
**Plastics — Differential scanning
calorimetry (DSC) —**

**Part 5:
Determination of characteristic
reaction-curve temperatures and
times, enthalpy of reaction and degree
of conversion**

Plastiques — Analyse calorimétrique différentielle (DSC) —

*Partie 5: Détermination des températures et temps caractéristiques
de la courbe de réaction, de l'enthalpie de réaction et du degré de
transformation*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 11357-5 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 11357-5:1999), which has been technically revised. Significant technical changes are the following:

- adaption of definition of characteristic temperatures and endo-/exothermic direction in accordance with ISO 11357-1;
- revision of determination of results;
- revision of test report.

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 5:

Determination of characteristic reaction-curve temperatures and times, enthalpy of reaction and degree of conversion

WARNING — Caution should be observed when working with materials which could give a runaway reaction or exhibit other dangerous behaviour.

1 Scope

This part of ISO 11357 specifies a method for the determination of reaction temperatures and times, enthalpies of reaction, and degrees of conversion using differential scanning calorimetry (DSC).

The method applies to monomers, prepolymers, and polymers in the solid or liquid state. The material can contain fillers and/or initiators in the solid or liquid state.

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

3 Terms and definitions

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

3.1

polymerization

process of converting a monomer or a mixture of monomers into a polymer

3.2

crosslinking

process of multiple intermolecular covalent or ionic bonding between polymer chains

3.3

degree of conversion

quantity of reacted product obtained during a reaction compared with the maximum possible quantity of the product

Note 1 to entry: The degree of conversion will depend on both time and temperature.

4 Principle

The principle is specified in ISO 11357-1.

The test method described indicates the various stages of the reaction by means of DSC curves.