.60	18.3	1.42	86.9	9.8	1.29	6.1	1.20	40S	G	L241
L249	127.8	-6.4	-.63	8.0	.62	76.9	-2.2	-.29	4.3	.84	40S	G	L249
L260	131.1	-3.1	-.30	15.8	1.22	78.5	-.6	-.08	5.2	1.03	40S	G	L260
L262S	130.4	-3.8	-.37	3.8	.30	79.3	.2	.02	4.1	.82	40S	G	L262S
L288	142.7	8.5	.84	14.9	1.15	67.0	7.9	1.04	7.3	1.46	40S	G	L288
L301	143.5	9.3	.92	14.2	1.10	65.5	6.4	.84	13.4	2.66	40S	G	L301
L315	117.5	-16.7	-1.65	13.2	1.02	61.5	-17.6	-2.32	4.7	.94	40S	G	L315
L318	117.6	-16.6	-1.64	8.2	.63	75.3	-3.8	-.50	4.2	.84	40S	G	L318
L352	144.5	10.3	1.02	13.7	1.06	61.7	2.6	.34	4.5	.89	40S	G	L352
L354	134.8	.6	.06	12.0	.92	78.3	-.8	-.11	6.3	1.24	40S	G	L354
L360	135.1	.9	.09	14.3	1.10	79.5	-3.6	-.48	3.8	.75	40S	G	L360
L390	134.0	-.2	-.02	11.0	.85	77.5	-1.6	-.21	6.8	1.34	40S	G	L390
L562	156.0	21.8	2.15	11.6	.90	96.0	18.9	2.49	6.4	1.27	40S	G	L562
L575	147.6	13.4	1.33	13.2	1.02	78.8	-.3	-.04	5.1	1.01	40S	G	L575
L585	122.5	-11.7	-1.15	5.9	.45	78.0	-1.1	-.15	3.5	.69	40S	G	L585
L597	135.4	1.2	.12	20.9	1.61	73.3	-5.8	-.77	4.8	.95	40S	G	L597
L600	129.1	-5.1	-.50	6.4	.49	72.9	-6.2	-.82	5.1	1.02	40S	G	L600
L626	114.4	-19.8	-1.95	7.7	.60	73.3	-5.8	-.77	3.9	.76	40S	G	L626
L684	131.9	-2.3	-.22	14.6	1.13	74.7	-4.4	-.58	4.7	.92	40S	G	L684
L687	132.9	-1.3	-.13	13.0	1.00	78.1	-1.0	-.14	4.8	.95	40S	G	L687
L698	122.4	-11.8	-1.16	8.3	.64	73.0	-6.1	-.81	6.9	1.36	40S	G	L698
L704	133.0	-1.2	-.12	10.2	1.25	NO DATA REPORTED FOR SAMPLE K22					40S	M	L704

GR. MEAN = 134.2 SHEFF. UNITS — GRAND MEAN = 79.1 SHEFF. UNITS — TEST DETERMINATIONS = 10

SD MEANS = 10.1 SHEFF. UNITS — SD OF MEANS = 7.6 SHEFF. UNITS — 34 LABS IN GRAND MEANS

AVERAGE SDR = 13.0 SHEFF. UNITS — AVERAGE SDR = 5.0 SHEFF. UNITS

L182B	580.0	445.8	44.01	63.2	4.88	278.0	198.9	26.23	14.2	2.81	40B	*	L182B
L280	328.7	194.3	19.20	24.0	1.89	129.0	49.9	6.58	9.3	1.85	40B	*	L280
L312	121.2	-13.0	-1.28	8.2	.65	61.7	2.6	.34	4.3	.86	40T	*	L312
L333	608.8	474.6	46.85	99.5	7.68	254.0	174.9	23.06	12.4	2.46	40B	*	L333
L484	575.0	440.8	43.51	63.5	4.90	275.0	195.9	25.83	25.5	5.05	40B	*	L484
L587	124.5	-9.7	-.95	5.0	.38	66.0	6.9	.91	5.2	1.02	40T	*	L587

TOTAL NUMBER OF LABORATORIES REPORTING = 42

Best values: A81 134 ± 15 Sheffield units

K22 78 ± 15 Sheffield units

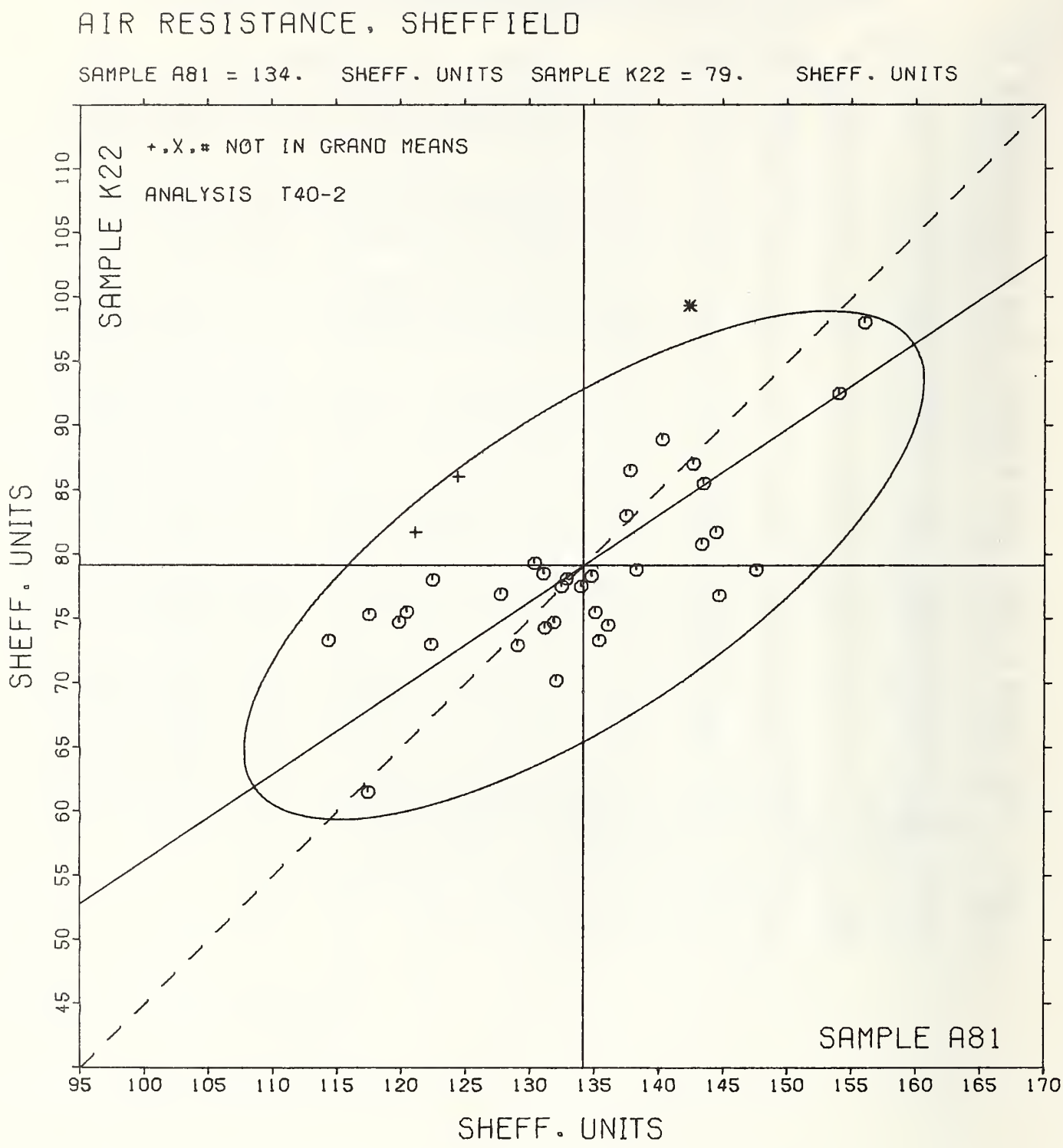
The following laboratories were omitted from the grand means because of extreme test results: 230S.

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 A81	MEANS K22	COORDINATES MAJOR	COORDINATES MINOR	AVG S.D.R	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L626	G	114.4	73.3	-19.7	6.2	.05	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L315	G	117.3	81.5	-23.7	-5.3	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L318	G	117.0	75.3	-15.9	6.1	.73	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L233	G	119.9	74.7	-14.3	4.3	.72	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L157	G	120.5	75.5	-13.4	4.6	.87	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L312	*	121.2	81.7	-9.3	9.4	.07	40T	AIR RESISTANCE, SHEFFIELD (3 INCH DIAMETER ORIFICE)
L698	G	122.4	73.0	-13.2	1.5	1.00	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L585	G	122.5	78.0	-10.3	5.6	.57	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L587	*	124.5	86.0	-4.2	11.1	.70	40T	AIR RESISTANCE, SHEFFIELD (3 INCH DIAMETER ORIFICE)
L245	G	127.8	76.9	-9.5	1.7	.73	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L600	G	129.1	72.9	-7.7	-2.3	.70	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L262S	G	130.4	79.3	-5.0	2.2	.58	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L260	G	131.1	78.5	-2.9	1.2	1.12	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L132	G	131.2	74.3	-5.2	-2.3	.98	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L684	G	131.9	74.7	-4.4	-2.4	1.03	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L223	G	132.1	70.2	-8.7	-8.3	1.20	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L158	G	132.5	77.5	-2.3	-.4	1.00	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L687	G	132.9	78.1	-1.8	-.1	.97	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L704	M	133.0				1.25	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L390	G	134.0	77.5	-1.1	-1.3	1.09	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L354	G	134.8	78.3	.1	-1.0	1.08	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L360	G	135.1	75.5	-1.3	-3.5	.93	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L597	G	135.4	73.3	-2.2	-5.5	1.26	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L213	G	136.1	74.5	-1.0	-4.9	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L190C	G	137.5	83.0	4.9	1.4	1.15	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L114	G	137.8	86.5	7.1	4.1	.79	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L124S	G	138.3	78.8	3.2	-2.0	.89	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L241	G	140.3	88.9	10.5	4.7	1.01	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L122S	*	142.4	99.3	18.1	12.2	1.21	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L288	G	142.7	87.0	11.5	1.8	1.30	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L148	G	143.4	80.8	8.0	-3.8	.94	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L301	G	143.5	85.5	11.3	.1	1.38	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L352	G	144.5	81.7	10.0	-3.0	.97	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L150	G	144.7	76.8	7.4	-7.8	1.20	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L575	G	147.6	78.8	11.0	-7.8	1.02	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L121	G	154.0	92.5	23.9	.0	.94	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L230S	#	154.9	127.3	44.1	28.4	1.15	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L562	G	156.0	98.0	28.0	3.5	1.08	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L280	*	328.7	129.0	189.3	-67.1	1.07	40D	AIR RESISTANCE, BENDTSEN, WG 150
L484	*	575.0	275.0	475.1	-83.3	4.37	40D	AIR RESISTANCE, BENDTSEN, WG 150
L182B	*	580.0	278.0	481.0	-83.6	3.04	40D	AIR RESISTANCE, BENDTSEN, WG 150
L333	*	608.8	254.0	491.5	-119.6	5.07	40D	AIR RESISTANCE, BENDTSEN, WG 150
GMEANS:		134.2	79.1			1.00		
		95% ELLIPSE:		30.8	11.7	WITH GAMMA = 33 DEGREES		


AIR RESISTANCE, SHEFFIELD
SAMPLE A81 = 134. SHEFF. UNITS SAMPLE K22 = 79. SHEFF. UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T40-2
SAMPLE K22
SHEFF. UNITS
SAMPLE A81
SHEFF. UNITS
45 50 55 60 65 70 75 80 85 90 95 100 105 110
95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170

REPORT NO. 61G — TAPPI COLLABORATIVE REFERENCE PROGRAM — SEPTEMBER 1979

ANALYSIS T41-1 TABLE 1

AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION

DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB CODE	SAMPLE D06 MEAN	RELEASE BASE M.F. 112 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	SAMPLE G11 MEAN	M.F. RELEASE PAPER 70 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	VAR	F	LAB
L128	160.	-4.	-.01	10.	.62	268.	-2.	-.06	51.	.62	41G	6	L128
L134	175.	11.	.01	23.	1.46	323.	53.	1.27	102.	1.23	41G	6	L134
L166M	191.	27.	2.09	27.	1.08	299.	29.	.69	120.	1.46	41G	6	L166M
L195	154.	-10.	-.78	10.	.62	176.	-95.	-2.29	45.	.55	41G	6	L195
L224	174.	10.	.77	29.	1.83	313.	43.	1.03	66.	.80	41G	6	L224
L230	19388.	19224.	1487.27	2104.	131.83	25972.	25701.	621.26	6154.	74.40	41G	#	L230
L259	147.	-18.	-1.38	9.	.58	239.	-31.	-.76	62.	.75	41G	6	L259
L312	162.	-2.	-.18	13.	.80	268.	-2.	-.06	73.	.88	41G	6	L312
L358	149.	-15.	-1.18	16.	1.02	266.	-5.	-.12	87.	1.05	41G	6	L358
L557	167.	3.	.23	10.	.63	299.	29.	.69	87.	1.05	41G	6	L557
L574	152.	-12.	-.93	9.	.58	230.	-40.	-.97	99.	1.20	41G	6	L574
L576	172.	7.	.57	19.	1.18	301.	30.	.73	85.	1.03	41G	6	L576
L618	2668.	2524.	195.30	990.	62.04	3438.	3167.	76.56	1075.	13.00	41G	#	L618
L697	168.	4.	.29	17.	1.04	264.	-7.	-.16	114.	1.38	41G	6	L697

GR. MEAN = 164. SEC/10 CC — GRAND MEAN = 271. SEC/10 CC — TEST DETERMINATIONS = 10

SD MEANS = 13. SEC/10 CC — SD OF MEANS = 41. SEC/10 CC — 12 LABS IN GRAND MEANS

AVERAGE SDR = 10. SEC/10 CC — AVERAGE SDR = 83. SEC/10 CC

TOTAL NUMBER OF LABORATORIES REPORTING = 14

Best values: D06 165 ± 20 seconds per 10 cc
G11 270 ± 180 mercury density, (direct reading)

Data from the following laboratories appear to be off by a multiplicative factor: 230, 618.

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.

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ANALYSIS T41-1 TABLE 2

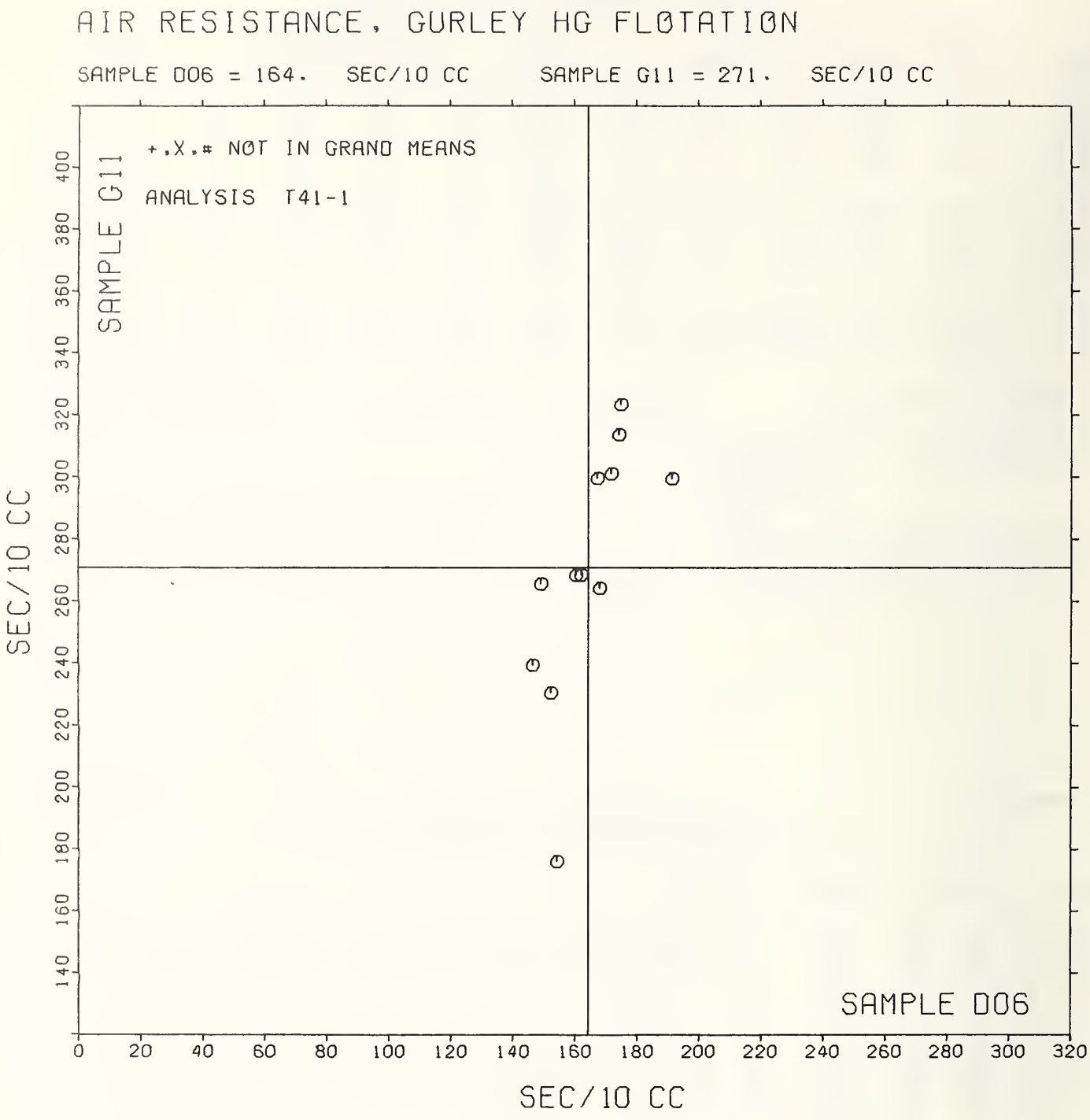
AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION

DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB CODE	F	MEANS D06	G11	COORDINATES MAJOR	MINOR	AVG N. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L259	6	147.	239.	-35.	10.	.60	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L358	6	149.	266.	-8.	14.	1.04	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L574	6	152.	230.	-42.	3.	.08	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L195	6	154.	176.	-95.	-11.	.09	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L128	6	160.	268.	-3.	3.	.62	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L312	6	162.	268.	-3.	2.	.64	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L557	6	167.	299.	29.	4.	.64	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L697	6	168.	264.	-0.	-5.	1.21	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L576	6	172.	301.	31.	-0.	1.10	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L224	6	174.	313.	44.	-0.	1.31	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L134	6	175.	323.	54.	2.	1.35	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L166M	6	191.	299.	34.	-20.	1.07	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L618	#	2668.	3438.	3653.	-1749.	37.62	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L230	#	19388.	25972.	29356.	-12970.	105.12	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION

GMEANS: 164. 271. 1.00

95% ELLIPSE: 127. 27. WITH GAMMA = 77 DEGREES


AIR RESISTANCE, GURLEY HG FLØTATIØN
SAMPLE D06 = 164. SEC/10 CC
SAMPLE G11 = 271. SEC/10 CC
+,X,# NØT IN GRAND MEANS
ANALYSIS T41-1
SAMPLE G11
SEC/10 CC
SAMPLE D06
SEC/10 CC
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320
140 160 180 200 220 240 260 280 300 320 340 360 380 400

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ANALYSIS T44-1 TABLE 1

SMOOTHNESS, PARKER PRINTSURF

LAB CODE	SAMPLE J74 PRINTING 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE K46 PRINTING 60 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L122	4.96	.69	1.44	.17	1.11	5.35	.77	1.59	.12	.74	44P	6	L122
L136	4.05	-.31	-.73	.20	1.25	5.44	-.15	-.31	.13	.80	44P	6	L136
L182	4.31	-.06	-.13	.15	.98	5.49	-.10	-.20	.16	.99	44P	6	L182
L288	4.81	.45	1.06	.20	1.31	6.05	.46	.96	.38	2.40	44P	6	L288
L317	4.32	-.04	-.11	.12	.79	5.27	-.32	-.66	.13	.85	44P	6	L317
L588	3.75	-.61	-1.47	.18	1.14	4.91	-.68	-1.41	.12	.76	44P	6	L588
L669	4.34	-.02	-.05	.07	.42	5.60	.01	.03	.07	.45	44P	6	L669

GR. MEAN = 4.36 MICRONS — GRAND MEAN = 5.59 MICRONS — TEST DETERMINATIONS = 10

SD MEANS = .42 MICRONS — SD OF MEANS = .48 MICRONS — 7 LABS IN GRAND MEANS

AVERAGE SDR = .18 MICRONS — AVERAGE SDR = .16 MICRONS

TOTAL NUMBER OF LABORATORIES REPORTING = 7

Best values: J74 4.3 microns
K46 5.5 microns

REPORT NO. 61G — TAPPI COLLABORATIVE REFERENCE PROGRAM — SEPTEMBER 1979

ANALYSIS T44-1 TABLE 2

SMOOTHNESS, PARKER PRINTSURF

LAB CODE	F	MEANS J74	K46	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L588	6	3.75	4.91	-.91	.02	.95	44P	SMOOTHNESS, PARKER PRINTSURF
L136	6	4.05	5.44	-.32	.14	1.03	44P	SMOOTHNESS, PARKER PRINTSURF
L182	6	4.31	5.49	-.11	-.02	.98	44P	SMOOTHNESS, PARKER PRINTSURF
L317	6	4.32	5.27	-.27	-.17	.82	44P	SMOOTHNESS, PARKER PRINTSURF
L669	6	4.34	5.60	-.00	.02	.44	44P	SMOOTHNESS, PARKER PRINTSURF
L288	6	4.81	6.05	.04	-.04	1.05	44P	SMOOTHNESS, PARKER PRINTSURF
L122	6	4.96	6.35	.97	.05	.93	44P	SMOOTHNESS, PARKER PRINTSURF
GMEANS:		4.36	5.59			1.00		
		95% ELLIPSE:		2.35	.36	WITH GAMMA = 49 DEGREES		

