BRITISH STANDARD

BS 7655 :
Section 1.2 :
1997

Specification for

Insulating and sheathing materials for cables

Part 1. Cross-linked elastomeric insulating compounds

Section 1.2 General 90 °C application

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

ICS 29.035.20

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
ERA Technology Ltd.
GAMBICA (BEAMA Ltd.)
London Underground Ltd.
Ministry of Defence
Queen Mary and Westfield College
Telecommunications Cables Group of BCMC
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

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 28362 3

Amendments issued since publication

Amd. No.	Date	Text affected

Contents

Foreword

This Section of BS 7655 has been prepared by Subcommittee GEL/20/3. It supersedes BS 7655 : Section 1.2 : 1993 which is withdrawn. This Section specifies the physical and electrical properties of elastomeric insulating compounds.

This revision introduces changes to the requirements for compound type GP 7.

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 cross-linked elastomeric insulating compounds listed in table 1. The relevant test methods are given in BS EN 60811, BS 6469 and BS 903.

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 elastomeric insulation

Type	Maximum material operating temperature °C	General application
GP 4	90	Ordinary duty
GP 5	90	Ordinary duty
GP 6	90	Ordinary duty HEPR
GP 7	90	Ordinary duty

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.

Table 2. Test requirements

Test	Test method in accordance with BS EN 60811 unless otherwise stated		Requirements for compound type			
	Section	Clause	GP 4	GP 5	GP 6	GP 7
Properties in the state as manufactured	1-1	**9.1**				
Minimum tensile strength (N/mm^2)			6.5	6.5	8.5	4.2
Minimum elongation at break (%)			200	200	200	200
Properties after ageing in air oven	1-2	**8.1**				
Temperature (˚C)			135 ± 2	135 ± 2	135 ± 2	135 ± 2
Duration (h)			7 × 24	7 × 24	7 × 24	7 × 24
Maximum variation for tensile strength (%)			30	30	30	30
Maximum variation for elongation at break (%)			30	30	30	30
Properties after ageing in air bomb	1-2	**8.2**				
Temperature (˚C)			127 ± 2	127 ± 2	127 ± 2	127 ± 2
Duration (h)			40	40	40	40
Maximum variation for tensile strength (%)			30	30	30	30
Maximum variation for elongation at break (%)			30	30	30	30
Water absorption (gravimetric)	1-3	**9**				
Temperature (˚C)			—	—	85 ± 2	85 ± 2
Duration (h)			—	—	14 × 24	14 × 24
Maximum variation in mass (mg/cm^2)			—	—	5	5
Ozone resistance test	2-1	**8**				
Temperature (˚C)			—	25 ± 2	25 ± 2	25 ± 2
Duration (h)			—	3	30	30
Ozone concentration (ppm)			—	250 to 300	250 to 300	250 to 300
Requirement			—	no cracks		
Alternative ozone resistance test (low concentration)	BS 6469 : Section 99.1 clause **13**					
Temperature (˚C)			—	40 ± 2	40 ± 2	40 ± 2
Duration (h)			—	8	72	72
Ozone concentration (pphm)			—	200 ± 50	200 ± 50	200 ± 50
Requirement			—	no cracks		
Hot set test	2-1	**9**				
Temperature (˚C)			200 ± 3	200 ± 3	250 ± 3	250 ± 3
Duration (min)			15	15	15	15
Mechanical stress (N/mm^2)			0.2	0.2	0.2	0.2
Requirements						
Maximum elongation under load (%)			100	100	100	100
Maximum elongation after unloading (%)			25	25	25	25

Table 2. Test requirements (*continued*)					
Test	**Test method**	**Requirements for compound type**			
	Section	**GP 4**	**GP 5**	**GP 6**	**GP 7**
Insulation resistance constant	BS 6469 : Section 99.2 clause **8**				
Minimum *K* value at 20 °C (MΩ·km)		2400	4800	—	—
Minimum *K* value at 90 °C (MΩ·km)		—	—	3.67	3.67
Power factor and permittivity test	BS 6469 : Section 99.2 clause **9**				
Maximum power factor at 20 °C		—	0.035	—	—
Maximum permittivity at 20 °C		—	4.5	—	—
Water absorption determined by the capacitance method	BS 6469 : Section 99.2 clause **10**				
Maximum increase in capacitance					
1 to 14 days (%)		10	6	—	—
7 to 14 days (%)		3	2.5	—	—
Determination of hardness	BS 903 : Part A26				
Minimum hardness (IHRD)		—	—	80	—

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