TECHNICAL ASSOCIATION OF THE
PULP AND PAPER INDUSTRY

COLLABORATIVE REFERENCE PROGRAM FOR PAPER

REPORT NO. 60G

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
- pH
- Opacity
- Blue reflectance (brightness)
- Specular gloss, 75°
- Thickness
- Concora (flat crush)
- Ring crush

FKBG-API Containerboard (48 times per year)

- Mullen burst of linerboard
- Concora test of medium

MCCA Color and Appearance (4 times per year)

- Gloss at 60°
- Color and color difference

CTS Rubber (4 times per year)

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

CTS Thermal Insulation Materials (2 times per year)

19 test methods for thermal insulation materials covering: thermal properties; strength properties; dimensions, stability, and density properties; fire properties; and properties of vapor barriers

ASTM Cement (2 times per year)

- Chemical (11 chemical components)
- Physical (8 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
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Report No. 60G

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NBSIR 79-1806

U. S. DEPARTMENT OF COMMERCE
National Bureau of Standards

INTRODUCTION

Reports 60S and 60G comprise the last set of reports for the 78-79 program year. Participants in tests which involve strength properties of paper will receive only the G report; those in tests which measure other properties will receive only the S 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 4 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

August 13, 1979

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.

TABLE OF CONTENTS

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

KEY TO TABLES AND GRAPHS

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

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

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

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

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

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

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

R. SDR - The relative standard deviation of repeated measurements; that is, the ratio of the SDR to the AVERAGE SDR; an indication of the ability of a participant to repeat his 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
5	0.27	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:

+ - Excluded from grand means because VAR non-standard for this analysis.

- Excluded because data were not understood or because of a non-coded variation reported by the laboratory. (See NOTES following Table 1 for each method).

M - Excluded because data for one sample are missing.

X - Excluded because plotted point would fall outside of the 99% error ellipse, (see below for explanation of Graph).

* - Included in grand means but plotted point falls outside of the 95% error ellipse. The participants should take this as a warning to reexamine his testing procedure.

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.

O - Included in grand mean and inside 95% error ellipse.

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

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

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

Graph - For each laboratory the MEAN for the second sample is plotted against the MEAN for the first sample, with each point representing a laboratory. The horizontal and vertical lines are the GRAND MEANS. The dashed line is drawn at 45°. The solid sloping line, which may or may not lie close to the 45° 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 '0'. A participant whose plotted point falls outside of the ellipse should carefully reexamine the testing procedure he 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 Standard or assumed here if there is no TAPPI Standard. This quantity is needed in the computation of TAPPI repeatability and reproducibility from the SD OF MEANS and the AVER SDR. See TAPPI Standard 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.

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.

ANALYSIS T40-1 TABLE 1
AIR RESISTANCE, GURLEY UNITS (SECONDS/100 CC)
TAPPI STANDARD T460 OS-75, AIR RESISTANCE OF PAPER

LAB CODE	SAMPLE B95 BEAT SET OFFSET BOOK 91 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE A81 KRAFT ENVELOPE 90 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L100	49.6	1.2	.42	4.3	.96	22.2	.2	.08	2.1	.83	40D	ó	L100
L106	44.0	-4.4	-1.53	5.2	1.14	21.9	-.1	-.07	1.4	.57	40D	ó	L106
L107	48.5	.1	.02	5.2	1.15	21.3	-.7	-.38	2.1	.83	40D	ó	L107
L121	43.6	-4.8	-1.66	2.5	.54	19.6	-2.5	-1.29	3.1	1.24	40D	ó	L121
L122	49.0	.6	.20	3.7	.82	21.1	-1.0	-.51	2.7	1.07	40D	ó	L122
L123	48.8	.4	.12	4.3	.95	20.9	-1.2	-.61	3.1	1.21	40D	ó	L123
L124G	47.5	-.9	-.31	6.2	1.37	20.8	-1.2	-.62	3.5	1.38	40D	ó	L124G
L125	48.5	.1	.02	3.2	.72	22.2	.1	.07	2.7	1.08	40D	ó	L125
L128	48.8	.4	.13	7.6	1.69	21.9	-.1	-.07	2.9	1.15	40D	ó	L128
L148	49.3	.9	.31	3.5	.78	26.0	4.0	2.08	2.4	.95	40D	ó	L148
L153	46.3	-2.1	-.74	7.2	1.59	23.5	1.5	.79	1.5	.61	40D	ó	L153
L158	43.6	-4.8	-1.67	5.8	1.29	17.4	-4.6	-2.43	2.5	.97	40D	ó	L158
L159	50.2	1.7	.60	4.2	.92	22.3	.3	.14	3.1	1.20	40D	ó	L159
L163	50.2	1.8	.61	3.9	.86	23.4	1.4	.71	1.7	.68	40D	ó	L163
L166	51.1	2.7	.94	5.5	1.22	24.3	2.3	1.20	2.3	.90	40D	ó	L166
L174	49.2	.7	.26	4.5	1.01	19.4	-2.6	-1.39	3.8	1.51	40D	ó	L174
L176	68.5	20.1	6.94	11.6	2.56	28.5	6.5	3.41	3.6	1.41	40D	#	L176
L182G	48.2	-.2	-.08	4.6	1.03	20.3	-1.8	-.93	2.6	1.01	40D	ó	L182G
L183	46.3	-2.1	-.74	5.1	1.14	22.9	.9	.48	2.6	1.04	40D	ó	L183
L190C	44.5	-3.9	-1.36	5.4	1.19	22.8	.8	.40	2.4	.94	40D	ó	L190C
L190R	48.3	-.1	-.05	5.2	1.15	22.6	.6	.32	2.5	.97	40D	ó	L190R
L212	44.8	-3.6	-1.25	3.8	.85	18.5	-3.5	-1.82	4.1	1.63	40D	ó	L212
L219	46.4	-2.0	-.70	4.9	1.08	20.5	-1.5	-.80	1.6	.62	40D	ó	L219
L223	49.0	.6	.19	5.1	1.13	24.7	2.7	1.40	1.4	.56	40D	ó	L223
L224	46.4	-2.0	-.70	4.1	.91	22.2	.2	.09	3.3	1.31	40D	ó	L224
L230G	50.8	2.4	.82	5.5	1.21	21.7	-.3	-.17	2.5	.97	40D	ó	L230G
L232	48.9	.4	.15	3.1	.68	22.7	.7	.37	2.0	.81	40D	ó	L232
L236	42.5	-5.9	-2.04	5.3	1.17	21.1	-.9	-.49	1.8	.72	40D	ó	L236
L238A	49.7	1.3	.44	3.1	.68	23.8	1.7	.91	2.5	.98	40D	ó	L238A
L241	46.7	-1.8	-.61	4.3	.94	24.0	2.0	1.03	4.4	1.75	40D	ó	L241
L242	48.6	.2	.06	3.7	.82	23.1	1.1	.56	.8	.32	40D	ó	L242
L254	48.5	.1	.02	5.0	1.10	23.6	1.6	.81	2.5	.99	40D	ó	L254
L259	51.2	2.8	.95	8.4	1.86	21.0	-1.0	-.51	3.3	1.31	40D	ó	L259
L261	48.6	.2	.05	4.7	1.04	22.6	.6	.30	1.9	.74	40D	ó	L261
L262G	49.0	.6	.21	2.2	.48	23.4	1.4	.71	1.8	.72	40D	ó	L262G
L265	49.4	1.0	.33	6.1	1.35	21.3	-.7	-.37	1.6	.63	40D	ó	L265
L274	47.1	-1.3	-.45	1.0	.22	21.1	-.9	-.49	.4	.15	40D	ó	L274
L278	56.9	8.5	2.93	11.2	2.47	26.5	4.4	2.33	4.2	1.66	40D	*	L278
L285	53.5	5.1	1.75	2.9	.63	23.1	1.1	.57	2.1	.84	40D	ó	L285
L308	50.9	2.5	.85	5.4	1.20	20.7	-1.3	-.71	2.8	1.10	40D	ó	L308
L313	49.0	.6	.20	4.6	1.03	22.2	.2	.09	2.5	1.00	40D	ó	L313
L320	45.2	-3.2	-1.12	3.3	.73	17.8	-4.2	-2.22	3.0	1.20	40D	ó	L320
L321	51.2	2.8	.95	5.3	1.16	21.4	-.6	-.33	2.3	.91	40D	ó	L321
L324	49.9	1.5	.51	2.0	.44	22.6	.6	.30	2.5	1.00	40D	ó	L324
L326	53.1	4.7	1.61	5.6	1.24	23.1	1.1	.58	2.9	1.15	40D	ó	L326
L328	47.5	-.9	-.32	4.2	.92	23.4	1.4	.73	1.9	.74	40D	ó	L328
L339	43.6	-4.8	-1.66	5.3	1.18	19.6	-2.4	-1.26	2.2	.89	40D	ó	L339
L344	45.8	-2.7	-.92	3.9	.87	20.2	-1.8	-.94	2.2	.86	40D	ó	L344
L376	50.4	2.0	.69	4.8	1.07	23.6	1.6	.84	2.2	.86	40D	ó	L376
L380	48.2	-.2	-.08	1.0	.23	23.8	1.8	.93	1.5	.58	40D	ó	L380
L388	54.3	5.9	2.02	5.9	1.30	24.7	2.7	1.40	4.0	1.57	40D	ó	L388
L394	51.1	2.7	.92	6.9	1.52	21.7	-.3	-.17	3.6	1.41	40D	ó	L394
L396M	51.4	2.9	1.02	4.8	1.06	21.9	-.1	-.05	3.7	1.44	40D	ó	L396M
L484	41.2	-7.3	-2.51	3.5	.77	17.7	-4.3	-2.28	3.1	1.23	40H	*	L484
L576	47.8	-.7	-.23	4.2	.93	24.1	2.1	1.09	3.2	1.26	40D	ó	L576
L585	49.6	1.1	.39	4.9	1.09	20.9	-1.1	-.58	4.0	1.58	40D	ó	L585
L597	49.6	1.2	.40	3.6	.80	21.7	-.3	-.17	3.3	1.30	40D	ó	L597
L604	45.4	-3.0	-1.05	5.1	1.12	21.9	-.1	-.04	2.3	.90	40D	ó	L604
L616	52.0	3.6	1.23	1.9	.43	23.1	1.1	.56	1.2	.47	40D	ó	L616
L651	46.6	-1.8	-.63	4.7	1.04	20.8	-1.2	-.64	3.6	1.40	40D	ó	L651
L676	50.1	1.6	.56	4.9	1.07	25.4	3.4	1.78	1.7	.67	40D	ó	L676
L697	47.1	-1.3	-.46	4.1	.90	19.5	-2.5	-1.33	3.9	1.53	40D	ó	L697

GR. MEAN = 48.4 GURLEY UNITS — GRAND MEAN = 22.0 GURLEY UNITS — TEST DETERMINATIONS = 10
SD MEANS = 2.9 GURLEY UNITS — SD OF MEANS = 1.9 GURLEY UNITS — 61 LABS IN GRAND MEANS
AVERAGE SDR = 4.5 GURLEY UNITS — AVERAGE SDR = 2.5 GURLEY UNITS

ANALYSIS T40-1 TABLE 1

AIR RESISTANCE, GURLEY UNITS (SECONDS/100 CC)

TAPPI STANDARD T460 OS-75, AIR RESISTANCE OF PAPER

LAB CODE	SAMPLE B95 MEAN	HEAT SET OFFSET BOOK 91 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	SAMPLE A81 MEAN	KRAFT ENVELOPE 90 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L115	49.8	1.4	.47	3.8	.85	21.3	-.7	-.38	3.8	1.48	40U	*	L115
L291	48.2	-.2	-.08	5.4	1.19	22.6	.6	.30	4.4	1.73	40U	*	L291
L564	7.6	-40.9	-14.10	.6	.14	4.0	-18.0	-9.44	.4	.16	40K	*	L564

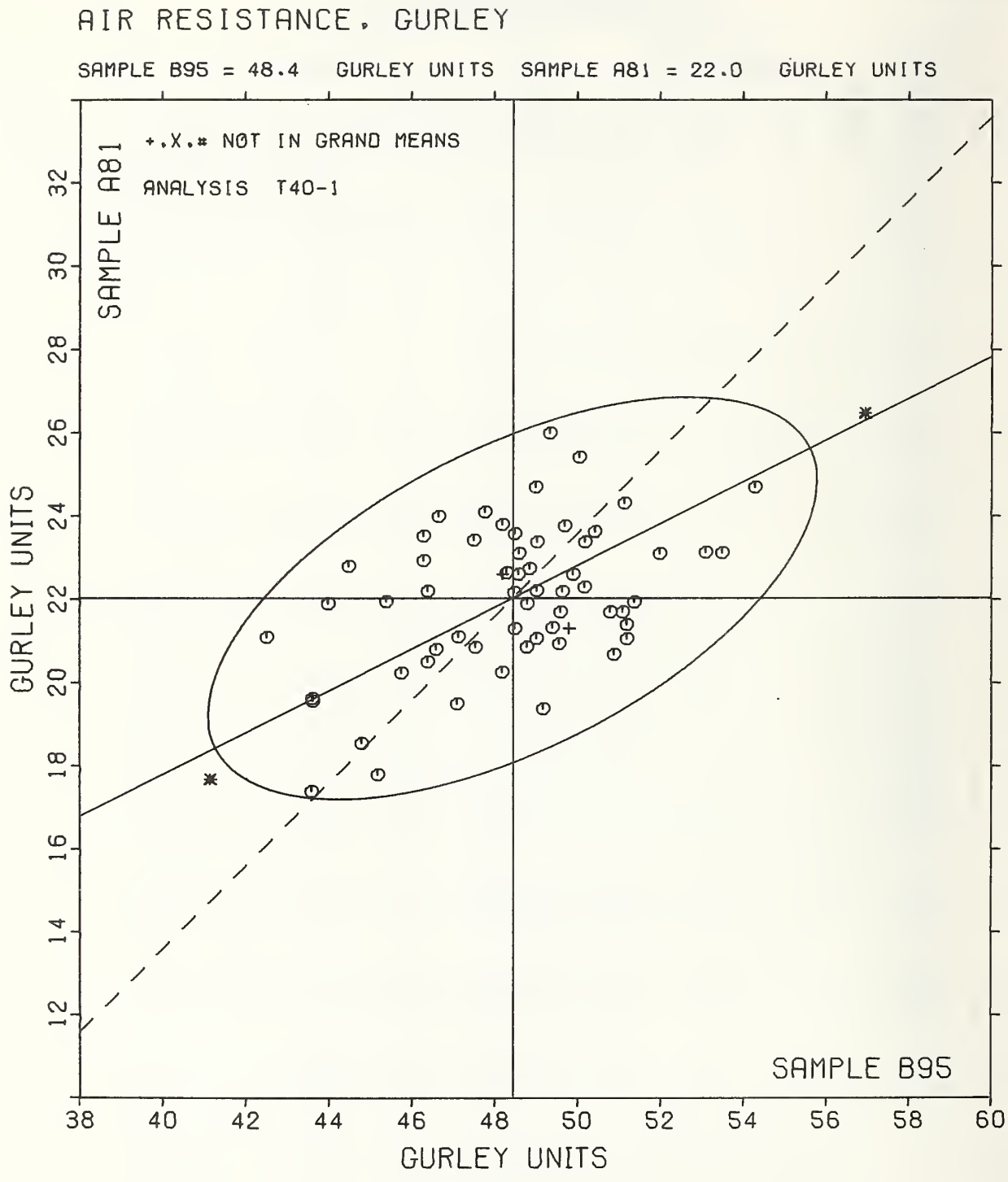
TOTAL NUMBER OF LABORATORIES REPORTING = 65

Best values: B95 48.5 ± 4.9 Gurley units
A81 22.0 ± 2.7 Gurley units

The following laboratories were omitted from the grand means because of extreme test results: 176.

ANALYSIS T40-1 TABLE 2
AIR RESISTANCE, GURLEY UNITS (SECONDS/100 CC)
TAPPI STANDARD T460 OS-75, AIR RESISTANCE OF PAPER

LAB CODE	F	MEANS B95	MEANS A81	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L564	*	7.6	4.0	-44.6	2.2	.15	40K	AIR RESISTANCE, BEKK
L484	#	41.2	17.7	-8.5	-.6	1.00	40H	AIR RESISTANCE, REGMED-TYPE GURLEY DENSOMETER -OIL FLOTATION
L236	O	42.5	21.1	-5.7	1.8	.95	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L158	O	43.6	17.4	-6.4	-2.0	1.13	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L339	O	43.6	19.6	-5.4	.0	1.03	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L121	O	43.6	19.6	-5.4	-.0	.89	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L106	O	44.0	21.9	-4.0	1.9	.86	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L190C	O	44.5	22.8	-3.2	2.5	1.06	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L212	O	44.8	18.5	-4.8	-1.5	1.24	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L320	O	45.2	17.8	-4.8	-2.3	.96	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L604	O	45.4	21.9	-2.7	1.3	1.01	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L344	O	45.8	20.2	-3.2	-.4	.86	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L153	O	46.3	23.5	-1.2	2.3	1.10	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L183	O	46.3	22.9	-1.5	1.8	1.09	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L224	O	46.4	22.2	-1.7	1.1	1.11	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L219	O	46.4	20.5	-2.5	-.5	.85	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L651	O	46.6	20.8	-2.2	-.3	1.22	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L241	O	46.7	24.0	-.7	2.6	1.34	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L697	O	47.1	19.5	-2.3	-1.7	1.22	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L274	O	47.1	21.1	-1.6	-.2	.18	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L328	O	47.5	23.4	-.2	1.7	.83	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L124G	O	47.5	20.8	-1.3	-.7	1.38	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L576	O	47.8	24.1	.3	2.1	1.09	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L291	*	48.2	22.6	.0	.6	1.46	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L380	O	48.2	23.8	.6	1.7	.40	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L182G	O	48.2	20.3	-1.0	-1.5	1.02	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L190R	O	48.3	22.6	.2	.6	1.06	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L125	O	48.5	22.2	.1	.1	.90	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L107	O	48.5	21.3	-.3	-.7	.99	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L254	O	48.5	23.6	.8	1.4	1.04	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L261	O	48.6	22.6	.4	.4	.89	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L242	O	48.6	23.1	.6	.9	.57	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L123	O	48.8	20.9	-.2	-1.2	1.08	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L128	O	48.8	21.9	.3	-.3	1.42	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L232	O	48.9	22.7	.7	.4	.74	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L223	O	49.0	24.7	1.7	2.1	.84	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L122	O	49.0	21.1	.1	-1.1	.95	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L313	O	49.0	22.2	.6	-.1	1.01	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L262G	O	49.0	23.4	1.1	.9	.60	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L174	O	49.2	19.4	-.5	-2.7	1.26	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L148	O	49.3	26.0	2.6	3.1	.87	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L265	O	49.4	21.3	.5	-1.1	.99	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L585	O	49.6	20.9	.5	-1.5	1.33	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L597	O	49.6	21.7	.9	-.8	1.05	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L100	O	49.6	22.2	1.2	-.4	.89	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L238A	O	49.7	23.8	1.9	1.0	.83	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L115	*	49.8	21.3	.9	-1.3	1.17	40U	AIR RESISTANCE, SHEFFIELD IN GURLEY UNITS
L324	O	49.9	22.6	1.6	-.2	.72	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L676	O	50.1	25.4	3.0	2.3	.87	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L159	O	50.2	22.3	1.7	-.5	1.06	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L163	O	50.2	23.4	2.2	.4	.77	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L376	O	50.4	23.6	2.5	.5	.96	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L230G	O	50.8	21.7	2.0	-1.4	1.09	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L308	O	50.9	20.7	1.6	-2.3	1.15	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L394	O	51.1	21.7	2.2	-1.5	1.47	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L166	O	51.1	24.3	3.4	.8	1.06	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L321	O	51.2	21.4	2.2	-1.8	1.04	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L259	O	51.2	21.0	2.0	-2.1	1.59	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L396M	O	51.4	21.9	2.6	-1.4	1.25	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L616	O	52.0	23.1	3.7	-.6	.45	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L326	O	53.1	23.1	4.7	-1.1	1.20	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L285	O	53.5	23.1	5.0	-1.3	.74	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L388	O	54.3	24.7	6.4	-.2	1.43	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L278	*	56.9	26.5	9.6	.2	2.07	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
L176	#	68.5	28.5	20.9	-3.2	1.99	40D	AIR RESISTANCE, GURLEY DENSOMETER - OIL FLOTATION
GMEANS:		48.4	22.0			1.00		
		95% ELLIPSE:		8.0	3.6	WITH GAMMA = 26 DEGREES		


AIR RESISTANCE, GURLEY
SAMPLE B95 = 48.4 GURLEY UNITS SAMPLE A81 = 22.0 GURLEY UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T40-1
SAMPLE A81
GURLEY UNITS
12
14
16
18
20
22
24
26
28
30
32
SAMPLE B95
38
40
42
44
46
48
50
52
54
56
58
60
GURLEY UNITS

ANALYSIS T40-2 TABLE 1

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

SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	SAMPLE B95 BEAT SET OFFSET BOOK 91 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE A81 KRAFT ENVELOPE 90 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D.= 10 VAR	F	LAB
L114	76.9	4.5	1.32	6.0	.97	126.0	-5.1	-.64	10.5	.80	40S	ó	L114
L121	73.8	1.4	.42	7.2	1.16	120.9	-10.2	-1.27	10.0	.77	40S	ó	L121
L124S	72.4	.0	.01	5.1	.82	120.6	-10.5	-1.31	6.3	.48	40S	ó	L124S
L132	70.7	-1.7	-.48	7.4	1.19	138.0	6.9	.86	17.5	1.34	40S	ó	L132
L148	79.5	7.1	2.07	7.2	1.17	138.0	6.9	.86	15.0	1.14	40S	ó	L148
L150	73.5	1.1	.33	7.0	1.13	138.6	7.5	.93	12.4	.95	40S	ó	L150
L157	69.9	-2.5	-.71	8.3	1.34	132.9	1.8	.22	10.1	.77	40S	ó	L157
L158	70.0	-2.4	-.68	4.1	.66	125.0	-6.1	-.76	13.3	1.02	40S	ó	L158
L173B	76.0	3.6	1.06	8.1	1.30	141.5	10.4	1.29	18.7	1.43	40S	ó	L173B
L190C	79.0	6.6	1.92	5.2	.83	142.5	11.4	1.42	20.6	1.57	40S	ó	L190C
L213	72.0	-.4	-.10	5.4	.87	119.4	-11.7	-1.46	8.8	.67	40S	ó	L213
L223	65.5	-6.9	-1.98	5.7	.91	129.9	-1.2	-.15	18.2	1.39	40S	ó	L223
L228	72.4	.0	.01	1.3	.20	172.2	41.1	5.12	18.4	1.40	40S	#	L228
L230S	66.2	-6.2	-1.78	7.0	1.12	119.9	-11.2	-1.40	13.1	1.00	40S	ó	L230S
L233	69.6	-2.8	-.80	9.1	1.47	134.5	3.4	.42	14.1	1.07	40S	ó	L233
L241	90.0	17.6	5.11	3.3	.54	147.5	16.4	2.04	11.8	.90	40S	#	L241
L249	70.9	-1.5	-.42	7.0	1.13	126.2	-4.9	-.61	16.2	1.24	40S	ó	L249
L255	96.5	24.1	6.99	5.3	.85	142.7	11.6	1.44	11.0	.84	40S	#	L255
L257A	74.9	2.5	.74	4.3	.70	127.4	-3.7	-.46	11.3	.86	40S	ó	L257A
L257B	74.0	1.6	.48	5.0	.80	136.9	5.8	.72	14.7	1.12	40S	ó	L257B
L257C	75.5	3.1	.91	9.0	1.45	134.8	3.7	.46	14.0	1.07	40S	ó	L257C
L260	72.4	.0	.01	5.0	.80	128.4	-2.7	-.34	7.7	.59	40S	ó	L260
L262S	71.8	-.6	-.16	3.9	.62	136.6	5.5	.68	6.9	.53	40S	ó	L262S
L288	74.0	1.6	.48	9.1	1.47	140.9	9.8	1.22	18.0	1.37	40S	ó	L288
L305	75.1	2.7	.80	5.0	.80	126.7	-4.4	-.55	7.9	.60	40S	ó	L305
L318	66.8	-5.6	-1.61	9.1	1.46	120.4	-10.7	-1.34	8.2	.63	40S	ó	L318
L352	73.1	.7	.22	6.5	1.05	136.3	5.2	.65	15.9	1.22	40S	ó	L352
L354	76.4	4.0	1.17	7.9	1.27	145.1	14.0	1.74	22.0	1.68	40S	ó	L354
L360	75.0	2.6	.77	5.1	.81	130.9	-.2	-.03	13.1	1.00	40S	ó	L360
L366	66.3	-6.1	-1.75	7.5	1.20	117.9	-13.2	-1.65	10.1	.77	40S	ó	L366
L372	74.8	2.4	.71	4.1	.66	127.2	-3.9	-.49	16.6	1.27	40S	ó	L372
L390	74.5	2.1	.62	3.7	.59	130.0	-1.1	-.14	14.1	1.08	40S	ó	L390
L562	71.2	-1.2	-.33	7.3	1.17	146.9	15.8	1.97	17.1	1.31	40S	ó	L562
L575	69.5	-2.9	-.83	4.0	.64	123.8	-7.3	-.91	12.1	.93	40S	ó	L575
L585	71.0	-1.4	-.39	3.9	.63	124.0	-7.1	-.89	11.7	.90	40S	ó	L585
L597	71.0	-1.4	-.39	5.8	.93	140.4	9.3	1.16	15.3	1.17	40S	ó	L597
L600	72.1	-.3	-.07	6.6	1.06	127.9	-3.2	-.40	6.9	.53	40S	ó	L600
L626	65.4	-7.0	-2.01	4.7	.75	122.8	-8.3	-1.04	11.9	.91	40S	ó	L626
L684	73.7	1.3	.39	10.2	1.65	143.3	12.2	1.52	16.0	1.22	40S	ó	L684
L687	70.9	-1.5	-.42	4.3	.68	129.0	-2.1	-.26	12.3	.94	40S	ó	L687
L698	74.1	1.7	.51	4.6	.74	131.0	-.1	-.01	9.3	.71	40S	ó	L698
GR. MEAN =	72.4 SHEFF. UNITS			GRAND MEAN =		131.1 SHEFF. UNITS			TEST DETERMINATIONS =		10		
SD MEANS =	3.5 SHEFF. UNITS			SD OF MEANS =		8.0 SHEFF. UNITS			38 LABS IN GRAND MEANS				
	AVERAGE SDR =			6.2 SHEFF. UNITS		AVERAGE SDR =			13.1 SHEFF. UNITS				
L182B	255.5	183.1	53.00	26.5	4.26	515.0	383.9	47.82	89.1	6.80	40B	+	L182B
L312	75.3	2.9	.85	6.3	1.01	127.4	-3.7	-.46	10.7	.82	40T	+	L312
L484	263.0	190.6	55.17	27.9	4.49	510.0	378.9	47.20	57.0	4.35	40B	+	L484

