

BS EN ISO 8936:2017



BSI Standards Publication

# **Awnings for leisure accommodation vehicles — Requirements and test methods**

**National foreword**

This British Standard is the UK implementation of EN ISO 8936:2017. It supersedes BS EN ISO 8936:2009 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee SW/136/11, Sleeping bags and tents.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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## Awnings for leisure accommodation vehicles - Requirements and test methods (ISO 8936:2017)

Auvents pour véhicules de loisirs habitables -  
Exigences et méthodes d'essai (ISO 8936:2017)

Vorzelte für bewohnbare Freizeitfahrzeuge -  
Anforderungen und Prüfverfahren (ISO 8936:2017)

This European Standard was approved by CEN on 21 December 2016.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## **European foreword**

This document (EN ISO 8936:2017) has been prepared by Technical Committee ISO/TC 83 "Sports and other recreational facilities and equipment" in collaboration with Technical Committee CEN/TC 136 "Sports, playground and other recreational facilities and equipment" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2017 and conflicting national standards shall be withdrawn at the latest by July 2017.

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

This document supersedes EN ISO 8936:2009.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### **Endorsement notice**

The text of ISO 8936:2017 has been approved by CEN as EN ISO 8936:2017 without any modification.

# Contents

Page

<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Classification of awnings</b> .....	<b>5</b>
4.1 Winter awning (Type W).....	5
4.2 Residential awning (Type R).....	5
4.3 Touring awning (Type T).....	6
4.4 Light-weight awning (Type L).....	6
<b>5 Requirements</b> .....	<b>6</b>
5.1 Dimensions.....	6
5.1.1 General.....	6
5.1.2 Entrance/exit dimensions.....	6
5.1.3 Standing height.....	6
5.1.4 Awning perimeter size.....	6
5.2 Fabrics.....	7
5.2.1 General.....	7
5.2.2 Coated or laminated roofs made of fabrics for types W, R, T and L.....	8
5.2.3 Non-coated roofs made of fabrics for types W, R, T, and L.....	8
5.2.4 Coated or laminated walls made of fabrics for types W, R, T, and L.....	8
5.2.5 Non-coated walls made of fabrics for types W, R, T, and L.....	8
5.2.6 Resistance to cracking at low temperatures.....	9
5.2.7 Dimensional stability.....	9
5.2.8 Colour fastness.....	9
5.2.9 Resistance to weathering.....	9
5.2.10 Flammability.....	10
5.3 Zip fasteners.....	10
5.4 Frame assembly.....	10
5.5 Guying and ground fastening.....	11
5.6 Metallic parts.....	12
5.7 Awning attachment to the vehicle.....	12
5.8 Ventilation.....	12
5.9 Draught exclusion.....	12
5.9.1 External mud wall.....	12
5.9.2 Internal mud wall.....	12
5.10 Window-cover.....	12
5.11 Rain resistance.....	12
5.12 Resistance to roof load.....	13
5.13 Accessories.....	13
5.14 Means of escape.....	13
<b>6 Testing</b> .....	<b>13</b>
6.1 General.....	13
6.2 Zip fasteners.....	13
6.3 Frame assembly.....	14
6.3.1 Test of load capacity.....	14
6.3.2 Corrosion.....	14
6.3.3 Testing of the shearing and crushing points.....	14
6.4 Guying system, ground fastening and mud wall pegging points.....	15
6.4.1 Guying system.....	15
6.4.2 Ground fastening and mud wall pegging points.....	15
6.5 Awning attachment (channel cord).....	16

6.6	Rain resistance.....	16
6.6.1	General.....	16
6.6.2	Rain-shower test.....	17
6.6.3	Resistance of seams and material to water ingress from pooled water (trough test).....	17
<b>7</b>	<b>Marking.....</b>	<b>18</b>
7.1	Warning notices.....	18
7.2	Product identification.....	19
<b>8</b>	<b>Information supplied by the manufacturer.....</b>	<b>19</b>
8.1	Information at the point of sale.....	19
8.2	Information accompanying the awning.....	20
<b>Annex A (informative) Warning notice for fire prevention and ventilation advice.....</b>		<b>22</b>
<b>Annex B (informative) Warning notice fire flame retardant precautions.....</b>		<b>24</b>
<b>Annex C (informative) Example for the display of information at the point of sale.....</b>		<b>25</b>
<b>Bibliography.....</b>		<b>26</b>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see the following URL: <http://www.iso.org/iso/foreword.html>

The committee responsible for this document is ISO/TC 83, *Sports and other recreational facilities and equipment*.

This fourth edition cancels and replaces the third edition (ISO 8936:2007) which has been technically revised.

The main changes include the following:

- a) terms and definitions updated;
- b) new type of awnings "Light-weight awnings (Type L)" added;
- c) roofs and walls divided into "coated and laminated" and "non-coated";
- d) in [5.1.3](#) "Awning perimeter size", the relation between awning and vehicle clarified;
- e) in [5.2.1](#) "General", requirements inner tents specified in regard to ISO 5912;
- f) in [5.8](#) "Ventilation", requirements for sewn in ground sheets formulated;
- g) in [5.12](#) "Resistance to roof loading", requirements modified;
- h) in [6.6.2](#) "Rainshower test", test method modified;
- i) in [6.6.3](#) "Resistance of seams and material to water ingress from pooled water (trough test)", test method for seam tightness simplified and two new figures added;
- j) [Clause 7](#) "Marking" modified and restructured;
- k) [Clause 8](#) "Information supplied by the manufacturer", modified and restructured;
- l) warning notices transformed into annexes;
- m) new [Annex C](#) added as an example for customer information prior to purchase.

## Introduction

### General

The principal objective of this document is to simplify it from previous editions. It combines test requirements and product requirements into one document, providing manufacturers, specifiers and consumers with a single reference point for the safety and quality performance of awnings.

The traditional frame assembly mechanism for awnings has been a system of structural tubular or sectioned metal poles. This has recently evolved to include flexible pole systems and inflatable tube systems. Over the course of revision of this document it has been possible to consider some but not all aspects of these changes. In particular no specific requirements have been given for inflatable systems. It is intended that these will be addressed if required at the next revision.

### Environmental considerations

Every product affects the environment in the course of its lifecycle from raw material acquisition through production, distribution and use, to disposal. Environmental impacts are consequences of the consumption of energy and resources and the generation of waste, as well as the emission of substances into air, water and soil. The magnitude of the environmental impacts during the various lifecycle changes depends on a number of choices made in the design of the product, such as the materials used, production methods, and considerations related to maintenance and recycling. Manufacturers and distributors of awnings for leisure accommodation vehicles should consider the environmental impact of their product by, for example:

- avoiding the use of environmentally harmful substances;
- selecting the best available technology and techniques to reduce consumption of energy and materials;
- considering use of recycled materials for product and packaging;
- encouraging responsible end of life disposal by the user including guidance on separation and identification of any recyclable components and packaging;
- using materials, components, and manufacturing facilities which have declared documented;
- environmental policies.



# Awnings for leisure accommodation vehicles — Requirements and test methods

## 1 Scope

This document specifies requirements, test methods and material performance characteristics for vehicle awnings. It applies to awnings intended to be pitched and struck.

