



NSAI
Standards

Irish Standard
I.S. EN 12697-46:2020

Bituminous mixtures - Test methods - Part 46: Low temperature cracking and properties by uniaxial tension tests

I.S. EN 12697-46:2020

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 12697-46:2020 is the adopted Irish version of the European Document EN 12697-46:2020, Bituminous mixtures - Test methods - Part 46: Low temperature cracking and properties by uniaxial tension tests

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EUROPEAN STANDARD

EN 12697-46

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 12697-46:2012

English Version

Bituminous mixtures - Test methods - Part 46: Low temperature cracking and properties by uniaxial tension tests

Mélanges bitumineux - Méthodes d'essai - Partie 46 :
Fissuration et propriétés à basse température par des
essais de traction uniaxiale

Asphalt - Prüfverfahren - Teil 46: Widerstand gegen
Kälterisse und Tieftemperaturverhalten bei
einachsigen Zugversuchen

This European Standard was approved by CEN on 18 November 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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EN 12697-46:2020 (E)**European foreword**

This document (EN 12697-46:2020) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

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

This document supersedes EN 12697-46:2012.

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

- the title no longer makes the method exclusively for hot mix asphalt;
- [ge] editorial update according to current standard template;
- [ge] NOTEs modified and adjusted to normal text where appropriate according to ISO/IEC Directives – Part 2:2016, 24.5;
- [Clause 4] changed order of indent 3 and 4 for consistency with Clause 8.3 and 8.4;
- [5.1.4] clause amended to read: Load measurement system, capable of monitoring the axial load up to $(25 \pm 0,025)$ kN with resolution of 0,001 kN or better and with an accuracy of $\pm 0,01$ kN or better.
- [5.1.4] excessive and incorrect NOTE deleted;
- [5.2.1] accuracy for Dynamic testing device (0,1 Hz) completed with “±”;
- [5.2.1] correction of keys for Figure 8;
- [5.2.5] clarified that temperature is measured on a dummy specimen;
- [6.1.1] clarified that the main reason for required calibration is to obtain correct loading condition;
- [7.3.1] added description for sawing of prismatic specimen to ensure a precise cross section;
- [7.3.2] added description for thickness to enable sawing of prismatic specimens;
- [8.2.2] clarified that the results of the test evaluation are measured (not failure stress and failure temperature);

- [8.5.1]; NOTE modified and adjusted to normal text according to ISO/IEC Directives – Part 2:2016, 24.5. Added description of suitable test temperature and testing frequency for intermediate low temperatures;
- [8.5.3.6] the reason for measuring clarified.

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

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

EN 12697-46:2020 (E)

1 Scope

This document specifies uniaxial tension tests for characterizing the resistance of an asphalt mixture against low temperature cracking. The results of the uniaxial tension tests can be used to evaluate the following:

- tensile strength at a specified temperature, using the uniaxial tension stress test (UTST);
- minimum temperature that the asphalt can resist before failure, using the thermal stress restrained specimen test (TSRST);
- tensile strength reserve at a specified temperature (using a combination of TSRST and UTST);
- relaxation time, using the relaxation test (RT);
- creep curve to back calculate rheological parameters, using the tensile creep tests (TCT);
- fatigue resistance at low temperatures due to the combination of cryogenic and mechanical loads, using the uniaxial cyclic tension stress tests (UCTST).

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 12697-6, *Bituminous mixtures — Test methods — Part 6: Determination of bulk density of bituminous specimens*

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

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

3 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:

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

3.1 tensile strength

β_t

maximum tensile stress measured in a tensile stress test

3.2 tensile failure strain

$\epsilon_{\text{failure}}$

tensile strain that is measured when the tensile strength has been reached

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