IEC 60684-3-214

Edition 4.0 2019-08
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Flexible insulating sleeving –
Part 3: Specifications for individual types of sleeving –
Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

IEC 60684-3-214:2019-08 RLV(en)

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FLEXIBLE INSULATING SLEEVING –

Part 3: Specifications for individual types of sleeving – Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60684-3-214 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

This fourth edition cancels and replaces the third edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to the previous edition:

a) removal of colour fastness to light test, as this is covered by the test for carbon black content.

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

FDIS	Report on voting
15/889/FDIS	15/899/RVD

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 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 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This document is one of a series of standards 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 document comprises one of the sheets of Part 3 as follows:

Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall.

FLEXIBLE INSULATING SLEEVING –

Part 3: Specifications for individual types of sleeving – Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

1 Scope

This part of IEC 60684 gives the requirements for two types of heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall with a nominal shrink ratio of 3:1.

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

- Type A: Medium wall – internal diameter up to 200 mm typically.
- Type B: Thick wall – internal diameter up to 200 mm typically.

These sleevings are normally supplied in colour black.

Since these types of sleeving cover a significantly large range of sizes and wall thicknesses, Annex A (Tables A.1 and A.2) of this document provides a guide to the range of sizes available. The actual size will be agreed between the user and supplier.

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

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 60296:2012, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

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*

ISO 868:2003, *Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 11358-1:~~1997~~2014, *Plastics – Thermogravimetry (TG) of polymers – Part 1: General principles*

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 sleeving shall be identified by the following designation:

Description	IEC publication number	IEC part number	IEC sheet number	Type	Size (expanded and recovered internal diameter in mm)	Colour
↓	↓	↓	↓	↓	↓	↓
Sleeving	IEC 60684	- 3	- 214	- B	- 85,0/25,0	- BK

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

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

5 Conditions of test

Unless otherwise specified, the sleeving shall be shrunk in a forced air circulation oven for (10 ± 1) min at 200 °C ± 3 K prior to testing.

6 Requirements

In addition to the general requirements given in IEC 60684-1, the sleeving shall comply with the requirements of Tables 1, 2, and 3, where applicable.

7 Sleeving conformance

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

- Type A: Recovered ~~ID~~ internal diameter 25 mm to 30 mm
- Type B: Recovered ~~ID~~ internal diameter 25 mm to 30 mm

Table 1 – Property requirements *(1 of 2)*

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or Min.	Requirements	Remarks
Dimensions Internal Diameter Wall thickness Concentricity expanded recovered	3 3.1.2 3.3.2 3.3.3	 mm mm %	 Min. Min.	To be agreed between purchaser and supplier 50 85	
Heat shock Tensile strength Elongation at break	6 19.1 and 19.2 19.1 and 19.2	 MPa %	 Min. Min.	 10 200	Heat at 200 °C ± 5 K
Longitudinal change	9	%	Max.	- 10 + 5	Heat expanded sleeving at 200 °C ± 3 K for (10 ± 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 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 Elongation at break	19.1 and 19.2 19.1 and 19.2	MPa %	Min. Min.	13 350	Use a jaw separation rate of 100 mm/min. Below 6,5 mm ∅ as sleeving. At 6,5 mm ∅ and above as dumbbells
Secant modulus at 2 % elongation	19.5	MPa -	Min. Max.	80 160	

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or Min.	Requirements	Remarks
Breakdown voltage	21	kV	Min.	Table 2	
Volume resistivity at room temperature after damp heat	23 23.5.2 23.5.4	 Ω.m Ω.m	 Min. Min.	 10^{12} 10^{11}	
Colour fastness to light Standard identification Number	34		Min.	The colour standard contrast between the exposed and unexposed parts of the specimen shall be equal to or less than that of the fastness standard	Fastness standard 5
Resistance to selected fluids Tensile strength Elongation at break	36 19.1 and 19.2 19.1 and 19.2	 MPa %	 Min. Min.	 10 250	Use the fluids and test temperatures specified in Table 3.
Heat ageing Tensile strength Elongation at break	39 19.1 and 19.2 19.1 and 19.2	 MPa %	 Min. Min.	 10 200	Heat at 150 °C ± 3 K Jacket only
Long term heat ageing Elongation at break	50 19.2	 %	 Min.	 175	The ageing temperature shall be 100 °C ± 3 K
Carbon black content	ISO 11358	%	Min.	2,5	
Hardness	ISO 868	Shore D	Min.	40	
Water Absorption	40	%	Max.	0,5	

