

ICS 91.100.50

English Version

## Bitumen and bituminous binders - Determination of Zero-Shear Viscosity (ZSV) using a Shear Stress Rheometer in creep mode

Bitumes et liants bitumineux - Détermination de la viscosité à taux de cisaillement nul (ZSV) utilisant un rhéomètre à contrainte de cisaillement en mode de fluage

Bitumen und bitumenhaltige Bindemittel - Bestimmung der Null-Scherviskosität (ZSV) mit Hilfe eines Schubspannungs-Rheometers im Kriechmodus

This Technical Specification (CEN/TS) was approved by CEN on 23 March 2007 for provisional application.

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## Foreword

This document (CEN/TS 15325:2008) has been prepared by Technical Committee CEN/TC 336 "Bituminous binders", the secretariat of which is held by AFNOR.

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## 1 Scope

This European standard describes the determination of Zero Shear Viscosity (ZSV),  $\eta_0$ , for bitumens and bituminous binders, preferably using test temperature domains in which  $100 \text{ Pa}\cdot\text{s} < \eta_0 < 50\,000 \text{ Pa}\cdot\text{s}$ . The preferred test temperature is  $60\text{ }^\circ\text{C}$  but other temperatures for example,  $45\text{ }^\circ\text{C}$  or  $50\text{ }^\circ\text{C}$  could be used.

Under these conditions, ZSV (also referred to as the first Newtonian viscosity or absolute viscosity) is a suitable indicator to evaluate the partial contribution of the bituminous binder (including Polymer Modified Binders) to the rutting resistance of asphalt pavement layers.

This European standard describes the determination of ZSV using a Shear Stress Rheometer (SSR) in creep mode.

This method is applicable to unaged, aged and recovered bituminous binders including Polymer Modified Binders (PMBs).

**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. Since this European standard involves handling apparatus and binders at high temperatures, always wear protective gloves and eye glasses when handling hot binder, and avoid contact with any exposed skin.**

## 2 Normative references

The following referenced European standards are indispensable for the application of this European standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced European standard (including any amendments) applies.

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

## 3 Terms and definitions

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

**3.1  
creep test**  
rheological test in which constant stress is applied to a sample and the resulting deformation is then measured as a function of loading time

**3.2  
steady-state flow**  
state at which the rate of deformation reaches a constant value

**3.3  
steady-state viscosity (SSV)**  
ratio of the applied stress to the deformation rate under steady-state flow, in Pascal.seconds (Pa.s)

**3.4  
zero-shear viscosity (ZSV) or Newtonian dynamic viscosity ( $\eta_0$ )**  
constant value to which the SSV tends at low shear stress or shear rate values, measured in Pascal.seconds (Pa.s)