SRI LANKA STANDARD 1282 : PART 1 : 2006

UDC 621.315.221.8

SPECIFICATION FOR
INSULATING AND SHEATHING MATERIALS FOR ELECTRIC CABLES
PART 1 : GENERAL INTRODUCTION

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PART 1 : GENERAL INTRODUCTION

SLS : 1282 : PART 1 : 2006

Gr. 6

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SRI LANKA.

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

FOREWORD

This standard was approved by the Sectoral Committee on Electric Cables and Conductors and was authorized for adoption as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2006-02-21.

This is the Part **1** of **SLS 1282 : 2006** which provides a general introduction to the other parts of the standard on insulating and sheathing materials. Part **1** and Part **2** of this Sri Lanka Standard supersede **SLS 988 : 1993 :** Specification for PVC insulation and sheath of electric cables.

All values given this specification are in SI units.

For the purpose of deciding whether a particular requirement of the standard is complied with the final value, observed or calculated, expressing the results of a test or an analysis shall be rounded off in accordance with **CS 102**. The number of figures to be retained in the rounded off value shall be the same as that of the specified value in the standard.

In the preparation of this standard the assistance derived from **BS 7655-0 :2000:** Specification for PVC insulating and sheathing materials for cables including Amd 1: 2000 is gratefully acknowledged.

SRI LANKA STANDARD
SPEICIFICATION FOR INSULATING AND SHEATHING MATERIALS FOR ELECTRIC CABLES
PART 1 : GENERAL INTRODUCTION

1 SCOPE

This Part of the standard presents a general introduction to the other parts of the standard on insulating and sheathing materials. It also includes the list of test methods and the list of other parts of the standard.

2 REFERENCES

ISO 48 Rubber, vulcanised or thermoplastic
Determination of hardness (hardness between 10 IRHD and 100 IRHD)

BS 2782 Methods of testing plastics
Part 8 : Methods 823 A and 823 B
Methods for the assessment of carbon black dispersion in polyethylene using a microscope.

IEC 60754 Tests on gases evolved during combustion of materials from cables - Procedures
Part 1 : Determination of amount of halogen acid gas
Part 2 : Determination of degree of acidity of gases for materials by measuring pH and conductivity

SLS 1199 Common Test Methods for insulating and sheathing materials of electric cables (adoption of IEC 60811 – upto Part 4.1)
Part 1 : General application
Part 1.1 : Measurement of thickness and overall dimensions - Tests for determining the mechanical properties (IEC 60811-1-1)
Part 1.2 : Thermal ageing methods (IEC 60811-1-2)
Part 1.3 : Methods for determining the density – Water absorption tests - Shrinkage test (IEC 60811-1-3)
Part 1.4 : Tests at low temperature (IEC 60811-1-4)
Part 2.1 : Methods specific to electrometric compounds-
Ozone resistance, hot set and mineral oil immersion test (IEC 60811-2-1)
Part 3. : Methods specific to PVC compounds.
Part 3.1 : Pressure test at high temperature – Tests for resistance to cracking (IEC 60811-3-1)
Part 3.2 : Loss of mass test – Thermal stability test (IEC 60811-3-2)
Part 4.1 : Methods specific to polyethylene and polypropylene compounds.
Resistance to environmental stress cracking – Wrapping test after thermal ageing in air – Measurement of melt flow index – Carbon black and/or mineral content measurement in Polyethylene (IEC 60811-4-1)
Part 6.1 : Method Specific to Thermoplastic Polyurethane Sheaths
Part 7.1 : Specific Test Methods - Non-electrical tests
Part 7.2 : Specific Test Methods - Electrical tests

(References made in other parts are given in Appendix **A)**

3 DEFINITIONS

For the purpose of this Part of **SLS 1282** the following definitions shall apply.

3.1 variation : 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 TESTING

4.1 General

The test methods called up in the particular parts of **SLS 1282** are listed in Table **2**.

