

REPORT
OF THE
Indian Tariff Board
ON THE
CLASSIFICATION OF PAPER
FOR TARIFF PURPOSES



DELHI: MANAGER OF PUBLICATIONS
1936

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Report

on the

Classification of Paper for tariff purposes.

PRELIMINARY.

Under the Government of India, Department of Commerce, Resolution No. 202-T. (1)/35, dated the 25th May, 1935, the Terms of Reference. Tariff Board were directed to enquire into the question of the classification of paper for tariff purposes with a view to giving effect to the intentions of the Legislature in granting protection to printing and writing papers under the Bamboo Paper Industry (Protection) Act, 1932. The resolution is reproduced below :—

“ In paragraph 101 of the 1931 Report on the grant of protection to the Paper and Paper Pulp Industries, the Tariff Board recommendation that in the event of their proposals in regard to the measure of protection to be afforded to the industries being accepted, steps should be taken at the earliest opportunity after the passing of the Act to specify, as definitely as might be possible, the classes of paper which are by ordinary trade usage included in the term “ Printing and Writing Paper ” as used in the Import Tariff Schedule. In announcing their decisions on the report the Government of India in their Resolution in this Department No. 202-T. (28), dated the 3rd February, 1932, expressed their inability to accept the Board's recommendation. In their view the definition of articles to which the protective tariff should apply was one which should indicate as precisely as possible the intention of the Legislature and should be so framed as to include any such articles as can be produced economically in the country or may compete with an indigenous product. For this purpose trade usage provides no guide. At the same time, the Government of India appreciated the fact that the then current statutory definition of the protected classes of paper gave rise to difficulties of interpretation, and declared that if protection were given for a further period to the Paper Industry they proposed to proceed to the revision of the basis of assessment to duty of imported paper in consultation with the different interests concerned in such a way as to obviate disputes regarding the interpretation of the tariff. They also undertook to place the result of such revision before the Legislature.

2. In accordance with their announcement the Government of India consulted the various interests concerned in the matter on a broad scheme of classification, the central idea of which was the specification of non-protected papers and the grouping of all others in a residual protective class. The views received have, however, been so divergent that it has been impossible to arrive at any satisfactory conclusion. The Government of India consider that in the circumstances the question should be investigated by the Tariff Board. They have decided therefore to ask the Board to examine the classification of paper for tariff purposes with a view to recommending such changes as may be considered necessary to give effect to the intentions of the Legislature in granting protection to printing and writing papers under the Bamboo Paper Industry (Protection) Act, 1932.

3. Firms or persons who desire that their views should be considered by the Tariff Board, should address their representations to the Secretary, Tariff Board."

2. The Board were, however, unable to take up this enquiry immediately as they were then engaged on the report on the Woollen Textile Industry. That report was signed on the 10th June, 1935. But the Board issued the following Press Communiqué on the evening of Saturday the 8th June, 1935, in order to give the public earliest information about the scope of the enquiry and the last date for submitting written representations:—

The Board's communiqué.

"The Government of India, Department of Commerce, in their Resolution No. 202-T. (1)/35, dated the 25th May, 1935, have referred to the Tariff Board the question of the classification of paper for tariff purposes with a view to recommending such changes as may be considered necessary to give effect to the intentions of the Legislature in granting protection to printing and writing papers under the Bamboo Paper Industry (Protection) Act, 1932. The terms of the Resolution are as follows:—

'In paragraph 101 of the 1931 Report on the grant of protection to the Paper and Paper Pulp Industries, the Tariff Board recommended that in the event of their proposals in regard to the measure of protection to be afforded to industries being accepted, steps should be taken at the earliest possible opportunity after the passing of the Act to specify, as definitely as might be possible, the classes of paper which are by ordinary trade usage included in the term "Printing and Writing Paper" as used in the Import Tariff Schedule. In announcing their decisions on the report the Government of India in their Resolution in this Department No. 202-T. (28), dated the 3rd February, 1932, expressed their inability to accept the Board's recommendation. In their view the definition of articles to which the protective tariff should apply was one which should indicate as

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2. Firms and persons interested in the enquiry should submit written representations (with six spare copies) embodying such views as they wish the Board to take into consideration not later than 1st July, 1935, to the Secretary, Tariff Board, Town Hall, Bombay."

