Bitumen and bituminous binders - Determination of dynamic viscosity of modified bitumen by cone and plate method - Cone and plate method

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English Version

Bitumen and bituminous binders - Determination of dynamic viscosity of modified bitumen by cone and plate method

Bitumes et liants bitumineux - Détermination de la viscosité dynamique des bitumes modifiés - Méthode cône et plateau

Bitumen und bitumenhaltige Bindemittel - Bestimmung der dynamischen Viskosität von modifiziertem Bitumen - Platte-Kegel-Verfahren

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Foreword

This document (EN 13702:2010) has been prepared by Technical Committee CEN/TC 336 “Bituminous binders”, the secretariat of which is held by AFNOR/BNPé.

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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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

This document supersedes EN 13702-1:2003.

This document was formerly known as EN 13702 – Part 1. As Part 2 of this standard was merged with another standard into EN 13302, this standard was renumbered into EN 13702.

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1 Scope

This European Standard specifies a method for determining the dynamic viscosity of a modified bituminous binder over a range of temperatures by means of a cone and plate viscometer. Although the method has been developed for modified binders, it is also suitable for other bituminous binders.

NOTE Unlike penetration grade bitumen, polymer modified bitumens (PMBs) may not show a straight line on the Heukelom-Diagram. This implies that in order to obtain information about the temperature susceptibility of PMBs, viscosity should be measured at different temperatures.

WARNING — The use of this European Standard can involve hazardous materials, operations and equipment. This European Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this European Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2 Normative references

The following referenced documents are indispensable for the application 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 12594, *Bitumen and bituminous binders — Preparation of test samples*

3 Principle

The sample is placed on a plate, a cone is pressed onto the sample and the system is brought to the test temperature. A stress is applied to the sample by rotation. The torque is measured from the applied shear rate and dynamic viscosity is calculated by:

$$\eta = \tau / \gamma \tag{1}$$

where

γ is the shear rate expressed in s^{-1};

τ is the stress expressed in Pa, calculated by:

$$\tau = A \times M_{\mathrm{d}} \tag{2}$$

where

A is the cone factor expressed in m^{-3};

M_{d} is the torque in expressed N · m.

NOTE The advantages of this method are the use of a very small sample and the speed of the method, especially regarding thermal conditioning of the specimen.