ANALYSIS T459-1 TABLE 1

SMOOTHNESS, SHEFFIELD UNITS

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

LAB CODE	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	No DEV	SDR	Ro SDR	SAMPLE A46 MEAN	PRINTING 60 GRAMS PER SQUARE METER DEV	No DEV	SDR	Ro SDR	TEST Do = 15 VAR	F	LAB
L107	130.3	49.5	8.97	10.6	2.11	214.7	47.2	5.97	16.8	1.81	45S	#	L107
L108	78.6	-2.3	-.41	3.0	.70	164.0	-3.4	-.43	3.9	.42	45S	@	L108
L114	82.6	1.7	.31	3.9	.70	170.8	3.4	.43	8.9	.96	45S	@	L114
L115	87.0	6.1	1.11	3.2	.62	163.7	-3.8	-.48	5.2	.55	45S	@	L115
L121	85.3	4.3	.81	4.5	.94	165.0	-2.4	-.31	3.8	.41	45S	@	L121
L122	80.9	.1	.01	4.9	.90	162.3	-5.2	-.65	6.2	.67	45S	@	L122
L123	84.7	3.9	.70	7.2	1.42	166.7	1.3	.16	10.5	1.13	45S	@	L123
L124	85.3	4.4	.80	5.9	1.15	165.4	-2.0	-.26	9.4	1.01	45S	@	L124
L125	78.7	-2.2	-.40	5.0	1.14	166.0	-1.4	-.18	6.9	.74	45S	@	L125
L126	87.6	6.7	1.22	4.4	.86	171.1	3.6	.46	7.3	.78	45S	@	L126
L128	85.5	4.7	.83	4.3	.85	165.8	-1.6	-.21	11.0	1.18	45S	@	L128
L132	80.9	.1	.01	10.6	2.08	175.1	7.7	.97	8.1	.87	45S	@	L132
L134	78.0	-2.9	-.52	4.1	.81	157.3	-10.1	-1.28	4.2	.45	45S	@	L134
L139S	88.1	7.3	1.32	6.0	1.18	174.0	6.6	.83	7.6	.81	45S	@	L139S
L148	83.0	7.1	1.29	4.9	.95	177.9	10.4	1.32	12.0	1.28	45S	@	L148
L150	75.8	-5.1	-.92	4.6	.90	174.5	7.1	.90	10.5	1.13	45S	@	L150
L152	91.9	11.1	2.01	3.6	.71	165.3	17.8	2.26	10.7	1.15	45S	@	L152
L153	103.5	22.0	4.10	3.4	.67	190.3	22.8	2.89	17.7	1.90	45S	X	L153
L157	77.5	-3.4	-.62	6.9	1.35	171.5	4.0	.51	10.3	1.10	45S	@	L157
L158	73.3	-7.5	-1.37	5.2	1.03	160.0	-7.4	-.94	9.3	.99	45S	@	L158
L159	78.9	-4.0	-.73	4.3	.85	166.3	.8	.11	7.0	.75	45S	@	L159
L162	80.5	-.3	-.06	5.4	1.05	162.3	-5.2	-.65	5.0	.54	45S	@	L162
L166	30.3	-.5	-.10	4.5	.85	151.7	-15.7	-1.99	9.8	1.05	45S	@	L166
L167	91.7	.8	.14	3.1	.61	166.0	-1.4	-.18	4.7	.50	45S	@	L167
L183S	77.5	-3.4	-.62	4.0	.79	164.2	-3.2	-.41	10.8	1.16	45S	@	L183S
L190C	85.0	4.1	.73	5.3	1.05	173.3	5.9	.75	10.8	1.16	45S	@	L190C
L190R	71.1	-9.8	-1.78	4.5	.90	161.9	-5.5	-.70	7.9	.85	45S	@	L190R
L195	77.5	-3.4	-.61	6.0	1.17	162.1	-5.4	-.68	9.3	.99	45S	@	L195
L203	78.6	-2.3	-.41	4.0	.79	166.4	-1.0	-.13	12.1	1.29	45S	@	L203
L206	83.3	2.5	.45	4.9	.95	173.2	5.8	.73	11.4	1.22	45S	@	L206
L211	79.9	-.9	-.17	5.0	.96	171.7	3.2	.41	12.2	1.31	45S	@	L211
L213	73.5	-7.4	-1.34	10.4	2.03	151.7	-15.8	-1.99	9.9	1.07	45S	@	L213
L219	96.1	15.2	2.76	4.5	.90	171.6	4.2	.53	11.5	1.23	45S	*	L219
L223	75.1	-5.8	-1.05	6.0	1.18	162.6	-4.8	-.61	10.3	1.11	45S	@	L223
L224	83.5	2.7	.49	3.9	.77	164.5	-3.0	-.38	7.8	.83	45S	@	L224
L226B	74.5	-6.3	-1.15	4.0	.79	156.3	-9.2	-1.16	6.6	.71	45S	@	L226B
L228	81.7	.8	.14	4.6	.90	173.6	6.2	.78	8.5	.91	45S	@	L228
L230S	89.9	9.0	1.63	5.4	1.06	187.1	19.6	2.48	13.0	1.39	45S	*	L230S
L231	77.9	-2.9	-.53	5.6	1.10	166.5	1.0	.13	12.7	1.36	45S	@	L231
L233	74.8	-6.1	-1.10	6.4	1.27	163.4	-4.0	-.51	8.9	.95	45S	@	L233
L237	78.9	-1.9	-.35	3.8	.74	174.7	7.2	.91	6.4	.69	45S	@	L237
L241	83.7	2.9	.52	4.6	.90	153.3	-14.1	-1.78	8.8	.94	45S	@	L241
L249	78.1	-2.7	-.50	5.5	1.04	167.3	-.2	-.02	9.0	.96	45S	@	L249
L254	79.4	-1.5	-.27	3.9	.76	170.8	3.4	.43	8.2	.87	45S	@	L254
L259	89.9	9.1	1.64	7.4	1.46	186.2	18.8	2.37	9.3	1.00	45S	@	L259
L260	80.1	-.7	-.13	4.0	.79	171.6	4.2	.53	6.7	.72	45S	@	L260
L261	75.3	-5.6	-1.02	6.0	1.18	166.7	-.8	-.10	12.6	1.35	45S	@	L261
L262	84.6	3.7	.68	4.1	.81	161.6	-5.8	-.74	12.7	1.36	45S	@	L262
L275	74.9	-6.0	-1.09	2.4	.46	164.6	-2.6	-.33	9.5	1.02	45S	@	L275
L277	87.1	6.3	1.14	8.1	1.58	190.3	22.9	2.90	6.3	.68	45S	*	L277
L278	95.5	14.7	2.66	7.5	1.40	195.3	27.8	3.52	8.2	.88	45S	X	L278
L281	73.0	-5.9	-1.06	2.9	.56	159.7	2.3	.29	9.8	1.05	45S	@	L281
L285	73.3	-7.6	-1.38	4.8	.95	157.3	-10.2	-1.29	9.8	1.05	45S	@	L285
L288	73.5	-7.3	-1.33	5.9	1.15	229.7	62.2	7.87	14.8	1.59	45S	#	L288
L290	80.5	-.4	-.07	2.7	.53	157.0	-10.4	-1.32	8.7	.93	45S	@	L290
L291S	83.5	2.7	.48	4.1	.81	166.8	-.6	-.08	11.9	1.27	45S	@	L291S
L301	83.5	2.7	.48	6.7	1.32	166.1	.6	.08	9.0	.97	45S	@	L301
L305	79.1	-1.7	-.32	6.2	1.22	160.3	-7.1	-.90	9.8	1.05	45S	@	L305
L308	79.5	-1.4	-.25	4.6	.91	162.4	-5.0	-.64	7.5	.81	45S	@	L308
L312	88.0	7.1	1.29	6.2	1.22	161.4	-6.0	-.76	6.3	.67	45S	@	L312
L317	77.1	-3.8	-.69	4.6	.90	159.9	-7.5	-.95	16.1	1.72	45S	@	L317
L318	73.7	-7.2	-1.31	6.7	1.31	165.8	-3.6	-.46	8.5	.91	45S	@	L318
L323	91.3	10.3	1.87	6.5	1.28	170.4	8.6	1.08	10.2	1.09	45S	@	L323
L326	84.3	3.5	.64	3.5	.68	156.6	-10.6	-1.35	8.0	.86	45S	@	L326
L328	76.3	-4.6	-.84	3.7	.72	169.7	2.3	.29	10.4	1.12	45S	@	L328

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

LAB CODE	SAMPLE J74 PRINTING 76 GRAMS PER SQUARE METER MEAN	DEV	NO. DEV	SDR	R. SDR	SAMPLE K46 PRINTING 60 GRAMS PER SQUARE METER MEAN	DEV	NO. DEV	SDR	R. SDR	VAP	F	LAB	TEST D. = 15
L348	82.2	1.3	.24	5.0	.98	170.9	3.4	.43	11.3	1.21	45S	C	L348	
L349	77.6	-3.3	-.59	9.8	1.34	171.2	3.8	.48	10.4	1.12	45S	C	L349	
L352	85.9	5.1	.92	7.0	1.38	173.1	5.7	.72	12.2	1.31	45S	C	L352	
L360	75.5	-5.4	-.96	5.1	1.00	168.9	1.4	.18	11.0	1.18	45S	C	L360	
L366	69.6	-11.3	-2.04	5.9	1.15	146.0	-21.4	-2.71	10.3	1.10	45S	*	L366	
L376	94.3	13.5	2.44	4.8	.94	170.9	9.5	1.20	9.9	1.06	45S	C	L376	
L380	79.5	-1.3	-.24	3.9	.76	169.3	1.9	.24	9.8	1.05	45S	C	L380	
L382	75.5	-5.4	-.98	4.3	.84	164.7	-2.8	-.35	4.9	.52	45S	C	L382	
L390	83.0	2.1	.37	4.6	.89	168.3	.9	.11	7.5	.80	45S	C	L390	
L562	80.4	-.5	-.09	8.3	1.63	174.1	6.6	.84	6.6	.70	45S	C	L562	
L567	78.8	-2.1	-.38	4.7	.93	164.5	-3.0	-.38	7.5	.80	45S	C	L567	
L571	100.7	25.8	4.63	7.5	1.47	207.3	39.9	5.05	13.9	1.49	45S	*	L571	
L575	83.3	2.4	.43	7.0	1.38	165.7	-1.8	-.22	8.5	.92	45S	C	L575	
L585	73.7	-7.2	-1.31	4.8	.94	170.3	8.9	1.13	18.0	1.93	45S	C	L585	
L587	82.3	1.5	.27	5.9	1.17	169.3	1.9	.24	10.8	1.16	45S	C	L587	
L597	75.9	-5.0	-.91	4.7	.93	167.7	.2	.03	15.2	1.63	45S	C	L597	
L600	82.1	1.3	.23	4.4	.86	166.7	-.8	-.10	7.4	.79	45S	C	L600	
L604	76.5	-4.4	-.80	5.9	1.16	164.3	-3.1	-.39	13.5	1.44	45S	C	L604	
L626	75.1	-5.8	-1.05	4.7	.91	167.5	.1	.01	9.8	1.05	45S	C	L626	
L636	92.1	11.2	2.03	1.9	.38	170.0	2.6	.32	7.5	.81	45S	C	L636	
L651	86.5	5.7	1.03	4.3	.85	147.8	-19.6	-2.48	6.9	.74	45S	X	L651	
L670	84.6	3.7	.68	5.6	1.10	183.1	15.7	1.99	15.5	1.66	45S	C	L670	
L698	77.3	-3.6	-.65	5.2	1.02	155.1	-12.4	-1.56	9.9	1.07	45S	C	L698	
L704	79.3	-1.6	-.28	6.8	1.33	NO DATA REPORTED FOR SAMPLE K46					45S	M	L704	

GR. MEAN = 80.9 SHEFF. UNITS GRAND MEAN = 167.4 SHEFF. UNITS TEST DETERMINATIONS = 15
SD MEANS = 5.5 SHEFF. UNITS SD OF MEANS = 7.9 SHEFF. UNITS 82 LABS IN GRAND MEANS
AVERAGE SDR = 5.1 SHEFF. UNITS AVERAGE SDR = 9.3 SHEFF. UNITS
TOTAL NUMBER OF LABORATORIES REPORTING = 89

Best values: J74 80 ± 9 Sheffield units
K46 167 ± 12 Sheffield units

The following laboratories were omitted from the grand means because of extreme test results: 107, 288, 571.

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

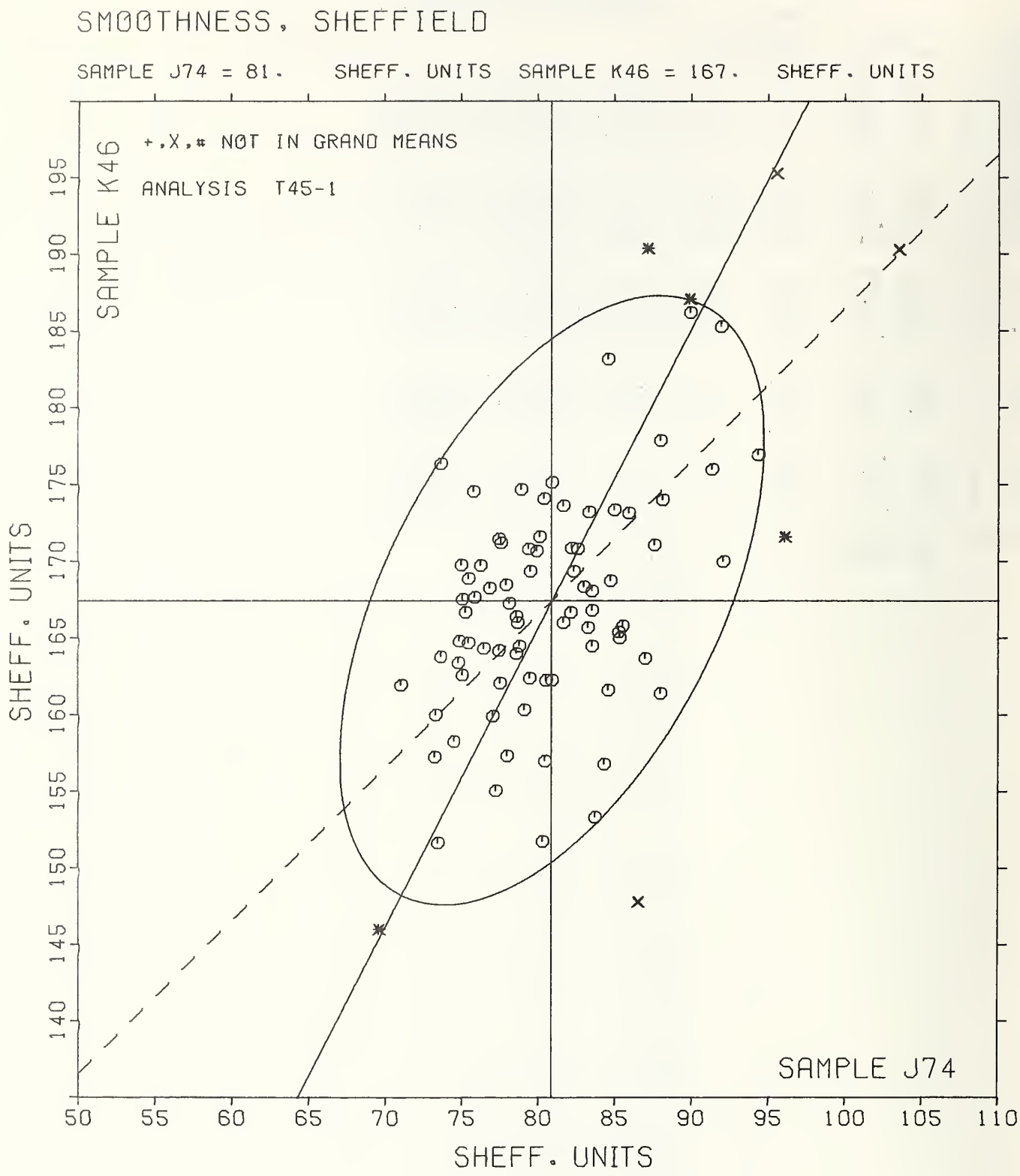
LAB CODE	F	MEANS J74	MEANS K46	COORDINATES MAJOR	COORDINATES MINOR	AVG DEV	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L366	*	69.6	146.0	-24.2	.3	1.13	45S	SMOOTHNESS, SHEFFIELD
L190R	0	71.1	161.9	-9.4	0.2	.68	45S	SMOOTHNESS, SHEFFIELD
L285	0	73.3	157.3	-12.5	2.1	1.00	45S	SMOOTHNESS, SHEFFIELD
L158	0	73.3	160.0	-10.1	3.3	1.01	45S	SMOOTHNESS, SHEFFIELD
L213	0	73.5	151.7	-17.4	-.6	1.36	45S	SMOOTHNESS, SHEFFIELD
L288	*	73.5	229.7	52.0	34.9	1.37	45S	SMOOTHNESS, SHEFFIELD
L585	0	73.7	176.3	4.6	10.5	1.44	45S	SMOOTHNESS, SHEFFIELD
L318	0	73.7	163.8	-6.5	4.8	1.11	45S	SMOOTHNESS, SHEFFIELD
L226B	0	74.5	158.3	-11.0	1.5	.75	45S	SMOOTHNESS, SHEFFIELD
L233	0	74.8	163.4	-6.4	3.6	1.11	45S	SMOOTHNESS, SHEFFIELD
L275	0	74.9	164.8	-5.1	4.1	.74	45S	SMOOTHNESS, SHEFFIELD
L281	0	75.0	169.7	-.0	6.3	.81	45S	SMOOTHNESS, SHEFFIELD
L626	0	75.1	167.5	-2.6	5.2	.95	45S	SMOOTHNESS, SHEFFIELD
L223	0	75.1	162.6	-7.0	3.0	1.14	45S	SMOOTHNESS, SHEFFIELD
L261	0	75.3	166.7	-3.2	4.6	1.26	45S	SMOOTHNESS, SHEFFIELD
L382	0	75.5	164.7	-4.9	3.6	.68	45S	SMOOTHNESS, SHEFFIELD
L360	0	75.5	168.9	-1.2	5.5	1.09	45S	SMOOTHNESS, SHEFFIELD
L150	0	75.8	174.5	4.0	7.6	1.01	45S	SMOOTHNESS, SHEFFIELD
L597	0	75.9	167.7	-2.1	4.6	1.28	45S	SMOOTHNESS, SHEFFIELD
L328	0	76.3	169.7	-.1	5.1	.92	45S	SMOOTHNESS, SHEFFIELD
L604	0	76.5	164.3	-4.8	2.5	1.30	45S	SMOOTHNESS, SHEFFIELD
L159	0	76.9	168.3	-1.1	3.9	.60	45S	SMOOTHNESS, SHEFFIELD
L317	0	77.1	159.9	-8.4	-.0	1.31	45S	SMOOTHNESS, SHEFFIELD
L698	0	77.3	155.1	-12.7	-2.4	1.04	45S	SMOOTHNESS, SHEFFIELD
L157	0	77.5	171.5	2.0	4.9	1.23	45S	SMOOTHNESS, SHEFFIELD
L183S	0	77.5	164.2	-4.4	1.6	.97	45S	SMOOTHNESS, SHEFFIELD
L195	0	77.5	162.1	-6.5	.5	1.08	45S	SMOOTHNESS, SHEFFIELD
L349	0	77.6	171.2	1.9	4.6	1.23	45S	SMOOTHNESS, SHEFFIELD
L231	0	77.9	168.5	-.4	3.1	1.23	45S	SMOOTHNESS, SHEFFIELD
L134	0	78.0	157.3	-10.3	-2.1	.63	45S	SMOOTHNESS, SHEFFIELD
L249	0	78.1	167.3	-1.4	2.4	1.00	45S	SMOOTHNESS, SHEFFIELD
L108	0	78.6	164.0	-4.1	.5	.96	45S	SMOOTHNESS, SHEFFIELD
L203	0	78.8	166.4	-2.0	1.5	1.04	45S	SMOOTHNESS, SHEFFIELD
L125	0	78.7	166.0	-2.3	1.3	.94	45S	SMOOTHNESS, SHEFFIELD
L567	0	78.8	164.5	-3.6	.5	.87	45S	SMOOTHNESS, SHEFFIELD
L237	0	78.9	174.7	5.6	5.0	.71	45S	SMOOTHNESS, SHEFFIELD
L305	0	79.1	160.3	-7.1	-1.7	1.13	45S	SMOOTHNESS, SHEFFIELD
L704	M	79.3				1.33	45S	SMOOTHNESS, SHEFFIELD
L254	0	79.4	170.8	2.3	2.8	.62	45S	SMOOTHNESS, SHEFFIELD
L308	0	79.5	162.4	-5.1	-1.0	.66	45S	SMOOTHNESS, SHEFFIELD
L380	0	79.5	169.3	1.1	2.1	.91	45S	SMOOTHNESS, SHEFFIELD
L211	0	79.9	170.7	2.4	2.3	1.14	45S	SMOOTHNESS, SHEFFIELD
L260	0	80.1	171.6	3.4	2.6	.75	45S	SMOOTHNESS, SHEFFIELD
L166	0	80.3	151.7	-14.2	-.7	.95	45S	SMOOTHNESS, SHEFFIELD
L562	0	80.4	174.1	5.7	3.4	1.16	45S	SMOOTHNESS, SHEFFIELD
L290	0	80.5	157.0	-9.3	-4.4	.73	45S	SMOOTHNESS, SHEFFIELD
L162	0	80.5	162.3	-4.8	-2.1	.80	45S	SMOOTHNESS, SHEFFIELD
L122	0	80.9	162.3	-4.6	-2.4	.81	45S	SMOOTHNESS, SHEFFIELD
L132	0	80.9	175.1	8.9	3.3	1.47	45S	SMOOTHNESS, SHEFFIELD
L167	0	81.7	166.0	-.9	-1.4	.98	45S	SMOOTHNESS, SHEFFIELD
L228	0	81.7	173.6	5.8	2.1	.93	45S	SMOOTHNESS, SHEFFIELD
L600	0	82.1	166.7	-.1	-1.5	.62	45S	SMOOTHNESS, SHEFFIELD
L348	0	82.2	170.9	3.7	.4	1.09	45S	SMOOTHNESS, SHEFFIELD
L587	0	82.3	169.3	2.4	-.4	1.16	45S	SMOOTHNESS, SHEFFIELD
L114	0	82.6	170.8	3.6	-.0	.66	45S	SMOOTHNESS, SHEFFIELD
L390	0	83.0	168.3	1.6	-1.3	.63	45S	SMOOTHNESS, SHEFFIELD
L575	0	83.3	165.7	-.3	-2.9	1.15	45S	SMOOTHNESS, SHEFFIELD
L206	0	83.3	173.2	6.3	.4	1.09	45S	SMOOTHNESS, SHEFFIELD
L301	0	83.5	168.1	1.8	-2.1	1.14	45S	SMOOTHNESS, SHEFFIELD
L224	0	83.5	164.5	-1.4	-3.7	.60	45S	SMOOTHNESS, SHEFFIELD
L291S	0	83.5	166.8	.6	-2.7	1.04	45S	SMOOTHNESS, SHEFFIELD
L241	0	83.7	153.3	-11.2	-9.0	.92	45S	SMOOTHNESS, SHEFFIELD
L326	0	84.3	156.8	-7.9	-7.9	.77	45S	SMOOTHNESS, SHEFFIELD
L670	0	84.6	183.1	19.7	3.8	1.38	45S	SMOOTHNESS, SHEFFIELD
L262	0	84.6	161.6	-3.3	-6.0	1.09	45S	SMOOTHNESS, SHEFFIELD

ANALYSIS T45-1 TABLE 2

SMOOTHNESS, SHEFFIELD UNITS

TAPPI USEFUL TEST METHOD UM 516, SMOOTHNESS OF PAPER (SHEFFIELD)

LAB CODE	F	MEANS J74	MEANS K46	COORDINATES MAJOR	COORDINATES MINOR	AVG R.O.U.R. VAR.	PROPERTY---TEST INSTRUMENT---CONDITIONS
L123	G	84.7	168.7	2.9	-2.8	1.27	45S SMOOTHNESS, SHEFFIELD
L190C	G	85.0	173.3	7.1	-1.0	1.10	45S SMOOTHNESS, SHEFFIELD
L124	G	85.3	165.4	.2	-4.8	1.08	45S SMOOTHNESS, SHEFFIELD
L121	G	85.3	165.0	-.1	-5.1	.07	45S SMOOTHNESS, SHEFFIELD
L128	G	85.5	165.8	.7	-4.9	1.01	45S SMOOTHNESS, SHEFFIELD
L352	G	85.9	173.1	7.4	-1.9	1.34	45S SMOOTHNESS, SHEFFIELD
L651	X	86.5	147.8	-14.9	-14.0	.79	45S SMOOTHNESS, SHEFFIELD
L115	G	87.0	163.7	-.6	-7.2	.59	45S SMOOTHNESS, SHEFFIELD
L277	#	87.1	190.3	23.2	4.9	1.13	45S SMOOTHNESS, SHEFFIELD
L126	G	87.6	171.1	6.3	-4.3	.62	45S SMOOTHNESS, SHEFFIELD
L148	G	88.0	177.9	12.5	-1.6	1.12	45S SMOOTHNESS, SHEFFIELD
L312	G	88.0	161.4	-2.1	-9.1	.55	45S SMOOTHNESS, SHEFFIELD
L139S	G	88.1	174.0	9.2	-3.5	1.00	45S SMOOTHNESS, SHEFFIELD
L230S	#	89.9	187.1	21.6	.9	1.23	45S SMOOTHNESS, SHEFFIELD
L259	G	89.9	186.2	20.8	.5	1.23	45S SMOOTHNESS, SHEFFIELD
L323	G	91.3	176.0	12.4	-5.4	1.39	45S SMOOTHNESS, SHEFFIELD
L152	G	91.9	185.3	20.9	-1.7	.53	45S SMOOTHNESS, SHEFFIELD
L636	G	92.1	170.0	7.4	-8.8	.60	45S SMOOTHNESS, SHEFFIELD
L376	G	94.3	176.9	14.6	-7.6	1.00	45S SMOOTHNESS, SHEFFIELD
L278	X	95.5	195.3	31.3	-.4	1.17	45S SMOOTHNESS, SHEFFIELD
L219	#	96.1	171.6	10.6	-11.6	1.66	45S SMOOTHNESS, SHEFFIELD
L153	X	103.5	190.3	30.6	-9.7	1.28	45S SMOOTHNESS, SHEFFIELD
L571	#	106.7	207.3	47.3	-4.8	1.48	45S SMOOTHNESS, SHEFFIELD
L107	#	130.3	214.7	54.6	-22.5	1.96	45S SMOOTHNESS, SHEFFIELD
GMEANS:		89.9	167.4			1.00	
		95% ELLIPSE:		21.6	10.9	WITH GAMMA = 62 DEGREES	


SMOOTHNESS, SHEFFIELD
SAMPLE J74 = 81. SHEFF. UNITS
SAMPLE K46 = 167. SHEFF. UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T45-1
SAMPLE K46
SHEFF. UNITS
140 145 150 155 160 165 170 175 180 185 190 195
SAMPLE J74
50 55 60 65 70 75 80 85 90 95 100 105 110
SHEFF. UNITS

ANALYSIS T45-2 TABLE 1
SMOOTHNESS, BEKK SECONDS
TAPPI SUGGESTED METHOD T479 SU-71, SMOOTHNESS OF PAPER (BEKK METHOD)

LAB CODE	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	NO.DEV	SDR	NO.SDR	SAMPLE K46 MEAN	PRINTING 60 GRAMS PER SQUARE METER DEV	NO.DEV	SDR	NO.SDR	VAR	F	LAB
L139B	85.2	1.5	.49	5.0	.74	29.9	2.8	1.24	3.2	1.11	45K	@	L139B
L162	88.4	4.7	1.23	11.0	1.44	26.6	-.5	-.22	3.7	1.30	45K	@	L162
L182K	65.3	-18.4	-4.00	5.1	.66	26.6	-.5	-.23	2.3	.80	45K	#	L182K
L190C	81.1	-2.6	-.68	7.8	1.03	26.7	-.4	-.17	3.6	1.26	45K	@	L190C
L230B	78.5	-5.2	-1.37	4.3	.59	23.4	-3.7	-1.67	2.0	.69	45K	@	L230B
L291K	88.4	4.7	1.24	13.9	1.82	27.8	.7	.32	3.3	1.18	45K	@	L291K
L564	85.5	1.8	.47	6.3	.83	26.7	1.6	.73	2.7	.93	45K	@	L564
L581	79.7	-4.0	-1.07	5.7	.75	24.7	-2.4	-1.10	1.4	.51	45K	@	L581
L697	82.7	-.9	-.25	6.2	.81	29.0	1.9	.86	2.9	1.02	45K	@	L697
GR. MEAN =	83.7 BEKK SECONDS			GRAND MEAN =		27.1 BEKK SECONDS			TEST DETERMINATIONS =		15		
SD MEANS =	3.8 BEKK SECONDS			SD OF MEANS =		2.2 BEKK SECONDS			8 LABS IN GRAND MEANS				
	AVERAGE SDR =	7.6 BEKK SECONDS				AVERAGE SDR =	2.8 BEKK SECONDS						
L250M	65.3	-18.4	-4.00	4.3	.56	25.2	-1.9	-.86	2.4	.83	45L	*	L250M
L251	74.2	-9.5	-2.04	8.4	1.10	23.5	-3.6	-1.62	1.5	.54	45L	*	L251

TOTAL NUMBER OF LABORATORIES REPORTING = 11

Best values: J74 84 Bekk seconds
K46 27 Bekk seconds

The following laboratories were omitted from the grand means because of extreme test results: 182K.

