



SLOVENSKI STANDARD
oSIST prEN 1097-8:2016
01-september-2016

Preskusi mehanskih in fizikalnih lastnosti agregatov - 8. del: Določevanje vrednosti količnika zaglajevanja kamenih zrn

Tests for mechanical and physical properties of aggregates - Part 8: Determination of the polished stone value

Prüfverfahren für mechanische und physikalische Eigenschaften von Gesteinskörnungen - Teil 8: Bestimmung des Polierwertes

Essais pour déterminer les caractéristiques mécaniques et physiques des granulats - Partie 8: Détermination du coefficient de polissage accéléré

[https://standards.iteh.ai/catalog/standards/sist/4e0dafcb-7560-492b-a4d3-](https://standards.iteh.ai/catalog/standards/sist/4e0dafcb-7560-492b-a4d3-a8430da9e2b0/osist-pr-en-1097-8-2016)

Ta slovenski standard je istoveten z: prEN 1097-8

ICS:

91.100.15 Mineralni materiali in izdelki Mineral materials and products

oSIST prEN 1097-8:2016

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 1097-8:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/4e0dafcb-7560-492b-a4d3-a8430da9e2b0/osist-pren-1097-8-2016>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 1097-8

June 2016

ICS 91.100.15

Will supersede EN 1097-8:2009

English Version

Tests for mechanical and physical properties of aggregates - Part 8: Determination of the polished stone value

Essais pour déterminer les caractéristiques
mécaniques et physiques des granulats - Partie 8:
Détermination du coefficient de polissage accéléré

Prüfverfahren für mechanische und physikalische
Eigenschaften von Gesteinskörnungen - Teil 8:
Bestimmung des Polierwertes

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 154.

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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

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

Contents	Page
European foreword	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Principle	6
5 Sampling.....	6
6 Materials	6
7 Apparatus	7
7.1 General.....	7
7.2 Accelerated polishing machine.....	8
7.3 Friction tester.....	10
7.4 Test sieves	13
7.5 Grid sieve	13
7.6 Length gauge or callipers.....	14
7.7 Equipment for preparing test specimens.....	14
8 Preparation of test specimens.....	14
9 Conditioning of the rubber-tyred wheel.....	16
10 Accelerated polishing of specimens.....	16
11 Friction test procedure.....	17
12 Calculation and expression of results	21
13 Test report.....	22
13.1 Required data.....	22
13.2 Optional data.....	22
Annex A (normative) Determination of aggregate abrasion value (AAV)	23
A.1 General.....	23
A.2 Principle.....	23
A.3 Sampling.....	23
A.4 Materials	23
A.5 Apparatus	24
A.6 Preparation of test specimens	25
A.7 Procedure	25
A.8 Calculation and expression of results	26

A.9	Test report	27
Annex B	(normative) Control of materials	28
Annex C	(normative) Calibration of the accelerated polishing machine.....	29
C.1	Control of rubber-tyred wheels.....	29
C.2	Accelerated polishing machine	29
C.3	Rate of flow of corn emery and emery flour	30
Annex D	(normative) Calibration of the friction tester and sliders	32
D.1	Friction tester	32
D.2	Control of sliders and slider rubber	33
Annex E	(normative) Friction tester reference stone specimen preparation and friction slider conditioning.....	34
E.1	General	34
E.2	Preparation and initial testing of friction tester reference stone specimens	34
E.3	Slider conditioning.....	34
Annex F	(informative) Precision	35
F.1	General	35
F.2	PSV value - National Standard	35
F.3	PSV value - European cross-border testing	35
F.4	Aggregate abrasion value (AAV)	36
Bibliography	37

EN 1097-8:2016 (E)**European foreword**

This document (prEN 1097-8:2016) has been prepared by Technical Committee CEN/TC 154 "Aggregates", the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1097-8:2009.