At the same time letters were addressed to the Collectors of Customs, the President, Forest Research Institute, Dehra Dun, and the Controller of Printing and Stationery asking for information upon specific points.

3. Though the scope of the enquiry was clearly defined in the Government of India Resolution reproduced in paragraph 1 above, several communications received by us Board's questionnaire. showed that considerable misunderstanding prevailed about the actual terms of reference. We therefore thought it best to clarify the position by issuing on the 22nd June a questionnaire to manufacturers, dealers and importers of paper and to others interested in the enquiry. A detailed list of the Associations, firms and persons from whom replies were received by us is given in Appendix III.

4. The Board carried out the following programme of visits Board's tour and oral examination of witnesses at Poona, oral evidence. Bombay, Calcutta and Dehra Dun:—

June 17th.—Inspected Deccan Paper Mills, Poona.

June 18th.—Had an informal meeting with the representatives of the Mills.

June 20th.—Visited the office of the Collector of Customs, Bombay and witnessed the actual tests carried out for determining the mechanical wood pulp content of paper.

July 19th.—Arrived Calcutta.

July 23rd.—Examined various classes of imported paper exhibited by Messrs. John Dickinson and Company, Limited, at their office.

July 24th.—Visited the Titaghur and Kankinara mills of the Titaghur Paper Mills Company, Limited.

July 25th.—Visited the office of the Statesman, Limited.

July 29th.—Took oral evidence of the Indian Paper Makers' Association.

July 30th.—Took oral evidence of the Calcutta Paper Import Association.

July 31st.—Took oral evidence of the Calcutta Paper Traders' Association.

August 1st.—Took oral evidence of the Collector of Customs, Calcutta.

August 5th.—Arrived Dehra Dun.

August 6th and 7th.—Inspected the sizing tests at the experimental paper plant installed at the Forest Research Institute and had informal discussions with the President, Forest Research Institute and his staff.

August 9th.—Arrived Bombay.

5. We wish to acknowledge the courtesy and assistance extended to us by all those whose places of business we visited and by

Acknowledgment. Mr. C. C. Trever, C.I.E., President, Forest Research Institute, Dehra Dun, and his assistants. We also take this opportunity of recording our appreciation of the services of Mr. B. Mazumdar, B.Sc., Appraiser, Custom House, Calcutta, who was appointed as a Technical Assistant under the Board. He helped us greatly during the course of the enquiry with his expert knowledge of paper and the Customs administration connected with it.

APPENDIX I.

List of papers mentioned in the evidence.

Serial No.	Quality.	Class of paper.	Liable to protective or non-protective duty.
1	Real Art Paper	Printing .	Protective.
2	Art paper imitation containing less than 70 per cent. mechanical wood pulp.	Printing .	Protective.
3	Art paper mechanical	Printing .	Protective.
4	Account book paper	Writing .	Protective.
5	Antique wove and laid suitable for writing .	Writing .	Protective.
6	Antique wove and laid suitable for printing .	Printing .	Protective.
7	Azure laid	Writing .	Protective.
8	Air mail paper	Writing .	Protective.
9	Paste boards	Boards .	Non-protective.
10	Mill boards	Boards .	Non-protective.
11	Card boards	Boards .	Non-protective.
12	Pulp boards	Boards .	Non-protective.
13	Leatherette Board	Boards .	Non-protective.
14	Straw board	Boards .	Non-protective.
15	Boards, all other sorts	Boards .	Non-protective.
16	Blotting paper . . . . .	..	See para. 34 of the report.
17	Blotting paper enamelled . . . . .	..	Non-protective.
18	Bag paper . . . . .	..	Non-protective.
19	Badami . . . . .	..	See paras. 22 and 25 of the report.
20	Bank	Writing .	Protective.
21	Bond	Writing .	Protective.
22	Book cover	Printing .	Protective.
23	Brown (nature) . . . . .	..	Non-protective.
24	Brown (black) . . . . .	..	Non-protective.
25	Buff, glazed and unglazed . . . . .	..	See paras. 22 and 25 of the report.
26	Cap paper which is ordinarily very thin paper	..	Non-protective.
27	Government stamp cap	Writing .	Protective.
28	Chromo	Printing .	Non-protective.
29	Cover paper . . . . .	..	See para. 27 of the report.
30	Copying paper . . . . .	..	Non-protective.
31	Crepe paper . . . . .	..	Non-protective.
32	Cigarette paper . . . . .	..	Non-protective.
33	Cigarette paper in small packets and out to sizes ready for use.	..	Non-protective.
34	Cellophane . . . . .	..	Non-protective.
35	Carbon paper . . . . .	..	Non-protective.
36	Cloth lined paper . . . . .	..	Non-protective.
37	Casing paper . . . . .	..	Non-protective.
38	Cheque paper	Writing .	Protective.
39	China Paper . . . . .	..	Non-protective.
40	Cartridge paper (white or coloured) . . . . .	..	See para. 31 of the report.
41	Cream laid	Writing .	Protective.