ANALYSIS T45-2 TABLE 2
SMOOTHNESS, BEKK SECONDS
TAPPI SUGGESTED METHOD T479 SU-71, SMOOTHNESS OF PAPER (BEKK METHOD)

LAB CODE	F	MEANS J74	K46	COORDINATES MAJOR	MINOR	AVG NO.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L250M	*	65.3	25.2	-17.6	5.7	.69	45L	SMOOTHNESS, BEKK, 20 C, 65% RH
L182K	#	65.3	26.6	-17.0	7.0	.73	45K	SMOOTHNESS, BEKK
L251	*	74.2	23.5	-10.1	.6	.82	45L	SMOOTHNESS, BEKK, 20 C, 65% RH
L230B	@	78.5	23.4	-6.2	-1.3	.64	45K	SMOOTHNESS, BEKK
L581	@	79.7	24.7	-4.7	-.6	.63	45K	SMOOTHNESS, BEKK
L190C	@	81.1	26.7	-2.5	.7	1.14	45K	SMOOTHNESS, BEKK
L697	@	82.7	29.0	-.1	2.1	.92	45K	SMOOTHNESS, BEKK
L139B	@	85.2	29.9	2.5	1.9	.92	45K	SMOOTHNESS, BEKK
L564	@	85.5	28.7	2.3	.8	.88	45K	SMOOTHNESS, BEKK
L291K	@	88.4	27.8	4.6	-1.3	1.30	45K	SMOOTHNESS, BEKK
L162	@	88.4	26.6	4.1	-2.4	1.37	45K	SMOOTHNESS, BEKK
GMEANS:		83.7	27.1			1.00		
		95% ELLIPSE:		14.1	5.6	WITH GAMMA = 23 DEGREES		

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ANALYSIS T47-1 TABLE 1

SMOOTHNESS, BENDTSEN (MILLILITERS/MINUTE)

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

LAB CODE	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	SAMPLE K46 MEAN	PRINTING 60 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L182B	98.8	2.2	.22	13.7	1.03	238.5	6.6	.42	27.3	1.17	47B	6	L182B
L242	84.4	-12.2	-1.24	0.0	.71	213.5	-10.4	-.66	19.2	.82	47B	6	L242
L244	93.7	-2.9	-.29	9.2	1.09	220.5	-3.4	-.22	28.0	1.20	47B	6	L244
L280	110.9	14.3	1.45	0.0	.61	254.6	30.7	1.95	37.2	1.59	47B	6	L280
L313	91.0	-5.0	-.57	9.9	1.18	216.0	-7.9	-.50	17.8	.76	47B	6	L313
L333	101.1	4.3	.40	13.3	1.58	260.6	-17.9	-1.14	26.0	1.11	47B	6	L333
L484	107.8	11.2	1.14	4.2	.50	236.0	12.1	.77	13.5	.58	47B	6	L484
L685	85.0	-11.0	-1.16	4.1	.49	214.0	-9.9	-.63	18.4	.78	47B	6	L685

GR. MEAN = 96.6 ML/MIN — GRAND MEAN = 223.9 ML/MIN — TEST DETERMINATIONS = 10

SD MEANS = 9.8 ML/MIN — SD OF MEANS = 15.7 ML/MIN — 8 LABS IN GRAND MEANS

AVERAGE SDR = 8.4 ML/MIN — AVERAGE SDR = 23.4 ML/MIN

TOTAL NUMBER OF LABORATORIES REPORTING = 8

Best values: J74 96 milliliter per minute
K46 220 milliliter per minute

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ANALYSIS T47-1 TABLE 2

SMOOTHNESS, BENDTSEN (MILLILITERS/MINUTE)

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

LAB CODE	F	MEANS J74	K46	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L242	6	84.4	213.5	-14.9	3.8	.77	47B	SMOOTHNESS, BENDTSEN, WG 150
L685	6	85.0	214.0	-14.2	3.5	.83	47B	SMOOTHNESS, BENDTSEN, WG 150
L313	6	91.0	216.0	-9.6	1.2	.97	47B	SMOOTHNESS, BENDTSEN, WG 150
L244	6	93.7	220.5	-4.4	.9	1.14	47B	SMOOTHNESS, BENDTSEN, WG 150
L182B	6	98.8	230.5	0.9	1.2	1.40	47B	SMOOTHNESS, BENDTSEN, WG 150
L333	6	101.1	260.0	-13.0	-12.5	1.33	47B	SMOOTHNESS, BENDTSEN, WG 150
L484	6	107.8	236.0	10.0	-4.1	.94	47B	SMOOTHNESS, BENDTSEN, WG 150
L280	6	110.9	254.6	33.6	2.0	1.20	47B	SMOOTHNESS, BENDTSEN, WG 150
GMEANS:		96.0	223.9			1.00		
		95% ELLIPSE:	61.0	20.4		Ward Gamma = 61 DEGREES		

ANALYSIS T53-1 TABLE 1
MOISTURE IN PAPER, PERCENT
TAPPI SUGGESTED METHOD T412 SU-69

LAB CODE	SAMPLE G09 PRINTING 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE G10 BROWN KRAFT 76 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	VAR	F	LAB
L134	6.32	.40	1.23	.10	1.34	6.36	.19	.39	.05	.68	53M	G	L134
L141	6.24	.32	.98	.05	.71	6.70	.53	1.09	.10	1.32	53D	G	L141
L162	5.46	-.46	-1.42	.13	1.65	5.45	-.72	-1.49	.07	.93	53M	G	L162
L213	5.37	-.55	-1.70	.06	1.07	5.42	-.75	-1.55	.12	1.62	53M	G	L213
L244	5.90	-.02	-.07	.00	.00	6.30	.13	.26	.00	.00	53D	G	L244
L291	6.17	.24	.73	.06	.75	6.83	.66	1.36	.15	2.02	53D	G	L291
L442	5.92	.00	.00	.12	1.55	6.29	.12	.25	.06	.82	53D	G	L442
L570	7.08	1.16	3.57	.93	12.08	5.60	-.57	-1.18	.71	9.36	53D	#	L570
L571	5.93	.01	.02	.05	.63	6.12	-.05	-.11	.08	1.04	53M	G	L571
L592	5.99	.07	.21	.10	1.29	6.08	-.09	-.19	.04	.56	53M	G	L592

GR. MEAN = 5.92 PERCENT GRAND MEAN = 6.17 PERCENT TEST DETERMINATIONS = 10
SD MEANS = .32 PERCENT SD OF MEANS = .48 PERCENT 9 LABS IN GRAND MEANS
AVERAGE SDR = .08 PERCENT AVERAGE SDR = .08 PERCENT
TOTAL NUMBER OF LABORATORIES REPORTING = 10
Best values: G09 5.9 percent
G10 6.1 percent

The following laboratories were omitted from the grand means because of extreme test results: 570

ANALYSIS T53-1 TABLE 2
MOISTURE IN PAPER, PERCENT
TAPPI SUGGESTED METHOD T412 SU-69

LAB CODE	F	MEANS G09	G10	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L213	G	5.37	5.42	-.93	.06	1.35	53M	MOISTURE CONTENT, MOISTREX
L162	G	5.46	5.45	-.80	-.00	1.29	53M	MOISTURE CONTENT, MOISTREX
L244	G	5.90	6.30	.09	.09	.00	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L442	G	5.92	6.29	.10	.06	1.19	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L571	G	5.93	6.12	-.04	-.04	.04	53M	MOISTURE CONTENT, MOISTREX
L592	G	5.99	6.08	-.04	-.11	.93	53M	MOISTURE CONTENT, MOISTREX
L291	G	6.17	6.83	.69	.15	1.38	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L141	G	6.24	6.70	.02	.02	1.02	53D	MOISTURE CONTENT, OVEN DRYING METHOD
L134	G	6.32	6.36	.37	-.23	1.01	53M	MOISTURE CONTENT, MOISTREX
L570	#	7.08	5.60	.15	-1.28	10.72	53D	MOISTURE CONTENT, OVEN DRYING METHOD
GMEANS:		5.92	6.17			1.00		
		95% ELLIPSE:		1.88	.38	WITH GAMMA = 57 DEGREES		

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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 B80 COATED OFFSET BOOK 75 GRAMS PER SQUARE METER MEAN	DEV	NO. DEV	SDR	R. SDR	SAMPLE B92 COATED HEAT SET OFFSET 76 GRAMS PER SQUARE METER MEAN	DEV	NO. DEV	SDR	R. SDR	TEST D. = 4 VAR	F	LAB
L126	24.7	.8	.24	1.1	1.37	23.1	-.7	-.24	.7	.91	56K	6	L126
L149	21.7	-2.2	-.72	.3	.04	21.7	-2.1	-.67	1.3	1.67	56K	6	L149
L182	25.4	1.5	.48	.8	.98	25.1	1.3	.43	.2	.25	56K	6	L182
L277	26.5	2.5	.89	.0	.74	26.C	2.2	.71	.8	1.08	56K	6	L277
L291	19.0	-5.0	-1.01	1.3	1.65	18.3	-5.5	-1.81	.6	.80	56K	6	L291
L333	21.5	-2.5	-.80	1.0	1.29	23.7	-.1	-.02	.5	.66	56K	6	L333
L337	22.3	-1.7	-.54	1.1	1.39	21.1	-2.7	-.88	1.3	1.70	56K	6	L337
L339	30.2	6.3	2.00	.3	.04	29.6	5.8	1.89	.7	.99	56K	6	L339
L616	23.7	-.2	-.06	.3	.04	24.7	.9	.30	.5	.66	56K	6	L616
L643	24.7	.8	.24	.5	.04	24.7	.9	.30	1.0	1.27	56K	6	L643

GR. MEAN = 24.0 K & N UNITS — GRAND MEAN = 23.8 K & N UNITS — TEST DETERMINATIONS = 4

SD MEANS = 3.1 K & N UNITS — SD OF MEANS = 3.1 K & N UNITS — 10 LABS IN GRAND MEANS

AVERAGE SDR = .8 K & N UNITS — AVERAGE SDR = .8 K & N UNITS

TOTAL NUMBER OF LABGRAIDARES REPORTING = 10

Best values: B80 25 K & N units

B92 23 K & N units

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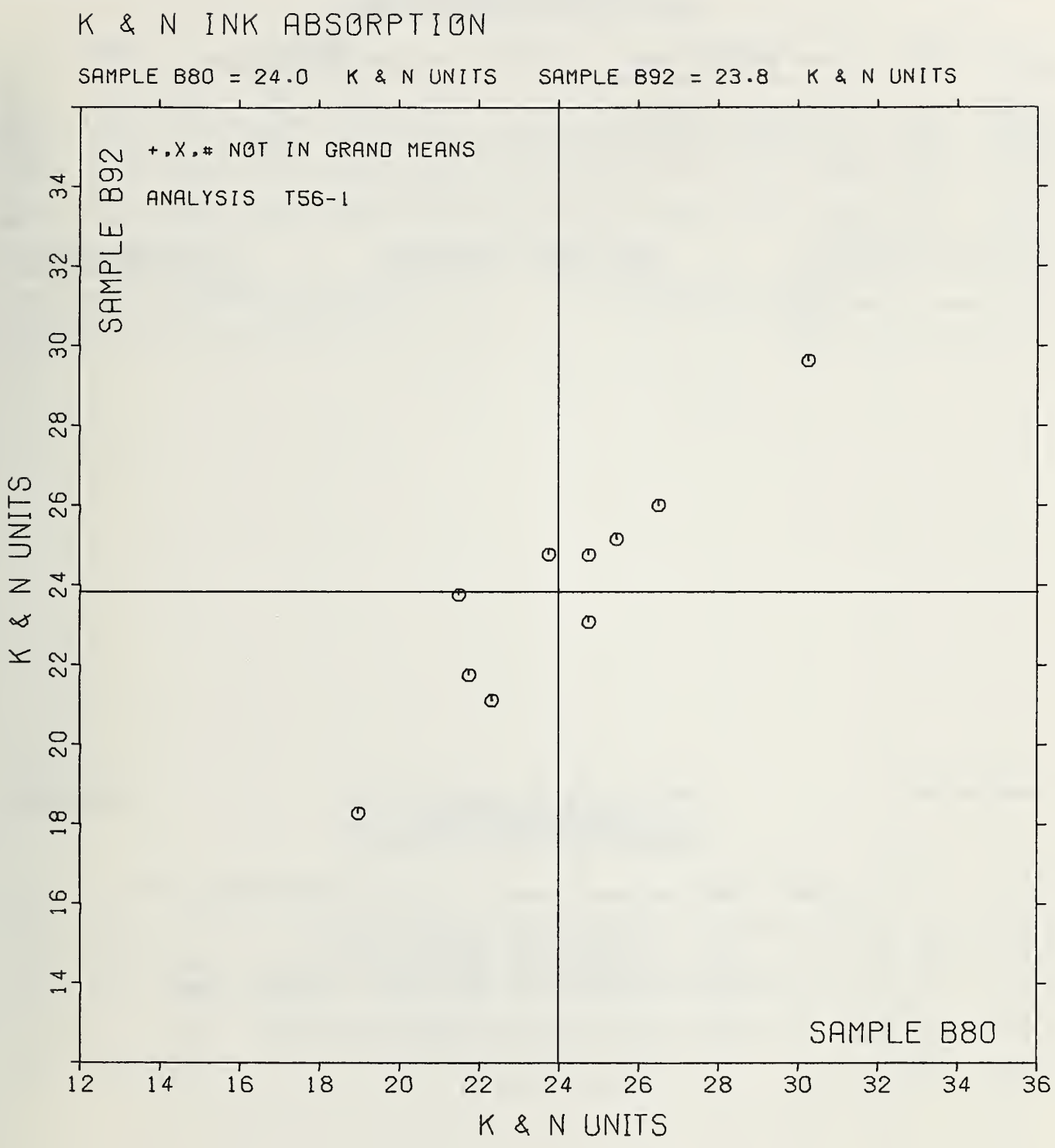
ANALYSIS T56-1 TABLE 2

K & N INK ABSORPTION

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

LAB CODE	F	MEANS B80	B92	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L291	6	19.0	18.3	-7.5	-.4	1.23	56K	INK ABSORPTION, K&N INK TEST
L333	6	21.5	23.7	-1.5	1.7	.97	56K	INK ABSORPTION, K&N INK TEST
L149	6	21.7	21.7	-3.1	.1	1.15	56K	INK ABSORPTION, K&N INK TEST
L337	6	22.3	21.1	-3.1	-.8	1.34	56K	INK ABSORPTION, K&N INK TEST
L616	6	23.7	24.7	.5	.8	.05	56K	INK ABSORPTION, K&N INK TEST
L126	6	24.7	23.1	.0	-1.1	1.14	56K	INK ABSORPTION, K&N INK TEST
L643	6	24.7	24.7	1.2	.1	.90	56K	INK ABSORPTION, K&N INK TEST
L182	6	25.4	25.1	2.0	-.1	.02	56K	INK ABSORPTION, K&N INK TEST
L277	6	26.5	26.0	3.3	-.2	.91	56K	INK ABSORPTION, K&N INK TEST
L339	6	30.2	29.6	8.5	-.2	.02	56K	INK ABSORPTION, K&N INK TEST
GMEANS:		24.0	23.8			1.00		
		95% ELLIPSE:		13.7	2.5	WITH GAMMA = 44 DEGREES		


K & N INK ABSORPTION
SAMPLE B80 = 24.0 K & N UNITS
SAMPLE B92 = 23.8 K & N UNITS
+.X.# NOT IN GRAND MEANS
ANALYSIS T56-1
SAMPLE B92
SAMPLE B80
K & N UNITS
K & N UNITS
12
14
16
18
20
22
24
26
28
30
32
34
36

REPORT NO. 61G

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T57-1 TABLE 1
HYDROGEN ION CONCENTRATION (PH), COLD
TAPPI OFFICIAL TEST METHOD T509 OS-77

SEPTEMBER 1979

LAB CODE	SAMPLE A99 REPROCOPY 78 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	R.SDR	SAMPLE J78 PRINTING 89 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	R.SDR	TEST D. = 5 VAR	F	LAB
L162	5.780	.051	.45	.049	1.69	7.348	.148	.38	.026	.32	57A	0	L162
L182C	5.850	.121	1.08	.052	1.15	7.380	.180	.46	.047	.58	57D	0	L182C
L251C	5.892	.163	1.45	.026	.57	7.634	.434	1.11	.024	.30	57P	0	L251C
L328	5.630	-.099	-.87	.045	.99	7.240	.040	.10	.042	.52	57M	0	L328
L356	5.604	-.125	-1.10	.051	1.13	6.742	-.458	-1.17	.032	.40	57V	0	L356
L442	5.709	-.020	-.18	.039	.85	7.477	.277	.71	.310	3.84	57G	0	L442
L484A	5.640	-.089	-.79	.095	1.21	6.580	-.620	-1.59	.084	1.04	57Y	0	L484A

GR. MEAN = 5.729 PH UNITS — GRAND MEAN = 7.200 PH UNITS — TEST DETERMINATIONS = 5
SD MEANS = .114 PH UNITS — SD OF MEANS = .391 PH UNITS — 7 LABS IN GRAND MEANS
AVERAGE SDR = .045 PH UNITS — AVERAGE SDR = .081 PH UNITS
TOTAL NUMBER OF LABORATORIES REPORTING = 7

Best values: A99 5.7 pH units
J78 7.3 pH units

REPORT NO. 61G

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T57-1 TABLE 2
HYDROGEN ION CONCENTRATION (PH), COLD
TAPPI OFFICIAL TEST METHOD T509 OS-77

SEPTEMBER 1979

LAB CODE	F	MEANS A99	J78	COORD.MATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L356	0	5.604	6.742	-.475	.020	.70	57V	PH, COLD, BECKMAN EXPANDOMATIC
L328	0	5.630	7.240	.017	.106	.75	57M	PH, COLD, BECKMAN ZEROMATIC
L484A	0	5.640	6.580	-.624	-.052	1.12	57Y	PH, COLD, BECKMAN MODEL H2
L442	0	5.709	7.477	.266	.062	2.35	57G	PH, COLD, ORION DIGITAL IONALYZER
L162	0	5.780	7.348	.155	-.016	.71	57A	PH, COLD, CORNING MODEL 12 RESEARCH METER
L182C	0	5.850	7.380	.202	-.077	.07	57D	PH, COLD, RADIOMETER TYPE PH M 28
L251C	0	5.892	7.634	.459	-.061	.44	57P	PH, COLD, RADIOMETER TYPE PH M64
GMEANS:		5.729	7.200			1.00		
		95% ELLIPSE:		1.492	.268	WITH GAMMA = 77 DEGREES		

ANALYSIS T57-2 TABLE 1
HYDROGEN ION CONCENTRATION (PH), HOT
TAPPI OFFICIAL TEST METHOD T435 OS-77

LAB CODE	SAMPLE A99 MEAN	REPROCOPY 78 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	SAMPLE J78 MEAN	PRINTING 89 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	TEST D. = 5 VAR	F	LAB
L128	4.960	-.222	-.80	.055	1.01	7.580	-.125	-.77	.045	.70	57L	G	L128
L162	4.926	-.256	-1.00	.022	.40	NO DATA REPORTED FOR SAMPLE J78					57C	M	L162
L174H	5.542	.359	1.40	.028	.51	7.896	.191	1.17	.021	.33	57G	G	L174H
L182H	5.188	.006	.02	.045	.84	7.784	.079	.49	.100	1.57	57E	G	L182H
L334	5.142	-.040	-.16	.186	3.45	8.818	1.113	6.84	.144	2.25	57C	#	L334
L484B	5.040	-.142	-.55	.089	1.65	7.560	-.145	-.89	.089	1.40	57Z	G	L484B

GR. MEAN = 5.182 PH UNITS GRAND MEAN = 7.705 PH UNITS TEST DETERMINATIONS = 5
SD MEANS = .258 PH UNITS SD OF MEANS = .163 PH UNITS 4 LABS IN GRAND MEANS
AVERAGE SDR = .054 PH UNITS AVERAGE SDR = .064 PH UNITS
TOTAL NUMBER OF LABORATORIES REPORTING = 6

The following laboratories were omitted from the grand means because of extreme test results: 334.

ANALYSIS T57-2 TABLE 2
HYDROGEN ION CONCENTRATION (PH), HOT
TAPPI OFFICIAL TEST METHOD T435 OS-77

LAB CODE	F	MEANS A99	J78	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L162	M	4.926				.40	57C	PH, HOT, CORNING MODEL 12 RESEARCH METER
L128	G	4.960	7.580	-.255	.010	.05	57L	PH, HOT, L+N
L484B	G	5.040	7.560	-.197	-.049	1.32	57Z	PH, HOT, BECKMAN MODEL H2
L334	#	5.142	8.818	.547	.970	2.05	57C	PH, HOT, CORNING MODEL 12 RESEARCH METER
L182H	G	5.188	7.784	.046	.004	1.20	57E	PH, HOT, RADIOMETER TYPE PH M 28
L174H	G	5.542	7.896	.406	-.025	.42	57G	PH, HOT, FISHER ACCUMET MODEL 220
GMEANS:		5.182	7.705			1.00		
		95% ELLIPSE:		2.264	.375	WITH GAMMA = 31 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

	SAMPLE	HIGH BRIGHTNESS PRINTING				SAMPLE	BOND				TEST D_o = 10		
LAB	G01	116 GRAMS PER SQUARE METER				E65	79 GRAMS PER SQUARE METER						
CODE	MEAN	DEV	N_o DEV	SDR	R_o SDR	MEAN	DEV	N_o DEV	SDR	R_o SDR	VAR	F	LAB
L105	96.20	.32	.94	.14	.62	89.84	.12	.28	.48	1.36	60H	@	L105
L108	95.55	-.33	-.96	.31	1.37	89.89	.17	.40	.82	2.30	60B	@	L108
L115	96.29	.41	1.20	.11	.48	90.16	.44	1.03	.29	.81	60B	@	L115
L118	95.82	-.00	-.00	.14	.61	89.75	.03	.07	.16	.47	60B	@	L118
L122	96.24	.30	1.00	.13	.59	89.94	.22	.52	.46	1.30	60D	@	L122
L123	96.00	.12	.35	.23	1.01	89.21	-.51	-1.20	.63	1.78	60W	@	L123
L124	96.26	.38	1.11	.08	2.96	89.72	.00	.00	.61	1.73	60B	@	L124
L125	95.79	-.09	-.27	.30	1.57	89.59	-.13	-.30	.35	.99	60H	@	L125
L132	95.48	-.40	-1.16	.23	.99	89.12	-.60	-1.41	.26	.74	60B	@	L132
L136	95.69	-.19	-.55	.11	.48	89.39	-.33	-.77	.20	.57	60H	@	L136
L139	95.70	-.18	-.53	.29	1.26	89.61	-.11	-.26	.27	.77	60B	@	L139
L148H	95.82	-.06	-.16	.23	1.03	89.35	-.37	-.87	.36	1.01	60H	@	L148H
L152	96.05	.17	.49	.08	.37	90.40	.68	1.60	.24	.69	60B	@	L152
L157	96.45	.57	1.67	.37	1.62	90.25	.53	1.24	.26	.74	60B	@	L157
L158	95.72	-.16	-.46	.16	.71	89.55	-.17	-.40	.44	1.25	60D	@	L158
L162	96.08	.20	.58	.17	.74	90.04	.32	.75	.27	.77	60W	@	L162
L166	95.23	-.65	-1.92	.15	.65	88.99	-.73	-1.71	.37	1.05	60B	@	L166
L172	95.95	.07	.20	.08	.37	89.46	-.26	-.61	.39	1.10	60B	@	L172
L190C	95.40	-.43	-1.42	.16	.60	89.14	-.58	-1.36	.39	1.10	60B	@	L190C
L190R	95.62	-.20	-.77	.17	.74	89.10	-.62	-1.45	.27	.78	60B	@	L190R
L206	95.82	-.06	-.16	.19	.82	89.83	.11	.26	.29	.83	60B	@	L206
L210B	96.20	.32	.94	.19	.85	90.33	.61	1.43	.25	.70	60B	@	L210B
L210D	95.96	.08	.23	.14	.63	89.96	.24	.56	.25	.69	60D	@	L210D
L211S	95.95	.07	.20	.16	.69	89.85	.13	.31	.24	.68	60R	@	L211S
L212	96.51	.63	1.86	.62	2.73	90.34	.62	1.46	.81	2.28	60B	@	L212
L213	96.19	.31	.91	.26	1.12	90.30	.58	1.36	.80	2.26	60B	@	L213
L223B	96.09	.21	.61	.15	.67	90.23	.51	1.20	.28	.79	60B	@	L223B
L225	96.43	.55	1.61	.49	2.17	89.92	.20	.47	.48	1.36	60B	@	L225
L226B	97.30	1.42	4.17	.23	.99	89.62	-.10	-.23	.34	.96	60B	X	L226B
L228	95.49	-.39	-1.15	.19	.81	88.73	-.99	-2.32	.35	.99	60H	@	L228
L230	95.49	-.39	-1.15	.32	1.39	89.17	-.55	-1.29	.30	.85	60B	@	L230
L241	96.18	.30	.88	.24	1.07	89.98	.26	.61	.41	1.16	60B	@	L241
L254	95.75	-.13	-.39	.23	1.08	89.44	-.28	-.66	.39	1.09	60H	@	L254
L259	95.93	.05	.14	.14	.62	89.92	.20	.47	.27	.76	60B	@	L259
L262	96.09	.21	.61	.17	.76	90.20	.48	1.13	.23	.65	60R	@	L262
L275	96.16	.28	.82	.22	.95	89.67	-.05	-.12	.34	.95	60R	@	L275
L278	95.76	-.12	-.35	.24	1.06	89.75	.03	.07	.31	.88	60B	@	L278
L285D	95.17	-.71	-2.09	.21	.90	88.94	-.78	-1.83	.36	1.01	60D	@	L285D
L285R	95.18	-.70	-2.06	.19	.85	84.91	-4.81	-11.29	5.29	14.92	60R	#	L285R
L288	96.35	.47	1.38	.21	.93	90.62	.30	.70	.29	.82	60D	@	L288
L301	95.84	-.04	-.11	.14	.63	89.74	.02	.05	.42	1.19	60B	@	L301
L305	95.92	.04	.11	.23	1.01	90.06	.34	.80	.12	.33	60F	@	L305
L308	96.06	.18	.52	.13	.59	90.39	.67	1.57	.33	.94	60H	@	L308
L317	95.61	-.27	-.80	.24	1.06	89.68	-.04	-.09	.21	.61	60B	@	L317
L323	96.43	.55	1.61	.26	1.24	90.55	.83	1.95	.41	1.16	60W	@	L323
L339	95.60	-.28	-.83	.00	2.88	89.85	.13	.31	.41	1.16	60B	@	L339
L341	95.33	-.55	-1.62	.23	.99	89.36	-.36	-.84	.12	.33	60R	@	L341
L348	95.28	-.60	-1.77	.21	.92	89.16	-.54	-1.27	.23	.65	60D	@	L348
L349	95.85	-.03	-.09	.15	.66	89.76	.04	.09	.18	.52	60D	@	L349
L354	94.99	-.89	-2.62	.30	1.31	90.40	.68	1.60	1.93	5.43	60B	X	L354
L366	94.80	-1.08	-3.18	.42	1.85	88.80	-.92	-2.16	.42	1.19	60L	*	L366
L390	96.13	.25	.73	.28	1.20	90.30	.58	1.36	.30	.84	60B	@	L390
L523	95.84	-.04	-.12	.15	.59	89.23	-.49	-1.15	.24	.68	60F	@	L523
L567	95.95	.07	.20	.18	.81	89.83	.11	.26	.37	1.03	60D	@	L567
L571	96.15	.27	.79	.24	1.04	89.83	.11	.26	.47	1.32	60D	@	L571
L573	96.02	.14	.41	.23	1.03	90.05	.33	.78	.26	.74	60H	@	L573
L581	95.91	.03	.08	.21	.91	89.67	.15	.35	.44	1.25	60B	@	L581
L587	95.87	.01	.03	.13	.59	90.02	.30	.70	.35	.98	60B	@	L587
L592	95.85	-.03	-.09	.24	1.04	89.48	-.26	-.61	.36	1.01	60W	@	L592
L594	95.98	.10	.29	.16	.77	90.04	.32	.75	.55	1.54	60D	@	L594
L597	95.05	-.83	-2.43	.16	.69	88.15	-1.57	-3.68	.47	1.34	60B	#	L597
L608	95.44	-.44	-1.30	.20	.88	89.96	.24	.56	.29	.81	60D	*	L608
L636	96.27	.39	1.14	.21	.92	89.42	-.30	-.70	.28	.80	60F	*	L636
L673R	96.05	.17	.49	.08	.37	89.65	-.07	-.16	.18	.50	60B	@	L673R
L673T	95.89	.01	.02	.17	.73	89.52	-.20	-.47	.28	.78	60B	@	L673T

