SLOVENSKI STANDARD
oSIST prEN 12697-49:2020

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Bitumenske zmesi - Preskusne metode - 49. del: Ugotavljanje tornih sposobnosti po poliranju

Bituminous mixtures - Test methods - Part 49: Determination of friction after polishing

Asphalt - Prüfverfahren - Teil 49: Messung der Griffigkeit nach dem Polieren

Mélanges bitumineux - Méthodes d'essai - Partie 49 : Détermination du coefficient de frottement après polissage

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93.080.20 Materiali za gradnjo cest Road construction materials

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English Version

Bituminous mixtures - Test methods - Part 49: Determination of friction after polishing

Mélanges bitumineux - Méthodes d'essai - Partie 49 : Détermination du coefficient de frottement après polissage

Asphalt - Prüfverfahren - Teil 49: Messung der Griffigkeit nach dem Polieren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 227.

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Contents

Page

European foreword

This document (prEN 12697-49:2020) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12697-49:2014.

The following is a list of significant changes from the previous edition:

— [1] Possibility of following FAP evolution as a function of the number of polishing passes.

— [2] and [5.1.4.5] Change of normative reference to ISO 48-4 for the determination of Shore hardness.

— [3.1.1] Rewording of the definition of pass, and information given as a Note to entry.

— [3.2] Introduction of the symbol μ, and rewording of μ_{FAP} definition.

— [5.1.1] Addition of reference to Annex A.

— [5.1.1] Completed with obligation to work in specified temperature and humidity room conditions.

— [5.1.2.3] Introduction of additional requirements for polishing rollers storage.

— [5.1.4.2] Rewording of title, and correction of a unit error for inertia moment.

— [5.1.4.3] Modification of the tolerance for moment measurement.

— [5.1.4.5] Modification of the criteria for resilience of sliding blocks. Deletion of Table 1 and following paragraph. Following tables renumbered accordingly.

— [5.1.4.5] In Figure 4, correction of the rotation radius value.

— [5.2] Rewording of title, and additional specification for μ_{ref} value.

— [5.3] Additional requirements for sand-blasting equipment.

— [6.1] Additional requirements for quartz powder.

— [6.2] Additional requirements for water/quartz-powder mixture.

— [6.3] Deletion of the Note about the supplier of corundum.

— [7.1.1] Addition of a new sub-heading "7.1.1 General". Following subclauses renumbered accordingly.

— [7.1.1] Achievement – or no – of sandblasting according to the test and/or product context.

— [7.1.2] Rewriting of sandblasting procedure, and change of storage position.

— [7.1.3] Modification of thickness requirement and change of storage position.

— [7.2] Additions in polishing procedure about conditioning, water/quartz-powder mixture, washing.

— [7.3.1] Obligation of pre-test check for each specimen.

— [7.3.2] Additional dispositions about water introduction and control plate test.

— [8.1] Clause totally rewritten for more clarity and consistency.

— [8.2] Modification of the criterion for validating the test, and possibility of a curve FAP = f (passes).

— [9] Correction of the number of decimals for FAP, mention the roller numbers, sandblasting, and curve.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

A list of all parts in the EN 12697 series can be found on the CEN website.

1 Scope

This document describes a test method to determine the friction at 60 km/h after polishing during a fixed number of passes on surfaces of bituminous mixtures samples, or to follow its evolution as a function of the number of polishing passes.

The samples used are either produced in a laboratory or are cores taken from the site.

NOTE This procedure was previously known as Wehner and Schulze method (see [1]).

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.

EN 12697-27, *Bituminous mixtures - Test methods - Part 27: Sampling*

EN 12697-33, *Bituminous mixtures - Test method - Part 33: Specimen prepared by roller compactor*

ISO 4662, *Rubber, vulcanized or thermoplastic - Determination of rebound resilience*

ISO 48-4, *Rubber, vulcanized or thermoplastic - Determination of hardness - Part 4: Indentation hardness by durometer method (Shore hardness)*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

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

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

3.1.1
pass
passage of a single roller of the polishing head on one given point of the sample surface

Note 1 to entry: A complete revolution of the rotating head is equivalent to three roller passes on one given point of the sample surface.

3.2 Symbols

μ	friction coefficient
μ_m	friction coefficient at 60 km/h
μ_{km}	mean value of the control plate before and after the friction measurement
μ_{ref}	known value of the Laboratory Skid Resistance of the control plate
μ_{FAP}	single result of friction measurement on a single specimen
FAP	Friction After Polishing: average of two or more single results μ_{FAP}
Ø	diameter in mm

4 Principle

The sample is polished and the friction force is determined. The device comprises a polishing station and a unit for measuring the friction. The polishing station, which is continuously supplied with a mixture of water and quartz powder, contains three polishing rollers that can be lowered and that move across the test surface at a predefined loading force.

In the friction measuring unit, a rotating measuring head is lowered onto the test surface while water is being added. The measuring head is fitted with three sliding blocks and can be declutched electronically. The moment generated by the contact between the rubber sliders and the surface is continuously measured and recorded until the measuring head comes to a standstill. The friction is subsequently calculated from the moment measured at 60 km/h.

5 Equipment

5.1 Test device

5.1.1 General

The test device consists of a unit to polish the sample, a specimen clamping system and a unit for measuring its friction coefficient. (See an example of polishing head and friction unit in Annex A.) The test apparatus shall be operated in laboratories with specified room temperature and relative humidity.

