



SLOVENSKI STANDARD

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Polnilne in tesnilne mase za stike – 1. del: Specifikacije za tesnilne mase, ki se vgrajujejo po vročem postopku

Joint fillers and sealants - Part 1: Specifications for hot applied sealants

Fugeneinlagen und Fugenmassen - Teil 1: Anforderungen an heißverarbeitbare Fugenmassen

Produits de scellement de joints - Partie 1: Spécification pour produits de scellement appliqués a chaud

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EUROPEAN STANDARD
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Joint fillers and sealants - Part 1: Specifications for hot applied sealants

Produits de scellement de joints - Partie 1 : Spécification pour produits de scellement appliqués à chaud

Fugeneinlagen und Fugenmassen - Teil 1: Anforderungen an heißverarbeitbare Fugenmassen

This European Standard was approved by CEN on 9 July 2004.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14188-1:2004) has been prepared by Technical Committee CEN/TC 227 "Road materials", 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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

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, which is an integral part of this document.

This document is one of a series of standards as listed below:

EN 14188-1, Joint fillers and sealants — Part 1: Specifications for hot applied sealants.

prEN 14188-2, Joint fillers and sealants - Part 2: Specifications for cold applied sealants

prEN 14188-3, Joint fillers and sealants - Part 3: Specification for preformed joint seals

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

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EN 14188-1:2004 (E)**1 Scope**

This document specifies requirements for hot-applied normal and fuel resistant joint sealants to be used in roads, airfields and other trafficked areas. The specification also applies to hot-applied normal joint sealants in bituminous surfacing and between bituminous surfacing and concrete pavements.

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.

EN 1427, *Bitumen and bituminous binders — Determination of softening point — Ring and Ball method.*

EN 13880-1, *Hot applied joint sealants — Part 1: Test methods for the determination of density at 25 °C.*

EN 13880-2, *Hot applied joint sealants — Part 2: Test methods for the determination of cone penetration at 25 °C.*

EN 13880-3, *Hot applied joint sealants — Part 3: Test methods for the determination of penetration and recovery (resilience).*

EN 13880-4, *Hot applied joint sealants — Part 4: Test method for the determination of heat resistance - Change in penetration value*

EN 13880-5, *Hot applied joint sealants — Part 5: Test methods for the determination of flow resistance.*

EN 13880-6, *Hot applied joint sealants — Part 6: Test methods for the preparation of samples for testing.*

EN 13880-7, *Hot applied joint sealants — Part 7: Function testing of joint sealants.*

EN 13880-8, *Hot applied joint sealants — Part 8: Test method for the determination of the change in weight of fuel resistant joint sealants after fuel immersion.*

EN 13880-9, *Hot applied joint sealants — Part 9: Test method for the determination of compatibility with asphalt pavements.*

EN 13880-10, *Hot applied joint sealants — Part 10: Test method for the determination of adhesion and cohesion following continuous extension and compression.*

EN 13880-13, *Hot applied joint sealants — Part 13: Test method for the determination of the discontinuous extension (adherence test).*

3 Terms and definitions

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

3.1

joint

vertical discontinuity between the adjacent faces of slabs in the concrete layer of a pavement or between an adjacent bituminous layer and a pavement, formed for the purpose of providing some movement capability

3.2

joint filler

strip of compressible heat-resistant material used to fill a joint space

3.3

joint sealant

material that, when applied in a uniform state to a joint, seals it by adhering to appropriate surfaces within the joint to prevent the ingress of water and deleterious substances

3.4

primer

surface coating applied to the faces of the joint before placing the sealant in order to ensure its adhesion

3.5

hot applied sealant

thermoplastic or thermosetting material which is heated up to the recommended pouring temperature prior to placement in the joint slot

3.6

pouring temperature

temperature to which the sealant is heated for the stated length of time as recommended by the manufacturer

3.7

safe heating temperature

maximum temperature as recommended by the manufacturer to which the sealant can be heated for a period of 6 h

3.8

manufacturer's limiting value (MLV)

manufacturer's stated minimum or maximum value to be met during testing according to the requirements of this European Standard

3.9

manufacturer's declared value (MDV)

value declared by the manufacturer accompanied by a declared tolerance

3.10

cold climate area

areas in which the temperature can go below $-25\text{ }^{\circ}\text{C}$ and the opening of the joint can exceed 35 %

4 Classification and specification

4.1 Joint sealant

Hot applied joint sealants shall be one of the types given in Table 1.