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 G01 HIGH BRIGHTNESS PRINTING 116 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE E85 BOND 79 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L692	95.84	-.04	-.12	.37	1.63	89.42	-.30	-.70	.38	1.08	60D	6	L692
L698	95.78	-.10	-.30	.25	1.01	89.29	-.43	-1.01	.46	1.30	60D	6	L698
L712	97.05	1.17	3.44	.28	1.24	90.26	.48	1.13	.59	1.65	60E	X	L712
GR. MEAN = 95.88 PERCENT						GRAND MEAN = 89.72 PERCENT					TEST DETERMINATIONS = 10		
SD MEANS = .34 PERCENT						SD OF MEANS = .43 PERCENT					63 LABS IN GRAND MEANS		
		AVERAGE SDR = .23 PERCENT					AVERAGE SDR = .35 PERCENT						
L219	97.00	1.12	3.29	.00	.00	82.00	-7.72	-18.12	.00	.00	60E	*	L219
L224	95.81	-.07	-.21	.35	1.44	89.39	-.33	-.77	.25	.70	60P	*	L224
L249	95.60	-.28	-.83	.28	1.15	88.83	-.89	-2.09	.53	1.50	60P	*	L249
L256	95.52	-.36	-1.06	.21	.94	88.57	-1.15	-2.70	.21	.58	60N	*	L256
L277	95.20	-.68	-2.01	.42	1.85	88.60	-1.12	-2.63	.52	1.46	60P	*	L277
L312	95.00	-.88	-2.59	.00	.00	88.10	-1.62	-3.80	.21	.59	60P	*	L312
L380	95.30	-.58	-1.71	.35	1.53	88.40	-1.32	-3.10	.52	1.46	60P	*	L380
L564	95.60	-.28	-.83	.52	2.28	89.00	-.72	-1.69	.00	.00	60P	*	L564
L685B	95.96	.08	.23	.06	.27	89.59	-.13	-.30	.31	.87	60P	*	L685B
L687	96.65	.77	2.28	.41	1.80	89.70	-.02	-.05	.42	1.19	60P	*	L687
L704	95.00	-.88	-2.59	.24	1.03	NO DATA REPORTED FOR SAMPLE E85					60P	*	L704

TOTAL NUMBER OF LABORATORIES REPORTING = 79

Best values: G01 95.9 ± 0.6 percent
E85 89.7 ± 0.7 percent

The following laboratories were omitted from the grand means because of extreme test results: 597.

ANALYSIS T60-1 TABLE 2

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

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

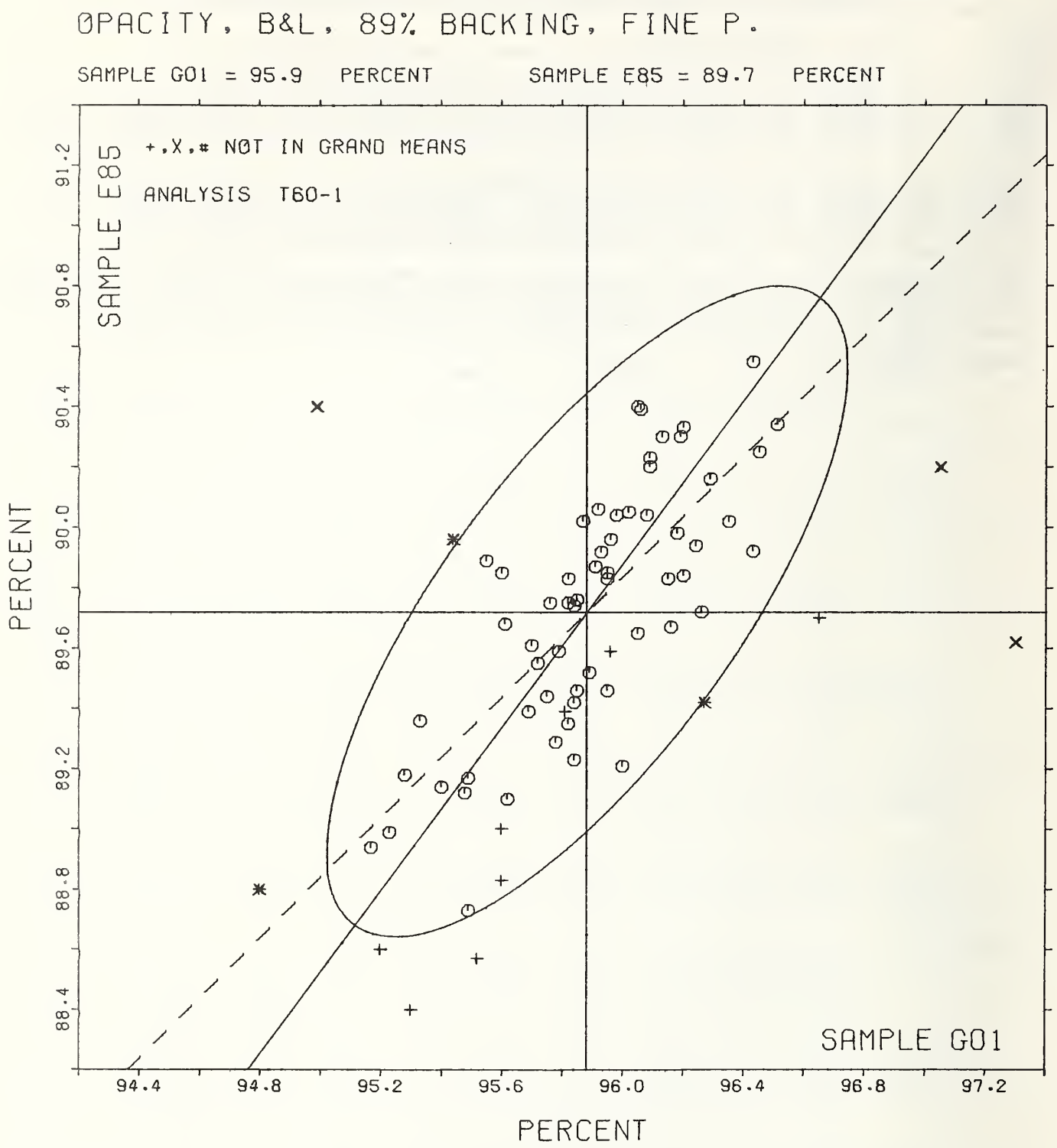
LAB CODE	F	MEANS G01	B85	COORDINATES MAJOR	MINOR	AVG RESDUAL VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L366	*	94.80	88.80	-1.38	.32	1.52 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L354	X	94.99	90.40	.02	1.12	.037 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L704	*	95.00				1.003 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L312	*	95.00	88.10	-1.83	-.25	.030 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L597	#	95.05	88.15	-1.78	-.26	1.041 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L285D	@	95.17	88.94	-1.06	.11	.095 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L285R	#	95.18	84.91	-4.29	-2.29	7.008 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L277	*	95.20	88.60	-1.31	-.12	1.005 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L166	@	95.23	88.99	-.97	.09	.005 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L348	@	95.23	89.18	-.79	.16	.078 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L380	*	95.30	88.40	-1.41	-.32	1.049 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L341	@	95.33	89.36	-.62	.23	.006 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L190C	@	95.40	89.14	-.75	.04	.095 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L608	*	95.44	89.96	-.07	.50	.005 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L132	@	95.48	89.12	-.72	-.03	.006 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L230	@	95.49	89.17	-.07	-.01	1.012 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L228	@	95.49	88.73	-1.03	-.27	.090 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L256	*	95.52	88.57	-1.14	-.39	.076 60N	OPACITY (WHITE BACKING)82 TO 95%, HUNTER
L108	@	95.55	89.89	-.06	.37	1.004 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L564	*	95.60	89.00	-.75	-.20	1.013 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L249	*	95.60	88.83	-.88	-.30	1.052 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L339	@	95.60	89.85	-.00	.30	2.002 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L317	@	95.61	89.68	-.19	.20	.003 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L190R	@	95.62	89.10	-.05	-.16	.076 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L136	@	95.69	89.39	-.38	-.04	.053 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L139	@	95.70	89.61	-.20	.08	1.041 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L158	@	95.72	89.55	-.23	.03	.098 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L254	@	95.75	89.44	-.30	-.06	1.008 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L278	@	95.76	89.75	-.05	.12	.097 60D	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L698	@	95.78	89.29	-.41	-.17	1.015 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L125	@	95.79	89.59	-.10	-.00	1.026 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L224	*	95.81	89.39	-.01	-.14	1.007 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L118	@	95.82	89.75	-.01	.07	.054 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L206	@	95.82	89.83	.05	.12	.003 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L148H	@	95.82	89.35	-.03	-.17	1.002 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L692	@	95.84	89.42	-.27	-.14	1.033 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L523	@	95.84	89.23	-.42	-.26	.003 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L301	@	95.84	89.74	-.01	.05	.091 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L592	@	95.85	89.46	-.23	-.13	1.002 60W	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN,DIGITAL
L349	@	95.85	89.76	.01	.05	.059 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L587	@	95.87	90.02	.23	.19	.078 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L673T	@	95.89	89.52	-.10	-.13	.070 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L581	@	95.91	89.87	.14	.07	1.008 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L305	@	95.92	90.06	.30	.17	.072 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L259	@	95.93	89.92	.19	.08	.009 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L211S	@	95.95	89.85	.15	.02	.009 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L567	@	95.95	89.83	.13	.01	.092 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L172	@	95.95	89.46	-.17	-.21	.073 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L685B	*	95.96	89.59	-.00	-.14	.002 60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L210D	@	95.96	89.96	.24	.08	.006 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L594	@	95.98	90.04	.02	.11	1.015 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L123	@	96.00	89.21	-.34	-.40	1.040 60W	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN,DIGITAL
L573	@	96.02	90.05	.33	.08	.009 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L152	@	96.05	90.40	.03	.27	.033 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L673R	@	96.05	89.65	.04	-.18	.044 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L308	@	96.06	90.39	.03	.25	.077 60H	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L162	@	96.08	90.04	.03	.03	.075 60W	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN,DIGITAL
L223B	@	96.09	90.23	.33	.14	.073 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L262	@	96.09	90.20	.31	.12	.070 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L390	@	96.13	90.30	.01	.14	1.002 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L571	@	96.15	89.83	.25	-.15	1.018 60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L275	@	96.16	89.67	.13	-.25	.095 60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L241	@	96.18	89.98	.39	-.09	1.012 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L213	@	96.19	90.30	.03	.10	1.009 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L210B	@	96.20	90.33	.08	.11	.076 60B	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB

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) - E&L TYPE

LAB CODE	F	MEANS G01	MEANS E85	COORDINATES MAJOR	COORDINATES MINOR	AVG ab DIF	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L105	G	96.20	89.84	.29	-.18	.99	60A	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN
L122	G	96.24	89.94	.39	-.16	.95	60J	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L124	G	96.26	89.72	.22	-.30	2.34	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L636	*	96.27	89.42	-.01	-.49	.86	60R	OPACITY (WHITE BACKING)82 TO 95%, THWING-ALBERT (WAS SRL)
L115	G	96.29	90.16	.00	-.07	.05	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L288	G	96.35	90.02	.52	-.20	.87	60D	OPACITY (WHITE BACKING)82 TO 95%, BNL-2
L323	G	96.43	90.55	.99	.05	1.40	60W	OPACITY (WHITE BACKING)82 TO 95%, HUYGEN,DIGITAL
L225	G	96.43	89.92	.49	-.32	1.76	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L157	G	96.45	90.25	.76	-.14	1.18	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L212	G	96.51	90.34	.87	-.14	2.51	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L687	*	96.65	89.70	.44	-.63	1.50	60P	OPACITY (WHITE BACKING)82 TO 95%, PHOTOVOLT
L219	*	97.00	82.00	-5.55	-5.48	.00	60E	OPACITY (WHITE BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L712	X	97.05	90.20	1.08	-.65	1.45	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
L226B	X	97.30	89.62	.76	-1.20	.97	60A	OPACITY (WHITE BACKING)82 TO 95%, BAUSCH + LOMB
GMEANS:		95.88	89.72			1.60		
		95% ELLIPSE:		1.29	.48	WITH GAMMA = 53 DEGREES		


OPACITY, B&L, 89% BACKING, FINE P.
SAMPLE G01 = 95.9 PERCENT
SAMPLE E85 = 89.7 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T60-1
SAMPLE E85
PERCENT
91.2
90.8
90.4
90.0
89.6
89.2
88.8
88.4
SAMPLE G01
94.4
94.8
95.2
95.6
96.0
96.4
96.8
97.2
PERCENT

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 G01 MEAN	HIGH BRIGHTNESS PRINTING 116 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	SAMPLE L65 MEAN	BOND 79 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	VAR	F	LAB
											TEST D. = 10		
L182E	94.33	-.09	-.30	.15	.66	92.20	.15	.59	.27	1.12	60J	@	L182E
L219	94.40	-.02	-.09	.62	2.53	92.30	.25	.99	.48	2.02	60F	@	L219
L242	94.48	.00	.25	.14	.68	91.90	-.15	-.61	.20	.84	60J	@	L242
L244	94.21	-.21	-.69	.26	1.27	91.76	-.29	-1.17	.13	.57	60F	@	L244
L250T	94.21	-.21	-.69	.21	1.04	91.96	-.09	-.37	.31	1.30	60J	@	L250T
L251	96.86	2.44	10.04	.14	.70	94.56	2.50	10.04	.18	.77	60F	#	L251
L309	94.07	-.35	-1.45	.18	.90	91.53	-.52	-2.10	.25	1.03	60J	@	L309
L313	94.67	.25	1.00	.22	1.06	92.37	.32	1.27	.14	.59	60J	@	L313
L360	94.06	-.36	-1.53	.15	.74	91.83	-.22	-.89	.19	.79	60F	@	L360
L446	94.49	.07	.31	.14	.69	92.10	.05	.19	.25	1.06	60J	@	L446
L484	94.60	.18	.76	.16	.80	92.31	.26	1.03	.22	.94	60F	@	L484
L575	94.49	.07	.30	.17	.81	91.99	-.06	-.25	.22	.94	60J	@	L575
L598	94.45	.03	.13	.16	.67	91.97	-.08	-.33	.17	.71	60J	@	L598
L678	94.93	.51	2.16	.21	1.01	92.36	.31	1.23	.34	1.41	60J	@	L678
L685A	94.49	.07	.30	.19	.94	92.16	.11	.43	.16	.69	60F	@	L685A
GR. MEAN =	94.42 PERCENT					GRAND MEAN =	92.05 PERCENT				TEST DETERMINATIONS =		10
SD MEANS =	.24 PERCENT					SD OF MEANS =	.25 PERCENT				14 LABS IN GRAND MEANS		
		AVERAGE SDR =		.20 PERCENT				AVERAGE SDR =		.24 PERCENT			
L118	93.63	-.79	-3.33	.23	1.13	91.49	-.56	-2.26	.42	1.77	60C	*	L118
L190C	93.92	-.50	-2.12	.30	2.74	91.74	-.31	-1.25	.48	2.03	60C	*	L190C
L190R	93.74	-.68	-2.88	.22	1.09	91.65	-.40	-1.62	.39	1.64	60C	*	L190R
L626	94.00	-.42	-1.78	.00	.00	91.10	-.95	-3.82	.21	.88	60Q	*	L626

TOTAL NUMBER OF LABORATORIES REPORTING = 19

Best values: G01 94.4 ± 0.4 percent
E85 92.0 ± 0.4 percent

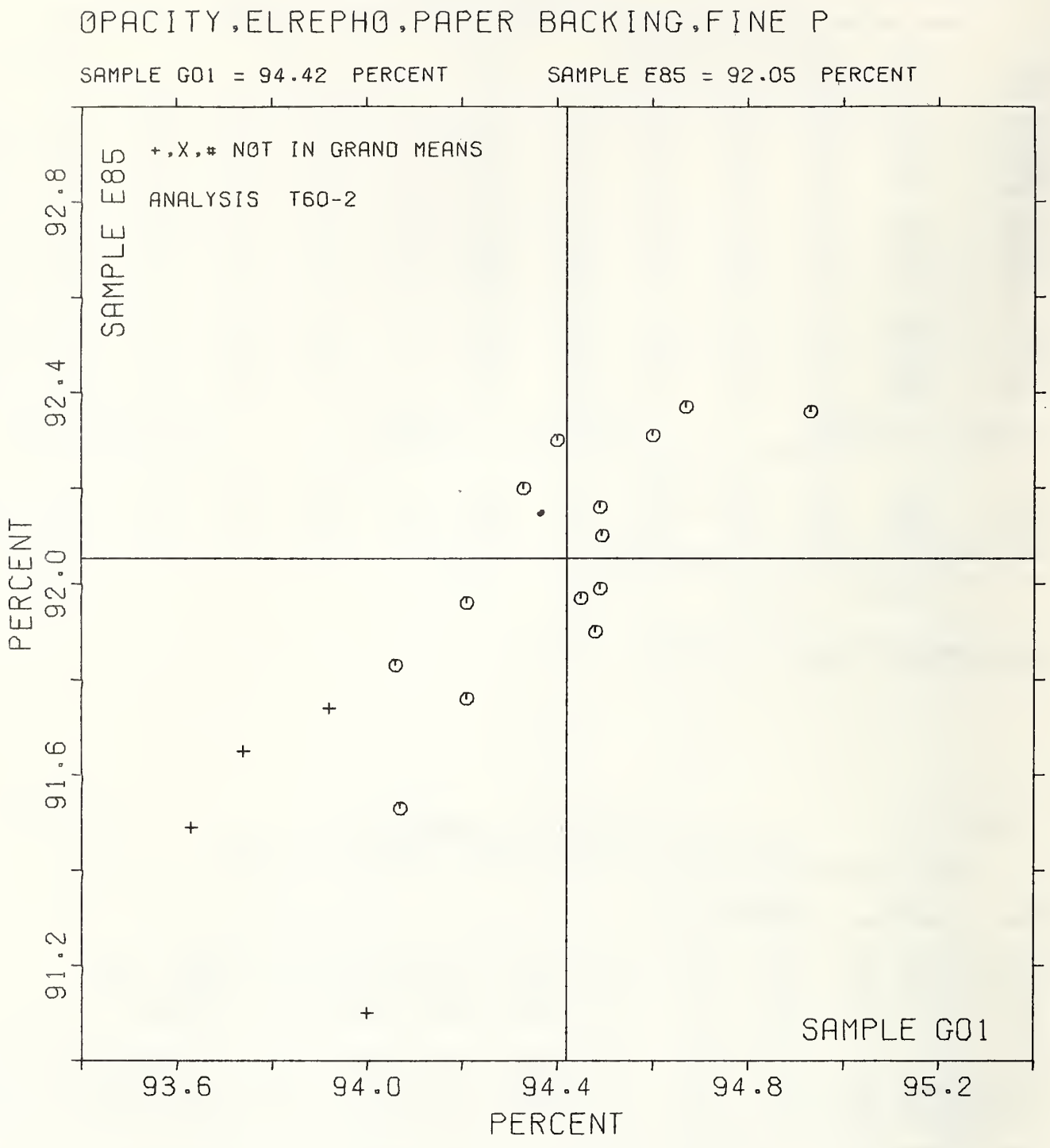
The following laboratories were omitted from the grand means because of extreme test results: 251.

