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**Textiles — Water resistance — Rain  
tests: exposure to a horizontal water  
spray**

*Textiles — Résistance à l'eau — Essai d'arrosage: exposition à une  
pulvérisation horizontale*



Reference number  
ISO 22958:2005(E)

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22958 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 2, *Cleansing, finishing and water resistance tests*.

## Introduction

This rain test is more suitable for measuring relatively low amounts of water penetrating highly water resistant fabric. ISO 9865, *Textiles — Determination of water repellency of fabrics by the Bundesmann rain-shower test*, is not very accurate for measuring water resistance (penetration) when testing the latest tightly woven or lightly coated fabrics in the market today.

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# Textiles — Water resistance — Rain tests: exposure to a horizontal water spray

## 1 Scope

This International Standard is applicable to any textile fabric, which may or may not have been given a water-resistant or water-repellent finish. It measures the resistance of fabrics to the penetration of water by impact, and thus can be used to predict the probable rain penetration resistance of textile fabrics. It is especially suitable for measuring apparel fabrics. With the instrument, tests may be made at different intensities of water impact to give a complete picture of the penetration resistance of a single fabric or combination of fabrics. The test is particularly suitable when measuring highly water resistant fabrics with low amounts of water penetration.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **water resistance**

characteristic indicating the ability to resist wetting and penetration by water

## 4 Principle

A test specimen, backed by a weighed blotter, is sprayed with water for 5 min under controlled conditions. The blotter is then reweighed to determine the amount of water which has leaked through the specimen during the test.

## 5 Safety precautions

Good laboratory practice should be followed. Wear safety glasses in all laboratory areas.

**NOTE** These safety precautions are for information purposes only. The precautions are ancillary to the test procedures and are not intended to be all-inclusive. It is the user's responsibility to use safe and proper techniques in handling materials used in this International Standard. Manufacturers should be consulted for specific details such as material safety sheets and other manufacturer's recommendations.

## 6 Apparatus

- 6.1 Rain Tester** <sup>1)</sup> (see Figures 1, 2 and 3). Typical pressure heads range from 610 mm to 1 830 mm.
- 6.2 White textile blotting paper**, of approximate thickness 0,7 mm, of approximate mass  $(385 \pm 4,5)$  g/m<sup>2</sup> and with an absorbent capacity of  $(200 \pm 30)$  %.<sup>2)</sup>
- 6.3 Water**, at  $(27 \pm 1)$  °C or  $(20 \pm 2)$  °C. Water hardness and pH-value shall be measured and recorded in the test report.
- 6.4 Laboratory balance**, accurate to 0,1 g

## 7 Test specimens

A minimum of three specimens measuring approximately  $(200 \times 200)$  mm are cut from the test fabric. Condition the test specimens and blotting paper for a minimum of 4 h. Conditioning and testing shall be carried out in accordance with ISO 139. If so agreed, conditioning and testing may be carried out in the ambient atmosphere.

## 8 Procedure

- 8.1** The test specimen, backed by a  $(150 \times 150)$  mm piece of textile blotting paper weighed to the nearest 0,1 g, is clamped in the specimen holder and the assembly is mounted in a vertical, rigid support frame positioned to locate the specimen in the central portion of the spray at a distance of 305 mm from the face of the spray nozzle.
- 8.2** A horizontal water spray is directed against the specimen and is allowed to continue for a period of 5 min at the specified pressure head.
- NOTE Most of the time, a specified pressure head is given when this test is requested. However, as stated in 9.2, different pressure heads can be used to obtain a complete overall picture of the penetration resistance of a fabric.
- 8.3** At the end of the spray period, the blotter is carefully removed and quickly reweighed to the nearest 0,1 g.
- 8.4** The number of test specimens required will be governed largely by the degree of accuracy desired, but in all cases a minimum of three specimens from each fabric or treatment should be tested.

## 9 Evaluation

- 9.1** The water penetration as indicated by the increase in mass of the blotting paper during the 5 min test period is calculated, and the average for at least three test specimens is reported. Individual determinations or average values of over 5,0 g may simply be reported as 5+ g or >5 g.

