IEC 62329-3-102

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Heat-shrinkable moulded shapes –
Part 3: Specification requirements for shape dimensions, material requirements and compatibility performance – Sheet 102: Heat-shrinkable elastomeric moulded shapes, semi-rigid, material requirements and system performance

Profilés thermorétractables –
Partie 3: Exigences relatives aux dimensions des profilés, exigences de matériaux et performances de compatibilité – Feuille 102: Profilés thermorétractables en élastomère, semi-rigides – Exigences relatives aux matériaux et performances du système

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HEAT-SHRINKABLE MOULDED SHAPES –

Part 3: Specification requirements for shape dimensions, material requirements and compatibility performance – Sheet 102: Heat-shrinkable elastomeric moulded shapes, semi-rigid, material requirements and system performance

FOREWORD

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International Standard IEC 62329-3-102 has been prepared by IEC technical committee 15: Solid electrical insulating materials.

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

FDIS	Report on voting
15/570/FDIS	15/590/RVD

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

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

A list of all the parts in the IEC 62329 series, under the general title *Heat-shrinkable moulded shapes*, 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 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- withdrawn,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

This International Standard is one of a series that deals with heat-shrinkable moulded shapes for electrical purposes.

The series consists of three parts:

Part 1: Definitions and general requirements (IEC 62329-1)

Part 2: Methods of test (IEC 62329-2)

Part 3: Specification requirements for shape dimensions, material requirements and compatibility performance (IEC 62329-3)

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

Sheet 102: Heat-shrinkable elastomeric moulded shapes, semi-rigid, material requirements and system performance

NOTE See IEC 62329-3-100 for moulded shape dimensions.

HEAT-SHRINKABLE MOULDED SHAPES –

Part 3: Specification requirements for shape dimensions, material requirements and compatibility performance – Sheet 102: Heat-shrinkable elastomeric moulded shapes, semi-rigid, material requirements and system performance

1 Scope

This sheet of IEC 62329-3 gives the requirements for heat-shrinkable elastomeric moulded shape, semi-rigid material requirements and system performance.

Experience of product performance indicates that this moulded shape material is suitable for inclusion in systems for operation in the following temperature ranges: –75 °C to + 120 °C.

The moulded shapes may be supplied with a pre-coated adhesive. Refer to the manufacturers/suppliers for options. A guide to adhesive compatibility is given in Annex A.

These moulded shapes are normally supplied in the styles and dimensions given in IEC 62329-3-100. The colour is normally Black.

Styles and dimensions other than those specifically listed in IEC 62329-3-100 may be available as custom items. These items shall be considered to comply with this standard if they comply with the property requirements listed in Table 1 with the exception of dimensions.

Materials that conform to this specification 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 specification alone.

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

IEC 60695-11-10:1999, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*
Amendment 1 (2003)

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

IEC 62329-1:2005, *Heat-shrinkable moulded shapes – Part 1: Definitions and general requirements*

IEC 62329-2:2006, *Heat-shrinkable moulded shapes – Part 2: Methods of test*

IEC 62329-3-100:2010, *Heat shrinkable moulded shapes – Part 3: Specification requirements for shape dimensions, material requirements and compatibility performance – Sheet 100: Heat-shrinkable moulded shape dimensions*

ISO 1817:2005, *Rubber, vulcanized - Determination of the effect of liquids*

3 Designation

The moulded shapes shall be designated as shown by the following example:

Description	IEC publication number	IEC Part number	IEC Sheet number	IEC Style/size code	Colour	Adhesive Code a	Drain holes b
↓	↓	↓	↓	↓	↓	↓	↓
Moulded shapes	IEC 62329	3	101	B/01	BK	U (see NOTE)	D

NOTE For compatible adhesives and codes, see Annex A.

a Insert UN if uncoated.

b Insert N if no drain holes.

Any abbreviation for colour shall comply with IEC 60757. Where no abbreviation is given, the colour shall be written in full.

4 Conditions of test for the moulded shapes

The moulded shapes shall be shrunk in a forced air circulation oven for (10 ± 1) min at the temperature specified in Table 1.

5 Requirements

In addition to the general requirements given in IEC 62329-1, the heat-shrinkable moulded shapes shall comply with the requirements in IEC 62329-3-100 and Table 1.

6 Moulded shapes material conformance

Conformance with the requirements of this specification shall be based on the results form test sheets, (2 ± 0,15) mm thick, unless otherwise specified[1], which shall be prepared from the same cross-linked heat shrinkable material that is used to manufacture the heat shrinkable moulded shapes.