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 G01	E85	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L118	*	93.63	91.49	-.99	.19	1.43	00C	OPACITY (PAPER BACKING)82 TO 95%, BAUSCH * LOMB
L190R	*	93.74	91.65	-.78	.22	1.37	00C	OPACITY (PAPER BACKING)82 TO 95%, BAUSCH * LOMB
L190C	*	93.92	91.74	-.57	.15	2.38	00C	OPACITY (PAPER BACKING)82 TO 95%, BAUSCH * LOMB
L626	*	94.00	91.10	-.98	-.34	.44	00Q	OPACITY (PAPER BACKING)82 TO 95%, PHOTOVOLT
L360	@	94.06	91.83	-.41	.11	.76	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L309	@	94.07	91.53	-.02	-.10	.96	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L244	@	94.21	91.76	-.30	-.05	.92	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L250T	@	94.21	91.96	-.21	.09	1.17	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L182E	@	94.33	92.20	.05	.17	.09	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L219	@	94.40	92.30	.17	.18	2.28	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L598	@	94.45	91.97	-.04	-.08	.79	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L242	@	94.48	91.90	-.07	-.15	.70	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L575	@	94.49	91.99	.00	-.09	.06	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L685A	@	94.49	92.16	.13	.02	.61	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L446	@	94.49	92.10	.09	-.02	.68	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L484	@	94.60	92.31	.31	.04	.07	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
L313	@	94.67	92.37	.40	.03	.03	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L678	@	94.93	92.36	.07	-.16	1.21	00J	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10) FILTER
L251	#	96.86	94.56	3.30	-.08	.74	00F	OPACITY (PAPER BACKING)82 TO 95%, Z.ELREPHO,FMY-C(10)NO TRAP
GMEANS:		94.42	92.05			1.00		
95% ELLIPSE:				.94	.32	WITH GAMMA = 47 DEGREES		


OPACITY,ELREPHO,PAPER BACKING,FINE P
SAMPLE G01 = 94.42 PERCENT
SAMPLE E85 = 92.05 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T60-2
SAMPLE E85
SAMPLE G01
PERCENT
PERCENT
92.8
92.4
92.0
91.6
91.2
93.6
94.0
94.4
94.8
95.2

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 Z03 NEWSPRINT 58 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	RO.SDR	SAMPLE G13 15 LB. BOND 56 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	RO.SDR	TEST DO.= 10 VAR	F	LAB
L121	93.76	.23	.44	.35	.75	81.17	-.67	-1.07	.92	1.26	61B	0	L121
L122	93.90	.37	.71	.28	.63	81.66	-.78	-1.25	.94	1.29	61D	0	L122
L150	93.45	-.08	-.16	.76	1.72	79.60	-2.04	-3.26	.71	.98	61B	#	L150
L159	94.11	.58	1.12	.36	.81	81.03	-.81	-1.29	.59	.81	61R	0	L159
L210B	93.99	.46	.89	.42	.94	82.01	.17	.27	.85	1.17	61B	0	L210B
L210D	93.64	.11	.21	.33	.75	81.68	-.16	-.26	.93	1.28	61D	0	L210D
L261	94.09	.56	1.08	.44	1.00	82.95	1.11	1.77	.96	1.32	61B	0	L261
L281	93.68	.15	.29	.63	1.43	82.39	.55	.87	.57	.79	61D	0	L281
L315	93.59	.06	.11	.00	1.36	81.73	-.11	-.18	.28	.38	61D	0	L315
L317	93.76	.23	.44	.45	.97	81.84	-.00	-.00	.91	1.25	61B	0	L317
L318	92.90	-.63	-1.22	.61	1.39	81.85	.01	.01	.78	1.08	61B	0	L318
L333	93.10	-.43	-.83	.46	1.04	81.26	-.58	-.93	1.00	1.37	61B	0	L333
L352	92.25	-1.28	-2.48	.27	.61	81.50	-.34	-.54	.50	.69	61R	0	L352
L599	93.20	-.33	-.64	.63	1.43	82.75	.91	1.45	.35	.49	61B	0	L599
L713	93.47	-.06	-.12	.39	.89	82.56	.72	1.15	.61	.84	61R	0	L713
GR. MEAN =	93.53 PERCENT					GRAND MEAN =	81.84 PERCENT				TEST DETERMINATIONS =		10
SD MEANS =	.52 PERCENT					SD OF MEANS =	.63 PERCENT				14 LABS IN GRAND MEANS		
	AVERAGE SDR =	.44 PERCENT					AVERAGE SDR =	.73 PERCENT					
L260	93.55	.02	.04	.44	.99	80.40	-1.44	-2.30	.39	.54	61P	*	L260

TOTAL NUMBER OF LABORATORIES REPORTING = 16

Best values: Z03 93.6 ± 1.1 percent
G13 81.7 ± 1.1 percent

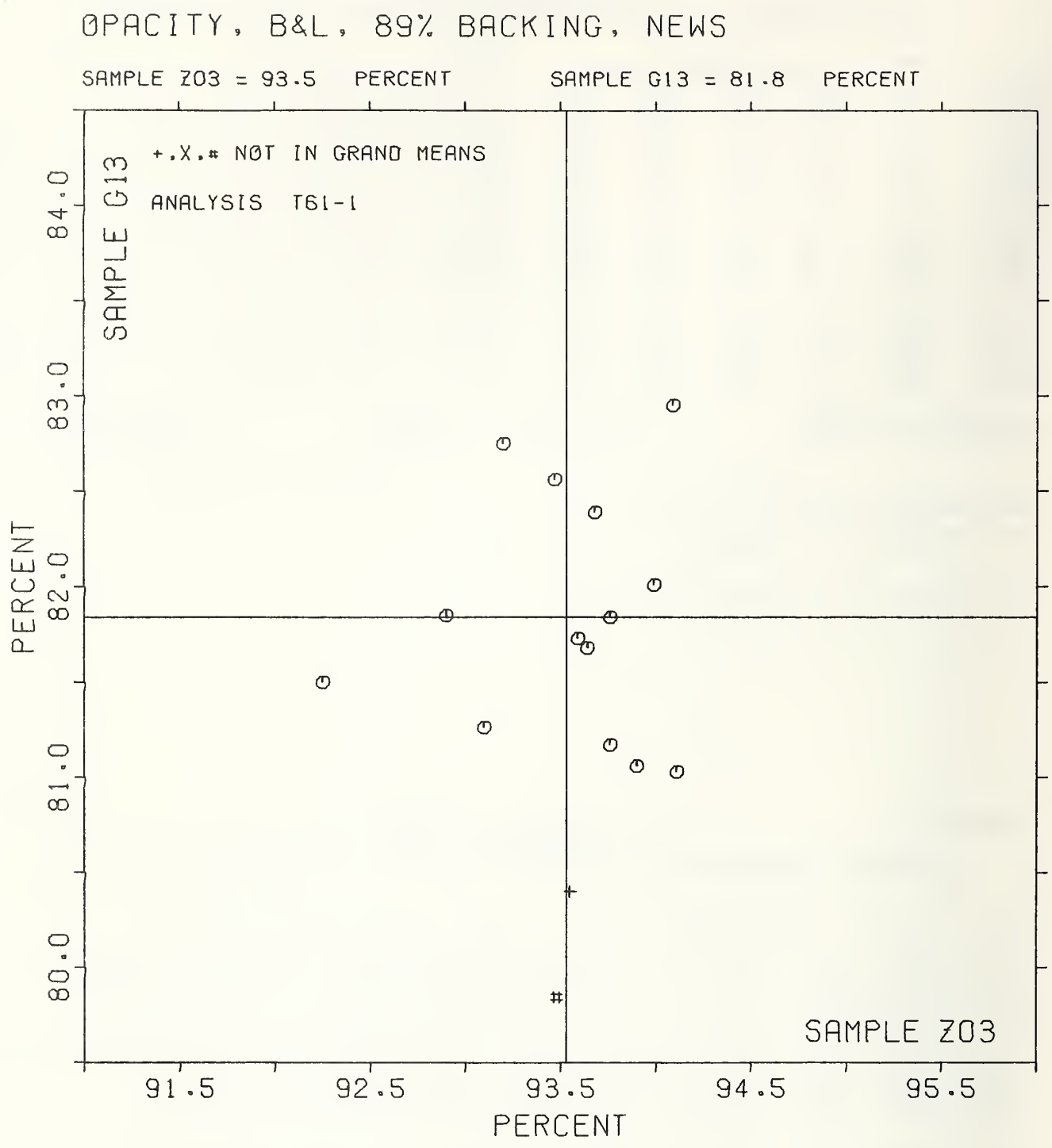
The following laboratories were omitted from the grand means because of extreme test results: 150.

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 Z03	G13	COORDINATES MAJOR	MINOR	AVG RO.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L352	0	92.25	81.50	-.48	1.24	.65	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L318	0	92.90	81.85	-.00	.63	1.23	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L333	0	93.10	81.26	-.02	.37	1.21	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L599	0	93.20	82.75	.87	.43	.96	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L150	#	93.45	79.80	-2.04	-.14	1.73	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L713	0	93.47	82.56	.71	.14	.86	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
L260	*	93.55	80.40	-1.43	-.17	.77	61P	OPACITY (WHITE BACKING)70 TO 90%, PHOTOVOLT
L315	0	93.59	81.73	-.11	-.07	.07	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L210D	0	93.64	81.68	-.15	-.13	1.01	61D	OPACITY (WBITE BACKING)70 TO 90%, BNL-2
L281	0	93.68	82.39	.50	-.09	1.11	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L317	0	93.76	81.84	.02	-.23	1.11	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L121	0	93.76	81.17	-.64	-.30	1.01	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L122	0	93.90	81.06	-.74	-.45	.90	61D	OPACITY (WHITE BACKING)70 TO 90%, BNL-2
L210B	0	93.99	82.01	.22	-.44	1.06	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L261	0	94.09	82.95	1.10	-.44	1.10	61B	OPACITY (WHITE BACKING)70 TO 90%, BAUSCH + LOMB
L159	0	94.11	81.03	-.74	-.66	.01	61R	OPACITY (WHITE BACKING)70 TO 90%, THWING-ALBERT (WAS SRL)
GMEANS:		93.53	81.84			1.00		
		95% ELLIPSE:	1.82	1.50		WITH GAMMA = 83 DEGREES		


OPACITY, B&L, 89% BACKING, NEWS
SAMPLE Z03 = 93.5 PERCENT
SAMPLE G13 = 81.8 PERCENT
+.X.# NOT IN GRAND MEANS
ANALYSIS T61-1
SAMPLE G13
PERCENT
84.0
83.0
82.0
81.0
80.0
SAMPLE Z03
91.5
92.5
93.5
94.5
95.5
PERCENT

ANALYSIS T61-2 TABLE 1

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY NEWS, DIRECTORY, AND CATALOG

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

LAB CODE	SAMPLE Z03 NEWSPRINT 58 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE Z13 15 LB. BOND 56 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	VAR	F	LAB
L150	96.91	-.04	-.70	.22	1.07	82.23	.21	.71	.63	1.26	61J	G	L150
L233F	96.99	.04	.70	.20	.93	81.81	-.21	-.71	.37	.74	61F	G	L233F

GR. MEAN = 96.95 PERCENT GRAND MEAN = 82.02 PERCENT TEST DETERMINATIONS = 10
SD MEANS = .06 PERCENT SD OF MEANS = .30 PERCENT 2 LABS IN GRAND MEANS
AVERAGE SDR = .21 PERCENT AVERAGE SDR = .50 PERCENT

L153	93.80	-3.15	-55.69	.48	2.29	79.70	-2.32	-7.82	.59	1.17	61C	*	L153

TOTAL NUMBER OF LABORATORIES REPORTING = 3

ANALYSIS T61-2 TABLE 2

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY NEWS, DIRECTORY, AND CATALOG

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

LAB CODE	F	MEANS Z03	Z13	COORDINATES MAJOR	MINOR	AVG N. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L153	*	93.80	79.70	1.70	-3.52	1.73	61C	OPACITY (PAPER BACKING)70 TO 90%, BAUSCH * LOMB
L150	G	96.91	82.23	-.21	.00	1.16	61J	OPACITY (PAPER BACKING)70 TO 90%, Z. ELREPHO,FMY-C(10) FILTER
L233F	G	96.99	81.81	.21	.00	.64	61F	OPACITY (PAPER BACKING)70 TO 90%, Z. ELREPHO,FMY-C(10)NO TRAP
GMEANS:		96.95	82.02			1.00		
		95% ELLIPSE:		.00	.00	WITH GAMMA =-79 DEGREES		

ANALYSIS T62-2 TABLE 1

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY TRACING, VELLUM, LIGHTWEIGHT SHEETS

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

LAB CODE	SAMPLE Z05 GLASSINE 47 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE Z07 M.F. SULFITE 36 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	VAR	F	LAB
L313	74.70			.10		61.06			.30		62J	G	L313

GR. MEAN = 74.70 PERCENT GRAND MEAN = 61.06 PERCENT TEST DETERMINATIONS = 10
SD MEANS = PERCENT SD OF MEANS = PERCENT 1 LAB IN GRAND MEANS
AVERAGE SDR = .18 PERCENT AVERAGE SDR = .30 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 1

ANALYSIS T62-2 TABLE 2

OPACITY (PAPER BACKING) IN PERCENT - PRIMARILY TRACING, VELLUM, LIGHTWEIGHT SHEETS

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

LAB CODE	F	MEANS Z05	Z07	COORDINATES MAJOR	MINOR	AVG N. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L313	*	74.70	61.06			1.00	62J	OPACITY (PAPER BACKING)45 TO 70%, Z. ELREPHO,FMY-C(10) FILTER
GMEANS:		74.70	61.06			1.00		

REPORT NO. 61G — TAPPI COLLABORATIVE REFERENCE PROGRAM — SEPTEMBER 1979

ANALYSIS T62-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY TRACING, VELLUM, AND LIGHTWEIGHT SHEETS
TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	SAMPLE Z05 GLASSINE 47 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	RO.SDR	SAMPLE Z07 M.F. SULFITE 36 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	RO.SDR	VAR	F	LAB
L122	69.30	.32	.34	.84	1.41	59.29	.12	.15	1.16	1.60	62D	@	L122
L131	68.04	-.94	-1.01	.74	1.24	57.97	-1.20	-1.47	.41	.56	62R	@	L131
L134	71.20	2.22	2.36	.92	1.55	62.60	3.43	4.20	.84	1.16	62R	#	L134
L326	69.26	.28	.29	.01	1.04	59.97	.80	.98	.86	1.18	62B	@	L326
L328	67.74	-1.24	-1.33	.22	.37	58.69	-.48	-.59	.34	.47	62B	@	L328
L396	69.29	.31	.33	.44	.75	58.94	-.23	-.28	.66	.90	62B	@	L396
L581	70.28	1.30	1.38	.70	1.18	60.15	.98	1.20	.94	1.29	62B	@	L581

GR. MEAN = 68.98 PERCENT — GRAND MEAN = 59.17 PERCENT — TEST DETERMINATIONS = 10
SD MEANS = .94 PERCENT — SD OF MEANS = .82 PERCENT — 6 LABS IN GRAND MEANS
AVERAGE SDR = .59 PERCENT — AVERAGE SDR = .73 PERCENT
TOTAL NUMBER OF LABORATORIES REPORTING = 7

The following laboratories were omitted from the grand means because of extreme test results: 134.

REPORT NO. 61G — TAPPI COLLABORATIVE REFERENCE PROGRAM — SEPTEMBER 1979

ANALYSIS T62-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT - PRIMARILY TRACING, VELLUM, AND LIGHTWEIGHT SHEETS
TAPPI OFFICIAL TEST METHOD T425 OS-75, OPACITY OF PAPER (15 DEG./DIFFUSE, ILLUMINANT A) - B&L TYPE

LAB CODE	F	MEANS Z05	Z07	COORDINATES MAJOR	MINOR	AVG RO.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L328	@	67.74	58.69	-1.26	.44	.42	62B	OPACITY (WHITE BACKING)45 TO 70%, BAUSCH & LOMB
L131	@	68.04	57.97	-1.39	-.30	.90	62R	OPACITY (WHITE BACKING)45 TO 70%, THWING-ALBERT (WAS SPL)
L326	@	69.26	59.97	.73	.43	1.11	62B	OPACITY (WHITE BACKING)45 TO 70%, BAUSCH & LOMB
L396	@	69.29	58.94	.08	-.37	.62	62B	OPACITY (WHITE BACKING)45 TO 70%, BAUSCH & LOMB
L122	@	69.30	59.29	.32	-.11	1.51	62D	OPACITY (WHITE BACKING)45 TO 70%, BNL-2
L581	@	70.28	60.15	1.52	-.09	1.24	62B	OPACITY (WHITE BACKING)45 TO 70%, BAUSCH & LOMB
L134	#	71.20	62.60	3.91	1.18	1.55	62R	OPACITY (WHITE BACKING)45 TO 70%, THWING-ALBERT (WAS SRL)
GMEANS:		68.98	59.17			1.00		
		95% ELLIPSE:		4.96	1.48	WITH GAMMA = 40 DEGREES		

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 J98 MEAN	PRINTING 89 GRAMS PER SQUARE METER DEV	NO.DEV	SDR	R.SDR	SAMPLE B47 MEAN	RELEASE BASE 82 GRAMS PER SQUARE METER DEV	NO.DEV	SDR	R.SDR	VAR	F	LAB	TEST D.= 8
L108	76.07	.14	.22	.13	.92	67.14	.88	.88	.23	.69	65M	6	L108	
L115	76.30	.36	.00	.11	.77	66.15	-.10	-.10	.21	.65	65N	6	L115	
L122	76.11	.17	.29	.08	.00	65.54	-.72	-.72	.23	.69	65N	6	L122	
L132	76.31	.37	.02	.10	.71	65.17	-1.08	-1.08	.37	1.13	65N	6	L132	
L158	77.09	1.15	1.90	.08	.00	66.11	-.14	-.14	.20	.59	65N	6	L158	
L172	75.71	-.23	-.08	.12	.90	65.61	-.64	-.64	.15	.44	65A	6	L172	
L176A	74.39	-1.55	-2.87	.14	.98	65.70	-.55	-.55	.45	1.36	65A	6	L176A	
L190C	75.51	-.43	-.71	.00	.00	65.00	-1.25	-1.25	.27	.83	65A	6	L190C	
L210M	75.26	-.68	-1.12	.15	1.09	65.42	-.83	-.83	.36	1.08	65M	6	L210M	
L210N	76.09	.15	.24	.11	.81	65.89	-.37	-.37	.46	1.39	65N	6	L210N	
L211	76.44	.50	.82	.09	.66	66.60	.35	.35	.39	1.17	65N	6	L211	
L225	77.19	1.25	2.07	.27	1.94	66.59	.33	.33	.22	.68	65N	6	L225	
L275	75.42	-.51	-.83	.21	1.53	65.85	-.40	-.40	.42	1.28	65M	6	L275	
L285	75.35	-.59	-.96	.18	1.28	65.10	-1.15	-1.15	.30	.90	65N	6	L285	
L288	76.04	.10	.16	.18	1.27	66.15	-.10	-.10	.42	1.29	65N	6	L288	
L308	76.25	.31	.51	.11	.77	65.04	-1.22	-1.22	.29	.89	65N	6	L308	
L315	76.07	.14	.22	.25	1.84	66.99	.73	.73	.55	1.67	65N	6	L315	
L317	75.91	-.03	-.05	.12	.90	65.65	-.60	-.60	.39	1.18	65M	6	L317	
L523	75.20	-.74	-1.22	.11	.77	65.36	-.89	-.89	.27	.82	65N	6	L523	
L543	76.41	.47	.78	.24	1.74	67.05	.80	.80	.25	.76	65M	6	L543	
L565	75.62	-.31	-.52	.07	.51	66.30	.05	.05	.26	.79	65A	6	L565	
L598	76.14	.20	.33	.14	1.02	67.09	.83	.83	.36	1.09	65N	6	L598	
L636A	76.00	.06	.10	.19	1.39	66.01	1.76	1.76	.29	.89	65M	6	L636A	
L636B	75.81	-.13	-.24	.15	1.05	67.41	1.16	1.16	.48	1.44	65M	6	L636B	
L636C	76.72	.79	1.30	.13	.92	68.22	1.97	1.97	.24	.74	65M	6	L636C	
L643	75.69	-.25	-.42	.13	1.05	66.06	1.81	1.81	.59	1.80	65N	6	L643	
L673R	75.00	-.94	-1.55	.08	.53	64.64	-1.62	-1.61	.23	.70	65N	6	L673R	
L692	76.19	.25	.41	.11	.81	67.26	1.01	1.01	.35	1.07	65N	6	L692	
GR. MEAN = 75.94 PERCENT						GRAND MEAN = 66.25 PERCENT								TEST DETERMINATIONS = 8
SD MEANS = .60 PERCENT						SD OF MEANS = 1.00 PERCENT								28 LABS IN GRAND MEANS
		AVERAGE SDR = .14 PERCENT					AVERAGE SDR = .33 PERCENT							
L105	75.99	.05	.08	.10	1.30	65.82	-.43	-.43	.12	.35	65T	*	L105	
L213	76.39	.45	.74	.05	.00	66.51	.26	.26	.20	.59	65T	*	L213	
L219	77.87	1.94	3.20	.35	2.55	65.81	2.56	2.56	.37	1.13	65P	*	L219	
L223	77.17	1.24	2.04	.13	.92	67.99	1.73	1.73	.17	.52	65G	*	L223	
L224	75.49	.55	.91	.20	1.41	66.94	.68	.68	.21	.65	65H	*	L224	
L241	76.14	.20	.33	.22	1.59	65.37	-.88	-.88	.30	.91	65I	*	L241	
L249	77.39	1.45	2.39	.14	.98	66.30	2.05	2.04	.12	.36	65P	*	L249	
L256	75.30	-.64	-1.06	.19	1.34	64.66	-1.59	-1.59	.49	1.48	65H	*	L256	
L259	75.84	-.10	-.17	.25	1.81	65.26	-.99	-.99	.38	1.16	65H	*	L259	
L260	76.24	.30	.49	.18	1.27	66.84	.58	.58	.17	.51	65F	*	L260	
L277	81.19	5.25	8.69	.26	1.87	77.94	11.68	11.67	1.40	4.24	65P	*	L277	
L278	78.20	2.26	3.74	.00	.00	70.06	3.81	3.80	.05	.16	65P	*	L278	
L301	76.60	.66	1.09	.21	1.49	66.14	-.12	-.12	.27	.82	65G	*	L301	
L312	79.00	3.06	5.07	.00	.00	70.75	4.50	4.49	.27	.81	65P	*	L312	
L328	78.04	2.10	3.47	.30	2.18	69.05	2.80	2.79	.14	.43	65P	*	L328	
L380	78.00	2.06	3.41	.00	.00	72.25	6.00	5.99	.27	.81	65P	*	L380	
L442	75.44	-.50	-.83	.07	.54	65.44	-.82	-.82	.32	.96	65T	*	L442	
L456	75.39	-.55	-.91	.20	1.40	67.65	1.40	1.39	.25	.76	65P	*	L456	
L562	80.00	4.06	6.72	.00	.00	74.00	7.75	7.74	.00	.00	65P	*	L562	
L564	78.62	2.69	4.44	.32	3.73	70.12	3.87	3.87	.35	1.07	65P	*	L564	
L587	77.06	1.12	1.86	.12	.80	66.64	.38	.38	.42	1.28	65I	*	L587	
L617	77.75	1.81	3.00	.11	.77	66.72	2.47	2.47	.27	.82	65G	*	L617	
L626	77.99	2.05	3.39	.04	.25	69.11	2.86	2.85	.32	.96	65P	*	L626	
L684	75.35	-.59	-.98	.09	.67	72.55	6.30	6.29	.39	1.19	65H	*	L684	
L695	78.00	2.06	3.41	.00	.00	69.00	2.75	2.74	.00	.00	65P	*	L695	
L698	76.04	.10	.16	.12	.80	64.64	-1.62	-1.61	.21	.65	65I	*	L698	
L704	77.67	1.74	2.87	.23	1.67	NO DATA REPORTED FOR SAMPLE B47					65P	*	L704	
L711	76.94	1.00	1.65	.18	1.27	67.50	1.25	1.24	.38	1.15	65P	*	L711	

TOTAL NUMBER OF LABORATORIES REPORTING = 56

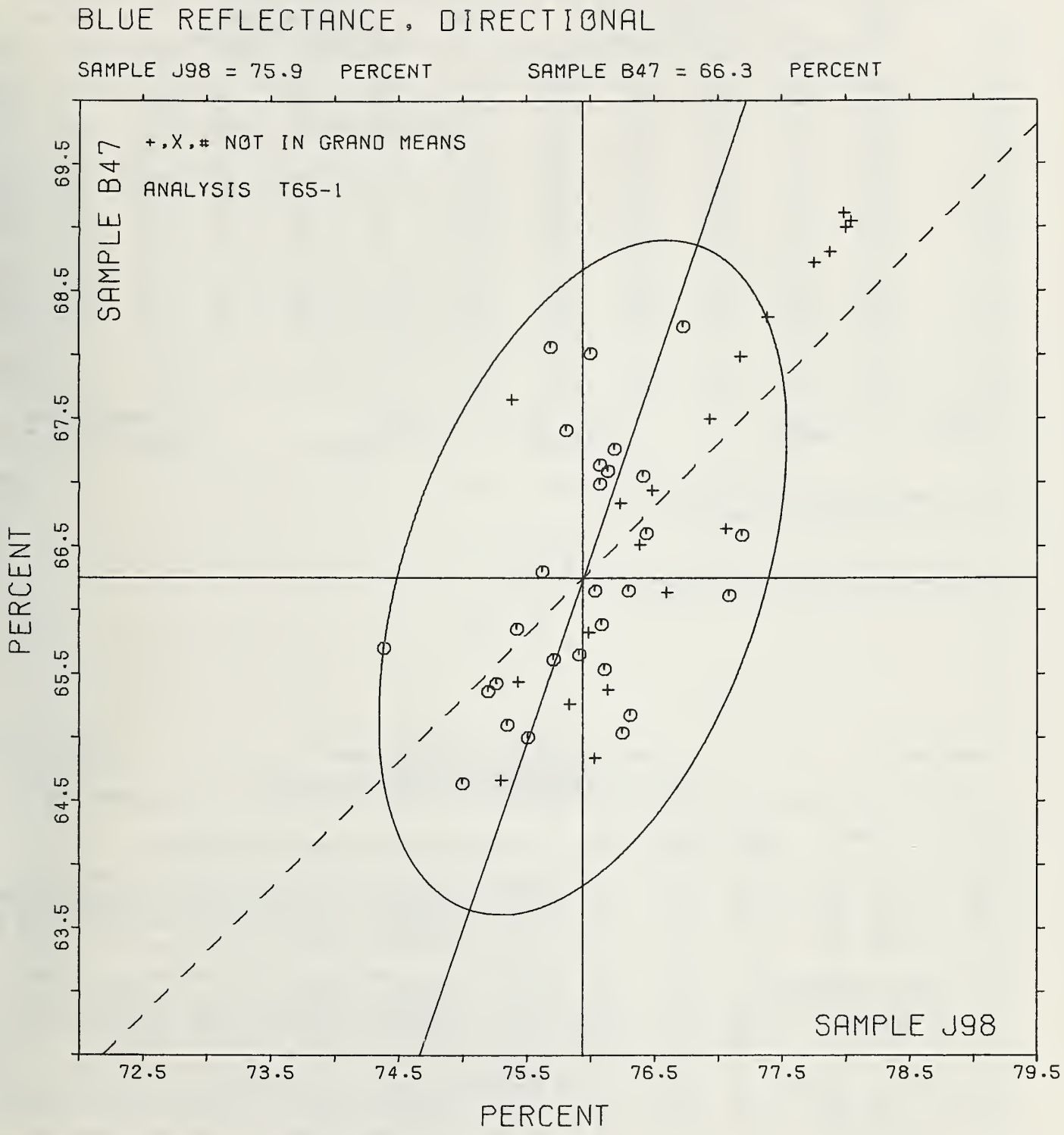
Best values: J98 76.0 ± 1.0 percent
B47 66.1 ± 1.8 percent