4.2 Sampling

4.2.1 *Insulation*

Unless otherwise stated in the standard for the particular cable, the tests on insulation shall be made on samples from each core if the cable has one, two or three cores, and on samples from three cores (of differing colours if any) if the cable has more than three cores. The samples shall be taken not less than 16 h after extrusion for thermoplastic materials and not less than 16 h after extrusion and cross-linking for thermosetting materials.

4.2.2 *Sheath*

Samples shall be taken not less than 16 h after extrusion for thermoplastic materials and not less than 16 h after extrusion and cross-linking for thermosetting materials.

4.3 Ambient temperature

Unless otherwise specified in the details for the particular test, tests shall be made at an ambient temperature within the range 5 ^{o}C to 35 ^{o}C.

5 REQUIREMENTS

The requirements for the various types of compound are such that conformity can be checked by testing samples taken from the finished cable.

TABLE 1 – Titles of parts of SLS 1282

Part No.	Title	Compounds included
Part **1**	General introduction	-----
Part **2** *Section **1***	PVC insulating and sheathing compound *PVC insulating compounds* Harmonized types Hard grade types	 TI 1, TI 2, TI 3, TI 4, TI 5 Type 2
*Section **2***	*PVC sheathing compound* Harmonized types General application Special applications – RF cables	 TM 1, TM 2, TM 3, TM 4, TM 5 Type 5,6,9,10 Type 7,8

TABLE 2 – Test methods

Test	Method (given in SLS 1199 unless otherwise stated)		
	Part / Section	Clause	
		Insulation	Sheath
Properties in the manufactured state : Tensile strength and elongation at break	1.1	9.1	9.2
Properties after ageing in air oven : Tensile strength and elongation at break	1.2	8.1	8.1
Properties after ageing in air bomb : Tensile strength and elongation at break	1.2	8.2	8.2
Properties after ageing in oxygen bomb: Tensile strength and elongation at break	1.2	8.3	8.3
Water absorption (gravimetric)	1.3	9.2	---
Bending test at low temperature	1.4	8.1	8.2
Elongation test at low temperature	1.4	8.3	8.4
Impact test at low temperature	1.4	8.5	8.5
Ozone resistance test	2.1	8	8
Hot set test	2.1	9	9
Mineral oil immersion test	2.1	---	10
Pressure test at high temperature	3.1	8.1	8.2
Test for resistance to cracking	3.1	9.1	9.2
Loss of mass test	3.2	8.1	8.2
Thermal stability test	3.2	9	9

TABLE 2 – (Concluded)

Carbon black content	4.1	---	11
Mechanical properties after immersion in water (resistance to hydrolysis)	6.1	---	5
Tear strength for TMPU	6.1	---	6
Resistance against saponification	6.1	---	7
Test for tear resistance	7.1	7	---
Hot deformation test	7.1	8	8
Test for resistance to environmental stress cracking on complete cable	7.1	---	9
Determination of linear swell after ageing in oil	7.1	---	10
Alternative ozone resistance test (low concentration)	7.1	11	11
Water immersion test on sheath	7.1	---	12
Determination of UV stability for MDPE sheath	7.1	---	13
Test for insulation resistance constant (*K* value)	7.2	6	6
Test for power factor and permittivity	7.2	7	7
Water absorption determined by the capacitance method	7.2	8	8
Hardness	ISO 48		
Carbon black dispersion	BS 2782 – 8 : Methods 823A and 823B	Dispersion in accordance with A of Figure **1**.	
Halogen gas emission PH and conductivity	IEC 60754 - 1 IEC 60754 - 2		

