
Rubber- or plastics-coated fabrics for water-resistant clothing — Specification

*Supports textiles revêtus de caoutchouc ou de plastique pour
vêtements imperméables à l'eau — Spécifications*

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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 8096 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

It cancels and replaces ISO 8096-1:1989, ISO 8096-2:1989 and ISO 8096-3:1988, which have been technically revised and combined into a single document.

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1 Scope

This International Standard specifies the requirements for water vapour permeable and non water vapour permeable coated fabrics suitable for use in the construction of water penetration resistant clothing. This standard does not address the method of fabrication of the garment. However, the physical requirements attributed to water penetration resistance of the final garment should in no way be inferior to those listed for the coated fabric.

NOTE The coding system applicable to the coating polymer(s) employed in the manufacture of these coated fabrics is given in Table 1.

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 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test* ISO 8096:2005
<https://standards.iteh.ai/catalog/standards/sist/c68522f7-1336-48bb-8c51-109b6858a819/iso-8096-2005>

ISO 105-C02, *Textiles — Tests for colour fastness — Part C02: Colour fastness to washing: Test 2*

ISO 105-D01, *Textiles — Tests for colour fastness — Part D01: Colour fastness to dry cleaning*

ISO 105-D02, *Textiles — Tests for colour fastness — Part D02: Colour fastness to rubbing: Organic solvents*

ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing*

ISO 811, *Textile fabrics — Determination of resistance to water penetration — Hydrostatic pressure test*

ISO 1419, *Rubber- or plastics-coated fabrics — Accelerated-ageing tests*

ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

ISO 3207, *Statistical interpretation of data — Determination of a statistical tolerance interval*

ISO 3303, *Rubber- or plastics-coated fabrics — Determination of bursting strength*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

ISO 4920, *Textiles — Determination of resistance to surface wetting (spray test) of fabrics*

ISO 5470-2, *Rubber- or plastics-coated fabrics — Determination of abrasion resistance — Part 2: Martindale abrader*

ISO 5978, *Rubber- or plastics-coated fabrics — Determination of blocking resistance*

ISO 6330:2000, *Textiles — Domestic washing and drying procedures for textile testing*

ISO 6451, *Plastics coated fabrics — Polyvinyl chloride coatings — Rapid method for checking fusion*

ISO 7500-1:2004, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

ISO 7854:1995, *Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing*

EN 471, *High-visibility warning clothing for professional use — Test methods and requirements*

BS 3424-38, *Testing coated fabrics — Part 38: Determination of wounded burst strength*

3 Terms and definitions

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

3.1

coated fabric

material composed of two or more layers, at least one of which is a textile material (woven, knitted or non-woven) and at least one of which is a substantially continuous polymeric film, bonded closely together by means of an added adhesive or by the adhesive properties of one or more of the component layers

3.2

water penetration resistance

WPR

ability of a coated fabric to withstand a hydrostatic head pressure when tested in accordance with ISO 811 at a rate of increase of pressure of 60 cmH₂O/min

NOTE 1 It is recommended that the term “water penetration resistant” should not be applied to any coated fabric that does not exhibit a WPR greater than 10 kPa (approx. 100 cmH₂O) when tested in the “as received” condition. The term “water-proof” is a deprecated term, which implies that the water penetration resistance of a coated fabric is equivalent to its hydraulic bursting strength.

NOTE 2 1 cmH₂O = 98,066 5 Pa.

3.3

water vapour permeable

ability of a coated fabric to transmit water vapour above a specified level whilst maintaining a high degree of water penetration resistance

3.4

water vapour permeability index

WVPI

water vapour permeability of a material expressed as a percentage of a known reference standard

3.5

delamination

partial or whole separation of two, or more, of the component layers of a coated fabric

NOTE This can be either a fabric to polymer separation or a separation within the actual polymeric layer.

3.6

single-texture coated fabric

single-faced coated fabric

coated fabric in which one face is composed of the coating polymer and the reverse is the textile substrate

3.7**double-faced coated fabric**

coated fabric in which both faces are composed of a coating polymer

3.8**double-textured coated-fabric**

coated fabric in which both faces of the coated fabric are of a textile nature

4 Marking and information

Each roll of coated fabric shall have a label attached bearing the following information:

- a) the name and/or distinctive mark of the manufacturer and a means of identifying the manufacturing batch number;
- b) the number of this International Standard and the supplier's quality code relating to the material.

5 Sampling

Samples shall be taken that are representative of the manufacturing batch from which they are drawn.

6 Testing and compliance**6.1 Population size**

The minimum performance values specified in Table 3 and Table 4 shall apply to the manufacturing batch as a whole.

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6.2 Tests on each sample

The tests shall be conducted as specified in Tables 3 and 4 on test pieces extracted from each sample.

6.3 Burst and tear strength tests

In the event of any individual burst or tear strength result being lower than the minimum value specified in Table 4, the results of the series of such tests shall be subject to analysis in accordance with the provisions of Annex B.

6.4 Pass/fail tests

If any of the test pieces tested for the properties specified in Table 3 and Table 4, excepting burst and tear strength, fails to conform to the requirements specified in Table 3 and Table 4, the tests which the test piece has failed shall be repeated twice. For this purpose, two further samples shall be taken from the same source as the original sample and test pieces shall be taken from each sample so that duplicate tests may be conducted.

If all the re-test results comply with the relevant requirements of Table 3 and/or Table 4, the bulk of the coated fabric that the samples represent shall be deemed to comply with this International Standard. If any of the results of the re-tests are not in accordance with the relevant requirements of Table 3 and/or Table 4, the bulk of the coated fabric that the samples represent shall be deemed not to conform to this International Standard.