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 J98	B47	COORDINATES MAJOR	MINOR	AVG DEV	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L176A	G	74.39	65.70	-1.03	1.29	1.17	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L673R	G	75.00	64.64	-1.83	.37	.02	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L523	G	75.20	65.36	-1.08	.41	.80	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L210M	G	75.26	65.42	-1.00	.37	1.06	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L256	*	75.30	64.66	-1.71	.09	1.41	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L684	*	75.35	72.55	3.77	2.59	.93	65A	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L285	G	75.35	65.10	-1.28	.19	1.09	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L456	*	75.39	67.65	1.14	.97	1.11	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L275	G	75.42	65.85	-.33	.36	1.40	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L442	*	75.44	65.44	-.94	.21	.75	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L190C	G	75.51	65.00	-1.32	-.00	.71	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L565	G	75.62	66.30	-.06	.31	.85	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L643	G	75.69	68.06	1.03	.82	1.42	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L172	G	75.71	65.61	-.00	.01	.07	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L636B	G	75.81	67.41	1.00	.49	1.25	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L259	*	75.84	65.26	-.97	-.22	1.48	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L317	G	75.91	65.65	-.38	-.17	1.04	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L105	*	75.99	65.82	-.39	-.18	.03	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L636A	G	76.00	68.01	1.00	.01	1.14	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L698	*	76.04	64.84	-1.31	-.55	.75	65I	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2A
L288	G	76.04	66.15	-.07	-.13	1.26	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L108	G	76.07	67.14	.88	.16	.81	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L315	G	76.07	66.99	.74	.11	1.75	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L210N	G	76.09	65.89	-.30	-.26	1.10	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L122	G	76.11	65.54	-.02	-.40	.04	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L598	G	76.14	67.09	.85	.08	1.05	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L241	*	76.14	65.37	-.77	-.47	1.25	65I	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2A
L692	G	76.19	67.26	1.03	.09	.94	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L260	*	76.24	66.84	.00	-.09	.09	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L308	G	76.25	65.04	-1.00	-.09	.03	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L115	G	76.30	66.15	.02	-.37	.71	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L132	G	76.31	65.17	-.90	-.70	.92	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L213	*	76.39	66.51	.39	-.34	.00	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L543	G	76.41	67.05	.91	-.19	1.25	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L211	G	76.44	66.60	.49	-.30	.91	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L224	*	76.49	66.94	.82	-.30	1.03	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L301	*	76.60	66.14	.10	-.06	1.16	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L636C	G	76.72	68.22	2.12	-.11	.03	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L711	*	76.94	67.50	1.30	-.54	1.21	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L587	*	77.06	66.64	.73	-.94	1.17	65I	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2A
L158	G	77.09	66.11	.24	-1.13	.80	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L223	*	77.17	67.99	2.04	-.01	.72	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L225	G	77.19	66.59	.72	-1.07	1.31	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANG/MgSo, S-4
L249	*	77.39	68.30	2.40	-.71	.07	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L617	*	77.75	68.72	2.92	-.91	.80	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L704	*	77.87				1.07	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L219	*	77.87	68.81	3.05	-1.00	1.04	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L626	*	77.99	69.11	3.37	-1.01	.01	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L380	*	78.00	72.25	6.34	-.01	.40	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L695	*	78.00	69.00	3.20	-1.06	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L328	*	78.04	69.05	3.32	-1.08	1.30	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L278	*	78.20	70.06	4.33	-.91	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L564	*	78.62	70.12	4.33	-1.29	2.40	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L312	*	79.00	70.75	5.24	-1.44	.40	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L562	*	80.00	74.00	8.04	-1.34	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L277	*	81.19	77.94	12.73	-1.19	3.93	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
GMEANS:		75.94	66.25			1.00		
		95% ELLIPSE:		2.76	1.40	WITH GAMMA = 71 DEGREES		


BLUE REFLECTANCE, DIRECTIONAL
SAMPLE J98 = 75.9 PERCENT
SAMPLE B47 = 66.3 PERCENT
+,X,# NOT IN GRAND MEANS
ANALYSIS T65-1
SAMPLE B47
PERCENT
69.5
68.5
67.5
66.5
65.5
64.5
63.5
SAMPLE J98
72.5
73.5
74.5
75.5
76.5
77.5
78.5
79.5
PERCENT

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ANALYSIS TOS-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 J98 MEAN	PRINTING 89 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE B47 MEAN	RELEASE BASE 82 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	VAR	F	LAB	TEST D. = 8
L121	76.04	.40	.00	.12	1.08	66.52	2.05	2.61	.12	.58	65K	#	L121	
L136	76.39	.76	1.24	.12	1.09	66.98	.51	.65	.25	1.20	65F	6	L136	
L150	74.83	-.81	-1.33	.12	1.10	65.30	-1.17	-1.49	.15	.71	65Q	6	L150	
L170	75.54	-.10	-.17	.05	.47	66.29	-.18	-.23	.30	1.47	65B	6	L170	
L182	75.80	.16	.27	.05	.43	66.41	-.06	-.07	.14	.66	65F	6	L182	
L210K	76.18	.54	.00	.09	.84	67.40	.93	1.19	.28	1.35	65K	6	L210K	
L242	75.13	-.51	-.04	.14	1.25	66.14	-.32	-.41	.21	1.04	65F	6	L242	
L250T	75.61	-.03	-.05	.10	.91	66.41	-.06	-.07	.14	.66	65F	6	L250T	
L280	75.82	.18	.30	.22	1.96	66.62	.15	.20	.18	.87	65Q	6	L280	
L313	76.15	.51	.84	.10	.94	67.18	.71	.91	.14	.66	65K	6	L313	
L325	76.96	1.32	2.18	.07	.05	68.37	1.90	2.42	.26	1.27	65F	6	L325	
L349	74.50	-1.14	-1.87	.12	1.06	65.01	-1.45	-1.85	.15	.73	65K	6	L349	
L446	75.26	-.38	-.63	.09	.80	66.02	-.44	-.57	.17	.84	65F	6	L446	
L573	75.84	.20	.33	.18	1.43	66.36	-.11	-.14	.25	1.19	65F	6	L573	
L575	75.56	-.08	-.13	.12	1.09	66.42	-.04	-.06	.35	1.67	65F	6	L575	
L598	75.35	-.29	-.47	.09	.81	66.10	-.36	-.46	.13	.63	65K	6	L598	
L680	75.30	-.34	-.56	.13	1.17	66.44	-.02	-.03	.22	1.06	65K	6	L680	
GR. MEAN = 75.64 PERCENT						GRAND MEAN = 66.47 PERCENT								TEST DETERMINATIONS = 8
SD MEANS = .61 PERCENT						SD OF MEANS = .79 PERCENT								16 LABS IN GRAND MEANS
		AVERAGE SDR = .11 PERCENT						AVERAGE SDR = .21 PERCENT						
L289	76.02	.39	.04	.12	1.00	66.76	.30	.38	.19	.93	65B	*	L289	

TOTAL NUMBER OF LABORATORIES REPORTING = 18

Best values: J98 75.6 ± 1.1 percent
B47 66.5 ± 1.2 percent

The following laboratories were omitted from the grand means because if extreme test results: 121.

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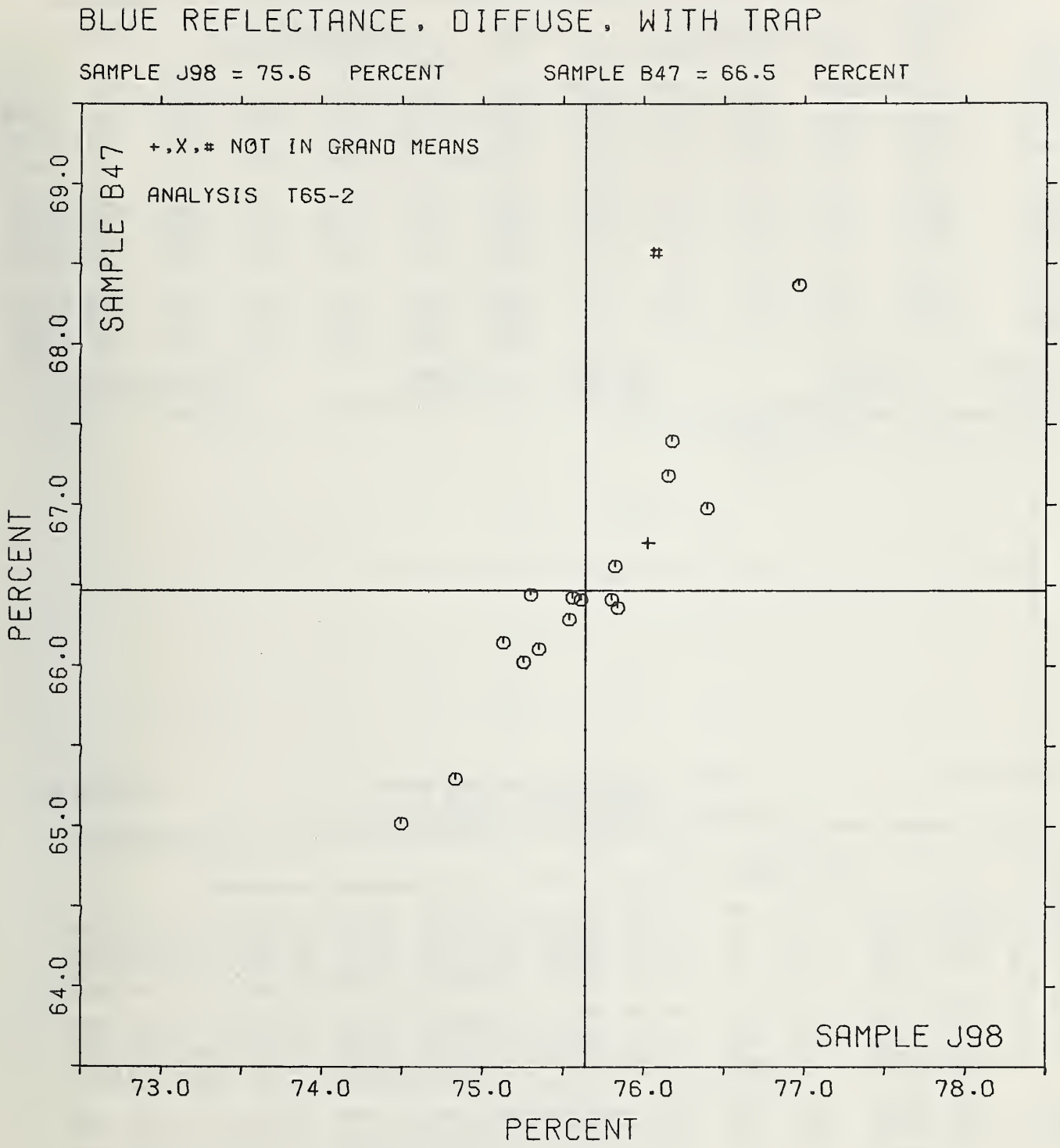
ANALYSIS TOS-2 TABLE 2

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 J98	B47	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L349	6	74.50	65.01	-1.84	.02	.90	65A	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L150	6	74.83	65.30	-1.42	-.07	.91	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L242	6	75.13	66.14	-.30	.21	1.14	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L446	6	75.26	66.02	-.39	.03	.82	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L680	6	75.30	66.44	-.23	.25	1.11	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L598	6	75.35	66.10	-.46	.31	.72	65A	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L170	6	75.54	66.29	-.20	-.03	.97	65B	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NBS ABSOLUTE BASE
L575	6	75.56	66.42	-.08	.04	1.08	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L250T	6	75.61	66.41	-.06	-.01	.79	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L182	6	75.80	66.41	.05	-.16	.94	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L280	6	75.82	66.62	.23	-.05	1.41	65Q	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L573	6	75.84	66.36	.04	-.22	1.31	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L289	*	76.02	66.76	.47	-.13	.99	65B	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, SPECIFIC CALIBRATION
L121	#	76.04	68.52	1.87	.93	.83	65A	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L313	6	76.15	67.18	.00	.03	.00	65A	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L210K	6	76.18	67.40	1.07	.14	1.10	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L136	6	76.39	66.98	.07	-.29	1.14	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L325	6	76.96	68.37	2.32	.10	.96	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
GMEANS:		75.64	66.47			1.00		
		95% ELLIPSE:		2.76	.41	WITH GAMMA = 52 DEGREES		


BLUE REFLECTANCE, DIFFUSE, WITH TRAP
SAMPLE J98 = 75.6 PERCENT
SAMPLE B47 = 66.5 PERCENT
+,X,# NOT IN GRAND MEANS
ANALYSIS T65-2
SAMPLE B47
SAMPLE J98
PERCENT
PERCENT
69.0
68.0
67.0
66.0
65.0
64.0
73.0
74.0
75.0
76.0
77.0
78.0

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	SAMPLE J98 PRINTING 89 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE B47 RELEASE BASE 82 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
CODE											TEST D.= 8		
L152	76.20	-.40	-.53	.09	1.02	67.76	-.35	-.53	.21	1.09	65E	6	L152
L157	76.92	.28	.34	.09	1.06	68.37	.26	.39	.26	1.37	65E	6	L157
L161	77.06	.40	.53	.09	.99	69.47	1.36	2.05	.20	1.04	65E	6	L161
L194	76.41	-.25	-.33	.11	1.22	67.76	-.35	-.53	.17	.89	65E	6	L194
L219	77.17	.51	1.07	.09	1.06	68.52	.41	.62	.12	.61	65E	6	L219
L241	76.91	.25	.32	.13	1.73	67.52	-.59	-.88	.15	.78	65E	6	L241
L244	76.97	.31	.00	.17	1.98	68.43	.32	.48	.32	1.68	65D	6	L244
L251	76.81	.15	.31	.05	.59	68.05	-.06	-.09	.21	1.09	65E	6	L251
L309	77.19	.53	1.11	.09	1.03	68.76	.65	.98	.14	.72	65J	6	L309
L360	77.06	.40	.83	.14	1.58	68.82	.71	1.07	.29	1.51	65E	6	L360
L384	76.65	-.01	-.02	.05	.02	68.00	-.11	-.16	.13	.69	65S	6	L384
L484	75.77	-.89	-1.88	.05	.01	68.91	-1.20	-1.80	.22	1.14	65E	6	L484
L565	75.90	-.76	-1.61	.00	.00	67.60	-.51	-.76	.19	.98	65W	6	L565
L685	76.25	-.41	-.86	.05	.53	67.55	-.56	-.84	.08	.40	65E	6	L685

GR. MEAN = 76.66 PERCENT GRAND MEAN = 68.11 PERCENT TEST DETERMINATIONS = 8

SD MEANS = .47 PERCENT SD OF MEANS = .66 PERCENT 14 LABS IN GRAND MEANS

AVERAGE SDR = .09 PERCENT AVERAGE SDR = .19 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 14

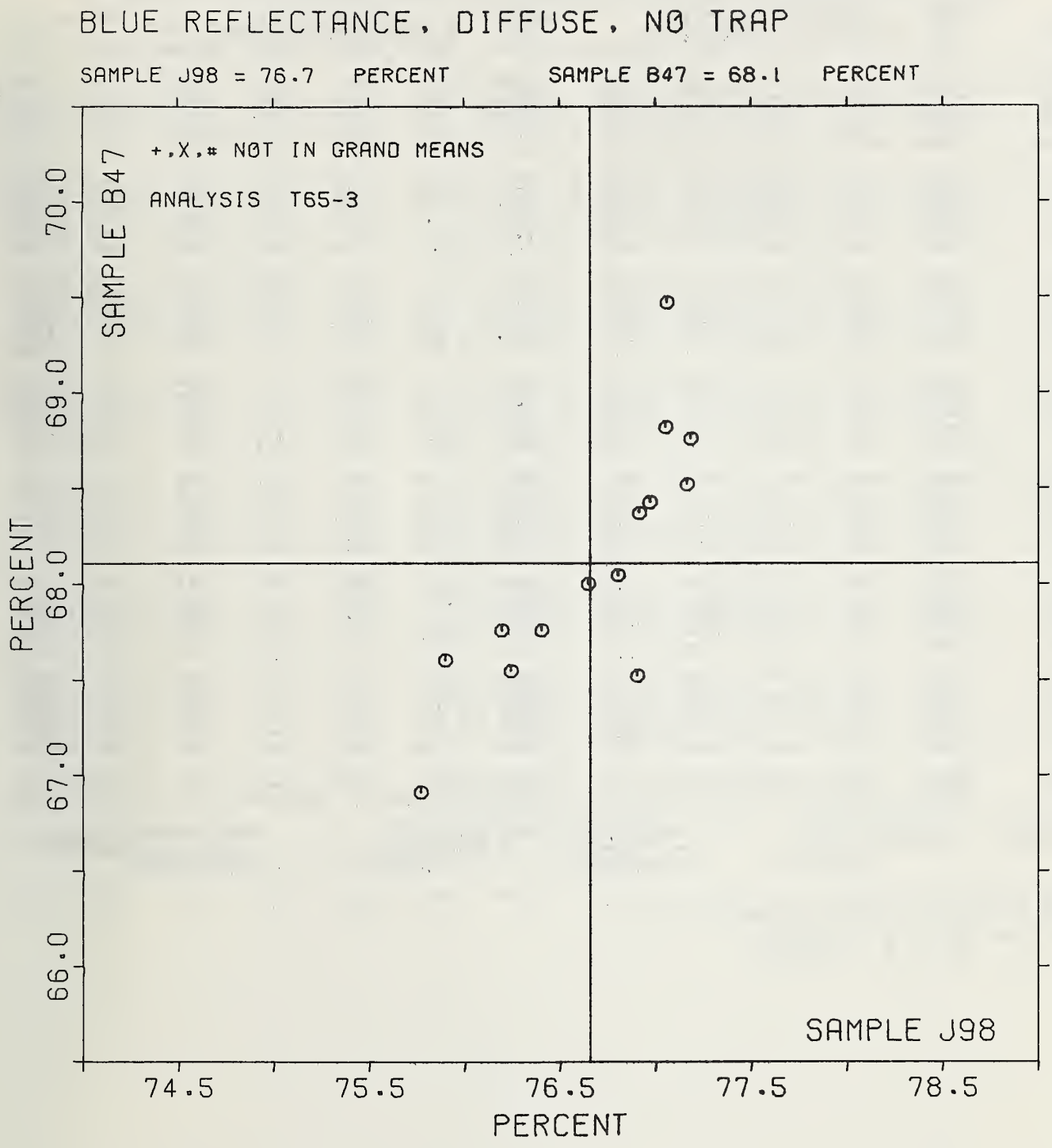
Best values: J98 76.7 ± 0.8 percent
B47 68.1 ± 1.2 percent

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 J98	B47	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L484	6	75.77	68.91	-1.49	.08	.08	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L565	6	75.90	67.60	-.84	.35	.49	65W	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBS MGO BASE
L152	6	76.20	67.76	-.35	.19	1.05	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L685	6	76.25	67.55	-.70	.04	.46	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L194	6	76.41	67.76	-.43	.02	1.05	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L384	6	76.65	68.00	-.10	-.05	.05	65S	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, ABSOLUTE-UNKNOWN BASE
L251	6	76.81	68.05	.03	-.16	.04	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L241	6	76.91	67.52	-.33	-.33	1.26	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L157	6	76.92	68.37	.36	-.07	1.22	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L244	6	76.97	68.43	.44	-.08	1.63	65D	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBC-PTB ABSOLUTE
L360	6	77.06	68.82	.81	.06	1.55	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L161	6	77.06	69.47	1.36	.42	1.02	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L219	6	77.17	68.52	.02	-.20	.04	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L309	6	77.19	68.76	.83	-.08	.06	65J	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBS ABSOLUTE
GMEANS:		76.66	68.11			1.00		
		95% ELLIPSE:		2.27	.08	Warn GAMMA = 56 DEGREES		


BLUE REFLECTANCE, DIFFUSE, NØ TRAP
SAMPLE J98 = 76.7 PERCENT
SAMPLE B47 = 68.1 PERCENT
+,X,* NØT IN GRAND MEANS
ANALYSIS T65-3
SAMPLE B47
PERCENT
70.0
69.0
68.0
67.0
66.0
SAMPLE J98
74.5
75.5
76.5
77.5
78.5
PERCENT

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 CODE	SAMPLE E87 OFFSET ENAMEL COATED 117 GRAMS PER SQUARE METER MEAN	DEV	N_0 DEV	SDR	R_0 SDR	SAMPLE L47 COATED GLOSS 91 GRAMS PER SQUARE METER MEAN	DEV	N_0 DEV	SDR	R_0 SDR	TEST D_0 = 10 VAR	F	LAB
L108	67.7	-1.1	-.40	.4	.23	63.0	-.7	-.36	.6	.39	75H	6	L108
L121	68.0	-.8	-.30	1.7	.93	62.3	-1.3	-.71	1.4	.87	75H	6	L121
L122	69.4	.7	.29	2.1	1.19	64.1	.5	.24	1.2	.73	75H	6	L122
L132	71.9	3.2	1.41	1.4	.76	66.9	3.2	1.72	1.3	.82	75G	6	L132
L172	63.5	-5.3	-2.35	2.3	1.48	59.7	-3.9	-2.08	1.8	1.10	75H	6	L172
L189	69.0	.2	.09	1.6	.87	64.8	1.2	.62	1.5	.94	75P	6	L189
L190C	67.3	-1.5	-.69	1.8	.96	61.1	-2.5	-1.36	2.7	1.61	75G	6	L190C
L190R	70.5	1.7	.78	1.4	.76	63.8	.1	.07	1.8	1.12	75G	6	L190R
L206	69.4	.0	.25	2.4	1.32	64.9	1.3	.68	1.6	.98	75H	6	L206
L210	72.8	4.0	1.81	1.6	.87	67.0	3.3	1.78	1.7	1.02	75H	6	L210
L211	68.3	-.5	-.23	2.5	1.40	64.1	.4	.23	2.0	1.21	75H	6	L211
L230	69.6	.8	.36	2.3	1.27	64.6	1.0	.51	2.0	1.18	75H	6	L230
L251	68.8	.1	.02	2.3	1.30	63.2	-.4	-.21	1.9	1.17	75G	6	L251
L256	72.1	3.3	1.47	1.8	.98	66.4	2.8	1.50	1.7	1.06	75H	6	L256
L262	69.0	.2	.09	1.7	.95	64.1	5.5	2.91	1.2	.72	75K	X	L262
L277A	69.8	1.0	.47	1.6	.91	63.6	-.7	-.36	1.9	1.16	75H	6	L277A
L277B	68.6	-.2	-.10	1.9	1.05	64.5	.8	.44	1.4	.82	75H	6	L277B
L278	66.7	-2.1	-.93	1.5	.82	62.1	-1.5	-.79	1.4	.87	75G	6	L278
L279	66.5	-2.3	-1.02	1.4	.78	61.8	-1.8	-.98	2.1	1.27	75G	6	L279
L291	71.1	2.4	1.05	1.6	.90	66.1	2.4	1.30	2.2	1.31	75H	6	L291
L301	64.4	-4.4	-1.95	1.3	.74	70.6	6.9	3.70	1.5	.88	75H	X	L301
L317	70.8	2.0	.87	1.5	.82	65.5	1.9	.99	1.3	.77	75H	6	L317
L323	69.9	1.1	.46	1.6	.92	63.8	.2	.10	1.3	.81	75H	6	L323
L349	68.7	-.1	-.03	2.3	1.39	62.3	-1.4	-.73	1.9	1.13	75B	6	L349
L388	63.6	-5.2	-2.32	1.6	.88	59.7	-3.9	-2.10	2.0	1.20	75P	6	L388
L483	70.3	1.0	.09	.8	.45	63.6	-.0	-.03	2.3	1.42	75H	6	L483
L564	70.3	1.0	.07	1.9	1.09	61.2	-2.4	-1.30	.4	.25	75P	X	L564
L573	68.0	-.8	-.35	2.8	1.58	63.7	.1	.03	1.7	1.03	75G	6	L573
L574	66.4	-2.3	-1.03	3.3	1.84	61.6	-2.6	-1.41	1.5	.91	75G	6	L574
L587	70.3	1.0	.07	2.0	1.12	65.8	2.2	1.15	1.2	.74	75H	6	L587
L592	71.0	2.4	.97	1.6	1.01	65.4	1.8	.93	1.4	.87	75H	6	L592
L598	64.7	-4.1	-1.84	1.0	.51	62.0	-1.6	-.87	.9	.52	75B	6	L598
L643	70.9	2.1	.93	1.0	.90	64.8	1.2	.62	1.8	1.09	75H	6	L643
L668	67.6	-1.2	-.53	1.8	1.00	63.5	-.1	-.08	1.9	1.15	75G	6	L668
L670	68.8	.1	.02	1.3	.73	63.5	-.2	-.10	1.6	.98	75H	6	L670
L697	68.0	-.8	-.37	1.3	.85	62.2	-1.5	-.78	1.2	.74	75H	6	L697
L704	71.0	2.2	.98	2.7	1.49	NO DATA REPORTED FOR SAMPLE E47					75P	M	L704
L250	61.2	-7.6	-3.39	1.6	.90	53.7	-9.9	-5.30	1.8	1.07	75Q	*	L250

