STANDARD	MULTI CORE PVC INSULATED POLYESTER TAPED PVC COVERED CABLE (DEFENCE APPLICATION)	SPEC. No. D 2723M ISSUE No. 2 26 APRIL 1996

AMENDMENT No. 1 DATED 7 / 8 / 1996 TO SPECIFICATION No. D 2723M Issue No. 2.

1 Clause 4.1.5 Insulation and Sheath

Delete Test under sub-clause (e) Hot Deformation test and re-number sub-clauses (f), (g), (h) and (i) as (e), (f), (g) and (h) respectively.

-: End of Amendment :-

PREPARED	S. Shantha Kumar AEE(QS)	Ref : JSS 51002 September 1971.	Page 1 / 1
CHECKED	T.V. Madhusudhan DCE(QS)		
APPROVED	[illegible] DGM(QSA)		

1 SCOPE

This specification covers the requirements of multi core cable with annealed tinned copper conductors PVC insulated ,polyester taped and PVC Sheathed for Defence application.

2 REFERENCES

a) JSS 51002	Detailed specification for Miniature Electric Cables
b) JSS 51000	General requirements for Low Frequency Cables and Wires
c) IS: 8130 - 1984	Conductors for Insulated Electric Cables and Flexible Cords
d) IS: 9938-1981	Recommended Colours for PVC Insulation for LF Wires and Cables
e) D 3802 (ITI)	Sampling Plan for Raw Materials (Cables)

2.1 Equivalent

The cables covered in this specification are equivalent to Type WMA series of JSS 51002.

3 GENERAL REQUIREMENTS

3.1 Conductor

The conductor shall be stranded and made up of 16/0.2mm annealed tinned high conductivity copper wires and shall have a nominal cross section of 0.5 sq. mm. It shall satisfy the following requirements :

a) Tensile Strength:The annealed tinned copper wire shall have a maximum tensile strength of 303×10^6 N/m^2 .

b) Resistance : The resistance of the conductor shall be 36 ohms / km at 20 ^{o}C (max).

c) Solderability : Shall satisfy the requirements given in JSS 51000.

d) Tinning : Shall satisfy the test given in IS 8130.

3.2 Insulation

The stranded conductor shall be uniformly insulated with extruded PVC in accordance with JSS 51002. The minimum radial thickness of insulation shall be 0.38mm and maximum overall diameter 1.9 mm. The colours of insulation shall be as per the scheme given in Table 1(colours given in capitals indicate base colours). The colours shall conform as nearly as possible to the standard colours of IS 9938. The insulation shall not be loose and it shall be possible to strip the insulation from the conductor using suitable stripping devices, without damaging the condutor and leaving the conductor sufficiently clean to permit connections.

3.3 Lay up of core

The core shall be made up of the required number of conductors according to the details given in Table 1 depending upon the JSS Types.

3.4 Sheath

The insulated conductors covered with Polyester tape shall be uniformly sheathed by extruded PVC in accordance with JSS 51002. The colour shall be Cream/Black/Grey and the colours shall conform as nearly as possible to the standard colours of IS 9938. The nominal radial thickness of sheath shall be 0.9 mm and maximum overall dia over sheath shall be as given in Table 1. A suitable non metallic rip cord shall be laid longitudinally under the sheath to facilitate easy stripping and removal of the sheath by cutting through the sheath, when pulled.

4 TESTS

The tests shall be conducted as per JSS 51000/JSS 51002/IS 8130 as applicable.

4.1 Type Approval Tests

4.1.1 Visual examination (for damages and colour of insulation sheath).

4.1.2 Dimensions (conductor , insulation and sheath).

4.1.3 Stripping properties of insulation and sheath.

4.1.4 Conductor

a) Tinning test
b) Resistance
c) Tensile strength
d) Solderability

4.1.5 Insulation and Sheath

a) Tensile strength :The tensile strengths of insulation and sheath shall be 10×10^6 N/m^2(min).

b) Elongation : The elongation of insulation and sheath shall be 150 %(min).

c) Cold Bend test : The insulation and sheath shall satisfy the requirements given in JSS 51002.

