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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 811

METHOD OF TEST FOR RESISTANCE OF FABRICS TO PENETRATION BY WATER

(Hydrostatic head test)

1st EDITION
August 1968

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BRIEF HISTORY

The ISO Recommendation R 811, *Method of test for resistance of fabrics to penetration by water (Hydrostatic head test),* was drawn up by Technical Committee ISO/TC 38, *Textiles,* the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question by the Technical Committee led, in 1964, to the adoption of a Draft ISO Recommendation.

In December 1966, this Draft ISO Recommendation (No. 1051) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Israel	Spain
Belgium	Japan	Sweden
Brazil	Korea, Rep. of	Switzerland
Czechoslovakia	Netherlands	Thailand
Denmark	New Zealand	Turkey
France	Norway	U.A.R.
Germany	Poland	United Kingdom
Hungary	Romania	U.S.S.R.
India	South Africa, Rep. of	
Iran		

Three Member Bodies opposed the approval of the Draft :

Argentina
Canada
Italy

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in August 1968, to accept it as an ISO RECOMMENDATION.

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ISO Recommendation R 811 August 1968

METHOD OF TEST FOR RESISTANCE OF FABRICS TO PENETRATION BY WATER

(Hydrostatic head test)

1. SCOPE

This ISO Recommendation describes a method of test for the resistance of fabrics to penetration by water. The method is primarily intended for water-repellent fabrics which are permeable to air.

2. PRINCIPLE

The hydrostatic head supported by a fabric is a measure of the opposition to the passage of water through the fabric. A specimen is subjected to a steadily increasing pressure of water on one face, under standard conditions, until penetration occurs in three places. The pressure at which the water penetrates the fabric at the third place is noted.

The result is immediately relevant to the behaviour of fabric articles which are subjected to water pressure for short or moderate periods of time.

3. APPARATUS

3.1 The apparatus used for the test should be designed to comply with the following conditions.

3.1.1 It should be possible to clamp the specimen of fabric in such a way that

- it is horizontal,
- an area of the fabric of 100 cm^2 is subjected to steadily increasing water pressure on one face,
- no leakage of water takes place at the clamps during the test period (see Appendix, clause Z.1),
- the specimen does not slip in the clamps,
- any tendency for penetration to occur at the clamped edge of the specimen is minimised (see Appendix, clause Z.1).

3.1.2 The water in contact with the test specimen should be distilled water maintained at either 20 ± 1 °C or 27 ± 1 °C. *

3.1.3 The rate of increase of water pressure should be 10 ± 0.5 cm head of water per minute.

3.1.4 A manometer connected to the testing head (s) should allow pressures to be read to an accuracy of 0.5 cm head of water (see Appendix, clause Z.2).

* The use of water at the higher temperature will yield lower values of hydrostatic head; the magnitude of this effect may vary from fabric to fabric.

4. CONDITIONING

Before testing, condition the samples of fabric for at least 24 hours in the atmosphere for testing defined in ISO Recommendation R 139, *Standard atmospheres for conditioning and testing textiles* (2nd edition, June 1967).

5. TEST SPECIMENS

After receipt, handle the fabric as little as possible, avoid folding it sharply or ironing it, and do not treat it in any way other than by conditioning. Take the test specimens from different places in the fabric so that they represent the material as fully as possible. Unless otherwise specified, test four specimens from any sample of fabric submitted.

6. TEST PROCEDURE

Provide freshly distilled water for each specimen tested (see Appendix, clause Z.3).

Wipe all water from the clamping surfaces. Clamp the conditioned specimen (s) on the testing head(s) in such a manner that water is not forced through the specimen prior to the start of the test and immediately subject the specimen(s) to increasing water pressure. Watch continuously for evidence of penetration by water.

Record the pressure, accurate to 0.5 cm head of water, at which water first appears at the third place in the specimen(s). Do not take into account very fine droplets which do not grow after being formed. Do not count subsequent drops which penetrate through the same place in the fabric. Note whether the penetration of water at the third place occurs at the edge of the clamp and reject as unsatisfactory any test in which such penetration occurs at a pressure less than the lowest pressure recorded for the other specimens from the same sample. Test further specimens until the requisite number of satisfactory results is obtained.

7. EXPRESSION OF RESULTS

Calculate the mean of the pressures recorded for the four satisfactory specimens tested. Report the four individual results and the mean result in centimetres head of water to the nearest 0.5 cm. State the temperature of the distilled water used for the test in the report.

APPENDIX

ADVICE ON CONDUCTING THE TEST

Z.1 Clamping the specimen(s)

With some forms of apparatus it has been found that correct conditions of clamping can be attained if the clamps are faced with a suitable grade of rubber.

Z.2 Manometer

(*a*) It is necessary to provide a manometer of suitable range. A manometer which provides for pressures up to 1 m head of water is suitable for fabrics similar in construction to gaberdines; for fabrics of closer construction it is advisable to use a manometer which provides for pressures up to 2 m head of water.

(*b*) If more than one testing head is used in conjunction with the manometer, means should be provided for separately disconnecting them. This is to prevent a high rate of leakage through test specimens already penetrated at three places. With most forms of apparatus, such a leakage can markedly reduce the rate of increase of pressure on the remaining specimens still under test.

Z.3 Provision of clean water surface

If the instrument used is of the type in which the water to be used for testing is contained in the testing head(s) and rises to come into contact with the specimen, the surface of the water in the testing head(s) may be cleaned in one of the following ways, stated in order of preference.

(*a*) Empty the testing head(s) and refill with sufficient freshly distilled water.

(*b*) Allow the distilled water to overflow from the testing head(s) so that the surface of the water is cleared. Sweep the surface of the water with a glass slide freshly coated with paraffin wax.

(*c*) Allow the distilled water to overflow from the testing head(s) so that the surface of the water is cleared.

Z.4 Presence of vapours of volatile organic liquids

The presence of vapours of volatile organic liquids, such as diethyl ether, in the laboratory when this test is being carried out can affect the results.