

# INTERNATIONAL STANDARD

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## **Fibre-reinforced plastics — Moulding compounds and preregs — Determination of mass per unit area**

*Plastiques renforcés de fibres — Préimprégnés — Détermination de la  
masse surfacique*



Reference number  
ISO 10352:1991(E)

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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.

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.

International Standard ISO 10352 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 13, *Composites and reinforcement fibres*.

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# Fibre-reinforced plastics — Moulding compounds and preregs — Determination of mass per unit area

## 1 Scope

This International Standard specifies a method for the determination of the mass per unit area of sheet moulding compounds (SMC) and preimpregnated fabrics and mats. Unless stated to the contrary in the relevant materials specification, this standard is applicable to preregs irrespective of which type of reinforcement (aramid, carbon, glass, etc.) or which type of matrix (thermosetting or thermoplastic) is used.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291:1977, *Plastics — Standard atmospheres for conditioning and testing*.

ISO 1886:1990, *Reinforcement fibres — Sampling plans applicable to received batches*.

## 3 Principle

The mass of a test specimen of known area is determined after conditioning in a specified atmosphere. The result is expressed as the mass per unit area.

## 4 Apparatus

4.1 **Balance**, accurate to 1 mg.

4.2 **Template**, measuring 200 mm × 200 mm.

4.3 **Sharp cutter**.

## 5 Sampling

Consult ISO 1886 in order to determine, within the lot, the number of elementary units (the elementary unit being either a roll or a series of sheets) that have to be tested. If necessary, taking into account the roll dimensions or the number of sheets per case, an agreement between supplier and user shall define either the size of the laboratory sample that has to be obtained from each unit or other information such as the number of specimens and their location within the laboratory sample.

## 6 Conditioning and testing

### 6.1 Conditioning

Except when otherwise stipulated in the product specification, the laboratory sample shall be conditioned for at least 2 h in order to establish equilibrium with the ambient temperature.

This operation shall be done while the material is still in its protective foils (in the case of sample sandwiched between two sheets) or in its styrene-proof plastic bag.

### 6.2 Standard atmosphere for testing

The standard atmosphere for testing shall be in accordance with ISO 291.

## 7 Test specimens

### 7.1 Shape and dimensions

The preferred specimen is a square with 200 mm ± 1 mm sides.

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For special applications, other specimen types which are rectangular, square or round may be used upon agreement between supplier and user.

The surface area of these specimens should be between 0,04 m<sup>2</sup> and 0,10 m<sup>2</sup>.

## 7.2 Number of test specimens

Unless otherwise required by a specification or by the person ordering an analysis, three specimens shall be taken from positions perpendicular to the edges of the prepreg.

The specimens shall be taken at least 50 mm away from the edges of the prepreg.

## 8 Procedure

Cut test specimens from each laboratory sample using the cutter (4.3).

Weigh each test specimen, with its protective foil(s), and record the mass ( $m_1$ ) to the nearest 1 mg.

Remove the protective foil(s), weigh them and record the mass ( $m_2$ ) to the nearest 1 mg.

**IMPORTANT — Perform the test immediately after cutting out the test specimens, so that the result will not be influenced by loss of volatile matter due to a delay between this operation and the weighing.**

If the protective sheets can be removed without taking any of the prepreg with them, the prepreps can be weighed directly without their sheets.

## 9 Expression of results

The mass per unit area, expressed in grams per square metre, is given by the equation

$$\rho_A = \frac{m_1 - m_2}{A}$$

where

$m_1$  is the mass, in grams, of the test specimen with its protective foils;

$m_2$  is the mass, in grams, of the protective foils;

$A$  is the surface area, in square metres, of the test specimen (for the preferred specimen,  $A = 0,04 \text{ m}^2$ ).

The mass per unit area of each elementary unit is the arithmetic mean of the values  $\rho_A$  obtained on the test specimens cut from that particular elementary unit.

## 10 Precision

The precision of this test method is not known because inter-laboratory data are not available. This method may not be suitable for use in specifications or in case of disputed results as long as these data are not available.

## 11 Test report

The test report shall include the following information:

- a reference to this International Standard;
- all details necessary for the complete identification of material tested;
- the sampling method used;
- the mass per unit area of each elementary unit and, if required, the results obtained on each test specimen;
- the date of the test;
- any departure from the test method specified in this International Standard, and any incident which may have influenced the results.

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