7 Performance

7.1 Water penetration and mechanical properties

When tested by the appropriate method given in Tables 3 and 4, the coated fabric shall conform to the minimum requirements specified in Tables 3 and 4.

7.2 Colour fastness and other physical properties

When tested by the appropriate method given in Table 4, the coated fabric shall conform to the requirements specified in Table 4.

The colour-fastness ratings specified in Table 4 shall apply to those surfaces of the coated fabric which are exposed, either as an inner or as an outer surface of the garment.

If the coated fabric is not exposed as a garment surface (e.g. a drop liner), the colour fastness to light requirements in Table 4 shall not apply.

7.3 Delamination

There shall be no evidence of delamination when the test piece is viewed without magnification after any of the tests given in Table 3 and tests 5, 6, 8, 9 and 10 in Table 4.

7.4 Colour

Where colours from EN 471 are employed, colour assessment shall be conducted in accordance with that standard.

Table 1 — Designation codes for specific coating polymers and accelerated-ageing procedures required

Polymer	Designation	Accelerated-ageing procedure
Polyurethane	PU (AU or EU)	168 h in accordance with ISO 1419 followed by three wash cycles in accordance with washing procedure 6A of ISO 6330:2000 (see Annex D)
Silicone elastomer	Q	
Acrylic or any other coating containing one or more polyurethane and/or silicone elastomers	AC	
Natural rubber	NR	168 h in accordance with ISO 1419
Polychloroprene	CR	
Butadiene-acrylonitrile	NBR	
Chlorosulfonated polyethylene	CSM	
Poly(vinyl chloride)	PVC	

Table 2 — Product identification codes

Code	Brief description of use
A	Material for use in conjunction with an outer shell for leisure or workwear
B	Long-duration light-activity outer or lining material
C	Long-duration medium- to high-activity outer material
D	Long-duration activity outer workwear
E	Long-duration arduous activity outer workwear
NOTE The classification is for guidance only, and is not intended to exclude other permutations or to be limited to the end-uses indicated.	

Table 3 — Minimum requirements for water penetration resistance (WPR)

Property kPa	Requirement					Test method
	Identification code					
	A	B	C	D	E	
1. Minimum WPR after flexing	150	300	300	450	600	Annex C
2. Minimum WPR after ageing and flexing	150	250	250	300	450	Annex D
3. Minimum WPR after abrasion (where applicable)	As required by the final garment end-use specification					Annex E
4. Minimum WPR after dry cleaning (PU-coated fabric only)	150	150	150	200	250	Annex F

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Table 4 — Other physical requirements and colour fastness

Property	Requirement					Test method
	Identification code					
	A	B	C	D	E	
1. Minimum bursting strength (N)	150	500	1 000	2 000	3 000	ISO 3303
2. Minimum wounded tear (N) (irrespective of tearing direction)	100	150	250	350	500	BS 3424-38
3. Minimum water vapour permeability: WVPI (%) WVP (g/m ² /24 h) (see Note 1)	70 560	55 440	60 480	60 480	45 360	Annex I Annex I
4. Spray rating of designated outer	Minimum 4 for all codes					ISO 4920
5. Blocking after ageing — all combinations, excluding washing, where relevant (see Note 2)	Separation without damage to the polymeric coated film					ISO 5978
6. Low-temperature crack resistance (kPa)	6	6	10	10	20	Annex G
7. Colour fastness to light on designated outer surface (see Note 3)	Minimum 4 to 5 for all codes					ISO 105-B02
8. Colour fastness to washing: Maximum change in shade Staining	3 to 4 for all codes; no delamination Minimum 3 to 4 for all codes					ISO 105-C02 (liquor ratio 50:1)
9. Colour fastness to dry cleaning (PU only): Maximum change in shade Staining	4 to 5; no delamination Maximum 4 to 5; no delamination					ISO 105-D02
10. Colour fastness to rubbing	Minimum 4 to 5 for both faces					ISO 105-X12
11. Fusion check (PVC only)	No cracking or disintegration					ISO 6451
12. Wet coating adhesion strength (N/50 mm)	Not relevant		35	40	60	Annex H
NOTE 1 This method of test relies on an air-gap between the water and the test piece. The results cannot be compared with those from test methods that have the water in direct contact with the test piece, which leads to significantly higher values of WVP expressed in g/m ² /24 h.						
NOTE 2 Blocking tests are unnecessary when double-textured materials are involved.						
NOTE 3 Where fluorescent colours are specified within the limits outlined in EN 471, it is recommended that the colour fastness be in accordance with that standard.						

Annex A (normative)

Method of sampling and selecting test pieces

- A.1** In the event of dispute, the sampling requirements in Clauses A.2 to A.6 shall apply.
- A.2** Select a sample from each manufacturing batch identified as such in accordance with Clause 4, at the frequency of not less than one sample per 1 000 running metres.
- A.3** Unless otherwise specified by the purchaser, select samples from the end of the roll of coated fabric.
- A.4** The size of samples taken from each manufacturing batch shall be such that the aggregate size of the samples is sufficient to enable test pieces to be selected for the purposes of fulfilling the test requirements in Tables 3 and 4.
- A.5** The test pieces shall be selected from the samples taken in accordance with A.4, such that all samples are represented by test pieces in each of the tests conducted in accordance with the requirements of Tables 3 and 4.
- A.6** In the case of multi-colour samples, all colours shall be represented in the test pieces selected for colour-fastness testing in accordance with Table 4.

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