
INTERNATIONAL STANDARD



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Cork and cork products — Determination of thermal conductivity — Hot plate method

Liège et produits en liège — Détermination de la conductivité thermique — Méthode de la plaque chaude

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2582 was developed by Technical Committee ISO/TC 87, *Cork*, and was circulated to the member bodies in April 1977.

It has been approved by the member bodies of the following countries :

Czechoslovakia	Mexico	Turkey
France	Romania	United Kingdom
Hungary	South Africa, Rep. of	Yugoslavia
Italy	Spain	

The member body of the following country expressed disapproval of the document on technical grounds :

Germany

Cork and cork products — Determination of thermal conductivity — Hot plate method

0 INTRODUCTION

The determination of the thermal conductivity in stationary regime of low conductivity materials may be performed by :

- **comparative measurement** : for routine checks such as are required for quality control; or for the determination of the thermal conductivity of moist materials, etc.

NOTE — Such measurements require nothing more than simple but reliable apparatus calibrated in relation to other apparatus serving as reference.

- **absolute measurement** : for the measurement and checking of materials that must be subject to specific tests under the provisions of public or private contracts; for the provision of technical data for expert appraisal; for the calibration of checking apparatus; and the provision of reference values for technical, scientific or industrial publications.

The hot plate method meets this second purpose and is dealt with in this International Standard.

The continuous progress of measurement techniques makes it difficult to standardize a given type of apparatus since this might hinder the future improvement of measuring procedures. Therefore, this International Standard concentrates mostly on laying down and standardizing the procedural conditions required to make the measurements. It gives, as an example, the general description of an apparatus meeting those requirements and indicates the procedure to be followed when using such an apparatus.

1 SCOPE

This International Standard specifies a hot plate method for the determination of the thermal conductivity of cork and cork products.

2 FIELD OF APPLICATION

The field of application of this International Standard is defined as follows :

2.1 Temperature range

Between -180 and $+200$ °C.

2.2 Thermal conductivity

Thermal conductivity of the material not exceeding $3,5 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ($3 \text{ kcal}\cdot\text{h}^{-1}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

2.3 Nature of materials

- a) Homogeneous materials and compact granular mixtures of appreciably continuous granulometry and of size not exceeding, for the largest dimension of the grain, $1/4$ of the thickness of the sample (unless special specifications apply to the material to be tested).

NOTE — A material is considered to be homogeneous when the value of the thermal conductivity is not affected by a change in thickness or in area, for the size range within which it is normally available and used.

- b) Structures containing cavities statistically distributed and with a mean diameter of less than 3 mm.

NOTE — Insufficiently homogeneous materials may be tested according to this method. However, they should never be reported as having been subjected to a thermal conductivity test and the relevant test report shall refer instead to the determination of the thermal resistance of material for a given thickness and composition.

2.4 Humidity of materials

The method is valid only if the transfer of moisture through the material during the measuring procedure remains negligible (see 6.2).

3 DEFINITIONS

3.1 heat flow rate : The quotient of the quantity of heat flowing through a surface, by the time.

3.2 density of heat flow rate through a surface : The quotient of the heat flow rate through a surface, by the area of that surface.

3.3 thermal conductivity : The quotient of the density of heat flow rate through a surface, by the temperature gradient.

For homogeneous materials at given temperature and moisture content and under steady-state conditions, the thermal conductivity is equal to the quotient of the quantity of heat passing through unit area in unit time, by the temperature gradient in the direction perpendicular to the surface.