BRITISH STANDARD

BS 7655 :
Section 2.5 :
1993

Specification for

Insulating and sheathing materials for cables

Part 2. Elastomeric sheathing compounds

Section 2.5 Sheathing compounds having low smoke and acid gas emission for general applications

BSI
STANDARDS

Foreword

This Section of BS 7655 has been prepared under the direction of the Cables and Insulation Standards Policy Committee.

This Section specifies the physical properties of elastomeric sheathing compound type LRS 1. For a general introduction to the BS 7655 series and a list of Parts and Sections, Part 0 should be consulted.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Specification

1 Scope

This Section of BS 7655 specifies the physical properties of elastomeric sheathing compounds given in table 1. The relevant test methods for verification of conformity are given in BS 6469 and BS 6425.

This Section is to be used in conjunction with BS 7655 : Part 0.

Table 1. Types of elastomeric sheathing compounds for general applications, with low smoke and acid gas emissions

Type	Maximum material operating temperature °C	General application
LRS 1[1)]	85	Ordinary duty oil-resisting with low emission of smoke and corrosive gases when affected by fire

[1)]This compound is equivalent in all respects to compound SW 3 in BS 7655 : Section 2.6 : 1993.

2 Normative references

This Section of BS 7655 incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed on the inside back page. For a dated reference, only the edition cited applies; any subsequent amendments to or revisions of the publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, any amendment to, or the latest edition of, the cited publication applies.

3 Definitions

For the purposes of this Section of BS 7655, the definitions given in BS 1755 : Part 1, BS 1755 : Part 2, BS 3558, BS 4727 : Part 2 : Group 08 and BS 7655 : Part 0 apply, together with the following.

3.1 variation

The difference between the median value after ageing and the median value without ageing expressed as a percentage of the latter.

3.2 median value

When several test results have been obtained and ordered in an increasing or decreasing succession, the median is the middle value if the number of available values is odd and is the mean of the two middle values if the number is even.

4 Test requirements for physical properties

4.1 General

4.1.1 The test methods shall be as specified in table 2 and the method of pre-conditioning shall be as described in **4.2**. The temperatures used for the test methods shall conform to the conditions specified in **4.3**.

Table 2. Test methods (in accordance with BS 6469 unless otherwise stated)

Test	Method	
	Section	Clause
Properties in the state as delivered		
Tensile strength and elongation at break	1.1 : 1992	**9**
Properties after ageing in air oven		
Tensile strength and elongation at break	1.2 : 1992	**8.1**
Properties after ageing in air bomb		
Tensile strength and elongation at break	1.2 : 1992	**8.2**
Hot set test	2.1 : 1992	**9**
Mineral oil immersion test	2.1 : 1992	**10**
Halogen gas emission test	BS 6425 : Part 1 : 1990	

4.1.2 When tested by the methods specified in **4.1.1** the properties shall be in accordance with the requirements given in table 3 for the particular type of material.

4.2 Pre-conditioning

The tests shall be carried out not less than 16 h after extrusion and cross-linking.

4.3 Temperatures for test methods

4.3.1 *Ambient temperature*

Tests shall be made at an ambient temperature within the range 5 °C to 35 °C unless otherwise specified in the details for the particular test.

Table 3. Test requirements		
Test		**Requirements for sheath type LRS 1**
Properties in the state as delivered		
Minimum tensile strength	N/mm^2	8
Minimum elongation at break	%	150
Properties after ageing in air oven		
Temperature	°C	120
Duration	h	7 × 24
Maximum variation for tensile strength	%	30
Maximum variation for elongation at break	%	30
Properties after ageing in air bomb		
Temperature	°C	127
Duration	h	40
Maximum variation for tensile strength	%	50[1)]
Maximum variation for elongation at break	%	50[1)]
Hot set test		
Temperature	°C	200
Duration	min	15
Mechanical stress	N/mm^2	0.2
Requirements		
Maximum elongation under load	%	100
Maximum elongation after unloading	%	25
Mineral oil immersion test		
Temperature	°C	100
Duration	h	24
Maximum variation for tensile strength	%	40
Maximum variation for elongation at break	%	40
Halogen acid gas emission test		
Maximum value	%	0.5

[1)]Only a reduction in values is subject to verification.

4.3.2 *Tolerances on temperature values*

Unless otherwise stated in the particular specification the tolerances on temperature values quoted in the test methods shall be as given in table 4.

Table 4. Tolerances on temperature values	
Specified temperature, t ° C	**Tolerance** °C
$-40 \leq t \leq 0$	±2
$0 < t \leq 50$	According to relevant clause
$50 < t \leq 150$	±2
$t > 150$	±3

List of references (see clause 2)

Normative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 1755 :	*Glossary of terms used in the plastics industry*
BS 1755 : Part 1 : 1982	*Polymer and plastics technology*
BS 1755 : Part 2 : 1974	*Manufacturing processes*
BS 3558 : 1980	*Glossary of rubber terms*
BS 4727 :	*Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms*
BS 4727 : Part 2 :	*Terms particular to power engineering*
BS 4727 : Part 2 : Group 08 : 1986	*Electric cable terminology*
BS 6425 :	*Methods of test for gases evolved during combustion of electric cables*
BS 6425 : Part 1 : 1990	*Method for determination of amount of halogen acid gas evolved during combustion of polymeric materials taken from cables*
BS 6469 :	*Insulating and sheathing materials of electric cables*
BS 6469 : Part 1 :	*Methods of test for general application*
BS 6469 : Part 1 : Section 1.1 : 1992	*Measurement of thickness and overall dimensions. Tests for determining the mechanical properties*
BS 6469 : Part 1 : Section 1.2 : 1992	*Thermal ageing methods*
BS 6469 : Part 2 :	*Methods of test specific to elastomeric compounds*
BS 6469 : Part 2 : Section 2.1 : 1992	*Ozone resistance test - Hot set test - Mineral oil immersion test*
BS 7655 :	*Specification for insulating and sheathing materials*
BS 7655 : Part 0 : 1993	*General introduction*
BS 7655 : Part 2 :	*Elastomeric sheathing compounds*
BS 7655 : Part 2 : Section 2.6 : 1993	*Sheathing compounds for ships wiring and offshore applications*

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Cables and Insulation Standards Policy Committee (CIL/-) to Technical Committee CIL/20, upon which the following bodies were represented:

Aluminium Federation
Association of Consulting Engineers
Association of Manufacturers of Domestic Electrical Appliances
British Approvals Service for Cables
British Cable Makers Confederation
British Plastics Federation
British Steel Industry
Department of the Environment (Property Services Agency)
Department of Trade and Industry (Consumer Safety Unit, CA Division)
Electricity Association
Engineering Equipment and Materials Users' Association
Institution of Electrical Engineers
London Regional Transport

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Railways Board
British Rubber Manufacturers Association Ltd.
British Telecommunications plc
ERA Technology Ltd.
GAMBICA (BEAMA Ltd.)
Institution of Incorporated Executive Engineers
London Underground Ltd.
Queen Mary and Westfield College
Telecommunications Cables Group of BCMC
Warrington Fire Research Centre

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BSI, 2 Park Street, London W1A 2BS BSI, Linford Wood, Milton Keynes MK14 6LE