IEC 62677-3-103

Edition 1.0 2019-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Heat-shrinkable low and medium voltage moulded shapes – Part 3: Specification for individual materials – Sheet 103: Heat-shrinkable, polyolefin, conductive moulded shapes for medium voltage applications

Profilés thermorétractables basse et moyenne tensions – Partie 3: Spécification pour matériaux particuliers – Feuille 103: Profilés thermorétractables conducteurs en polyoléfine pour applications moyenne tension

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CONTENTS

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HEAT-SHRINKABLE LOW AND MEDIUM VOLTAGE MOULDED SHAPES –

Part 3: Specification for individual materials – Sheet 103: Heat-shrinkable, polyolefin, conductive moulded shapes for medium voltage applications

FOREWORD

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International Standard IEC 62677 has been prepared by committee TC 15: Solid electrical insulating materials.

The text of this International Standard is based on the following documents:

CDV	Report on voting
15/833/CDV	15/861/RVC

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

A list of all parts in the IEC 62677 series, published under the general title *Heat shrinkable low and medium voltage moulded shapes*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

INTRODUCTION

This part of IEC 62677 is one of a series that deals with heat shrinkable low and medium voltage moulded shapes. It consists of three parts:

Part 1: General requirements (IEC 62677-1)

Part 2: Methods of test (IEC 62677-2) 1

Part 3: Specification for individual materials

This standard gives one of the sheets comprising Part 3 as follows:

Sheet 103: Heat shrinkable, polyolefin, conductive moulded shapes for medium voltage applications

HEAT-SHRINKABLE LOW AND MEDIUM VOLTAGE MOULDED SHAPES

Part 3: Specification for individual materials
Sheet 103: Heat-shrinkable, polyolefin, conductive moulded shapes for medium voltage applications

1 Scope

This part of IEC 62677 is applicable to heat shrinkable low and medium voltage moulded shapes, conductive, in a range of configurations suitable for environmental sealing, mechanical protection, strain relief for power cable terminations, joints and stop ends. These moulded shapes have been found suitable for use for temperatures between −40 ºC and 100 ºC.

The moulded shapes can be supplied with a pre-coated adhesive. A guide to adhesive compatibility and temperature performance is given in Annex A. The manufacturers/suppliers can be consulted for options.

Materials which conform to this specification meet established levels of performance. However, the selection of a material by a user for a specific application will need to be based on the actual requirements necessary for adequate performance in that application and not based on this specification alone.

The tests specified are designed to control the quality of the moulded shapes but it is recognized that they are designed to be used in low and medium voltage cable accessories and as such electrical performance will be proven as part of the assembly. Examples of this are described in EN 50393, HD 629 and IEC 60502 (all parts).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60296, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

IEC 60757, *Code for designation of colours*

IEC 62677-1, *Heat shrinkable low and medium voltage moulded shapes – Part 1: General requirements*

IEC 62677-2:2017, *Heat shrinkable low and medium voltage moulded shapes – Part 2: Methods of test*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Designation

The moulded shapes shall be identified by the following designation:

Description	IEC publication number	IEC Part number	IEC sheet number	Adhesive	Colour	Table 3 code
↓	↓	↓	↓	↓	↓	↓
Suppliers part number	IEC 62677	- 3	- 103	-U	- BK	X

Any colour abbreviation shall comply with IEC 60757, where applicable. Non-standard colours shall be written out in full.

The addition of “X” at the end of the designation indicates that the properties contained in Table 3 have been agreed upon between the user and supplier.

See Annex A for adhesive nomenclature.

NOTE This information is for packaging labelling only, in accordance with IEC 62677-1.

5 Conditions of test for dimensions

The moulded shapes shall be shrunk in a forced air circulation oven at 200 °C ± 5 K for (10 ± 1) min.

6 Requirements

In addition to the general requirements given in IEC 62677-1, the heat-shrinkable moulded shapes shall comply with the requirements in Table 1 and where applicable with those in Table 3.

7 Moulded shapes material conformance

Conformance with the requirements of this specification shall be based on the results from test sheets, (2 ± 0,15) mm thick, unless otherwise specified, which shall be prepared from the same heat-shrinkable material and conditions (including cross-linking) that is used to manufacture the heat shrinkable moulded shapes.

Table 1 – Property requirements

Property	IEC 62677-2:2017 clause or subclause	Units	Max. or Min.	Requirements	Remarks
Dimensions	6	mm	Min. Min.	To be agreed between purchaser and supplier	See Clause 5
Heat shock	7				Heat at 150 °C ± 5 K
Tensile strength	10	MPa	Min.	8	
Elongation at break	10	%	Min.	175	

Property	IEC 62677-2:2017 clause or subclause	Units	Max. or Min.	Requirements	Remarks
Bending at low temperature	8	-	-	No cracking shall be visible	Test at –40 °C The mandrel shall be between 20 and 22 times the sample thickness.
Dimensional stability on storage	9	-	-	The dimensions shall remain as agreed between purchaser and supplier	See Clause 5
Tensile strength Elongation at break	10 10	MPa %	Min. Min.	10 200	Use a jaw separation rate of 100 mm/min.
Secant modulus at 2 % elongation	11	MPa	Max.	250	
Volume resistivity at room temperature	13	Ω.m	Max.	10^3	Test voltage to be less than 5 V. The requirement is set so as to define the material as conductive. It does not indicate any guarantee of suitable performance in an accessory and further testing by the supplier will be needed to prove this. The value may change with applied voltage.
Resistance to selected fluids Tensile strength Elongation at break	18 10 10	 MPa %	 Min. Min.	 8 175	Use the fluids and test temperatures specified in Table 2
Heat ageing Tensile strength Elongation at break	20 10 10	 MPa %	 Min. Min.	 8 175	Heat at 150 °C ± 3 K
Long term ageing Elongation at break	19 10	 %	 Min.	 100	The ageing temperature shall be 100 °C ± 3 K

Table 2 – Resistance to selected fluids

Test fluid No.	Fluids	Type	Standard or symbol	Immersion temperature °C ± 2 K
1	Insulating oil	Mineral based	IEC 60296 transformer oil	23
2	Cleaning fluids		Iso propyl alcohol	23
3	-	Water	De – ionized	85

Other fluids and/or temperatures may be specified for customers with specific needs. These additional fluids and/or temperatures shall be applicable when incorporated into agreements between the supplier and customer.

Table 3 – Additional property requirements

Property	IEC 62677-2	Units	Max or Min	Requirement	Remarks
Resistance to weathering	27 After 3 000 h test to 10 10	 MPa %	 Min. Min.	 8 200	All samples should be cut to the appropriate size to fit the sample holders. Intermediate tests may also be done at 1 000 h intervals as an intermediate check