
Hidroizolacijski trakovi - Polimerni in elastomerni trakovi za hidroizolacijo betonskih premostitvenih objektov in drugih betonskih prometnih površin - Definicije in lastnosti

Flexible sheets for waterproofing - Plastic and rubber sheets for waterproofing of concrete bridge decks and other trafficked areas of concrete - Definitions and characteristics

Abdichtungsbahnen - Kunststoff- und Elastomerbahnen für Abdichtungen von Betonbrücken und anderen Verkehrsflächen aus Beton - Definitionen und Eigenschaften

Feuilles souples d'étanchéité - Feuilles plastiques et élastomères pour l'étanchéité de ponts et autres surfaces en béton circulables par les véhicules - Définitions et caractéristiques

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Flexible sheets for waterproofing - Plastic and rubber sheets for waterproofing of concrete bridge decks and other trafficked areas of concrete - Definitions and characteristics

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 254.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17048:2016) has been prepared by Technical Committee CEN/TC 254 “Flexible sheets for waterproofing”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

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1 Scope

This European Standard specifies characteristics and performance of plastic and rubber sheets for waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles where the waterproofing is fully bonded to the concrete deck and fully bonded to the asphalt overlay.

This European Standard also states the test methods used for verifying the characteristics and gives rules for the assessment and verification of consistency of performance of the product.

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 495-5, *Flexible sheets for waterproofing — Determination of foldability at low temperature — Part 5: Plastic and rubber sheets for roof waterproofing*

EN 1107-2, *Flexible sheets for waterproofing — Determination of dimensional stability — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 1110, *Flexible sheets for waterproofing — Bitumen sheets for roof waterproofing — Determination of flow resistance at elevated temperature*

EN 1296, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roofing — Method of artificial ageing by long term exposure to elevated temperature*

EN 1548, *Flexible sheets for waterproofing — Plastic and rubber sheets for roof waterproofing — Method for exposure to bitumen*

EN 1848-2, *Flexible sheets for waterproofing — Determination of length, width, straightness and flatness — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 1849-2, *Flexible sheets for waterproofing — Determination of thickness and mass per unit area — Part 2: Plastic and rubber sheets*

EN 1850-2, *Flexible sheets for waterproofing — Determination of visible defects — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12311-2, *Flexible sheets for waterproofing — Determination of tensile properties — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 13375, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Specimen preparation*

EN 13416, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Rules for sampling*

EN 13596, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of bond strength*

EN 13653, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of shear strength*

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EN 14223, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of water absorption*

EN 14224, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of crack bridging ability*

EN 14691, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Compatibility by heat conditioning*

EN 14692, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of the resistance to compaction of an asphalt layer*

EN 14693, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of the behaviour of bitumen sheets during application of mastic asphalt*

EN 14694, *Flexible sheets for waterproofing — Waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Determination of resistance to dynamic water pressure after damage by pre-treatment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13375, EN 13416 and the following apply.

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3.1 waterproofing

action to prevent the passage of water from one plane to another

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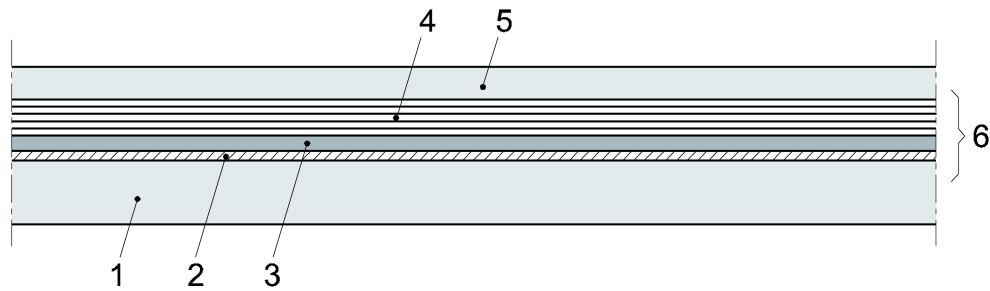
3.2 bridge waterproofing system

assembly of layers between a concrete bridge deck (or other trafficked areas of concrete) and an overlay

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Note 1 to entry: See Figure 1.