GR. MEAN = 68.8 GLOSS UNITS GRAND MEAN = 63.6 GLOSS UNITS TEST DETERMINATIONS = 10

SD MEANS = 2.2 GLOSS UNITS SD OF MEANS = 1.9 GLOSS UNITS 33 LABS IN GRAND MEANS

AVERAGE SDR = 1.6 GLOSS UNITS AVERAGE SDR = 1.7 GLOSS UNITS

TOTAL NUMBER OF LABORATORIES REPORTING = 38

Best values: E87 69 ± 4 gloss units

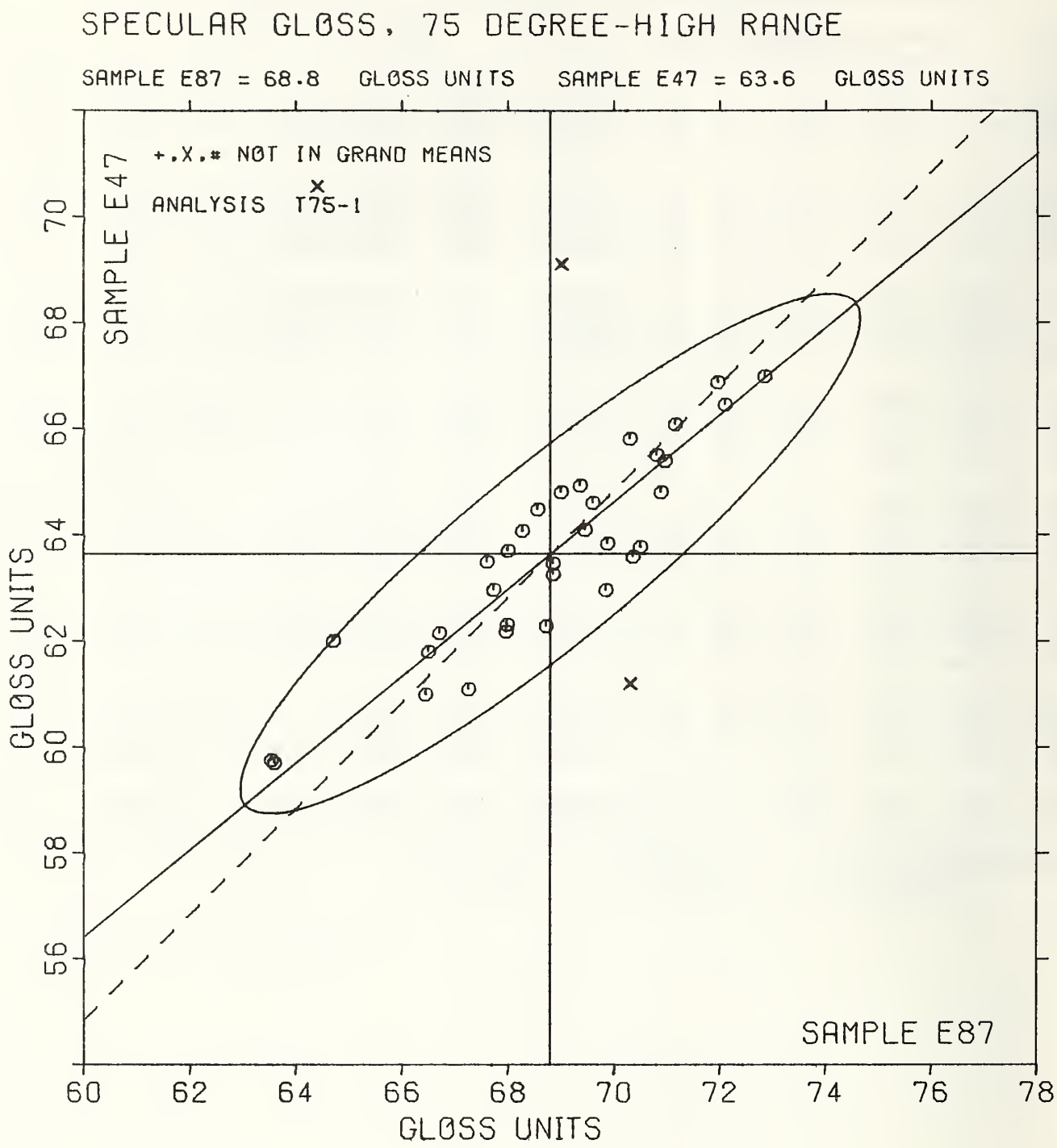
E47 64 ± 3 gloss units

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 E87	MEANS E47	COORDINATES MAJOR	COORDINATES MINOR	AVG ROOT VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L250	*	61.2	53.7	-12.4	-2.9	0.9	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT,20C,65%RH
L172	G	63.5	59.7	-0.5	0.3	1.19	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L388	G	63.6	59.7	-0.5	0.3	1.64	75P SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L301	X	64.4	70.6	1.0	8.1	0.1	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L598	G	64.7	62.0	-4.2	1.3	0.72	75D SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, BAUSCH + LOMB
L574	G	66.4	61.0	-3.5	-0.6	1.37	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L279	G	66.5	61.8	-2.9	0.0	1.01	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L278	G	66.7	62.1	-2.6	0.2	0.4	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L190C	G	67.3	61.1	-2.8	-1.0	1.30	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L669	G	67.6	63.5	-1.0	0.6	1.08	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L108	G	67.7	63.0	-1.3	0.2	0.1	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L697	G	68.0	62.2	-1.6	-0.6	0.0	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L121	G	68.0	62.3	-1.5	-0.9	0.9	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L573	G	68.0	63.7	-0.6	0.6	1.30	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L211	G	68.3	64.1	-0.1	0.7	1.01	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L277B	G	68.6	64.5	0.3	0.8	0.93	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L349	G	68.7	62.3	-0.9	-1.0	1.26	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L670	G	68.8	63.5	-0.1	-0.2	0.0	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L251	G	68.8	63.2	-0.2	-0.3	1.24	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L189	G	69.0	64.8	0.9	0.8	0.90	75P SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L262	X	69.0	69.1	3.0	4.1	0.4	75A SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GAERTNER (K-C TYPE)
L206	G	69.4	64.9	1.2	0.6	1.15	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L122	G	69.4	64.1	0.8	-0.1	0.96	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L230	G	69.6	64.6	1.2	0.2	1.42	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L277A	G	69.8	63.0	0.4	-1.2	1.04	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L323	G	69.9	63.8	1.0	-0.5	0.6	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L587	G	70.3	65.8	2.3	0.7	0.9	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L564	X	70.3	61.2	-0.4	-2.8	0.7	75P SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L483	G	70.3	63.6	1.2	-1.0	0.4	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L190R	G	70.5	63.8	1.4	-1.0	0.5	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L317	G	70.8	65.5	2.7	0.2	0.6	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L643	G	70.9	64.8	2.3	-0.4	1.00	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L592	G	71.0	65.4	2.8	-0.0	0.4	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L704	M	71.0				1.49	75P SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, PHOTOVOLT
L291	G	71.1	66.1	3.4	0.4	1.11	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L132	G	71.9	66.9	4.0	0.5	0.7	75G SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, GARDNER
L256	G	72.1	66.4	4.0	0.1	1.02	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
L210	G	72.8	67.0	5.2	0.0	0.4	75H SPECULAR GLOSS, 75 DEGREE, 50-95 UNITS, HUNTER
GMEANS:		68.8	63.6			1.00	
		95% ELLIPSE:		7.4	1.0	WITH GAMMA = 39 DEGREES	


SPECULAR GLOSS, 75 DEGREE-HIGH RANGE
SAMPLE E87 = 68.8 GLOSS UNITS
SAMPLE E47 = 63.6 GLOSS UNITS
+.X.* NOT IN GRAND MEANS
ANALYSIS T75-1
SAMPLE E47
GLOSS UNITS
SAMPLE E87
GLOSS UNITS
56
58
60
62
64
66
68
70
72
74
76
78

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 G05 MACHINE COATED DULL 116 GRAMS PER SQUARE METER MEAN	DEV	No. DEV	SDR	Ro. SDR	SAMPLE E78 PRINTING 116 GRAMS PER SQUARE METER MEAN	DEV	No. DEV	SDR	Ro. SDR	VAR	F	LAB	TEST Do. = 10
L122	36.74	-1.18	-.83	.93	.77	5.47	-.54	-.94	.28	.95	76H	G	L122	
L128	36.00	-1.92	-1.83	.94	.78	6.20	.19	.33	.42	1.42	76G	G	L128	
L134	37.30	-.62	-.33	1.08	.87	6.00	-.01	-.02	.47	1.59	76H	G	L134	
L136	40.98	3.06	1.83	1.06	.88	6.98	.97	1.69	.36	1.20	76G	G	L136	
L149	34.30	-3.62	-1.93	1.49	1.23	6.00	-.01	-.02	.00	.00	76G	G	L149	
L153	40.45	2.53	1.33	.80	.66	4.90	-1.11	-1.94	.32	1.07	76G	*	L153	
L162	40.83	2.91	1.57	1.15	.93	7.40	1.39	2.42	.39	1.33	76G	G	L162	
L182	38.05	.13	.07	1.47	1.22	5.79	-.22	-.38	.28	.95	76H	G	L182	
L210	39.72	1.80	.97	.95	.78	6.34	.33	.58	.29	.98	76H	G	L210	
L213	38.07	.15	.08	1.01	1.33	5.68	-.33	-.58	.28	.95	76H	G	L213	
L223	36.90	-1.02	-.55	1.38	1.14	5.78	-.23	-.40	.30	1.01	76H	G	L223	
L226	37.51	-.41	-.22	1.30	1.07	5.91	-.10	-.17	.27	.90	76H	G	L226	
L259	38.30	.38	.21	.89	.74	6.11	.10	.17	.19	.64	76H	G	L259	
L288	35.87	-2.05	-1.10	.82	.68	5.63	-.38	-.66	.29	.97	76H	G	L288	
L317	37.70	-.22	-.12	1.70	1.41	5.90	-.11	-.19	.32	1.07	76H	G	L317	
L328	38.62	.70	.38	.88	.73	10.27	4.26	7.43	.31	1.04	76H	#	L328	
L456	37.96	.04	.02	1.42	1.17	6.07	.06	.10	.31	1.04	76H	G	L456	
L713	38.32	.40	.22	.58	.48	9.33	3.32	5.79	.52	1.75	76H	#	L713	
GRo. MEAN = 37.92 GLOSS UNITS						GRAND MEAN = 6.01 GLOSS UNITS								TEST DETERMINATIONS = 10
SD MEANS = 1.86 GLOSS UNITS						SD OF MEANS = .57 GLOSS UNITS								16 LABS IN GRAND MEANS
AVERAGE SDR = 1.21 GLOSS UNITS						AVERAGE SDR = .30 GLOSS UNITS								
L250	36.30	-1.62	-.87	.07	.06	6.10	.09	.16	.21	.71	76Q	*	L250	

TOTAL NUMBER OF LABORATORIES REPORTING = 19

Best values: G05 38 ± 3 gloss units
E78 6 ± 1 gloss units

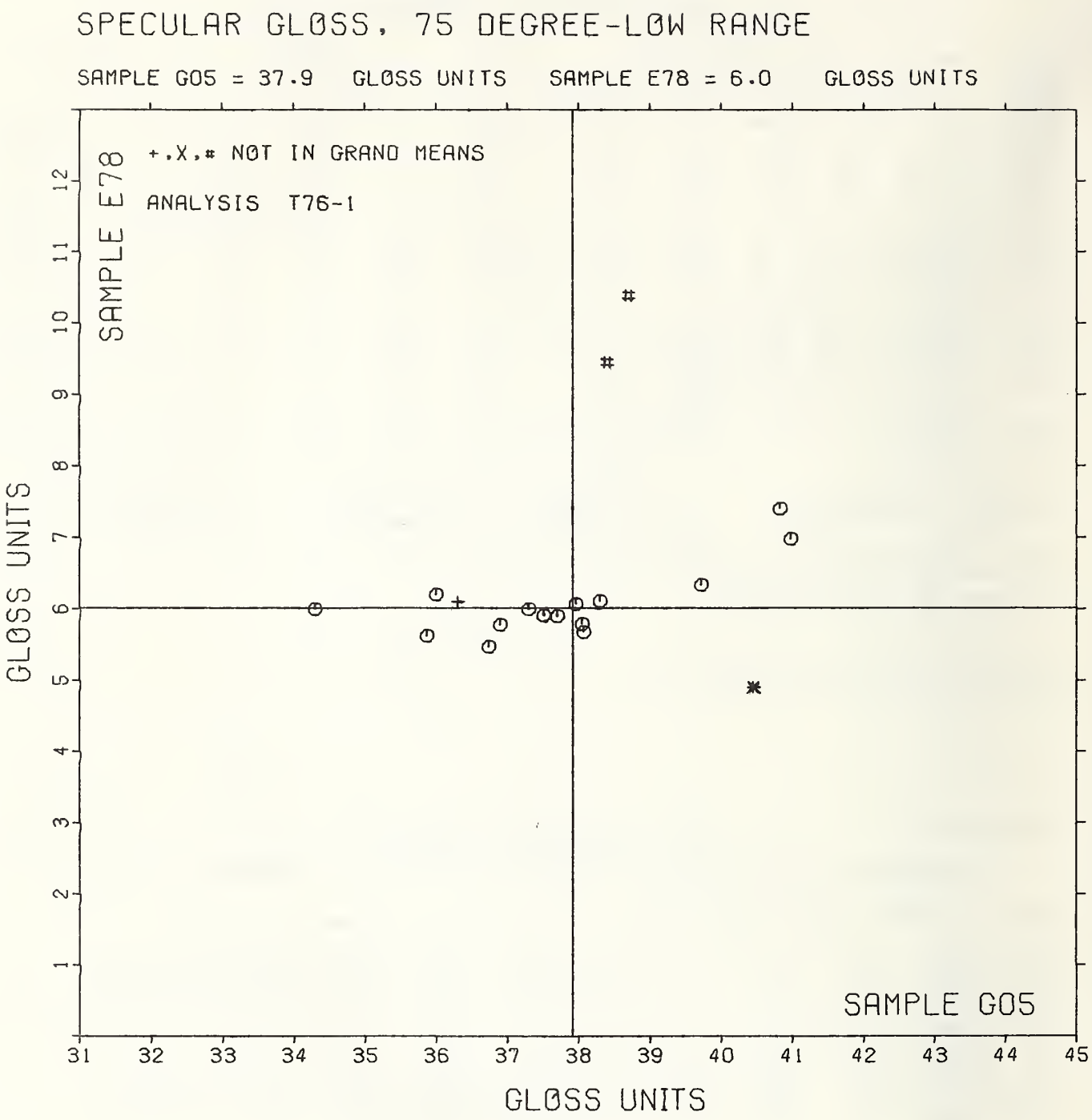
The following laboratories were omitted from the grand means because of extreme test results: 328, 713.

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 G05	E78	COORDINATES MAJOR	MINOR	AVG Ro. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L149	G	34.30	6.00	-3.39	.45	.02	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L288	G	35.87	5.63	-2.08	-.11	.82	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L128	G	36.00	6.20	-1.38	.43	1.10	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L250	*	36.30	6.10	-1.39	.30	.03	76Q	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, PHOTOVOLT,20C,65%RH
L122	G	36.74	5.47	-1.24	-.38	.80	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L223	G	36.90	5.78	-1.04	-.10	1.08	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L134	G	37.30	6.00	-.61	.07	1.23	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L226	G	37.51	5.91	-.42	-.05	.99	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L317	G	37.70	5.90	-.23	-.08	1.24	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L456	G	37.96	6.07	.05	.05	1.11	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L182	G	38.05	5.79	.10	-.24	1.06	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L213	G	38.07	5.68	.11	-.35	1.14	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L259	G	38.30	6.11	.39	.05	.09	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L713	#	38.32	9.33	.63	3.24	1.12	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L328	#	38.62	10.27	1.24	4.13	.08	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L210	G	39.72	6.34	1.63	.10	.88	76H	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, HUNTER
L153	*	40.45	4.90	2.37	-1.43	.66	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L162	G	40.83	7.40	3.07	1.90	1.15	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
L136	G	40.98	6.98	3.10	.57	1.04	76G	SPECULAR GLOSS, 75 DEGREE, 20-65 UNITS, GARDNER
GMEANS:		37.92	6.01			1.00		
95% ELLIPSE:				5.29	1.49	WITH GAMMA = 7 DEGREES		


SPECULAR GLOSS, 75 DEGREE-LOW RANGE
SAMPLE G05 = 37.9 GLOSS UNITS
SAMPLE E78 = 6.0 GLOSS UNITS
+,X,# NOT IN GRAND MEANS
ANALYSIS T76-1
SAMPLE E78
GLOSS UNITS
SAMPLE G05
GLOSS UNITS
1
2
3
4
5
6
7
8
9
10
11
12
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45

LAB CODE	SAMPLE J82 PRINTING 73 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	R.SDR	SAMPLE J22 PRINTING 89 GRAMS PER SQUARE METER MEAN	DEV	NO.DEV	SDR	R.SDR	VAR	F	LAB	TEST D. = 10
L105	2.732	.032	.44	.027	.68	3.046	.028	.35	.029	.52	90Q	0	L105	
L118	2.705	.005	.07	.032	.81	3.028	.010	.13	.024	.43	90Q	0	L118	
L122	2.727	.027	.37	.045	1.15	3.034	.016	.20	.088	1.57	90V	0	L122	
L123F	2.875	.175	2.42	.026	.67	3.195	.177	2.19	.112	1.99	90F	3	L123F	
L125	2.656	-.044	-.61	.032	1.31	3.025	.007	.09	.056	1.01	90T	0	L125	
L128	2.691	-.009	-.12	.031	.80	2.990	-.028	-.34	.037	.65	90T	0	L128	
L141	2.626	-.074	-1.02	.025	.63	2.954	-.064	-.78	.064	1.14	90T	0	L141	
L153	2.830	.130	1.80	.043	1.09	3.153	.135	1.67	.063	1.13	90T	0	L153	
L158	2.630	-.070	-.97	.046	1.22	2.990	-.028	-.34	.057	1.01	90T	0	L158	
L159	2.720	.020	.28	.025	.63	3.072	.054	.67	.064	1.14	90T	0	L159	
L162	2.557	-.143	-1.98	.032	.81	2.899	-.119	-1.46	.029	.51	90V	0	L162	
L166	2.703	.003	.04	.042	1.05	2.960	-.058	-.71	.058	1.03	90T	0	L166	
L172	2.681	-.019	-.26	.032	1.30	3.006	-.012	-.14	.044	.79	90T	0	L172	
L174	2.660	-.100	-1.38	.047	1.19	2.980	-.038	-.46	.063	1.13	90T	0	L174	
L182	2.715	.015	.20	.060	1.52	3.002	-.015	-.19	.098	1.75	90L	0	L182	
L183	2.652	-.048	-.66	.029	.74	2.971	-.047	-.57	.034	.61	90T	0	L183	
L190C	2.700	-.000	-.00	.027	1.09	2.910	-.108	-1.33	.074	1.32	90T	*	L190C	
L203A	2.630	-.070	-.97	.046	1.22	2.910	-.108	-1.33	.110	1.96	90T	0	L203A	
L203C	2.805	.105	1.45	.037	.93	3.050	.032	.40	.088	1.57	90T	0	L203C	
L212	2.690	-.010	-.14	.040	1.16	3.050	.032	.40	.047	.84	90T	0	L212	
L213	2.680	-.020	-.28	.042	1.07	2.950	-.068	-.83	.053	.94	90T	0	L213	
L223	2.648	-.052	-.72	.032	.80	2.964	-.054	-.66	.030	.53	90V	0	L223	
L228	2.700	-.000	-.00	.062	2.07	2.990	-.028	-.34	.099	1.77	90T	0	L228	
L233	2.797	.097	1.34	.051	1.28	3.124	.106	1.31	.042	.75	90Q	0	L233	
L241	2.780	.080	1.11	.071	1.81	3.095	.077	.96	.044	.78	90T	0	L241	
L242G	2.742	.042	.58	.033	.84	3.073	.056	.69	.037	.66	90G	0	L242G	
L242P	2.671	-.029	-.40	.040	1.23	3.030	.012	.15	.047	.84	90P	0	L242P	
L249	2.682	-.018	-.25	.023	.58	2.907	-.051	-.62	.014	.25	90T	0	L249	
L259	2.751	.051	.71	.030	1.27	3.093	.075	.93	.032	.56	90Q	0	L259	
L260	2.744	.044	.61	.019	.48	3.022	.004	.06	.035	.62	90T	0	L260	
L261	2.722	.022	.30	.047	1.20	3.034	.016	.20	.038	.67	90T	0	L261	
L262	2.670	-.030	-.41	.026	.65	2.975	-.043	-.52	.042	.76	90T	0	L262	
L291	2.801	.101	1.40	.025	.63	3.156	.138	1.71	.043	.77	90T	0	L291	
L305	2.700	-.000	-.00	.041	1.03	3.060	.042	.52	.070	1.25	90T	0	L305	
L309	2.650	-.050	-.69	.053	1.33	2.990	-.028	-.34	.057	1.01	90T	0	L309	
L315	2.670	-.030	-.41	.067	1.71	3.090	.072	.89	.057	1.01	90T	0	L315	
L318	2.615	-.085	-1.18	.024	.61	2.875	-.143	-1.76	.092	1.64	90T	0	L318	
L320	2.590	-.110	-1.52	.021	.53	2.840	-.178	-2.19	.039	.70	90T	0	L320	
L323	2.805	.105	1.45	.051	1.28	3.159	.141	1.74	.069	1.23	90T	0	L323	
L324	2.720	.020	.28	.035	.89	3.055	.037	.46	.050	.89	90T	0	L324	
L326	2.748	.048	.66	.034	.86	3.051	.033	.41	.043	.76	90T	0	L326	
L328	2.711	.011	.15	.039	1.00	3.021	.003	.04	.077	1.38	90T	0	L328	
L333	2.645	-.055	-.76	.043	1.08	2.951	-.067	-.82	.044	.79	90V	0	L333	
L339	2.698	-.002	-.03	.041	1.05	2.990	-.028	-.34	.058	1.04	90T	0	L339	
L341	2.806	.106	1.47	.040	1.02	3.128	.110	1.36	.020	.35	90T	0	L341	
L352	2.743	.043	.59	.021	.53	3.036	.018	.23	.045	.79	90Q	0	L352	
L356	2.649	-.051	-.71	.023	.59	2.930	-.088	-1.08	.039	.69	90T	0	L356	
L358	2.665	-.035	-.48	.071	1.80	2.982	-.036	-.44	.039	.69	90T	0	L358	
L376	2.560	-.140	-1.94	.032	.80	2.920	-.098	-1.20	.048	.86	90T	0	L376	
L380	2.786	.086	1.19	.023	.58	2.965	-.053	-.65	.041	.73	90T	X	L380	
L382	2.863	.163	2.25	.029	.75	3.142	.124	1.53	.054	.96	90T	0	L382	
L390	2.640	-.060	-.83	.032	.80	2.965	-.053	-.65	.047	.85	90T	0	L390	
L442	2.837	.137	1.89	.022	.56	3.148	.130	1.61	.032	.58	90V	0	L442	
L556	2.718	.018	.25	.029	.74	3.117	.099	1.23	.042	.75	90T	0	L556	
L557	2.715	.015	.21	.047	1.20	2.945	-.073	-.89	.080	1.42	90T	0	L557	
L567	2.717	.017	.24	.037	.94	3.057	.039	.49	.039	.70	90V	0	L567	
L571	2.670	-.030	-.41	.046	1.22	2.960	-.058	-.71	.070	1.25	90V	0	L571	
L574	2.545	-.155	-2.14	.042	1.08	2.851	-.167	-2.05	.031	.56	90V	0	L574	
L575	2.662	-.038	-.52	.030	.96	2.987	-.031	-.38	.036	.64	90T	0	L575	
L576	2.701	.001	.01	.031	.80	3.103	.085	1.05	.286	5.11	90T	0	L576	
L581	2.755	.055	.76	.026	.72	3.115	.097	1.20	.063	1.12	90T	0	L581	
L587	2.640	-.060	-.83	.052	1.31	3.010	-.008	-.09	.032	.56	90T	0	L587	
L626	2.589	-.111	-1.53	.046	1.17	2.867	-.151	-1.86	.050	.90	90T	0	L626	
L704	2.585	-.115	-1.59	.063	1.59	NO DATA REPORTED FOR SAMPLE J22					90T	M	L704	
L713	2.760	.060	.83	.032	.80	3.060	.042	.52	.046	.82	90T	0	L713	

GR. MEAN = 2.700 MILS — GRAND MEAN = 3.018 MILS — TEST DETERMINATIONS = 10
SD MEANS = .072 MILS — SD OF MEANS = .081 MILS — 63 LABS IN GRAND MEANS
AVERAGE SDR = .039 MILS — AVERAGE SDR = .056 MILS
GR. MEAN = 68.58 MICROMETER — GRAND MEAN = 76.64 MICROMETER

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

LAB CODE	SAMPLE J32 PRINTING 73 GRAMS PER SQUARE METER MEAN	DEV	No. DEV	SDR	Ro. SDR	SAMPLE J22 PRINTING 89 GRAMS PER SQUARE METER MEAN	DEV	No. DEV	SDR	Ro. SDR	TEST Do. = 1C VAR	F	LAB
L106	2.780	.080	1.11	.060	1.60	2.990	-.028	-.34	.032	.56	90C	*	L106
L108	2.895	.195	2.70	.010	.40	3.005	-.013	-.15	.060	1.07	90C	*	L108
L185	2.780	.080	1.11	.042	1.07	3.140	.122	1.51	.070	1.25	90B	*	L185
L203B	2.520	-.180	-2.49	.065	1.60	2.860	-.138	-1.69	.079	1.41	90C	*	L203B
L251	2.675	-.025	-.34	.012	.32	2.979	-.039	-.48	.028	.49	90W	*	L251
L285	2.648	.148	2.05	.008	2.43	3.128	.110	1.36	.041	.74	90X	*	L285
L342	2.609	-.091	-1.26	.030	.90	2.901	-.117	-1.44	.047	.83	90U	*	L342
L344	2.640	-.060	-.83	.070	1.77	2.970	-.048	-.59	.048	.86	90U	*	L344
L484	2.724	.024	.34	.041	1.03	2.984	-.033	-.41	.041	.73	90E	*	L484
L563	2.760	.060	.83	.052	1.31	3.050	.032	.40	.085	1.52	90U	*	L563
L616	2.644	-.056	-.77	.035	.89	3.024	.006	.08	.066	1.18	90C	*	L616
L684	2.760	.060	.83	.052	1.31	3.030	.012	.15	.067	1.20	90U	*	L684