This document is not applicable to:

- a) sun awnings: structure detachable from the vehicle which is used to provide shelter from the sun, but is not designed or constructed to provide shelter from wind, rain or snow;

NOTE 1 A sun awning can be used with additional front and side panels to form an enclosure, but this enclosure would not meet the requirements of an awning as defined in this document.

- b) external blinds: structure permanently fixed to a vehicle which is used to provide shelter from the sun, but is not designed or constructed to provide shelter from wind, rain or snow;

NOTE 2 An external blind can be used with additional front and side panels to form an enclosure, but this enclosure would not meet the requirements of an awning as defined in this document.

- c) fixed awnings: permanent awning which is not designed for mobile use.

EXAMPLE Awnings equipped with square aluminium frames or timber supporting structures and the possibility to install living compartment windows and doors.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 105-B04, *Textiles — Tests for colour fastness — Part B04: Colour fastness to artificial weathering: Xenon arc fading lamp test*

ISO 105-E01, *Textiles — Tests for colour fastness — Part E01: Colour fastness to water*

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 1421, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break*

ISO 2081, *Metallic and other inorganic coatings — Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 4675:1990, *Rubber- or plastics-coated fabrics — Low-temperature bend test*

ISO 4892-2:2013, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 5912:2011, *Camping tents*

ISO 6925, *Textile floor coverings — Burning behaviour — Tablet test at ambient temperature*

ISO 6941:2003, *Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens*

ISO 7152, *Camping tents and caravan awnings — Vocabulary and list of equivalent terms*

ISO 7771, *Textiles — Determination of dimensional changes of fabrics induced by cold-water immersion*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

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

ISO 13937-2, *Textiles — Tear properties of fabrics — Part 2: Determination of tear force of trouser-shaped test specimens (Single tear method)*

EN 15977:2011, *Rubber or plastic coated fabrics — Mechanical properties — Determination of the elongation under load and the residual deformation*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7152 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **awning**

closable structure intended to be fixed to a stationary vehicle or to stand free of the vehicle

Note 1 to entry: Structures which are designed as awnings are considered as awnings even if they are free-standing, such as awning variations for caravans and motorised vehicles.

#### 3.2

##### **free-standing awning**

awning that will remain erected without support from a vehicle

#### 3.3

##### **outer awning dimensions**

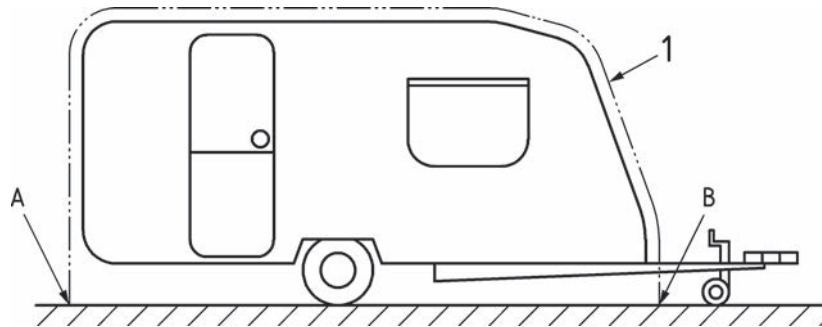
dimension of the smallest rectangular pitching space required for the awning, excluding guy lines

#### 3.4

##### **perimeter**

distance from point A, up round the awning channel, usually fitted around the edge of the vehicle and down to point B when the vehicle is parked, on level ground, with all corner steadies in contact with the ground

Note 1 to entry: See [Figure 1](#).



**Key**

- 1 perimeter
- A rear ground point
- B front ground point

**Figure 1 — Perimeter**

### 3.5 Depth at ground level

#### 3.5.1

##### **depth at ground level of an erected awning**

horizontal distance on the ground between the base of the vehicle wall and the base of the front edges of the awning

Note 1 to entry: This definition is applicable to awnings fixed to the awning rail.

Note 2 to entry: See [Figure 2](#).

#### 3.5.2

##### **depth at ground level of a free-standing awning**

horizontal distance on the ground between the base of the back edge and the base of the front edge of the awning

Note 1 to entry: The back edges and the front edges on the same side are used (do not measure in the diagonal direction).

Note 2 to entry: The flexible connection between the free-standing awning and the vehicle is not included in the depth at ground level.

### 3.6

##### **awning depth at standing height**

horizontal distance between the vehicle wall and the awning front wall at roof level

Note 1 to entry: See [Figure 2](#).

### 3.7

##### **overall depth**

horizontal distance between the vehicle wall and the foremost part of the awning, measured at right angles

Note 1 to entry: The overall depth contains the maximum flexible connection depth for free-standing awnings.

### 3.8

##### **outer fabric**

fabric of awning which, when used as intended, is directly subjected to weather

**3.9**  
**frame assembly**  
framework or part of an awning or free-standing awning that is designed to retain its shape laterally or longitudinally in normal usage

**3.10**  
**flexible connection**  
adjustable connection between a free-standing awning and the vehicle

Note 1 to entry: This protects the user when moving between the vehicle and the awning and is variable in dimension.

**3.11**  
**sealed awning**  
awning that has the groundsheet sewn to the flysheet to form a sealed enclosed area, or an awning with a draught-skirt

Note 1 to entry: Awnings with draught-skirts are not normally sealed awnings but there is the possibility of snow or sand building up on these draught-skirts which can restrict air circulation creating a sealed awning.

Note 2 to entry: The use of a sealed awning can result in a build-up of harmful gases within the awning.

**3.12**  
**standing height**  
vertical height measured from the ground or the upper side of the sewn in ground sheet to the underside of the roof fabric

Note 1 to entry: See [Figure 2](#).

**3.13**  
**awning depth at ground level**  
depth of awning perpendicular to the vehicle measured from the vehicle to the furthest point of the awning at ground level

Note 1 to entry: See [Figure 2](#).

**3.14**  
**awning width at standing height**  
maximum width of awning measured parallel to the vehicle at standing height

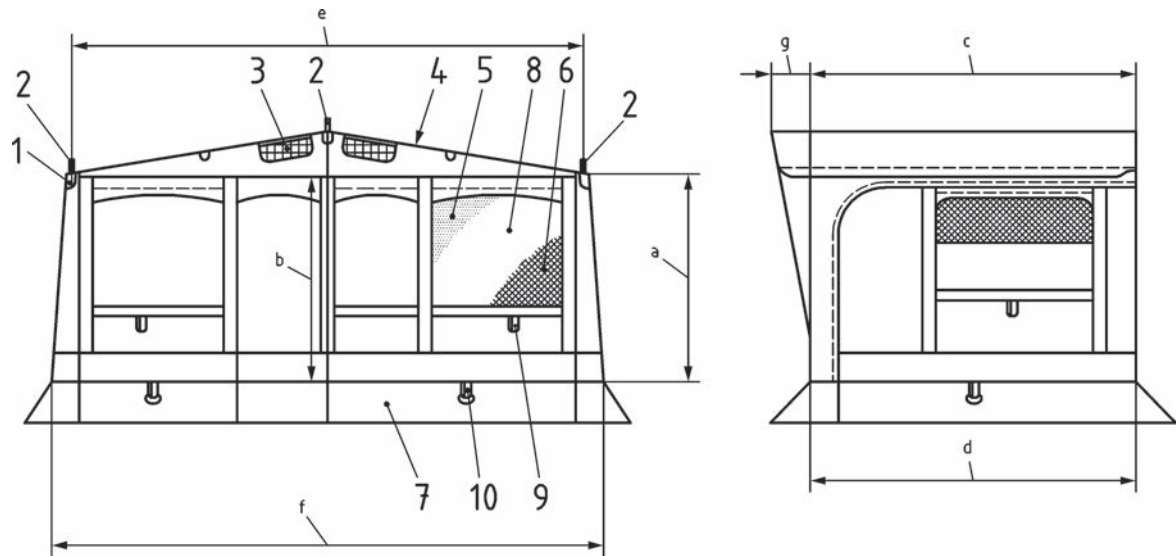
Note 1 to entry: See [Figure 2](#).

