Products and systems for the protection and repair of concrete structures - Test methods - Determination of glass transition temperatures of polymers

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12614:2004 sisaldab Euroopa standardi EN 12614:2004 ingliskeelset teksti. Käesolev dokument on jõustatud 21.12.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 12614:2004 consists of the English text of the European standard EN 12614:2004. This document is endorsed on 21.12.2004 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European standard covers a test method for the determination of glass transition temperature (GTT) of polymers by differential scanning calorimetry (DSC) or differential thermal analysis (DTA). This test method is applicable to polymers in granular form (below 60 mesh, < 250 µ, avoiding grinding if possible) or to any fabricated shape from which appropriate samples can be cut	**Scope:** This European standard covers a test method for the determination of glass transition temperature (GTT) of polymers by differential scanning calorimetry (DSC) or differential thermal analysis (DTA). This test method is applicable to polymers in granular form (below 60 mesh, < 250 µ, avoiding grinding if possible) or to any fabricated shape from which appropriate samples can be cut

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Products and systems for the protection and repair of concrete structures - Test methods - Determination of glass transition temperatures of polymers

Produits et systèmes pour la protection et la réparation des structures en béton - Méthodes d'essai - Détermination de la température de transition vitreuse

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Prüfverfahren - Bestimmung der Glasübergangstemperatur von Polymeren

This European Standard was approved by CEN on 27 February 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 12614:2004) has been prepared by Technical Committee CEN /TC 104, "Concrete and related products", the secretariat of which is held by DIN.

It has been elaborated by Sub-Committee 8 "Products and systems for the protection and repair of concrete structures" (Secretariat AFNOR).

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 April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document covers a test method for the determination of glass transition temperature (GTT) of polymers by differential scanning calorimetry (DSC) or differential thermal analysis (DTA).

This test method is applicable to polymers in granular form (below 60 mesh, < 250 µ, avoiding grinding if possible) or to any fabricated shape from which appropriate samples can be cut.

This test method is useful for specification acceptance.

This test method determines the structural behaviour of a polymer according to the variations of temperatures.

2 Terms and definitions

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

2.1
differential scanning calorimetry (DSC)
differential scanning calorimetry can be carried out according to two principles, depending on the method of measurement used

Power compensation differential scanning calorimetry records in function of time or temperature the required power to maintain a zero temperature difference between the polymer and an inert reference, when they are subjected to a controlled temperature program (Power-compensation DSC).

Heat-flux differential scanning calorimetry records in function of time or temperature the difference of heat-flux diffusing between the sample holder, the reference holder and the testing unit of the equipment (Heat-flux DSC).

For the two principles, the recording chart gives a DSC curve with, at the Y-axis, the heat flow and, at the X-axis, the temperature or time.

2.2
differential thermal analysis (DTA)
differential thermal analysis records the temperature difference between the polymer sample and an inert reference, while they are subjected to a controlled temperature program

The recording chart gives a DTA curve with, at the Y-axis, the temperature difference between the sample and the reference and, at the X-axis, the temperature or time.

3 Test principle

The test method consists of heating or cooling the sample at a controlled rate in a controlled atmosphere.

A suitable sensing device monitors continuously:

— temperature difference between the sample and the reference for differential thermal analysis;

— power or heat-flux changes for differential scanning calorimetry.

Glass transition of the sample is characterized on the recording chart by a change of the baseline during the heating or the cooling.

The test shall be carried out under an inert blanket (nitrogen) to avoid any reaction of the sample with air during the temperature cycle. The output of the inert gas shall be controlled by a flowmeter.

In addition, some polymers can react near the transition temperature; care shall be used to distinguish between reaction and transition.