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or min.	Requirements	Remarks
Dimensions	3				
Internal diameter	3.1.2	mm		To be agreed between purchaser and supplier	
Wall thickness	3.3.2	mm			
Concentricity	3.3.3	%			
expanded			Min.	50	
recovered			Min.	85	
Heat shock	6				Heat at 200 °C ± 5 K
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	200	
Longitudinal change	9	%	Max.	- 10 + 5	
Bending at low temperature	14	-	-	No cracking shall be visible	Test at –20 °C For strips, the mandrel shall be between 20 times and 22 times the wall thickness. Full section sleeving is tested and the mandrel shall be between 20 times and 22 times the outer diameter.
Dimensional stability on storage	16	-	-	The dimensions shall remain as agreed	See Clause 1
Tensile strength	19.2 and 19.3	MPa	Min.	13	Use a jaw separation rate of 100 mm/min. Below 6,5 mm Ø as sleeving At 6,5 mm Ø and above as dumbbells
Elongation at break	19.2 and 19.3	%	Min.	350	
Secant modulus at 2 % elongation	19.5	MPa	Min. Max.	80 160	

Table 1 *(2 of 2)*

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or min.	Requirements	Remarks
Breakdown voltage	21.2	kV	Min.	Table 2	
Volume resistivity	23				
at room temperature	23.5.2	Ω.m	Min.	10^{12}	
after damp heat	23.5.4	Ω.m	Min.	10^{11}	
Resistance to selected fluids	36				Use the fluids and test temperatures specified in Table 3
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	250	
Heat ageing	39				Heat at 150 °C ± 3 K Jacket only
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	200	
Long term heat ageing	50				The ageing temperature shall be 100 °C ± 3 K
Elongation at break	19.2 and 19.3	%	Min.	175	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Carbon black content	ISO 11358-1	%	Min.	2,5	Identify carbon black peak and report weight loss %
Hardness	ISO 868	Shore D	Min.	40	
Water absorption	40	%	Max.	0,5	

Table 2 – Requirements for breakdown voltage

Expanded wall thickness mm	**Dielectric strength** [a] Min.	
All dimensions	**Expanded ID**	**Dielectric strength** kV/mm
	Type A	
	10 to 25	14
	26 to 50	12
	51 to 120	10
	121 and above	8
	Type B	
	10 to 25	12
	26 to 50	10
	51 to 120	8
	121 and above	6
~~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 this table.~~ 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.		
[a] Measure the expanded wall thickness and calculate the dielectric strength by dividing the breakdown voltage by this value.		

Table 3 – Resistance to selected fluids

Test fluid No.	**Fluids**	**Type**	**Standard or symbol**	**Immersion temperature** °C ± 2 K
1	Insulating oil	Transformer oil	IEC 60296	23
2	Cleaning fluids		Isopropyl 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.

Annex A
(informative)

Guide to the available sizes and wall thicknesses

Table A.1 – Type A medium wall

Internal diameter		Wall
Expanded Min. mm	Recovered Max. mm	Recovered wall thickness Min. mm
10	3	1,0
10	4	1,4
12	3	1,4
16	5	1,4
19	6	2,0
25	8	2,0
28	10	2,0
33	10	2,0
35	12	2,0
38	13	2,3
43	13	2,3
50	18	2,3
63	19	2,3
70	26	2,3
85	25	2,5
90	36	2,5
115	34	2,5
120	54	2,5
140	42	2,8
152	48	2,8
160	50	3,0
180	60	3,0
200	77	3,3

Table A.2 – Type B thick wall

Internal diameter		Wall
Expanded Min. mm	**Recovered Max.** mm	**Recovered wall thickness Min.** mm
9	3	1,8
13	4	2,4
19	6	2,4
20	6	2,4
28	9	3,0
33	8	3,2
38	12	4,0
43	12	4,0
48	15	4,0
51	16	4,0
68	22	4,0
70	21	4,0
85	25	4,0
90	30	4,0
105	26	4,0
105	30	4,0
115	40	4,0
130	36	4,0
130	40	4,2
150	48	4,3
160	50	4,3
170	60	4,3
200	77	4,3

Bibliography

IEC 60684-3 (all sheets), *Flexible insulating sleeving – Part 3: Specifications for individual types of sleeving*

