

Specification for

Insulating and sheathing materials for cables

Part 5. Cross-linked insulating compounds having low emission of corrosive gases, and suitable for use in cables having low emission of smoke when affected by fire

Section 5.1 Harmonized cross-linked types

IMPORTANT NOTE. This Section of BS 7655 is to be read in conjunction with BS 7655 : Part 0.

ICS 29.035.20

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee GEL/20, Electric cables, to Subcommittee GEL/20/3, Insulation and sheath, upon which the following bodies were represented:

Association of Consulting Engineers
British Approvals Service for Cables
British Cable Makers Confederation
British Plastics Federation
British Railways Board
British Rubber Manufacturers' Association Ltd.
British Telecommunications plc
Department of Trade and Industry (Consumer Safety Unit, CA Division)
Electricity Association
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Warrington Fire Research Centre

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on
15 October 1997

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First published April 1993
Second edition October 1997

The following BSI references relate to the work on this standard:
Committee reference GEL/20/3
Draft for comment 96/213358 DC

ISBN 0 580 28366 6

Amendments issued since publication

Amd. No.	Date	Text affected

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Foreword

This Section of BS 7655 has been prepared by Subcommittee GEL/20/3. It is a revision of BS 7655 : Section 5.1 : 1994 which is withdrawn. It specifies harmonized types of cross-linked insulating compounds having low emission of corrosive gases, and suitable for use in cables having low emission of smoke when affected by fire, in accordance with HD 22.1.

This edition of BS 7655 : Section 5.1 introduces compound type EI 8 in accordance with A19 of HD 22.1 S2.

Test methods are specified in this Section of BS 7655 by reference to the latest edition of standards in which they appear. A dated reference to the most recent edition of the relevant standard for each test method is given in Part 0, which is to be read in conjunction with this Section.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 3 and a back cover.

Specification

1 Scope

This Section of BS 7655 specifies the requirements for the harmonized cross-linked insulating compounds listed in table 1. The relevant test methods are given in BS EN 60811, BS 6469 and BS 6425 : Part 2.

NOTE. Requirements for smoke emission, which are based on tests on cables and not on individual materials, are given in the relevant cable standard.

This Section is to be read in conjunction with BS 7655 : Part 0, which contains essential provisions for the application of this Section of BS 7655.

Table 1. Types of harmonized cross-linked insulation having low emission of corrosive gases, and suitable for use in cables having low emission of smoke when affected by fire

Type	Maximum material operating temperature °C	General application
EI 5	90	Ordinary duty
EI 8	70	Ordinary duty for flexible cables

2 References

2.1 Normative references

For the purposes of this Section of BS 7655, the requirements of 2.1 of BS 7655 : Part 0 apply with regard to normative references.

The latest editions of the standards giving test methods are listed in the most recent edition of BS 7655 : Part 0.

2.2 Informative references

For the purposes of this Section of BS 7655, the requirements of 2.2 of BS 7655 : Part 0 apply with regard to informative references.

3 Definitions

For the purposes of this Section of BS 7655 the definitions given in clause 3 of BS 7655 : Part 0 apply.

4 Requirements

The requirements specified for each compound listed in table 2 shall be met when the compound is tested using the test methods listed against each particular requirement.

NOTE. For cross-references to the latest editions of the test method standards see table 2 of BS 7655 : Part 0.

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Table 2. Test requirements				
Test	Test methods in accordance with BS EN 60811 unless otherwise stated		Requirements for insulation type	
	Section	Clause	EI 5	EI 8
<i>Properties in the state as manufactured</i>	1-1	9.1		
Minimum tensile strength (N/mm ²)			10	5
Minimum elongation at break (%)			125	125
<i>Properties after ageing in air oven</i>	1-2	8.1		
Temperature (°C)			135 ± 2	110 ± 2
Duration (h)			7 × 24	7 × 24
Minimum tensile strength (N/mm ²)			—	—
Maximum variation (%)			30	30 ²⁾
Minimum elongation at break (%)			—	125
Maximum variation (%)	30	30		
<i>Bending test at low temperature</i>	1-4	8.1		
Temperature (°C)			-15 ± 2	—
Requirement			no cracks	—
<i>Elongation test at low temperature</i>	1-4	8.3		
Temperature (°C)			-15 ± 2	—
Minimum elongation without break (%)			30	—
<i>Impact test at low temperature</i>	1-4	8.5		
Temperature (°C)			-15 ± 2	—
Requirement			no cracks	—
<i>Ozone resistance test</i>	2-1	8.1		
Temperature (°C)			25 ± 2	25 ± 2
Duration (h)			24	24
Ozone concentration (ppm)			250 to 300	250 to 300
Requirement			no cracks	no cracks
<i>Alternative ozone resistance test: low concentration</i>	BS 6469 : Section : 99.1	13		
Temperature (°C)			40 ± 2	40 ± 2
Duration (h)			72	72
Ozone concentration (pphm)			200 ± 50	200 ± 50
Requirement			no cracks	no cracks
<i>Hot set test</i>	2-1	9		
Temperature (°C)			200 ± 3	200 ± 3
Duration (min)			15	15
Mechanical stress (N/mm ²)			0.2	0.2
Test requirements				
Maximum elongation under load (%)			100	100
Maximum elongation after unloading (%)	25	25		

Table 2. Test requirements (continued)				
Test	Test methods in accordance with BS EN 60811 unless otherwise stated		Requirements for insulation type	
	Section	Clause	EI 5	EI 8
<i>Pressure test at high temperature</i>	3-1	8.1		
Test conditions				
Force exerted by the blade with a <i>k</i> value of 1.0			1)	—
Duration of heating under load			1)	—
Temperature (°C)			100 ± 2	—
Maximum indentation (%)		50	—	
<i>Acidic (corrosive) gases evolved</i>	BS 6425 : Part 2			
pH (minimum)			4.3	4.3
Conductivity (maximum) (µS/mm)			10	10

¹⁾ See BS EN 60811-3-1, clause 8.1.

²⁾ No limit for the positive tolerance.

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