



Practical thermal properties of building materials and products

Caractéristiques thermiques utiles des matériaux et des produits de construction

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types :

- type 1, when the necessary support within the technical committee cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development requiring wider exposure;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports are accepted for publication directly by ISO Council. Technical Reports types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 9165 was prepared by Technical Committee ISO/TC 163, *Thermal insulation*.

The reasons which led to the decision to publish this document in the form of a Technical Report type 2 are explained in the Introduction.

UDC 691 : 536.2

Ref. No. ISO/TR 9165 : 1988 (E)

Descriptors: buildings, construction materials, thermodynamic properties, thermal conductivity, thermal insulation, thermal resistance.

© International Organization for Standardization, 1988 •

Printed in Switzerland

Price based on 21 pages

Contents

	Page
1 Scope and field of application	2
2 References	2
3 Definitions and symbols	3
3.1 Symbols	3
3.2 Basic thermal characteristics	3
3.3 Practical thermal characteristics	3
4 General considerations and principles	4
5 Test methods and test conditions	5
5.1 Test methods	5
5.2 Test conditions	5
6 General principles for correcting measurements	6
6.1 Preliminary measurements	6
6.2 Corrections	6
7 Statistical considerations	6
8 Corrections for materials	7
8.1 Mineral fibres	7
8.2 Cellular plastics — polystyrene and polyurethane boards	8
8.3 Cellular glass	10
8.4 Wood and wood products	11
8.5 Concrete	11
8.6 Masonry	13
Annex	
Heat transfer modes in insulating materials	15

0 Introduction

Whilst the technical committee accepts the need for an International Standard in this field, it recommends immediate publication in the form of a Technical Report which is urgently needed as guidance for developing national standards in this field. The technical committee will discuss this matter further to develop an International Standard.

1 Scope and field of application

This Technical Report deals only with the thermal characteristics of building materials and products related to thermal conductivity or thermal resistance. It gives the procedures needed to correct laboratory test values to practical values for building materials or products.

These practical thermal values are needed for use in calculations of thermal properties of building components, but the procedures given here may not be applicable to composite structures.

The procedures are in general applicable in the temperature range -30 to $+30$ °C.

No specific procedures for allowing for the influence of workmanship are given.

2 References

ISO 2859, *Sampling procedures and tables for inspection by attributes*.

ISO 3951, *Sampling procedures and charts for inspection by variables for percent defective*.

ISO 7345, *Thermal insulation — Physical quantities and definitions*.