Serial No.	Quality.	Class of paper.	Liable to protective or non-protective duty.
42	Calf leatherette . . . . .	..	Non-protective.
43	Duplicator, soft or hard . . . . .	..	See para. 33 of the report.
44	Design kraft . . . . .	..	Non-protective.
45	Envelope made of wrapping paper . . . . .	..	Non-protective.
46	Envelope made of writing paper	Writing	Protective.
47	Enamelled paper . . . . .	..	Non-protective.
48	Emery paper . . . . .	..	Non-protective if coated with emery.
49	Ferro prussiate paper . . . . .	..	Non-protective.
50	Filter paper . . . . .	..	Non-protective.
51	Flint paper	Printing	Non-protective.
52	Felt paper . . . . .	..	Non-protective.
53	Graph paper . . . . .	..	Non-protective if printed on.
54	Glassine paper . . . . .	..	Non-protective.
55	Gold and silver paper . . . . .	..	Non-protective.
56	Greaseproof paper . . . . .	..	Non-protective.
57	Glazed M. G. wrapping . . . . .	..	See paras. 28 and 32 of the report.
58	Gummed paper . . . . .	..	Non-protective.
59	Glass paper . . . . .	..	Non-protective if complete manufactured article.
60	Insulating paper . . . . .	..	Non-protective if in reels.
61	Ivory printing	Printing	Protective.
62	Kraft . . . . .	..	Non-protective.
63	Kraft imitation . . . . .	..	Non-protective.
64	Kraft, other sorts . . . . .	..	Non-protective.
65	Kite paper . . . . .	..	Non-protective.
66	Litho paper (except coated)	Printing	Protective.
67	Lace paper . . . . .	..	Non-protective if punched.
68	Ledger paper	Writing	Protective.
69	Leatherette paper . . . . .	..	Non-protective.
70	Metallic paper . . . . .	..	Non-protective.
71	Match paper, glazed and unglazed . . . . .	..	See our remarks on unglazed coloured thin paper and M. G. Wrappings, paras. 25, 28 and 32.
72	Matrix or stereo paper cut to size . . . . .	..	Non-protective.
73	Matrix or stereo paper other sorts . . . . .	..	Non-protective.
74	Marble paper . . . . .	..	Non-protective.
75	Machine glazed pressings . . . . .	..	See para. 28 of the report.
76	Manilla, glazed and unglazed . . . . .	..	Non-protective.
77	Manifold	Writing	Protective.
78	Napkin paper . . . . .	..	Non-protective if manufactured.
79	Newsprint	Printing	Protective.
80	Oil paper . . . . .	..	Non-protective.

