SLOVENSKI STANDARD
SIST EN 12697-35:2025

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Bitumenske zmesi - Preskusne metode - 35. del: Laboratorijska zmes

Bituminous mixtures - Test methods - Part 35: Laboratory mixing

Asphalt - Prüfverfahren - Teil 35: Labormischen

Mélanges bitumineux - Méthodes d'essais - Partie 35: Malaxage de laboratoire

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Bituminous mixtures - Test methods - Part 35: Laboratory mixing

Mélanges bitumineux - Méthodes d'essai - Partie 35 : Mélange de laboratoire

Asphalt - Prüfverfahren - Teil 35: Labormischen

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

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Contents

Page

European foreword

This document (EN 12697-35:2025) 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of an identical text or by endorsement, at the latest by September 2025, and conflicting national standards shall be withdrawn at the latest by September 2025.

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 12697-35:2016.

EN 12697-35:2025 includes the following significant technical changes with respect to EN 12697-35:2016:

— (Clause 1) Scope modified to be in line with subclause 6.1 and the amended titles for the Annexes;

— (Clause 2) deletion of normative references that are considered informative. Listed in the Bibliography;

— (Clause 2) deletion of normative reference to EN 12697-38 as it is obsolete and will be deleted from the EN 12697 series;

— (Clause 2) correction of title of EN 12697-42 by deletion of “for hot mix asphalt”;

— (Clause 4) NOTE completed with “of a mixture or for the reference installation temperature of mastic asphalt” due to the amended subclause 6.1 and Table 1.

— (3.2) explanation of symbol *p*: completed with “expressed in %”;

— (5.1) NOTE reworded to normal text;

— (5.2) deletion of reference to EN 12697-38. Paragraph completed for clarity with « for mixtures or the reference installation temperature for mastic asphalt due to the amended subclause 6.1 and Table 1. Replacement of “accuracy” with “maximum permissible error of 5°C;

— (5.3) “measuring” altered to “weighing”. Deletion of reference to EN 12697-38. Replacement of “accuracy” with “maximum permissible error at least 0,1 g for masses up to 5 kg, and 1 g for masses over 5 kg;

— (5.4) introduction of new Clause with requirements for balance for the weighing of additives (smaller amounts). Following Clauses re-numbered accordingly;

— (5.5) deletion of reference to EN 12697-38. Replacement of “accuracy” with “maximum permissible error of 2°C. (Previously 5.4);

— (5.6) deletion of reference to EN 12697-38. Replacement of “accuracy” with “maximum permissible error of 2°C. (Previously 5.5);

— (6.1) clause title “Mixing temperature” amended to read to read “Reference compaction temperature for mixtures and reference installation temperature for mastic asphalt”;

— (6.1) paragraph amended for clarity. References to EN 12591, EN 13924-1, EN 14023, EN 13924-2 placed in new NOTE 1 and new NOTE 2. References to EN 13108-1 to −7 and −9 deleted and replaced by new NOTE 3 for the guidance of calculations of the penetration or the softening point of the binder. Existing NOTE re-numbered to NOTE 4;

— (6.1) Table 1: Title completed with “reference installation temperature for mastic asphalt mixtures”. Table 1 completed with column for the reference installation temperature for mastic asphalt mixtures;

— (6.1) completion with paragraphs for the reference to the respective normative Annexes A and B;

— (6.2.2) replacement of “accuracy” with “to the nearest”;

— (6.2.3) replacement of “accuracy of 1%” with “to the nearest 0,1 g”;

— (6.2.4) completion of paragraph to take into account additives such as pigments and fibres;

— (6.3.1) replacement of “accuracy” with “to the nearest”;

— (6.3.2) paragraph modified for clarity;

— (6.3.3, 6.3.4) text in clauses merged and reworded for clarity. Following clauses re-numbered;

— (6.3.3) NOTE with examples of precautions to avoid build-up pressure reworded to normal text;

— (6.3.4) (previously 6.3.5). Paragraph clarified regarding the introduction of reclaimed asphalt when the reclaimed asphalt is note heated to the full target laboratory mixing temperature at the mixing plant or when the procedure is not determined with the completion that the reclaimed asphalt temperature shall be indicated in the test report;

— (6.3.4) (previously 6.3.5). NOTE deleted.

— (6.3.6) (previously 6.3.7). NOTE in 6.3.8 (previous version) reworded to normal text and introduced in 6.3.6;

— (6.4) paragraph introduced for the preheating of binders for mastic asphalt. 1st paragraph of NOTE 2 has been altered to normal text;

— (6.5.2) introduction of new NOTE 2 with reference to EN 13043. “NOTE” renumbered to NOTE 1;

— (6.5.3) NOTE reworded to normal text;

— (6.5.6) addition of informative NOTE regarding laboratory mixing times for mastic asphalt;

— (6.5.8) paragraph added with recommendation to proceed with subsequent testing within 1 h after completed mixing;

— (6.5.8) completion with paragraph for the reference to the normative Annex C.