Table 1 — Types of hot applied joint sealants

| Material | Type |
|-------------------------------|------|
| Elastic – high extension | N1 |
| Normal – low extension | N2 |
| High extension fuel-resistant | F1 |
| Low extension fuel-resistant | F2 |

4.2 Primer

Where a primer is recommended by the manufacturer of the joint sealant, the manufacturer's directions for its use shall be followed. Where a primer is part of the system recommended by the manufacturer, then specimens prepared for the appropriate performance tests shall include a primer.

The manufacturer shall always specify whether a primer is required or not.

5 Requirements

5.1 Shelf life

When stored in the original unopened containers and within the temperature range and expiry date recommended by the manufacturer, the sealant and primer (if required) shall be capable of being heated and applied to the joint and shall conform to this standard.

5.2 Compliance to requirements after safe heating temperature

When heated to the safe heating temperature for a period of $6\text{ h} \pm 15\text{ min}$, the sealant shall conform to all requirements of this standard.

5.3 Softening point

The softening point shall be determined in accordance with EN 1427 and the result shall conform to the relevant value given in Table 2, line 2.

5.4 Density

The density shall be determined in accordance with EN 13880-1 and the result shall conform to the manufacturer's declared values as defined in Table 2, line 3.

5.5 Cone penetration

The cone penetration shall be determined in accordance with EN 13880-2 and the result shall conform to the values given in Table 2, line 4.

5.6 Penetration and recovery at +25 °C (resilience)

The penetration and recovery shall be determined in accordance with EN 13880-3 and the results shall conform to the values given in Table 2, line 5.

5.7 Heat stability

The heat stability shall be determined in accordance with EN 13880-4 and the results shall conform to the values in Table 2, line 6.

5.8 Flow resistance

The flow resistance shall be determined in accordance with EN 13880-5 and the results shall conform to the values given in Table 2, line 7.

5.9 Resistance to fuel immersion (solubility)

The resistance to fuel immersion shall be determined in accordance with EN 13880-8 and the result shall conform to the relevant values in Table 2, line 8.

5.10 Compatibility with asphalt pavements

The compatibility of hot applied sealants type N1 and type N2 with asphalt pavements shall be determined in accordance with EN 13880-9 and the result shall conform to the requirements in Table 2, line 9.

5.11 Bonding strength

The bonding strength shall be determined in accordance with EN 13880-13 and the results shall conform to the relevant values in Table 2, line 10.

5.12 Cohesion

The cohesion shall be determined in accordance with EN 13880-10 and the results shall conform to the relevant values in Table 2, line 11.1.

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For cold climate areas: The cohesion shall be determined in accordance with EN 13880-7 and the results shall conform to the relevant values in Table 2, line 11.2.

5.13 Dangerous substances.

The manufacturer shall ensure that there are no emissions of any substances hazardous to health or the environment in excess of the legally permitted level in the member state of destination.

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Table 2 — Requirements and test methods for hot applied sealants

