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# International Standard



# 4920

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Textile fabrics — Determination of resistance to surface wetting (Spray test)

*Étoffes — Détermination de la résistance au mouillage superficiel (Essai d'arrosage)*

First edition — 1981-05-01

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UDC 677.063 : 677.017.63

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Descriptors : textiles, fabrics, tests, determination, wettability, spraying.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4920 was developed by Technical Committee ISO/TC 38, *Textiles*, and was circulated to the member bodies in October 1979.

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It has been approved by the member bodies of the following countries :

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|                     |                |                       |
|---------------------|----------------|-----------------------|
| Australia           | Ghana          | Romania               |
| Belgium             | Hungary        | South Africa, Rep. of |
| Bulgaria            | India          | Spain                 |
| Canada              | Israel         | Sweden                |
| China               | Italy          | Switzerland           |
| Cyprus              | Japan          | Thailand              |
| Czechoslovakia      | Korea, Rep. of | Turkey                |
| Denmark             | Netherlands    | United Kingdom        |
| Egypt, Arab Rep. of | New Zealand    | USA                   |
| Finland             | Norway         | USSR                  |
| France              | Poland         | Venezuela             |
| Germany, F.R.       | Portugal       |                       |

No member body expressed disapproval of the document.

# Textile fabrics — Determination of resistance to surface wetting (Spray test)

## 1 Scope and field of application

This International Standard specifies a spray test method for determining the resistance of any fabric — which may or may not have been given a water-resistant or water-repellent finish — to surface wetting by water.

It is not intended for use in predicting the rain penetration resistance of fabrics, since it does not measure penetration of water through the fabric.

## 2 Reference

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

## 3 Definition

For the purposes of this International Standard, the following definition applies.

**spray rating** : A measure of the resistance of the surface of a fabric to wetting.

## 4 Principle

A specified volume of distilled or fully deionized water is sprayed on a test specimen which has been mounted on a ring and placed at an angle of 45° so that the centre of the specimen is at a specified distance below the spray nozzle. The spray rating is determined by comparing the appearance of the specimen with descriptive standards and photographs.

## 5 Apparatus and materials

**5.1 Spray device** (see figure 1), consisting of a 150 mm funnel held vertically, with a metal nozzle (5.2) connected to the end of the stem by rubber tubing of 10 mm bore. The distance from the top of the funnel to the bottom of the nozzle is 190 mm.

**5.2 Metal nozzle<sup>1)</sup>** (see figure 2), having a convex face with 19 holes of 0,9 mm diameter (see figure 2). The holes are

distributed over the face of the nozzle. The duration of flow for the specified volume of 250 ml of water poured into the funnel shall be between 25 and 30 s.

**5.3 Specimen holder**, consisting of two wood or metal rings, which fit into each other, one of 150 mm inside diameter and one of 150 mm outside diameter (for example an embroidery hoop), into which the specimen can be secured. The rings should, when in position for a test, rest on a suitable support so that it is inclined at an angle of 45° with the centre of the test area 150 mm below the centre of the face of the spray nozzle.

**5.4 Distilled or fully deionized water**, at  $20 \pm 2$  °C, or  $27 \pm 2$  °C.

## 6 Conditioning and testing atmospheres

Conditioning and testing shall be carried out according to ISO 139. If so agreed, conditioning and testing may be carried out in the ambient atmosphere.

## 7 Test specimens

Take at least three test specimens, 180 mm square, from different places in the fabric so that they represent the material as fully as possible. Do not take test specimens from places with creases or fold marks.

## 8 Procedure

**8.1** Condition the test specimens for at least 24 h in the atmosphere defined in clause 6.

**8.2** After conditioning, mount the test specimen securely on the specimen holder (5.3) and place it with the face of the fabric uppermost on the hoop support. Unless otherwise stated in the material specification, the specimen shall be orientated so that the warp direction is parallel to the flow of water down the specimen.

Pour 250 ml of water (5.4) into the funnel (see 5.1) quickly, but steadily so that the spraying shall be continuous once it has commenced.

1) Suitable metal nozzles are available commercially. Details may be obtained from the ISO Central Secretariat or from the Secretariat of ISO/TC 38.