7 Moulded shapes compatibility

Conformance with the compatibility requirements of this specification shall be based on the results from the assembly configuration as shown in Figure 3 of IEC 62329-2.

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1 A suitable size has been found to be 150 mm × 150 mm.

Table 1 – Property requirements

Property	IEC 62329-2 clause or subclause	Units	Max. or Min.	Requirements	Remarks
Dimensions	5	mm	–	IEC 62329-3-100 Tables 1 - 22	Condition at 150°C ± 3 K.
Heat shock	7				Heat at 175°C ± 3 K.
Tensile strength	10	MPa	Min.	10	
Elongation at break	10	%	Min.	250	
Bending at low temperature	8	–	–	No visible cracks.	Condition at –75° C ± 2 K. Mandrel diameter shall be 20 mm $^{+1}_{-0}$ mm.
Dimensional stability on storage	9	–	–	The dimensions shall be as specified in Tables 1 to 22 in IEC 62329-3-100.	Recovery conditions as Clause 5 for dimensions.
Tensile strength	10	MPa	Min.	12	Use a jaw separation rate of 100 mm/min.
Elongation at break	10	%	Min.	350	
Secant modulus at 2% elongation	11	MPa	–	80 to 160	
Electric strength	12	MV/m	Min.	8	
Volume resistivity after damp heat	13	Ω·m	Min.	10^{11}	
Flammability	16	s	Max.	30	Test in accordance with method A of IEC 60695-11-10
Copper corrosion	18	%	Max.	None above the allowable 8	Heat for (16 ± 0,5) h at 150°C ± 3 K.
Resistance to selected fluids	20				Use the fluids and test temperatures specified in Table 2.
Tensile strength	10	MPa	Min.	8	
Elongation at break	10	%	Min.	250	
Heat ageing	23				Heat at 160°C ± 3 K
Tensile strength	10	MPa	Min.	10	
Elongation at break	10	%	Min.	250	
Water absorption	24	%	Max.	0,5	
Mould growth	30				Method B 56 days exposure
Tensile strength	10	MPa	Min.	12	
Elongation at break	10	%	Min.	350	
Long term heat ageing	21				Heat for (3000 ± 5) h at 150° C ± 3 K
Elongation at break	10	%	Min.	100	
Compatibility	31				
Adhesive type				R,T and U [a]	Test at °C ± 3 K
Dynamic shear					
At room temperature	31.1	N	Min.	300	23
At elevated temperature	31.1.7	N	Min.	110	100

Property	IEC 62329-2 clause or subclause	Units	Max. or Min.	Requirements	Remarks		
Static load							
At room temperature	31.2	kg		20	23		
At elevated temperature		kg		5	100		
Dynamic shear	31.1	N		300	23		
Fluid resistance	31.3	N	Min.	150	Fluid type	Standard or symbol	(24 ± 0,5) h immersion at °C ± 2 K
					Kerosene fuel	F34	70
					Grease	G 354	70
					Oil	0-156	70
					Water		70
Thermal ageing	31.4	N	Min.	300	Heat for (168 ± 1) h at 150° C ± 3 K.		
Peel adhesion	31.5	N/25mm	Min.	60			
Altitude immersion	31.6	Ω	Min.	10^9			

a These system performance requirements are based on using R,T and U adhesives (see Annex A). When using other adhesives the performance may be different. Refer to the supplier/manufacturer.

Table 2 – Resistance to selected fluids

Fluids	Type	Standard or symbol	Immersion temperature °C ± 2K
Fuels	Gasoline	ISO 1817 Liquid B	40
	Kerosene	ISO 1817 Liquid F	40
Hydraulic fluids	Phosphate base	ISO 1817 Liquid 103	70
	Silicone base	S-1714 [a]	50
	Mineral base	H-520 [a]	50
Oils	Synthetic base	ISO 1817 Liquid 101	70
	Mineral base	ISO 1817 Oil No. 2	50
	Mineral base	O-1176 [a]	50
	Mineral base	O-142 [a]	50
Cleaning fluids	Solvent	Isopropyl alcohol	23
		Propanol 25% White spirit 75%	23
		Methylethylketone	23
De-icing fluids	Runway de-icers	Inhibited potassium acetate in water, 50%	23
	Aircraft de-icers	Ethylene glycol 80% Water 20%	23
NOTE Other fluids and/or temperatures may be specified with specific needs. These additional fluids and/or temperatures should be applicable when incorporated into agreements between the supplier and customer.			
[a] These are commercially available fluids which can be identified in aviation fluid guides.			