

Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1: Standard method (ISO 1133-1:2011)

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English Version

Plastics - Determination of the melt mass-flow rate (MFR) and
melt volume-flow rate (MVR) of thermoplastics - Part 1:
Standard method (ISO 1133-1:2011)

Plastiques - Détermination de l'indice de fluidité à chaud
des thermoplastiques, en masse (MFR) et en volume
(MVR) - Partie 1: Méthode normale (ISO 1133-1:2011)

Kunststoffe - Bestimmung der Schmelze-Massefließrate
(MFR) und der Schmelze-Volumenfließrate (MVR) von
Thermoplasten - Teil 1: Allgemeines Prüfverfahren (ISO
1133-1:2011)

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Foreword

This document (EN ISO 1133-1:2011) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 1133:2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 1133-1:2011 has been approved by CEN as a EN ISO 1133-1:2011 without any modification.

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Introduction

For stable materials that are not rheologically sensitive to the time-temperature history experienced during melt flow rate testing, this part of ISO 1133 is recommended.

For materials whose rheological behaviour is sensitive to the test's time-temperature history, e.g. materials which degrade during the test, ISO 1133-2 is recommended.

NOTE At the time of publication, there is no evidence to suggest that the use of ISO 1133-2 for stable materials results in better precision in comparison with the use of this part of ISO 1133.

Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics —

Part 1: Standard method

WARNING — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory requirements.

1 Scope

This part of ISO 1133 specifies two procedures for the determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastic materials under specified conditions of temperature and load. Procedure A is a mass-measurement method. Procedure B is a displacement-measurement method. Normally, the test conditions for measurement of melt flow rate are specified in the material standard with a reference to this part of ISO 1133. The test conditions normally used for thermoplastics are listed in Annex A.

The MVR is particularly useful when comparing materials of different filler content and when comparing filled with unfilled thermoplastics. The MFR can be determined from MVR measurements, or vice versa, provided the melt density at the test temperature is known.

This part of ISO 1133 is also possibly applicable to thermoplastics for which the rheological behaviour is affected during the measurement by phenomena such as hydrolysis (chain scission), condensation and cross-linking, but only if the effect is limited in extent and only if the repeatability and reproducibility are within an acceptable range. For materials which show significantly affected rheological behaviour during testing, this part of ISO 1133 is not appropriate. In such cases, ISO 1133-2 applies.

NOTE The rates of shear in these methods are much smaller than those used under normal conditions of processing, and therefore it is possible that data obtained by these methods for various thermoplastics will not always correlate with their behaviour during processing. Both methods are used primarily in quality control.

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 1133-2, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-rate (MVR) of thermoplastics — Part 2: Method for materials sensitive to time-temperature history and/or moisture*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

3 Terms and definitions

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