

Specification for

# Insulating and sheathing materials for cables —

**Part 8: Cross-linked sheathing compounds having low emission of corrosive gases, and suitable for use in cables having low emission of smoke when affected by fire —**

## **Section 8.1: Harmonized types**

**IMPORTANT NOTE** This section of BS 7655 is to be read in conjunction with BS 7655-0.

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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:

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British Approvals Service for Cables  
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British Plastics Federation  
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## Foreword

This section of BS 7655 has been prepared by Subcommittee GEL/20/3. It supersedes BS 7655-8.1:1997 which is withdrawn. It specifies the requirements for harmonized cross-linked sheathing compounds, in accordance with HD 22.1, having low emission of corrosive gases and suitable for use in cables having low emission of smoke when affected by fire.

This revision brings this section of BS 7655 fully into line with BS 7655-0:1997, including amendment 1:2000 and with HD 22.1 S3. It also introduces type EM 10, as specified in HD 22.13 S1, amendment A1.

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 BS 7655-0, which is to be read in conjunction with this section.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 5 and a back cover.

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## 1 Scope

This section of BS 7655 specifies the requirements for the harmonized cross-linked sheathing compounds listed in Table 1. The relevant test methods are given in BS EN 60811, BS 6469 and BS EN 50267-2-2.

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

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

**Table 1 — Types of harmonized cross-linked sheathing compounds 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
EM 8	70	Ordinary duty
EM 10	70	Inner sheath

## 2 Normative references

For the purposes of this section of BS 7655, the requirements of BS 7655-0, **2.1** apply with regard to normative references.

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

## 3 Definitions

For the purposes of this section of BS 7655 the definitions given in BS 7655-0, clause **3** apply.

## 4 Requirements

The requirements specified for the compounds 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 BS 7655-0, Table 2.

Table 2 — Test requirements

Test	Test methods in accordance with BS EN 60811 unless otherwise stated		Requirements for compound type	
	Section	Clause	EM 8	EM 10
<b><i>Properties in the state as manufactured</i></b>	1-1	<b>9.2</b>		
Minimum tensile strength (N/mm <sup>2</sup> )			7	5
Minimum elongation at break (%)			125	125
<b><i>Properties after ageing in air oven</i></b>	1-2	<b>8.1.3.1</b>		
Temperature (°C)			100 ± 2	100 ± 2
Duration (h)			7 × 24	7 × 24
Minimum tensile strength (N/mm <sup>2</sup> )			—	5
Maximum variation (%)			30 <sup>1)</sup>	30 <sup>1)</sup>
Minimum elongation at break (%)			100	100
Maximum variation (%)	30	30		
<b><i>Bending test at low temperature</i></b>	1-4	<b>8.2</b>		
Temperature (°C)			-15 ± 2	-15 ± 2
Requirement			no cracks	no cracks
<b><i>Elongation test at low temperature</i></b>	1-4	<b>8.4</b>		
Temperature (°C)			-15 ± 2	-15 ± 2
Minimum elongation without break (%)			30	30
<b><i>Impact test at low temperature</i></b>	1-4	<b>8.5</b>		
Temperature (°C)			-15 ± 2	—
Requirement			no cracks	—
<b><i>Ozone resistance test</i></b>	2-1	<b>8.1</b>		
Temperature (°C)			25 ± 2	—
Duration (h)			24	—
Ozone concentration (ppm)			250 to 300	—
Requirement			no cracks	—
<b><i>Alternative ozone resistance test — low concentration</i></b>	BS 6469-99.1, clause 13			
Temperature (°C)			40 ± 2	—
Duration (h)			72	—
Ozone concentration (pphm)			200 ± 50	—
Requirement			no cracks	—
<b><i>Hot set test</i></b>	2-1	<b>9</b>		
Temperature (°C)			200 ± 3	200 ± 3
Duration (min)			15	15
Mechanical stress (N/mm <sup>2</sup> )			0.2	0.2
Requirements				
Maximum elongation under load (%)			100	100
Maximum elongation after unloading (%)	25	25		

Table 2 — Test requirements (*concluded*)

Test	Test methods in accordance with BS EN 60811 unless otherwise stated		Requirements for compound type	
	Section	Clause	EM 8	EM 10
<b><i>Mineral oil immersion test</i></b>	2-1	10		
Temperature (°C)			100 ± 2	—
Duration (h)			24	—
Maximum variation for tensile strength (%)			40	—
Maximum variation for elongation at break (%)			40	—
<b><i>Acidic (corrosive) gases evolved</i></b>	BS EN 50267-2-2			
pH (minimum)			4.3	4.3
Conductivity (maximum) (µS/mm)			10	10
1) Only a reduction in value is subject to verification.				

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## Bibliography

See BS 7655-0, 2.2.

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