**3.15**  
**awning width at ground level**  
maximum width of awning measured parallel to the vehicle at ground level

Note 1 to entry: See [Figure 2](#).

**3.16**  
**canopy depth**  
maximum distance a canopy extends beyond a wall

Note 1 to entry: See [Figure 2](#).



### Key

1	corner guying point	10	ground anchorage
2	pole spike	a	Standing height.
3	vent (see ISO 7152)	b	Entrance height of a door or entrance.
4	roof	c	Awning depth at standing height.
5	window-cover	d	Awning depth at ground level.
6	window ventilation	e	Awning width at standing height.
7	mud wall	f	Awning width at ground level.
8	window	g	Canopy depth.
9	storm guying point		

NOTE The overall depth of the awning is not illustrated.

**Figure 2 — Illustration of parts and components of awnings**

## 4 Classification of awnings

### 4.1 Winter awning (Type W)

Awning suitable for all year round use with a roof load as specified in [5.12 a](#)).

### 4.2 Residential awning (Type R)

Awning suitable for continual use over extended periods including a light snow load and for a roof load as specified in [5.12 b](#)).

### 4.3 Touring awning (Type T)

Awning suitable for repeated pitching and striking and use at any time of the year but not in winter snow conditions with a roof load as specified in [5.12 c\)](#).

NOTE Striking is the act of dismantling and packing away an awning.

### 4.4 Light-weight awning (Type L)

Awning suitable for repeated pitching and striking which is characterized by ease of use and lightness with a total weight of  $< 2,75 \text{ kg/m}^2$  base area, and which is suitable for a roof load as specified in [5.12 d\)](#).

## 5 Requirements

### 5.1 Dimensions

#### 5.1.1 General

Where dimensions are provided in any information to the user they should be measured in centimetres by the manufacturer as a guide only in the approximate positions as indicated in [Figure 2](#)

#### 5.1.2 Entrance/exit dimensions

At least one entrance/exit shall have a height, measured from ground level, of  $\geq 1\,700 \text{ mm}$  at the highest point and a width of  $\geq 500 \text{ mm}$  measured at  $1\,500 \text{ mm}$  above the ground with entrance fully opened.

#### 5.1.3 Standing height

Awnings shall have a standing height of  $\geq 1\,800 \text{ mm}$ , over 70 % of the base area.

#### 5.1.4 Awning perimeter size

For those awnings fitting around the perimeter of a caravan, the range of perimeters within which it fits shall be indicated according to [Table 1](#).

**Table 1 — Awning perimeter sizes**

Size	Awning perimeter cm
1	595 to 619
2	620 to 644
3	645 to 669
4	670 to 694
5	695 to 718
6	719 to 742
7	743 to 766
8	767 to 790
9	791 to 814
10	815 to 839
11	840 to 864
12	865 to 889
13	890 to 914
14	915 to 939
15	940 to 964
16	965 to 989
17	990 to 1 014
18	1 015 to 1 039
19	1 040 to 1 064
20	1 065 to 1 089
21	1 090 to 1 114
22	1 115 to 1 139
23	1 140 to 1 164
24	1 165 to 1 189
25	1 190 to 1 234

NOTE 1 The selection of the awning from the perimeter measurement might not be sufficient. The vehicle manufacturer can specify the correct size. It is seen as beneficial if awning manufacturers can provide lists of which size of awnings fit various caravans and other leisure accommodation vehicles.

NOTE 2 Awning perimeter sizes are only applicable to those awnings that fit all the way around the perimeter of the caravan. The caravan perimeter dimension can vary due to the tyre dimensions or vehicle loading. For free standing awnings and porch awnings this dimension is not required.

## 5.2 Fabrics

### 5.2.1 General

The minimum requirements and test methods for the outer fabrics are specified in [5.2.2](#) to [5.2.10](#).

If an inner tent is provided, the performance requirements according to ISO 5912 apply.

NOTE Manufacturers who intend that their products conform to this document might consider the health and safety of the user, the environment and the upstream product chain. It is seen as beneficial to take into account the provisions of national law with respect to release of hazardous substances under foreseeable conditions of manufacture or normal use, including any which can result from decomposition and subsequent release (see References [8] and [9]).

### 5.2.2 Coated or laminated roofs made of fabrics for types W, R, T and L

Coated or laminated roofs shall fulfil the minimum requirements listed in [Table 2](#). The tests shall be performed on an awning in new condition in accordance with the test methods provided in [Table 2](#).

**Table 2 — Minimum requirements for coated or laminated roofs**

Characteristic	Type				Direction	Test method
	W	R	T	L		
Tensile strength (N)	1 800	500	1 000	500	Warp and weft	ISO 1421
Tearing strength (N)	80	10	20	10	Warp and weft	ISO 13937-2
Resistance against water penetration (kPa) <sup>a</sup>	150	25	40	25	—	ISO 811
<sup>a</sup> 1 kPa = 1 000 Pa = 10 mbar = 101,971 62 mmH <sub>2</sub> O = 10,197 162 cmH <sub>2</sub> O.						

### 5.2.3 Non-coated roofs made of fabrics for types W, R, T, and L

Non-coated roofs shall fulfil the minimum requirements listed in [Table 3](#). The tests shall be performed on an awning in new condition in accordance with the test methods provided in [Table 3](#).

**Table 3 — Minimum requirements for non-coated roofs**

Characteristic	Type				Direction	Test method
	W	R	T	L		
Tensile strength (N)	— <sup>a</sup>	— <sup>a</sup>	1 000	500	Warp and weft	ISO 13934-1
Tearing strength (N)	— <sup>a</sup>	— <sup>a</sup>	20	10	Warp and weft	ISO 13937-2
Resistance against water penetration (kPa) <sup>b</sup>	— <sup>a</sup>	— <sup>a</sup>	30	20	—	ISO 811
<sup>a</sup> Non-coated fabrics for awning type R and type W are not suitable for this application.						
<sup>b</sup> 1 kPa = 1 000 Pa = 10 mbar = 101,971 62 mmH <sub>2</sub> O = 10,197 162 cmH <sub>2</sub> O.						

