BRITISH STANDARD

BS 7655 :
Section 4.1 :
1997

Specification for

Insulating and sheathing materials for cables

Part 4. PVC sheathing compounds

Section 4.1 Harmonized types

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

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Contents

Foreword

This Section of BS 7655 has been prepared by Subcommittee GEL/20/3. It is a revision of BS 7655 : Section 4.1 : 1993 which is withdrawn. It specifies harmonized types of PVC sheathing compounds in accordance with HD 21.1 S2.

This edition of BS 7655 : Section 4.1 introduces compound types TM 4 and TM 5 in accordance with A14 and 16 respectively of HD 21.1 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 PVC sheathing compounds listed in table 1. The relevant test methods are given in BS EN 60811.

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 PVC sheath

Type	Maximum cable operating temperature °C	General application
TM 1	70	General purpose for fixed installation cables. May be suitable for oversheathing of cables with a metallic layer operating at a maximum conductor temperature of 80 °C
TM 2	70	Flexible general purpose
TM 3	90	Flexible for high temperature use
TM 4	70	Flexible for low temperature use
TM 5	70	Oil-resistant flexible

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, together with the following:

3.1 PVC

Combinations of materials, of which polyvinyl chloride is the characteristic constituent, suitably selected, proportioned and treated, which meet the requirements given in the particular specification.

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		Test requirements for sheath type				
	Section	Clause	TM 1	TM 2	TM 3	TM 4	TM 5
Properties in the state as manufactured	1-1	**9.2**					
Minimum tensile strength (N/mm^2)			12.5	10	10	10	10
Minimum elongation at break (%)			12.5	150	150	150	150
Properties after ageing in air oven	1-2	**8.1**					
Temperature (°C)			80 ± 2	80 ± 2	135 ± 2	80 ± 2	80 ± 2
Duration (h)			7 × 24	7 × 24	14 × 24	7 × 24	7 × 24
Minimum tensile strength (N/mm^2)			12.5	10	10	10	10
Maximum variation (%)			20	20	25	20	20
Minimum elongation at break (%)			125	150	150	150	150
Maximum variation (%)			20	20	25	20	20
Bending test at low temperature	1-4	**8.2**					
Temperature (°C)			−15 ± 2	−15 ± 2	−15 ± 2	−30 ± 2	−15 ± 2
Requirement			no cracks				
Elongation test at low temperature	1-4	**8.4**					
Temperature (°C)			−15 ± 2	−15 ± 2	−15 ± 2	−30 ± 2	−15 ± 2
Minimum elongation without break (%)			30	30	30	30	30
Impact test at low temperature	1-4	**8.5**					
Temperature (°C)			−15 ± 2	−15 ± 2	−15 ± 2	−30 ± 2	−15 ± 2
Requirement			no cracks				
Mineral oil immersion test	2-1	**10**					
Temperature (°C)			—	—	—	—	90 ± 2
Duration (h)			—	—	—	—	7 × 24
Maximum variation for tensile strength (%)			—	—	—	—	30
Maximum variation for elongation at break (%)			—	—	—	—	30
Pressure test at high temperature	3-1	**8.2**					
Test conditions							
Force exerted by the blade			1)	1)	1)	1)	1)
Duration of heating under load			1)	1)	1)	1)	1)
Temperature (°C)			80 ± 2	70 ± 2	90 ± 2	70 ± 2	70 ± 2
Maximum indentation (%)			50	50	50	50	50

Table 2. Test requirements *(continued)*

Test	Test method in accordance with BS EN 60811 unless otherwise stated		Test requirements for sheath type				
	Section	Clause	TM 1	TM 2	TM 3	TM 4	TM 5
Resistance to cracking	3-1	**9.2**					
Temperature (°C)			150 ± 2	150 ± 2	150 ± 2	150 ± 2	150 ± 2
Requirement			no cracks				
Loss of mass test	3-2	**8.2**					
Temperature (°C)			80 ± 2	80 ± 2	115 ± 2	80 ± 2	80 ± 2
Duration (h)			7 × 24	7 × 24	10 × 24	7 × 24	7 × 24
Maximum loss of mass (mg/cm^2)			2	2	1.5	2	2
Minimum thermal stability at (200 ± 0.5) °C (min)	3-2	**9**	—	—	240	—	—

[1] See BS EN 60811-3-1 Clause **8.2**.

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