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Fibre-reinforced plastics — Thermosetting moulding compounds and preregs — Determination of flowability, maturation and shelf life

*Plastiques renforcés de fibres — Compositions de moulage
thermodurcissables et préimprégnés — Détermination de la fluidité,
de la maturation et de la durée de vie*

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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 12115 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

Introduction

The flowability of a moulding compound is a property which describes the ability of the compound to fill a mould cavity during the moulding operation.

The flowability varies with the age of the moulding compound due to the occurrence of a thickening process. This so-called maturation process is normally initiated by an additive, the aim being to prevent significant separation of the components of the moulding compound, and yet ensure sufficient flow for the moulding compound to be easy to handle and for it to spread out to fill the whole mould cavity when it is moulded.

When the flowability of a moulding compound has developed to a defined limit, the compound is said to have reached its matured state. This means it can be handled and moulded satisfactorily under given operating conditions.

The maturation and shelf life are determined from flowability measurements. The flowability is measured at several different points in time after production of the moulding compound, and the change in flowability plotted as a function of time. The shelf life of the moulding compound is determined by assessing the ease of handling and moulding behaviour as given by the flowability. Experience indicates that in some cases shelf life may also be dependent on the cure characteristics of the moulding compound (see ISO 12114).

Maturation and shelf life are not parameters in their own right. For a particular moulding compound, the shelf life, for instance, may even differ from one set of moulding conditions to another and from one application to the next.

Fibre-reinforced plastics — Thermosetting moulding compounds and preregs — Determination of flowability maturation and shelf life

1 Scope

This International Standard specifies two methods for the determination of the flowability of fibre-reinforced thermosetting moulding compounds and preregs. The methods apply to all fibre-reinforced thermosetting moulding compounds and differ in the test conditions and the apparatus required.

The methods may be used to assess the influence of individual components of the moulding compound on the moulding behaviour by determining the flowability of the compound. They are also suitable for quality control purposes, as well as the development of moulding compound formulations.

The major field of application is with moulding compounds based on unsaturated polyester (UP) resins.

Method I is a flowability test carried out at room temperature. Conducting the test at room temperature reduces the effect on the results of changes in the temperature of the moulding compound during the test.

Method II is a flowability test carried out under commonly used moulding conditions. In addition, the plate produced may be used for further testing.

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 472:1988, *Plastics — Vocabulary*.

ISO 8605:1989, *Textile glass reinforced plastics — Sheet moulding compound (SMC) — Basis for a specification*.

ISO 8606:1990, *Plastics — Preregs — Bulk moulding compound (BMC) and dough moulding compound (DMC) — Basis for a specification*.

ISO 12114:1997, *Fibre-reinforced plastics — Thermosetting moulding compounds and preregs — Determination of curing behaviour*.