### 5.2.4 Coated or laminated walls made of fabrics for types W, R, T, and L

Coated or laminated walls shall fulfil the minimum requirements listed in [Table 4](#). The tests shall be performed on an awning in new condition in accordance with the test methods provided in [Table 4](#).

**Table 4 — Minimum requirements for coated or laminated walls**

Characteristic	Type				Direction	Test method
	W	R	T	L		
Tensile strength (N)	1 800	1 800	1 000	500	Warp and weft	ISO 1421
Tearing strength (N)	80	80	20	10	Warp and weft	ISO 13937-2
Resistance against water penetration (kPa) <sup>a</sup>	150	100	40	25	—	ISO 811
<sup>a</sup> 1 kPa = 1 000 Pa = 10 mbar = 101,971 62 mmH <sub>2</sub> O = 10,197 162 cmH <sub>2</sub> O.						

### 5.2.5 Non-coated walls made of fabrics for types W, R, T, and L

Non-coated walls shall fulfil the minimum requirements listed in [Table 5](#). The tests shall be performed on an awning in new condition in accordance with the test methods provided in [Table 5](#).



**Table 5 — Minimum requirements for non-coated walls**

Characteristic	Type				Direction	Test method
	W	R	T	L		
Tensile strength (N)	1 800	650	600	300	Warp and weft	ISO 13934-1
Tearing strength (N)	80	18	15	10	Warp and weft	ISO 13937-2
Resistance against water penetration (kPa) <sup>a</sup>	100	80	30	20	—	ISO 811

<sup>a</sup> 1 kPa = 1 000 Pa = 10 mbar = 101,971 62 mmH<sub>2</sub>O = 10,197 162 cmH<sub>2</sub>O.

### 5.2.6 Resistance to cracking at low temperatures

The test shall be carried out in accordance with ISO 4675 at a test temperature of

- a) -20 °C for materials for awning type W,
- b) -10 °C for materials for awning type R,
- c) -10 °C for materials for awning type T, and
- d) -5 °C for materials for awning type L.

Only grade A cracks in accordance with ISO 4675:1990, 9.1, are permissible for all coated fabrics and PVC windows.

### 5.2.7 Dimensional stability

#### 5.2.7.1 Dimensional stability under the influence of moisture

When testing in accordance with ISO 7771, the dimensional change shall not be more than ± 3 % for a two-hour cycle.

#### 5.2.7.2 Dimensional stability under mechanical stress

When testing in accordance with EN 15977:2011, Table 1, column 1, the residual deformation shall not be more than +4 %.

### 5.2.8 Colour fastness

The fabrics shall reach at least the colour fastness grades in accordance with [Table 6](#):

**Table 6 — Outer fabrics for awnings**

Characteristic	Type				Test method
	W	R	T	L	
Colour fastness to light	6		5	4	ISO 105-B02
Colour fastness to weathering	5		4	3	ISO 105-B04
Colour fastness to water	5		4	4	ISO 105-E01
Colour fastness to rubbing, wet	4		4	4	ISO 105-X12

### 5.2.9 Resistance to weathering

All outer fabrics (roof, walls, etc.) shall show minimum resistance to natural sunlight, regardless of the awning type. This requirement is considered fulfilled if, after artificial weathering in accordance with ISO 4892-2:2013, method A, with test parameters in accordance with [Table 7](#), the tensile strength and

the resistance to water penetration are  $\geq 70\%$  of the minimum value specified for the type and part of the awning in [Tables 2](#) to [5](#).

**Table 7 — Test parameters in accordance with ISO 4892-2**

Parameter	Requirement
Test duration	180 h
Light source	Xenon-arc light (total radiant exposure)
Black-panel temperature	$(55 \pm 3) ^\circ\text{C}$
Relative humidity	$(65 \pm 5) \%$
Spraying/Drying cycle	18 min/102 min
Test specimen dimensions	Suitable for the test apparatus and for the test specimens for testing tensile strength and water tightness
Number of test specimens	At least 3
Expression of results	Mean value from at least three tests

## 5.2.10 Flammability

### 5.2.10.1 General

If the fabrics of awnings are claimed to have flame retardant properties they shall be tested when new and shall comply with the requirements in [5.2.10.2](#) and [5.2.10.3](#).

### 5.2.10.2 Outer material

When tested in accordance with ISO 6941:2003, Procedure A (using a 10 s ignition time, surface ignition), no marker threads shall be severed, there shall be no flaming debris, there shall be no flame to either vertical edge of the test specimen, no single sample shall show after-flame time exceeding 10 s, and the average after-flame time shall not exceed 6 s.

### 5.2.10.3 Groundsheet

When tested in accordance with ISO 6925, the radius of burn shall be  $< 35$  mm.

## 5.3 Zip fasteners

**5.3.1** The slider shall not be the same colour as the teeth and ribbon of the zip, unless a conspicuous handle of a different colour is attached to the slider. The minimum lateral strength of the zip fasteners in accordance with [6.2](#) shall be:

- a) 700 N for zip fasteners in all load-bearing outside walls (e.g. wind load-bearing walls);
- b) 300 N for zip fasteners for windows and window-covers.

**5.3.2** At least one of the pullers of the zip fasteners at each entrance shall be near the ground in the closed position. In addition they shall be capable of being operated from inside and outside.

## 5.4 Frame assembly

**5.4.1** The manufacturer shall consider means of adjustment and tensioning the frame or fabric to accommodate factors such as uneven ground, the effects of the weather and properties of the material.

If two frame components are fitted into each other, the lower component shall not become detached when subjected to a force equal to twice its own weight in the vertical position.

The upper part of a joint shall overlap the lower part, to avoid the ingress of water.

**5.4.2** Frame components which are not connected by spring links or other means shall be permanently marked or supplied with a detailed frame plan.

**5.4.3** The tapering on frame assembly components intended to be fitted into each other shall be at least as long as two times the outside diameter.

**5.4.4** Frame assemblies, when tested in accordance with [6.3.1](#), shall be free from damage or permanent deflection.

**5.4.5** Any parts of the frame which are accessible during use shall be free of sharp edges.

**5.4.6** It shall be possible to place all pole spikes of the frame tubes approximately in the vertical position or they shall be fitted with appropriate protection.

**5.4.7** Shearing and crushing points which only occur during pitching or folding are permissible under the prerequisite that it can be assumed of the user that he/she is in control of his/her movements and is capable of reducing without delay the expenditure of force if he/she feels pain.

The edges of shearing and crushing points shall be rounded-off or bevelled.

No accessible shearing and crushing points shall occur due to parts of the frame structure that are operated by mechanical devices, e.g. mechanical springs, gas lift.

No accessible shearing and crushing points shall occur which are caused by application of load during normal use.

NOTE The use of an automatic locking mechanism is the most suitable way to prevent this danger.

Test in accordance with [6.3.3](#).

## **5.5 Guying and ground fastening**

**5.5.1** Ground fastening systems shall have a breaking strength of  $\geq 350$  N, when tested in accordance with [6.4](#).

**5.5.2** Awnings shall have at least two guying points and free-standing awnings shall have at least four guying points.