Serial No.	Quantity.	Class of paper.	Liable to protective or non-protective duty.
81	Pasting paper . . . . .	..	Non-protective.
82	Machine Glazed Poster paper . . . . .	..	Non-protective.
83	Parchment writing	Writing .	Protective.
84	Parchment wrapping . . . . .	..	Non-protective.
85	Stencil paper . . . . .	..	Non-protective if waxed.
86	Stereo paper . . . . .	..	Non-protective.
87	Supercalendered printing	Printing .	Protective.
88	Sulphite envelope . . . . .	..	Non-protective.
89	Suede paper . . . . .	..	Non-protective.
90	Sand paper . . . . .	..	Non-protective if coated.
91	Transparent cellulose paper, if cellophane. . . . .	..	Non-protective.
92	Tin foil paper . . . . .	..	Non-protective.
93	Target Poster . . . . .	..	Non-protective.
94	Typewriting paper	Writing .	Protective.
95	Toilet paper . . . . .	..	Non-protective if in rolls or cut to small sizes.
96	Tracing paper . . . . .	..	Non-protective if prepared.
97	Telegraph machine paper in reels . . . . .	..	Non-protective.
98	Unglazed thin coloured except buff and deep blue colour. . . . .	..	See paras. 25 and 19 of our report.
99	Unglazed thin white and buff . . . . .	..	See paras. 24 and 25 of our report.
100	Wall paper . . . . .	..	Non-protective.
101	Waxed paper . . . . .	..	Non-protective.
102	Waterproof paper . . . . .	..	Non-protective if prepared.

N.B.—A printing paper, it is understood, will be subjected to a revenue rate of duty if it contains not less than 70 per cent. mechanical wood pulp in its fibre content.

APPENDIX II.

The Weight Factor Method for Fibre Analysis.

(Spence and Krauss.)

Tear a few small pieces about the size of $\frac{1}{4}$ " diameter from different parts of the paper or pulp sample (widely separated if the sample is large). Suspend in a 1 per cent. solution of caustic soda and bring to the boil in a beaker. Drain off the solution; wash in the beaker with distilled water twice, draining off the water each time. Wash in a 1 per cent. solution of hydrochloric acid, then twice more with distilled water.

Roll the scraps of paper into a ball and work between the fingers to loosen the fibres. Put the ball into a test tube (or glass stoppered cylinder or any other convenient vessel), place 10/20 glass beads or lead shot and shake with distilled water until the fibres are well separated. Dilute the suspension to a consistence such that not more than four complete diameter lengths of fibres will appear on any one field. Denser fields are difficult to evaluate and tend to lessen the accuracy of the results. Shake the tube, insert a glass tube (6 mm. internal diameter and about 20 cm. long) to a depth of about 2 inches below the surface of the solution and carefully place one or two drops on a slide, dry with filter paper. (The excess of water is either driven off on a water oven or to save time the water is drawn off by placing the folded edge of a piece of filter paper on one side of the spread out drop and carefully withdrawing the filter paper). When the water has been drawn away, tease out any bundles or 'knots'. The stain is kept ready for use by previously mixing the two solutions Hershberg's A and B diluting with water or zinc chloride in such a way as to give a lemon yellow colour with mechanical wood pulp and blue to greenish blue with sulphite pulp. Two drops of this stain are placed on the dried fibres obtained above, and the whole then covered with a cover slip. A cross line micrometer divided into 10/10 mm. square is inserted into the diaphragm of the eyepiece and the side of each square is taken as a unit. Measure the *lengths only* of the fibres in the field starting at one extreme corner of the slide, counting all the mechanical wood pulp in that line by the help of a moving stage until the other extremity is reached. A return trip is now made along the same line counting all the blue fibres. The slide is now shifted in the perpendicular direction by moving the mechanical stage and the fibres counted in the same way. Thus the whole of the slide is covered strip by strip, counting rigidly every fibre.

The total length of each type of fibre multiplied by its weight factor gives the number of the fibres present and a ratio is obtained on the total of these numbers as usual.

Equal areas covered by different kinds of fibre do not represent equal weights; neither do equal lengths. Hence to determine correctly the percentage weight of each kind of fibre present the relative weights of equal areas or lengths of the different fibres must be known.

Experiments carried out in the Lahore Laboratory on synthetic mixtures of mechanical wood pulp and chemical pulp gave as the ratio in equal length weight C. P./weight M. W. P.=0.566.

The factor 0.55 recommended on many more experiments than we have been able to do, has been taken as standard.

APPENDIX III.

List of Associations, Firms and Persons from whom replies to the Board's Questionnaire have been received.