Immediately the spray has ceased, remove the holder with its specimen and tap smartly twice against a solid object (on diametrically opposite points of the frame). During this operation, the plane of the fabric shall be almost horizontal, with the fabric face down.

After tapping, with the specimen still on the holder, assign to the specimen the rating in the following descriptive scale or in the photographic scale (see the annex and figure 3) which best describes the observed degree of wetting. Make no attempt to assign intermediate ratings.

NOTE — Photographic standards are not entirely satisfactory for dark-coloured fabrics and for such fabrics more reliance should be placed on verbal descriptions.

**Spray rating :**

- 1 — Wetting of the whole of the sprayed surface.
- 2 — Wetting of half of the sprayed surface. This usually occurs through the merging of small discrete wetting areas.

3 — Wetting of the sprayed surface only at small discrete areas.

4 — No wetting of, but adherence of small drops to, the sprayed surface.

5 — No wetting of, and no adherence of small drops to, the sprayed surface.

**9 Test report**

The test report shall include the following information :

- a) reference to this International Standard;
- b) the atmosphere used (Standard temperate or Standard tropical or other atmosphere);
- c) the temperature of the water (20 or 27 °C or other temperature);
- d) the spray rating for each specimen tested.

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Dimensions in millimetres

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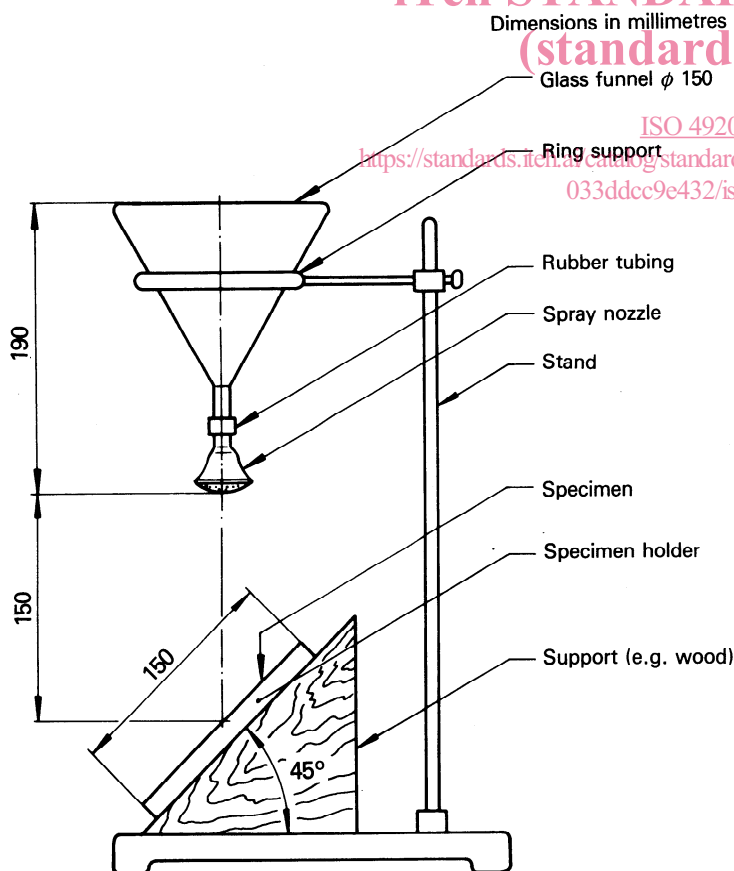


