

FINAL VERSION

VERSION FINALE

**Electric and optical fibre cables – Test methods for non-metallic materials –
Part 511: Mechanical tests – Measurement of the melt flow index of polyethylene
and polypropylene compounds**

**Câbles électriques et à fibres optiques – Méthodes d’essai pour les matériaux
non-métalliques –
Partie 511: Essais mécaniques – Mesure de l’indice de fluidité à chaud des
mélanges polyéthylène et polypropylène**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC AND OPTICAL FIBRE CABLES –
TEST METHODS FOR NON-METALLIC MATERIALS –**

**Part 511: Mechanical tests –
Measurement of the melt flow index
of polyethylene and polypropylene compounds**

FOREWORD

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This Consolidated version of IEC 60811-511 bears the edition number 1.1. It consists of the first edition (2012-03) [documents 20/1307/FDIS and 20/1356/RVD] and its amendment 1 (2017-07) [documents 20/1736/FDIS and 20/1741/RVD]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 60811-511 has been prepared by IEC technical committee 20: Electric cables.

There are no specific technical changes with respect to the previous edition, but see the Foreword to IEC 60811-100:2012.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This part of IEC 60811 shall be used in conjunction with IEC 60811-100.

A list of all the parts in the IEC 60811 series, published under the general title *Electric and optical fibre cables – Test methods for non-metallic materials*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The IEC 60811 series specifies the test methods to be used for testing non-metallic materials of all types of cables. These test methods are intended to be referenced in standards for cable construction and for cable materials.

NOTE 1 Non-metallic materials are typically used for insulating, sheathing, bedding, filling or taping within cables.

NOTE 2 These test methods are accepted as basic and fundamental and have been developed and used over many years principally for the materials in all energy cables. They have also been widely accepted and used for other cables, in particular optical fibre cables, communication and control cables and cables for ships and offshore applications.

ELECTRIC AND OPTICAL FIBRE CABLES – TEST METHODS FOR NON-METALLIC MATERIALS –

Part 511: Mechanical tests – Measurement of the melt flow index of polyethylene and polypropylene compounds

1 Scope

This Part 511 of IEC 60811 describes the procedure for the measurement of the melt flow index for polyethylene and polypropylene compounds.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60811-100:2012, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 100: General*

IEC 60811-606, *Electric and optical fibre cables – Test methods for non-metallic materials-Part 606: Physical tests – Methods for determining the density*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60811-100 apply.

4 Test method

4.1 General

This part of IEC 60811 shall be used in conjunction with IEC 60811-100.

The melt flow index (MFI) of polyethylene and polypropylene compounds is the quantity of material extruded in 1,5 min or 10 min at a given temperature through a specified die under the action of a load determined by the method used.

The temperature for polyethylene compounds is 190 °C and for polypropylene compounds it is 230 °C.

NOTE 1 The same method is also specified in ISO 1133 as melt mass-flow rate (MFR) procedure.

NOTE 2 The melt flow index is not applicable to flame retarding polyethylene. Flame retardant polyethylene is defined as polyethylene containing additives intended to reduce flame propagation.

4.2 Apparatus

The apparatus consists basically of an extrusion plastometer, the general design being as shown in Figure 1. The compound, which is contained in a vertical cylinder, is extruded