1. American Baptist Mission Press, Rangoon.
2. Printing Materials Store, Bombay.
3. Ghosh Brothers and Company, Rangoon.
4. Calcutta Paper Agency, Calcutta.
5. The Commercial Stationery Mart, Calcutta.
6. The Publishers' Association of Bengal, Calcutta.
7. Messrs. Longmans, Green and Company, Limited, Calcutta.
8. Messrs. Bholanath Dutt and Sons, Calcutta.
9. Messrs. A. Bonner and Company, Calcutta.
10. Bengal Association of the Master Printers and Allied Industries, Calcutta.
11. Messrs. J. N. Singh and Company, Limited, Delhi.
12. Messrs. Kamala Book Depot, Limited, Calcutta.
13. Calcutta Paper Traders' Association, Calcutta.
14. The Calcutta Paper Import Association, Calcutta.
15. Indian Paper Makers' Association, Calcutta.
16. The Times of India, Bombay.

APPENDIX IV.

Correspondence regarding sizing tests.

- (1) LETTER NO. SCA-PAPER, 1935, No. 2, DATED THE 31ST AUGUST, 1935, FROM THE SPECIAL CHEMICAL ADVISER, CENTRAL BOARD OF REVENUE, CAMP SIMLA, TO THE TARIFF BOARD.

I have the honour to say that the Central Board of Revenue has requested me to answer to your letter No. 556, dated the 22nd of August, 1935, direct and I enclose accordingly seven copies of my views on the proposed tests for distinguishing between printing and writing papers by tests designed to determine the degree of sizing on the papers under examination.

As the Members of the Board will observe, I foresee no difficulty in carrying out these or any other approved tests but it is quite essential that they should be clearly specified in every detail and that standard samples of paper should be available so that their action on samples under test may be compared with the accepted standards.

Enclosure.

Proposed tests to distinguish between Printing and Writing Papers, Reference Tariff Board letter No. 556, dated the 22nd August, 1935, addressed to the Secretary, Central Board of Revenue.

Three tests are proposed:

- (a) Sindall and Bacon's test for relative hardness of sizing;
- (b) The ferrocyanide test for time of penetration.
- (c) Sindall and Bacon's 'flotation' test for relative hardness of sizing.

There is no difficulty in carrying out these tests at all the Board's laboratories and experienced chemists are available to do the work who are capable of tackling any standard method.

The methods would have to be carefully standardised by some Central paper makers' association and a set of standard papers of repeatable specification provided so that tests could be checked up periodically.

Method (a).—The Association would be expected to specify the standard "drawing pen of the bar type", the angle at which it should be laid or pressed on the paper and, if pressed, the method of exerting and amount of pressure.

The exact method of making up Schlutting and Naumann's Normal ferrogallic writing ink should be prescribed and the quality of the reagents clearly specified. The blue dye should be exactly specified.

Presumably no 'spreading' is allowed but before long we shall undoubtedly be told that a 'little' spreading is permissible. What is a 'little'? The amount of spreading permitted and its method of measurement by a micro gauge should be clearly set forth.

It might be necessary to define humidity conditions for this test.

From time to time we are up against the type of arguments that we are "general analytical chemists" and that therefore our opinion cannot be really valuable (unless favourable to the importer or appellant) in opposition to that of a paper 'expert'. Our experience in M. W. P. cases has been that, in sufficient cases to be significant, unreliable certificates are submitted in support of paper cases and we must be protected. It takes time to judge between true and false certificates.

(b) *The "ferro-cyanide test.*—There is no difficulty about the operation of this test but the instructions should be more specific. Does the solution contain 5 parts per hundred weight by weight of $K_4Fe(CN)_6 \cdot 6H_2O$, the usual solid reagent, or 5 parts of $K_4Fe(CN)_6$ anhydrous? This is how the instruction reads but probably the former is intended.

Ferric chloride solution of "5-10 per cent. strength" is very indefinite. Does it contain sufficient hydrochloric acid to prevent excessive hydrolysis? Old ferric chloride would behave differently from the freshly prepared reagent. Presumably in this case $FeCl_3$ (5-10 per cent.) means 5-10 per cent. of ferric chloride calculated as anhydrous salt.

(c) *Method of sizing.*—The degree of fineness of the castor sugar should be stated in terms of wire gauze mesh.

A set of suitable dyes for given approximate ranges of coloured paper should be clearly specified and not left to the option of the operator.

Summary.