Note 2 to entry: Generally comprises a primer, the plastic and rubber sheet (or the assembly of several plastic and rubber sheets) and the protection layer if specified by the manufacturer.

**Key**

- 1 concrete bridge deck
- 2 primer
- 3 plastic and rubber sheet(s)
- 4 protection layer
- 5 overlay (asphalt)
- 6 bridge waterproofing system (2 + 3 and 4 if specified)

Figure 1 — Schematic section of bridge waterproofing system

3.3**carrier**

material incorporated into or onto a factory-made plastic and rubber sheet to ensure its stability and/or mechanical resistance

3.4**backing**

material incorporated onto a factory-made plastic and rubber sheet without a permanent mechanical function

3.5**surfacing**

material applied on one or both sides of plastic and rubber sheets, either as a permanent light surface protection on the upper surface or as an anti-sticking substance of the plastic and rubber sheets

3.6**batch**

amount of product manufactured to the same specification

3.7**manufacturer's limiting value****MLV**

value stated by the manufacturer to be met during testing

Note 1 to entry: The MLV can be a minimum or a maximum value according to statements made under product characteristics of this European Standard.

3.8**manufacturer's declared value****MDV**

value declared by the manufacturer accompanied by a declared tolerance

prEN 17048:2016 (E)**3.9****primer**

initial coating applied directly to the prepared concrete deck prior to the bridge waterproofing sheet being installed to achieve adhesion to the concrete surface; the primer can be made up by one or more layers of bituminous products or resin based products

3.10**plastic and rubber sheet**

factory made flexible waterproofing sheet with or without internal or external incorporation of one or more carriers, which can be rolled up or folded for easy transport to the site

3.11**protection layer**

layer above the plastic and rubber sheet, the aim of which being to protect the sheet from mechanical damage

Note 1 to entry: Depending on the bridge waterproofing system, this layer can have an additional waterproofing function.

3.12**overlay**

asphalt layer immediately above the bridge waterproofing system

4 Product characteristics

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4.1 General

When a tolerance is defined by this European Standard, it does not have to be declared by the manufacturer.

When tested for purposes other than type testing or factory production control (see 5.1), the tests to determine product characteristics indicated in this European Standard shall be started within one month of delivery from the manufacturer.

4.2 Sheet characteristics**4.2.1 Visible defects**

The product shall be free of visible defects, as determined in accordance with EN 1850-2.

4.2.2 Dimensions, tolerances and mass per unit area

The length, width and straightness shall be determined in accordance with EN 1848-2. The length and width shall not be shorter than the manufacturer's limiting value. The maximum deviation from straightness shall not exceed 20 mm per 10 m length, or in proportion for other lengths (e.g. 10 mm per 5 m length).

Where a product is specified by mass per unit area, it shall be measured in accordance with EN 1849-2, and the results shall lie within the declared tolerance of the manufacturer's declared value.

Where a product is specified by thickness, it shall be measured in accordance with EN 1849-2 and the results shall lie within the declared tolerance of the manufacturer's declared value.

Where sheets with surfacing are specified by thickness, the measurement of thickness may additionally be carried out on the selvedge. This shall be declared in the report.

4.2.3 Tensile properties

The tensile properties shall be determined in accordance with EN 12311-2 and the results (for the longitudinal and transverse directions) shall lie within the declared tolerance of the manufacturer's declared value.

4.2.4 Water absorption

The content of water absorbed shall be determined in accordance with EN 14223. The water absorption shall be less than or equal to the manufacturer's limiting value.

4.2.5 Foldability at low temperature

The foldability at low temperature shall be determined in accordance with EN 495-5 and shall be less than or equal to the manufacturer's limiting value.

This test does not give results directly corresponding to the application conditions in practice. Results should only be used to compare products of similar thickness and construction.

In the case of sheets where the reinforcement is placed in the cross section visually closer to the upper surface, the test shall be performed on the bottom face only.

If the upper surface is covered with a non-woven (e.g. tissue, fleece, etc.) the test shall be performed on the bottom side only.