— (Clause 7) introductory paragraph and list of bullets revised. Addition of bullet h) for temperature of the added reclaimed asphalt;

— (Annex A) title amended to read “Laboratory mixing using foamed bitumen” for clarity;

— (A.1) completion with a general description for the procedure;

— (A.3.4.2) paragraph clarified regarding optimum water content for foamed bitumen. NOTE revised for clarity;

— (A.4.4.2) paragraph revised for clarity. Addition of optimum water content;

— (A.5.3.2) replacement of “accuracy” with “to the nearest 0,1g;

— (Annex B) title amended to read “Laboratory mixing using bitumen emulsion” for clarity;

— (B.2.1.3) NOTE reworded to normal text;

— (B.2.2.4) introduction of new subclause for the measurement of the water content of the reclaimed asphalt;

— (B.2.3.2) last paragraph transferred to new subclause B.2.3.3 for clarity and in line with B.3.3.2. NOTE reworded to normal text;

— (B.2.4.4) deletion of Clause for waiting time after mixing. Following Clause re-numbered;

— (B.3.3.2) NOTE reworded to normal text and introduced in paragraph in line with B.3.3.2;

— (B.3.4.4) amendment of waiting time after mixing “(30 ± 5) s” to read (300 ± 5) s;

— (Annex C) title amended to read “Preparation of mastic asphalt specimens” for clarity;

— (C.1) NOTE revised to refer to EN 12697-20;

— (C.2) amendment of maximum temperature of the temperature ranges from 150°C to read 160°C. NOTE reworded to normal text;

— (Bibliography) completed with references to documents that are referred to informatively in this document. Deletion of reference to EN 12595 as not referred to in this document.

A list of all parts in a series can be found on the CEN website: www.cencenelec.eu.

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.

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1 Scope

This document describes the laboratory mixing of bituminous materials for the manufacture of specimens. This document specifies the reference compaction temperatures for mixtures and the reference installation temperature for mastic asphalt mixtures based on the grade of the binder for paving grade and hard paving grade bitumen.

Annex A describes the method for laboratory mixing using foamed bitumen.

Annex B describes the method for laboratory mixing using bitumen emulsion.

Annex C describes the preparation of mastic asphalt specimens after laboratory mixing.

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 1097-5, *Tests for mechanical and physical properties of aggregates — Part 5: Determination of the water content by drying in a ventilated oven*

EN 12697-42, *Bituminous mixtures — Test methods — Part 42: Amount of foreign matter in reclaimed asphalt*

EN 13302, *Bitumen and bituminous binders — Determination of dynamic viscosity of bituminous binder using a rotating spindle apparatus*

EN 13702, *Bitumen and bituminous binders — Determination of dynamic viscosity of bitumen and bituminous binders by the cone and plate method*

3 Terms, definitions and symbols

3.1 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/

3.1.1
reference compaction temperature
target value at which compaction (or installation for mastic asphalt) of an asphalt mixture starts

Note 1 to entry: The term “reference compaction temperature” is used here for mastic asphalt despite mastic asphalt not being compacted.

3.1.2
target laboratory mixing temperature
value at which component materials are mixed to form an asphalt mixture

3.1.3
maximum laboratory mixing temperature
value that an asphalt mixture shall not exceed during the mixing process

3.1.4
reclaimed asphalt temperature
target value to which a reclaimed asphalt shall be heated before mixing

3.2 Symbols

θ_{RCT}	is the reference compaction temperature
θ_{TLMT}	is the target laboratory mixing temperature
θ_{RA}	is the reclaimed asphalt temperature
θ_{FA}	is the temperature to which the fresh aggregate shall be heated
p	is the proportion of reclaimed asphalt expressed in %

4 Principle

The bituminous mixture is prepared at a target laboratory mixing temperature within a time that is limited in order to reduce mechanical degradation of the aggregates and thermal degradation of the binder.

NOTE The target laboratory mixing temperature for mixing is related to the grade of binder and to the reference compaction temperatures used for its subsequent compaction of a mixture or for the reference installation temperature of mastic asphalt.

5 Apparatus

5.1 Laboratory mixer capable of entirely coating all mineral substances in not more than 5 min.

The mixer shall be of the whisk or other type that is not so rigid that it can damage either the aggregate particles or the bowl.

The mixer can be equipped with a thermostatically controlled heating system, a mechanical speed control; and a mixing time programmer.

5.2 Ventilated oven, for heating aggregates and bitumen up to a temperature at least 20 °C above the relevant reference compaction temperature for mixtures or the reference installation temperature for mastic asphalt indicated in Table 1 with a maximum permissible error of 5 °C.

5.3 Balance, capable of weighing mass of the intended mixture with a maximum permissible error of not more than 0,1g for masses up to 5 kg, and 1 g for masses over 5 kg.

5.4 Balance, capable of weighing additives with a maximum permissible error of 0,05 g.

5.5 Device, capable of measuring the target laboratory mixing temperature with a maximum permissible error of 2 °C.

5.6 Adjustable hot plate, capable of maintaining the target laboratory mixing temperature during the manual mixing with a maximum permissible error of 2 °C.