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1) Rain Tester is the trade-name of a suitable apparatus supplied by AATCC, P.O. Box 12215, Research Triangle Park, NC 27709-2215, USA (Tel: +1-919-549-8141; Fax: +1-919-549-8933; www.aatcc.org). This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the apparatus named. Equivalent apparatus may be used if it can be shown to lead to the same results.

2) White Textile Blotting Paper is the trade-name of a product supplied by AATCC, P.O. Box 12215, Research Triangle Park, NC 27709-2215. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.



**9.2** In order to obtain a complete overall picture of the penetration resistance of a fabric or fabric combination, the average penetrations with different pressure heads on the nozzle should be obtained. The pressure head should be varied by 305 mm increments in order to determine (a) the maximum head at which no penetration occurs, (b) the change in penetration of water with increasing head, and (c) the minimum head required to cause “breakdown”, i.e. the penetration of more than 5 g of water. At each pressure head, a minimum of three specimens should be tested in order to obtain the average penetration for that head.

## 10 Test report

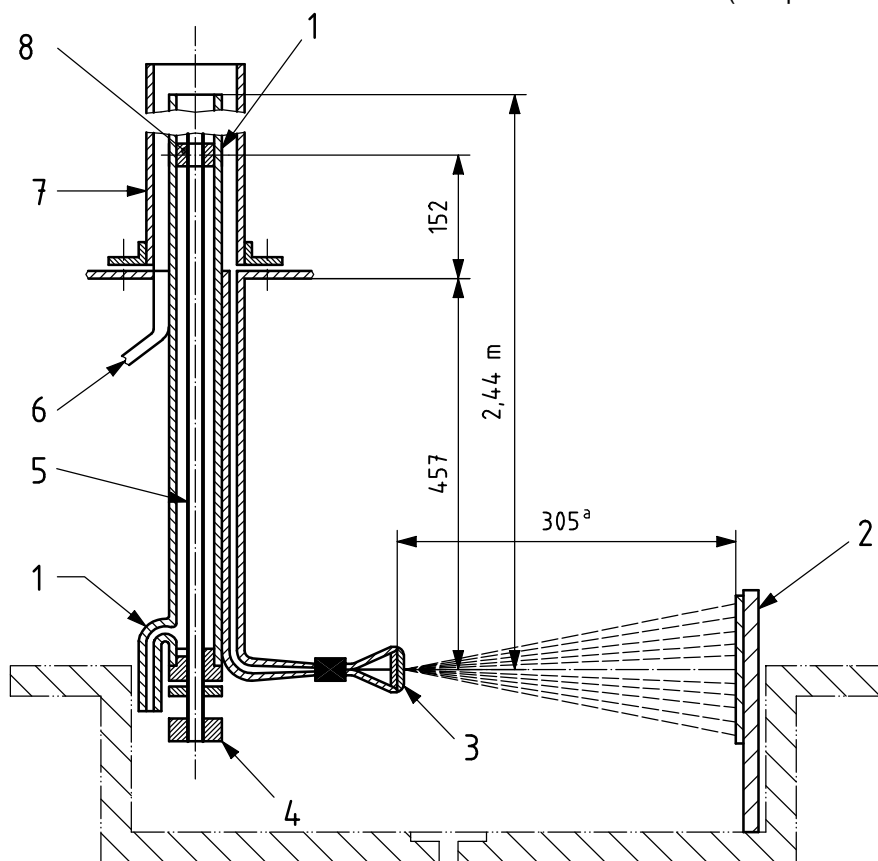
The test report shall include the following information:

- a) a reference to this International Standard;
- b) the number of specimens tested;
- c) all information necessary for complete identification of the sample tested;
- d) the atmosphere used for conditioning and testing;
- e) the hardness and pH-value of the water used;
- f) any deviation from the procedure specified;
- g) the test results.

