
**Rigid PVC pipes — Differential scanning
calorimetry (DSC) method —**

Part 2:

**Measurement of the enthalpy of fusion of
crystallites**

*Tubes rigides en PVC — Méthode utilisant la calorimétrie différentielle à
balayage —*

Partie 2: Mesurage de l'enthalpie de fusion des cristallites



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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 18373-2 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 5, *General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*.

ISO 18373 consists of the following parts, under the general title *Rigid PVC pipes — Differential scanning calorimetry (DSC) method*:

- Part 1: Measurement of the processing temperature
- Part 2: Measurement of the enthalpy of fusion of crystallites

Introduction

Studies have been undertaken at the international level to determine a method of measuring the enthalpy of fusion of crystallites produced during the processing of rigid pipes. These studies have demonstrated that a test using differential scanning calorimetry (DSC) fulfils these requirements.

The method involves taking small samples from the pipe wall and heating these in a differential scanning calorimeter. Small endotherms are used to detect the thermal history of the samples and the enthalpy of fusion of crystallites is derived from these data.

The technique requires a good understanding of DSC instruments and techniques, particularly in relation to PVC. It is important that newcomers to the technique familiarize themselves with both the instrumentation and method prior to undertaking reportable tests.

This method is given as a guide and no specific requirement is given in this part of ISO 18373 for the enthalpy of fusion.

The method can also be suitable for other types of extruded rigid PVC products, but different sampling protocols might be required.

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Rigid PVC pipes — Differential scanning calorimetry (DSC) method —

Part 2:

Measurement of the enthalpy of fusion of crystallites

1 Scope

This part of ISO 18373 specifies a method for the determination of the enthalpy of fusion of crystallites in rigid PVC pipe samples. The method is based on the measurement of the thermal history using differential scanning calorimetry (DSC) and is suitable for all types of rigid PVC pipes.

2 Terms and definitions

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

2.1

curve magnification

magnification of the DSC curve around A-onset and B-onset temperature (“zooming”)

2.2

A-onset

(enthalpy of fusion measurement) first indication of “secondary” crystallite melting

2.3

B-onset

T_p

indication of maximum processing temperature

2.4

enthalpy of fusion

A-endotherm

ΔH_A

fusion enthalpy of the secondary crystallites in the pipe

NOTE Enthalpy of fusion is expressed in joules per gram.

2.5

instrumental baseline

measurement with empty sample pan, i.e. background subtraction

2.6

position of sample

location in the product from where the sample was taken

2.7

purge gas

gas used to ensure an inert environment