
**Fibre-reinforced plastics — Methods of
producing test plates —**

**Part 9:
Moulding of GMT/STC**

*Plastiques renforcés de fibres — Méthodes de fabrication de plaques
d'essai —*

Partie 9: Moulage des GMT/STC

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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 1268-9 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

Together with the other parts (see below), this part of ISO 1268 cancels and replaces ISO 1268:1974, which has been technically revised.

ISO 1268 consists of the following parts, under the general title *Fibre-reinforced plastics — Methods of producing test plates*:

- *Part 1: General conditions*
- *Part 2: Contact and spray-up moulding*
- *Part 3: Wet compression moulding*
- *Part 4: Moulding of prepregs*
- *Part 5: Filament winding*
- *Part 6: Pultrusion moulding*
- *Part 7: Resin transfer moulding*
- *Part 8: Compression moulding of SMC and BMC*
- *Part 9: Moulding of GMT/STC*
- *Part 10: Injection moulding of BMC and other long-fibre moulding compounds — General principles and moulding of multipurpose test specimens*
- *Part 11: Injection moulding of BMC and other long-fibre moulding compounds — Small plates*

Fibre-reinforced plastics — Methods of producing test plates —

Part 9: Moulding of GMT/STC

1 Scope

This part of ISO 1268 specifies a method for preparing test plates by compression moulding of reinforced thermoplastic sheet (GMT/STC) to be used for the preparation of test specimens to determine the mechanical and physical properties of the laminate. The proposed method is applicable to laminates made from a thermoplastic matrix reinforced with glass, carbon, aramid or other reinforcing fibres, alone or in combination and in any form suitable for compression moulding.

This part of ISO 1268 is intended to be read in conjunction with ISO 1268-1.

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 527-4, *Plastics — Determination of tensile properties — Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites* 1268-9:2003

ISO 1172, *Textile-glass-reinforced plastics — Prepregs, moulding compounds and laminates — Determination of the textile-glass and mineral-filler content — Calcination methods*

ISO 1268-1, *Fibre-reinforced plastics — Methods of producing test plates — Part 1: General conditions*

ISO 1268-4, *Fibre-reinforced plastics — Methods of producing test plates — Part 4: Moulding of prepregs*

3 Terms and definitions

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

3.1

GMT

the abbreviation generally accepted within the industry for Glass-fibre Mat reinforced Thermoplastic sheet, in which the thermoplastic is generally polypropylene

3.2

STC

the accepted abbreviation for any kind of Sheet Thermoplastic Composite, irrespective of the type of the polymer or the nature or form of the reinforcement

4 Health and safety

See ISO 1268-1.

5 Principle

This method is based on a compression-moulding procedure using a normal commercial press, a plate mould and the moulding conditions recommended by the supplier of the GMT/STC material.

The material concerned, cut to the required size and heated to the moulding temperature, is inserted in the centre of the mould cavity. The mould is closed and the material allowed to flow and solidify under pressure.

It is absolutely essential for the cavity to be completely filled. The method may nevertheless be used for materials which do not flow in the mould, but changes are required in the procedure.

6 Materials

The method may be used for all types of GMT/STC material, irrespective of the type of thermoplastic polymer used or the type and nature of the reinforcement, providing the material is suitable for compression moulding.

The method is designed for materials which flow during the moulding process. Materials which do not flow during the moulding process can be moulded by this method, but consideration should also be given to using the method given in ISO 1268-4, which may be more suitable for the high-fibre-content, high-melt-temperature STC materials.

7 Plate dimensions

7.1 Surface area of mould: at least 200 mm × 200 mm but larger if test specimens cut from the plate are to conform to the requirements of ISO 527-4.

7.2 Plate thickness: $(4 \pm 0,2)$ mm.

8 Reinforcement content

Unless otherwise specified, it is assumed that the reinforcement content and reinforcement orientation are uniform in the x and y planes of the moulded plate. In cases where the reinforcement orientation is non-uniform, the specification of the test plate shall define the orientation required in the test plate and the stacking sequence of the material in the mould.

9 Apparatus

9.1 **Hydraulic moulding press**, with a closing speed of at least 15 mm/s and capable of a 2 000 kN mould-clamping force.

9.2 **Temperature-controlled plate mould**, with a minimum width of 200 mm and a recommended length of 590 mm, mounted on the press (9.1).

NOTE Other mould sizes may be used by agreement between the interested parties, but the shape of the mould affects the flow of the material during moulding and hence the fibre orientation and the properties of the resultant material.