Figure 1 — Apparatus for spray test

Dimensions in millimetres

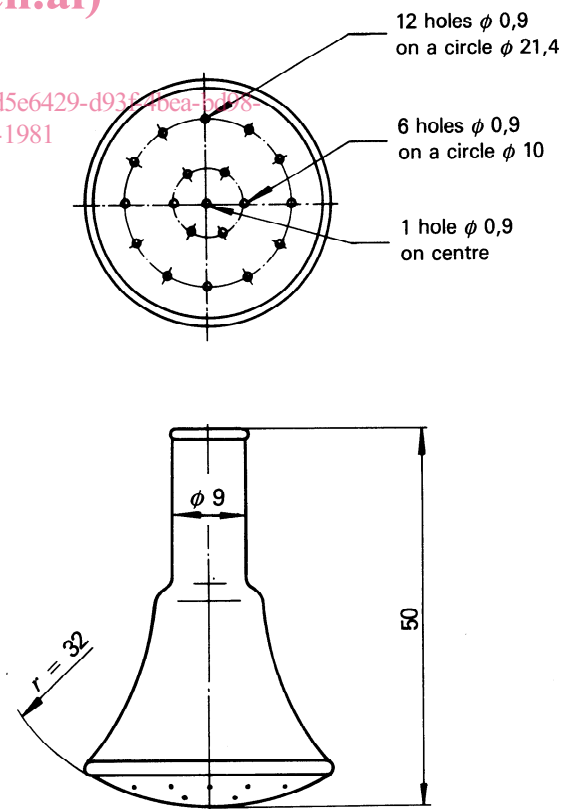


Figure 2 — Spray nozzle

## Annex

### ISO photographic scale

(This annex forms part of the Standard.)

The ISO descriptive rating scale corresponds to the AATCC photographic scale<sup>1)</sup> as follows :

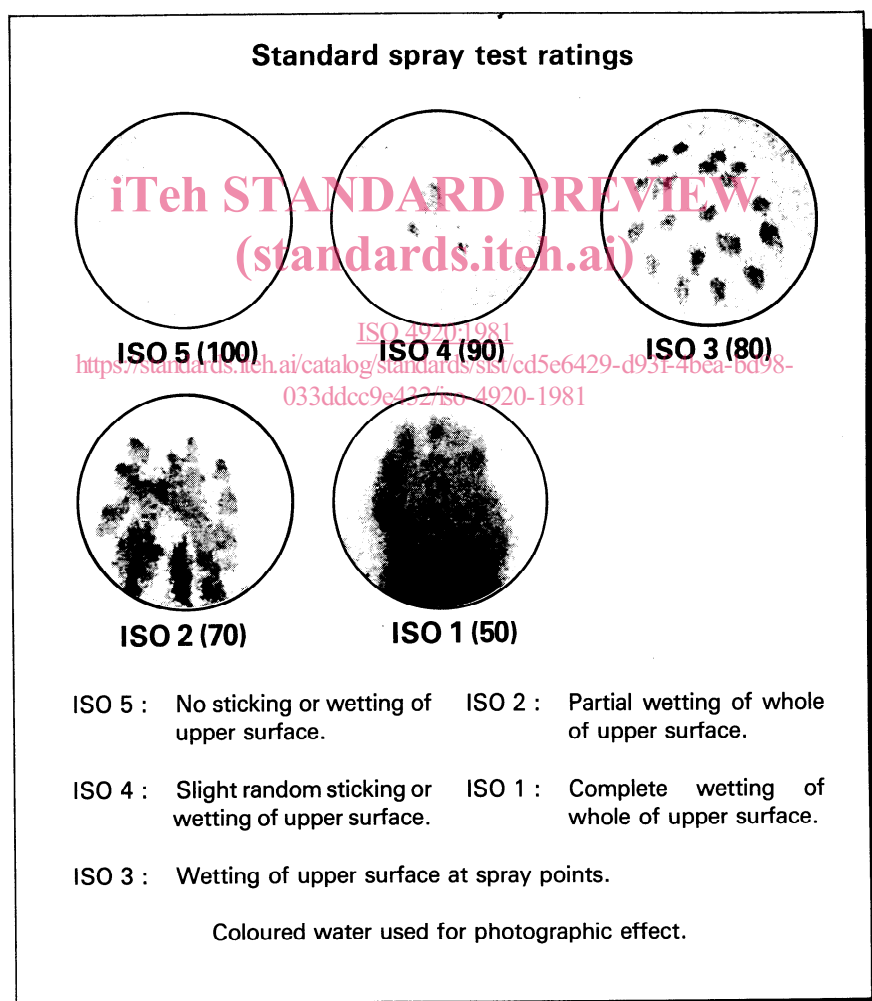
ISO 1 = AATCC 50

ISO 2 = AATCC 70

ISO 3 = AATCC 80

ISO 4 = AATCC 90

ISO 5 = AATCC 100



**Figure 3 — ISO spray test rating chart based on the AATCC photographic scale**

1) The AATCC (American Association of Textile Chemists and Colorists) scale is available commercially. Details may be obtained from the ISO Central Secretariat or from the Secretariat of ISO/TC 38.

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