TOTAL NUMBER OF LABORATORIES REPORTING = 44

Best values: B95 72 ± 6 Sheffield units

A81 130 ± 12 Sheffield units

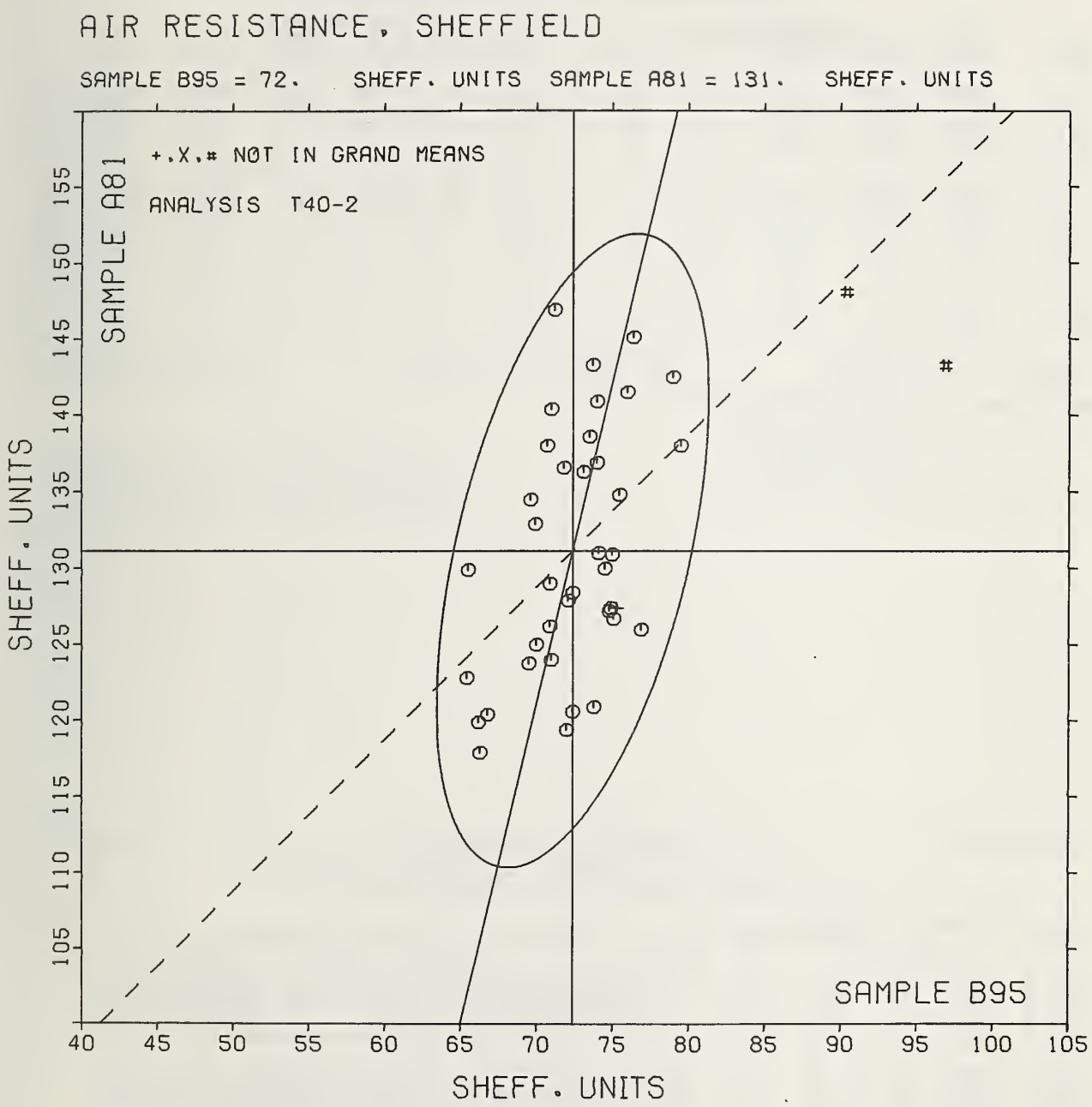
The following laboratories were omitted from the grand means because of extreme test results: 228, 241, 255.

ANALYSIS T40-2 TABLE 2

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

SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	F	MEANS BS5	MEANS A81	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L626	O	65.4	122.8	-9.7	4.8	.83	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L223	O	65.5	129.9	-2.8	6.4	1.15	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L230S	O	66.2	119.9	-12.3	3.4	1.06	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L366	O	66.3	117.9	-14.3	2.8	.98	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L318	O	66.8	120.4	-11.7	2.9	1.04	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L575	O	69.5	123.8	-7.8	1.1	.78	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L233	O	69.6	134.5	2.7	3.5	1.27	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L157	O	69.9	132.9	1.2	2.8	1.06	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L158	O	70.0	125.0	-6.5	.9	.84	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L132	O	70.7	138.0	6.3	3.2	1.26	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L687	O	70.9	129.0	-2.4	.9	.81	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L249	O	70.9	126.2	-5.1	.3	1.18	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L597	O	71.0	140.4	8.7	3.5	1.05	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L585	O	71.0	124.0	-7.2	-.3	.76	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L562	O	71.2	146.9	15.1	4.8	1.24	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L262S	O	71.8	136.6	5.2	1.8	.58	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L213	O	72.0	119.4	-11.5	-2.4	.77	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L600	O	72.1	127.9	-3.2	-.5	.79	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L228	#	72.4	172.2	40.0	9.4	.80	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L124S	O	72.4	120.6	-10.2	-2.5	.65	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L260	O	72.4	128.4	-2.6	-.7	.69	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L352	O	73.1	136.3	5.2	.5	1.13	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L150	O	73.5	138.6	7.5	.6	1.04	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L684	O	73.7	143.3	12.2	1.5	1.43	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L121	O	73.8	120.9	-9.6	-3.8	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L288	O	74.0	140.9	9.9	.7	1.42	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L257B	O	74.0	136.9	6.0	-.3	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L698	O	74.1	131.0	.3	-1.7	.72	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L390	O	74.5	130.0	-.6	-2.3	.84	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L372	O	74.8	127.2	-3.2	-3.3	.96	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L257A	O	74.9	127.4	-3.0	-3.3	.78	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L360	O	75.0	130.9	.4	-2.6	.91	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L305	O	75.1	126.7	-3.7	-3.7	.70	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L312	*	75.3	127.4	-2.9	-3.7	.91	40T	AIR RESISTANCE, SHEFFIELD (3 INCE DIAMETER ORIFICE)
L257C	O	75.5	134.8	4.3	-2.2	1.26	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L173B	O	76.0	141.5	10.9	-1.2	1.37	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L354	O	76.4	145.1	14.5	-.7	1.47	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L114	O	76.9	126.0	-3.9	-5.6	.89	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L190C	O	79.0	142.5	12.6	-3.8	1.20	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L148	O	79.5	138.0	8.3	-5.4	1.15	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L241	#	90.0	147.5	20.0	-13.4	.72	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L255	#	96.5	142.7	16.8	-20.8	.85	40S	AIR RESISTANCE, SHEFFIELD (3/4 INCH DIAMETER ORIFICE)
L182B	*	255.5	515.0	415.8	-89.6	5.53	40B	AIR RESISTANCE, BENDTSEN, WG 150
L484	*	263.0	510.0	412.7	-98.0	4.42	40B	AIR RESISTANCE, BENDTSEN, WG 150
GMEANS:		72.4	131.1			1.00		
		95% ELLIPSE:		21.3	7.7	WITH GAMMA = 76 DEGREES		


AIR RESISTANCE, SHEFFIELD
SAMPLE B95 = 72. SHEFF. UNITS SAMPLE A81 = 131. SHEFF. UNITS
+,X,# NOT IN GRAND MEANS
ANALYSIS T40-2
SAMPLE A81
SHEFF. UNITS
105 110 115 120 125 130 135 140 145 150 155
SAMPLE B95
40 45 50 55 60 65 70 75 80 85 90 95 100 105
SHEFF. UNITS

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T41-1 TABLE 1

AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION

DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB CODE	SAMPLE B73 RELEASE BASE 116 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE D06 RELEASE BASE M.F. 112 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	TEST D. = 10 VAR	F	LAB
L122	1533.	314.	1.45	786.	1.62	175.	11.	.68	49.	2.34	41G	ó	L122
L128	1034.	-185.	-.85	328.	.68	166.	2.	.13	18.	.85	41G	ó	L128
L134	1318.	99.	.46	430.	.89	172.	8.	.49	17.	.83	41G	ó	L134
L166M	1456.	237.	1.09	606.	1.25	171.	7.	.43	18.	.88	41G	ó	L166M
L195	1121.	-97.	-.45	403.	.83	161.	-3.	-.19	11.	.52	41G	ó	L195
L224	26322.	25104.	115.80	13056.	26.91	4115.	3951.	249.14	300.	14.20	41G	#	L224
L259	25557.	24338.	112.27	7703.	15.88	3723.	3559.	224.42	204.	9.68	41G	#	L259
L312	801.	-417.	-1.93	226.	.47	132.	-32.	-2.03	7.	.33	41G	ó	L312
L358	1282.	64.	.29	548.	1.13	168.	4.	.26	15.	.71	41G	ó	L358
L557	989.	-229.	-1.06	256.	.53	168.	4.	.27	17.	.82	41G	ó	L557
L558	1191.	-28.	-.13	651.	1.34	140.	-23.	-1.48	10.	.45	41G	ó	L558
L576	1325.	106.	.49	475.	.98	189.	25.	1.61	58.	2.74	41G	ó	L576
L697	1356.	137.	.63	630.	1.30	161.	-3.	-.17	11.	.53	41G	ó	L697

GR. MEAN = 1219. SEC/10 CC — GRAND MEAN = 164. SEC/10 CC — TEST DETERMINATIONS = 10

SD MEANS = 217. SEC/10 CC — SD OF MEANS = 16. SEC/10 CC — 11 LABS IN GRAND MEANS

AVERAGE SDR = 485. SEC/10 CC — AVERAGE SDR = 21. SEC/10 CC

TOTAL NUMBER OF LABORATORIES REPORTING = 13

Best values: B73 1300 seconds per 10cc,
D06 170 mercury density,
(direct reading)

Data from the following laboratories appear to be off by a multiplicative factor: 224, 259.

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.

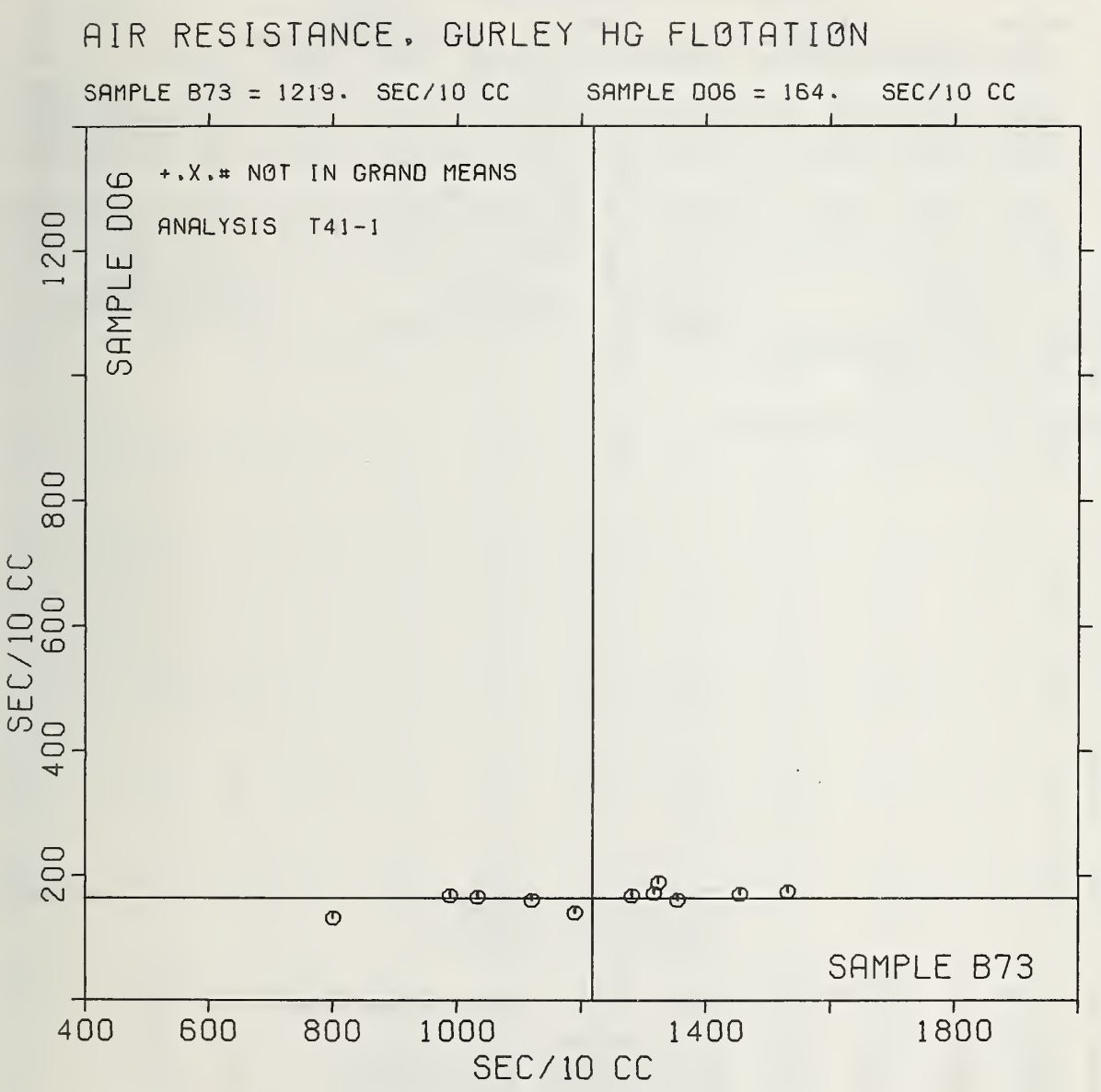
REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T41-1 TABLE 2

AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION

DIRECT READING, SEC/10 CC, MERCURY DENSITY

LAB CODE	F	MEANS B73	D06	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L312	ó	801.	132.	-419.	-13.	.40	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L557	ó	989.	168.	-229.	15.	.67	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L128	ó	1034.	166.	-184.	11.	.76	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L195	ó	1121.	161.	-97.	1.	.68	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L558	ó	1191.	140.	-29.	-22.	.90	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L358	ó	1282.	168.	64.	1.	.92	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L134	ó	1318.	172.	99.	3.	.86	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L576	ó	1325.	189.	107.	21.	1.86	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L697	ó	1356.	161.	137.	-9.	.91	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L166M	ó	1456.	171.	237.	-4.	1.06	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L122	ó	1533.	175.	314.	-4.	1.98	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L259	#	25557.	3723.	24475.	2445.	12.78	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
L224	#	26322.	4115.	25258.	2802.	20.56	41G	AIR RESISTANCE, HIGH RANGE, GURLEY MERCURY FLOTATION
GMEANS:		1219.	164.			1.00		
95% ELLIPSE:				667.	38.	WITH GAMMA = 2 DEGREES		


AIR RESISTANCE, GURLEY HG FLØTATIØN
SAMPLE B73 = 1219. SEC/10 CC
SAMPLE D06 = 164. SEC/10 CC
+,X,* NØT IN GRAND MEANS
ANALYSIS T41-1
SAMPLE D06
SEC/10 CC
200
400
600
800
1200
SAMPLE B73
400
600
800
1000
1400
1800
SEC/10 CC

ANALYSIS T44-1 TABLE 1
SMOOTHNESS, PARKER PRINTSURF

LAB CODE	SAMPLE J50 94 GRAMS PER SQUARE METER MEAN	PRINTING DEV	N.DEV	SDR	R.SDR	SAMPLE J74 76 GRAMS PER SQUARE METER MEAN	PRINTING DEV	N.DEV	SDR	R.SDR	TEST D.= 10 VAR	F	LAB
L122	6.95	.87	1.51	.16	1.45	5.09	.80	2.09	.15	1.25	44P	O	L122
L136	5.88	-.20	-.35	.08	.72	3.94	-.35	-.92	.07	.58	44P	O	L136
L182	5.92	-.16	-.28	.05	.49	4.40	.11	.29	.10	.80	44P	O	L182
L183	5.79	-.29	-.51	.07	.68	4.35	.06	.15	.08	.71	44P	O	L183
L223	8.25	2.17	3.77	.14	1.30	5.94	1.65	4.30	.10	.83	44P	#	L223
L288	6.96	.88	1.52	.08	.77	4.29	-.00	-.01	.14	1.21	44P	O	L288
L317	5.93	-.15	-.26	.22	1.99	4.17	-.12	-.32	.14	1.18	44P	O	L317
L484	5.92	-.16	-.28	.13	1.21	4.28	-.01	-.03	.15	1.29	44P	O	L484
L588	5.31	-.77	-1.34	.07	.68	3.81	-.48	-1.26	.12	1.00	44P	O	L588

GR. MEAN = 6.08 MICRONS GRAND MEAN = 4.29 MICRONS TEST DETERMINATIONS = 10
SD MEANS = .58 MICRONS SD OF MEANS = .38 MICRONS 8 LABS IN GRAND MEANS
AVERAGE SDR = .11 MICRONS AVERAGE SDR = .12 MICRONS
TOTAL NUMBER OF LABORATORIES REPORTING = 9

Best values: J50 6.0 microns
J74 4.3 microns

The following laboratories were omitted from the grand means because of extreme test results: 223.

REPORT NO. 60G TAPPI COLLABORATIVE REFERENCE PROGRAM JUNE 1979

ANALYSIS T44-1 TABLE 2
SMOOTHNESS, PARKER PRINTSURF

LAB CODE	F	MEANS J50	J74	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L588	O	5.31	3.81	-.91	-.03	.84	44P	SMOOTHNESS, PARKER PRINTSURF
L183	O	5.79	4.35	-.22	.20	.69	44P	SMOOTHNESS, PARKER PRINTSURF
L136	O	5.88	3.94	-.35	-.20	.65	44P	SMOOTHNESS, PARKER PRINTSURF
L484	O	5.92	4.28	-.15	.07	1.25	44P	SMOOTHNESS, PARKER PRINTSURF
L182	O	5.92	4.40	-.08	.18	.64	44P	SMOOTHNESS, PARKER PRINTSURF
L317	O	5.93	4.17	-.19	-.03	1.58	44P	SMOOTHNESS, PARKER PRINTSURF
L122	O	6.95	5.09	1.15	.26	1.35	44P	SMOOTHNESS, PARKER PRINTSURF
L288	O	6.96	4.29	.76	-.44	.99	44P	SMOOTHNESS, PARKER PRINTSURF
L223	#	8.25	5.94	2.70	.34	1.07	44P	SMOOTHNESS, PARKER PRINTSURF
GMEANS:		6.08	4.29			1.00		
		95% ELLIPSE:		2.26	.81	WITH GAMMA = 30 DEGREES		

ANALYSIS T45-1 TABLE 1

SMOOTHNESS, SHEFFIELD UNITS

SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	SAMPLE J50 MEAN	PRINTING 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.= 15 VAR	F	LAB
L100	274.6	1.1	.10	6.9	.98	80.7	1.4	.19	5.6	1.12	45S	O	L100
L107	270.0	-3.5	-.31	5.6	.79	134.4	55.0	7.53	8.6	1.71	45S	#	L107
L108	280.5	6.9	.62	6.5	.92	79.3	-.1	-.01	4.0	.79	45S	O	L108
L114	275.1	1.5	.14	10.3	1.45	90.0	.6	.09	4.8	.95	45S	O	L114
L115	272.0	-1.5	-.14	7.3	1.03	83.7	4.3	.59	5.2	1.02	45S	O	L115
L121	245.2	-28.3	-2.52	8.0	1.13	76.1	-3.2	-.44	6.1	1.20	45S	*	L121
L122	275.9	2.3	.21	8.3	1.17	80.7	1.4	.19	5.8	1.16	45S	O	L122
L123	280.7	7.1	.63	11.6	1.64	81.4	2.0	.28	6.3	1.26	45S	O	L123
L124	263.7	-9.8	-.87	4.9	.69	75.3	-4.1	-.56	4.0	.80	45S	O	L124
L125	263.3	-10.2	-.91	12.3	1.74	82.7	3.3	.45	6.5	1.29	45S	O	L125
L126	277.7	4.2	.37	9.9	1.40	81.9	2.6	.35	5.3	1.05	45S	O	L126
L128	273.6	.1	.01	4.9	.69	77.2	-2.2	-.29	3.5	.69	45S	O	L128
L132	275.9	2.3	.21	6.4	.91	78.3	-1.0	-.14	5.1	1.01	45S	O	L132
L134	283.7	10.1	.90	5.2	.73	76.0	-3.4	-.46	5.7	1.14	45S	O	L134
L139S	274.0	.5	.04	5.1	.71	88.8	9.4	1.29	3.5	.70	45S	O	L139S
L148	283.9	10.4	.92	9.1	1.28	86.7	7.3	1.00	5.5	1.09	45S	O	L148
L150	284.9	11.3	1.01	6.7	.95	81.8	2.4	.33	5.2	1.04	45S	O	L150
L152	252.5	-21.1	-1.87	3.1	.44	92.0	12.6	1.73	5.1	1.01	45S	*	L152
L153	290.0	16.5	1.46	5.3	.75	99.2	19.8	2.72	4.8	.95	45S	*	L153
L157	289.5	16.0	1.42	5.3	.75	83.7	4.4	.60	4.3	.85	45S	O	L157
L158	268.0	-5.5	-.49	10.7	1.50	80.7	1.3	.18	4.6	.91	45S	O	L158
L159	274.4	.9	.08	7.8	1.10	80.2	.8	.12	5.6	1.11	45S	O	L159
L162	273.7	.1	.01	7.2	1.01	76.7	-2.7	-.37	4.9	.97	45S	O	L162
L166	260.1	-13.4	-1.19	6.3	.89	77.0	-2.4	-.32	5.3	1.04	45S	O	L166
L167	276.3	2.8	.25	4.8	.68	81.3	2.0	.27	3.5	.70	45S	O	L167
L173B	273.7	.1	.01	7.7	1.08	78.7	-.7	-.09	4.8	.95	45S	O	L173B
L183S	271.9	-1.7	-.15	9.8	1.38	81.7	2.4	.33	6.1	1.21	45S	O	L183S
L190C	258.0	-15.5	-1.38	6.8	.95	83.7	4.3	.59	6.4	1.27	45S	O	L190C
L190R	257.6	-15.9	-1.42	4.3	.61	66.3	-13.0	-1.78	2.9	.57	45S	O	L190R
L195	265.3	-8.3	-.73	7.3	1.03	83.1	3.7	.51	5.5	1.09	45S	O	L195
L203	273.0	-.5	-.05	6.2	.88	71.7	-7.6	-1.04	5.7	1.13	45S	O	L203
L206	275.9	2.3	.21	6.9	.97	83.5	4.2	.57	5.0	.99	45S	O	L206
L211	257.1	-16.4	-1.46	7.2	1.01	67.7	-11.7	-1.60	6.1	1.20	45S	O	L211
L213	266.3	-7.2	-.64	6.7	.94	66.5	-12.8	-1.75	5.7	1.12	45S	O	L213
L223	264.9	-8.7	-.77	6.5	.92	72.6	-6.8	-.92	4.1	.82	45S	O	L223
L224	276.0	2.5	.22	9.1	1.28	61.7	-17.6	-2.41	4.9	.98	45S	*	L224
L226B	259.4	-14.1	-1.26	8.1	1.14	70.2	-9.2	-1.25	5.5	1.10	45S	O	L226B
L228	287.3	13.7	1.22	13.0	1.83	80.4	1.0	.14	6.0	1.20	45S	O	L228
L230S	277.1	3.6	.32	6.8	.96	80.1	.8	.11	5.8	1.15	45S	O	L230S
L231	285.5	12.0	1.07	7.8	1.10	77.9	-1.5	-.20	3.2	.64	45S	O	L231
L232S	276.3	2.8	.25	4.0	.56	78.0	-1.4	-.19	4.9	.98	45S	O	L232S
L233	241.9	-31.7	-2.81	4.2	.59	75.5	-3.9	-.53	5.0	.99	45S	*	L233
L237	275.0	1.5	.13	5.0	.70	77.3	-2.0	-.28	2.6	.51	45S	O	L237
L241	252.3	-21.2	-1.88	6.2	.88	85.1	5.8	.79	3.4	.67	45S	O	L241
L249	279.7	6.1	.55	8.0	1.12	78.1	-1.2	-.17	4.4	.88	45S	O	L249
L254	263.9	-9.6	-.85	9.6	1.35	84.6	5.2	.72	8.1	1.60	45S	O	L254
L255	275.6	2.1	.18	5.6	.78	96.4	17.0	2.33	2.7	.53	45S	O	L255
L257A	272.2	-1.3	-.12	5.1	.71	87.6	8.2	1.13	7.2	1.44	45S	O	L257A
L257B	283.5	9.9	.88	9.1	1.28	99.1	19.7	2.70	6.7	1.34	45S	*	L257B
L257C	273.7	.1	.01	7.7	1.09	98.3	19.0	2.60	6.2	1.24	45S	*	L257C
L259	296.3	22.8	2.03	5.2	.73	85.1	5.7	.78	4.9	.96	45S	O	L259
L260	269.9	-3.7	-.33	3.9	.54	76.8	-2.6	-.35	4.9	.98	45S	O	L260
L261	278.7	5.1	.46	7.2	1.01	74.5	-4.9	-.67	2.4	.47	45S	O	L261
L262	273.7	.1	.01	8.5	1.19	89.1	9.7	1.33	6.5	1.29	45S	O	L262
L275	285.0	11.5	1.02	8.0	1.13	76.3	-3.0	-.41	4.8	.95	45S	O	L275
L277	287.5	13.9	1.24	6.2	.88	91.9	12.6	1.72	6.0	1.19	45S	O	L277
L278	298.1	24.5	2.18	6.4	.91	86.2	6.8	.94	6.2	1.23	45S	O	L278
L281	273.2	-.3	-.03	5.6	.78	76.1	-3.3	-.45	6.2	1.22	45S	O	L281
L285	265.7	-7.9	-.70	6.8	.96	67.3	-12.0	-1.64	5.0	.98	45S	O	L285
L288	NO DATA REPORTED FOR SAMPLE J50					81.4	2.0	.28	4.0	.79	45S	M	L288
L290	249.9	-23.6	-2.10	4.0	.57	74.5	-4.8	-.66	5.3	1.05	45S	O	L290
L291S	286.8	13.3	1.18	4.9	.68	82.5	3.1	.43	6.1	1.20	45S	O	L291S
L305	278.5	5.0	.45	8.9	1.26	78.9	-.4	-.06	6.5	1.29	45S	O	L305
L308	275.7	2.2	.20	5.3	.75	72.9	-6.4	-.88	4.0	.80	45S	O	L308
L312	292.0	18.5	1.64	3.1	.44	85.8	6.4	.88	5.4	1.06	45S	O	L312