This standard forms part of a series of tests for mechanical and physical properties of aggregates. Test methods for other properties of aggregates are covered by Parts of the following European Standards:

- EN 932, *Tests for general properties of aggregates*
- EN 933, *Tests for geometrical properties of aggregates*
- EN 1367, *Tests for thermal and weathering properties of aggregates*
- EN 1744, *Tests for chemical properties of aggregates*
- EN 13179, *Tests for filler aggregate used in bituminous mixtures*

The other parts of EN 1097 are:

- *Part 1: Determination of the resistance to wear (micro-Deval)*
- *Part 2: Methods for the determination of resistance to fragmentation*
- *Part 3: Determination of loose bulk density and voids*
- *Part 4: Determination of the voids of dry compacted filler*
- *Part 5: Determination of water content by drying in a ventilated oven*
- *Part 6: Determination of particle density and water absorption*
- *Part 7: Determination of the particle density of filler – Pyknometer method*
- *Part 9: Determination of the resistance to wear by abrasion from studded tyres: Nordic test*
- *Part 10: Water suction height*

In this standard the Annexes A, B, C, D and E are normative and the Annex F is informative.

1 Scope

This European Standard describes the reference method used for type testing and in case of dispute for determining the polished stone value (PSV) of a coarse aggregate used in road surfacings. For other purposes, in particular factory production control, other methods may be used provided that an appropriate working relationship with the reference method has been established. Examples of advanced test methods can be found in the Bibliography.

Annex A describes an optional method for the determination of the aggregate abrasion value (AAV).

NOTE The AAV method is suitable to use when particular types of skid resistant aggregates, (typically those with a PSV of 60 or greater) which can be susceptible to abrasion under traffic, are required.

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 932-2, *Tests for general properties of aggregates - Part 2: Methods for reducing laboratory samples*

EN 932-5, *Tests for general properties of aggregates - Part 5: Common equipment and calibration*

EN 932-6, *Tests for general properties of aggregates - Part 6: Definitions of repeatability and reproducibility*

EN 933-3, *Tests for geometrical properties of aggregates - Part 3: Determination of particle shape - Flakiness index*

EN 1097-6, *Tests for mechanical and physical properties of aggregates - Part 6: Determination of particle density and water absorption*

ISO 48, *Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

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

ISO 7619-2, *Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 2: IRHD pocket meter method*

3 Terms and definitions

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

3.1

batch

production quantity, a delivery quantity, a partial delivery quantity (railway wagon-load, lorry-load, ship's cargo) or a stockpile produced at one time under conditions that are presumed uniform

Note 1 to entry: With a continuous process the quantity produced during an agreed period is treated as a batch.

3.2

laboratory sample

reduced sample derived from a bulk sample for laboratory testing

EN 1097-8:2016 (E)**3.3****subsample**

sample obtained by means of a sample reduction procedure

3.4**test portion**

sample used as a whole in a single test

3.5**test specimen**

sample used in a single determination when a test method requires more than one determination of a property

4 Principle

PSV is a measure of the resistance of coarse aggregate to the polishing action of vehicle tyres under conditions which simulate those occurring on the surface of a road.

The test is carried out on aggregate passing a 10 mm sieve and retained on a 7,2 mm grid sieve, and is in two parts:

- a) test specimens are subjected to a polishing action in an accelerated polishing machine;
- b) the state of polish reached by each specimen is measured by means of a friction test. The PSV is then calculated from the friction determinations.

5 Sampling

oSIST prEN 1097-8:2016

<https://standards.iteh.ai/catalog/standards/sist/4e0dafcb-7560-492b-a4d3-83842b38c10b/en-1097-8:2016>

The sample submitted to the laboratory for the test shall be obtained from a batch of normal production from the source.

Aggregate that has been freshly produced in the laboratory or has been recovered from bituminous mixtures can give misleading results and shall not be used for conformity testing.

6 Materials

6.1 *General* Detailed requirements for the control of materials are specified in Annex B.

6.2 *Natural corn emery*, complying with the grading specified in Table 1. This shall be used only once.