When tested in accordance with [6.4](#), the guying system, including eyelet, upper and lower fastening and tensioning device (without ground tensioners), shall resist a breaking strength of  $\geq 500$  N.

NOTE A higher strength has been chosen for the guying system than for the fastening system, in order to allow for ageing, as these parts cannot be replaced.

**5.5.3** The distance between adjacent ground fastening points shall not exceed

- a) 500 mm for awning type W,
- b) 650 mm for awning type R,
- c) 750 mm for awning type T, or
- d) 750 mm for awning type L.

## 5.6 Metallic parts

All metallic parts shall be such that there is no change at the end of the test in accordance with [6.3.2](#), except minor changes of colour. In the case of enamelled or coated frame assembly components, there shall be no infiltration under the varnish of > 0,5 mm in accordance with ISO 9227.

## 5.7 Awning attachment to the vehicle

If the awning is fixed with a channel cord to a channel cord rail, it shall be tested in accordance with [6.5](#). It shall not be possible to pull the channel cord out of the test rail with a load of  $\leq 1\ 000$  N.

## 5.8 Ventilation

By the suitable choice of materials and product design, an awning shall enable circulation of air to prevent the build-up of toxic gases and reduce condensation. In order to provide a sufficient circulation of air, a minimum of 2 ventilation openings shall be provided, each of which shall be at least 500 cm<sup>2</sup>. These openings shall be of such a design that when opened they cannot be closed by prevailing weather conditions.

If the awning is constructed with a sewn in ground sheet similar to the construction of a camping tent the ventilation requirements according to ISO 5912 shall be met.

## 5.9 Draught exclusion

### 5.9.1 External mud wall

External mud walls where fitted shall have pegging points which are a maximum of

- a) 750 mm for awning type T,
- b) 750 mm for awning type L,
- c) 650 mm for awning type R, and
- d) 500 mm for awning type W

apart. The pegging points shall be resistant to tearing. This condition is fulfilled if the pegging points withstand the test in [6.4.2](#) without damage.

### 5.9.2 Internal mud wall

Internal mud walls where fitted shall have a height of  $\geq 300$  mm and shall overlap where they meet.

## 5.10 Window-cover

Windows which are not rainproof shall be provided with a window-cover which overlaps the window on all sides by  $\geq 100$  mm. On the vertical edges, the cover shall be provided with attachment points (e.g. toggles or hook and loop) at intervals of  $\leq 350$  mm. These requirements do not apply when zip fasteners or other continuous fasteners are used. The cover shall be provided with attachment points along the horizontal edges with a distance of  $\geq 900$  mm apart.

## 5.11 Rain resistance

When testing in accordance with [6.6.2](#), no water shall penetrate the awning interior.

All seams that are not taped shall be tested in accordance with [6.6.3](#) and are regarded as passed if:

- a) absorbent paper applied to the internal face seam (side not in contact with water in the test) after a 2 h test shall remain dry; and

- b) absorbent paper applied to the internal face seam (side not in contact with water in the test) after a 16 h test shall show no more than slight moisture spotting and there shall be no visible water drops on the seam or fabric.

### 5.12 Resistance to roof load

Awnings having all or parts of the roof at an angle  $\leq 30^\circ$  to the horizontal shall be tested in accordance with [6.3.1](#) and withstand the following loads without damage or changes reducing the functional capacity (show no cracks, no permanent deformation, no compromise to ability to assemble, disassemble and adjust the frame):

- a)  $(750 \pm 2)$  N/m<sup>2</sup> for awning type W;
- b)  $(200 \pm 2)$  N/m<sup>2</sup> for awning type R;
- c)  $(50 \pm 2)$  N/m<sup>2</sup> for awning type T;
- d)  $(25 \pm 2)$  N/m<sup>2</sup> for awning type L.

NOTE 1 These loads are inclusive of the supporting media for the load.

NOTE 2 The recommended supporting media is the foam as described in [6.3.1](#) as this will not slide of the sloping roof.

NOTE 3 It is considered that roofs with angles  $> 30^\circ$  have sufficient slope to not retain significant volumes of rain water or snow to cause damage to the awning.

### 5.13 Accessories

A sufficient number of pegs shall be supplied to meet the requirements specified in [5.5.3](#) and [5.9.1](#) and for all guyropes and storm straps supplied with the awning.

Guyropes shall be of a length sufficient to allow it to be fixed  $\geq 1\,000$  mm from the base of the awning.

Separate bags shall be supplied for the awning fabric, frame components and the pegs.

### 5.14 Means of escape

Awnings having a base area of  $> 5$  m<sup>2</sup> shall have at least one exit and a further means of escape directly to the outside.

NOTE A means of escape might be a window, a door, a removable panel etc.

## 6 Testing

### 6.1 General

If no specific tests are indicated in this document, the requirements specified in [Clause 5](#) shall be satisfied in a suitable way, e.g. by measurement, visual or manual assessment.

### 6.2 Zip fasteners

Test in accordance with ISO 5912:2011, 8.4.

## 6.3 Frame assembly

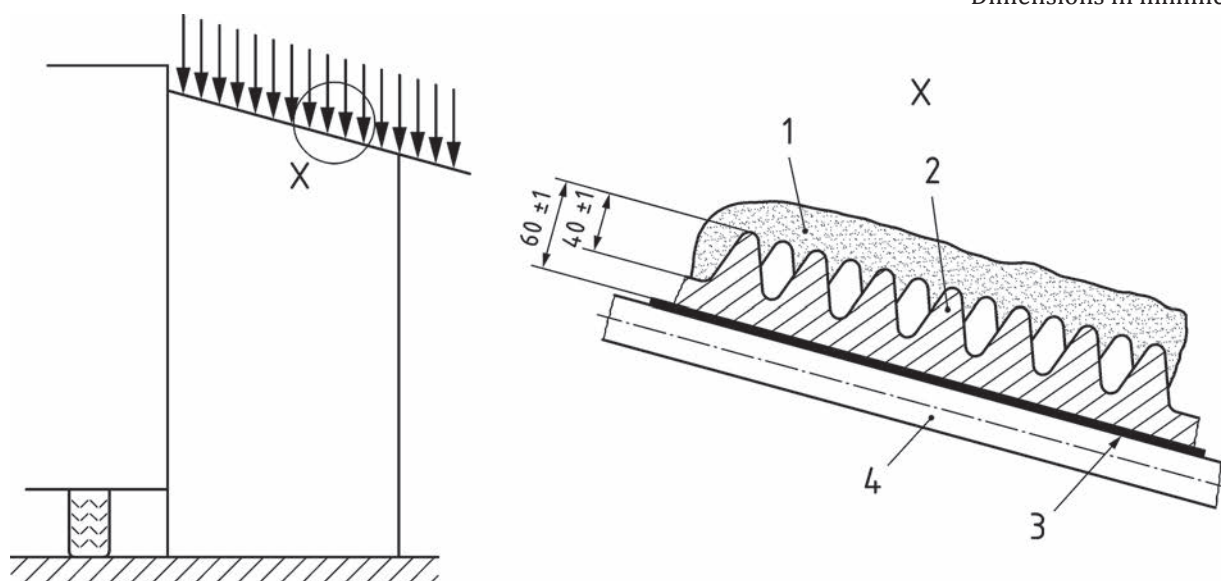
### 6.3.1 Test of load capacity

The total roof area of the awning with an angle of  $\leq 30^\circ$  to the horizontal shall be covered evenly with a load according to 5.12.