5.1.2 Polishing unit

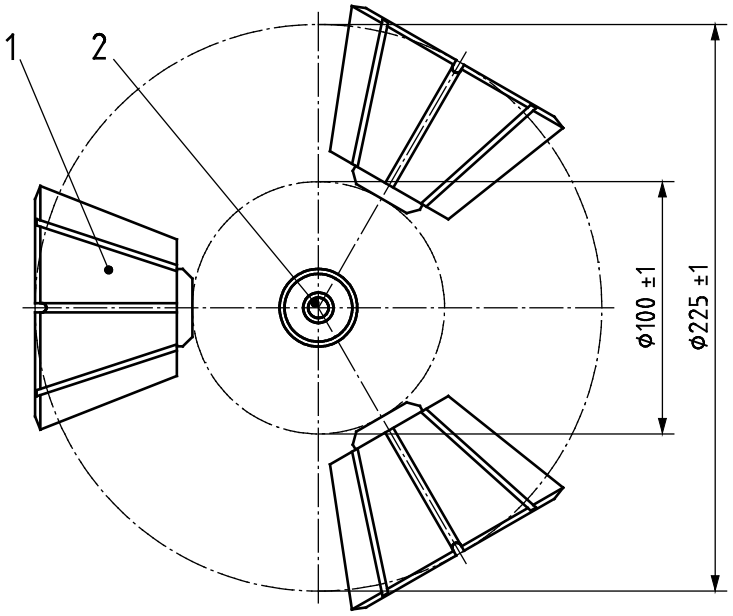
5.1.2.1 General

The polishing unit includes a polishing head with polishing rollers and a water-quartz powder mixture projection system.

5.1.2.2 Polishing head

A polishing head equipped with three polishing rollers as indicated on Figure 1, able to be lowered onto the test surface with loading force calibrated in static of (392 ± 3) N. The polishing head shall move on the surface of the specimen during the polishing procedure and rotate at a rotation speed of (500 ± 5) r/min.

Dimensions in millimetres



Key

1 polishing roller

2 water quartz powder projection device

Figure 1 — Polishing head (view from below)

5.1.2.3 Polishing rollers

The rollers, as shown in Figure 2, consist of a circular, cone-shaped metal carrier housing covered with an (8,5 ± 0,5) mm thick layer of rubber at the start of the test. Eight profile grooves with a depth of (4,5 ± 0,5) mm and a width of (3,5 ± 0,5) mm are cut into this rubber layer.

The polishing rollers shall have the following characteristics:

— diameter D_1: (36 ± 1) mm and D_2: (80 ± 1) mm;

— height H (56,3 ± 0,1) mm;

— shore hardness (65 ± 3) Shore A at a temperature of (23 ± 2) °C, according to ISO 48-4.

Dimensions in millimetres

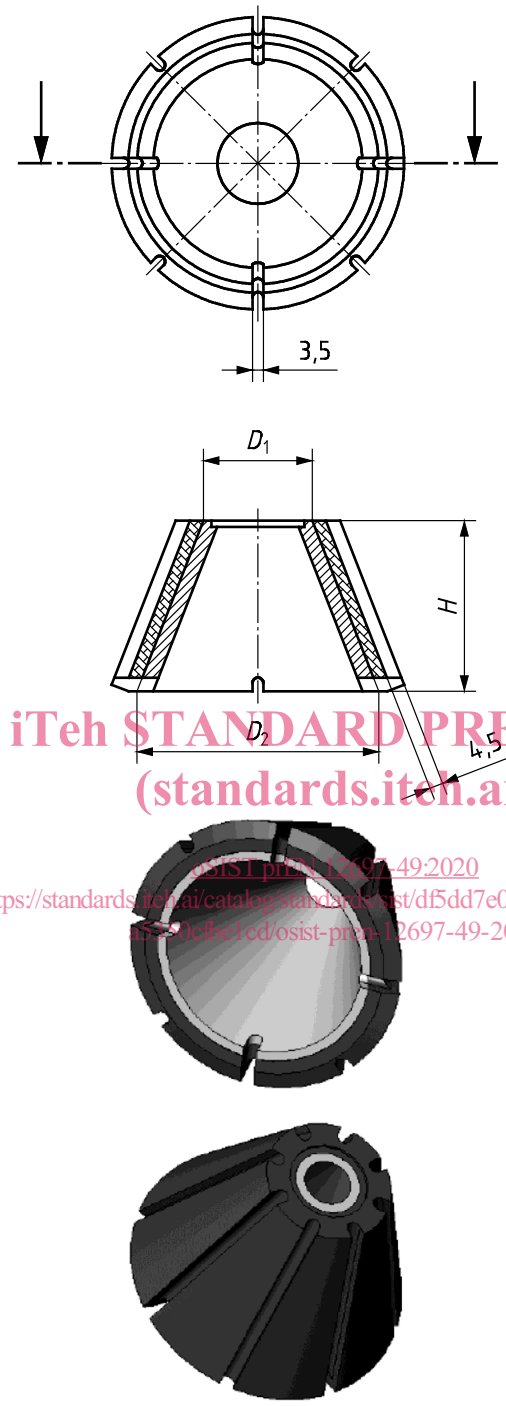


Figure 2 — Polishing rollers — 3D view, cross and longitudinal section

The friction in the bearings of the polishing rollers should be checked periodically according to the following procedure:

The torque moment measured on a sample made with a fine aggregate 0,2/0,4 mm or an asphalt surface during 90 000 passes shall be constant to ± 10 % between 10 000 passes and 85 000 passes.

Any polishing rollers not used should be packed in film and stored in a dark place at a temperature of 4 °C to 10 °C for less than two years. Once the rollers are removed from their packaging, beyond 2 months at a temperature higher than 10 °C without any use, their rubber hardness shall be checked again.