
**Binders for paints and varnishes —
Determination of glass transition
temperature**

*Liants pour peintures et vernis — Détermination de la température de
transition vitreuse*



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Foreword

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Introduction

The determination of the glass transition temperature (T_g) is a very accurate and reproducible way of characterizing polymers. However, there are a number of factors which have to be considered if a standard for the determination of the T_g is to be developed. The T_g of a polymer is dependent on the heating rate, the moisture content of the sample and also on the amount of sample used. Since sample preparation is a very important part of the procedure (and a special method may be necessary for binders for paints and varnishes), this International Standard specifies only the procedure for sample preparation. The measurement procedure itself is already specified in another International Standard.

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Binders for paints and varnishes — Determination of glass transition temperature

1 Scope

This International Standard specifies the procedure to be used for sample preparation for the determination of the glass transition temperature of binders for paints and varnishes, including coating powders, by differential scanning calorimetry (DSC). The method to be used for determining the glass transition temperature is specified in ISO 11357-2.

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 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

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

ISO 11357-2:1999, *Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature*

3 Terms and definitions

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

3.1

glass transition

reversible change in an amorphous polymer or in amorphous regions of a partially crystalline polymer from (or to) a viscous rubbery condition to (or from) a hard and brittle one

NOTE It is the temperature at which the rotational degrees of freedom of a polymer are excited.

[Adapted from ISO 11357-2:1999]

3.2

glass transition temperature

approximate midpoint of the temperature range over which the glass transition takes place

NOTE 1 The assigned glass transition temperature (T_g) may vary, depending on the specific property and on the method and conditions selected to measure it.

NOTE 2 The so-called onset temperature (see ISO 11357-2), which can also be used, is often more accurately defined.

NOTE 3 To avoid interference or inaccurate measurements due to relaxation or evaporation of solvent/water residues, it can be better to carry out the measurement twice with the same sample and report the second result.

[Adapted from ISO 11357-2:1999]