TOTAL NUMBER OF LABORATORIES REPORTING * 77

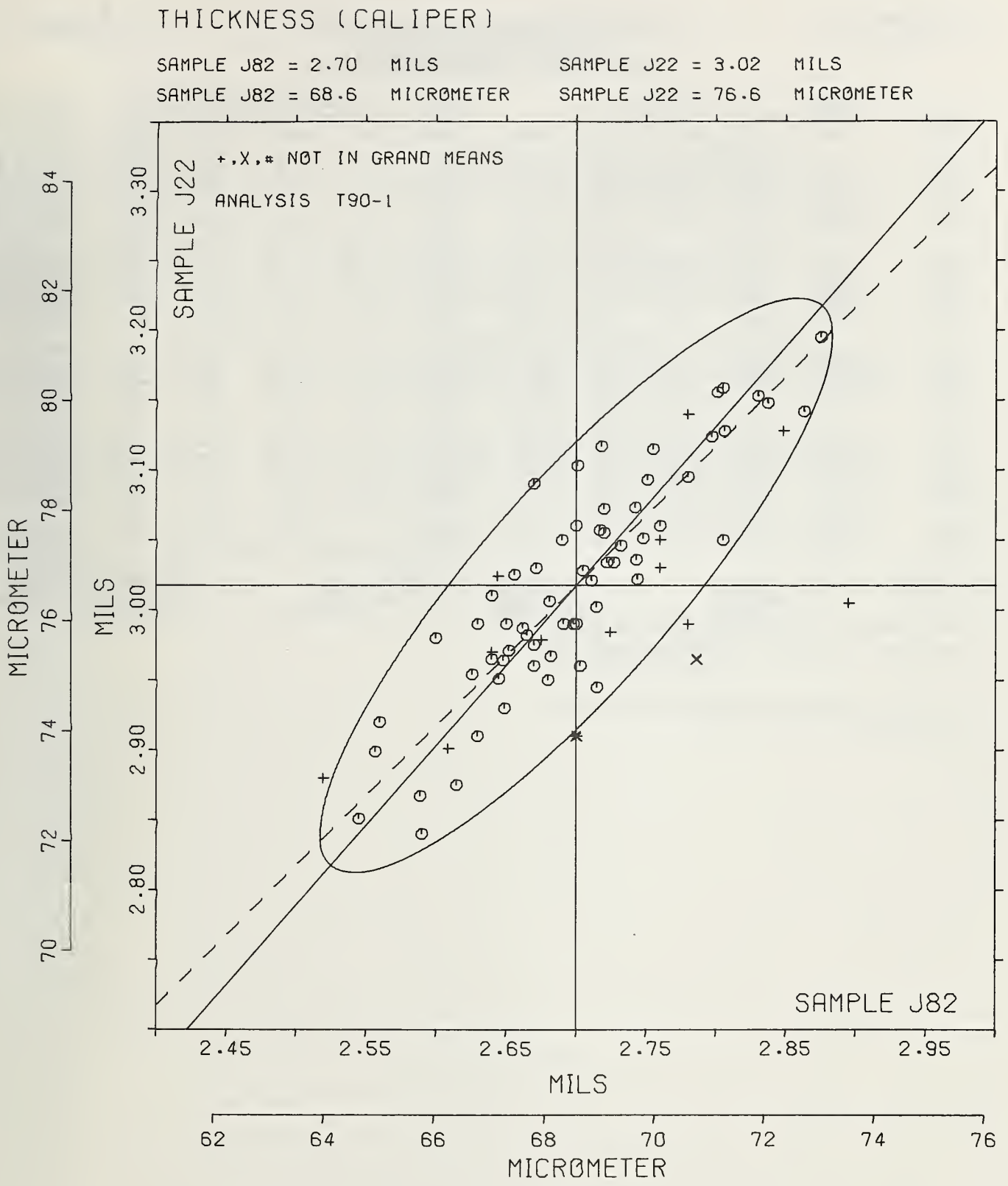
Best values: J82 2.70 ± 0.11 mils
J22 3.02 ± 0.15 mils

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

LAB CODE	F	MEANS J82	MEANS J22	COORDINATES MAJOR	COORDINATES MINOR	AVG RESID	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L203B	*	2.520	2.880	-.222	.045	1.050	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L574	O	2.545	2.851	-.227	.007	.061	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L162	O	2.557	2.899	-.183	.030	.066	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L376	O	2.560	2.920	-.186	.041	.063	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I704	M	2.585				1.059	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L626	O	2.589	2.867	-.186	-.016	1.063	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L320	O	2.590	2.840	-.206	-.034	.062	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L174	O	2.600	2.980	-.094	.051	1.016	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L342	*	2.609	2.901	-.148	-.008	.067	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L318	O	2.615	2.875	-.165	-.030	1.013	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L141	O	2.626	2.954	-.097	.014	.069	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L158	O	2.630	2.990	-.067	.035	1.012	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I203A	O	2.630	2.910	-.127	-.018	1.059	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L390	O	2.640	2.965	-.079	.011	.062	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L344	*	2.640	2.970	-.075	.014	1.052	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L587	O	2.640	3.010	-.045	.040	.094	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L616	*	2.644	3.024	-.032	.046	1.003	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L333	O	2.645	2.951	-.086	-.002	.053	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L223	O	2.648	2.964	-.075	.004	.066	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L356	O	2.649	2.930	-.099	-.019	.064	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L309	O	2.650	2.990	-.054	.019	1.017	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L183	O	2.652	2.971	-.067	.005	.068	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I125	O	2.656	3.025	-.023	.038	1.016	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I575	O	2.662	2.987	-.048	.008	.060	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L358	O	2.665	2.982	-.050	.003	1.025	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L262	O	2.670	2.975	-.052	-.005	.071	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L571	O	2.670	2.960	-.065	-.015	1.024	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L315	O	2.670	3.090	.035	.070	1.036	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I242P	O	2.671	3.030	-.010	.030	1.003	90P	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, ISO R534
I251	*	2.675	2.979	-.046	-.007	.040	90W	THICKNESS (CALIPER), L + W, MOTOR DRIVEN, 20 C, 65% RH
L213	O	2.680	2.950	-.064	-.029	1.000	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L172	O	2.681	3.006	-.021	.007	1.043	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L249	O	2.682	2.967	-.050	-.020	.042	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L212	O	2.690	3.050	.016	.029	1.000	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L128	O	2.691	2.990	-.027	-.011	.072	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L339	O	2.698	2.990	-.022	-.017	1.004	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L305	O	2.700	3.060	.032	.028	1.014	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I190C	*	2.700	2.910	-.081	-.071	1.050	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L228	O	2.700	2.990	-.021	-.018	1.052	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L576	O	2.701	3.103	.065	.056	2.053	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L166	O	2.703	2.960	-.041	-.040	1.004	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L118	O	2.705	3.028	.011	.003	.062	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L328	O	2.711	3.021	.010	-.006	1.019	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I182	O	2.715	3.002	-.002	-.021	1.003	90L	THICKNESS (CALIPER), L + W, MOTOR DRIVEN
I557	O	2.715	2.945	-.045	-.059	1.031	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I567	O	2.717	3.057	.041	.013	.062	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
I556	O	2.718	3.117	.087	.052	.075	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L324	O	2.720	3.055	.041	.010	.069	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L159	O	2.720	3.072	.054	.021	.069	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I261	O	2.722	3.034	.027	-.006	.094	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L484	*	2.724	2.984	-.009	-.040	.068	90E	THICKNESS (CALIPER), SCHOPPER, HAND DRIVEN
L122	O	2.727	3.034	.030	-.009	1.030	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
I105	O	2.732	3.046	.043	-.005	.060	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L242O	O	2.742	3.073	.070	.005	.075	90O	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, BS3983
L352	O	2.743	3.036	.042	-.020	.066	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
I260	O	2.744	3.022	.032	-.030	.055	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L326	O	2.748	3.051	.057	-.014	.061	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I259	O	2.751	3.093	.090	.011	.092	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L581	O	2.755	3.115	.110	.023	.092	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I684	*	2.760	3.030	.049	-.037	1.025	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L563	*	2.760	3.050	.064	-.024	1.041	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
I713	O	2.760	3.060	.071	-.017	.061	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L241	O	2.780	3.095	.111	-.009	1.030	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
I185	*	2.780	3.140	.145	.020	1.015	90B	THICKNESS (CALIPER), ANTHOR, HAND DRIVEN
I106	*	2.780	2.990	.032	-.078	1.008	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN

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

LAB CODE	F	MEANS J62	MEANS J22	COORDINATES MAJOR	COORDINATES MINOR	AVG RATIO VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L360	X	2.780	2.965	.017	-.099	.05 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L233	G	2.797	3.124	.144	-.003	1.01 90Q	THICKNESS (CALIPER), EMVECO, METER DRIVEN
L291	G	2.801	3.156	.171	.015	.70 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L203C	G	2.805	3.050	.094	-.058	1.25 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L323	G	2.805	3.159	.176	.014	1.25 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L341	G	2.806	3.128	.153	-.007	.69 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L153	G	2.830	3.153	.166	-.009	1.11 90T	THICKNESS (CALIPER), TMI, METER DRIVEN
L442	G	2.837	3.148	.166	-.017	.57 90V	THICKNESS (CALIPER), TMI, METER DRIVEN,DIGITIZED
L285	*	2.848	3.128	.131	-.039	1.46 90X	THICKNESS (CALIPER): GIVE INSTR. MAKE*MODEL.( )METER,( )HAND
L382	G	2.863	3.142	.201	-.041	.85 90I	THICKNESS (CALIPER), TMI, METER DRIVEN
L123F	G	2.875	3.195	.249	-.015	1.33 90F	THICKNESS (CALIPER), FEDERAL, METER DRIVEN
L108	*	2.895	3.005	.119	-.155	.73 90C	THICKNESS (CALIPER), CADY, BAND DRIVEN
GMEANS:		2.700	3.018			1.00	
		95% ELLIPSE:		.200	.071	WITH GAMMA = 48 DEGREES	


THICKNESS (CALIPER)
SAMPLE J82 = 2.70 MILS
SAMPLE J82 = 68.6 MICROMETER
SAMPLE J22 = 3.02 MILS
SAMPLE J22 = 76.6 MICROMETER
+,X,* NOT IN GRAND MEANS
ANALYSIS T90-1
SAMPLE J22
MILS
3.30
3.20
3.10
3.00
2.90
2.80
MICROMETER
84
82
80
78
76
74
72
70
SAMPLE J82
2.45
2.55
2.65
2.75
2.85
2.95
MILS
62
64
66
68
70
72
74
76
MICROMETER

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

LAB CODE	SAMPLE D37 MEAN	HAS BOND 61 GRAMS PER SQUARE METER DEV	NO. DEV	SDR	NO. SDR	SAMPLE D36 MEAN	COATED OFFSET BOOK 75 GRAMS PER SQUARE METER DEV	NO. DEV	SDR	NO. SDR	VAR	F	TEST D. = 10 LAB
L121	62.03	1.17	1.61	.37	.53	77.91	.92	1.50	.56	1.30	95B	6	L121
L162	60.59	-.27	-.41	1.87	2.73	77.70	.71	1.16	.60	.00	95K	6	L162
L213	60.62	-.23	-.36	1.00	1.55	76.71	-.27	-.44	.27	.64	95F	6	L213
L233	60.77	-.09	-.14	.73	1.06	77.00	.01	.02	.86	2.00	95T	6	L233
L244	59.75	-1.11	-1.70	1.20	1.76	76.40	-.59	-.95	.89	2.08	95T	6	L244
L249	61.90	1.04	1.61	1.17	1.71	77.02	.03	.06	.17	.39	95I	6	L249
L280	60.38	-.48	-.73	.29	.42	77.52	.53	.87	.34	.80	95T	6	L280
L285	59.97	-.89	-1.37	.21	.30	76.20	-.79	-1.27	.30	.70	95T	6	L285
L305	60.45	-.41	-.63	.37	.54	77.11	.12	.20	.31	.72	95T	6	L305
L339	61.30	.44	.68	.42	.62	77.05	.06	.10	.37	.86	95T	6	L339
L344	61.31	.45	.69	.13	.19	78.12	1.14	1.85	.28	.64	95T	6	L344
L442	61.38	.52	.81	.53	.77	77.49	.50	.82	.26	.60	95K	6	L442
L557	61.57	.71	1.09	1.40	2.04	76.94	-.04	-.07	.60	1.41	95D	6	L557
L564	61.00	.14	.22	.82	1.19	77.40	.41	.67	.84	1.96	95E	6	L564
L567	61.56	.70	1.08	1.03	1.51	77.36	.37	.61	.41	.96	95E	6	L567
L571	60.27	-.59	-.90	.38	.56	76.01	-.98	-1.58	.56	1.31	95P	6	L571
L574	60.46	-.39	-.60	.33	.48	76.80	-.18	-.30	.39	.91	95D	6	L574
L597	60.91	.05	.08	.39	.57	75.91	-1.07	-1.74	.51	1.20	95C	6	L597
L604	36.19	-24.66	-38.00	.32	.46	43.95	-31.04	-50.31	.28	.64	95T	#	L604
L616	59.97	-.89	-1.37	.36	.55	76.30	-.68	-1.11	.36	.83	95T	6	L616
L626	60.95	.09	.14	.02	.91	76.74	-.25	-.40	.30	.70	95E	6	L626
L704	61.04	.18	.28	.31	.45	NO DATA REPORTED FOR SAMPLE D36					95T	N	L704

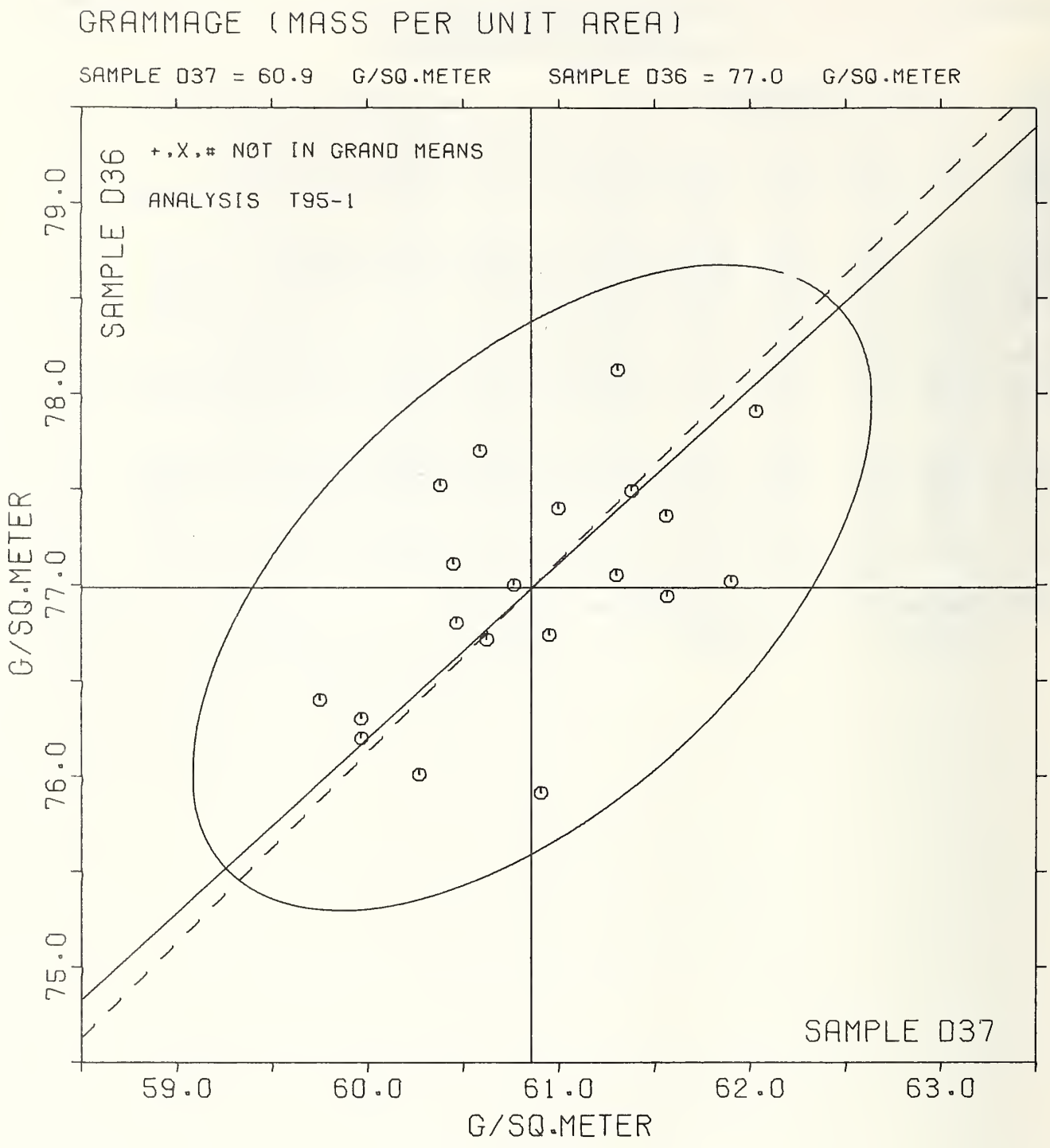
GR. MEAN = 60.86 G/SQ.METER GRAND MEAN = 76.99 G/SQ.METER TEST DETERMINATIONS = 10
SD MEANS = .65 G/SQ.METER SD OF MEANS = .62 G/SQ.METER 20 LABS IN GRAND MEANS
AVERAGE SDR = .68 G/SQ.METER AVERAGE SDR = .43 G/SQ.METER
TOTAL NUMBER OF LABORATORIES REPORTING = 22

Best values: D37 60.9 ± 1.1 grams per square meter
D36 77.0 ± 1.0 grams per square meter

Data from the following laboratories appear to be off
by a multiplicative factor: 604.

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

LAB CODE	F	MEANS D37	MEANS D36	COORDINATES MAJOR	COORDINATES MINOR	AVG No.Sht Var	PROPERTY---TEST INSTRUMENT---CONDITIONS
L604	#	36.19	45.95	-39.14	-0.26	.05	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L244	@	59.75	76.40	-1.21	.31	1.52	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L616	@	59.97	76.30	-1.12	.10	.05	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L285	@	59.97	76.20	-1.19	.02	.50	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L571	@	60.27	76.01	-1.09	-.32	.53	95P BASIS WEIGHT (GRAMMAGE), PRODUCTION REAM CUTTER
L280	@	60.38	77.52	.01	.72	.01	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L305	@	60.45	77.11	-.22	.37	.03	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L574	@	60.40	76.80	-.41	.13	.70	95D BASIS WEIGHT (GRAMMAGE), DIE CUT
L162	@	60.59	77.70	.29	.71	1.36	95A BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L213	@	60.62	76.71	-.35	-.04	1.09	95F BASIS WEIGHT (GRAMMAGE), FOUR-SQUARE CUTTER
L233	@	60.77	77.00	-.06	.07	1.53	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L597	@	60.91	75.91	-.09	-.82	.08	95C BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
L626	@	60.95	76.74	-.10	-.24	.00	95E BASIS WEIGHT (GRAMMAGE), GUILLOTINE TYPE CUTTER
L564	@	61.00	77.40	.39	.21	1.38	95E BASIS WEIGHT (GRAMMAGE), GUILLOTINE TYPE CUTTER
L704	M	61.04				.45	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L339	@	61.30	77.05	.37	-.25	.74	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L344	@	61.31	78.12	1.10	.54	.42	95T BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L442	@	61.38	77.49	.73	.02	.08	95A BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L567	@	61.56	77.36	.77	-.20	1.23	95E BASIS WEIGHT (GRAMMAGE), GUILLOTINE TYPE CUTTER
L557	@	61.57	76.94	.49	-.51	1.72	95D BASIS WEIGHT (GRAMMAGE), DIE CUT
L249	@	61.90	77.02	.79	-.68	1.65	95I BASIS WEIGHT (GRAMMAGE), INGENTO PAPER CUTTER
L121	@	62.03	77.91	1.49	-.11	.92	95B BASIS WEIGHT (GRAMMAGE), CENCERA CUTTER
GMEANS:		60.86	76.99			1.00	
		95% ELLIPSE:		2.17	1.14	WITH GAMMA = 42 DEGREES	


GRAMMAGE (MASS PER UNIT AREA)
SAMPLE D37 = 60.9 G/SQ.METER
SAMPLE D36 = 77.0 G/SQ.METER
+,X,# NOT IN GRAND MEANS
ANALYSIS T95-1
SAMPLE D36
G/SQ.METER
79.0
78.0
77.0
76.0
75.0
SAMPLE D37
59.0
60.0
61.0
62.0
63.0
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		A01	21.9	1.7	2.8	10	59	62	10	2.5	4.6
T460-1	GURLEY UNITS	K22	45.4	2.6	3.1					2.7	7.2
AIR RESISTANCE, SHEFFIELD		A01	134.2	10.1	13.0	10	34	42	10	11.4	28.1
T460-2	SHEFF. UNITS	K22	79.1	7.0	5.0					4.4	21.0
AIR RESISTANCE, GURLEY HD FLOTATION		D06	164.	13.	16.	10	12	14	10	14.	36.
T460-1	SEC/10 CC	G11	271.	41.	83.					72.	115.
SMOOTHNESS, PARKER PRINT-SURF		J74	4.36	.42	.16	10	7	7	10	.14	1.16
T444-1	MICRONS	K46	5.59	.46	.16					.14	1.34
SMOOTHNESS, SHEFFIELD		J74	80.9	5.5	5.1	15	82	89	10	4.5	15.5
T538-1	SHEFF. UNITS	K46	167.4	7.9	9.3					8.2	22.4
SMOOTHNESS, BEKK		J74	83.7	3.8	7.6	15	8	11	5	9.5	13.0
T538-2	BEKK SECONDS	K46	27.1	2.2	2.8					3.5	6.8
SMOOTHNESS, BENDTSEN		J74	96.6	9.5	8.4	10	8	8	10	7.4	27.3
T547-1	ML/MIN	K46	223.9	15.7	23.4					20.5	43.6
MOISTURE		G09	5.92	.32	.08	10	9	10	2	.15	.91
T553-1	PERCENT	G10	6.17	.48	.08					.15	1.35
K & N INK ABSORPTION		B80	24.0	3.1	.8	4	10	10	2	1.5	8.7
T556-1	K & N UNITS	B92	23.8	3.1	.8					1.5	8.6
PH, COLD		A99	5.729	.114	.045	5	7	7	2	.089	.322
T457-1	PH UNITS	J75	7.200	.391	.081					.158	1.089
PH, HOT		A99	5.182	.256	.054	5	4	6	2	.106	.718
T457-2	PH UNITS	J75	7.705	.163	.064					.125	.461
OPACITY, E&L, 89% BACKING, FINE P.		G01	95.88	.34	.23	10	63	79	5	.28	.96
T460-1	PERCENT	E85	89.72	.43	.35					.44	1.22
OPACITY, ELREPHO, PAPER BACKING, FINE P		G01	94.42	.24	.20	10	14	19	5	.25	.68
T460-2	PERCENT	E85	92.05	.25	.24					.30	.72
OPACITY, E&L, 89% BACKING, NEWS		Z03	93.53	.52	.44	10	14	16	5	.55	1.48
T461-1	PERCENT	G13	81.84	.63	.73					.90	1.85
OPACITY, E&L, 89% BACKING, TRACING		Z05	88.98	.94	.59	10	6	7	5	.73	2.65
T462-1	PERCENT	Z07	59.17	.82	.73					.90	2.35
OPACITY, ELREPHO, PAPER BACKING, NEWS		Z03	90.95	.06	.21	10	2	3	5		
T461-2	PERCENT	G13	82.02	.30	.50						
OPACITY, ELREPHO, PAPER BACK., TRACING		Z05	74.70		.18	10	1	1	5		
T462-2	PERCENT	Z07	61.06		.30						
BLUE REFLECTANCE, DIRECTIONAL		J98	75.94	.60	.14	8	28	56	5	.17	1.68
T465-1	PERCENT	B47	66.25	1.00	.33					.41	2.78
BLUE REFLECTANCE, DIFFUSE, WITH TRAP		J98	75.64	.61	.11	8	16	18	5	.14	1.69
T465-2	PERCENT	B47	66.47	.79	.21					.26	2.18
BLUE REFLECTANCE, DIFFUSE, NO TRAP		J98	70.66	.47	.09	8	14	14	5	.11	1.31
T465-3	PERCENT	B47	68.11	.66	.19					.23	1.85
SPECULAR GLOSS, 75 DEGREE-HIGH RANGE		E67	68.8	2.2	1.8	10	33	38	5	2.2	6.4
T75-1	GLOSS UNITS	E47	63.6	1.9	1.7					2.0	5.4
SPECULAR GLOSS, 75 DEGREE-LOW RANGE		G05	37.92	1.66	1.21	10	16	19	5	1.50	5.25
T76-1	GLOSS UNITS	E78	6.01	.57	.30					.37	1.61
THICKNESS (CALIPER)		J82	2.700	.072	.039	10	63	77	10	.035	.200
T90-1	MILS	J22	3.018	.061	.056					.049	.225
GRAMMAGE (MASS PER UNIT AREA)		D37	60.86	.65	.68	10	20	22	3	1.09	2.02
T95-1	G/SQ.METER	D36	76.99	.62	.43					.69	1.80

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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

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