REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASONS	PREPARED BY	APPROVED BY
00	24/04/92	Supersedes CN 75931	-	AV,MRV	N.J
01	29/03/94	Totally Revised	Ref.stds Reissued	SHG	N.J
02	12/08/94	CL.5.6 Revised	F.B From QC	SHG	N.J
03	26/12/94	CL.5.6 Removed	F.B From Suppliers	SHG	N.J
04	17/11/97	CL.2.0 & related clauses changed	JSS 51002 SUPER SEEDED BY 510034	SHG	N.S
05	15/06/99	Title Modified & Table-3 Added	F.B From Supplier & MM(CE)	AR,RS	NS
06	24/06/03	Cl.10.1&10.2 Revised	F.B.From MA	HRN	NS
07	10/03/09	Generally Revised	Committee Revised	HRN	MTR

APPROVED :
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PREPARED : HRN | ISSUED : STDS GROUP | DATE : 10/03/09

HIGH TEMPERATURE PTFE INSULATED SINGLE CORE COPPER CABLE (GRADE UPTO 2000 VOLTS AC rms).

1.0 GENERAL:

This specification governs the quality of Polytetrafluoro ethylene (PTFE) insulated single core (unsheathed) silver plated copper cable for operation up to a voltage of 2000 volts AC.rms and temperature of 200^0 C.

2.0 COMPLIANCE WITH NATIONAL STANDARDS:

Assistance has been taken from JSS 51034 "Detail specification for equipment wires, PTFE insulated" and MIL-W-16878 "High temperature insulated electrical wire".

3.0 SIZES:

Sizes shall be as per Table-2.

4.0 CONDUCTOR:

4.1 The conductor shall be composed of Silver plated (1 micron thick.min.) annealed high conductivity copper wire with electrical and mechanical properties in accordance with JSS 51034. The details of the conductor shall be as per Table-1.

4.2 The resistance of the conductor at 25^0 C shall not exceed the appropriate maximum value given in the Table-1. The conductor resistance measured for a length of 25 cm and compared with the resistance of the conductor without any joint shall be not more than 5 % of the resistance of adjacent conductor.

4.3 Whenever a conductor is broken, the supplier can join the same by welding or brazing process only. Tensile strength of such joined conductor shall be not less than 9O % of the value of the conductor without joint.

5.0 INSULATION:

5.1 The insulation shall be provided with polytetrafluoro ethylene (PTFE) and shall meet the requirements of JSS 51034.

5.2 The nominal thickness of insulation shall be as per Table-2 Compliance shall be checked by the method specified in JSS 51034, CL.13.2.

5.3 Insulation shall be applied uniformly, continuously and concentrically over the conductor and so cured, processed or maintained as to provide for accurate centering of the conductor and retention of a circular cross section.

5.4 Joining of core insulation material is not acceptable and repair work on insulation of core also is not acceptable.

5.5 Colour of Insulation:

The colour of PTFE insulation shall be as specified in the order.

6.0 OVERALL DIAMETER:

The overall diameter shall not exceed the maximum overall diameter specified in Table-2. Compliance shall be checked in line with clause 13.1.2.2 of JSS 51034.

7.0 TESTS:

7.1 Procedure for High voltage test: JSS 51034,Cl.13.7(Routine Test) (Refer Table-3):

7.2 Procedure for Spark test voltage: JSS 51034,Cl.13.3:(Routine Test) (Refer Table-3)

7.3 Insulation Resistance: (JSS 51034,Cl.13.8) (Routine Test)

7.4 Cold bend test: JSS 5100,Cl.13.15: (Type test)

The sample shall not show any crack or scales visible to the naked eye. Conditioning temperature shall be -65^{0}C for 4 hours.

7.5 Resistance to flame propagation: JSS 51034,Cl.13.19(Routine Test)

The sample shall not burn more than 1O seconds after the removal of the flame. The total length of the cable decomposed or burned shall not exceed 75 mm.

7.6 Resistance to soldering heat: JSS 51034,Cl.13.18 (Routine Test)

The insulation shall not flare away from the conductor, open up over the bend portion nor shrink back more than O.79 mm.