ANALYSIS T45-1 TABLE 1
SMOOTHNESS, SHEFFIELD UNITS
SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	SAMPLE J50 MEAN	PRINTING 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F 15 VAR	F	LAB
L317	277.7	4.1	.37	7.3	1.03	73.1	-6.2	-.85	4.9	.97	45S	ó	L317
L318	272.3	-1.3	-.11	7.5	1.05	76.4	-3.0	-.40	7.6	1.52	45S	ó	L318
L321	251.7	-21.9	-1.94	4.9	.69	73.7	-5.7	-.78	4.0	.79	45S	ó	L321
L323	262.0	-11.5	-1.02	7.3	1.03	78.7	-.7	-.09	5.2	1.02	45S	ó	L323
L326	253.4	-20.1	-1.79	7.9	1.12	87.3	8.0	1.09	4.3	.86	45S	ó	L326
L328	285.2	11.7	1.04	7.5	1.05	77.3	-2.0	-.28	4.2	.82	45S	ó	L328
L352	271.9	-1.7	-.15	8.0	1.13	81.1	1.7	.23	4.6	.91	45S	ó	L352
L360	273.7	.1	.01	3.9	.55	73.2	-6.2	-.84	5.3	1.06	45S	ó	L360
L366	278.3	4.8	.43	8.2	1.15	75.4	-4.0	-.54	5.3	1.06	45S	ó	L366
L372	270.0	-3.5	-.31	6.8	.96	64.1	-15.3	-2.09	5.5	1.08	45S	ó	L372
L376	274.0	.5	.04	5.7	.81	92.1	12.8	1.75	4.5	.90	45S	ó	L376
L380	268.7	-4.9	-.43	7.7	1.08	73.0	-6.4	-.87	3.7	.73	45S	ó	L380
L382	284.9	11.3	1.01	5.9	.84	76.3	-3.1	-.42	4.2	.83	45S	ó	L382
L390	265.0	-8.5	-.76	6.3	.88	76.7	-2.7	-.37	6.5	1.28	45S	ó	L390
L554	277.0	3.5	.31	10.4	1.47	73.5	-5.8	-.80	5.7	1.14	45S	ó	L554
L575	299.9	26.3	2.34	7.5	1.05	79.2	-.2	-.02	6.4	1.27	45S	ó	L575
L585	272.3	-1.2	-.11	9.0	1.27	71.7	-7.7	-1.05	5.2	1.04	45S	ó	L585
L597	267.0	-6.5	-.58	10.3	1.45	72.9	-6.5	-.89	5.2	1.03	45S	ó	L597
L600	280.3	6.8	.61	8.4	1.18	83.1	3.7	.51	5.4	1.07	45S	ó	L600
L626	281.0	7.5	.66	8.3	1.17	71.3	-8.1	-1.11	3.4	.67	45S	ó	L626
L648	272.3	-1.2	-.11	9.5	1.34	73.0	-6.4	-.87	4.1	.82	45S	ó	L648
L651	235.0	-38.5	-3.42	4.6	.65	90.7	11.3	1.55	6.8	1.34	45S	X	L651
L670	278.7	5.2	.46	7.2	1.02	78.6	-.8	-.10	3.7	.73	45S	ó	L670
L679	269.9	-3.7	-.33	5.7	.81	82.3	2.9	.40	4.3	.85	45S	ó	L679
L688	274.3	.8	.07	8.4	1.19	73.7	-5.7	-.78	5.8	1.15	45S	ó	L688
L698	285.8	12.3	1.09	5.1	.71	80.4	1.0	.14	4.9	.96	45S	ó	L698
L174	316.7	43.2	3.84	3.8	.54	196.6	117.2	16.04	2.5	.50	45R	*	L174

GR. MEAN = 273.5 SHEFF. UNITS — GRAND MEAN = 79.4 SHEFF. UNITS — TEST DETERMINATIONS = 15
SD MEANS = 11.3 SHEFF. UNITS — SD OF MEANS = 7.3 SHEFF. UNITS — 88 LABS IN GRAND MEANS
AVERAGE SDR = 7.1 SHEFF. UNITS — AVERAGE SDR = 5.0 SHEFF. UNITS

TOTAL NUMBER OF LABORATORIES REPORTING = 92

Best values: J50 274 ± 21 Sheffield units
J74 79 ± 12 Sheffield units

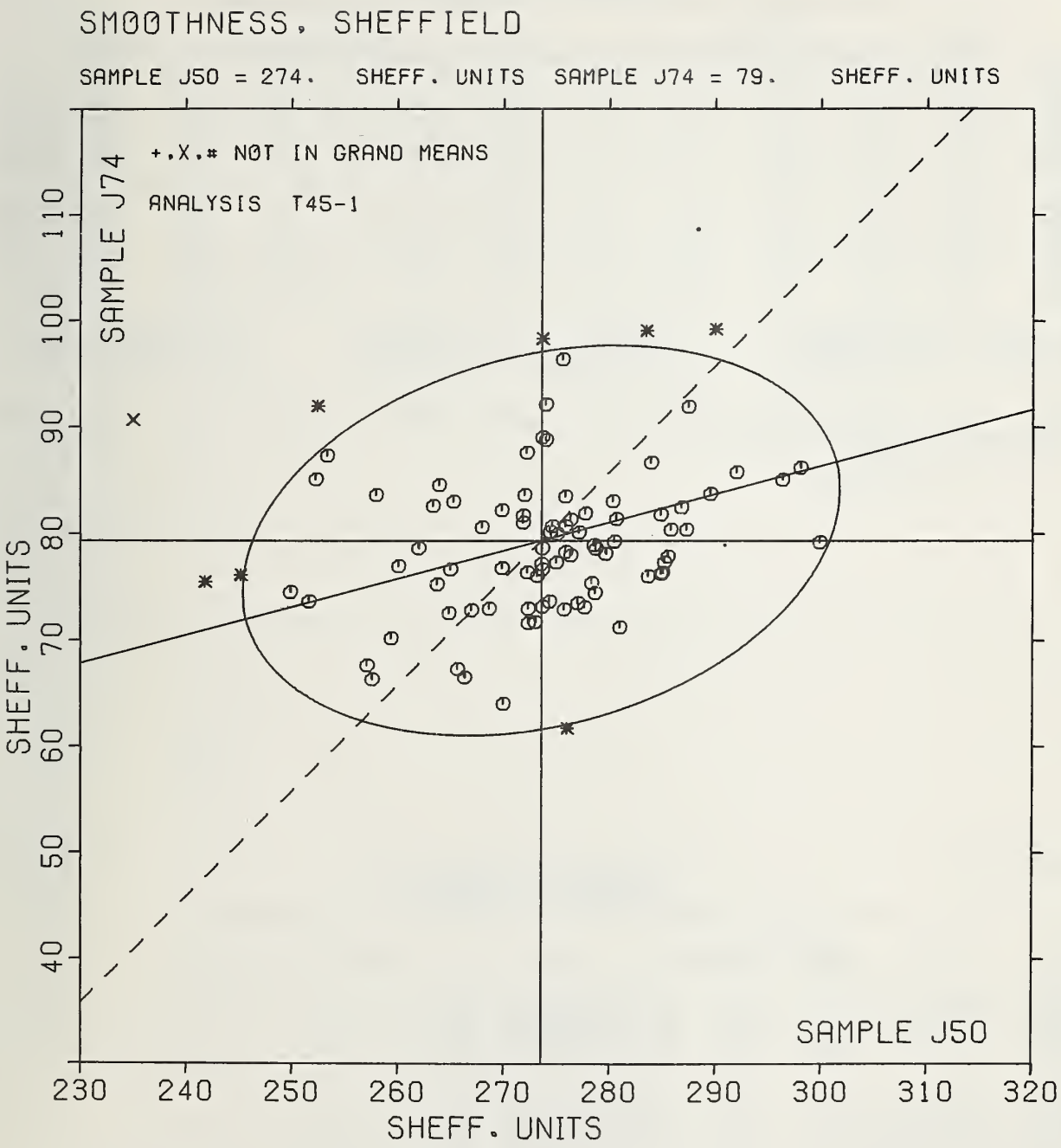
The following laboratories were omitted from the grand means because of extreme test results: 107.

ANALYSIS T45-1 TABLE 2
SMOOTHNESS, SHEFFIELD UNITS
SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	F	MEANS J50	J74	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L288	M		81.4			.79	45S	SMOOTHNESS, SHEFFIELD
L651	X	235.0	90.7	-34.3	20.8	1.00	45S	SMOOTHNESS, SHEFFIELD
L233	*	241.9	75.5	-31.6	4.3	.79	45S	SMOOTHNESS, SHEFFIELD
L121	*	245.2	76.1	-28.2	4.1	1.16	45S	SMOOTHNESS, SHEFFIELD
L290	O	249.9	74.5	-24.0	1.4	.81	45S	SMOOTHNESS, SHEFFIELD
L321	O	251.7	73.7	-22.6	.1	.74	45S	SMOOTHNESS, SHEFFIELD
L241	O	252.3	85.1	-19.0	11.0	.78	45S	SMOOTHNESS, SHEFFIELD
L152	*	252.5	92.0	-17.1	17.6	.73	45S	SMOOTHNESS, SHEFFIELD
L326	O	253.4	87.3	-17.4	12.9	.99	45S	SMOOTHNESS, SHEFFIELD
L211	O	257.1	67.7	-18.8	-7.1	1.10	45S	SMOOTHNESS, SHEFFIELD
L190R	O	257.6	66.3	-18.7	-8.5	.59	45S	SMOOTHNESS, SHEFFIELD
L190C	O	258.0	83.7	-13.9	8.1	1.11	45S	SMOOTHNESS, SHEFFIELD
L226B	O	259.4	70.2	-16.0	-5.2	1.12	45S	SMOOTHNESS, SHEFFIELD
L166	O	260.1	77.0	-13.5	1.2	.97	45S	SMOOTHNESS, SHEFFIELD
L323	O	262.0	78.7	-11.3	2.3	1.02	45S	SMOOTHNESS, SHEFFIELD
L125	O	263.3	82.7	-9.0	5.8	1.52	45S	SMOOTHNESS, SHEFFIELD
L124	O	263.7	75.3	-10.5	-1.4	.74	45S	SMOOTHNESS, SHEFFIELD
L254	O	263.9	84.6	-7.9	7.5	1.48	45S	SMOOTHNESS, SHEFFIELD
L223	O	264.9	72.6	-10.1	-4.3	.87	45S	SMOOTHNESS, SHEFFIELD
L390	O	265.0	76.7	-8.9	-.4	1.08	45S	SMOOTHNESS, SHEFFIELD
L195	O	265.3	83.1	-7.0	5.7	1.06	45S	SMOOTHNESS, SHEFFIELD
L285	O	265.7	67.3	-10.7	-9.6	.97	45S	SMOOTHNESS, SHEFFIELD
L213	O	266.3	66.5	-10.2	-10.6	1.03	45S	SMOOTHNESS, SHEFFIELD
L597	O	267.0	72.9	-8.0	-4.6	1.24	45S	SMOOTHNESS, SHEFFIELD
L158	O	268.0	80.7	-5.0	2.7	1.21	45S	SMOOTHNESS, SHEFFIELD
L380	O	268.7	73.0	-6.3	-4.9	.91	45S	SMOOTHNESS, SHEFFIELD
L679	O	269.9	82.3	-2.8	3.8	.83	45S	SMOOTHNESS, SHEFFIELD
L260	O	269.9	76.8	-4.2	-1.5	.76	45S	SMOOTHNESS, SHEFFIELD
L107	#	270.0	134.4	10.7	54.1	1.25	45S	SMOOTHNESS, SHEFFIELD
L372	O	270.0	64.1	-7.3	-13.9	1.02	45S	SMOOTHNESS, SHEFFIELD
L183S	O	271.9	81.7	-1.0	2.7	1.30	45S	SMOOTHNESS, SHEFFIELD
L352	O	271.9	81.1	-1.2	2.1	1.02	45S	SMOOTHNESS, SHEFFIELD
L115	O	272.0	83.7	-.4	4.6	1.02	45S	SMOOTHNESS, SHEFFIELD
L257A	O	272.2	87.6	.8	8.3	1.07	45S	SMOOTHNESS, SHEFFIELD
L318	O	272.3	76.4	-2.0	-2.5	1.29	45S	SMOOTHNESS, SHEFFIELD
L648	O	272.3	73.0	-2.8	-5.8	1.08	45S	SMOOTHNESS, SHEFFIELD
L585	O	272.3	71.7	-3.1	-7.1	1.16	45S	SMOOTHNESS, SHEFFIELD
L203	O	273.0	71.7	-2.5	-7.2	1.00	45S	SMOOTHNESS, SHEFFIELD
L281	O	273.2	76.1	-1.2	-3.1	1.00	45S	SMOOTHNESS, SHEFFIELD
L128	O	273.6	77.2	-.5	-2.1	.69	45S	SMOOTHNESS, SHEFFIELD
L173B	O	273.7	78.7	-.0	-.7	1.02	45S	SMOOTHNESS, SHEFFIELD
L360	O	273.7	73.2	-1.4	-6.0	.80	45S	SMOOTHNESS, SHEFFIELD
L262	O	273.7	89.1	2.6	9.4	1.24	45S	SMOOTHNESS, SHEFFIELD
L257C	*	273.7	98.3	5.0	18.3	1.16	45S	SMOOTHNESS, SHEFFIELD
L162	O	273.7	76.7	-.6	-2.6	.99	45S	SMOOTHNESS, SHEFFIELD
L376	O	274.0	92.1	3.7	12.2	.85	45S	SMOOTHNESS, SHEFFIELD
L139S	O	274.0	88.8	2.9	9.0	.71	45S	SMOOTHNESS, SHEFFIELD
L688	O	274.3	73.7	-.7	-5.7	1.17	45S	SMOOTHNESS, SHEFFIELD
L159	O	274.4	80.2	1.1	.6	1.10	45S	SMOOTHNESS, SHEFFIELD
L100	O	274.6	80.7	1.4	1.1	1.05	45S	SMOOTHNESS, SHEFFIELD
L237	O	275.0	77.3	.9	-2.3	.61	45S	SMOOTHNESS, SHEFFIELD
L114	O	275.1	80.0	1.7	.2	1.20	45S	SMOOTHNESS, SHEFFIELD
L255	O	275.6	96.4	6.4	15.9	.66	45S	SMOOTHNESS, SHEFFIELD
L308	O	275.7	72.9	.5	-6.8	.78	45S	SMOOTHNESS, SHEFFIELD
L132	O	275.9	78.3	2.0	-1.6	.96	45S	SMOOTHNESS, SHEFFIELD
L206	O	275.9	83.5	3.3	3.4	.98	45S	SMOOTHNESS, SHEFFIELD
L122	O	275.9	80.7	2.6	.7	1.17	45S	SMOOTHNESS, SHEFFIELD
L224	*	276.0	61.7	-2.1	-17.7	1.13	45S	SMOOTHNESS, SHEFFIELD
L232S	O	276.3	78.0	2.4	-2.0	.77	45S	SMOOTHNESS, SHEFFIELD
L167	O	276.3	81.3	3.2	1.2	.69	45S	SMOOTHNESS, SHEFFIELD
L554	O	277.0	73.5	1.9	-6.5	1.31	45S	SMOOTHNESS, SHEFFIELD
L230S	O	277.1	80.1	3.7	-.2	1.05	45S	SMOOTHNESS, SHEFFIELD
L317	O	277.7	73.1	2.4	-7.1	1.00	45S	SMOOTHNESS, SHEFFIELD
L126	O	277.7	81.9	4.7	1.4	1.23	45S	SMOOTHNESS, SHEFFIELD
L366	O	278.3	75.4	3.6	-5.1	1.11	45S	SMOOTHNESS, SHEFFIELD

ANALYSIS T45-1 TABLE 2
SMOOTHNESS, SHEFFIELD UNITS
SHEFFIELD TESTER IS STANDARD FOR THIS ANALYSIS

LAB CODE	F	MEANS J50	J74	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L305	6	278.5	78.9	4.7	-1.7	1.27	45S	SMOOTHNESS, SHEFFIELD
L261	6	276.7	74.5	3.7	-6.0	.74	45S	SMOOTHNESS, SHEFFIELD
L670	6	278.7	78.6	4.8	-2.1	.88	45S	SMOOTHNESS, SHEFFIELD
L249	6	279.7	78.1	5.6	-2.8	1.00	45S	SMOOTHNESS, SHEFFIELD
L600	6	280.3	83.1	7.5	1.8	1.12	45S	SMOOTHNESS, SHEFFIELD
L108	6	280.5	79.3	6.7	-1.9	.86	45S	SMOOTHNESS, SHEFFIELD
L123	6	280.7	81.4	7.4	.1	1.45	45S	SMOOTHNESS, SHEFFIELD
L626	6	281.0	71.3	5.2	-9.7	.92	45S	SMOOTHNESS, SHEFFIELD
L257B	*	283.5	99.1	14.7	16.5	1.31	45S	SMOOTHNESS, SHEFFIELD
L134	6	283.7	76.0	8.9	-5.8	.93	45S	SMOOTHNESS, SHEFFIELD
L148	6	283.9	86.7	11.9	4.4	1.18	45S	SMOOTHNESS, SHEFFIELD
L150	6	284.9	81.8	11.6	-.5	.99	45S	SMOOTHNESS, SHEFFIELD
L382	6	284.9	76.3	10.2	-5.9	.83	45S	SMOOTHNESS, SHEFFIELD
L275	6	285.0	76.3	10.3	-5.9	1.04	45S	SMOOTHNESS, SHEFFIELD
L328	6	285.2	77.3	10.8	-4.9	.94	45S	SMOOTHNESS, SHEFFIELD
L231	6	285.5	77.9	11.2	-4.5	.87	45S	SMOOTHNESS, SHEFFIELD
L698	6	285.8	80.4	12.1	-2.1	.84	45S	SMOOTHNESS, SHEFFIELD
L291S	6	286.8	82.5	13.6	-.4	.94	45S	SMOOTHNESS, SHEFFIELD
L228	6	287.3	80.4	13.6	-2.5	1.51	45S	SMOOTHNESS, SHEFFIELD
L277	6	287.5	91.9	16.7	8.6	1.03	45S	SMOOTHNESS, SHEFFIELD
L157	6	289.5	83.7	16.6	.1	.80	45S	SMOOTHNESS, SHEFFIELD
L153	*	290.0	99.2	21.0	15.0	.85	45S	SMOOTHNESS, SHEFFIELD
L312	6	292.0	85.8	19.5	1.5	.75	45S	SMOOTHNESS, SHEFFIELD
L259	6	296.3	85.1	23.5	-.3	.85	45S	SMOOTHNESS, SHEFFIELD
L278	6	298.1	86.2	25.5	.3	1.07	45S	SMOOTHNESS, SHEFFIELD
L575	6	299.9	79.2	25.4	-6.9	1.16	45S	SMOOTHNESS, SHEFFIELD
L174	*	316.7	196.6	71.8	102.3	.52	45R	SMOOTHNESS, SHEFFIELD, NON-STANDARD INSTRUMENT
GMEANS:		273.5	79.4			1.00		
		95% ELLIPSE:		28.8	17.3	WITH GAMMA = 14 DEGREES		


SM00THNESS, SHEFFIELD
SAMPLE J50 = 274. SHEFF. UNITS
SAMPLE J74 = 79. SHEFF. UNITS
+,X,* NOT IN GRAND MEANS
ANALYSIS T45-1
SAMPLE J74
SHEFF. UNITS
40
50
60
70
80
90
100
110
SAMPLE J50
230
240
250
260
270
280
290
300
310
320
SHEFF. UNITS

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T45-2 TABLE 1

SMOOTHNESS , BEKK SECONDS

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

LAB CODE	SAMPLE J50 MEAN	PRINTING 94 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.= 15 VAR	F	LAB
L139B	10.59	.28	.41	.52	.90	87.13	7.18	.69	8.13	.91	45K	O	L139B
L162	10.20	-.10	-.15	.41	.72	82.20	2.24	.22	7.84	.88	45K	O	L162
L182K	9.31	-1.00	-1.47	.74	1.29	71.53	-8.42	-.81	5.57	.62	45K	O	L182K
L190C	10.33	.03	.04	.62	1.07	78.27	-1.69	-.16	7.74	.87	45K	O	L190C
L230B	8.93	-1.37	-2.01	.70	1.22	90.47	10.51	1.01	6.85	.77	45K	O	L230B
L232B	10.07	-.24	-.35	.34	.58	69.77	-10.18	-.98	6.49	.73	45K	O	L232B
L274K	10.75	.44	.65	.96	1.66	68.48	-11.48	-1.10	3.27	.37	45K	O	L274K
L291K	10.83	.52	.77	.78	1.34	101.87	21.91	2.11	10.78	1.21	45K	O	L291K
L564	11.20	.90	1.31	.56	.97	71.27	-8.69	-.84	5.62	.63	45K	O	L564
L581	10.27	-.04	-.06	.46	.79	84.13	4.18	.40	10.88	1.22	45K	O	L581
L697	10.89	.58	.85	.28	.48	74.41	-5.54	-.53	24.99	2.80	45K	O	L697
L250M	10.21	-.10	-.14	.99	1.71	67.73	-12.22	-1.18	4.40	.49	45L	*	L250M
L251	9.79	-.52	-.76	.47	.82	74.53	-5.42	-.52	4.94	.55	45L	*	L251

GR. MEAN = 10.30 BEKK SECONDS — GRAND MEAN = 79.96 BEKK SECONDS — TEST DETERMINATIONS = 15

SD MEANS = .68 BEKK SECONDS — SD OF MEANS = 10.39 BEKK SECONDS — 11 LABS IN GRAND MEANS

AVERAGE SDR = .58 BEKK SECONDS — AVERAGE SDR = 8.92 BEKK SECONDS

TOTAL NUMBER OF LABORATORIES REPORTING = 13

Best values: J50 10 Bekk seconds
J74 79 Bekk seconds

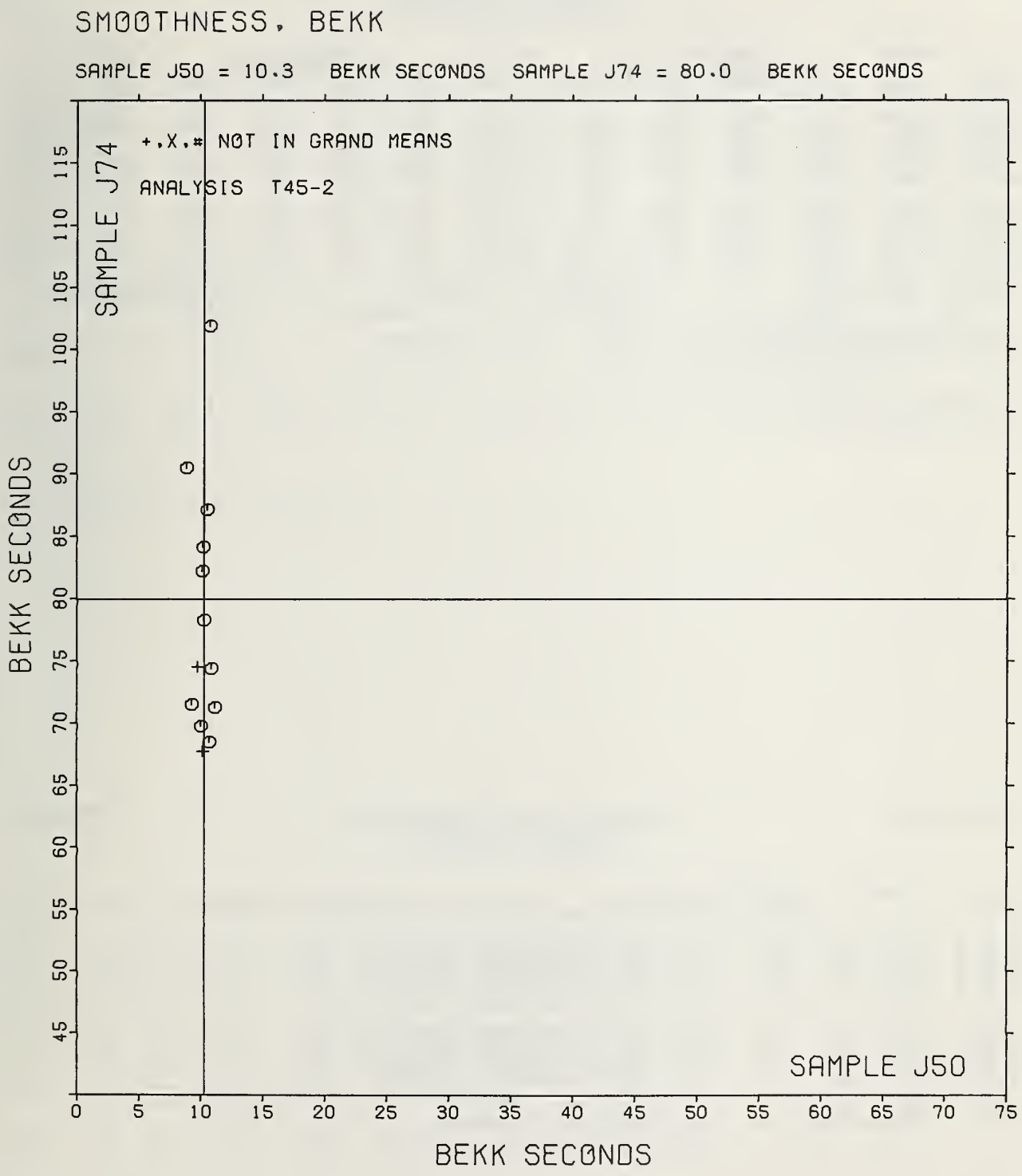
REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T45-2 TABLE 2

SMOOTHNESS , BEKK SECONDS

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

LAB CODE	F	MEANS J50	J74	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L230B	O	8.93	90.47	-10.52	-1.31	.99	45K	SMOOTHNESS, BEKK
L182K	O	9.31	71.53	8.42	-1.05	.95	45K	SMOOTHNESS, BEKK
L251	*	9.79	74.53	5.42	-.55	.69	45L	SMOOTHNESS, BEKK, 20 C, 65% RH
L232B	O	10.07	69.77	10.18	-.30	.65	45K	SMOOTHNESS, BEKK
L162	O	10.20	82.20	-2.24	-.09	.80	45K	SMOOTHNESS, BEKK
L250M	*	10.21	67.73	12.22	-.17	1.10	45L	SMOOTHNESS, BEKK, 20 C, 65% RH
L581	O	10.27	84.13	-4.18	-.01	1.01	45K	SMOOTHNESS, BEKK
L190C	O	10.33	78.27	1.69	.02	.97	45K	SMOOTHNESS, BEKK
L139B	O	10.59	87.13	-7.17	.33	.91	45K	SMOOTHNESS, BEKK
L274K	O	10.75	68.48	11.48	.37	1.01	45K	SMOOTHNESS, BEKK
L291K	O	10.83	101.87	-21.91	.66	1.28	45K	SMOOTHNESS, BEKK
L697	O	10.89	74.41	5.55	.55	1.64	45K	SMOOTHNESS, BEKK
L564	O	11.20	71.27	8.70	.84	.80	45K	SMOOTHNESS, BEKK
GMEANS:		10.30	79.96			1.00		
		95% ELLIPSE:		31.96	2.08	WITH GAMMA =-89 DEGREES		


SMOOTHNESS, BEKK
SAMPLE J50 = 10.3 BEKK SECONDS SAMPLE J74 = 80.0 BEKK SECONDS
+,X,# NOT IN GRAND MEANS
ANALYSIS T45-2
SAMPLE J74
BEKK SECONDS
SAMPLE J50
BEKK SECONDS

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T47-1 TABLE 1

SMOOTHNESS, BENDTSEN

LAB CODE	SAMPLE J50 MEAN	PRINTING 94 GRAMS PER SQUARE METER DBV	N.DBV	SDR	R.SDR	SAMPLE J74 MEAN	PRINTING 76 GRAMS PER SQUARE METER DBV	N.DEV	SDR	R.SDR	TEST D. = 10 VAR	F	LAB
L100	476.5	-5.9	-.11	15.1	.33	85.1	-8.0	-1.13	7.1	.76	47B	O	L100
L182B	552.5	70.1	1.27	46.3	1.01	95.2	2.1	.29	11.8	1.27	47B	O	L182B
L236	484.0	1.6	.03	72.3	1.58	102.9	9.8	1.38	13.3	1.43	47B	O	L236
L242	472.5	-9.9	-.18	69.2	1.51	86.1	-7.0	-.99	11.2	1.20	47B	O	L242
L244	230.0	-252.4	-4.58	19.4	.42	73.5	-19.6	-2.76	12.8	1.37	47B	#	L244
L248	435.5	-46.9	-.85	42.7	.93	86.9	-6.2	-.87	6.5	.70	47B	O	L248
L313	449.5	-32.9	-.60	46.3	1.01	91.5	-1.6	-.23	10.3	1.10	47B	O	L313
L333	574.0	91.6	1.66	54.9	1.20	94.2	1.1	.15	7.2	.77	47B	O	L333
L484	415.0	-67.4	-1.22	20.1	.44	103.0	9.9	1.39	7.2	.77	47B	O	L484

GR. MEAN = 482.4 ML/MIN — GRAND MEAN = 93.1 ML/MIN — TEST DETERMINATIONS = 10

SD MEANS = 55.1 ML/MIN — SD OF MEANS = 7.1 ML/MIN — 8 LABS IN GRAND MEANS

AVERAGE SDR = 45.9 ML/MIN — AVERAGE SDR = 9.3 ML/MIN

TOTAL NUMBER OF LABORATORIES REPORTING = 9

Best values: J50 480 milliliter per minute
J74 90 milliliter per minute

Data from the following laboratories appear to be off by a multiplicative factor: 244.