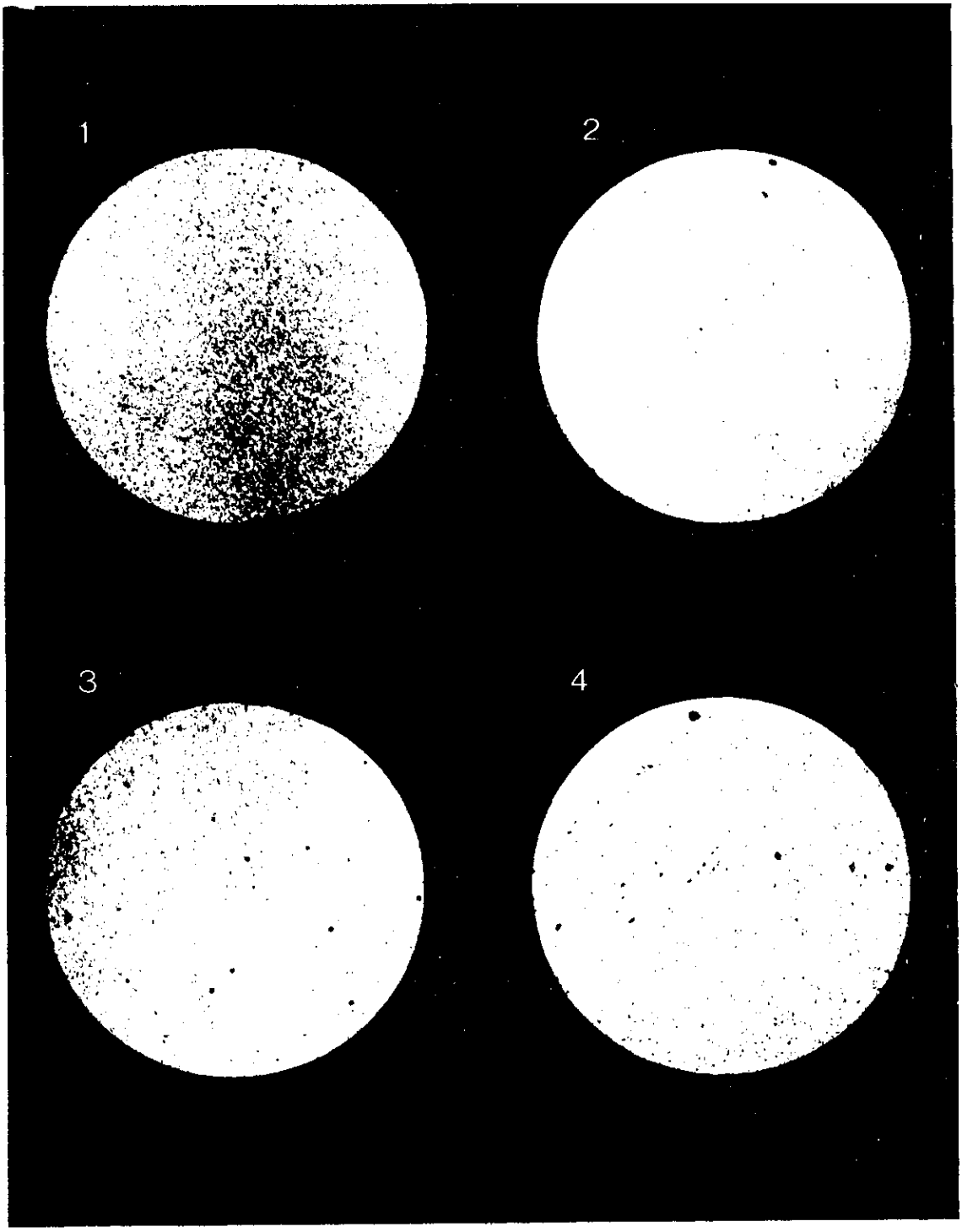

FIGURE 1 - Photomicrographs 1 to 7 and A (Continued)

FIGURE 1 - Photomicrographs 1 to 7 and A (Concluded)

APPENDIX A

REFERENCES MADE IN OTHER PARTS

BS 6195	Specification for insulated flexible cables and cords for coil leads
BS 6883	Elastomer insulated cables for fixed wiring in ships and on mobile and fixed offshore units – Requirements and test methods
BS 7917	Elastomer insulated fire resistance (limited circuit integrity) cables for fixed wiring in ships and on mobile and fixed offshore units – Requirements and test methods
IEC 6746 C	Colour chart for insulation and sheath of electric cables
IEC 60245-6	Rubber insulated cables – Rated voltage upto and including 450/750V Part 6 : Arc welding electrode cables
IEC 60096	Specification for radio-frequency cables

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

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Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.

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