Singapore Standard SS 358 : Part 1 : 1996
(formerly SS IEC 227-1 : 1993)

SPECIFICATION FOR POLYVINYL CHLORIDE INSULATED CABLES OF RATED VOLTAGES UP TO AND INCLUDING 450/750 V PART 1 : GENERAL REQUIREMENTS

AMENDMENT NO. 1

July 1998

1. *Re-number* SS IEC 227-1 : 1993 to SS 358 : Part 1 : 1996.

2. **Page 3, Contents**

   Add "IEC Amendment 2 : 1998-02" after "IEC Corrigendum 1995-12".

3. **Page 4, National Foreword**

   (a) *Replace* the second paragraph as follows:
   "This standard is identical to IEC 60227-1 : 1993-02 (Second Edition) including IEC Amendment 1 : 1995-11, Corrigendum : 1995-12 and IEC Amendment 2 : 1998-02, published by the International Electrotechnical Commission".

   (b) *Replace* the reference to SS IEC 227 as follows:
   SS IEC 227-2 to SS 358 : Part 2
   SS IEC 227-4 to SS 358 : Part 4
   SS IEC 227-6 to SS 358 : Part 6

4. *Add* the attached IEC 60227-1 : 1993, Amendment 2 : 1998-02 after the IEC Corrigendum. The editorial amendments to IEC Amendment 2 are as follows:

   Amend Page 13 to Page 8

   Amend Page 23 to Page 13

   Amend Page 29 to Page 16

   Amend Page 31 to Page 17

   Amend Page 41 to Page 22

Singapore Standard SS 358 : Part 1 : 1996
Amendment No. 1

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60227-1

1993

AMENDEMENT 2
AMENDMENT 2

1998-02

Amendement 2

Conducteurs et câbles isolés au polychlorure de vinyle, de tension nominale au plus égale à 450/750 V –

Partie 1: Prescriptions générales

Amendment 2

Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V –

Part 1: General requirements

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by subcommittee 20B: Low-voltage cables, of IEC technical committee 20: Electric cables.

The text of this amendment is based on the following documents:

FDIS	Report on voting
20B/254/FDIS	20B/262/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

This amendment cancels and replaces amendment 1 (1995).

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3.1.1 Continuity of marks

Replace the existing text of this subclause by the following new text:

Each specified mark shall be regarded as continuous if the distance between the end of the mark and the beginning of the next identical mark does not exceed

- 550 mm if the marking is on the outer sheath of the cable;
- 275 mm if the marking is
  a) on the insulation of an unsheathed cable;
  b) on the insulation of a sheathed cable;
  c) on a tape within a sheathed cable.

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Table 1 – Requirements for the non-electrical tests for polyvinyl chloride (PVC) insulation

Replace in this table, reference numbers 3.1 and 3.2 by the following new numbers 3.1 and 3.2:

Table 1 – Requirements for the non-electrical tests for polyvinyl chloride (PVC) insulation

1	2	3	4	5	6	7	
Reference No.	**Test**	**Unit**	**Type of compound**			**Test method described in:**	
			PVC/C	**PVC/D**	**PVC/E**	**IEC**	**Subclause**
3	Compatibility test [2]						
3.1	Ageing conditions	°C h	80 ± 2 7 × 24	80 ± 2 7 × 24	100 ± 2 10 × 24	60811-1-2	8.1.4
3.2	Mechanical properties after ageing Values to be obtained		As in references Nos. 1.2.2 and 1.2.3				

[1] Variation: difference between the median value after ageing and the median value without ageing, expressed as a percentage of the latter.
[2] If applicable, see 5.3.1.

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5.5.1 Material

Insert, in the existing list, the following new dash:

– type PVC/ST10 in the case of cables sheathed with a 90 °C polyvinyl chloride compound.

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Table 2 – Requirements for the non-electrical test for polyvinyl chloride (PVC) sheath

Replace the existing table 2 by the following new table 2.