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T47-1 TABLE 2

SMOOTHNESS, BENDTSEN

LAB CODE	F	MEANS J50	MEANS J74	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L244	#	230.0	73.5	-252.5	-18.9	.90	47B	SMOOTHNESS, BENDTSEN, WG 150
L484	O	415.0	103.0	-67.4	10.1	.61	47B	SMOOTHNESS, BENDTSEN, WG 150
L248	O	435.5	86.9	-47.0	-6.1	.81	47B	SMOOTHNESS, BENDTSEN, WG 150
L313	O	449.5	91.5	-32.9	-1.5	1.06	47B	SMOOTHNESS, BENDTSEN, WG 150
L242	O	472.5	86.1	-10.0	-7.0	1.36	47B	SMOOTHNESS, BENDTSEN, WG 150
L100	O	476.5	85.1	-6.0	-8.0	.54	47B	SMOOTHNESS, BENDTSEN, WG 150
L236	O	484.0	102.9	1.6	9.8	1.50	47B	SMOOTHNESS, BENDTSEN, WG 150
L182B	O	552.5	95.2	70.1	1.9	1.14	47B	SMOOTHNESS, BENDTSEN, WG 150
L333	O	574.0	94.2	91.6	.8	.98	47B	SMOOTHNESS, BENDTSEN, WG 150
GMEANS:		482.4	93.1			1.00		
		95% ELLIPSE:		191.0	24.6	WITH GAMMA = 0 DEGREES		

ANALYSIS T56-1 TABLE 1
K & N INK ABSORPTION

LAB CODE	SAMPLE E50 MEAN	PRINTING 91 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE B80 MEAN	COATED OFFSET BOOK 75 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F 4 VAR	F	LAB
L126	63.52	-1.55	-.29	.29	.49	25.17	.07	.02	.85	.68	56K	d	L126
L149	58.75	-6.32	-1.17	.50	.85	23.75	-1.36	-.47	2.50	2.01	56K	d	L149
L182	66.27	1.20	.22	.43	.72	25.32	.22	.08	.85	.68	56K	d	L182
L213	68.22	3.15	.59	.79	1.34	27.60	2.49	.87	1.43	1.15	56K	d	L213
L277	69.75	4.68	.87	.50	.85	26.25	1.14	.40	.50	.40	56K	d	L277
L291	67.25	2.18	.40	1.04	1.76	22.75	-2.36	-.82	1.26	1.01	56K	d	L291
L333	59.25	-5.82	-1.08	.50	.85	22.00	-3.11	-1.08	.82	.66	56K	d	L333
L339	73.87	8.80	1.64	.25	.42	30.87	5.77	2.01	1.44	1.15	56K	d	L339
L564	32.25	-32.82	-6.10	.50	.85	60.50	35.39	12.32	1.00	.80	56K	#	L564
L616	.25	-64.82	-12.04	.00	.00	.60	-24.51	-8.53	.00	.00	56K	#	L616
L643	58.75	-6.32	-1.17	1.01	1.72	22.25	-2.86	-.99	1.56	1.25	56K	d	L643
GR. MEAN = 65.07 K & N UNITS						GRAND MEAN = 25.11 K & N UNITS					TEST DETERMINATIONS = 4		
SD MEANS = 5.38 K & N UNITS						SD OF MEANS = 2.87 K & N UNITS					9 LABS IN GRAND MEANS		
		AVERAGE SDR = .59 K & N UNITS					AVERAGE SDR = 1.24 K & N UNITS						
L651	28.47	-36.60	-6.80	.96	1.63	51.37	26.27	9.14	.85	.68	56O	*	L651
L688	25.02	-40.05	-7.44	.44	.75	56.20	31.09	10.82	.98	.79	56O	*	L688

TOTAL NUMBER OF LABORATORIES REPORTING = 13

Best values: E50 65 K + N units
B80 25 K + N units

The following laboratories were omitted from the grand means because of extreme test results: 564, 616.

ANALYSIS T56-1 TABLE 2
K & N INK ABSORPTION

LAB CODE	F	MEANS E50	B80	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L616	#	.25	.60	-69.04	6.02	.00	56K	INK ABSORPTION, K&N INK TEST
L688	*	25.02	56.20	-22.61	45.38	.77	56O	INK ABSORPTION: GWN METHOD
L651	*	28.47	51.37	-21.59	39.54	1.16	56O	INK ABSORPTION: GWN METHOD
L564	#	32.25	60.50	-14.23	46.12	.83	56K	INK ABSORPTION, K&N INK TEST
L643	d	58.75	22.25	+6.94	.17	1.49	56K	INK ABSORPTION, K&N INK TEST
L149	d	58.75	23.75	-6.29	1.52	1.43	56K	INK ABSORPTION, K&N INK TEST
L333	d	59.25	22.00	-6.59	-.28	.75	56K	INK ABSORPTION, K&N INK TEST
L126	d	63.52	25.17	-1.37	.73	.58	56K	INK ABSORPTION, K&N INK TEST
L182	d	66.27	25.32	1.18	-.33	.70	56K	INK ABSORPTION, K&N INK TEST
L291	d	67.25	22.75	.94	-3.07	1.39	56K	INK ABSORPTION, K&N INK TEST
L213	d	68.22	27.60	3.92	.88	1.25	56K	INK ABSORPTION, K&N INK TEST
L277	d	69.75	26.25	4.71	-1.00	.62	56K	INK ABSORPTION, K&N INK TEST
L339	d	73.87	30.87	10.43	1.38	.79	56K	INK ABSORPTION, K&N INK TEST
GMEANS:		65.07	25.11			1.00		
95% ELLIPSE:				19.53	4.67	WITH GAMMA = 25 DEGREES		

REPORT NO. 60G

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

JUNE 1979

LAB CODE	SAMPLE J18 PRINTING 93 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R.SDR	SAMPLE A99 RHPROCOPY 78 GRAMS PER SQUARE METER MEAN	DEV	N.DHV	SDR	R.SDR	TEST D. = 5 VAR	F	LAB
L174C	3.300	-1.434	-6.60	.000	.00	4.540	-1.066	-3.71	.055	.39	57F	#	L174C
L182C	4.858	.124	.57	.011	.16	5.818	.212	.74	.048	.34	57D	O	L182C
L251C	4.658	-.076	-.35	.029	.42	5.466	-.140	-.49	.069	.49	57P	O	L251C
L274	4.420	-.314	-1.44	.220	3.22	5.720	.114	.39	.220	1.55	57V	O	L274
L328	4.790	.056	.26	.074	1.09	5.420	-.186	-.65	.409	2.87	57M	O	L328
L356	4.740	.006	.03	.055	.80	5.460	-.146	-.51	.055	.39	57V	O	L356
L442	4.571	-.163	-.75	.019	.28	5.261	-.345	-1.20	.124	.87	57O	O	L442
L484A	5.100	.366	1.68	.071	1.04	6.100	.494	1.72	.071	.50	57Y	O	L484A

GR. MEAN = 4.734 PH UNITS — GRAND MEAN = 5.606 PH UNITS — TEST DETHRMINATIONS = 5
SD MEANS = .217 PH UNITS — SD OF MEANS = .288 PH UNITS — 7 LABS IN GRAND MEANS
AVERAGE SDR = .068 PH UNITS — AVERAGE SDR = .142 PH UNITS
TOTAL NUMBHR OF LAHORATORIHS RHPORTING = 8

Best values: J18 4.7 pH units
A99 5.6 pH units

The following laboratories were omitted from the grand means because of extreme test results: 174C.

REPORT NO. 60G

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

JUNE 1979

LAB CODE	F	MEANS J18	A99	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L174C	#	3.300	4.540	-1.669	.639	.19	57F	PH, COLD, FISHER ACCUMET MODEL 220
L274	O	4.420	5.720	-.072	.326	2.38	57V	PH, COLD, HECKMAN EXPANDOMATIC
L442	O	4.571	5.261	-.379	-.048	.58	57O	PH, COLD, ORION DIGITAL IONALYZER
L251C	O	4.658	5.466	-.159	-.011	.45	57P	PH, COLD, RADIOMETER TYPE PH M64
L356	O	4.740	5.460	-.120	-.084	.59	57V	PH, COLD, BECKMAN EXPANDOMATIC
L328	O	4.790	5.420	-.127	-.147	1.98	57M	PH, COLD, BECKMAN ZEROMATIC
L182C	O	4.858	5.818	.245	.009	.25	57D	PH, COLD, RADIOMETER TYPE PH M 28
L484A	O	5.100	6.100	.613	-.044	.77	57Y	PH, COLD, BECKMAN MODEL H2
GMEANS:		4.734	5.606			1.00		
95% ELLIPSE:				1.218	.568	WITH GAMMA = 57 DEGREES		

REPORT NO. 60G

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T57-2 TABLE 1
HYDROGEN ION CONCENTRATION (PH), HOT
TAPPI STANDARD T435 OS-77

JUNE 1979

LAB CODE	SAMPLE J18 PRINTING 93 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	SAMPLE A99 REPROCOPY 78 GRAMS PER SQUARE METER MEAN	DEV	N.DEV	SDR	R. SDR	TEST D. = 5 VAR	F	LAB
L128	4.292	-.120	-1.10	.013	.50	5.074	-.026	-.45	.009	.20	57L	O	L128
L162	4.336	-.076	-.69	.029	1.10	5.020	-.080	-1.39	.033	.76	57C	O	L162
L174H	3.180	-1.232	-11.30	.045	1.70	4.060	-1.040	-18.14	.055	1.25	57G	#	L174H
L182H	4.482	.070	.65	.004	.17	5.170	.070	1.23	.047	1.07	57E	O	L182H
L334	4.388	-.024	-.22	.030	1.15	5.134	.034	.60	.059	1.36	57C	O	L334
L484B	4.560	.148	1.36	.055	2.08	5.100	.000	.01	.071	1.61	57Z	O	L484H

GR. MEAN = 4.412 PH UNITS — GRAND MEAN = 5.100 PH UNITS — TEST DETERMINATIONS = 5
SD MEANS = .109 PH UNITS — SD OF MEANS = .057 PH UNITS — 5 LABS IN GRAND MEANS
AVERAGE SDR = .026 PH UNITS — AVERAGE SDR = .044 PH UNITS
TOTAL NUMBER OF LABORATORIES REPORTING = 6

Best values: J18 4.4 pH units
A99 5.1 pH units

The following laboratories were omitted from the grand means because of extreme test results: 174H.

REPORT NO. 60G

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T57-2 TABLE 2
HYDROGEN ION CONCENTRATION (PH), HOT
TAPPI STANDARD T435 OS-77

JUNE 1979

LAB CODE	F	MEANS J18	A99	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L174H	#	3.180	4.060	-1.501	-.586	1.48	57G	PH, HOT, FISHER ACCUMET MODEL 220
L128	O	4.292	5.074	-.121	.014	.35	57L	PH, HOT, L+N
L162	O	4.336	5.020	-.097	-.051	.93	57C	PH, HOT, CORNING MODEL 12 RESEARCH METER
L334	O	4.388	5.134	-.011	.040	1.25	57C	PH, HOT, CORNING MODEL 12 RESEARCH METER
L182H	O	4.482	5.170	.089	.044	.62	57E	PH, HOT, RADIOMETER TYPE PH M 28
L484B	O	4.560	5.100	.141	-.048	1.85	57Z	PH, HOT, BECKMAN MODEL H2
GMEANS:		4.412	5.100			1.00		
95% ELLIPSE:				.576	.234	WITH GAMMA = 18 DEGREES		

ANALYSIS T60-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT

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

LAB CODE	SAMPLE K24 MEAN	PRINTING 103 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	SAMPLE G01 MEAN	PRINTING 116 GRAMS PER SQUARE METER DBV	N.DEV	SDR	R. SDR	TEST D.= 10 VAR	F	LAB
L105	95.94	.55	1.47	.18	.67	96.42	.60	1.36	.16	.67	60H	@	L105
L108	95.32	-.07	-.20	.30	1.09	95.69	-.13	-.29	.18	.74	60B	@	L108
L115	95.48	.09	.23	.21	.78	96.23	.41	.93	.24	1.00	60B	@	L115
L118	95.54	.15	.39	.30	1.10	95.86	.04	.09	.13	.53	60B	@	L118
L121	95.51	.12	.31	.17	.60	95.89	.07	.16	.22	.93	60B	@	L121
L122	95.17	-.22	-.60	.31	1.13	95.73	-.09	-.20	.21	.88	60D	@	L122
L123	94.82	-.57	-1.54	.22	.80	95.85	.03	.07	.33	1.36	60W	X	L123
L124	95.47	.08	.21	.51	1.84	96.04	.22	.50	.36	1.48	60B	@	L124
L125	94.76	-.63	-1.70	.30	1.07	95.37	-.45	-1.01	.17	.71	60H	@	L125
L131	94.61	-.78	-2.10	.23	.83	95.39	-.43	-.97	.31	1.29	60R	*	L131
L132	95.09	-.30	-.82	.31	1.13	95.79	-.03	-.06	.14	.60	60B	@	L132
L134	96.00	.61	1.63	.00	.00	96.10	.28	.63	.32	1.31	60R	@	L134
L136	95.30	-.09	-.25	.31	1.11	95.63	-.19	-.42	.33	1.36	60H	@	L136
L139	95.28	-.11	-.31	.32	1.16	95.64	-.18	-.40	.15	.63	60B	@	L139
L148H	95.10	-.29	-.79	.30	1.08	95.53	-.29	-.65	.25	1.06	60H	@	L148H
L150	96.00	.61	1.63	.24	.85	96.75	.93	2.10	.42	1.77	60B	@	L150
L152	95.71	.32	.85	.18	.65	96.19	.37	.84	.23	.95	60B	@	L152
L153	95.40	.01	.02	.39	1.43	95.75	-.07	-.15	.26	1.09	60B	@	L153
L157	95.89	.50	1.33	.33	1.21	96.10	.28	.63	.32	1.31	60B	@	L157
L158	95.54	.15	.39	.17	.62	95.89	.07	.16	.29	1.21	60D	@	L158
L159	95.51	.12	.31	.12	.43	95.97	.15	.34	.20	.83	60R	@	L159
L162	95.59	.20	.53	.28	1.03	96.27	.45	1.02	.25	1.06	60W	@	L162
L166	95.19	-.20	-.55	.31	1.14	95.78	-.04	-.09	.29	1.19	60B	@	L166
L173A	95.34	-.05	-.14	.12	.43	95.48	-.34	-.76	.06	.26	60B	@	L173A
L190C	95.51	.12	.31	.21	.77	95.90	.08	.18	.38	1.59	60B	@	L190C
L190R	95.54	.15	.39	.22	.79	95.95	.13	.30	.10	.40	60B	@	L190R
L206	95.54	.15	.39	.31	1.14	95.76	-.06	-.13	.19	.79	60B	@	L206
L210B	95.42	.03	.07	.36	1.32	95.93	.11	.25	.13	.52	60B	@	L210B
L210D	95.43	.04	.10	.21	.76	95.95	.13	.30	.22	.90	60D	@	L210D
L211S	95.22	-.17	-.47	.21	.78	95.61	-.21	-.47	.17	.72	60R	@	L211S
L212	95.60	.21	.55	.62	2.23	96.06	.24	.54	.69	2.87	60B	@	L212
L213	95.74	.35	.93	.49	1.76	96.48	.66	1.49	.35	1.45	60B	@	L213
L223B	95.39	-.00	-.01	.37	1.35	96.05	.23	.52	.25	1.02	60B	@	L223B
L225	95.57	.18	.47	.29	1.05	96.03	.21	.48	.18	.73	60B	@	L225
L226B	95.42	.03	.07	.23	.83	95.79	-.03	-.06	.26	1.08	60B	@	L226B
L228	94.98	-.41	-1.11	.19	.68	95.38	-.44	-.99	.19	.78	60H	@	L228
L230	95.58	.19	.50	.36	1.32	95.91	.09	.21	.22	.91	60B	@	L230
L236B	95.02	-.37	-1.00	.49	1.79	95.62	-.20	-.45	.37	1.53	60B	@	L236B
L238A	94.73	-.66	-1.78	.21	.75	95.13	-.69	-1.55	.14	.59	60R	@	L238A
L241	95.66	.27	.72	.25	.92	96.20	.38	.86	.16	.68	60B	@	L241
L254	95.57	.18	.47	.33	1.21	96.06	.24	.54	.18	.76	60H	@	L254
L255	94.77	-.62	-1.67	.23	.84	94.99	-.83	-1.87	.25	1.04	60B	@	L255
L259	95.10	-.29	-.79	.30	1.09	95.66	-.16	-.36	.32	1.33	60B	@	L259
L261	96.40	1.01	2.70	.32	1.15	97.00	1.18	2.66	.00	.00	60B	*	L261
L262	95.51	.12	.31	.19	.67	96.00	.18	.41	.22	.90	60R	@	L262
L275	95.23	-.16	-.44	.13	.45	96.04	.22	.50	.18	.76	60R	@	L275
L278	95.60	.21	.55	.33	1.21	95.93	.11	.25	.16	.65	60B	@	L278
L281	95.57	.18	.47	.27	.98	96.21	.39	.88	.22	.91	60D	@	L281
L285D	94.81	-.58	-1.57	.27	.99	95.13	-.69	-1.55	.13	.52	60D	@	L285D
L285R	94.85	-.54	-1.46	.41	1.50	95.06	-.76	-1.71	.08	.35	60R	@	L285R
L288	95.59	.20	.53	.29	1.06	96.09	.27	.61	.15	.63	60D	@	L288
L305	94.86	-.53	-1.43	.19	.69	94.84	-.98	-2.20	.15	.63	60R	@	L305
L308	95.91	.52	1.39	.35	1.26	96.65	.83	1.87	.50	2.07	60H	@	L308
L315	95.23	-.16	-.44	.24	.85	95.65	-.17	-.38	.14	.60	60D	@	L315
L317	94.99	-.40	-1.08	.31	1.11	95.50	-.32	-.72	.29	1.22	60B	@	L317
L318	95.45	.06	.15	.44	1.59	96.01	.19	.43	.33	1.36	60B	@	L318
L323	95.95	.56	1.49	.26	.95	96.65	.83	1.87	.16	.69	60W	@	L323
L326	95.06	-.33	-.90	.20	.71	95.17	-.65	-1.46	.27	1.11	60B	@	L326
L328	94.00	-1.39	-3.74	1.75	6.33	96.25	.43	.97	1.32	5.47	60B	X	L328
L339	95.40	.01	.02	.52	1.87	95.60	-.22	-.49	.52	2.15	60B	@	L339
L341	95.26	-.13	-.36	.30	1.07	95.25	-.57	-1.28	.27	1.13	60R	@	L341
L352	95.11	-.28	-.76	.26	.94	95.82	.00	.00	.17	.70	60R	@	L352
L354	95.00	-.39	-1.06	.00	.00	95.00	-.82	-1.84	.00	.00	60B	@	L354
L390	95.56	.17	.45	.21	.77	95.62	-.20	-.45	1.08	4.49	60B	@	L390
L396	95.00	-.39	-1.06	.00	.00	95.00	-.82	-1.84	.00	.00	60B	@	L396

ANALYSIS T60-1 TABLE 1

OPACITY (89% REFLECTANCE BACKING) IN PERCENT

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

LAB CODE	SAMPLE K24 MEAN	PRINTING 103 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE G01 MEAN	PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D. = 10 VAR	F	LAB
L523	95.30	-.09	-.25	.21	.74	95.86	.04	.09	.20	.81	60R	@	L523
L571	95.50	.11	.29	.31	1.12	95.98	.16	.36	.16	.67	60D	@	L571
L573	95.52	.13	.34	.19	.70	95.92	.10	.23	.18	.73	60H	@	L573
L581	95.53	.14	.37	.32	1.15	95.95	.13	.30	.21	.86	60B	@	L581
L592	94.94	-.45	-1.22	.46	1.68	95.30	-.52	-1.17	.21	.85	60W	@	L592
L594	95.84	.45	1.20	.26	.95	95.92	.10	.23	.09	.38	60D	@	L594
L597	95.00	-.39	-1.06	.00	.00	95.20	-.62	-1.39	.42	1.75	60B	@	L597
L599	95.25	-.14	-.39	.35	1.28	95.75	-.07	-.15	.42	1.77	60B	@	L599
L608	96.15	.76	2.03	.18	.67	96.57	.75	1.69	.29	1.22	60D	@	L608
L673R	95.83	.44	1.17	.35	1.28	96.05	.23	.52	.10	.40	60E	@	L673R
L673T	95.40	.01	.02	.34	1.23	95.79	-.03	-.06	.19	.77	60E	@	L673T
L688	96.24	.85	2.27	.40	1.44	96.65	.83	1.87	.30	1.24	60B	@	L688
L692	95.29	-.10	-.28	.33	1.21	95.80	-.02	-.04	.20	.83	60D	@	L692
L698	94.65	-.74	-2.00	.26	.94	95.11	-.71	-1.60	.14	.57	60D	@	L698
GR. MEAN =	95.39 PERCENT					GRAND MEAN =	95.82 PERCENT				TEST DETERMINATIONS =		10
SD MEANS =	.37 PERCENT					SD OF MEANS =	.44 PERCENT				77 LABS IN GRAND MEANS		
		AVERAGE SDR =		.28 PERCENT			AVERAGE SDR =		.24 PERCENT				
L100	95.56	.17	.45	.20	.73	95.98	.16	.36	.19	.80	60E	*	L100
L224	95.86	.47	1.25	.21	.75	95.62	-.20	-.45	.56	2.32	60P	*	L224
L232	95.00	-.39	-1.06	.00	.00	95.30	-.52	-1.17	.42	1.75	60P	*	L232
L249	95.11	-.28	-.76	.21	.75	95.54	-.28	-.63	.40	1.65	60P	*	L249
L256	94.96	-.43	-1.16	.32	1.16	95.45	-.37	-.83	.20	.81	60N	*	L256
L260	95.49	.10	.26	.19	.67	95.71	-.11	-.24	.26	1.08	60P	*	L260
L274P	95.00	-.39	-1.06	.41	1.48	96.05	.23	.52	.37	1.53	60P	*	L274P
L277	4.80	-90.59	-243.23	.42	1.53	4.40	-91.42	-205.99	.52	2.15	60P	*	L277
L312	94.55	-.84	-2.27	.28	1.03	94.90	-.92	-2.07	.32	1.31	60P	*	L312
L380	95.00	-.39	-1.06	.00	.00	95.00	-.82	-1.84	.00	.00	60P	*	L380
L564	95.00	-.39	-1.06	.00	.00	95.10	-.72	-1.62	.32	1.31	60P	*	L564
L687	95.80	.41	1.09	.67	2.45	96.30	.48	1.09	.35	1.45	60P	*	L687

