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BSI Standards Publication

Bitumen and bituminous binders — Determination of the softening point — Ring and Ball method

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PTI/13, Petroleum Testing and Terminology.

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

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BS 2000 Series

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English Version

Bitumen and bituminous binders - Determination of the softening point - Ring and Ball method

Bitumes et liants bitumineux - Détermination du point de ramollissement - Méthode Bille et Anneau

Bitumen und bitumenhaltige Bindemittel - Bestimmung des Erweichungspunktes - Ring- und Kugel-Verfahren

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Foreword

This document (EN 1427:2015) has been prepared by Technical Committee CEN/TC 336 “Bituminous binders”, the secretariat of which is held by AFNOR.

This document supersedes EN 1427:2007.

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of an identical text or by endorsement, at the latest by January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

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.

The major changes in comparison to EN 1427:2007 are:

- mercury thermometer is no longer the normative reference thermometer (see 6.1.7);
- the description of establishing the temperature gradient has been improved (see 8.6);
- it is recognised that it is difficult to establish the temperature gradient homogeneously in the bath (6.1.6) in the temperature range from 30 °C till 60 °C when glycerol is used as bath liquid. A new procedure requires the gradient to be met from 60 °C. An informative Annex B with examples of valid and invalid temperature gradients has been added for clarification.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method for the determination of the softening point of bitumen and bituminous binders in the range of 28 °C to 150 °C.

Technical warning - The change from mercury thermometers to electronic temperature devices has revealed that the temperature definition in the mercury thermometer has not been precise enough to make a correct, unbiased transfer to electronic devices. Care should be taken for softening points ring and ball above 100 °C as the condition may have changed from previous practise to present days testing equipment. Below approx. 100 °C the difference in temperature readings between electronic and mercury stem thermometer is acceptable compared to the repeatability of this test methods. [Reference: ASTM E20 Group]

NOTE The method described is also applicable to bituminous binders that have been recovered from bituminous mixes, e.g. by extraction.

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

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

EN 12597, *Bitumen and bituminous binders - Terminology*

EN ISO 3696:1995, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12597 and the following apply.

3.1
softening point
temperature at which material under standardised test conditions attains a specific consistency

4 Principle

Two horizontal discs of bituminous binder, cast in shouldered brass rings shall be heated at a controlled rate in a liquid bath while each supports a steel ball. The softening point shall be reported as the mean of the temperatures at which the two discs soften enough to allow each ball, enveloped in bituminous binder, to fall a distance of (25,0 ± 0,4) mm.

5 Reagents and materials

5.1 General

Use only reagents of specified analytical grade and water conforming to grade 3 of EN ISO 3696:1995 unless otherwise specified.