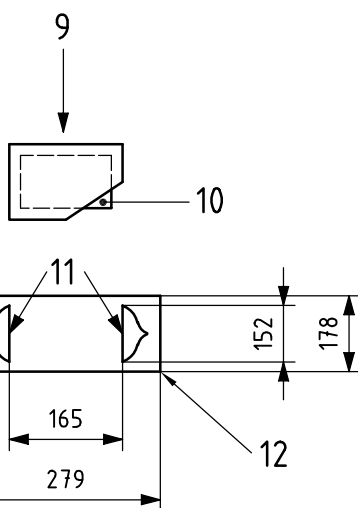


Figure 1 — Rain Tester, complete assembly

Dimensions in millimetres (except where otherwise indicated)



a) Side view

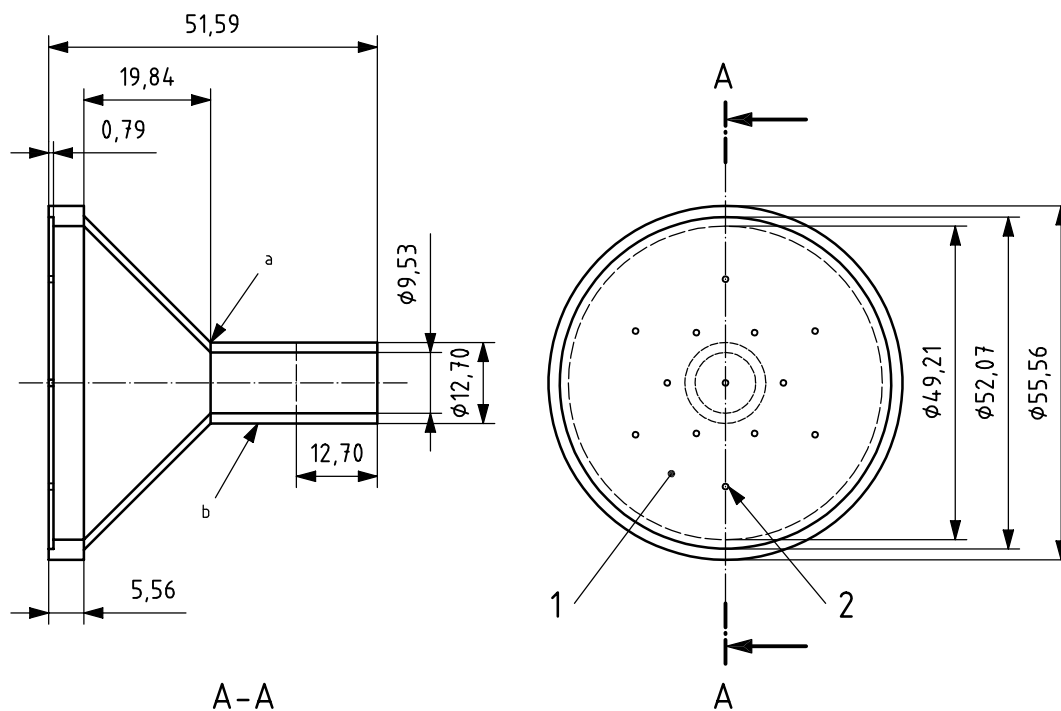


b) Details of test specimen holder

**Key**

- |                                                                |                                    |
|----------------------------------------------------------------|------------------------------------|
| 1 overflow                                                     | 7 pyrex glass pipe                 |
| 2 test specimen holder                                         | 8 valve at 0,6 m level             |
| 3 nozzle 55,56 mm in diameter, with 13 (0,99 ± 0,013) mm holes | 9 test specimen, (200 × 200) mm    |
| 4 valve handle                                                 | 10 blotter, (152 × 152) mm         |
| 5 brass valve stem                                             | 11 spring clips (2), 152 mm long   |
| 6 water inlet                                                  | 12 clear plastic or masonite board |
- <sup>a</sup> Distance from nozzle to test specimen.

**Figure 2 — Rain Tester, structural details**



**Key**

- 1 0,79 mm thick disc with 1 hole in centre, 6 holes on an 18,26 mm diameter circle and 6 holes on a 32,54 mm diameter circle, glued and staked to body
- 2 13 holes, diameter  $(0,99 \pm 0,013)$  mm after plating

Finish: black-anodized.

Material: aluminium.

- a 12,78 mm diameter at this point.
- b Tapered.

**Figure 3 — Nozzle details**

## Bibliography

- [1] AATCC Test Method 35, *Water Resistance: Rain Test*

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