TOTAL NUMBER OF LABORATORIES REPORTING = 91

Best values: K24 95.4 $\pm$ 0.6 percent
G01 95.8 $\pm$ 0.8 percent

ANALYSIS T60-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT

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

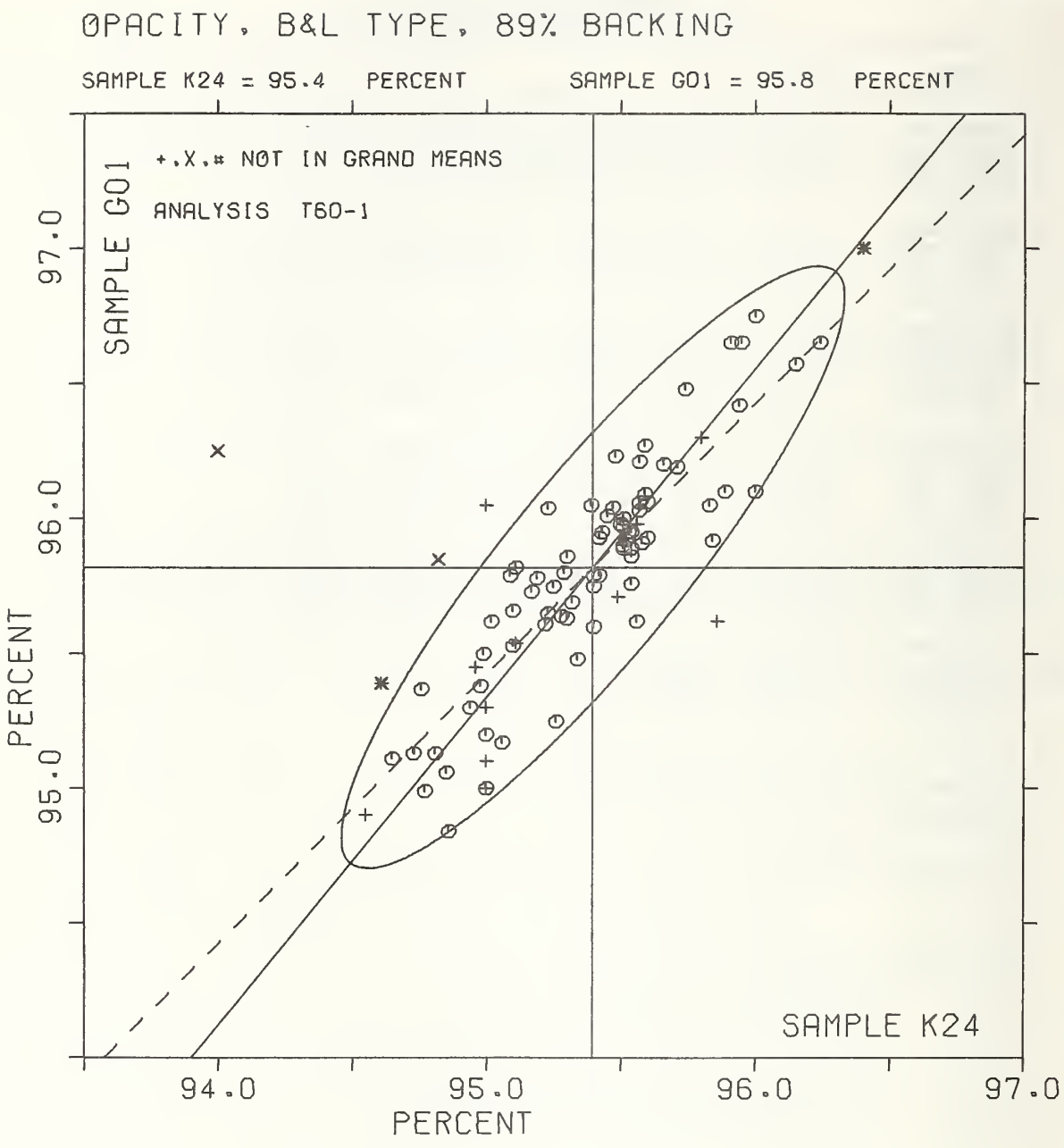
LAB CODE	F	MEANS X24	G01	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L277	*	4.80	4.40	-128.15	11.93	1.84	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L328	X	94.00	96.25	-.55	1.35	5.90	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L312	*	94.55	94.90	-1.25	.07	1.17	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L131	*	94.61	95.39	-.83	.33	1.06	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L698	O	94.65	95.11	-1.02	.12	.75	60D	OPACITY (WHITE BACKING), BNL-2
L238A	O	94.73	95.13	-.95	.08	.67	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L125	O	94.76	95.37	-.75	.20	.89	60H	OPACITY (WHITE BACKING), HUYGEN
L255	O	94.77	94.99	-1.04	-.04	.94	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L285D	O	94.81	95.13	-.90	.01	.75	60D	OPACITY (WHITE BACKING), BNL-2
L123	X	94.82	95.85	-.34	.46	1.08	60W	OPACITY (WHITE BACKING), HUYGEN,DIGITAL
L285R	O	94.85	95.06	-.93	-.06	.93	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L305	O	94.86	94.84	-1.09	-.21	.66	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L592	O	94.94	95.30	-.69	.02	1.26	60W	OPACITY (WHITE BACKING), HUYGEN,DIGITAL
L256	*	94.96	95.45	-.56	.10	.99	60N	OPACITY (WHITE BACKING), HUNTER
L228	O	94.98	95.38	-.60	.04	.73	60H	OPACITY (WHITE BACKING), HUYGEN
L317	O	94.99	95.50	-.50	.11	1.17	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L274P	*	95.00	96.05	-.07	.45	1.51	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L564	*	95.00	95.10	-.80	-.15	.66	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L380	*	95.00	95.00	-.88	-.22	.00	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L232	*	95.00	95.30	-.65	-.03	.88	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L597	O	95.00	95.20	-.73	-.09	.88	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L396	O	95.00	95.00	-.88	-.22	.00	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L354	O	95.00	95.00	-.88	-.22	.00	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L236B	O	95.02	95.62	-.39	.16	1.66	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L326	O	95.06	95.17	-.71	-.15	.91	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L132	O	95.09	95.79	-.21	.22	.86	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L259	O	95.10	95.66	-.31	.13	1.21	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L148B	O	95.10	95.53	-.41	.04	1.07	60B	OPACITY (WHITE BACKING), HUYGEN
L352	O	95.11	95.82	-.18	.22	.82	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L249	*	95.11	95.54	-.40	.04	1.20	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L122	O	95.17	95.73	-.21	.12	1.01	60D	OPACITY (WHITE BACKING), BNL-2
L166	O	95.19	95.78	-.16	.13	1.16	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L211S	O	95.22	95.61	-.27	.00	.75	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L315	O	95.23	95.65	-.23	.02	.73	60D	OPACITY (WHITE BACKING), BNL-2
L275	O	95.23	96.04	.07	.27	.61	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L599	O	95.25	95.75	-.14	.07	1.52	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L341	O	95.26	95.25	-.52	-.26	1.10	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L139	O	95.28	95.64	-.21	-.03	.89	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L692	O	95.29	95.80	-.08	.07	1.02	60D	OPACITY (WHITE BACKING), BNL-2
L136	O	95.30	95.63	-.21	-.05	1.23	60H	OPACITY (WHITE BACKING), HUYGEN
L523	O	95.30	95.86	-.03	.10	.78	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L108	O	95.32	95.69	-.15	-.02	.92	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L173A	O	95.34	95.48	-.30	-.17	.34	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L223B	O	95.39	96.05	.18	.15	1.19	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L673T	O	95.40	95.79	-.02	-.02	1.00	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L153	O	95.40	95.75	-.05	-.05	1.26	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L339	O	95.40	95.60	-.16	-.14	2.01	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L226B	O	95.42	95.79	-.01	-.04	.96	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L210B	O	95.42	95.93	.10	.05	.92	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L210D	O	95.43	95.95	.12	.06	.83	60D	OPACITY (WHITE BACKING), BNL-2
L318	O	95.45	96.01	.18	.08	1.47	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L124	O	95.47	96.04	.22	.08	1.66	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L115	O	95.48	96.23	.37	.19	.89	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L260	*	95.49	95.71	-.02	-.14	.88	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L571	O	95.50	95.98	.19	.02	.90	60D	OPACITY (WHITE BACKING), BNL-2
L121	O	95.51	95.89	.13	-.04	.77	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L262	O	95.51	96.00	.21	.03	.78	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L159	O	95.51	95.97	.19	.01	.63	60R	OPACITY (WHITE BACKING), TAPPING-ALBERT (FORMERLY SRL)
L190C	O	95.51	95.90	.14	-.04	1.18	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L573	O	95.52	95.92	.16	-.03	.71	60H	OPACITY (WHITE BACKING), HUYGEN
L581	O	95.53	95.95	.19	-.02	1.00	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L206	O	95.54	95.76	.05	-.15	.96	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L190R	O	95.54	95.95	.19	-.03	.60	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L158	O	95.54	95.89	.15	-.07	.92	60D	OPACITY (WHITE BACKING), BNL-2
L118	O	95.54	95.86	.13	-.09	.81	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB

ANALYSIS T60-1 TABLE 2

OPACITY (89% REFLECTANCE BACKING) IN PERCENT

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

LAB CODE	F	MEANS K24	MEANS G01	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L390	O	95.56	95.62	-.05	-.25	2.63	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L100	*	95.56	95.98	.23	-.03	.77	60E	OPACITY (WHITE BACKING), ZEISS ELREPHO, PMY-C(10) FILTER
L281	O	95.57	96.21	.41	.11	.94	60D	OPACITY (WHITE BACKING), BNL-2
L225	O	95.57	96.03	.28	-.00	.89	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L254	O	95.57	96.06	.30	.02	.99	60H	OPACITY (WHITE BACKING), HUYGEN
L230	O	95.58	95.91	.19	-.09	1.11	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L288	O	95.59	96.09	.33	.02	.85	60D	OPACITY (WHITE BACKING), BNL-2
L162	O	95.59	96.27	.47	.14	1.04	60W	OPACITY (WHITE BACKING), HUYGEN,DIGITAL
L278	O	95.60	95.93	.22	-.09	.93	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L212	O	95.60	96.06	.32	-.01	2.55	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L241	O	95.66	96.20	.46	.04	.80	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L152	O	95.71	96.19	.49	-.01	.80	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L213	O	95.74	96.48	.73	.15	1.61	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L687	*	95.80	96.30	.63	-.01	1.95	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L673R	O	95.83	96.05	.46	-.19	.84	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L594	O	95.84	95.92	.36	-.28	.67	60D	OPACITY (WHITE BACKING), BNL-2
L224	*	95.86	95.62	.14	-.49	1.54	60P	OPACITY (WHITE BACKING), PHOTOVOLT
L157	O	95.89	96.10	.53	-.20	1.26	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L308	O	95.91	96.65	.97	.13	1.67	60H	OPACITY (WHITE BACKING), HUYGEN
L105	O	95.94	96.42	.81	-.04	.67	60H	OPACITY (WHITE BACKING), HUYGEN
L323	O	95.95	96.65	1.00	.10	.82	60W	OPACITY (WHITE BACKING), HUYGEN,DIGITAL
L150	O	96.00	96.75	1.10	.12	1.31	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L134	O	96.00	96.10	.60	-.29	.66	60R	OPACITY (WHITE BACKING), THWING-ALBERT (FORMERLY SRL)
L608	O	96.15	96.57	1.06	-.11	.95	60D	OPACITY (WHITE BACKING), BNL-2
L688	O	96.24	96.65	1.18	-.13	1.34	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
L261	*	96.40	97.00	1.55	-.03	.57	60B	OPACITY (WHITE BACKING), BAUSCH + LOMB
GMEANS:		95.39	95.82			1.00		
		95% ELLIPSE:		1.42	.33	WITH GAMMA = 50 DEGREES		


OPACITY, B&L TYPE, 89% BACKING
SAMPLE K24 = 95.4 PERCENT
SAMPLE G01 = 95.8 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T60-1
SAMPLE G01
97.0
96.0
95.0
PERCENT
SAMPLE K24
94.0
95.0
96.0
97.0
PERCENT

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T60-2 TABLE 1

OPACITY (PAPER BACKING) IN PERCENT

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

LAB CODE	SAMPLE K24 MEAN	PRINTING 103 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE G01 MEAN	PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F = 10 VAR	F	LAB
L115	95.74	.09	.66	.27	1.16	94.09	.21	.63	.32	1.18	60C	6	L115
L118	95.79	.14	1.02	.24	1.04	93.68	-.20	-.61	.18	.64	60C	6	L118
L190C	95.58	-.07	-.47	.22	.94	93.78	-.10	-.31	.20	.75	60C	6	L190C
L190R	95.71	.06	.45	.19	.79	93.86	-.02	-.07	.25	.94	60C	6	L190R
L236B	95.66	.01	.09	.36	1.53	94.41	.53	1.60	.38	1.41	60C	6	L236B
L274	96.10	.45	3.23	.46	1.97	96.25	2.37	7.18	.26	.97	60C	#	L274
L543	95.40	-.25	-1.76	.12	.53	93.47	-.41	-1.25	.29	1.07	60V	6	L543

GR. MEAN = 95.65 PERCENT — GRAND MEAN = 93.88 PERCENT — TEST DETERMINATIONS = 10

SD MEANS = .14 PERCENT — SD OF MEANS = .33 PERCENT — 6 LABS IN GRAND MEANS

AVERAGE SDR = .23 PERCENT — AVERAGE SDR = .27 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 7

Best values: K24 95.7 percent
G01 93.9 percent

The following laboratories were omitted from the grand means because of extreme test results: 274.

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T60-2 TABLE 2

OPACITY (PAPER BACKING) IN PERCENT

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

LAB CODE	F	MEANS K24	G01	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L543	6	95.40	93.47	-.46	.15	.80	60V	OPACITY (PAPER BACKING), DIANO/BNL
L190C	6	95.58	93.78	-.11	.04	.85	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
L236B	6	95.66	94.41	.52	.10	1.47	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
L190R	6	95.71	93.86	-.01	-.07	.87	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
L115	6	95.74	94.09	.22	-.05	1.17	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
L118	6	95.79	93.68	-.17	-.18	.84	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
L274	#	96.10	96.25	2.41	.07	1.47	60C	OPACITY (PAPER BACKING), BAUSCH + LOMB
GMEANS:		95.65	93.88			1.00		
		95% ELLIPSE:		1.40	.51	WITH GAMMA = 77 DEGREES		

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T60-3 TABLE 1

OPACITY (PAPER BACKING) IN PERCENT

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

LAB CODE	SAMPLE K24 MEAN	PRINTING 103 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	SAMPLE G01 MEAN	PRINTING 116 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L100	96.29	.04	.24	.20	1.16	94.50	.11	.45	.15	.91	60J	O	L100
L150	96.14	-.11	-.68	.17	.95	94.29	-.10	-.44	.17	1.04	60J	O	L150
L182E	96.10	-.15	-.94	.14	.81	94.19	-.20	-.86	.14	.89	60J	O	L182E
L219	NO DATA REPORTED FOR SAMPLE K24					94.15	-.24	-1.01	.21	1.28	60F	M	L219
L233F	96.12	-.13	-.82	.19	1.07	94.14	-.25	-1.08	.11	.66	60F	O	L233F
L236	96.04	-.21	-1.31	.14	.81	94.31	-.09	-.37	.18	1.08	60J	O	L236
L242	96.25	-.00	-.01	.14	.82	94.43	.04	.15	.21	1.26	60J	O	L242
L244	96.03	-.22	-1.38	.09	.54	94.05	-.34	-1.46	.11	.66	60F	O	L244
L250T	96.20	-.05	-.32	.18	1.01	94.45	.06	.24	.16	1.01	60J	O	L250T
L251	97.89	1.64	10.24	.16	.93	96.80	2.41	10.19	.20	1.20	60F	#	L251
L309	96.24	-.01	-.05	.14	.79	94.29	-.10	-.43	.12	.76	60J	O	L309
L313	96.41	.16	.99	.19	1.09	94.59	.20	.83	.17	1.06	60J	O	L313
L360	96.18	-.07	-.44	.18	1.00	94.08	-.31	-1.33	.24	1.46	60F	O	L360
L446	96.35	.10	.61	.14	.78	94.48	.09	.38	.18	1.10	60J	O	L446
L484	96.28	.03	.18	.40	2.31	94.48	.09	.36	.24	1.49	60F	O	L484
L575	96.53	.28	1.76	.17	.97	94.68	.29	1.23	.14	.85	60J	O	L575
L598	96.26	.01	.06	.17	.98	94.37	-.02	-.10	.14	.87	60J	O	L598
L678	96.59	.34	2.12	.16	.91	94.97	.58	2.44	.15	.91	60J	O	L678
GR. MEAN = 96.25 PERCENT						GRAND MEAN = 94.39 PERCENT					TEST DETERMINATIONS = 10		
SD MEANS = .16 PERCENT						SD OF MEANS = .24 PERCENT					16 LABS IN GRAND MEANS		
AVERAGE SDR = .18 PERCENT						AVERAGE SDR = .16 PERCENT							
L626	96.09	-.16	-1.01	.07	.42	93.91	-.48	-2.05	.17	1.02	60Q	*	L626

TOTAL NUMBER OF LABORATORIES REPORTING = 19

Best values: K24 96.2 ± 0.3 percent
G01 94.4 ± 0.4 percent

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

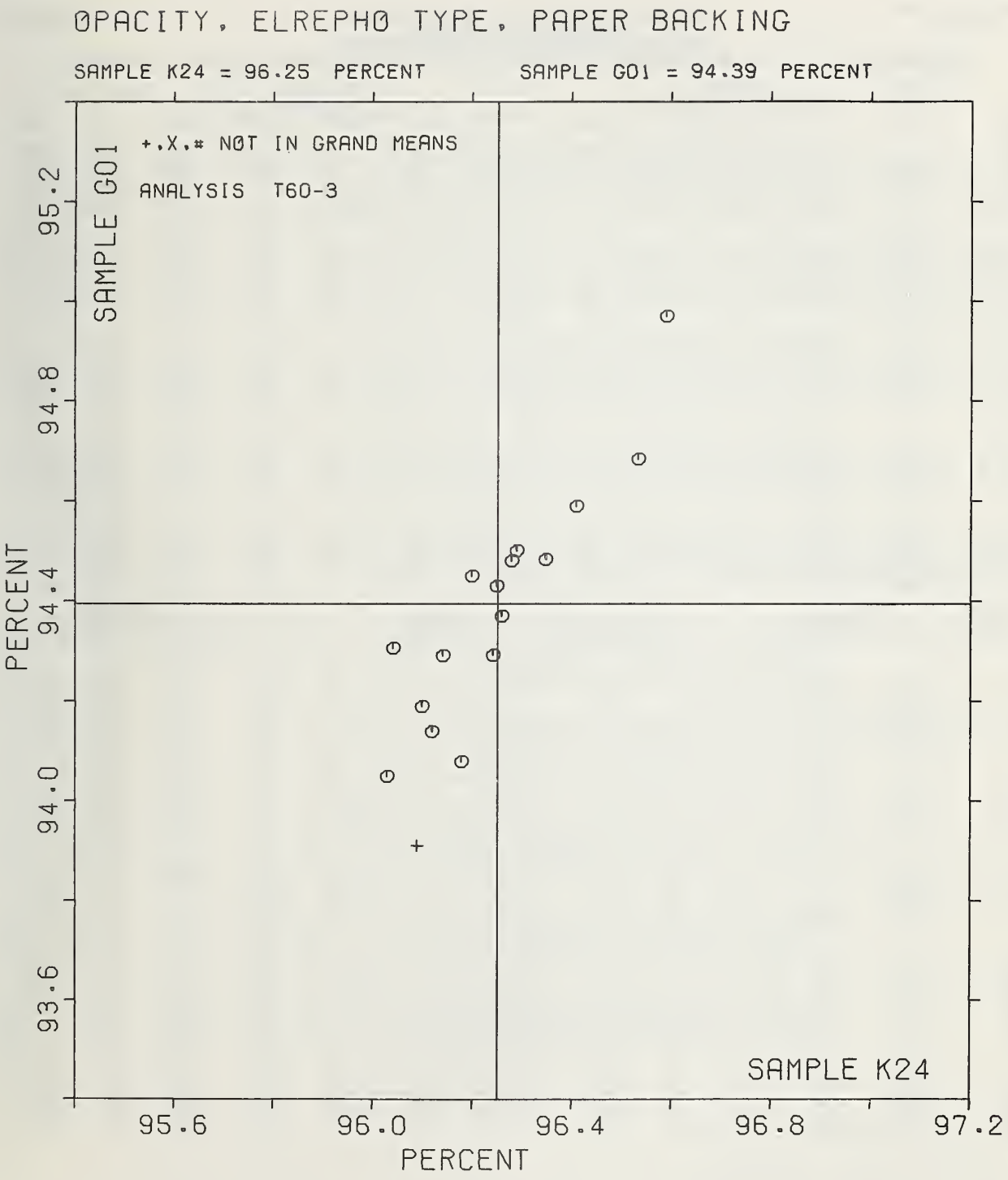
REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

ANALYSIS T60-3 TABLE 2

OPACITY (PAPER BACKING) IN PERCENT

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

LAB CODE	F	MEANS K24	MEANS G01	COORDINATES MAJOR	COORDINATES MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L219	M		94.15			1.28	60F	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) NO TRAP
L244	O	96.03	94.05	-.41	-.00	.60	60F	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) NO TRAP
L236	O	96.04	94.31	-.19	.13	.95	60J	OPACITY (PAPER BACKING), ZEISS ELHEPHO, FMY-C(10) FILTER
L626	*	96.09	93.91	-.49	-.13	.72	60Q	OPACITY (PAPER BACKING), PHOTOVOLT
L182E	O	96.10	94.19	-.25	.02	.85	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L233F	O	96.12	94.14	-.28	-.03	.86	60F	OPACITY (PAPER BACKING), ZEISS ELHEPHO, FMY-C(10) NO TRAP
L150	O	96.14	94.29	-.15	.04	.99	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L360	O	96.18	94.08	-.30	-.11	1.23	60F	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) NO TRAP
L250T	O	96.20	94.45	.02	.07	1.01	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L309	O	96.24	94.29	-.09	-.05	.78	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L242	O	96.25	94.43	.03	.02	1.04	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L598	O	96.26	94.37	-.02	-.02	.92	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L484	O	96.28	94.48	.09	.02	1.90	60F	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) NO TRAP
L100	O	96.29	94.50	.11	.03	1.03	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L446	O	96.35	94.48	.13	-.03	.94	60J	OPACITY (PAPER BACKING), ZEISS ELHEPHO, FMY-C(10) FILTER
L313	O	96.41	94.59	.25	-.03	1.07	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L575	O	96.53	94.68	.40	-.08	.91	60J	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) FILTER
L678	O	96.59	94.97	.67	.03	.91	60J	OPACITY (PAPER BACKING), ZEISS ELHEPHO, FMY-C(10) FILTER
L251	#	97.89	96.80	2.91	-.06	1.06	60F	OPACITY (PAPER BACKING), ZEISS ELREPHO, FMY-C(10) NO TRAP
GMEANS:		96.25	94.39			1.00		
95% ELLIPSE:				.79	.16	WITH GAMMA = 56 DEGREES		


OPACITY, ELREPHO TYPE, PAPER BACKING
SAMPLE K24 = 96.25 PERCENT
SAMPLE G01 = 94.39 PERCENT
+.X.* NOT IN GRAND MEANS
ANALYSIS T60-3
SAMPLE G01
PERCENT
95.2
94.8
94.4
94.0
93.6
SAMPLE K24
95.6
96.0
96.4
96.8
97.2
PERCENT

ANALYSIS T65-1 TABLE 1

DIRECTIONAL BLUE REFLECTANCE IN PERCENT

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

LAB CODE	SAMPLE E79 MEAN	PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE J98 MEAN	PRINTING 89 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.= 8 VAR	F	LAB
L108	96.15	.15	.51	.14	1.19	75.92	-.04	-.11	.13	.99	65M	G	L108
L122	96.39	.39	1.32	.14	1.14	76.02	.06	.18	.07	.55	65M	G	L122
L132	95.62	-.37	-1.27	.07	.60	76.17	.21	.60	.13	.99	65N	G	L132
L158	97.04	1.04	3.52	.07	.63	77.29	1.32	3.78	.12	.94	65N	#	L158
L176A	94.11	-1.89	-6.40	.04	.30	74.51	-1.45	-4.15	.12	.97	65A	#	L176A
L190C	95.66	-.34	-1.14	.09	.77	75.45	-.51	-1.47	.12	.93	65A	G	L190C
L210M	95.74	-.26	-.89	.15	1.27	75.94	-.03	-.08	.19	1.49	65M	G	L210M
L210N	96.00	.00	.00	.05	.45	76.41	.45	1.28	.15	1.13	65N	G	L210N
L211	94.19	-1.81	-6.15	.69	5.80	76.31	.35	1.00	.10	.77	65N	#	L211
L225	96.04	.04	.13	.12	1.00	75.74	-.23	-.65	.18	1.37	65N	G	L225
L259	95.81	-.19	-.63	.23	1.93	75.75	-.21	-.61	.12	.93	65M	G	L259
L275	96.02	.03	.09	.18	1.54	76.24	.27	.78	.13	1.01	65M	G	L275
L285	95.62	-.37	-1.27	.15	1.25	75.84	-.13	-.36	.14	1.09	65N	G	L285
L288	96.10	.10	.34	.08	.64	76.26	.30	.85	.11	.82	65N	G	L288
L308	96.10	.10	.34	.08	.64	76.49	.52	1.50	.08	.65	65N	G	L308
L315	96.22	.23	.77	.10	.87	76.30	.34	.96	.16	1.24	65N	G	L315
L317	95.51	-.49	-1.65	.10	.83	75.35	-.61	-1.76	.19	1.49	65M	G	L317
L523	95.74	-.26	-.89	.05	.44	75.66	-.30	-.86	.15	1.17	65N	G	L523
L543	96.31	.31	1.06	.17	1.45	76.36	.40	1.14	.11	.82	65M	G	L543
L565	95.84	-.16	-.55	.07	.63	75.65	-.31	-.90	.14	1.10	65A	G	L565
L598	96.16	.16	.55	.13	1.10	75.89	-.08	-.22	.08	.65	65M	G	L598
L636	96.54	.54	1.83	.20	1.68	75.46	-.50	-1.43	.28	2.15	65M	*	L636
L673R	97.56	1.56	5.30	.09	.77	76.01	.05	.14	.08	.65	65N	#	L673R
L692	96.40	.40	1.36	.15	1.27	76.36	.40	1.14	.07	.58	65N	G	L692
GR. MEAN =	96.00 PERCENT					GRAND MEAN =	75.96 PERCENT				TEST DETERMINATIONS =		8
SD MEANS =	.29 PERCENT					SD OF MEANS =	.35 PERCENT				20 LABS IN GRAND MEANS		
		AVERAGE SDR =		.12 PERCENT			AVERAGE SDR =		.13 PERCENT				
L105	96.77	.78	2.63	.14	1.17	76.64	.67	1.93	.13	1.01	65T	*	L105
L213	97.07	1.08	3.65	.07	.60	76.19	.22	.64	.10	.77	65T	*	L213
L219	97.76	1.76	5.98	.05	.44	77.75	1.79	5.11	.08	.59	65P	*	L219
L223	97.81	1.81	6.15	.06	.54	77.30	1.34	3.82	.13	1.02	65G	*	L223
L224	96.24	.24	.81	.07	.63	76.56	.60	1.71	.09	.71	65H	*	L224
L232	96.00	.00	.00	.00	.00	77.37	1.41	4.04	.23	1.79	65P	*	L232
L241	95.96	-.04	-.13	.05	.44	76.42	.46	1.32	.17	1.29	65I	*	L241
L249	96.02	.03	.09	.07	.60	77.11	1.15	3.29	.17	1.34	65P	*	L249
L256	95.86	-.14	-.46	.12	1.00	75.26	-.70	-2.01	.12	.92	65H	*	L256
L260	95.85	-.15	-.51	.16	1.35	75.92	-.04	-.11	.14	1.08	65P	*	L260
L277	93.37	-2.62	-8.90	.52	4.36	81.25	5.29	15.12	.46	3.59	65P	*	L277
L278	95.81	-.19	-.63	.30	2.52	75.87	-.09	-.25	.23	1.79	65P	*	L278
L312	96.56	.56	1.91	.50	4.17	78.37	2.41	6.90	.52	4.01	65P	*	L312
L321	100.00	4.00	13.57	.00	.00	79.50	3.54	10.12	.00	.00	65P	*	L321
L339	98.82	2.83	9.59	.12	.98	79.00	3.04	8.69	.00	.00	65P	*	L339
L380	95.25	-.75	-2.54	.46	3.90	79.00	3.04	8.69	.00	.00	65P	*	L380
L442	98.12	2.13	7.21	.09	.75	75.45	-.51	-1.47	.09	.72	65T	*	L442
L562	97.00	1.00	3.40	.00	.00	81.50	5.54	15.84	.00	.00	65P	*	L562
L564	96.25	.25	.85	.46	3.90	78.00	2.04	5.83	.00	.00	65P	*	L564
L591	98.68	2.68	9.09	.08	.70	75.86	-.10	-.29	.13	1.00	65H	*	L591
L617	97.15	1.15	3.90	.05	.45	77.60	1.64	4.68	.09	.72	65G	*	L617
L626	98.65	2.65	8.99	.19	1.62	78.89	2.92	8.36	.08	.65	65P	*	L626
L684	92.41	-3.59	-12.17	.22	1.82	75.32	-.64	-1.83	.16	1.23	65H	*	L684
L695	98.75	2.75	9.33	.27	2.25	78.06	2.10	6.00	.42	3.24	65P	*	L695
L698	96.60	.60	2.04	.08	.64	76.40	.44	1.25	.29	2.27	65I	*	L698