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INTERNATIONAL STANDARD

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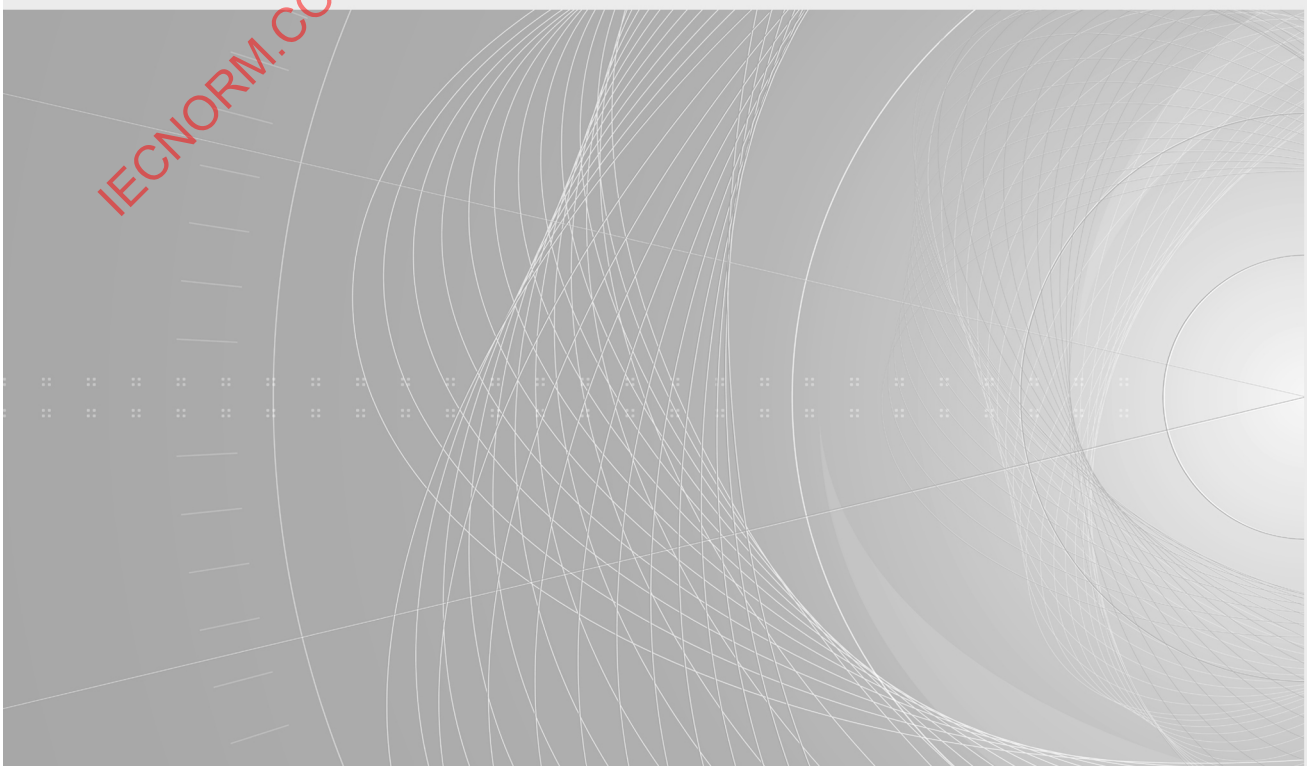
Flexible insulating sleeving –
Part 3: Specifications for individual types of sleeving –
Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

Gaines isolantes souples –
Partie 3: Spécifications pour types particuliers de gaines –
Feuille 214: Gaines thermorétractables en polyoléfine, non ignifugées, à paroi épaisse et moyenne



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FLEXIBLE INSULATING SLEEVING –

Part 3: Specifications for individual types of sleeving – Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

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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 document comprises one of the sheets of Part 3 as follows:

Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall.

FLEXIBLE INSULATING SLEEVING –

Part 3: Specifications for individual types of sleeving – Sheet 214: Heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall

1 Scope

This part of IEC 60684 gives the requirements for two types of heat-shrinkable, polyolefin sleeving, not flame retarded, thick and medium wall with a nominal shrink ratio of 3:1.

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

- Type A: Medium wall – internal diameter up to 200 mm typically.
- Type B: Thick wall – internal diameter up to 200 mm typically.

These sleevings are normally supplied in colour black.

Since these types of sleeving cover a significantly large range of sizes and wall thicknesses, Annex A (Tables A.1 and A.2) of this document provides a guide to the range of sizes available. The actual size will be agreed between the user and supplier.

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 be based on the actual requirements necessary for adequate performance in that application and not based on this specification alone.

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.