Table 1 — Grading requirements for corn emery

Nominal width of sieve aperture mm	Total passing %
1,0	100
0,600	98 to 100
0,500	70 to 100
0,425	30 to 90
0,355	0 to 30
0,300	0 to 5

6.3 *Air-floated or water-washed natural emery flour*, complying with the characteristics specified below. This shall be used only once.

- a) at least 50 % Al_2O_3 content;
- b) particle density of at least 3,5 Mg/m³;
- c) particle size distribution (by air jet sieving) as given in Table 2.

Table 2 — Grading requirements for emery flour

Sieve size mm	Passing %
0,063	100
0,050	99 to 100
0,032	75 to 98
0,020	60 to 80

6.4 *PSV control stone*, from a recognized source, with a mean PSV value in the range 50 to 60.

NOTE 1 At present the only recognized source of PSV control stone is a stock of granite aggregate controlled by Technische Universität München (TUM), MPA Bau – Abteilung Baustoffe, Baumbachstrasse 7, 81245 München, Germany.

NOTE 2 An alternative source of PSV control stone with a mean PSV value in the range 50 to 60 can be used provided the PSV value has been established in a controlled experiment carried out in at least ten laboratories, by cross testing against the TUM type control stone.

In case of dispute, the TUM type control stone should be used.

6.5 *Friction tester reference stone*, from a recognized source, for conditioning new sliders (Annex E) and checking the friction tester (11.3), with a mean PSV value in the range 60 to 65.

NOTE 1 At present, the only recognized source of friction tester reference stone is a stock of olivine basalt aggregate controlled by WESSEX, United Kingdom.

NOTE 2 An alternative source of friction tester reference stone with a mean PSV value in the range 60 to 65 can be used provided the PSV value has been established in a controlled experiment carried out in at least 10 laboratories, by cross testing against the WESSEX type friction tester reference stone.

In case of dispute, the WESSEX type friction tester reference stone should be used.

7 Apparatus

7.1 General

All apparatus, unless otherwise stated, shall conform to the general requirements of EN 932-5. Additional requirements for calibration and control of the accelerated polishing machine and the rubber-tyred wheels are given in Annex C.

EN 1097-8:2016 (E)

7.2 Accelerated polishing machine

The polishing machine (Figure 1) shall be mounted on four adjustable levelling feet, placed at the corners and secured on a firm, level base of stone or concrete. It shall include the following:

7.2.1 A wheel, referred to as the “road wheel”, having a flat periphery and clamping arrangements to hold the aggregate specimens shown in Figure 2. It shall be of such a size and shape as to permit 14 of the specimens described in Clause 8 to be clamped onto the periphery so as to form a surface of aggregate particles (406 ± 3) mm in diameter and bounded by clamping rings ($44,5 \pm 0,5$) mm apart.

7.2.2 A means of rotating the road wheel about its own axis at a speed of (320 ± 5) min⁻¹ under test conditions.

7.2.3 Two solid rubber-tyred wheels of (200 ± 3) mm diameter and with a width of (38 ± 2) mm. One of these wheels shall be used exclusively with the corn emery and clearly marked as such, whereas the other wheel shall be used exclusively with the emery flour and clearly marked as such. The surface of the rubber tyres shall initially have a hardness of (69 ± 3) IRHD as specified in ISO 7619-2.

