

This document is a preview generated by EVS

Bituminous mixtures - Test methods - Part 24:
Resistance to fatigue

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12697-24:2018 sisaldab Euroopa standardi EN 12697-24:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 12697-24:2018 consists of the English text of the European standard EN 12697-24:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 20.06.2018.	Date of Availability of the European standard is 20.06.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 93.080.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN 12697-24

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2018

ICS 93.080.20

Supersedes EN 12697-24:2012

English Version

Bituminous mixtures - Test methods - Part 24: Resistance to fatigue

Mélanges bitumineux - Méthodes d'essai pour mélange hydrocarboné à chaud - Partie 24: Résistance à la fatigue

Asphalt - Prüfverfahren - Teil 24: Beständigkeit gegen Ermüdung

This European Standard was approved by CEN on 26 February 2018.

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 CEN-CENELEC Management Centre 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 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms, definitions, symbols and abbreviations.....	5
3.1 General.....	6
3.2 Two-point bending test on trapezoidal shaped specimens (2PB-TR)	6
3.3 Two-point bending test on prismatic shaped specimens (2PB-PR)	7
3.4 Three-point bending test on prismatic shaped specimens (3PB-PR).....	9
3.5 Four-point bending test on prismatic shaped specimens (4PB-PR).....	10
3.6 Symbols for indirect tensile test on cylindrical shaped specimens (IT-CY)	15
3.7 Symbols for Cyclic Indirect tensile Test on cylindrical shaped specimen (CIT-CY).....	15
4 Sample preparation.....	16
4.1 Storage of the specimens.....	16
4.2 Drying of the specimens	16
4.3 Dimensions and bulk density of the specimens.....	17
5 Failure	17
6 Selection test conditions.....	17
7 Summary of the procedures.....	17
7.1 Two-point bending test on trapezoidal shaped specimens (2PB-TR)	17
7.2 Two-point bending test on prismatic shaped specimens (2PB-PR)	17
7.3 Three-point bending test on prismatic shaped specimens (3PB-PR).....	17
7.4 Four-point bending test on prismatic shaped specimens (4PB-PR).....	18
7.5 Indirect tensile test on cylindrical shaped specimens (IT-CY).....	18
7.6 Cyclic Indirect tensile test on cylindrical shaped specimens (CIT-CY).....	18
8 Checking of the testing equipment	18
9 Test report.....	19
Annex A (normative) Two-point bending test on trapezoidal shaped specimens (2PB-TR).....	20
A.1 Principle	20
A.2 Equipment	21
A.3 Specimen preparation.....	21
A.4 Procedure.....	24
A.5 Calculation and expression of results.....	25
A.6 Test report.....	26
A.7 Precision.....	26
Annex B (normative) Two-point bending test on prismatic shaped specimens (2PB-PR).....	28
B.1 Principle	28
B.2 Equipment	28
B.3 Specimen preparation.....	29
B.4 Procedure.....	29

B.5	Calculation and expression of results	30
B.6	Test report	32
B.7	Precision	32
Annex C (normative)	Three-point bending test on prismatic shaped specimens (3PB-PR)	33
C.1	Principle.....	33
C.2	Equipment.....	33
C.3	Specimen preparation	34
C.4	Procedure.....	34
C.5	Calculation and expression of results	35
C.6	Test report	38
C.7	Precision	39
Annex D (normative)	Four-point bending test on prismatic shaped specimens (4PB-PR)	40
D.1	Principle.....	40
D.2	Equipment.....	42
D.3	Specimen preparation	43
D.4	Procedure.....	44
D.5	Calculation and expression of results	46
D.6	Test report	46
D.7	Precision	47
Annex E (normative)	Indirect tensile test on cylindrical shaped specimens (IT-CY)	48
E.1	Principle.....	48
E.2	Equipment.....	48
E.3	Specimen preparation	51
E.4	Procedure.....	52
E.5	Calculation and reporting of results.....	53
E.6	Test report	56
E.7	Precision	56
Annex F (normative)	Cyclic indirect tensile test on cylindrical shaped specimens (CIT-CY)	57
F.1	Principle.....	57
F.2	Equipment.....	57
F.3	Specimen preparation	59
F.4	Procedure.....	60
F.5	Calculation and reporting of results.....	62
F.6	Test report	63
F.7	Precision	63
	Bibliography	64

European foreword

This document (EN 12697-24:2018) 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 December 2018, and conflicting national standards shall be withdrawn at the latest by December 2018.

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

This document supersedes EN 12697-24:2012.

Compared with EN 12697-24:2012, the following changes have been made:

- the series title no longer makes the method exclusively for hot mix asphalt [Title];
- editing of several text sections in order to clarify the procedures [Ge];
- “load applications” amended to “load cycles” [Ge];
- Figure A.1 corrected: Key 3 pointing at the groove [A.1.2];
- completion of Figure E.3: Line 1 added to extensometer in front view figure [E.2.5.3];
- introduction of new annex for cyclic indirect tensile test on cylindrical specimens (CIT-CY) [Annex F].

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the methods for characterizing the fatigue of bituminous mixtures using alternative tests, including bending tests and direct and indirect tensile tests. The tests are performed on compacted bituminous material under a sinusoidal loading or other controlled loading, using different types of specimens and supports.

The procedure is used:

- a) to rank bituminous mixtures on the basis of resistance to fatigue;
- b) as a guide to relative performance in the pavement;
- c) to obtain data for estimating the structural behaviour of the road; and
- d) to judge test data according to specifications for bituminous mixtures.

Because this European Standard does not impose a particular type of testing device, the precise choice of the test conditions depends on the possibilities and the working range of the device used. For the choice of specific test conditions, the requirements of the product standards for bituminous mixtures need to be respected. The applicability of this document is described in the product standards for bituminous mixtures.

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

EN 12697-7, *Bituminous mixtures — Test methods for hot mix asphalt — Part 7: Determination of bulk density of bituminous specimens by gamma rays*

EN 12697-8, *Bituminous mixtures — Test methods for hot mix asphalt — Part 8: Determination of void characteristics of bituminous specimens*

EN 12697-26, *Bituminous mixtures — Test methods — Part 26: Stiffness*

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

EN 12697-29, *Bituminous mixtures — Test method for hot mix asphalt — Part 29: Determination of the dimensions of a bituminous specimen*

EN 12697-31, *Bituminous mixtures — Test methods for hot mix asphalt — Part 31: Specimen preparation by gyratory compactor*

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

3 Terms, definitions, symbols and abbreviations

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