The loading time shall be 1 h.

NOTE A suggested method is to use a profiled soft-foam layer with the approximate dimensions given in Figure 3 and a density of approximately  $35 \text{ kg/m}^3$  being loaded with sand. The quantity of sand needed to achieve the weight is calculated by multiplying the projected roof area in square metres by the roof load specific to the type of awning (see 5.12) less the weight of the foam. The calculated quantity of sand might be distributed uniformly over the profiled foam layers (see Figure 3).

Dimensions in millimetres



#### Key

- 1 sand
- 2 profiled soft-foam layer
- 3 roof fabric
- 4 roof pole

Figure 3 — Test of load capacity

### 6.3.2 Corrosion

Subject the frame assembly components for 36 h to a neutral salt spray test (NSS test) in accordance with ISO 9227, or for 192 h to a test for basis metal corrosion (red rust) in accordance with ISO 2081.

### 6.3.3 Testing of the shearing and crushing points

Assemble the awning in accordance with the instructions supplied by the manufacturer and ensure that there are no accessible shear and squeeze points created by parts of the frame assembly operated by mechanisms such as mechanical springs, gas lifts, or by loads applied during normal use.

Inspect the edges of any shear and squeeze points visually and by hand to ensure they are rounded or chamfered.

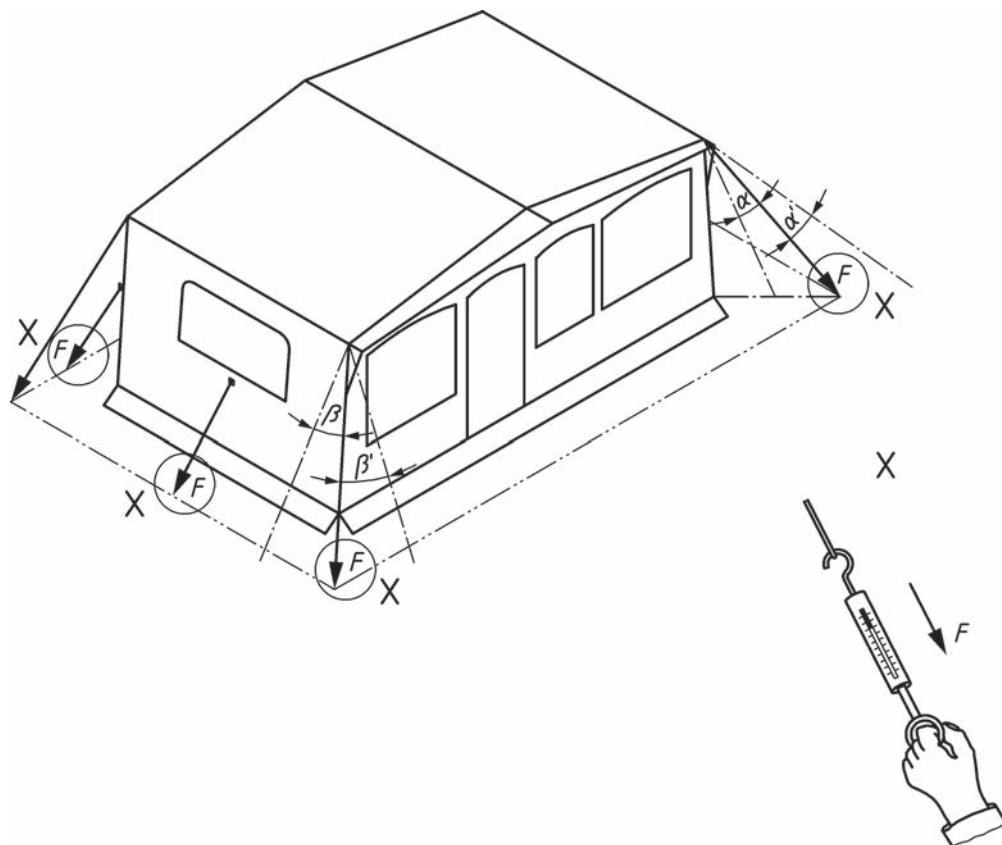
Where automated locking systems are used, ensure that they prevent the creation of any shear and squeeze points which might be created by loads applied during normal use.

## 6.4 Guying system, ground fastening and mud wall pegging points

### 6.4.1 Guying system

Assemble and pitch the awning according to the instructions supplied by the manufacturer and close the awning doors and windows.

Dismantle a guy and apply a tensile force in the direction of use on the respective parts of the guying system for a duration of 1 min (see [Figure 4](#)).



#### Key

$\alpha, \alpha'$  angle of deflection of the guy (parallel to the usual position of the ground fastening)

$\beta, \beta'$  angle of deflection of the guy (rectangular to the usual position of the ground fastening)

$F$  force

**Figure 4 — Strength test of the guying system**

If a ground fastening cannot be tested with a load in the direction of use, a static test on the components of the awning can be carried out.

### 6.4.2 Ground fastening and mud wall pegging points

A load of

- a) 400 N for awning type W,
- b) 400 N for awning type R,



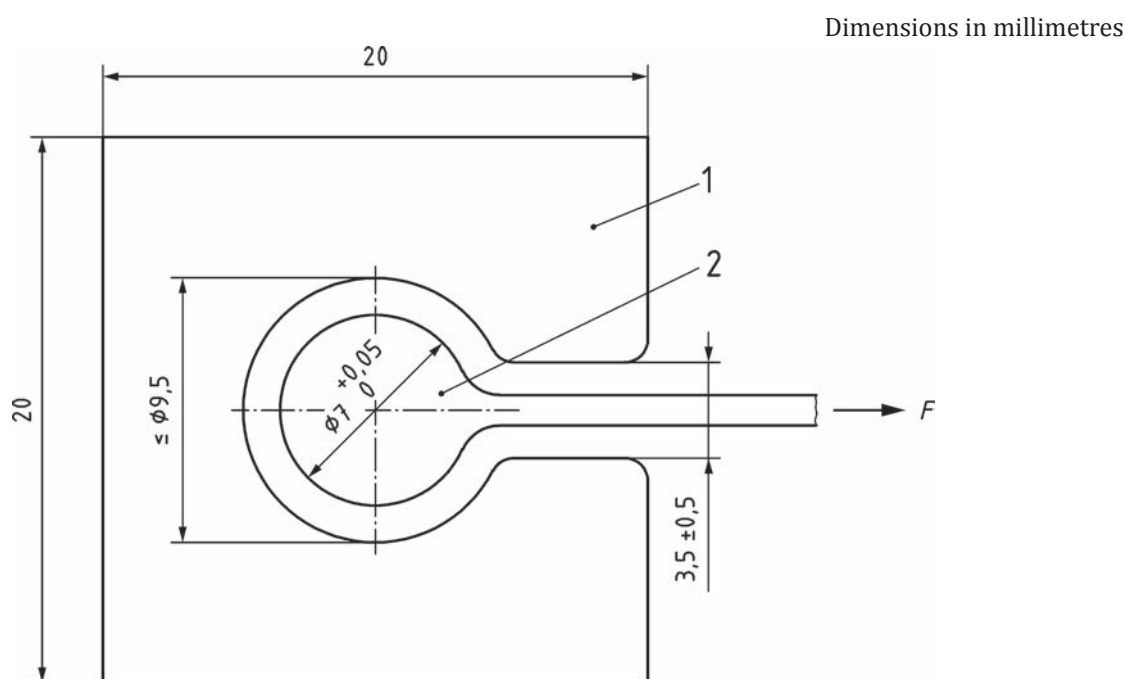
- c) 400 N for awning type T, and
- d) 300 N for type L

is applied for 1 min to the ground fastening or mud wall pegging points (see 6.4.1), using a 5 mm thick metal hook.