Table 2 – Requirements for the non-electrical test for polyvinyl chloride (PVC) sheaths

1	2	3	4	5	6	7	8	
Reference No.	Test	Unit	Type of compound				Test method described in	
			PVC/ ST4	PVC/ ST5	PVC/ ST9	PVC/ ST10	IEC	clause/ subclause
1	Tensile strength and elongation at break						60811-1-1	9.2
1.1	Properties in the state as delivered							
1.1.1	Values to be obtained for the tensile strength: – median, min.	N/mm^2	12,5	10,0	10,0	10, 0		
1.1.2	Values to be obtained for the elongation at break – median, min.	%	125	150	150	150		
1.2	Properties after ageing in the air oven						60811-1-2	8.1
1.2.1	Ageing conditions: – temperature – duration of treatment	°C h	80 ± 2 7 × 24	80 ± 2 7 × 24	80 ± 2 7 × 24	135 ± 2 10 × 24		
1.2.2	Values to be obtained for the tensile strength: – median, min. – variation[1], max.	N/mm^2 %	12,5 ±20	10,0 ±20	10,0 ±20	10,0 ±25		
1.2.3	Values to be obtained for the elongation at break: – median, min. – variation[1], max.	% %	125 ±20	150 ±20	150 ±20	150 ±25		
2	Loss of mass test						60811-3-2	8.2
2.1	Ageing conditions: – temperature – duration of treatment	°C h	As in reference No. 1.2.1			115 ± 2 10 × 24		
2.2	Values to be obtained for the loss of mass, max.	mg/cm^2	2,0	2,0	2,0	2,0		
3	Compatibility test[2]						60811-1-2	8.1.4
3.1	Ageing conditions: – temperature – duration of treatment	°C h	As in reference No. 1.2.1			100 ± 2 10 × 24		
3.2	Mechanical properties after ageing Values to be obtained		As in references Nos. 1.2.2 and 1.2.3					
4	Heat shock test						60811-3-1	9.2
4.1	Test conditions: – temperature – duration of treatment	°C h	150 ± 2 1	150 ± 2 1	150 ± 2 1	150 ± 2 1		
4.2	Result to be obtained		Absence of cracks					

[1] Variation: difference between the median value after ageing and the median value without ageing, expressed as a percentage of the latter.

[2] Only applicable when called up by the particular cable standard, see also 5.3.1.

Table 2 *(concluded)*

1	2	3	4	5	6	7	8	
Reference No.	Test	Unit	Type of compound				Test method described in	
			PVC/ ST4	PVC/ ST5	PVC/ ST9	PVC/ ST10	IEC	clause/ subclause
5	Pressure test at high temperature						60811-3-1	8.2
5.1	Test conditions: – force exercised by the blade – duration of heating under load – temperature	 h °C	 80 ± 2	 70 ± 2	 70 ± 2	 90 ± 2	 60811-3-1 60811-3-1	 8.2.4 8.2.5
5.2	Results to be obtained: – median of the depth of penetration, max.	%	50	50	50	50		
6	Bending test at low temperature						60811-1-4	8.2
6.1	Test conditions: – temperature[1] – period of application of low temperature	°C h	−15 ± 2	−15 ± 2	−15 ± 2	−15 ± 2	 60811-1-4	 8.2.3
6.2	Results to be obtained		Absence of cracks					
7	Elongation test at low temperature						60811-1-4	8.4
7.1	Test conditions: – temperature[1] – period of application of low temperature	°C h	−15 ± 2	−15 ± 2	−15 ± 2	−15 ± 2	 60811-1-4	 8.4.4 and 8.4.5
7.2	Result to be obtained: – elongation without break, min.	%	20	20	20	20		
8	Impact test at low temperature						60811-1-4	8.5
8.1	Test conditions: – temperature[1] – period of application of low temperature – mass of hammer	°C h	−15 ± 2	−15 ± 2	−15 ± 2	−15 ± 2	 60811-1-4 60811-1-4	 8.5.5 8.5.4
8.2	Result to be obtained						60811-1-4	8.5.6
9	Mechanical properties after immersion in mineral oil						60811-2-1	10
9.1	Test conditions: – temperature of oil – duration of immersion in oil	°C h	– –	– –	90 ± 2 24	– –		
9.1.1	Value to be obtained for the tensile strength: – variation[2] max.	%	–	–	±30	–		
9.1.2	Value to be obtained for the elongation at break: – variation[2] max.	%	–	–	±30	–		
10	Minimum thermal stability at 200 °C	min	–	–	–	180	60811-3-2	9

[1] Due to climatic conditions, national standards may require the use of a lower test temperature.

[2] Variation is the difference between the median value after ageing and the median value without ageing, expressed as a percentage of the latter.

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Annex A

Add the following new types in category 7:

71c Circular polyvinyl chloride sheathed lift cable and cable for flexible connections (60227 IEC 71c).
