



**SLOVENSKI STANDARD**  
**oSIST prEN 343:2017**  
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**Varovalna obleka - Zaščita pred dežjem**

Protective clothing - Protection against rain

Schutzkleidung - Schutz gegen Regen

Habillement de protection - Protection contre la pluie

**Ta slovenski standard je istoveten z: EN prEN 343**

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English Version

## Protective clothing - Protection against rain

Habillement de protection - Protection contre la pluie

Schutzkleidung - Schutz gegen Regen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 162.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Contents

	Page
European foreword.....	4
Introduction .....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions .....	7
4 Performance assessment and requirements .....	7
4.1 General requirements and innocuousness.....	7
4.2 Resistance to water penetration, <i>WP</i> .....	8
4.3 Water vapour resistance, $R_{ct}$ .....	9
4.4 Tensile strength of the woven outer shell material.....	9
4.5 Tear resistance of the woven outer shell material .....	9
4.6 Bursting strength of the knitted outer shell material.....	10
4.7 Dimensional change of the protective clothing.....	10
4.8 Seam strength of the outer shell material.....	10
4.9 Waterproofness of a readymade garment (optional) .....	10
5 Pretreatment .....	10
5.1 General.....	10
5.2 Pretreatment by cleaning.....	10
5.3 Pretreatment by abrasion.....	11
5.4 Pretreatment by repeated flexing.....	11
5.5 Pretreatment with fuel and oil.....	11
6 Test methods .....	12
6.1 Sampling.....	12
6.2 General requirements and innocuousness.....	12
6.3 Water penetration, <i>WP</i> .....	12
6.4 Water vapour resistance, $R_{et}$ .....	12
6.5 Tensile strength.....	12
6.6 Tear resistance.....	13
6.7 Bursting strength .....	13
6.8 Dimensional change after cleaning .....	13
6.9 Testing of seam strength .....	13
6.10 Testing the waterproofness of a readymade garment (optional) .....	13
6.11 Ageing.....	13
7 Size designation .....	13
8 Marking and care labelling.....	14
9 Information supplied by the manufacturer.....	14
Annex A (informative) Recommendations for wearing time .....	15
Annex B (informative) Test device for one sided exposure to fuel and oil .....	16
Annex C (informative) Significant changes between this document and the previous edition ...	17
Annex ZA (informative) Relationship between this European Standard and the essential requirements of EU Directive 89/686/EC aimed to be covered.....	18

**Annex ZB (informative) Relationship between this European Standard and the essential requirements of Regulation (EU) 2016/245 of the European parliament and of the Council of 9 March 2016 on personal protective equipment aimed to be covered ..... 19**

**Bibliography ..... 20**

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SIST EN 343:2019

<https://standards.iteh.ai/catalog/standards/sist/c05b82bb-fe89-4891-a885-a02c6908b5dc/sist-en-343-2019>

**prEN 343:2017 (E)**

## **European foreword**

This document (prEN 343:2017) has been prepared by Technical Committee CEN/TC 162 “Protective clothing including hand and arm protection and lifejackets”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 343:2003+A1:2007.

A list of the significant technical changes compared to the previous edition can be found in Annex C.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA and ZB, which are integral parts of this document.

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## Introduction

In this European Standard the measured properties of materials and seams of protective clothing and their subsequent classification are intended to ensure an adequate protection level. Water proofness and water vapour resistance are the essential properties tested and marked on the label.

Water proofness is the most important property and it is measured on material of the outer garment layer. Tests are made on pretreated fabric samples and on parts with seams.

A test method for an optional readymade garment test after cleaning is described (rain tower test). Some waterproof materials are impermeable to water vapour transmission. However other materials on the market combine water proofness with water vapour permeability. This property expressed by low water vapour resistance enhances sweat evaporation and significantly contribute to body cooling. This is valuable, because it contributes to better comfort and less physiological strain and prolongs the wearing time in certain climatic conditions (see Annex A).

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## 1 Scope

This European Standard specifies requirements and test methods applicable to ready-made garments, materials and seams of protective clothing against the influence of precipitation (e.g. rain, snowflakes), fog and ground humidity.

## 2 Normative references

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

EN 388:2016, *Protective gloves against mechanical risks*

EN 530:2010, *Abrasion resistance of protective clothing material - Test methods*

EN 14360:2004, *Protective clothing against rain - Test method for ready made garments - Impact from above with high energy droplets*

EN 20811:1992, *Textiles - Determination of resistance to water penetration - Hydrostatic pressure test*

EN ISO 1421:2016, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break (ISO 1421:2016)*

EN ISO 4674-1:2016, *Rubber- or plastics-coated fabrics - Determination of tear resistance - Part 1: Constant rate of tear methods (ISO 4674-1:2016)*

EN ISO 7854:1997, *Rubber- or plastics-coated fabrics - Determination of resistance to damage by flexing (ISO 7854:1995)*

EN ISO 12947-1:1998, *Textiles - Determination of the abrasion resistance of fabrics by the Martindale method - Part 1: Martindale abrasion testing apparatus (ISO 12947-1:1998)*

EN ISO 13688:2013, *Protective clothing - General requirements (ISO 13688:2013)*

EN ISO 13934-1:2013, *Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1:2013)*

EN ISO 13935-2:2014, *Textiles - Seam tensile properties of fabrics and made-up textile articles - Part 2: Determination of maximum force to seam rupture using the grab method (ISO 13935-2:2014)*

EN ISO 13938-1:1999, *Textiles - Bursting properties of fabrics - Part 1: Hydraulic method for determination of bursting strength and bursting distension (ISO 13938-1:1999)*

EN ISO 13938-2:1999, *Textiles - Bursting properties of fabrics - Part 2: Pneumatic method for determination of bursting strength and bursting distension (ISO 13938-2:1999)*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*



### 3 Terms and definitions

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

#### 3.1

##### **water vapour resistance**

$R_{et}$

water-vapour pressure difference between the two faces of a material divided by the resultant evaporative heat flux per unit area in the direction of the gradient

Note 1 to entry: It is a quantity specific to textile materials or composites, which determines the “latent” evaporative heat flux across a given area in response to a steady applied water-vapour pressure gradient. The evaporative heat flux can consist of both diffusive and convective components.