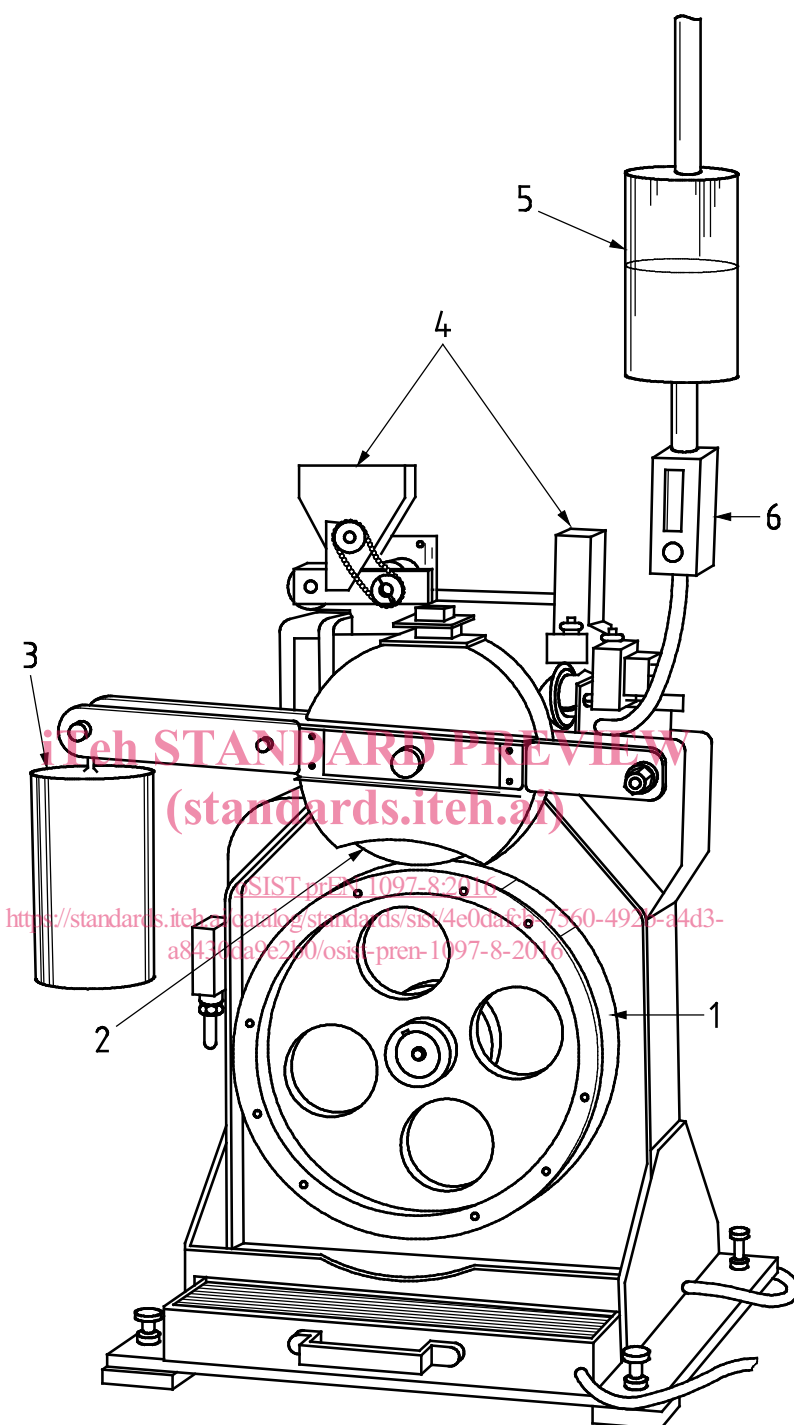
7.2.4 A lever arm and weight to bring the surface of the appropriate solid rubber-tyred wheel to bear on the road wheel with a total free force of (725 ± 10) N. The solid rubber-tyred wheel shall be free to rotate about its own axis, which shall be parallel with the axis of the road wheel, and the plane of rotation of the tyre shall be in line with that of the road wheel.

The machine shall be accurately aligned so that the road wheel and either of the rubber-tyred wheels shall be free to rotate without play in the bearings (C.2.4):

- a) the planes of rotation of the two wheels in use shall be not more than $0,33^\circ$ of arc out of parallel (1 mm in 200 mm);
- b) the planes of rotation through the centres of the two wheels in use shall be not more than 0,8 mm apart.

7.2.5 Feed mechanism, identified as being for use with the rubber-tyred wheel marked for use with the corn emery (7.2.3), to feed the corn emery (6.2) and water at the specified rates. The emery and water shall be fed directly onto the road wheel near the point of contact with the rubber-tyred wheel.