### 6.5 Awning attachment (channel cord)

Insert a test specimen comprising awning material attached as intended to channel cord, with a width of  $(200 \pm 5)$  mm into a section of test rail with a width of  $(100 \pm 2)$  mm allowing an even overlap at each side. The test rail may be held in a static position or may be held in one set of jaws on a Tensiometer. Clamp the the awning material sample centrally into a  $(50 \pm 2)$  mm wide jaw for tensile testing (see Figure 5). A static force of  $(1\ 000 \pm 10)$  N shall be applied without shock for 5 min.

Report whether the channel cord is pulled out of the test rail.



#### Key

- 1 test rail (metal)
- 2 channel cord
- F pulling force

Figure 5 — Test of resistance of awning attachment to being pulled out

## 6.6 Rain resistance

### 6.6.1 General

The awning shall be subjected to pre-treatment which consists of a rain-shower test and a subsequent drying phase in ambient conditions. After the awning has been completely dried, the tests according to 6.6.2 and 6.6.3 shall be performed.



### 6.6.2 Rain-shower test

Test in accordance with ISO 5912:2011, 8.3.3 and 8.3.4, with the window-covers in place as described in [5.11](#). For this test the awning shall be either pitched and fixed to a suitable vehicle, or closed as intended to be when the vehicle has been removed or have the open side sealed by other means. The tightness of the connection of the awning to the vehicle is not covered by this test.

### 6.6.3 Resistance of seams and material to water ingress from pooled water (trough test)

A seamed fabric test specimen is held in a frame such that it creates a trough which is filled with water for an extended period in order to test the integrity of the seam against water ingress.

NOTE A similar test without the seam can be used to check pooled water ingress of the material itself.

A wooden frame, plastic box or similar structure with the width dimensions of [Figure 6](#) shall be used to support the test sample during the test. The height can be chosen freely, but it shall be high enough that the fabric does not have any contact with the ground when filled with water.

The structure of the box should be such that the underside of the test sample (the seamed area) should be visible and accessible to evaluation during the test period. This may be effected by placement of the frame onto legs or any similar means.

A fabric sample of dimensions as provided in [Figure 7](#) shall be tested. A single seam shall be present in the middle of the fabric sample (see [Figure 7](#)). Each seam type shall be tested.

The fabric sample shall be placed into the frame with sufficient overlap over the top to allow it to be firmly clamped in position or otherwise fixed (nails are acceptable providing they are well outside of the immersed test area or any wicking area of the material during test). The “trough” which results shall be formed so that the seam of the fabric sample runs through the lowest portion of the trough. The fabric sample should be placed into test in such a way that the side which is the outer of the awning is in contact with the water during the test.

Water is added into the trough to the point that a standing water height of  $(200 \pm 2)$  mm occurs in the middle of the trough.

The seamed section shall be checked for any immediate leakage by visual examination and gentle application of absorbent paper along its length. This process shall be repeated after 2 h and 16 h and the following shall be noted:

- a) whether the absorbent paper is dry;
- b) whether the absorbent paper is wet, being slight moisture spotting or visibly wet from water droplets;
- c) whether there are any visible water droplets, leakage or large damp patches.

Report findings.

Dimensions in millimetres

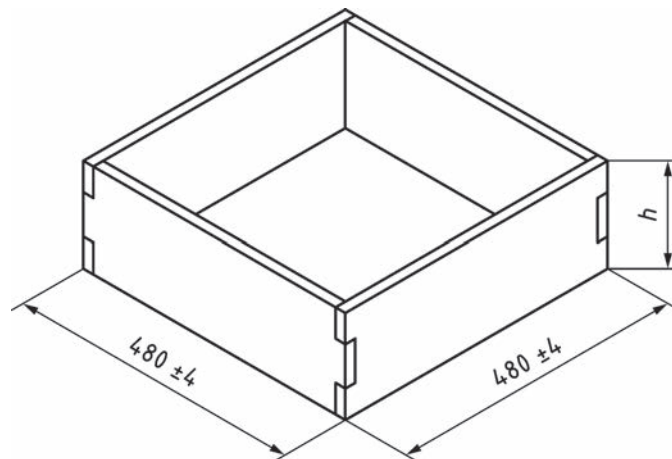
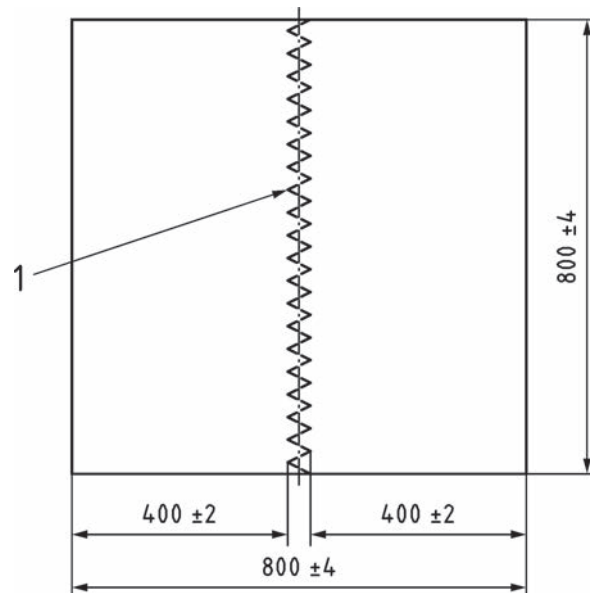


Figure 6 — Test equipment for ingress from pooled water

Dimensions in millimetres



**Key**

1 seam

Figure 7 — Dimension of test sample and position of seam

## 7 Marking

### 7.1 Warning notices

A permanent legible notice, at least in English and French, giving simple fire prevention and ventilation advice, shall be attached inside the awning in a position where it can be easily and readily seen.

It is recommended that this notice is also written in the language of the country in which the awning will be sold (see A.3 for example in German).

The minimum dimensions of the notice shall be 60 mm × 130 mm for each language.

The letters for the heading “Fire and ventilation precautions” shall be at least twice as high as the letters for the remainder of the text. The heading shall be in red letters, the remainder of the text shall be black on a white background (see [Annex A](#)).