Note 2 to entry: The water-vapour resistance is expressed in square metres pascal per watt.

[SOURCE: EN ISO 11092:2014, 2.2]

#### 3.2

##### **resistance to water penetration**

$WP$

hydrostatic pressure supported by a material as a measure of the opposition to the passage of water through material

Note 1 to entry:  $WP$  is expressed in pascal.

#### 3.3

##### **outer shell material**

outermost material of which the protective clothing is made

#### 3.4

##### **liner**

insert with a waterproof property

#### 3.5

##### **thermal liner**

layer with a waterproof property providing additional thermal insulation

#### 3.6

##### **lining**

innermost material without waterproof property

### 4 Performance assessment and requirements

#### 4.1 General requirements and innocuousness

##### 4.1.1 General requirements

When tested in accordance with 6.2.1 the following requirements shall be met:

- The garment shall not have rough, sharp or hard surfaces that irritate or injure the user.
- The jacket/coat or coverall shall be closable up to the collar or neckband and shall be long enough to cover the tops of the trousers.

**prEN 343:2017 (E)**

- External pockets shall be closable.
- Closures, such as slide fasteners, fasteners, buttons etc. shall not open inadvertently.
- Hoods attached permanently or as a removable accessory to the jacket shall not harm the wearer in cases where the working environment shows risks of being caught.
- Any restrictions of turning the head by stowed hoods shall be avoided or minimized.
- The manufacturer information shall address the required procedures for handling of the hood in certain working scenarios of intended use.

NOTE 1 Hoods are not a mandatory part of rain protection garments.

In situations where the comfort can be reduced by the weight of the garment, preliminary wearing tests are recommended.

Protective garments against rain are typically the outermost shell of a garment ensemble containing additional layers underneath. It has been demonstrated that the garment layers underneath can support the overall breathability and comfort heavily if they provide a moisture management capability. Garment layers which store moisture are inferior in this regard and shall be avoided.

For material testing the application of the single tests to each component is shown in Table 1.

**Table 1 — Application of performance tests on the components**

Property	Reference clause	Outer shell material	Liner or thermal liner	Lining
Resistance to water penetration (before and/or after pretreatment)	4.2	X (in combination if applicable)	X	
Water vapour resistance	4.3	X (in combination if applicable)	X	X
Tensile strength	4.4	X		
Tear resistance	4.5	X (wovens)		
Bursting strength	4.6	X (knits)		
Dimensional change	4.7	X (in combination if applicable)	X	X
Seam strength	4.8	X		

#### 4.1.2 Innocuousness

When tested in accordance with 6.2.2 the requirements of EN ISO 13688:2013, 4.2, shall be met with regard to innocuousness.

#### 4.2 Resistance to water penetration, *WP*

When tested in accordance with 6.3, resistance to water penetration *WP* of the outer shell material together with any applied waterproof layer shall be in accordance with Table 2.

If a specimen gets different classes of classification in the different tests for marking in accordance with Clause 6, the lowest class shall be indicated.

**Table 2 — Classification of resistance to water penetration**

Water penetration resistance $WP$	Class			
	1	2	3	4
Specimen to be tested				
— material before pre-treatment;	$WP \geq 8\,000$ Pa	no test required <sup>a</sup>	no test required <sup>a</sup>	no test required <sup>a</sup>
— material after each pre-treatment (see 5.2 to 5.5)	no test required	$WP \geq 8\,000$ Pa	$WP \geq 13\,000$ Pa	$WP \geq 20\,000$ Pa
— seams before pre-treatment	$WP \geq 8\,000$ Pa	$WP \geq 8\,000$ Pa	$WP \geq 13\,000$ Pa	no test required <sup>b</sup>
— seams after cleaning (see 5.2)	no test required	no test required	no test required	$WP \geq 20\,000$ Pa
NOTE 1 For each class several requirements shall be met.				
NOTE 2 1000 [Pa] approximately 101.974 [mmH <sub>2</sub> O]				
a No test required because the worst case situation for classes 2,3 and 4 is after pretreatment.				
b No test required because the worst case situation for class 4 is after pretreatment				

#### 4.3 Water vapour resistance, $R_{et}$

When tested in accordance with 6.4, water vapour resistance  $R_{et}$  of all layers of the garment shall be in accordance with Table 3.

**Table 3 — Classification of water vapour resistance**

Water vapour resistance $R_{et}$	Class			
	1	2	3	4
$\frac{m^2 \cdot Pa}{W}$	$R_{et}$ above 40	$20 < R_{et} \leq 40$	$10 < R_{et} \leq 20$	$R_{et} \leq 10$
<b>WARNING — All classes can result in a restricted wearing time, see Annex A.</b>				

#### 4.4 Tensile strength of the woven outer shell material

When tested in accordance with 6.5, the outer shell material shall withstand a minimum tensile force of 450 N in both orthogonal directions of the material. For materials with an elongation of more than 50 % this requirement is not applicable.

#### 4.5 Tear resistance of the woven outer shell material

When tested in accordance with 6.6 the outer shell material shall withstand a minimum tearing force of 20 N in both orthogonal directions of the material.