

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Flexible insulating sleeving –
Part 3: Specifications for individual types of sleeving –
Sheet 285: Heat-shrinkable polyolefin sleeving, for medium voltage joint
insulation**

[IEC 60684-3-285:2014](#)

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Gaines isolantes souples –

Partie 3: Spécifications pour types particuliers de gaines –

**Feuille 285: Gaines thermorétractables en polyoléfine, pour isolation de jonction
moyenne tension**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FLEXIBLE INSULATING SLEEVING –

**Part 3: Specifications for individual types of sleeving –
Sheet 285: Heat-shrinkable polyolefin sleeving,
for medium voltage joint insulation**

FOREWORD

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International Standard IEC 60684-3-285 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

This bilingual version (2015-10) corresponds to the English version, published in 2014-10.

The text of this standard is based on the following documents:

CDV	Report on voting
15/694/CDV	15/727/RVC

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

The French version of this standard has not been voted upon.

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

A list of all parts in the IEC 60684 series, published under the general title *Flexible insulating sleeving*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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
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INTRODUCTION

This International Standard is one of a series which deals with flexible insulating sleeving for electrical purposes.

The series consists of three parts:

Part 1: Definitions and general requirements (IEC 60684-1)

Part 2: Methods of test (IEC 60684-2)

Part 3: Specifications for individual types of sleeving (IEC 60684-3)

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

Sheet 285: Heat-shrinkable polyolefin sleeving, for medium voltage joint insulation.

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FLEXIBLE INSULATING SLEEVING –

Part 3: Specifications for individual types of sleeving – Sheet 285: Heat-shrinkable polyolefin sleeving, for medium voltage joint insulation

1 Scope

This part of IEC 60684 gives the requirements for heat-shrinkable sleeving for medium voltage joint insulation, with a range of shrink ratios.

This sleeving has been found suitable up to temperatures of 100 °C.

These sleeveings are normally supplied in colour, red or brown.

Since this type of sleeveings covers a significantly large range of sizes and wall thicknesses, the actual size will be agreed between the purchaser and supplier.

Materials which conform to this standard meet established levels of performance. However, the selection of a material by a user for a specific application should be based on the actual requirements necessary for adequate performance in that application and not based on this standard alone. This sleeving is designed to be used in medium voltage cable accessories and as such electrical performance will be proven as part of the assembly. Examples of this are described in HD 629 and IEC 60502.

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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 60684-1:2003, *Flexible insulating sleeving – Part 1: Definitions and general requirements*

IEC 60684-2:2011, *Flexible insulating sleeving – Part 2: Methods of test*

IEC 60757:1983, *Code for designation of colours*

3 Designation

The sleeving shall be identified by the following designation:

Description	IEC publication number	IEC part number	IEC sheet number	Size (Expanded and recovered internal diameter in mm)	Colour
↓	↓	↓	↓	↓	↓
Sleeving	IEC 60684	- 3	- 285	- 75,0/30,0	- RD

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

NOTE This information is for packaging labelling only in accordance with IEC 60684-1.

4 Conditions of test

Unless otherwise specified, the sleeving shall be shrunk in a forced air circulation oven for (20 ± 1) min at $200 \text{ }^{\circ}\text{C} \pm 3 \text{ K}$ prior to testing.

5 Requirements

In addition to the general requirements given in IEC 60684-1, the sleeving shall comply with the requirements of Tables 1 and 2.

6 Sleeving conformance

Conformance to the requirements of this standard shall normally be based on the results from typical sizes.

Recovered ID 25 mm – 30 mm

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Table 1 – Property requirements

Property	IEC 60684-2:2011 Clause or Subclause	Units	Max. or Min.	Requirements	Remarks
Dimensions	3				
Internal diameter	3.1.2	mm	Min.	To be agreed between purchaser and supplier	
Wall thickness	3.3.2	mm	Min.		
Concentricity expanded	3.3.3	%		60	
recovered				85	
Heat shock	6				
Tensile strength	19.1 and 19.2	MPa	Min.	5	Heat at 200 °C ± 5 K
Elongation at break	19.1 and 19.2	%	Min.	200	
Longitudinal change	9	%	Max.	- 10 + 5	Heat expanded sleeving at 200 °C ± 3 K for (20 ± 1) min
Bending at low temperature	14			No cracking shall be visible	Test at -20 °C For strips, the mandrel shall be between 20 and 22 times the wall thickness. Full section sleeving is tested unfilled and the mandrel shall be between 20 and 22 times the outer diameter.
Dimensional stability on storage	16	-	-	The dimensions shall remain as agreed.	See Clause 1 (Scope)
Tensile strength	19.1 and 19.2	MPa	Min.	8	Rate of jaw separation shall be 100 mm/min.
Elongation at break	19.1 and 19.2	%	Min.	400	
Secant modulus at 2 % elongation	19.5	MPa	Max.	175	
Breakdown voltage	21	kV	Min.	See Table 2.	
Volume resistivity at room temperature	23 23.5.2	Ω. m	Min.	10 ¹²	
Heat ageing	39				
Tensile strength	19.1 and 19.2	MPa	Min.	5	Heat at 135 °C ± 3 K
Elongation at break	19.1 and 19.2	%	Min.	200	

Table 2 – Requirements for breakdown voltage

Expanded wall thickness (mm)	Electric strength ^a Min.	
	All dimensions	Expanded wall thickness/mm <u>Type B</u> < 1 1 to 1,5 > 1,5
^a Measure the expanded wall thickness and calculate the electric strength by dividing the breakdown voltage by this value.		

The breakdown voltage shall be determined by the method described in 21.4 of IEC 60684-2:2011. The central value shall comply with the minimum value in the above Table 2.

The sleeving shall be tested in the expanded condition.

The rate of application of the voltage shall be 500 V/s.

Care should be taken on selection of sizes based on these values. Refer to the manufacturer for actual values on installed conditions.