TOTAL NUMBER OF LABORATORIES REPORTING = 49

Best values: E79 96.0 $\pm$ 0.4 percent
J98 76.0 $\pm$ 0.5 percent

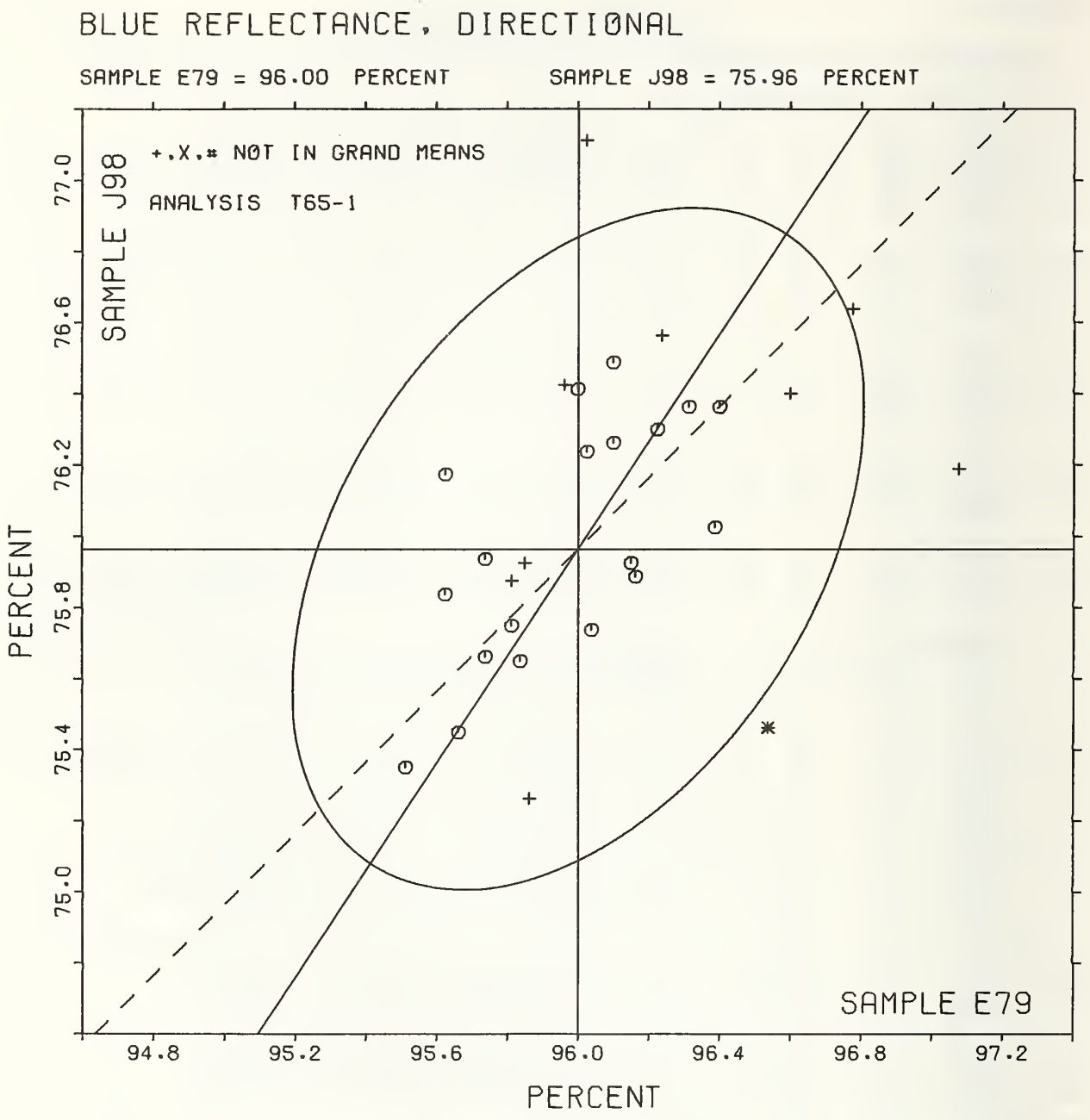
The following laboratories were omitted from the grand means because of extreme test results: 158, 176A, 211, 673R.

ANALYSIS T65-1 TABLE 2

DIRECTIONAL BLUE REFLECTANCE IN PERCENT

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

LAB CODE	F	MEANS E79	MEANS J98	COORDINATES MAJOR	COORDINATES MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L684	*	92.41	75.32	-2.51	2.64	1.52	65E	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L277	*	93.37	81.25	2.95	5.11	3.97	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L176A	#	94.11	74.51	-2.25	.77	.63	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L211	#	94.19	76.31	-.71	1.70	3.29	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L380	*	95.25	79.00	2.12	2.30	1.95	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L317	O	95.51	75.35	-.78	.07	1.16	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L132	O	95.62	76.17	-.03	.43	.79	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L285	O	95.62	75.84	-.31	.24	1.17	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L190C	O	95.66	75.45	-.61	-.00	.85	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L210M	O	95.74	75.94	-.17	.20	1.38	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L523	O	95.74	75.66	-.40	.05	.80	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L278	*	95.81	75.87	-.18	.11	2.16	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L259	O	95.81	75.75	-.28	.04	1.43	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L565	O	95.84	75.65	-.35	-.04	.86	65A	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (ACBT),S-2
L260	*	95.85	75.92	-.11	.10	1.21	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L256	*	95.86	75.26	-.66	-.27	.96	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L241	*	95.96	76.42	.36	.29	.86	65I	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2A
L210N	O	96.00	76.41	.37	.25	.79	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L232	*	96.00	77.37	1.18	.78	.90	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L275	O	96.02	76.24	.24	.13	1.28	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L249	*	96.02	77.11	.97	.61	.97	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L225	O	96.04	75.74	-.17	-.16	1.19	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L288	O	96.10	76.26	.30	.08	.73	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L308	O	96.10	76.49	.49	.21	.64	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L108	O	96.15	75.92	.05	-.15	1.09	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L598	O	96.16	75.89	.03	-.18	.87	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L315	O	96.22	76.30	.40	-.00	1.06	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L224	*	96.24	76.56	.63	.13	.67	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L564	*	96.25	78.00	1.84	.92	1.95	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L543	O	96.31	76.36	.51	-.04	1.14	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L122	O	96.39	76.02	.27	-.29	.84	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L692	O	96.40	76.36	.55	-.11	.92	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L636	#	96.54	75.46	-.12	-.73	1.92	65M	BLUE REFLECTANCE (DIRECTIONAL), MARTIN SWEETS (GE), S-1
L312	*	96.56	78.37	2.32	.86	4.09	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L698	*	96.60	76.40	.70	-.26	1.45	65I	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2A
L105	*	96.77	76.64	.99	-.27	1.09	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L562	*	97.00	81.50	5.17	2.23	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L158	#	97.04	77.29	1.68	-.13	.78	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L213	*	97.07	76.19	.78	-.77	.68	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L617	*	97.15	77.60	2.00	-.05	.58	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L673R	#	97.56	76.01	.90	-1.28	.71	65N	BLUE REFLECTANCE (DIRECTIONAL), TECHNIDYNE/DIANO/M.S., S-4
L219	*	97.76	77.75	2.46	-.48	.51	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L223	*	97.81	77.30	2.12	-.77	.78	65G	BLUE REFLECTANCE (DIRECTIONAL), GARDNER
L442	*	98.12	75.45	.75	-2.06	.73	65T	BLUE REFLECTANCE (DIRECTIONAL), HUNTER D25D2M
L626	*	98.65	78.89	3.90	-.59	1.13	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L591	*	98.68	75.86	1.40	-2.29	.85	65H	BLUE REFLECTANCE (DIRECTIONAL), HUNTER
L695	*	98.75	78.06	3.27	-1.13	2.74	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L339	*	98.82	79.00	4.09	-.68	.49	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
L321	*	100.00	79.50	5.16	-1.38	.00	65P	BLUE REFLECTANCE (DIRECTIONAL), PHOTOVOLT
GMEANS:		96.00	75.96			1.00		
		95% ELLIPSE:		1.06	.67	WITH GAMMA = 56 DEGREES		


BLUE REFLECTANCE, DIRECTIONAL
SAMPLE E79 = 96.00 PERCENT
SAMPLE J98 = 75.96 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T65-1
SAMPLE J98
PERCENT
77.0
76.6
76.2
75.8
75.4
75.0
94.8
95.2
95.6
96.0
96.4
96.8
97.2
SAMPLE E79
PERCENT

ANALYSIS T65-2 TABLE 1

DIFFUSE BLUE REFLECTANCE IN PERCENT (GLOSS TRAP)

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

LAB CODE	SAMPLE E79 MEAN	PRINTING 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE J98 MEAN	PRINTING 89 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D.F. = 8 VAR	F	LAB
L100	97.99	1.56	2.05	.12	1.73	75.86	.03	.06	.09	.73	65F	O	L100
L121	97.27	.84	1.10	.10	1.52	76.76	.93	1.75	.18	1.42	65K	O	L121
L136	96.73	.29	.39	.05	.69	76.41	.57	1.08	.14	1.10	65F	O	L136
L150	97.00	.57	.75	.08	1.11	75.21	-.63	-1.18	.18	1.43	65Q	O	L150
L170	95.31	-1.12	-1.47	.04	.52	75.41	-.42	-.79	.10	.78	65B	O	L170
L182	96.12	-.31	-.41	.07	1.05	75.64	-.20	-.37	.16	1.23	65F	O	L182
L210K	95.77	-.66	-.87	.11	1.57	77.13	1.30	2.45	.14	1.10	65K	O	L210K
L236	96.74	.30	.40	.06	.86	75.51	-.32	-.61	.12	.98	65F	O	L236
L242	96.68	.24	.32	.05	.69	75.61	-.22	-.42	.11	.89	65F	O	L242
L250T	96.83	.40	.52	.09	1.32	76.10	.27	.51	.10	.82	65P	O	L250T
L280	96.29	-.14	-.18	.08	1.11	75.78	-.05	-.09	.21	1.64	65Q	O	L280
L313	96.62	.19	.25	.05	.68	76.33	.49	.93	.12	.94	65K	O	L313
L325	95.35	-1.08	-1.42	.10	1.47	75.77	-.06	-.11	.13	1.04	65F	O	L325
L446	96.10	-.34	-.44	.05	.70	75.24	-.60	-1.12	.05	.40	65F	O	L446
L573	97.56	1.13	1.48	.00	.00	75.70	-.13	-.25	.07	.56	65F	O	L573
L575	95.38	-1.06	-1.39	.05	.77	75.81	-.02	-.04	.13	.99	65F	O	L575
L598	96.30	-.14	-.18	.08	1.11	75.33	-.51	-.96	.13	1.03	65K	O	L598
L680	95.76	-.67	-.89	.07	1.09	75.40	-.43	-.82	.12	.92	65K	O	L680
GR. MEAN =	96.43 PERCENT					GRAND MEAN =	75.83 PERCENT				TEST DETERMINATIONS =		8
SD MEANS =	.76 PERCENT					SD OF MEANS =	.53 PERCENT				18 LABS IN GRAND MEANS		
	AVERAGE SDR =			.07 PERCENT			AVERAGE SDR =			.13 PERCENT			
L289	95.62	-.81	-1.06	.07	1.04	76.07	.24	.45	.13	1.01	65O	*	L289

TOTAL NUMBER OF LABORATORIES REPORTING = 19

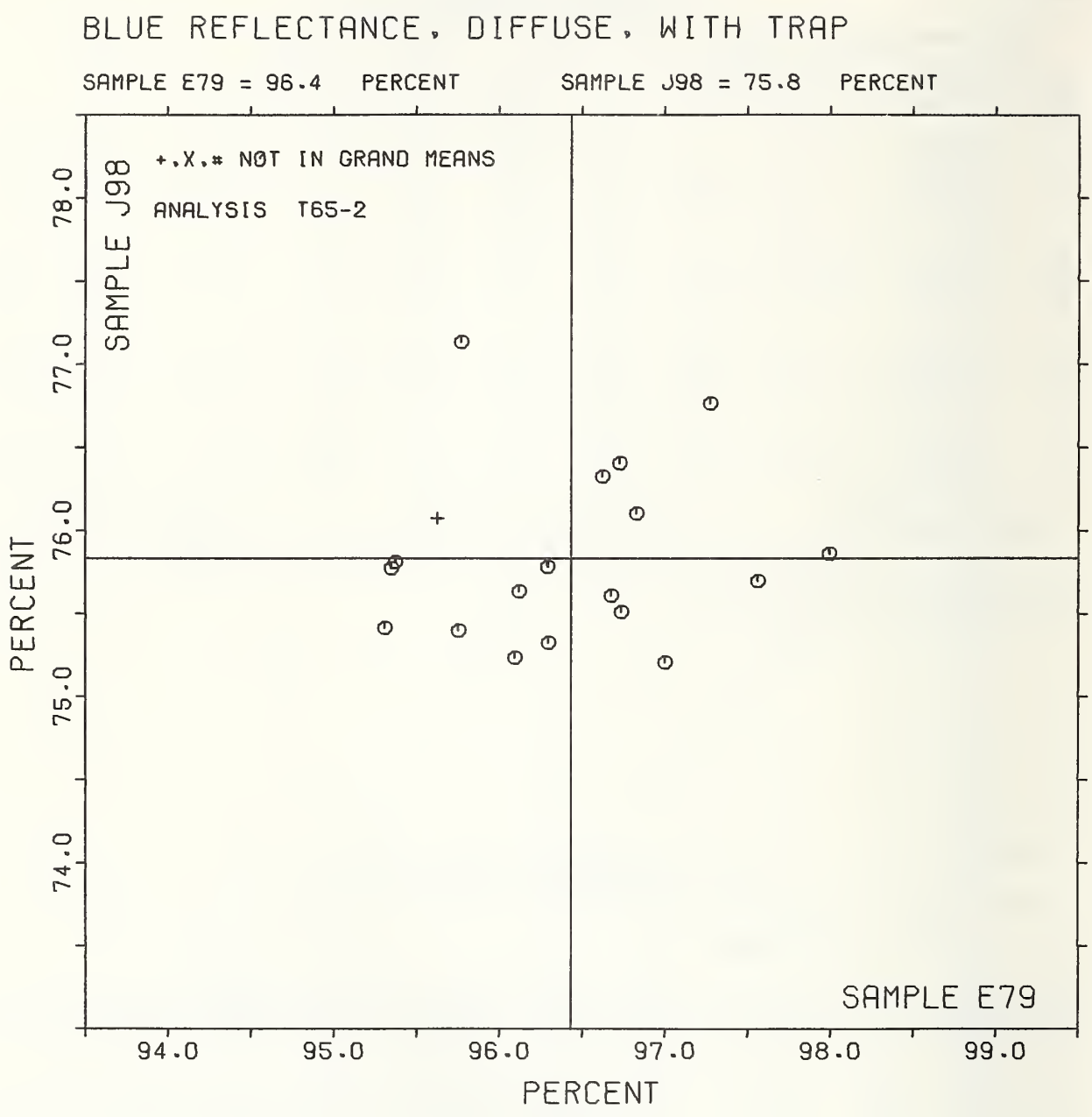
Best values: E79 96.5 ± 1.2 percent
J98 75.7 ± 0.9 percent

ANALYSIS T65-2 TABLE 2

DIFFUSE BLUE REFLECTANCE IN PERCENT (GLOSS TRAP)

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

LAB CODE	F	MEANS E79	J98	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L170	O	95.31	75.41	-1.17	-.23	.65	65B	DIFFUSE REFLECTANCE, BLREPEO, GL.TRAP, NBS ABSOLUTE BASE
L325	O	95.35	75.77	-1.08	.12	1.26	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L575	O	95.38	75.81	-1.05	.15	.88	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L289	*	95.62	76.07	-.76	.37	1.02	65O	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, SPECIFIC CALIBRATION
L680	O	95.76	75.40	-.74	-.32	1.01	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L210K	O	95.77	77.13	-.44	1.39	1.34	65K	DIFFUSE REFLECTANCE, BLREPEO, GL.TRAP, MGO (ZEISS) BASE
L446	O	96.10	75.24	-.43	-.53	.55	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L182	O	96.12	75.64	-.34	-.14	1.14	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L280	O	96.29	75.78	-.15	-.03	1.38	65Q	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, ZEISS ABSOLUTE BASE
L598	O	96.30	75.33	-.22	-.48	1.07	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L313	O	96.62	76.33	.27	.46	.81	65K	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, MGO (ZEISS) BASE
L242	O	96.68	75.61	.20	-.26	.79	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L136	O	96.73	76.41	.38	.52	.90	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L236	O	96.74	75.51	.25	-.37	.92	65F	DIFFUSE REFLECTANCE, ELREPHO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L250T	O	96.83	76.10	.43	.20	1.07	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L150	O	97.00	75.21	.46	-.71	1.27	65Q	DIFFUSE REFLECTANCE, BLREPHO, GL.TRAP, ZEISS ABSOLUTE BASE
L121	O	97.27	76.76	.98	.78	1.47	65K	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, MGO (ZEISS) BASE
L573	O	97.56	75.70	1.09	-.32	.28	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
L100	O	97.99	75.86	1.54	-.23	1.23	65F	DIFFUSE REFLECTANCE, ELREPEO, GL.TRAP, NRC-PTB ABSOLUTE BASE
GMEANS:		96.43	75.83			1.00		
95% ELLIPSE:				2.13	1.45	WITE GAMMA = 9 DEGREES		


BLUE REFLECTANCE, DIFFUSE, WITH TRAP
SAMPLE E79 = 96.4 PERCENT
SAMPLE J98 = 75.8 PERCENT
+,X,* NOT IN GRAND MEANS
ANALYSIS T65-2
SAMPLE J98
SAMPLE E79
PERCENT
PERCENT
78.0
77.0
76.0
75.0
74.0
94.0
95.0
96.0
97.0
98.0
99.0

REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

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 E79	PRINTING 116 GRAMS PER SQUARE METER				SAMPLE J98	PRINTING 89 GRAMS PER SQUARE METER				TEST D.F = 8		
CODE	MEAN	DEV	N.DEV	SDR	R.SDR	MEAN	DEV	N.DEV	SDR	R.SDR	VAR	F	LAB
L115	94.98	-.06	-.05	.21	1.93	76.37	-.25	-.28	.18	1.66	65E	O	L115
L152	94.19	-.85	-.75	.09	.83	76.48	-.13	-.15	.08	.78	65E	O	L152
L157	97.49	2.46	2.18	.08	.78	77.28	.66	.76	.06	.60	65E	O	L157
L161	94.69	-.35	-.31	.04	.35	77.07	.46	.52	.08	.73	65E	O	L161
L173A	93.99	-1.04	-.93	.07	.66	76.17	-.44	-.51	.08	.71	65E	O	L173A
L194	93.81	-1.23	-1.09	.07	.65	77.68	1.07	1.22	.07	.66	65E	O	L194
L219	96.41	1.37	1.22	.13	1.23	77.14	.53	.60	.12	1.09	65E	O	L219
L238A	94.42	-.62	-.55	.00	.00	77.02	.40	.46	.08	.71	65E	O	L238A
L241	95.23	.19	.17	.15	1.36	75.47	-1.14	-1.30	.20	1.87	65E	O	L241
L244	95.33	.29	.26	.13	1.25	77.11	.50	.57	.05	.44	65D	O	L244
L251	94.69	-.35	-.31	.07	.66	76.43	-.18	-.21	.05	.49	65E	O	L251
L255	96.32	1.28	1.14	.09	.85	77.97	1.35	1.54	.11	1.08	65D	O	L255
L305	92.72	-2.32	-2.06	.18	1.73	74.21	-2.41	-2.74	.22	2.03	65D	*	L305
L309	95.71	.68	.60	.03	.31	77.24	.63	.71	.15	1.39	65J	O	L309
L360	94.98	-.06	-.05	.09	.86	76.76	.14	.16	.15	1.46	65E	O	L360
L384	96.21	1.18	1.04	.16	1.54	76.67	.06	.07	.09	.83	65S	O	L384
L484	95.30	.26	.23	.34	3.22	75.65	-.97	-1.10	.17	1.64	65E	O	L484
L565	94.20	-.84	-.74	.05	.50	76.34	-.28	-.32	.09	.86	65W	O	L565

GR. MEAN = 95.04 PERCENT — GRAND MEAN = 76.62 PERCENT — TEST DETERMINATIONS = 8

SD MEANS = 1.13 PERCENT — SD OF MEANS = .88 PERCENT — 18 LABS IN GRAND MEANS

AVERAGE SDR = .11 PERCENT — AVERAGE SDR = .11 PERCENT

TOTAL NUMBER OF LABORATORIES REPORTING = 18

Best values: E79 95.0 ± 1.8 percent
J98 76.7 ± 1.3 percent

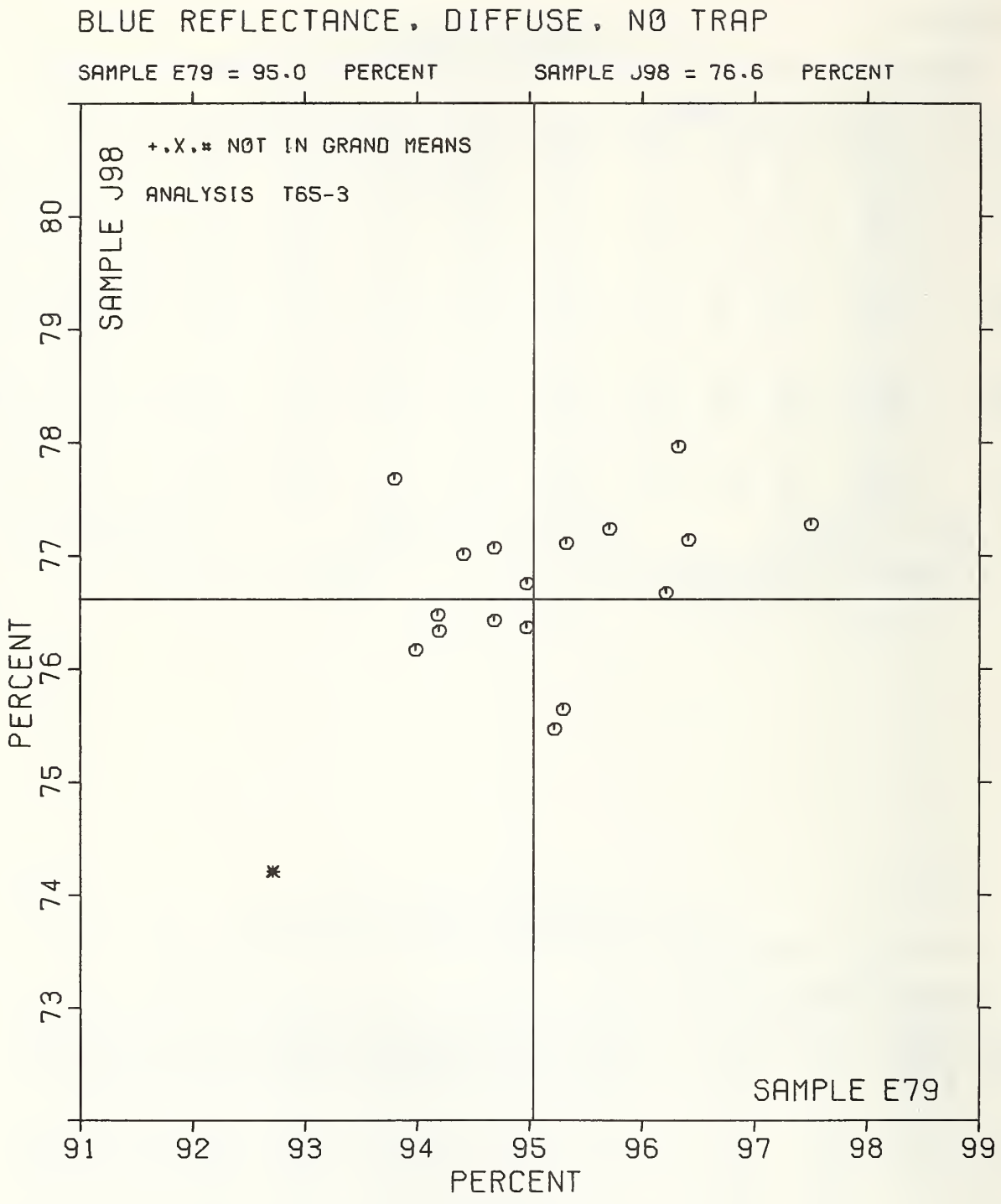
REPORT NO. 60G — TAPPI COLLABORATIVE REFERENCE PROGRAM — JUNE 1979