8.0 INSPECTION:

Supplier shall furnish compliance to core stage internal inspection certificate and other internal test reports before offering for final inspection.

9.0 TEST CERTIFICATE:

Three copies of Type & Routine test certificates shall be supplied (Routine test certificate shall be furnished for each batch)giving the following information:

ED 28596: PTFE insulated single core copper cable (grade up to 2000 volts)
Material code number :
BHEL Order number :
Size and length of cable:
Batch / lot number :
Overall diameter as per TABLE-1
Test results obtained for all the properties and dimensional tolerances as per the specification. Supplier

shall certify in the test certificate that the cable supplied does not have any joints in the insulation.

Type test certificate shall be considered valid for a period of three years from the date of test certificate. These tests shall be valid at the time of placement of purchase order. However if the type test requirement is specifically mentioned in the purchase order, the same has to be conducted as per purchase order terms.

10.0 PACKING AND MARKING:

10.1 Packing: Unless otherwise specified in the Purchase order, the cable shall be supplied on non-returnable plastic bobbins each carrying 1OO metres in one piece without joints. If the manufacturer so desires he may supply upto 1O percent of a type in random lengths provided that each bobbin contains 1OO metres consisting of not more than four pieces, the minimum length of any one piece being not less than 2O metres. Both the flanges of such bobbin shall show the length of each individual piece and its position on the reel. The bobbins shall be packed and labeled. To prevent moisture entry, free ends of the cable to be sealed with plastic caps.

10.2 Marking: The label which is securely attached to the bobbin shall have the following information:
ED 28596: PTFE insulated single core copper cable (grade up to 2000 volts)

Material code number :
BHEL order no. :
Manufacturer's / Supplier's Name:
Size (conductor cross sectional area and no. of strands / dia. of each strand) :
Length :
Weight :
Batch / Lot No. :

10.3 ACCEPTANCE CRITERIA:
1) Verification as per Table- 1 & 2
2) Witnessing of routine tests
3) Packing and marking
4) Verification of Test reports

TABLE-1

SL. NO.	CONDUCTOR CROSS-SECTIONAL AREA. NOMINAL	NO. OF STRANDS & DIA.OF EACH STRAND NOMINAL	AWG SIZE	DIAMETER OF BUNCHED CONDUCTOR. NOMINAL	CONDUCTOR RESISTANCE AT 25^{0}C. MAXIMUM
	(sq.mm)	(No/mm)	-	(mm)	(Ohms/km)
1	0.352	7/0.25	22/7/30	0.76	55.0
2	0.553	7/0.32	20/7/28	0.97	34.0
3	0.597	19/0.20	20/19/32	1.00	33.0
4	0.963	19/0.25	18/19/30	1.27	20.0
5	1.940	19/0.36	14/19/27	1.80	10.0

TABLE-2

SL. NO.	CONDUCTOR CROSS-SECTIONAL AREA. NOMINAL	NO. OF STRANDS & DIA.OF EACH STRAND NOMINAL	VOLTAGE GRADE	INSULATION THICKNESS NOMINAL	OVERALL DIAMETER MIN.-MAX.
-	(sq.mm)	(No/mm)	(V RMS)	(mm)	(mm)
1	0.352	7/0.25	600	0.25	1.17-1.37
2	0.553	7/0.32	600	0.25	1.37-1.58
3	0.597	19/0.20	600	0.25	1.40-1.66
4	0.963	19/0.25	1000	0.38	1.93-2.18
5	0.963	19/0.25	2000	0.50	2.16-2.36
6	1.940	19/0.36	1000	0.38	2.46-2.87
7	1.940	19/0.36	2000	0.50	2.80-3.30

TABLE-3

SL.NO.	VOLTAGE GRADE	TEST VOLTAGE FOR DIEELECTRIC WITHSTANDING VOLTAGE	TEST VOLTAGE FOR SPARK TEST
1	600	2.0 KV AC.rms	3.4 KV AC.rms.
2	1000	3.0 KV AC.rms	5.0 KV AC.rms
3	2000	5.0 KV AC.rms	10.0 KV AC.rms