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ISO 868:2003, *Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)*

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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 sleeving shall be identified by the following designation:

Description	IEC publication number	IEC part number	IEC sheet number	Type	Size (expanded and recovered internal diameter in mm)	Colour
↓	↓	↓	↓	↓	↓	↓
Sleeving	IEC 60684	- 3	- 214	- B	- 85,0/25,0	- BK

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

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

5 Conditions of test

Unless otherwise specified, the sleeving shall be shrunk in a forced air circulation oven for (10 ± 1) min at 200 °C ± 3 K prior to testing.

6 Requirements

In addition to the general requirements given in IEC 60684-1, the sleeving shall comply with the requirements of Tables 1, 2, and 3, where applicable.

7 Sleeving conformance

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

- Type A: Recovered internal diameter 25 mm to 30 mm
- Type B: Recovered internal diameter 25 mm to 30 mm

Table 1 – Property requirements *(1 of 2)*

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or min.	Requirements	Remarks
Dimensions	3				
Internal diameter	3.1.2	mm		To be agreed between purchaser and supplier	
Wall thickness	3.3.2	mm			
Concentricity	3.3.3	%			
expanded			Min.	50	
recovered			Min.	85	
Heat shock	6				Heat at 200 °C ± 5 K
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	200	
Longitudinal change	9	%	Max.	- 10 + 5	
Bending at low temperature	14	-	-	No cracking shall be visible	Test at –20 °C For strips, the mandrel shall be between 20 times and 22 times the wall thickness. Full section sleeving is tested and the mandrel shall be between 20 times and 22 times the outer diameter.
Dimensional stability on storage	16	-	-	The dimensions shall remain as agreed	See Clause 1
Tensile strength	19.2 and 19.3	MPa	Min.	13	Use a jaw separation rate of 100 mm/min. Below 6,5 mm Ø as sleeving At 6,5 mm Ø and above as dumbbells
Elongation at break	19.2 and 19.3	%	Min.	350	
Secant modulus at 2 % elongation	19.5	MPa	Min. Max.	80 160	

Table 1 *(2 of 2)*

Property	IEC 60684-2:2011 clause or subclause	Units	Max. or min.	Requirements	Remarks
Breakdown voltage	21.2	kV	Min.	Table 2	
Volume resistivity	23				
at room temperature	23.5.2	Ω.m	Min.	10^{12}	
after damp heat	23.5.4	Ω.m	Min.	10^{11}	
Resistance to selected fluids	36				Use the fluids and test temperatures specified in Table 3
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	250	
Heat ageing	39				Heat at 150 °C ± 3 K Jacket only
Tensile strength	19.2 and 19.3	MPa	Min.	10	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Elongation at break	19.2 and 19.3	%	Min.	200	
Long term heat ageing	50				The ageing temperature shall be 100 °C ± 3 K
Elongation at break	19.2 and 19.3	%	Min.	175	Use a jaw separation rate of 100 mm/min. For internal diameters < 6,5 mm, use sleeving samples for testing. On 6,5 mm and larger diameter sleeving, use dumb-bell samples cut from the sleeving
Carbon black content	ISO 11358-1	%	Min.	2,5	Identify carbon black peak and report weight loss %
Hardness	ISO 868	Shore D	Min.	40	
Water absorption	40	%	Max.	0,5	

Table 2 – Requirements for breakdown voltage

Expanded wall thickness mm	**Dielectric strength** [a] Min.	
All dimensions	**Expanded ID**	**Dielectric strength** kV/mm
	Type A	
	10 to 25	14
	26 to 50	12
	51 to 120	10
	121 and above	8
	Type B	
	10 to 25	12
	26 to 50	10
	51 to 120	8
	121 and above	6
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.		
[a] Measure the expanded wall thickness and calculate the dielectric strength by dividing the breakdown voltage by this value.		

Table 3 – Resistance to selected fluids

Test fluid No.	**Fluids**	**Type**	**Standard or symbol**	**Immersion temperature** °C ± 2 K
1	Insulating oil	Transformer oil	IEC 60296	23
2	Cleaning fluids		Isopropyl 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.