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		MEANS		COORDINATES		AVG		
CODE	F	E79	J98	MAJOR	MINOR	R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L305	*	92.72	74.21	-3.25	-.79	1.88	65D	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBC-PTE ABSOLUTE
L194	O	93.81	77.68	-.47	1.56	.65	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L173A	O	93.99	76.17	-1.12	.18	.69	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L152	O	94.19	76.48	-.78	.34	.81	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L565	O	94.20	76.34	-.86	.21	.68	65W	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NES MGO BASE
L238A	O	94.42	77.02	-.31	.67	.35	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L251	O	94.69	76.43	-.39	.03	.57	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L161	O	94.69	77.07	-.05	.57	.54	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L360	O	94.98	76.76	.02	.15	1.16	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L115	O	94.98	76.37	-.18	-.17	1.80	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L241	O	95.23	75.47	-.45	-1.07	1.62	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L484	O	95.30	75.65	-.29	-.96	2.43	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L244	O	95.33	77.11	.51	.26	.85	65D	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBC-PTE ABSOLUTE
L309	O	95.71	77.24	.91	.17	.85	65J	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NES ABSOLUTE
L384	O	96.21	76.67	1.03	-.58	1.19	65S	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, ABSOLUTE-UNKNOWN BASE
L255	O	96.32	77.97	1.81	.45	.96	65D	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, NBC-PTE ABSOLUTE
L219	O	96.41	77.14	1.44	-.29	1.16	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
L157	O	97.49	77.28	2.43	-.75	.69	65E	DIFFUSE REFLECTANCE, ELREPHO, NO TRAP, MGO (ZEISS) BASE
GMEANS:		95.04	76.62			1.00		
		95% ELLIPSE:		3.52	1.84	WITH GAMMA = 32 DEGREES		


BLUE REFLECTANCE, DIFFUSE, NØ TRAP
SAMPLE E79 = 95.0 PERCENT
SAMPLE J98 = 76.6 PERCENT
+,X,* NØT IN GRAND MEANS
ANALYSIS T65-3
SAMPLE J98
SAMPLE E79
PERCENT
PERCENT
73
74
75
76
77
78
79
80
91
92
93
94
95
96
97
98
99

ANALYSIS T75-1 TABLE 1

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS

TAPPI STANDARD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB CODE	SAMPLE E92 MEAN	COATED PRINTING 167 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE G05 MEAN	COATED DULL 116 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D. = 10 VAR	F	LAB
L108	49.58	.35	.22	.67	.73	37.18	-.64	-.38	.98	.85	75H	G	L108
L121	50.62	1.39	.86	1.31	1.42	37.93	.11	.07	1.48	1.29	75H	G	L121
L122	48.83	-.40	-.24	.92	1.00	37.32	-.50	-.29	1.49	1.30	75H	G	L122
L128	50.10	.87	.54	.57	.62	36.50	-1.32	-.78	1.84	1.61	75G	G	L128
L134	48.30	-.93	-.57	1.34	1.45	37.50	-.32	-.19	.85	.74	75H	G	L134
L136	53.48	4.25	2.62	.80	.87	41.41	3.59	2.11	1.52	1.33	75G	*	L136
L149	48.30	-.93	-.57	1.16	1.26	35.10	-2.72	-1.60	1.45	1.26	75G	G	L149
L153	51.20	1.97	1.22	1.01	1.09	40.50	2.68	1.58	1.33	1.16	75G	G	L153
L162	53.71	4.48	2.77	.71	.77	42.80	4.98	2.93	1.26	1.10	75G	*	L162
L173A	47.80	-1.43	-.88	.79	.86	35.50	-2.32	-1.36	.85	.74	75G	G	L173A
L182	47.44	-1.79	-1.10	.86	.93	36.72	-1.10	-.65	.91	.80	75H	G	L182
L189	50.25	1.02	.63	.98	1.06	40.20	2.38	1.40	.92	.80	75P	G	L189
L190C	47.23	-2.00	-1.23	.85	.92	36.38	-1.44	-.85	1.28	1.12	75G	G	L190C
L190R	49.72	.49	.30	.75	.81	38.21	.39	.23	1.00	.87	75G	G	L190R
L206	48.33	-.90	-.55	.86	.93	37.58	-.24	-.14	1.03	.90	75H	G	L206
L210	50.19	.96	.59	1.23	1.34	37.44	-.38	-.22	1.05	.91	75H	G	L210
L211	49.48	.25	.16	.98	1.06	37.45	-.37	-.22	1.79	1.57	75H	G	L211
L212	51.40	2.17	1.34	.52	.56	42.90	5.08	2.99	.99	.87	75P	X	L212
L213	49.40	.17	.11	1.07	1.17	37.30	-.52	-.30	.95	.83	75H	G	L213
L223	48.72	-.51	-.31	.69	.75	38.88	1.06	.62	1.57	1.37	75H	G	L223
L224	48.20	-1.03	-.63	.63	.69	35.90	-1.92	-1.13	1.10	.96	75H	G	L224
L230	49.20	-.03	-.02	1.23	1.33	36.60	-1.22	-.72	1.51	1.31	75H	G	L230
L251	47.90	-1.33	-.82	.46	.50	36.75	-1.07	-.63	.92	.80	75G	G	L251
L255	49.80	.57	.35	.63	.69	38.50	.68	.40	1.08	.94	75G	G	L255
L256	53.37	4.14	2.56	.69	.75	42.00	4.18	2.46	.46	.40	75H	*	L256
L259	51.15	1.92	1.19	.97	1.06	39.18	1.36	.80	1.62	1.41	75H	G	L259
L262	49.95	.72	.45	.80	.87	38.60	.78	.46	.97	.84	75K	G	L262
L274	53.80	4.57	2.82	.42	.46	47.00	9.18	5.40	.82	.71	75P	#	L274
L277A	49.14	-.09	-.05	1.16	1.26	38.07	.25	.15	1.05	.92	75H	G	L277A
L277B	48.95	-.28	-.17	1.23	1.34	37.96	.14	.08	1.26	1.10	75H	G	L277B
L278	48.60	-.63	-.39	.39	.43	36.98	-.84	-.49	.50	.44	75G	G	L278
L279	49.50	.27	.17	.85	.92	35.80	-2.02	-1.19	1.48	1.29	75G	G	L279
L288	49.33	.10	.06	.91	.98	38.68	.86	.51	1.05	.92	75H	G	L288
L291	48.99	-.24	-.15	.85	.92	37.11	-.71	-.42	1.07	.94	75H	G	L291
L315	48.70	-.53	-.32	1.70	1.85	38.70	.88	.52	1.34	1.17	75G	G	L315
L317	49.20	-.03	-.02	1.23	1.33	37.90	.08	.05	1.20	1.04	75H	G	L317
L321	51.20	1.97	1.22	.92	1.00	39.20	1.38	.81	1.14	.99	75G	G	L321
L323	47.69	-1.54	-.95	1.34	1.45	36.14	-1.68	-.99	1.37	1.19	75H	G	L323
L328	48.55	-.68	-.42	.60	.65	37.06	-.76	-.45	.95	.82	75H	G	L328
L339	53.80	4.57	2.82	1.18	1.28	44.90	7.08	4.16	1.71	1.49	75P	#	L339
L372	50.00	.77	.48	.00	.00	39.00	1.18	.69	1.05	.92	75B	G	L372
L388	50.15	.92	.57	1.40	1.52	40.20	2.38	1.40	1.01	.88	75P	G	L388
L396	49.60	.37	.23	1.17	1.27	38.30	.48	.28	1.16	1.01	75G	G	L396
L456	48.33	-.90	-.55	.90	.98	37.71	-.11	-.06	1.10	.96	75H	G	L456
L483	49.40	.17	.11	.99	1.07	37.26	-.56	-.33	.98	.86	75H	G	L483
L564	48.60	-.63	-.39	1.17	1.27	41.50	3.68	2.16	1.08	.94	75P	X	L564
L573	49.10	-.13	-.08	1.29	1.40	36.90	-.92	-.54	.99	.87	75G	G	L573
L583	49.83	.60	.37	.94	1.02	39.24	1.42	.84	1.27	1.11	75H	G	L583
L592	46.05	-3.18	-1.96	.97	1.05	34.39	-3.43	-2.02	.53	.46	75H	G	L592
L598	48.02	-1.21	-.74	.74	.80	36.79	-1.03	-.60	.98	.86	75H	G	L598
L643	48.34	-.89	-.55	.63	.69	38.73	.91	.54	1.34	1.17	75H	G	L643
L668	45.42	-3.81	-2.35	1.02	1.11	36.42	-1.40	-.82	1.33	1.16	75G	*	L668
L670	49.98	.75	.46	1.13	1.23	38.75	.93	.55	1.18	1.03	75H	G	L670
L688	46.50	-2.73	-1.68	.80	.87	35.19	-2.63	-1.55	.80	.70	75G	G	L688
L697	47.73	-1.50	-.92	.40	.43	36.85	-.97	-.57	1.10	.96	75H	G	L697
GR. MEAN =	49.23 GLOSS UNITS					GRAND MEAN =	37.82 GLOSS UNITS				TEST DETERMINATIONS =		10
SD MEANS =	1.62 GLOSS UNITS					SD OF MEANS =	1.70 GLOSS UNITS				51 LABS IN GRAND MEANS		
		AVERAGE SDR =		.92 GLOSS UNITS				AVERAGE SDR =		1.15 GLOSS UNITS			
L250	47.70	-1.53	-.94	.48	.52	37.60	-.22	-.13	.84	.74	75Q	+	L250

TOTAL NUMBER OF LABORATORIES REPORTING = 56

Best values: E92 49 ± 3 gloss units
G05 37 ± 3 gloss units

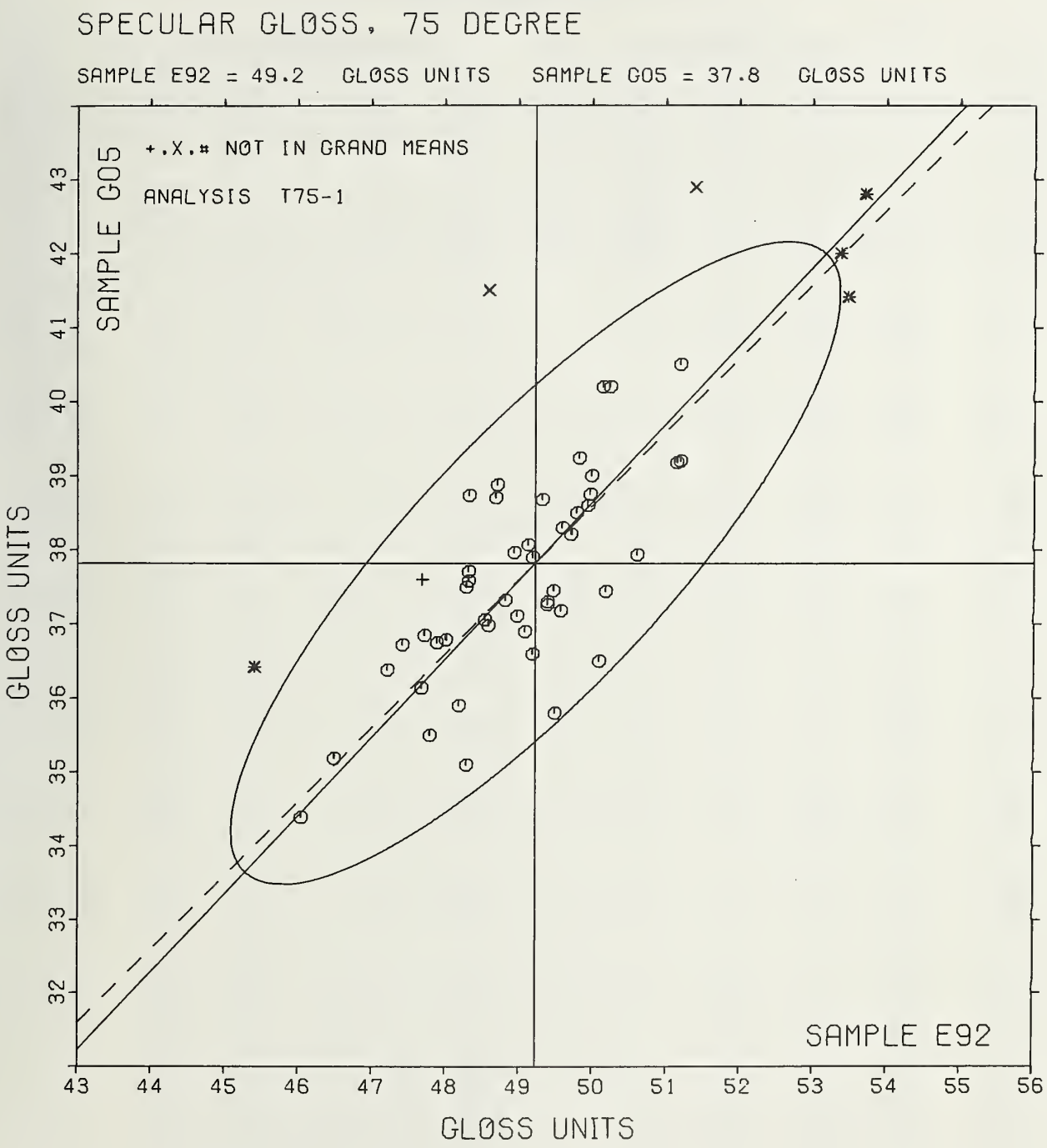
The following laboratories were omitted from the grand means because of extreme test results: 274, 339.

ANALYSIS T75-1 TABLE 2

SPECULAR GLOSS AT 75 DEGREES, IN GLOSS UNITS

TAPPI STANDARD T480 OS-78, SPECULAR GLOSS OF PAPER AND PAPERBOARD AT 75 DEGREES

LAB CODE	F	MEANS E92	G05	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L668	*	45.42	36.42	-3.63	1.81	1.13	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L592	O	46.05	34.39	-4.67	-.04	.76	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L688	O	46.50	35.19	-3.78	.18	.79	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L190C	O	47.23	36.38	-2.42	.46	1.02	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L182	O	47.44	36.72	-2.03	.55	.86	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L323	O	47.69	36.14	-2.28	-.03	1.32	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L250	*	47.70	37.60	-1.21	.96	.63	75Q	SPECULAR GLOSS (75 DEGREE), PHOTOVOLT, 20 C, 65% RH
L697	O	47.73	36.85	-1.73	.42	.70	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L173A	O	47.80	35.50	-2.67	-.55	.80	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L251	O	47.90	36.75	-1.69	.23	.65	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L598	O	48.02	36.79	-1.58	.17	.83	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L224	O	48.20	35.90	-2.10	-.57	.82	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L149	O	48.30	35.10	-2.61	-1.19	1.26	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L134	O	48.30	37.50	-.87	.46	1.10	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L456	O	48.33	37.71	-.69	.58	.97	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L206	O	48.33	37.58	-.79	.49	.92	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L643	O	48.34	38.73	.05	1.27	.93	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L328	O	48.55	37.06	-1.02	-.03	.74	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L278	O	48.60	36.98	-1.04	-.12	.43	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L564	X	48.60	41.50	2.25	2.98	1.11	75P	SPECULAR GLOSS (75 DEGREE), PECTOVOLT
L315	O	48.70	38.70	.28	.99	1.51	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L223	O	48.72	38.88	.42	1.10	1.06	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L122	O	48.83	37.32	-.63	-.05	1.15	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L277E	O	48.95	37.96	-.09	.30	1.22	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L291	O	48.99	37.11	-.68	-.31	.93	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L573	O	49.10	36.90	-.76	-.54	1.13	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L277A	O	49.14	38.07	.12	.24	1.09	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L230	O	49.20	36.60	-.90	-.82	1.32	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L317	O	49.20	37.90	.04	.07	1.19	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L288	O	49.33	38.68	.70	.52	.95	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L483	O	49.40	37.26	-.29	-.51	.96	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L213	O	49.40	37.30	-.26	-.48	1.00	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L211	O	49.48	37.45	-.09	-.44	1.31	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L279	O	49.50	35.80	-1.28	-1.58	1.11	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L108	O	49.58	37.18	-.22	-.70	.79	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L396	O	49.60	38.30	.61	.06	1.14	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L190R	O	49.72	38.21	.62	-.09	.84	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L255	O	49.80	38.50	.89	.05	.81	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L583	O	49.83	39.24	1.45	.54	1.06	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L262	O	49.95	38.60	1.06	.01	.85	75K	SPECULAR GLOSS (75 DEGREE), GAERTNER (K-C TYPE)
L670	O	49.98	38.75	1.19	.09	1.13	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L372	O	50.00	39.00	1.39	.25	.46	75E	SPECULAR GLOSS (75 DEGREE), BAUSCH + LOMB
L128	O	50.10	36.50	-.36	-1.54	1.11	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L388	O	50.15	40.20	2.37	.96	1.20	75P	SPECULAR GLOSS (75 DEGREE), PECTOVOLT
L210	O	50.19	37.44	.39	-.96	1.13	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L189	O	50.25	40.20	2.43	.89	.93	75P	SPECULAR GLOSS (75 DEGREE), PECTOVOLT
L121	O	50.62	37.93	1.04	-.94	1.36	75E	SPECULAR GLOSS (75 DEGREE), HUNTER
L259	O	51.15	39.18	2.31	-.46	1.23	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L153	O	51.20	40.50	3.30	.40	1.13	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L321	O	51.20	39.20	2.36	-.49	.99	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L212	X	51.40	42.90	5.19	1.91	.71	75P	SPECULAR GLOSS (75 DEGREE), PECTOVOLT
L256	*	53.37	42.00	5.88	-.14	.58	75H	SPECULAR GLOSS (75 DEGREE), HUNTER
L136	*	53.48	41.41	5.53	-.63	1.10	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L162	*	53.71	42.60	6.70	.16	.93	75G	SPECULAR GLOSS (75 DEGREE), GARDNER
L339	#	53.80	44.90	8.29	1.53	1.39	75P	SPECULAR GLOSS (75 DEGREE), PHOTOVOLT
L274	#	53.80	47.00	9.82	2.97	.59	75P	SPECULAR GLOSS (75 DEGREE), PHOTOVOLT
GMEANS:		49.23	37.82			1.00		
		95% ELLIPSE:		5.74	1.74	WITE GAMMA = 46 DEGREES		


SPECULAR GLOSS, 75 DEGREE
SAMPLE E92 = 49.2 GLOSS UNITS
SAMPLE G05 = 37.8 GLOSS UNITS
+.X.* NOT IN GRAND MEANS
ANALYSIS T75-1
SAMPLE G05
GLOSS UNITS
SAMPLE E92
GLOSS UNITS
32
33
34
35
36
37
38
39
40
41
42
43
43
44
45
46
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ANALYSIS T90-1 TABLE 1
THICKNESS (CALIPER), THOUSANDTHS OF AN INCH
TAPPI STANDARD T411 OS-76

LAB CODE	SAMPLE J66 MEAN	PRINTING 93 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	SAMPLE J82 MEAN	PRINTING 73 GRAMS PER SQUARE METER DEV	N. DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L100	6.476	.139	1.29	.063	.67	2.762	.077	1.10	.030	.76	90V	6	L100
L105	6.446	.109	1.01	.125	1.35	2.762	.077	1.10	.039	.98	90Q	6	L105
L118	6.433	.096	.89	.075	.81	2.713	.028	.40	.013	.33	90Q	6	L118
L122	6.220	+.117	-1.09	.094	1.02	2.727	.042	.60	.031	.77	90V	6	L122
L123F	6.535	.198	1.84	.075	.80	2.835	.150	2.14	.034	.84	90F	6	L123F
L125	6.435	.098	.91	.077	.83	2.730	.045	.64	.047	1.16	90T	6	L125
L128	6.292	-.045	-.42	.076	.81	2.678	-.007	-.10	.046	1.14	90T	6	L128
L153	6.192	-.145	-1.35	.053	.57	2.873	.188	2.68	.044	1.09	90T	X	L153
L158	6.360	.023	.21	.052	.56	2.670	-.015	-.21	.048	1.20	90T	6	L158
L159	6.342	.005	.05	.096	1.03	2.743	.058	.83	.046	1.15	90T	6	L159
L162	6.310	-.027	-.25	.110	1.19	2.720	.035	.50	.063	1.57	90D	6	L162
L166	6.210	-.127	-1.18	.063	.68	2.598	-.087	-1.23	.049	1.21	90T	6	L166
L173B	6.395	.058	.54	.076	.82	2.718	.033	.47	.037	.91	90F	6	L173B
L174	.006	-6.331	-58.81	.000	.00	.003	-2.682	-38.14	.000	.00	90T	#	L174
L182	6.336	-.001	-.01	.055	.59	2.746	.061	.87	.046	1.14	90L	6	L182
L183	6.507	.170	1.58	.102	1.10	2.721	.036	.51	.036	.90	90T	6	L183
L185	6.430	.093	.86	.125	1.35	2.690	.005	.07	.032	.79	90A	6	L185
L190C	6.200	-.137	-1.27	.094	1.02	2.660	-.025	-.35	.052	1.28	90T	6	L190C
L203A	6.065	-.272	-2.53	.151	1.63	2.610	-.075	-1.06	.070	1.74	90T	*	L203A
L203C	6.410	.073	.68	.152	1.64	2.770	.085	1.21	.098	2.43	90T	6	L203C
L212	6.436	.099	.92	.074	.80	2.695	.010	.14	.050	1.25	90T	6	L212
L213	6.370	.033	.31	.157	1.69	2.700	.015	.22	.000	.00	90T	6	L213
L223	6.372	.035	.33	.090	.96	2.740	.055	.78	.027	.66	90V	6	L223
L228	6.390	.053	.49	.074	.79	2.770	.085	1.21	.048	1.20	90T	6	L228
L233	6.347	.010	.09	.075	.80	2.571	-.114	-1.62	.050	1.24	90Q	6	L233
L238A	6.250	-.087	-.81	.080	.86	2.584	-.101	-1.43	.030	.73	90T	6	L238A
L241	6.430	.093	.86	.125	1.35	2.780	.095	1.35	.042	1.05	90T	6	L241
L242B	6.300	-.037	-.34	.088	.95	2.640	-.045	-.64	.032	.80	90B	6	L242B
L242P	6.324	-.013	-.12	.138	1.49	2.596	-.088	-1.26	.047	1.17	90P	6	L242P
L249	6.326	-.011	-.10	.079	.85	2.671	-.014	-.20	.015	.38	90T	6	L249
L259	6.305	-.032	-.30	.051	.55	2.565	-.120	-1.70	.020	.50	90T	6	L259
L260	6.303	-.034	-.31	.045	.49	2.704	.019	.27	.039	.98	90T	6	L260
L261	6.484	.147	1.37	.080	.87	2.753	.068	.97	.021	.53	90T	6	L261
L262	6.300	-.037	-.34	.053	.57	2.630	-.055	-.78	.042	1.05	90T	6	L262
L274D	6.300	-.037	-.34	.094	1.02	2.760	.075	1.07	.084	2.10	90D	6	L274D
L285	6.431	.094	.87	.129	1.39	2.720	.035	.50	.041	1.02	90T	6	L285
L291	6.230	-.107	-.99	.082	.89	2.640	-.045	-.64	.052	1.28	90T	6	L291
L305	6.330	-.007	-.06	.116	1.25	2.650	-.035	-.50	.082	2.03	90T	6	L305
L309	6.279	-.058	-.54	.160	1.72	2.670	-.015	-.21	.042	1.04	90T	6	L309
L318	6.265	-.072	-.67	.082	.88	2.590	-.095	-1.35	.039	.98	90T	6	L318
L320	.006	-6.331	-58.81	.000	.00	.003	-2.682	-38.14	.000	.00	90T	#	L320
L323	6.195	-.142	-1.32	.055	.59	2.628	-.057	-.81	.018	.45	90T	6	L323
L324	6.270	-.067	-.62	.123	1.32	2.685	.000	.00	.024	.60	90T	6	L324
L326	6.420	.083	.77	.079	.85	2.715	.030	.43	.024	.60	90T	6	L326
L328	6.235	-.102	-.95	.091	.99	2.665	-.020	-.28	.041	1.02	90T	6	L328
L331	6.310	-.027	-.25	.142	1.53	2.819	.134	1.91	.052	1.30	90T	*	L331
L339	6.200	-.137	-1.27	.133	1.44	2.540	-.145	-2.06	.052	1.28	90T	6	L339
L341	6.491	.154	1.43	.082	.88	2.743	.058	.83	.035	.87	90T	6	L341
L352	6.358	.021	.20	.058	.63	2.736	.051	.73	.066	1.64	90Q	6	L352
L356	6.222	-.115	-1.07	.136	1.47	2.558	-.127	-1.80	.042	1.03	90T	6	L356
L358	6.248	-.089	-.83	.094	1.02	2.646	-.039	-.55	.039	.96	90T	6	L358
L376	6.530	.193	1.79	.142	1.53	2.640	-.045	-.64	.070	1.74	90T	*	L376
L380	6.290	-.047	-.44	.074	.79	2.720	.035	.50	.042	1.05	90T	6	L380
L382	6.482	.145	1.35	.092	.99	2.770	.085	1.21	.025	.62	90T	6	L382
L390	6.296	-.041	-.38	.074	.80	2.608	-.077	-1.09	.030	.75	90T	6	L390
L442	6.571	.234	2.17	.074	.80	2.815	.130	1.85	.030	.74	90V	6	L442
L556	6.362	.025	.23	.093	1.00	2.748	.063	.90	.029	.73	90T	6	L556
L557	6.250	-.087	-.81	.158	1.70	2.640	-.045	-.64	.070	1.74	90T	6	L557
L571	6.280	-.057	-.53	.140	1.51	2.560	-.125	-1.77	.052	1.28	90V	6	L571
L575	6.183	-.154	-1.43	.074	.79	2.665	-.020	-.28	.027	.68	90T	6	L575
L581	6.435	.098	.91	.091	.99	2.700	.015	.22	.041	1.02	90T	6	L581
L585	6.440	.103	.96	.135	1.45	2.690	.005	.07	.032	.79	90T	6	L585
L626	6.100	-.237	-2.20	.077	.83	2.613	-.072	-1.02	.034	.84	90T	6	L626
L679	6.190	-.147	-1.36	.046	.49	2.595	-.090	-1.28	.044	1.09	90T	6	L679
L693	6.356	.019	.18	.115	1.24	2.677	-.008	-.11	.027	.66	90T	6	L693