The following wording shall be used:

- If using gas or other combustion appliances, additional ventilation is required;
- Do not place hot appliances near the walls, roof or curtains;
- Always observe the safety instructions for these appliances;
- Never allow children to play near hot appliances;
- Keep passage ways clear;
- Make sure you know the fire precaution arrangements on the site;
- Make sure ventilation openings are open all the time to avoid suffocation.

If the fabric of an awning is claimed to have flame retardant properties according to [5.2.10](#), a relevant warning at least in English and French shall be attached inside the awning in a position where it can be easily and readily seen (see [Annex B](#)). The minimum dimensions of the notice shall be 50 mm × 80 mm. It is recommended that this notice is also written in the language of the country in which the awning will be sold.

## 7.2 Product identification

The awning shall be permanently marked with at least the following:

- a) a reference to this document, i.e. ISO 8936:2016;
- b) the name or trademark of the manufacturer, supplier or importer;
- c) the data concerning the awning, at least:
  - 1) product name;
  - 2) total weight;
  - 3) perimeter size (where applicable);
- d) the classification (see [Clause 4](#)).

## 8 Information supplied by the manufacturer

### 8.1 Information at the point of sale

Purchase information shall be available at the point of sale, showing the types of awnings in accordance with [Clause 4](#) in comparison to each other, and shall contain at least the following:

- a) type of awning regarding this document;
- b) designed usage;
- c) minimum roof load;
- d) water column (hydrostatic head).

NOTE An example for the display of this information is given in [Annex C](#).

## 8.2 Information accompanying the awning

Each awning shall be accompanied by information supplied by the manufacturer with explanatory sketches or drawings. In particular, this information shall ensure that the pitching and maintenance are well understood by a person who buys an awning for the first time.

The information supplied by the manufacturer shall at least contain information about the following items:

- a) classification including explanations about the type (see [Clause 4](#));
- b) outer awning dimensions;
- c) trial pitching of the awning (to get used to the design);
- d) choice of the site:
  - type of ground;
  - prevailing wind direction.
- e) pitching/striking:
  - information concerning the marking of the frame assembly components;
  - order of pitching/striking;
  - fastening, storm guyropes.
- f) behaviour in the event of fire/means of escape:
  - warning to occupiers (see [5.14](#)).
- g) ventilation:
  - formation of condensation;
  - toxic gases.
- h) particular problems:
  - snow;
  - sand soil;
  - storms;
  - particular environmental conditions.
- i) packing:
  - folding scheme;
  - consequences of packing wet awnings;
  - separation of frame assembly components and fabrics.
- j) maintenance/repair:
  - cleaning, spot removal;
  - permanent storage;
  - repair of minor leaks;

- reproofing;
  - maintenance of zip fasteners and frame assembly;
  - repair of broken frame assembly components;
  - repair of damage to fabrics or plastic sheets.
- k) substances requiring declaration:
- such as EC 1907/2006<sup>[9]</sup>.

## Annex A (informative)

### Warning notice for fire prevention and ventilation advice

The following wording and layout of the notice should be used:

NOTE This annex is formatted in a way to be easily understandable. It does not reflect the requirements for the notices regarding the text size ratio, text colour and dimensions as specified in 7.1.

a) English

#### Fire and ventilation precautions

Caution:

- If using gas or other combustion appliances, additional ventilation is required.
- Do not place hot appliances near the walls, roof or curtains.
- Always observe the safety instructions for these appliances.
- Never allow children to play near hot appliances.
- Keep passage ways clear.
- Make sure you know the fire precaution arrangements on the site.
- Make sure ventilation openings are open all the time to avoid suffocation.

b) French

#### Conseils de sécurité

Précaution:

- Lors de l'utilisation de gaz ou d'autres équipements de combustion, une ventilation supplémentaire est nécessaire.
- Ne pas placer d'appareils chauds à proximité des parois, du toit ou des rideaux.
- Bien respecter les consignes de sécurité de ces appareils.
- Ne jamais permettre aux enfants de jouer aux alentours des appareils chauds.
- Dégager les passages.
- Se renseigner sur les dispositifs et mesures prévus sur le terrain en cas d'incendie.
- Lorsque l'auvent est utilisé les aérations doivent être laissées ouvertes afin de permettre à l'air de circuler et d'empêcher l'accumulation de gaz toxiques.

c) German

**Vorsichtsmaßnahmen zu Feuer und Lüftung**

Vorsicht:

- Bei der Verwendung von Gas oder anderen Verbrennungsgeräten ist zusätzliche Lüftung notwendig.
- Keine heißen Geräte in der Nähe der Wände, des Daches oder der Vorhänge aufstellen.
- Immer die Sicherheitshinweise für diese Geräte beachten.
- Niemals Kindern erlauben, in der Nähe von heißen Geräten zu spielen.
- Durchgänge frei halten.
- Stellen Sie sicher, dass Sie die Vorkehrungen gegen Feuer auf dem Gelände kennen.
- Stellen Sie sicher, dass die Lüftungsöffnungen zu jeder Zeit geöffnet sind, um Ersticken zu verhindern.

## **Annex B** (informative)

### **Warning notice fire flame retardant precautions**

The following wording should be used:

#### **Flame retardant precautions**

**WARNING — Keep all flame and heat sources away from this awning fabric.**

**The [outer awning/groundsheet] meets the flammability requirements of ISO 8936. The fabric may burn if left in continuous contact with any flame source. The flame retardant properties will diminish with use over a period of time. The application of any foreign substance to the awning fabric may render the flame-retardant properties ineffective.**



## Annex C (informative)

### Example for the display of information at the point of sale

[Table C.1](#) should be used.

**Table C.1 — Example for the display of information at the point of sale**

Type	W	R	T	L
<b>Designed usage</b>	Awning suitable for all year round use	Awning suitable for continual use over extended periods including a light snow load	Awning suitable for repeated pitching and striking and use at any time of the year but not in winter snow conditions	Awning suitable for repeated pitching and striking which is characterized by ease of use and lightness with a total weight of < 2,75 kg/m <sup>2</sup> base area
<b>Roof load</b>	≤ 75 kg/m <sup>2</sup>	≤ 20 kg/m <sup>2</sup>	≤ 5 kg/m <sup>2</sup>	≤ 2,5 kg/m <sup>2</sup>
<b>Water column (hydrostatic head)</b>	≥ 15 000 mm	≥ 15 000 mm	≥ 7 000 mm	≥ 2 500 mm
<b>This awning equates to ISO 8936, Type:</b>	—	—	<b>X</b>	—

## Bibliography

- [1] ISO 1420, *Rubber- or plastics-coated fabrics — Determination of resistance to penetration by water*
- [2] ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*
- [3] ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*
- [4] ISO 6940, *Textile fabrics — Burning behaviour — Determination of ease of ignition of vertically oriented specimens*
- [5] CEN/TR 16741, *Textiles and textile products — Guidance on health and environmental issues related to chemical content of textile products intended for clothing, interior textiles and upholstery*
- [6] EN 13878, *Leisure accommodation vehicles — Terms and definitions*
- [7] 67/548/EEC, *Council Directive on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances*
- [8] Regulation (EC) no.1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)







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