If the sheet on the upper surface is covered with permanent light surface protection and where the reinforcement is placed in the cross section visually closer to the upper surface the test shall be performed on the bottom side only.

4.2.6 Flow resistance at elevated temperature

If a bituminous layer is part of the plastic or rubber sheet the flow resistance at elevated temperature shall be determined in accordance with EN 1110. The result shall be greater than or equal to the manufacturer's limiting value (MLV).

4.2.7 Dimensional stability at elevated temperatures

The dimensional stability at elevated temperature shall be determined in accordance with EN 1107-2 (6 h at 80 °C). The result shall be less than or equal to the manufacturer's limiting value.

For plastic and rubber sheets to be used with a layer of mastic asphalt directly on the plastic and rubber sheet, the dimensional stability at elevated temperatures (1 h at 160 °C) shall be evaluated in accordance with Annex A when subject to regulatory requirements, and may be evaluated when not subject to such requirements. The test result shall be less than or equal to the manufacturer's limiting value.

NOTE The test at 80 °C is intended to determine the dimensional changes as a result of production-induced internal stresses under the effect of heat. When combined with a mastic asphalt layer, the effect of heat is much larger and can cause severe shrinkage to the plastic and rubber sheet. This effect is therefore declared as well for sheets intended for use in combination with a mastic asphalt layer.

4.2.8 Thermal ageing behaviour

In order to verify the thermal ageing behaviour of the product, characteristics shall be determined before and after exposure in accordance with EN 1296 for a period of 12 weeks at 70 °C. The relevant characteristics are the foldability at low temperature before and after aging. The foldability at low temperature shall be determined in accordance with EN 495-5 (see 4.2.5) and the results shall lie within the declared tolerance of the manufacturer's declared value.

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The purpose of testing in accordance with EN 1296 is to characterize the long-term thermal stability of plastic and rubber sheets. The test does not give results corresponding to the service conditions in practice. Results should only be used to compare products of similar thickness, construction and composition, and they cannot be used for general durability classification. The chosen exposure duration for artificial ageing in accordance to EN 1296 has no relevance to a real product lifetime.

4.3 Performance related characteristics**4.3.1 General**

Test specimens for performance-related testing shall be prepared in accordance with EN 13375. Where a sheet can be used in more than one waterproofing system, some of the following tests shall require repeating.

4.3.2 Bond strength

The bond strength shall be determined in accordance with EN 13596, and shall be greater than or equal to the manufacturer's limiting value.

4.3.3 Shear strength

The shear strength shall be determined in accordance with EN 13653, and shall be greater than or equal to the manufacturer's limiting value.

4.3.4 Crack bridging ability

Where required the crack bridging ability of fully bonded plastic and rubber sheets shall be determined in accordance with EN 14224 and the temperature shall be lower than or equal to the manufacturer's limiting value. Testing on type 3 specimens covers also type 1 specimens.

The crack bridging ability shall be evaluated when subject to regulatory requirements, and may be evaluated when not subject to such requirements.

4.3.5 Compatibility by heat conditioning

The compatibility by heat conditioning shall be determined in accordance with EN 14691. The test result shall be greater than or equal to the manufacturer's limiting value.

4.3.6 Resistance to compaction of an asphalt layer

For plastic and rubber sheets to be used with a compacted asphalt layer directly on the plastic and rubber sheet, the resistance of the plastic and rubber sheet to compaction of an asphalt layer shall be determined in accordance with EN 14692, method 1 or 2, and a resistant result is required to demonstrate product compliance with this European Standard.

4.3.7 Behaviour of plastic and rubber sheets during application of mastic asphalt

Plastic and rubber sheets intended for use with a protection layer of mastic asphalt shall be tested to determine its behaviour during application of mastic asphalt in accordance with EN 14693. The test results shall be less than or equal to the manufacturer's limiting value.

4.3.8 Bitumen compatibility

Plastic and rubber sheets intended for use with a contact with bitumen or asphalt shall be bitumen compatible tested in accordance with EN 1548.

The sheet is compatible with bitumen if:

- a) for sheets with an inner carrier the change in mass shall be less than or equal to 5 %;