There is absolutely no difficulty about our carrying out the tests at the Board's laboratories but it is essential that—

- (i) the methods, reagents, etc., should be clearly specified,
- (ii) repeatable samples of suitable ranges of standard papers should be available for control and comparative testing,
- (iii) It is desirable that both (a) and (b) should be accepted by the Trade. This, however, is a matter for the administrative officers to decide and I only propose it to save the testing laboratories from an inordinate number of complaints.

(2) LETTER No. 3818/37, DATED THE 30TH AUGUST, 1935, FROM THE PRESIDENT, FOREST RESEARCH INSTITUTE AND COLLEGE, DEHRA DUN, TO THE TARIFF BOARD.

With reference to your letter No. 556, dated the 22nd August, 1935, I have the honour to enclose herewith a note by the Officer-in-charge, Paper Pulp Section, of this Institute.

Enclosure.

Copy of a Note dated the 28th August, 1935, by the Officer-in-charge, Paper Pulp Section, Forest Research Institute.

Reference letter from the Tariff Board below regarding the adoption of one or more methods, at the Customs Laboratories, for determining the relative degree of sizing of papers.

While the "Ink flotation" test and the "Ferro-cyanide" test do indicate the relative degree of sizing, I would give preference over them to the "Dry Indicator" test, on which Sindall and Bacon's method is based, for the following reasons:—

- (1) The "Ink flotation" and the "Ferro-cyanide" methods are not capable of being so well standardised as the "Dry Indicator" method, and
- (2) Personal equation plays a far greater part in the ink flotation and Ferro-cyanide tests than in the Dry indicator test.

I believe Sindall and Bacon's method will give satisfactory results, if the technique of the method is standardised. From enclosure "A" of the Tariff Board's letter, giving account of the method, it appears that the technique of the method has not been standardised in full details. I would, therefore, recommend that the technique of the method, as standardised by the Technical Association of the Pulp and Paper Industry, United States, after several years of investigation and research work, may be adopted at the Customs laboratories. A copy of the standard method for adoption by the Customs Department is attached herewith. We have adopted this

method for recently carrying out, at the request of the Tariff Board, the sizing tests on papers.

The method will express the degree of sizing of papers in numbers (seconds or minutes). This alone, however, will not be sufficient for the purpose of the present enquiry, which is to demarcate writing and printing papers in a certain class of papers, *viz.*, mechanical pulp papers containing 70 per cent. or more of mechanical pulp. In order to differentiate writing from printing papers in this class, it is necessary to fix a maximum number, as determined by the method recommended, for the degree of sizing of printing papers. Any paper, the degree of sizing of which is expressed by a number of higher than this, would then be classed as "writing paper".

Appendix.

STANDARD METHOD OF THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, U. S. A.

I.—Scope.

This method is tentatively limited to paper having not more than a medium degree of water resistance such as imported by rosin, glue, starch, and wax sizing and not more than .01 inch in thickness.

II.—Apparatus.

The following special apparatus is required:—

- (1) A support for the test specimen to permit even wetting of the lower surface of the specimen and protection of the upper surface with a cover glass. A hollow cylinder of metal or glass, such as an oil cup glass, about 1½ inches in diameter and 2 inches long, and having even and smooth edges, is suitable.
- (2) A shaker by means of which the indicator is distributed through a 70-mesh wire screen (see Section VII).

III.—Reagents.

A. Indicator.—Water-transudation indicator composed of pure cane sugar, such as "domino" lump sugar; soluble starch, C. P.; and methyl violet dye, Du Pont N. E. Methyl Violet, National Aniline and Chemical Co., 2 B. P. Methyl Violet, or equivalent. Each ingredient shall be ground separately until it all passes through a 100-mesh screen, and shall be completely dried in a desiccator over calcium chloride before making the mixture. When dry, the following proportions are weighed and mixed:—

Sugar	45 grams.
Soluble Starch	5 grams.
Dye	1 gram.

The ingredients shall be mixed by screening repeatedly through a 60-mesh wire until the mixture is uniform. The mixture must be kept dry, therefore exposure to the moisture of the atmosphere is to be avoided as far as possible (see Section VII).

N.B.—If a dye, other than that mentioned above, is taken, the proportions of the ingredients may be changed to suit conditions.

B. Water.—Water of fair purity, such as the usual drinking water, is suitable.

IV.—Specimen.