Annex A
(informative)

Guide to the available sizes and wall thicknesses

Table A.1 – Type A medium wall

Internal diameter		Wall
Expanded Min. mm	Recovered Max. mm	Recovered wall thickness Min. mm
10	3	1,0
10	4	1,4
12	3	1,4
16	5	1,4
19	6	2,0
25	8	2,0
28	10	2,0
33	10	2,0
35	12	2,0
38	13	2,3
43	13	2,3
50	18	2,3
63	19	2,3
70	26	2,3
85	25	2,5
90	36	2,5
115	34	2,5
120	54	2,5
140	42	2,8
152	48	2,8
160	50	3,0
180	60	3,0
200	77	3,3

Table A.2 – Type B thick wall

Internal diameter		Wall
Expanded Min. mm	**Recovered Max.** mm	**Recovered wall thickness Min.** mm
9	3	1,8
13	4	2,4
19	6	2,4
20	6	2,4
28	9	3,0
33	8	3,2
38	12	4,0
43	12	4,0
48	15	4,0
51	16	4,0
68	22	4,0
70	21	4,0
85	25	4,0
90	30	4,0
105	26	4,0
105	30	4,0
115	40	4,0
130	36	4,0
130	40	4,2
150	48	4,3
160	50	4,3
170	60	4,3
200	77	4,3

Bibliography

IEC 60684-3 (all sheets), *Flexible insulating sleeving – Part 3: Specifications for individual types of sleeving*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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GAINES ISOLANTES SOUPLES –

Partie 3: Spécifications pour types particuliers de gaines – Feuille 214: Gaines thermorétractables en polyoléfine, non ignifugées, à paroi épaisse et moyenne

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La Norme internationale IEC 60684-3-214 a été établie par le comité d'études 15 de l'IEC: Matériaux isolants électriques solides.

Cette quatrième édition annule et remplace la troisième édition parue en 2013. Cette édition constitue une révision technique.

Cette édition inclut la modification technique majeure suivante par rapport à l'édition précédente:

a) suppression de l'essai de solidité de la couleur à la lumière, cet essai étant couvert par l'essai de détermination de la teneur en noir de carbone.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
15/889/FDIS	15/899/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60684, publiées sous le titre général *Gaines isolantes souples*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
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INTRODUCTION

Le présent document fait partie d'une série de normes traitant des gaines isolantes souples à usages électriques.

Cette série est constituée de trois parties:

Partie 1: Définitions et exigences générales (IEC 60684-1)

Partie 2: Méthodes d'essai (IEC 60684-2)

Partie 3: Spécifications pour types particuliers de gaines (IEC 60684-3)

Le présent document contient l'une des feuilles qui composent la Partie 3, comme suit:

Feuille 214: Gaines thermorétractables en polyoléfine, non ignifugées, à paroi épaisse et moyenne.

GAINES ISOLANTES SOUPLES –

Partie 3: Spécifications pour types particuliers de gaines – Feuille 214: Gaines thermorétractables en polyoléfine, non ignifugées, à paroi épaisse et moyenne

1 Domaine d'application

La présente partie de l'IEC 60684 donne les exigences relatives à deux types de gaines thermorétractables, en polyoléfine, non ignifugées, à paroi épaisse et moyenne, dont le rapport de rétreint nominal est 3:1.

Ces gaines se sont avérées appropriées pour une utilisation à des températures allant jusqu'à 100 °C.

- Type A: Paroi moyenne – diamètre intérieur généralement jusqu'à 200 mm.
- Type B: Paroi épaisse – diamètre intérieur généralement jusqu'à 200 mm.

La couleur de ces gaines est normalement le noir.

Comme ces types de gaines couvrent une plage très étendue de tailles et d'épaisseurs de paroi, l'Annexe A (Tableaux A.1 et A.2) du présent document fournit un guide des tailles disponibles dans cette plage. La taille réelle fait l'objet d'un accord entre l'utilisateur et le fournisseur.

Les matériaux conformes à la présente spécification satisfont à des niveaux de performances établis. Cependant, le choix d'un matériau par un utilisateur, pour une application spécifique, est fondé sur les exigences réelles nécessaires pour obtenir une performance adéquate pour l'application concernée, et n'est pas fondé sur cette seule spécification.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60296:2012, *Fluides pour applications électrotechniques – Huiles minérales isolantes neuves pour transformateurs et appareillages de connexion*

IEC 60684-1:2003, *Gaines isolantes souples – Partie 1: Définitions et exigences générales*

IEC 60684-2:2011, *Gaines isolantes souples – Partie 2: Méthodes d'essai*

IEC 60757:1983, *Code de désignation de couleurs*

ISO 868:2003, *Plastiques et ébonite – Détermination de la dureté par pénétration au moyen d'un duromètre (dureté Shore)*

ISO 11358-1:2014, *Plastiques – Thermogravimétrie (TG) des polymères – Partie 1: Principes généraux*