| Column | 1 | 2 | 3 | 4 | 5 | 6 |
|--------|--|--|--------------|----------------|-----------|-------------|
| Line | Material properties | Type of hot applied sealant | | | | Test method |
| | | not fuel resistant | | fuel resistant | | |
| | | N1 | N2 | F1 | F2 | |
| 1 | Preparation of samples for testing and perceptible properties | Homogenous in accordance with manufacturer's declaration | | | | EN 13880-6 |
| 2 | Softening point, ring and ball, in °C | ≥85 | ≥85 | ≥85 | ≥75 | EN 1427 |
| 3 | Density at +25 °C, in Mg/m ³ | In accordance with manufacturer's declaration | | | | EN 13880-1 |
| 4 | Cone penetration at +25 °C, 5 s, 150 g, in 0,1 mm | 40 to 130 | 40 to 100 | 40 to 130 | 40 to 100 | EN 13880-2 |
| 5 | Penetration and recovery (resilience) at +25 °C, 75 g ball, 5 s, in % | ≥60 | ≤60 | ≥60 | ≤60 | EN 13880-3 |
| 6 | Heat stability/ change in penetration value at +70 °C/168 h | | | | | EN 13880-4 |
| 6.1 | cone penetration, in 0,1 mm | 40 to 130 | 40 to 100 | 40 to 130 | 40 to 100 | |
| 6.2 | penetration and recovery (resilience), in % | ≥60 | ≤60 | ≥60 | ≤60 | |
| 7 | Flow resistance, initial and heat degradation at +60 °C, 5 h, 75° angle, in mm | ≤2 | ≤3 | ≤5 | ≤10 | EN 13880-5 |
| 8 | Resistance to fuel immersion (solubility) | | | | | EN 13880-8 |
| 8.1 | +35 °C, 24 h/change in mass, % | – | – | – | ≤2 | |
| 8.2 | +50 °C, 24 h/change in mass, % | – | – | ≤2 | – | |
| 9 | Compatibility with asphalt pavements at +60 °C, 72 h | No failures in adhesion and no formation of any oily exudate | | | | EN 13880-9 |
| 10 | Bonding strength | | | | | EN 13880-13 |
| 10.1 | Total extension within 5 h, in mm | ≥5 | ≥5 | ≥5 | ≥5 | |
| 10.2 | Test temperature, in °C | –25 | –20 | –20 | –10 | |
| 10.3 | Immersion – water immersion, 14 days, room temperature – fuel immersion (see line 8.2) | x | x | x | x | |
| 10.4 | Tensions – maximum tension, in N/mm ² – final tension, in N/mm ² | 1,00 ≤0,15 | 0,75 – | – – | – – | |
| 10.5 | Adhesion failure – totally separated block faces, in mm ² – depth of separation, in mm | none none | none none | <50 <3 | <50 <3 | |
| 10.6 | Cohesion failure – totally superficial area of cracks, in mm ² – depth of cracks, in mm | none none | none none | <20 <3 | <20 <3 | |

Table 2 (concluded)

| Column | 1 | 2 | 3 | 4 | 5 | 6 |
|--------|--|-----------------------------|---------------|----------------|---------------|-------------|
| Line | Material properties | Type of hot applied sealant | | | | Test method |
| | | not fuel resistant | | fuel resistant | | |
| | | N1 | N2 | F1 | F2 | |
| 11.1 | Cohesion | | | | | EN 13880-10 |
| 11.1.1 | Extension, in mm | 18 | 18 | 12 | 12 | |
| | Extension, in % | 75 | 75 | 50 | 50 | |
| 11.1.2 | Number of cycles | 3 | 3 | 3 | 3 | |
| 11.1.3 | Test temperature, in °C | -20 | 0 | -20 | 0 | |
| 11.1.4 | Maximum tension, in N/mm ² | 0,48 ±0,10 | 0,48 ±0,10 | 0,48 ±0,10 | 0,48 ±0,10 | |
| 11.1.5 | Adhesion – totally separated block faces, in mm ² – depth of separation, in mm | <50 <3 | <50 <3 | <50 <3 | <50 <3 | |
| 11.1.6 | Cohesion – totally superficial area of cracks, in mm ² – depth of cracks, in mm | <20 <3 | <20 <3 | <20 <3 | <20 <3 | |
| 11.2 | Cohesion (for cold climate areas) | | | | | EN 13880-7 |
| 11.2.1 | Temperature cycling range, in °C | +25/-30 | +25/-20 | +25/-30 | +25/-20 | |
| 11.2.2 | Rate of deformation, in mm/h | 0,6 | 0,6 | 0,6 | 0,6 | |
| 11.2.3 | Extension – compression, in % – extension, in % | 5 60 | 5 15 | 20 60 | 5 15 | |
| 11.2.4 | Number of cycles | 3 | 3 | 3 | 3 | |
| 11.2.5 | Rain, total time +5 °C/+20 °C, in % | 20 | 20 | 20 | 20 | |
| 11.2.6 | Inspections after extension to 60 % at room temperature – adhesive failures – cohesive failures | none none | none none | none none | none none | |
| 11.2.7 | Inspection after compression and re-elongation to 60 % with 2-mm-notch in 1 corner – adhesive failure – cohesive failure | none none | none none | none none | none none | |
| 11.2.8 | Maximum tension at lower temperature – Asphalt, in N/mm ² – Concrete, in N/mm ² | 0,3 1,0 | 0,3 1,0 | 0,3 1,0 | 0,3 1,0 | |