The test specimens shall be cut from different portions of the test sample in such a way as to be thoroughly representative of it. They shall be free from folds, wrinkles or other blemishes not commonly inherent in the paper. A convenient size is 3×3 inches.

V.—Procedure.

The tests shall be made on paper conditioned in specified atmospheric conditions.

(At the Customs laboratories 35°C and 70 per cent. relative humidity may be adopted for conditioning papers.)

A thin uniform sprinkling of the indicator is dusted from the shaker on to the surface of the test specimen by gently tapping the bottom of the inverted shaker and moving it slowly over the surface of the specimen so that the paper remains just visible between the particles of the indicator.

About three quarts of water are put in a vessel of such proportions that it is filled to a depth of about 2 inches. The temperature of the water shall be maintained at 35 degree C. ± 0.5 degrees. If a cylinder is used as a support, it is placed in the water with one end resting on the bottom of the vessel and the water level is adjusted until the other end is barely covered with water. The test specimen is placed over the end of the submerged cylinder and covered with a watch glass, or other suitable concave cover glass. When putting the specimen on the water, care must be taken not to wet the upper surface nor to entrap air bubbles underneath. The test specimen shall be examined after the test and if evidence of uneven wetting is found the result shall be discarded.

The test specimen shall be watched continuously for a change in the color of the indicator. With the aid of two stop watches or a double-reading stop watch, the elapsed time in seconds is measured from the contact of the paper with the water until (1) one-quarter of the indicator and (2) three-quarters of the indicator changes in color. The average of the two readings is the water resistance (or degree of sizing) for the specimen. An equal number of tests shall be made on both sides of the paper, and not less than 10 different specimens shall be tested.

VI.—Report.

The report shall give the minimum, maximum and average water resistance (or degree of sizing) of the paper, calculated from the test data for all of the specimens tested.

VII.—Additional Information.

The reproducibility of the average test results by experienced operators is within 10 per cent.

The novel feature of the method is the use of a suitable hygroscopic material in the indicator, such as sugar, to trap transuded water. The starch is added to the indicator to render it more stable. Because of the necessity of keeping the indicator dry, storage in a desiccator over calcium chloride, except while in actual use, is recommended. Mixing the components of the indicator by screening is essential to avoid discoloration, which occurs if they are ground together.

A convenient indicator shaker is prepared from a small glass screw-top bottle by cutting away most of the metal of the flat portion of the top, fitting a 70-mesh wire inside the top, and screwing the top back in place.

(S) LETTER No. 923/35, DATED THE 27TH AUGUST, 1935, FROM THE COLLECTOR OF CUSTOMS, BOMBAY, TO THE TARIFF BOARD.

Sizing tests—Adoption of, for distinguishing between printing and writing papers—Your letter No. 556, dated the 22nd August, 1935.

I have the honour to refer to your letter cited above.

2. I enclose herewith a copy of a Note by my Chemical Examiner, which deals with the points raised.

3. The Special Chemical Adviser to the Central Board of Revenue, Lahore, has not been consulted.

Enclosure.

Copy of Note dated the 24th August, 1935, from Mr. S. S. Aiyar, Chemical Examiner for Customs, Bombay.

1. The inkmarks test is simple and can be adopted as a routine test. We can also make the standard ink recommended by Schlutting and Naumann. The Paper Makers' Association do not say anything regarding the borderline cases which always give us trouble. I would recommend distribution of samples of limit papers after testing a number of samples, if the test is adopted by the Government. We may recommend its adoption.

2. Sindal and Bacon's test for relative hardness of Papers.

This test will have to be applied as a confirmatory test in case the ink mark test is not conclusive. The authors have not however laid down the minimum time limit for penetration in the case of writing papers. This will have to be fixed by the Tariff Board or the Central Board of Revenue after we have comparatively tested a number of paper samples.

3. The ferro-cyanide test (for sizing) applied to papers other than writing paper.

This again involves a time factor. The Indian Paper Makers' Association specify a penetration time of 15 seconds. We do not know what the paper importers have to say on the matter. The recommendation is only tentative and we will have to fix the time factor after we have tested a number of samples of imported papers.

In my opinion we will have to adopt all three methods to enable us to definitely distinguish printing from writing papers.

