

Bituminous mixtures - Test methods - Part 4: Bitumen
recovery: Fractionating column

This document is a preview generated by EVS



EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12697-4:2023 sisaldab Euroopa standardi EN 12697-4:2023 ingliskeelset teksti.	This Estonian standard EVS-EN 12697-4:2023 consists of the English text of the European standard EN 12697-4:2023.
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 and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.04.2023.	Date of Availability of the European standard is 12.04.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

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 Standardimis- ja Akrediteerimiskeskusele

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

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis-ja Akrediteerimiskeskusega: 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 and Accreditation

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 and Accreditation.

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

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

EUROPEAN STANDARD

EN 12697-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2023

ICS 93.080.20

Supersedes EN 12697-4:2015

English Version

Bituminous mixtures - Test methods - Part 4: Bitumen recovery: Fractionating column

Mélanges Bitumineux - Méthodes d'essai - Partie 4 :
Extraction des bitumes à la colonne à distiller

Asphalt - Prüfverfahren - Teil 4: Rückgewinnung des
Bindemittels: Fraktionierkolonne

This European Standard was approved by CEN on 3 March 2023.

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, 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, Türkiye 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	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle	5
5 Apparatus	6
5.1 Apparatus for the extraction of the soluble bitumen	6
5.2 Apparatus for the clarification of the bitumen solution	6
5.3 Distillation apparatus	7
6 Solvent and other materials	7
7 Procedure	7
7.1 Extraction of the bitumen and removal of insoluble matter	7
7.2 Assembling and checking the apparatus for air leaks	8
7.3 Distillation procedure	8
8 Preparation of the bitumen for testing	9
9 Test report	9
10 Precision	9
Bibliography	14

European foreword

This document (EN 12697-4:2023) 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 October 2023, and conflicting national standards shall be withdrawn at the latest by October 2023.

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 12697-4:2015.

The main changes compared to the previous edition are listed below:

- general update of standard texts according to CEN/CENELEC Internal Regulations Part 3:2019;
- [Clause 1] clarification of the scope;
- [Clause 2] deletion of “for hot mix asphalt” for EN 12697-1 and correction of dated reference;
- [Clause 2] deletion of reference to EN 12697-3. Added to Bibliography;
- [Clause 2] deletion of reference to EN 12697-38;
- [Clause 5.2.1] deletion of paragraph describing calibration and maintenance for the centrifuge with reference to EN 12697-38;
- [Clause 5.3.2] clarification of the temperature capacity for oil bath;
- [Clause 5.3.5] the term “accuracy” for thermometer replaced by “maximum permissible error”;
- [Clause 7.1.2] correction of dated reference to EN 12697-1:2020;
- [Clause 7.3.5] completion of tolerances for temperatures;
- [Clause 9] revision of data to be reported;
- [Clause 10.1] completion with reference to Table 1 in paragraph;
- [Figure 2] completion with keys for X and Y.

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies 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, Türkiye and the United Kingdom.

Introduction

WARNING — The method described in this document may require the use of dichloromethane (methylene chloride), 1,1,1 trichlorethane, benzene, trichlorethylene, xylene, toluene or other solvent capable of dissolving bitumen. These solvents are hazardous to health and are subject to occupational exposure limits as detailed in relevant legislation and regulations.

Exposure levels are related to both handling procedures and ventilation provision and it is emphasized that adequate training should be given to staff employed in the usage of these substances.

1 Scope

This document specifies a method for the recovery of soluble bitumen from bituminous mixtures used in road, airfield or similar pavements in a form suitable for further testing.

The method is applicable for the recovery of paving grade bitumen and is the reference method for recovery of soluble bitumen from bituminous mixtures containing volatile matter such as cut-back bitumen.

The method is not applicable for recovery of polymer-modified bitumen.

NOTE EN 12697-3 is the reference method for the recovery of paving grade bitumen and polymer-modified bitumen.

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 12594, *Bitumen and bituminous binders - Preparation of test samples*

EN 12697-1:2020, *Bituminous mixtures - Test methods - Part 1: Soluble binder content*

3 Terms and definitions

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

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

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

3.1

soluble binder content

percentage by mass of extractable binder in an anhydrous sample determined by extracting the binder from the sample

Note 1 to entry: Extraction can be followed by binder recovery.

3.2

insoluble binder content

percentage by mass of binder that adheres to the aggregate after extraction

4 Principle

The bitumen is separated from the sample by dissolving in dichloromethane (or other suitable solvent). After removal of undissolved solids, the bitumen solution is concentrated by atmospheric distillation in a fractionating column. The last traces of solvent are removed from the concentrate by distillation at a temperature of 100 °C above the expected softening point or 175 °C, whichever is the higher, with the pressure reduced from atmospheric pressure 100 kPa to 20 kPa and with the aid of a stream of carbon dioxide gas. When cut-back bitumens containing very volatile fluxes, e.g. white spirit, are being recovered the carbon dioxide gas is omitted.