
Thermal-insulating materials — Determination of compressive creep

*Matériaux d'isolation thermique — Détermination du fluage en
compression*



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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.

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Thermal-insulating materials — Determination of compressive creep

1 Scope

This International Standard specifies equipment and procedures for determining the compressive creep of test specimens under various conditions of stress. It is applicable to thermal-insulation products.

2 Normative references

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

ISO 844, *Rigid cellular plastics — Determination of compression properties*

ISO 1923, *Cellular plastics and rubbers — Determination of linear dimensions*

3 Terms and definitions

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

3.1

thickness

linear dimension measured perpendicular to the length and width plane

3.1.1

thickness d

original product thickness

3.1.2

thickness d_s

initial thickness of the test specimen

3.1.3

thickness d_L

thickness of the test specimen under the basic compressive stress of the loading device (“dead weight”)

3.1.4

thickness d_0

thickness of the test specimen 60 s after the beginning of loading

3.1.5

thickness d_t

thickness of the test specimen at a given time t

3.2
compressive stress

σ_c
ratio of the compressive force to the initial cross-sectional area of the test specimen

3.3
deformation

X
reduction in thickness of the test specimen

3.4
relative deformation

ε
ratio of the deformation X of the test specimen and its thickness d_s , measured in the direction of the load

3.5
compressive creep

X_{ct}
increase, with time, in the deformation of the test specimen under a constant stress under specified conditions of temperature and humidity

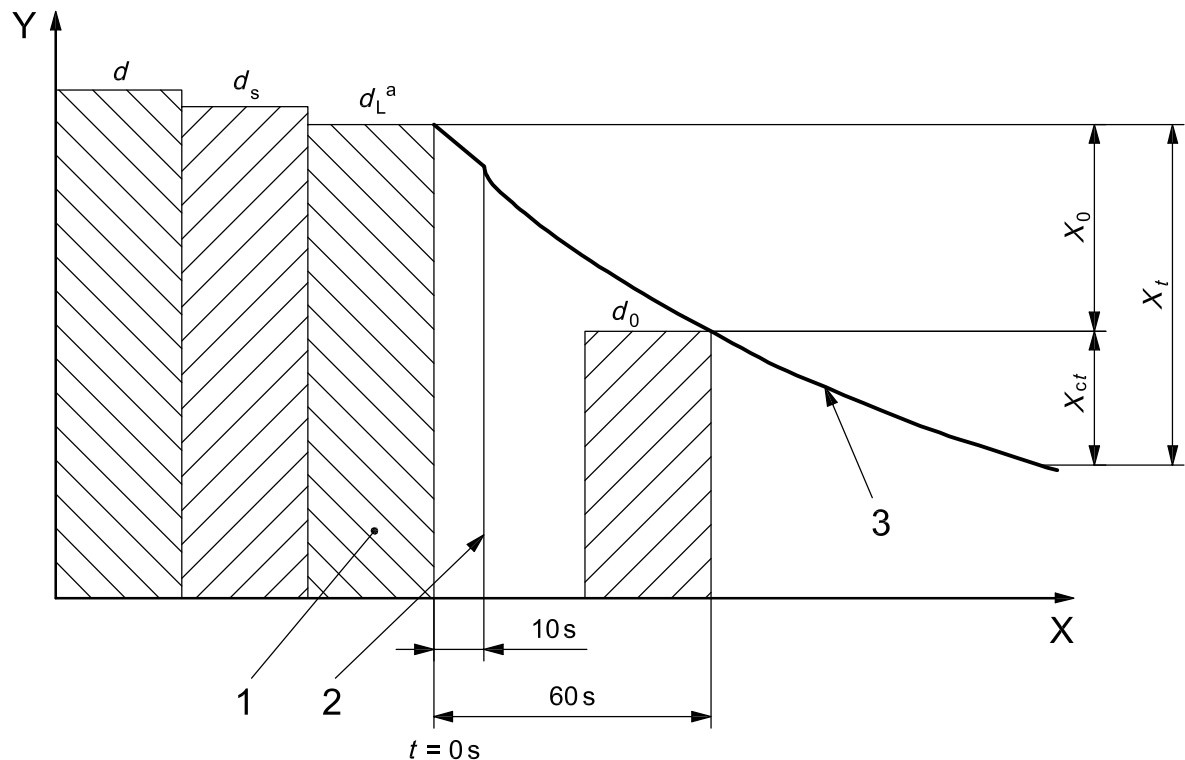
NOTE $X_{ct} = X_t - X_0$

where

X_t is the deformation at time t ;

X_0 is the initial deformation (60 s after the beginning of loading).

An illustration of the different thicknesses and deformations is given in Figure 1.



Key

X time, t

Y thickness

- 1 thickness under the “dead weight” of the loading device ($< 10\%$ of the smallest chosen stress for the creep test)
- 2 point when load is applied for the compressive-creep test
- 3 deformation curve

^a In the illustration, d_L is used as the reference value for the measurements of deformation. If d_s is used as the reference value, the illustration can be used with the omission of the column for d_L (see 7.3).

Figure 1 — Illustration of the various thicknesses and deformations

4 Principle

The compressive creep is determined by measuring the increase in deformation of a test specimen under a constant compressive stress and specified conditions of temperature, humidity and time.

5 Apparatus

5.1 Loading device, consisting of two flat plates, one of which shall be movable, so arranged that they compress the test specimen in the vertical direction. The movable plate shall be mounted in such a manner as to be self-aligning. The plates shall be capable of being loaded smoothly and without distortion so that, during the test, the static stress does not change by more than $\pm 5\%$.

5.2 Measuring device (e.g. dial gauge), capable of determining the distance between the two plates, i.e. the deformation of the test specimen, to an accuracy of 0,01 mm.

5.3 Suitable damping facilities, to minimize the effects of external vibration, e.g. a substantial base supporting the apparatus.