

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)



BSI Standards Publication

Bituminous mixtures — Test methods

Part 11: Determination of the affinity between aggregate and bitumen

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)

National foreword

This British Standard is the UK implementation of EN 12697-11:2020. It supersedes BS EN 12697-11:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/510/1, Asphalt products.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 539 02221 6

ICS 93.080.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

February 2020

ICS 93.080.20

Supersedes EN 12697-11:2012

English Version

Bituminous mixtures - Test methods - Part 11: Determination of the affinity between aggregate and bitumen

Mélanges bitumineux - Méthodes d'essai - Partie 11 :
Détermination de l'affinité granulats-bitume

Asphalt - Prüfverfahren - Teil 11: Bestimmung der
Affinität von Gesteinskörnungen und Bitumen

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

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, 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

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)

Contents	Page
European foreword.....	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Principle	7
5 Rolling bottle method.....	8
5.1 Equipment	8
5.2 Preparation of test specimens.....	11
5.2.1 Aggregate	11
5.2.2 Bitumen	12
5.2.3 Mixing aggregate and bitumen.....	12
5.3 Conditioning.....	13
5.4 Procedure.....	14
5.5 Calculation and expression of results.....	15
5.6 Test report.....	15
5.7 Precision.....	16
6 Static method.....	17
6.1 Equipment	17
6.1.1 Flat bottomed container	17
6.1.2 Mixing bowl	17
6.1.3 Heating apparatus.....	17
6.2 Solvent and other materials.....	17
6.3 Preparation of test specimens.....	17
6.3.1 Aggregate	17
6.3.2 Bitumen	17
6.4 Procedure.....	17
6.5 Calculation and expression of results.....	18
6.6 Test report.....	18
6.7 Precision.....	19
7 Boiling water stripping method.....	19
7.1 General.....	19
7.2 Equipment and materials.....	19
7.3 Sample preparation.....	21
7.3.1 Aggregate	21
7.3.2 Bitumen	21
7.3.3 Mixing aggregate and bitumen.....	21
7.4 Conditioning.....	22
7.5 Test procedure	22
7.5.1 Establishing the acid/base equivalence factor.....	22
7.5.2 Establishing the calibration curve	22
7.5.3 Stripping test	24
7.6 Calculation and expression of results.....	25
7.6.1 Determination of the calibration curve	25
7.6.2 Calculation of the degree of bitumen coverage	26

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)

7.7 Test report 26
7.8 Precision 26
Annex A (informative) Guidance for estimation of the degree of bitumen coverage..... 27
Bibliography 28

European foreword

This document (EN 12697-11:2020) 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 12697-11:2012.

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 adjusted according to ISO/IEC Directives – Part 2:2016,24.5;
- [3.5] chemical expression for molar concentration updated. The definition "Normality, N" amended to molarity. Amended description of the definition and change of unit to mol/l;
- [5.1.5] alternative procedure for addition of adhesion agent by using a syringe introduced. Change of title for 5.1.5. The following clauses renumbered accordingly;
- [5.1.13] clarified that the speed requirements refer to bottle rather than machine rotation;
- [5.2.3.4] clarified procedure for the addition of liquid adhesion agents with time limits including description for addition of small amounts (less than 0,4 g). Clarified that the weighed amount of adhesive agent shall be reported in the test report. Description of the evaluation of heat stability of adhesion agents introduced;
- [5.2.3.6] Formula (1) clarified. Keys added;
- [5.4.1] editorial: clarified and simplified description;
- [5.6] bullet e): completed with "amount";
- [6.4.5] NOTE clarified that additional procedure has to be mentioned in the test report;
- [7.1 to 7.6.2.1] chemical expressions for concentration, "N", amended to mol/l in relevant places in line with changed definition in 3.5;

This is a preview of "BS EN 12697-11:2020". [Click here to purchase the full version from the ANSI store.](#)

- [7.2.12] last paragraph clarified regarding concentration;
- [7.6.1.1] Formula (4) clarified. Keys added.

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.

This is a preview of "BS EN 12697-11:2020". Click here to purchase the full version from the ANSI store.

1 Scope

This document specifies procedures for the determination of the affinity between aggregate and bitumen and its influence on the susceptibility of the combination to stripping. This property is intended to be of assistance to the designer for mixture design rather than as a type test. Susceptibility to stripping, as determined by these procedures, is an indirect measure of the power of a binder to adhere to various aggregates, or of various binders to adhere to a given aggregate. The procedures can also be used to evaluate the effect of moisture on a given aggregate-binder combination with or without adhesion agents including liquids, such as amines, and fillers, such as hydrated lime or cement.

In the rolling bottle method, the affinity is expressed by visual registration of the degree of bitumen coverage on uncompacted bitumen-coated mineral aggregate particles after influence of mechanical stirring action in the presence of water.

NOTE 1 The rolling bottle test is a simple but subjective test and suitable for routine testing. It is not appropriate for aggregates that are highly abrasive.

In the static test method, the affinity is expressed by visual registration of the degree of bitumen coverage on uncompacted bitumen-coated mineral aggregate particles after storage in water.

NOTE 2 The static test is a simple, though subjective test that is generally less precise, but that can cope with high PSV-aggregates.

In the boiling water stripping test method, the affinity is expressed by determining the degree of bitumen-coverage on uncompacted bitumen-coated aggregate after immersion in boiling water under specified conditions.

NOTE 3 The boiling water stripping test is an objective test and has a high precision. However, it is a more specialist test because it requires greater skill of the operatives and uses chemicals as reagent. The latter point might also imply extra health and safety considerations.

NOTE 4 The boiling water stripping test procedure can be used for any binder-aggregate combinations in which the mineral aggregate is calcareous, silico-calcareous or siliceous by nature.

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 58, *Bitumen and bituminous binders — Sampling bituminous binders*

EN 1426, *Bitumen and bituminous binders — Determination of needle penetration*

EN 12697-2, *Bituminous mixtures — Test methods — Part 2: Determination of particle size distribution*

EN 12697-35, *Bituminous mixtures — Test methods — Part 35: Laboratory mixing*

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>