GR. MEAN = 6.337 MILS — GRAND MEAN = 2.685 MILS — TEST DETERMINATIONS = 10
SD MEANS = .108 MILS — SD OF MEANS = .070 MILS — 62 LABS IN GRAND MEANS
AVERAGE SDR = .093 MILS — AVERAGE SDR = .040 MILS
GR. MEAN = 160.96 MICROMETER — GRAND MEAN = 68.19 MICROMETER

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

LAB CODE	SAMPLE J66 MEAN	PRINTING 93 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	SAMPLE J82 MEAN	PRINTING 73 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R. SDR	TEST D. = 10 VAR	F	LAB
L106	6.010	-.327	-3.04	.032	.34	8.000	5.315	75.58	.000	.00	90C	*	L106
L203B	6.310	-.027	-.25	.120	1.29	2.770	.085	1.21	.106	2.63	90C	*	L203B
L251	6.178	-.159	-1.48	.058	.63	2.644	-.041	-.58	.022	.56	90W	*	L251
L274C	6.310	-.027	-.25	.074	.79	2.750	.065	.93	.085	2.11	90C	*	L274C
L344	6.200	-.137	-1.27	.170	1.83	2.650	-.035	-.50	.053	1.31	90U	*	L344
L484	6.405	.069	.64	.081	.87	2.728	.044	.62	.019	.47	90E	*	L484
L563	6.550	.213	1.98	.097	1.05	2.780	.095	1.35	.063	1.57	90U	*	L563
L576	6.289	-.048	-.44	.126	1.36	2.881	.196	2.79	.047	1.16	90C	*	L576
L616	2.416	-3.921	-36.42	.034	.36	2.740	.055	.78	.097	2.40	90C	*	L616
L684	6.200	-.137	-1.27	.105	1.14	2.810	.125	1.78	.057	1.41	90U	*	L684

TOTAL NUMBER OF LABORATORIES REPORTING = 75

Best values: J66 6.33 ± 0.17 mils
J82 2.69 ± 0.11 mils

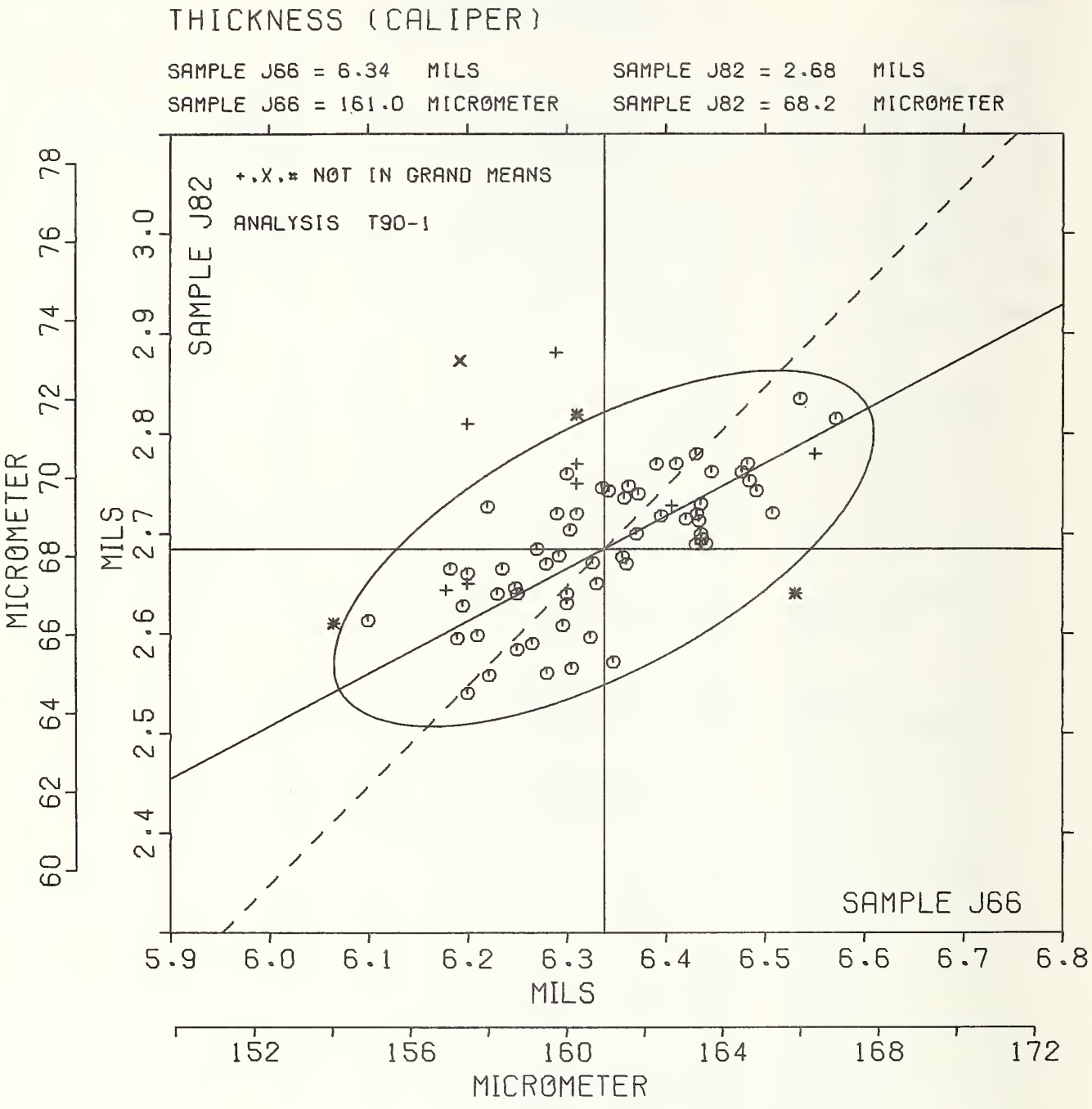
Data from the following laboratories appear to be off by a multiplicative factor: 174, 320.

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

LAB CODE	F	MEANS J66	MEANS J82	COORDINATES MAJOR	COORDINATES MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L320	#	.006	.003	-6.851	.581	.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L174	#	.006	.003	-6.851	.581	.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L616	*	2.416	2.740	-3.442	1.878	1.38	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L106	*	6.010	8.000	2.190	4.854	.17	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L203A	*	6.065	2.610	-.275	.061	1.68	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L626	O	6.100	2.613	-.243	.047	.83	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L251	*	6.178	2.644	-.160	.038	.59	90W	THICKNESS (CALIPER), L * W, MOTOR DRIVEN, 20 C, 65% RH
L575	O	6.183	2.665	-.145	.054	.73	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L679	O	6.190	2.595	-.172	-.011	.79	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L153	X	6.192	2.873	-.040	.234	.83	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L323	O	6.195	2.628	-.152	.016	.52	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L684	*	6.200	2.810	-.063	.175	1.27	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L344	*	6.200	2.650	-.137	.033	1.57	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L339	O	6.200	2.540	-.189	-.064	1.36	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L190C	O	6.200	2.660	-.133	.042	1.15	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L166	O	6.210	2.598	-.153	-.018	.95	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L122	O	6.220	2.727	-.084	.092	.89	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L356	O	6.222	2.558	-.161	-.059	1.25	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L291	O	6.230	2.640	-.115	.010	1.09	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L328	O	6.235	2.665	-.099	.030	1.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L358	O	6.248	2.646	-.097	.007	.99	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L557	O	6.250	2.640	-.098	.001	1.72	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L238A	O	6.250	2.584	-.124	-.049	.80	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L318	O	6.265	2.590	-.108	-.050	.93	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L324	O	6.270	2.685	-.059	.031	.96	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L309	O	6.279	2.670	-.058	.014	1.38	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L571	O	6.280	2.560	-.109	-.084	1.40	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L576	*	6.289	2.881	.049	.196	1.26	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L380	O	6.290	2.720	-.025	.053	.92	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L128	O	6.292	2.678	-.043	.015	.97	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L390	O	6.296	2.608	-.072	-.049	.77	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L262	O	6.300	2.630	-.058	-.031	.81	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L274D	O	6.300	2.760	.002	.084	1.56	90D	THICKNESS (CALIPER), CADY, MOTOR DRIVEN
L242O	O	6.300	2.640	-.054	-.023	.87	90O	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, BS3983
L260	O	6.303	2.704	-.021	.033	.73	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L259	O	6.305	2.565	-.084	-.091	.53	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L274C	*	6.310	2.750	.007	.070	1.45	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L203B	*	6.310	2.770	.016	.088	1.96	90C	THICKNESS (CALIPER), CADY, HAND DRIVEN
L331	*	6.310	2.819	.039	.131	1.42	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L162	O	6.310	2.720	-.007	.044	1.38	90D	THICKNESS (CALIPER), CADY, MOTOR DRIVEN
L242P	O	6.324	2.596	-.053	-.072	1.33	90P	THICKNESS (CALIPER), MESSMER, MOTOR DRIVEN, ISO R534
L249	O	6.326	2.671	-.016	-.007	.61	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L305	O	6.330	2.650	-.022	-.028	1.64	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L182	O	6.336	2.746	.027	.055	.86	90L	THICKNESS (CALIPER), L * W, MOTOR DRIVEN
L159	O	6.342	2.743	.032	.049	1.09	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L233	O	6.347	2.571	-.044	-.105	1.02	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L693	O	6.356	2.677	.013	-.016	.95	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L352	O	6.358	2.736	.043	.035	1.13	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L158	O	6.360	2.670	.014	-.024	.88	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L556	O	6.362	2.748	.052	.044	.87	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L213	O	6.370	2.700	.036	-.002	.84	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L223	O	6.372	2.740	.057	.032	.81	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L228	O	6.390	2.770	.087	.051	1.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L173B	O	6.395	2.718	.067	.002	.87	90F	THICKNESS (CALIPER), FEDERAL, MOTOR DRIVEN
L484	*	6.405	2.728	.081	.006	.67	90E	THICKNESS (CALIPER), SCHOPPER, HAND DRIVEN
L203C	O	6.410	2.770	.104	.041	2.04	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L326	O	6.420	2.715	.088	-.012	.73	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L185	O	6.430	2.690	.085	-.039	1.07	90A	THICKNESS (CALIPER), AMTHOR, MOTOR DRIVEN
L241	O	6.430	2.780	.127	.041	1.20	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L285	O	6.431	2.720	.100	-.013	1.20	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L118	O	6.433	2.713	.098	-.020	.57	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L581	O	6.435	2.700	.094	-.032	1.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L125	O	6.435	2.730	.108	-.006	1.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L212	O	6.436	2.695	.092	-.037	1.02	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L585	O	6.440	2.690	.094	-.044	1.12	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN

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

LAB CODE	F	MEANS J66	J82	COORDINATES MAJOR	MINOR	AVG R. SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L105	O	6.446	2.762	.133	.017	1.16	90Q	THICKNESS (CALIPER), EMVECO, MOTOR DRIVEN
L100	O	6.476	2.762	.159	.003	.72	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
L382	O	6.482	2.770	.168	.008	.81	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L261	O	6.484	2.753	.162	-.008	.70	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L341	O	6.491	2.743	.163	-.020	.88	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L183	O	6.507	2.721	.167	-.047	1.00	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L376	*	6.530	2.640	.150	-.130	1.63	90T	THICKNESS (CALIPER), TMI, MOTOR DRIVEN
L123F	O	6.535	2.835	.245	.040	.82	90F	THICKNESS (CALIPER), FEDERAL, MOTOR DRIVEN
L563	+	6.550	2.780	.233	-.015	1.31	90U	THICKNESS (CALIPER), TMI, HAND DRIVEN
L442	O	6.571	2.815	.268	.006	.77	90V	THICKNESS (CALIPER), TMI, MOTOR DRIVEN,DIGITIZED
GMEANS:		6.337	2.685			1.00		
		95% ELLIPSE:		.301	.124	WITH GAMMA = 27 DEGREES		


THICKNESS (CALIPER)
SAMPLE J66 = 6.34 MILS
SAMPLE J66 = 161.0 MICROMETER
SAMPLE J82 = 2.68 MILS
SAMPLE J82 = 68.2 MICROMETER
+,X,* NOT IN GRAND MEANS
ANALYSIS T90-1
SAMPLE J82
MILS
MICROMETER
SAMPLE J66
MILS
MICROMETER

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T95-1 TABLE 1
GRAMMAGE (MASS PER UNIT AREA)
TAPPI STANDARD T410 OS-68

LAB CODE	SAMPLE D34 MEAN	OFFSET ENAMEL COATED 117 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	SAMPLE D35 MEAN	NEWSPRINT 55 GRAMS PER SQUARE METER DEV	N.DEV	SDR	R.SDR	TEST D. = 10 VAR	F	LAB
L100	119.20	.26	.30	.92	1.33	55.50	.06	.07	.65	.81	95C	O	L100
L121	117.90	-1.04	-1.24	.75	1.09	54.83	-.61	-.75	.79	.98	95B	O	L121
L162	116.97	-1.97	-2.34	1.17	1.70	56.02	.58	.70	1.20	1.49	95K	O	L162
L213	118.08	-.87	-1.03	.66	.96	54.41	-1.03	-1.26	.69	.85	95F	O	L213
L233	118.68	-.27	-.32	.61	.89	55.22	-.23	-.27	.56	.69	95T	O	L233
L249	119.49	.55	.65	.56	.81	55.83	.39	.47	.47	.58	95I	O	L249
L274	119.00	.06	.07	.47	.68	57.00	1.56	1.89	.47	.58	95E	O	L274
L280	118.27	-.67	-.80	.69	1.00	55.13	-.31	-.38	1.00	1.24	95T	O	L280
L305	117.80	-1.14	-1.36	.79	1.14	240.00	184.56	224.68	1.05	1.31	95T	#	L305
L339	120.00	1.06	1.25	.00	.00	56.02	.58	.70	.13	.16	95T	O	L339
L342	119.26	.32	.37	.86	1.24	55.86	.42	.51	.51	.64	95C	O	L342
L344	120.09	1.14	1.35	.33	.48	53.35	-2.10	-2.55	3.80	4.71	95T	O	L344
L442	118.70	-.24	-.29	.35	.51	55.54	.10	.12	.20	.25	95K	O	L442
L484	119.20	.26	.30	.92	1.33	65.54	10.10	12.29	.58	.71	95H	#	L484
L557	118.73	-.21	-.25	1.55	2.24	56.10	.66	.80	.93	1.15	95C	O	L557
L559	119.29	.35	.41	.50	.73	55.46	.02	.02	.65	.80	95K	O	L559
L571	72.57	-46.37	-55.02	1.02	1.48	34.27	-21.18	-25.78	.43	.53	95P	#	L571
L597	122.80	3.86	4.57	1.69	2.45	58.00	2.56	3.11	.00	.00	95C	#	L597
L688	119.58	.64	.76	.84	1.22	55.79	.34	.42	.54	.67	95T	O	L688
L693	119.88	.94	1.11	.77	1.11	55.04	-.40	-.49	.31	.39	95G	O	L693

GR. MEAN = 118.94 G/SQ.METER GRAND MEAN = 55.44 G/SQ.METER TEST DETERMINATIONS = 10
SD MEANS = .84 G/SQ.METER SD OF MEANS = .82 G/SQ.METER 16 LABS IN GRAND MEANS
AVERAGE SDR = .69 G/SQ.METER AVERAGE SDR = .81 G/SQ.METER
TOTAL NUMBER OF LABORATORIES REPORTING = 20

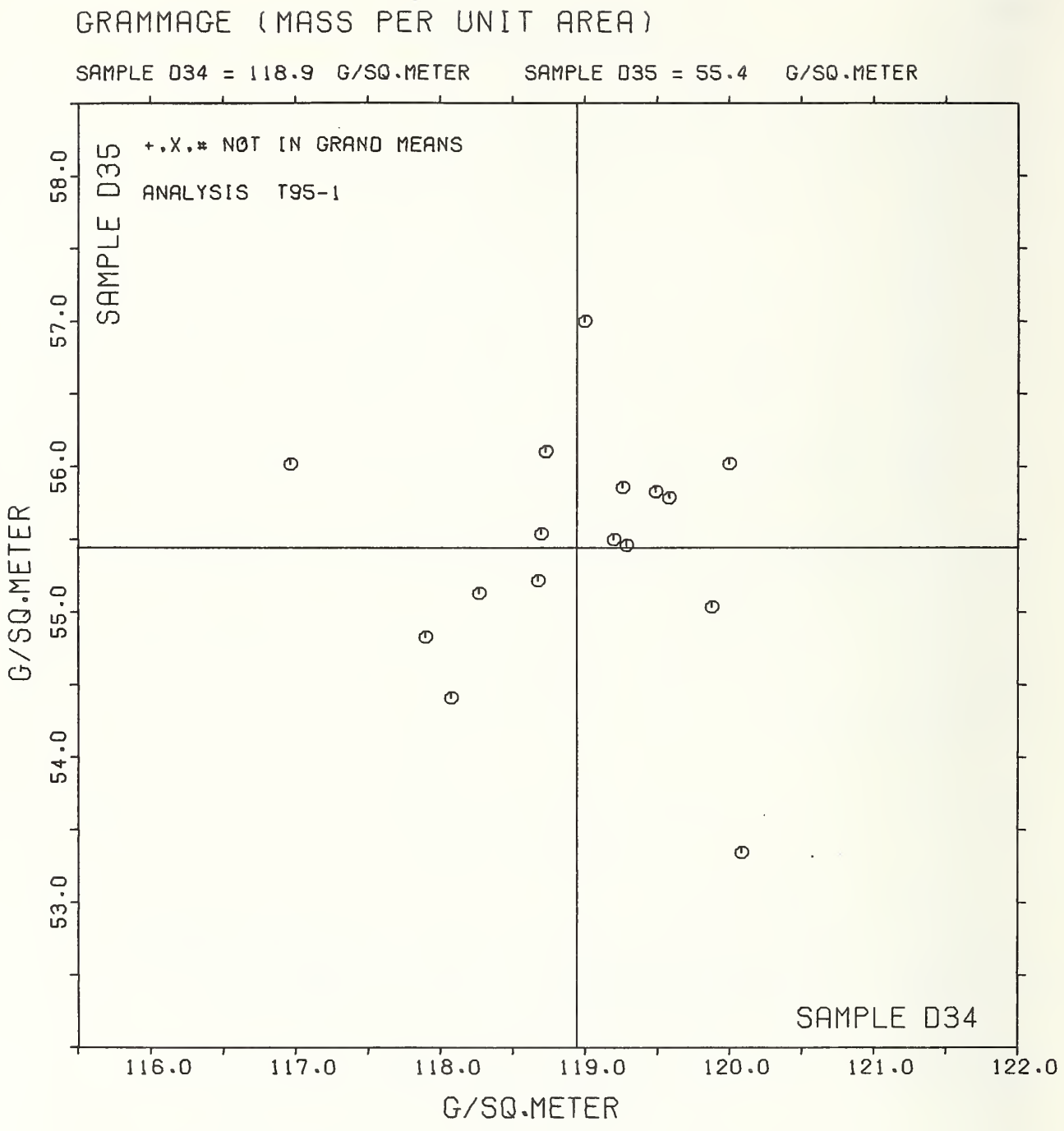
Best values: D34 119.0 ± 1.1 grams per square meter
D35 55.5 ± 1.4 grams per square meter

The following laboratories were omitted from the grand means because of extreme test results: 305, 484, 597.

Data from the following laboratories appear to be off by a multiplicative factor: 571.

TAPPI COLLABORATIVE REFERENCE PROGRAM
ANALYSIS T95-1 TABLE 2
GRAMMAGE (MASS PER UNIT AREA)
TAPPI STANDARD T410 OS-68

LAB CODE	F	MEANS D34	D35	COORDINATES MAJOR	MINOR	AVG R.SDR	VAR	PROPERTY---TEST INSTRUMENT---CONDITIONS
L571	#	72.57	34.27	-23.93	-45.01	1.01	95P	BASIS WEIGHT (GRAMMAGE), PRODUCTION REAM CUTTER
L162	O	116.97	56.02	-1.92	-.74	1.59	95K	BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L305	#	117.80	240.00	-113.17	145.79	1.23	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L121	O	117.90	54.83	-.46	-1.12	1.04	95B	BASIS WEIGHT (GRAMMAGE), CONCORA CUTTER
L213	O	118.08	54.41	-.06	-1.35	.90	95F	BASIS WEIGHT (GRAMMAGE), FOUR-SQUARE CUTTER
L280	O	118.27	55.13	-.35	-.66	1.12	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L233	O	118.68	55.22	-.07	-.34	.79	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L442	O	118.70	55.54	-.25	-.07	.38	95K	BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L557	O	118.73	56.10	-.57	.39	1.70	95C	BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
L274	O	119.00	57.00	-.90	1.27	.63	95B	BASIS WEIGHT (GRAMMAGE), CONCORA CUTTER
L100	O	119.20	55.50	.17	.20	1.07	95C	BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
L484	#	119.20	65.54	-5.94	8.17	1.02	95H	BASIS WEIGHT (GRAMMAGE), SQUARE AND BLADE
L342	O	119.26	55.86	-.00	.52	.94	95C	BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
L559	O	119.29	55.46	.26	.22	.77	95K	BASIS WEIGHT (GRAMMAGE), WEIGHED AS RECEIVED
L249	O	119.49	55.83	.20	.64	.69	95I	BASIS WEIGHT (GRAMMAGE), INGENTO PAPER CUTTER
L688	O	119.58	55.79	.30	.66	.94	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L693	O	119.88	55.04	.99	.25	.75	95G	BASIS WEIGHT (GRAMMAGE), PRECISION CUTTER
L339	O	120.00	56.02	.49	1.10	.08	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L344	O	120.09	53.35	2.18	-.97	2.59	95T	BASIS WEIGHT (GRAMMAGE), TEMPLATE CUT
L597	#	122.80	58.00	1.50	4.37	1.22	95C	BASIS WEIGHT (GRAMMAGE), CUTTING BOARD
GMEANS:		118.94	55.44			1.00		
95% ELLIPSE:				2.47	2.24	WITH GAMMA = -37 DEGREES		


GRAMMAGE (MASS PER UNIT AREA)
SAMPLE D34 = 118.9 G/SQ.METER
SAMPLE D35 = 55.4 G/SQ.METER
+,X,* NOT IN GRAND MEANS
ANALYSIS T95-1
SAMPLE D35
SAMPLE D34
G/SQ.METER
G/SQ.METER
58.0
57.0
56.0
55.0
54.0
53.0
116.0
117.0
118.0
119.0
120.0
121.0
122.0

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		B95	48.4	2.9	4.5	10	61	65	10	4.0	8.0
T40-1	GURLEY UNITS	A81	22.0	1.9	2.5					2.2	5.3
AIR RESISTANCE, SHEFFIELD		B95	72.4	3.5	6.2	10	38	44	10	5.4	9.6
T40-2	SHEFF. UNITS	A81	131.1	8.0	13.1					11.5	22.2
AIR RESISTANCE, GURLEY HG FLOTATION		B73	1219.	217.	485.	10	11	13	10	425.	600.
T41-1	SEC/10 CC	D06	164.	16.	21.					18.	44.
SMOOTHNESS, PARKER PRINTSURF		J50	6.08	.58	.11	10	8	9	10	.10	1.60
T44-1	MICRONS	J74	4.29	.38	.12					.11	1.06
SMOOTHNESS, SHEFFIELD		J50	273.5	11.3	7.1	15	88	92	10	6.2	31.4
T45-1	SHEFF. UNITS	J74	79.4	7.3	5.0					4.4	20.4
SMOOTHNESS, BEKK		J50	10.30	.68	.58	15	11	13	10	.51	1.91
T45-2	BEKK SECONDS	J74	79.96	10.39	8.92					7.82	29.14
SMOOTHNESS, BENDTSEN		J50	482.4	55.1	45.9	10	8	9	10	40.2	152.7
T47-1	ML/MIN	J74	93.1	7.1	9.3					8.2	19.7
K & N INK ABSORPTION		E50	65.07	5.38	.59	4	9	13	4	.82	14.91
T56-1	K & N UNITS	B80	25.11	2.87	1.24					1.72	7.96
PH, COLD		J18	4.734	.217	.068	5	7	8	2	.134	.611
T57-1	PH UNITS	A99	5.606	.288	.142					.278	.826
PH, HOT		J18	4.412	.109	.026	5	5	6	2	.051	.305
T57-2	PH UNITS	A99	5.100	.057	.044					.086	.172
OPACITY, B&L TYPE, 89% BACKING		K24	95.39	.37	.28	10	77	91	5	.34	1.06
T60-1	PERCENT	G01	95.82	.44	.24					.30	1.25
OPACITY, B&L TYPE, PAPER BACKING		K24	95.65	.14	.23	10	6	7	5	.29	.44
T60-2	PERCENT	G01	93.88	.33	.27					.34	.94
OPACITY, ELREPHO TYPE, PAPER BACKING		K24	96.25	.16	.18	10	16	19	5	.22	.47
T60-3	PERCENT	G01	94.39	.24	.16					.20	.67
BLUE REFLECTANCE, DIRECTIONAL		E79	96.00	.29	.12	8	20	49	6	.13	.82
T65-1	PERCENT	J98	75.96	.35	.13					.15	.97
BLUE REFLECTANCE, DIFFUSE, WITH TRAP		E79	96.43	.76	.07	8	18	19	6	.08	2.11
T65-2	PERCENT	J98	75.83	.53	.13					.14	1.47
BLUE REFLECTANCE, DIFFUSE, NO TRAP		E79	95.04	1.13	.11	8	18	18	6	.12	3.13
T65-3	PERCENT	J98	76.62	.88	.11					.12	2.44
SPECULAR GLOSS, 75 DEGREE		E92	49.23	1.62	.92	10	51	56	5	1.14	4.56
T75-1	GLOSS UNITS	G05	37.82	1.70	1.15					1.42	4.82
THICKNESS (CALIPER)		J66	6.337	.108	.093	10	62	75	10	.081	.298
T90-1	MILS	J82	2.685	.070	.040					.035	.195
GRAMMAGE (MASS PER UNIT AREA)		D34	118.94	.84	.69	10	16	20	3	1.10	2.51
T95-1	G/SQ.METER	D35	55.44	.82	.81					1.29	2.52

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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)*

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