NOTE Feeding the corn emery and water near the point of contact with the rubber-tyred wheel is usually achieved using a nozzle into which water and emery mix. In such a case, instead of having a continuous emery flow, emery clusters may form under capillary forces and discharge discontinuously near the point of contact with the rubber-tyred wheel. To avoid this phenomenon, a possible solution would be to connect the water supply to the lowest point of the nozzle (close to the road wheel).

**Key**

- | | | | |
|---|--------------------------|---|-----------------|
| 1 | road wheel | 4 | feed mechanisms |
| 2 | solid rubber-tyred wheel | 5 | water feed |
| 3 | weight | 6 | flow gauge |

Figure 1 — Typical accelerated polishing machine

EN 1097-8:2016 (E)

Dimensions in millimetres

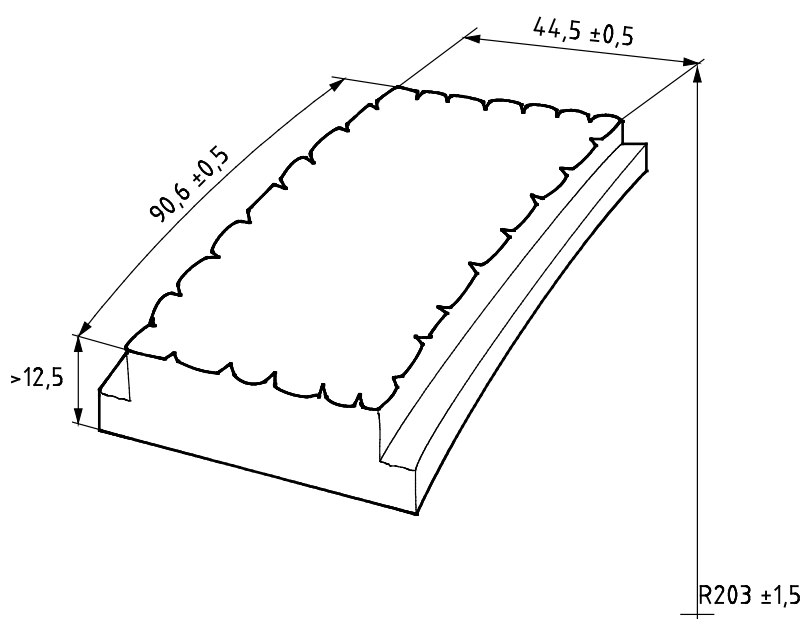


Figure 2 — Test specimen dimensions
 (standards.iteh.ai)

7.2.6 Feed mechanism, identified as being for use with rubber-tyred wheel marked for the emery flour (7.2.3), to feed the emery flour (6.3) and water continuously at the specified rates between the rubber tyred-wheel and the road wheel.

<https://standards.iteh.ai/catalog/standards/sist/4e0dafcb-7560-492b-a4d3-c8479c10e2b0/iso-1097-8-2016>

NOTE Most feed mechanisms inject emery flour at the top of the rubber-tyred wheel and not at the contact point with the road wheel. In this case, it is important to ensure that most emery is driven to the contact point between the road wheel and the rubber-tyred wheel. For this purpose, some feed mechanisms incorporate a disposable felt pad in contact with the rubber-tyred wheel to homogeneously spread and stick the emery flour onto its tread. It is advised to change this felt pad every two tests.

7.2.7 A means of ensuring that the rubber-tyred wheels are not left under load when not running, to prevent the risk of the tyre becoming deformed. When not in use, the rubber-tyred wheels should be removed from the machine and stored as described in Annex C.

7.3 Friction tester

7.3.1 Calibration

Additional requirements for calibration and control of the friction tester, sliders and slider rubber are given in Annex D.

7.3.2 Design

The friction test shall be carried out using the equipment shown in Figure 3 (see Note). All bearings and working parts shall be enclosed as far as possible, and all materials used shall be treated to prevent corrosion under wet conditions.