



NSAI
Standards

Irish Standard
I.S. EN ISO 11357-7:2015

Plastics - Differential scanning calorimetry (DSC) - Part 7: Determination of crystallization kinetics (ISO 11357-7:2015)

I.S. EN ISO 11357-7:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:

EN ISO 11357-7:2015

Published:

2015-09-09

*This document was published
under the authority of the NSAI
and comes into effect on:*

2015-09-28

ICS number:

83.080.01

NOTE: If blank see CEN/CENELEC cover page

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National Foreword

I.S. EN ISO 11357-7:2015 is the adopted Irish version of the European Document EN ISO 11357-7:2015, Plastics - Differential scanning calorimetry (DSC) - Part 7: Determination of crystallization kinetics (ISO 11357-7:2015)

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EUROPEAN STANDARD

EN ISO 11357-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2015

ICS 83.080.01

Supersedes EN ISO 11357-7:2013

English Version

**Plastics - Differential scanning calorimetry (DSC) - Part 7:
Determination of crystallization kinetics (ISO 11357-
7:2015)**

Plastiques - Analyse calorimétrique différentielle (DSC)
- Partie 7: Détermination de la cinétique de
cristallisation (ISO 11357-7:2015)

Kunststoffe - Dynamische Differenz-Thermoanalyse
(DSC) - Teil 7: Bestimmung der Kristallisationskinetik
(ISO 11357-7:2015)

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EN ISO 11357-7:2015 (E)

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European foreword

This document (EN ISO 11357-7:2015) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 11357-7:2013.

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Endorsement notice

The text of ISO 11357-7:2015 has been approved by CEN as EN ISO 11357-7:2015 without any modification.

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INTERNATIONAL STANDARD

**ISO
11357-7**

Second edition
2015-08-15

Plastics — Differential scanning calorimetry (DSC) —

Part 7: Determination of crystallization kinetics

Plastiques — Analyse calorimétrique différentielle (DSC) —

Partie 7: Détermination de la cinétique de cristallisation



Reference number
ISO 11357-7:2015(E)

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ISO 11357-7:2015(E)

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#).

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 11357-7:2002), which has been technically revised with the following changes:

- a) values to be recorded for isothermal crystallization revised, starting time of the isothermal step ($t = 0$) added (10.2.1), and [Figure 2](#) to [Figure 6](#) revised accordingly;
- b) Formula (A.1) and Formula (A.2) are corrected;
- c) dated references changed to undated references.

ISO 11357 consists of the following parts, under the general title *Plastics — Differential scanning calorimetry (DSC)*:

- *Part 1: General principles*
- *Part 2: Determination of glass transition temperature and glass transition step height*
- *Part 3: Determination of temperature and enthalpy of melting and crystallization*
- *Part 4: Determination of specific heat capacity*
- *Part 5: Determination of characteristic reaction-curve temperatures and times, enthalpy of reaction and degree of conversion*
- *Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)*
- *Part 7: Determination of crystallization kinetics*

Plastics — Differential scanning calorimetry (DSC) —

Part 7:

Determination of crystallization kinetics

1 Scope

This part of ISO 11357 specifies two methods (isothermal and non-isothermal) for studying the crystallization kinetics of partially crystalline polymers using differential scanning calorimetry (DSC).

It is only applicable to molten polymers.

NOTE These methods are not suitable if the molecular structure of the polymer is modified during the test.

2 Normative references

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

ISO 472, *Plastics — Vocabulary*

ISO 11357-1, *Plastics — Differential scanning calorimetry (DSC) — Part 1: General principles*

ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472, ISO 11357-1, ISO 11357-3, and the following apply.

3.1

crystallization kinetics

description of the rate of crystallization of a material taking into account the effects of variables such as time, temperature, pressure, stress, and molecular structure

Note 1 to entry: These factors and also any additives, fillers, or contaminants can modify the crystallinity of the polymer at the end of crystallization.

3.2

relative crystallinity

α

ratio between the crystallinity at a particular point in time or a particular temperature and the crystallinity at the end of crystallization

Note 1 to entry: The relative crystallinity can be expressed either as a ratio or as a percentage if multiplied by 100.

Note 2 to entry: In DSC, the relative crystallinity can be determined as the ratio between the partial area of the crystallization peak, at each time or each temperature, and the total area of the peak.

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