SLOVENSKI STANDARD
SIST EN 61074:1998

01-junij-1998

Determination of heats and temperatures of melting and crystallisation of electrical insulating materials by differential scanning calorimetry (IEC 61074:1991)

Determination of heats and temperatures of melting and crystallization of electrical insulating materials by differential scanning calorimetry

Bestimmung von Wärmewerten und Temperaturen beim Schmelzen und Kristallisieren von Elektroisolierstoffen mittels dynamischer Differenz-Kalorimetrie

Détermination des chaleurs et températures de fusion et de cristallisation des matériaux isolants électriques par analyse calorimétrique différentielle

Ta slovenski standard je istoveten z: **EN 61074:1993**

ICS:

29.035.01	Izolacijski materiali na splošno	Insulating materials in general

SIST EN 61074:1998 **en**

EUROPEAN STANDARD EN 61074

NORME EUROPEENNE

EUROPÄISCHE NORM May 1993

UDC 621.315.6:620.1:536.42

Descriptors: Insulating materials, insulating solid materials, determination, temperature, heating, melting, crystallization, calorimetric method, differential scanning method

ENGLISH VERSION

Determination of heats and temperatures of melting and crystallization of electrical insulating materials by differential scanning calorimetry (IEC 1074:1991)

Détermination des chaleurs et températures de fusion et de cristallisation des matériaux isolants électriques par analyse calorimétrique différentielle (CEI 1074:1991)

Bestimmung von Wärmewerten und Temperaturen beim Schmelzen und Kristallisieren von Elektroisolierstoffen mittels dynamischer Differenz-Kalorimetrie (IEC 1074:1991)

This European Standard was approved by CENELEC on 1993-03-09. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Ref. No. EN 61074:1993 E

1993-05-20

FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 1074:1991 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 61074 on 9 March 1993.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1994-03-01
- latest date of withdrawal of conflicting national standards	(dow)	1994-03-01

ENDORSEMENT NOTICE

The text of the International Standard IEC 1074:1991 was approved by CENELEC as a European Standard without any modification.

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
IEC
1074

Première édition
First edition
1991-09

Détermination des chaleurs et températures de fusion et de cristallisation des matériaux isolants électriques par exploration calorimétrique comparative

Determination of heats and temperatures of melting and crystallization of electrical insulating materials by differential scanning calorimetry

Bureau central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève Suisse
Téléfax: +41 22 919 0300 e-mail: inmail@iec.ch IEC web site http://www.iec.ch

IEC

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE L

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DETERMINATION OF HEATS AND TEMPERATURES OF MELTING AND CRYSTALLIZATION OF ELECTRICAL INSULATING MATERIALS BY DIFFERENTIAL SCANNING CALORIMETRY

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This International Standard has been prepared by Sub-Committee 15A: Short-time tests, of IEC Technical Committee No. 15: Insulating materials.

The text of this standard is based on the following documents:

DIS	Report on Voting
15A(CO)59	15A(CO)62

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

DETERMINATION OF HEATS AND TEMPERATURES OF MELTING AND CRYSTALLIZATION OF ELECTRICAL INSULATING MATERIALS BY DIFFERENTIAL SCANNING CALORIMETRY

1 Scope

1.1 This method covers the determination of heats and temperatures of melting and crystallization of electrical insulating materials by differential scanning calorimetry.

1.2 The typical operating temperature range extends from –100 °C to +500 °C. The temperature range can be extended depending upon the instrumentation used.

1.3 The method is generally applicable to thermally stable materials with well-defined exothermic and endothermic behaviour.

2 Definitions

Differential scanning calorimetry (DSC): A technique in which the difference in energy inputs into a test material, referred to as "test specimen" thoughout the text, and a reference material is measured as a function of temperature while the test specimen and the reference material are subjected to a controlled temperature programme.

NOTE - In this standard the terms "heat", "heat of fusion" and "heat of crystallization" used throughout the text are taken to be equivalent to the phrases "enthalpy", "enthalpy of fusion" and "enthalpy of crystallization", respectively.

3 Significance

3.1 Differential scanning calorimetry provides a rapid method for the determination of enthalpic changes accompanying first order transitions of materials.

3.2 This test is useful for quality assurance, specification acceptance, and research.

4 Test method

The method consists of heating (or cooling) the test specimen at a controlled rate in a controlled atmosphere through the region of melting (or crystallization). The difference in heat flow between the test specimen and the reference material due to energy changes in the material is continuously monitored and recorded as a function of temperature. A transition is marked by the absorption (or release) of energy by the test specimen

resulting in a corresponding endothermic (or exothermic) peak in the heating (or cooling) curve. Integration of the recorded peak area as a function of time results in a measurement of the energy of the transition. Observation of the position of the transition on the temperature axis provides the necessary temperature information.

5 Interference

Test specimens that release volatiles on heating will change mass and this may invalidate the test.

6 Precautions

6.1 This standard may involve the use of hazardous materials, operations and equipment. It is the responsibility of whoever uses this standard to establish appropriate safety practices and to determine the applicability of regulatory limitations prior to use.

6.2 Toxic or corrosive effluents, or both, may be released when heating the materials and could be harmful to the personnel or apparatus.

7 Apparatus

7.1 Differential scanning calorimeter having the following performance:

a) heating or cooling rate up to 20 K/min;

b) automatic recording of differential heat flow between the test specimen and the reference material;

c) heat flow sensitivity to provide an accuracy of ±1 %;

d) time base precision of ±1 % over the time base range from 0,1 to 2,0 min/cm (10,0 to 0,5 cm/min) of chart;

e) temperature sensitivity sufficient to provide a specimen temperature accurate to at least ±0,1 K;

f) preferred operating range of –100 °C to +500 °C.

7.2 Planimeter, or other means of area measurement with an accuracy and precision of ±0,1 %.

7.3 Specimen holders, inert to the material being tested over the prescribed temperature range, composed of aluminium or other material of high thermal conductivity.