(4) LETTER R. No. 1073/35, DATED THE 29TH AUGUST 1935, FROM THE COLLECTOR OF CUSTOMS, MADRAS, TO THE TARIFF BOARD.

Test—Distinction between printing and writing paper.

I have the honour to refer to your letter No. 556, dated the 22nd August, 1935.

2. The tests mentioned in the letter depend upon comparison of the time taken for standard liquid preparations to soak through pieces of the samples of paper floating on them, the time required being a measure of the degree of sizing. The Assistant Chemical Examiner of this Custom House is of the opinion that these are very rough empirical tests and require careful standardisation by testing a large number of authentic samples under varying conditions at different laboratories, before they can be adopted in practice. Of the three tests mentioned in your letter, the "Ferro-cyanide" test is said to be preferable, because the liquid can be prepared to exact strength, there being no insoluble or partly soluble ingredients.

3. I have had no time to consult the Special Chemical Adviser to the Central Board of Revenue, but I am sending him copy of the correspondence for favour of expressing his opinion direct to you.

(5) LETTER No. 1662/35, DATED THE 29TH AUGUST, 1935 FROM THE COLLECTOR OF CUSTOMS, KARACHI, TO THE TARIFF BOARD.

I have the honour to refer to your letter No. 556, dated the 22nd August, 1935.

2. From a few Preliminary experiments carried out in this Custom House Laboratory, it appears that the methods suggested are quite suitable. The details regarding time limit will have to be worked out later on on actual samples of writing and printing papers and on border line cases.

(6) LETTER No. 515, DATED THE 30TH AUGUST, 1935, FROM THE COLLECTOR OF CUSTOMS, CALCUTTA, TO THE TARIFF BOARD.

I have the honour to refer to your letter No. 556, dated the 22nd August, 1935.

I enclose a report from my Chemical Examiner from which it appears that the tests can be carried out in the Custom House Laboratory.

As regards the last sentence of the note, high class printing and writing papers are comparatively expensive, so that if the tariff is framed so that protected papers pay the protective duty or the revenue duty whichever is higher these papers will be assessable in any case at the revenue rate and it will not be necessary to test.

Enclosure.

Copy of report dated the 28th August, 1935, by the Chemical Examiner, Custom House, Calcutta.

The Association recommend—

- (1) Writing test and Flootation test with Ferro-gallic ink made according to a fixed formula, for finding out the suitability of paper for writing purpose.
- (2) Ferro-cyanide test for paper other than writing paper. They recommend a penetration of time limit for 15 seconds.

They also mention Sindall and Bacon water penetration test for indicating the relative hardness of sizing of paper.

These are standard tests and are easy to carry out.

They have been found valuable to distinguish Printing and Writing papers in most cases.

The Penetration time limit of 15 seconds as recommended by the Association would, I think be suitable for recognising cheap Printing Papers (softsized). But experiments on extended range of samples would be necessary to find out the time limit, etc., to suit our purpose.

Hardsized and costly printing papers ("Capital" printing paper), Imitation Art Printing Papers, etc., do not show any penetration of Potassium Ferro-cyanide solution within the time limit of 15 seconds. But imitation art papers are not suitable for writing purposes and can easily be differentiated. High class Printing and Writing Papers are in my opinion difficult to distinguish by the above tests. They contain little Mechanical wood pulp.

(7) LETTER C. No. 555/35, DATED THE 31ST AUGUST, 1935, FROM THE COLLECTOR OF CUSTOMS, RANGOON, TO THE TARIFF BOARD.

Printing and Writing paper—Test of.

I have the honour to refer to your letter No. 556, dated the 22nd August, 1935.

2. My Assistant Chemical Examiner has no experience of the tests referred to in your letter. Consequently I am unable to offer any useful comments on their respective merits, from the point of view of convenience. But it is not anticipated that in practice any difficulty will be experienced in applying any of the three that may be finally decided for adoption.

3. I may add that under our present system any duplicating paper on which the ink spreads in writing and which is absorbent is not regarded as writing paper. I consider that this simple method which has worked well in practice can with advantage be extended to all papers in regard to which it may be claimed that they are not writing paper. The experience of this port is not such as to point to the necessity of prescribing chemical tests for distinguishing between writing paper and printing paper.