d) Accelerated ageing : Insulation and sheath shall satisfy the requirements as given in JSS 51002.

e) Hot Deformation test : The insulation and sheath shall satisfy the values given in JSS 51002.

f) Heat Shock test : There shall be no cracks or damages of insulation and sheath after conditioning for $150 \pm 2^{\circ}$ C for 1 hour.

g) Shrinkage test: Shrinkage shall not exceed 4% after conditioning as given in JSS 51002.

h) Resistance to Flame Propagation : The sample shall not burn for more than 60 seconds after removal of the flame and the total length of cable decomposed shall not exceed 200 mm.

i) Resistance to soldering heat: The insulation material shall not split and shall not show unsuitability for use on soldered connections.

4.1.6 Electrical Tests

a) Dielectric Strength : The cable shall with stand 2000 Volts AC (50 $\pm$10 Hz) without flash over or breakdown.

b) Insulation Resistance: The insulation resistance shall be 20 meg ohms / km at 20 $^{\circ}$ C (min) at 500 + / - 10 V DC.

c) Spark Test : The cable shall withstand 6000 V AC (50$\pm$ 10 Hz) without breakdown.

4.1.7 Flexibility

The wire/cable shall not show signs of damage when tested for flexibility.

4.1.8 Resistance to Fluids

The wire / cable shall satisfy the requirements given in JSS 51002.

4.2 Sample for Type Approval

50 metres of samples of continuous length shall be submitted free of cost, under each type for Type Approval.

4.3 Acceptance Tests

The following tests shall be conducted on each batch of supply, for acceptance purpose.

4.3.1 Visual Examination (for damages and colour of insulation & sheath)

4.3.2 Dimensions (conductor, insulation and sheath)

4.3.3 Stripping property of insulation & sheath.

4.3.4 Solderability (conductor)

4.3.5 Conductor Resistance.

4.3.6 Tensile Strength of Conductor.

4.3.7 Tensile Strength of Insulation and Sheath.

4.3.8 Elongation of Insulation and Sheath.

4.3.9 Heat Shock Test.

4.3.10 Dielectric Strength.

4.3.11 Insulation Resistance

4.3.12 Resistance to Flame Propagation.

4.3.13 Packing and Marking.

4.4 Sampling Plan

The sampling plan to specification D 3802 shall be followed for acceptance testing of supplies.

5 TEST CERTIFICATE

The manufacturer shall provide test certificate during type approval as well as along with every batch of supplies, indicating the tests conducted and the results. This test certificate shall be verified during the type approval and batch acceptance.

6. ORDERING CODES

While ordering the cables, the following ordering code shall be quoted in the Purchase Requisition / Order in addition to specification number. The same codification shall be maintained for stocking purposes :

D 2723 M - XX. The last two digits indicate the number of cores (insulated conductors in the cables) as given in Table 1.

eg. : D 2723 M - 02 means two core cable and so on.

7 SUPPLY

The cable shall be supplied as specified in the order. The minimum continuous length shall be 100 metres.

8 PACKING AND MARKING

The cable shall be wound on reels or drums. If supplied as coils it shall be tied suitably to prevent it from uncoiling. It shall be packed in such a way to avoid damage during transit and storage and ingress of moisture. The reels,drums or coils shall be marked with the following details:

a) Name of the manufacturer / Trade mark
b) Trade Mark/ Specification number / Ordering Code
c) Order reference
d) Type of cable / Length of cable / Gross weight
e) Date of manufacture / Batch numbers

9 DEPARTURE FROM SPECIFICATION

Any departure from this specification shall be agreed to in writing by the Company prior to the execution of the order.

10 REJECTION OF SUPPLIES

ITI LIMITED has the right to reject any cable which does not conform to the aforesaid conditions and to return any cable which subsequently proves faulty in use.

11 ACCEPTANCE OF SPECIFICATION

The acceptance of this specification without comment will be taken to indicate that the contractor agrees to comply with the conditions herein contained.

Table 1

SL No.	JSS Style Ref	Number of Cores	Overall Dia of Sheath Max. in mm	Layup	Colour Scheme		
					Centre (R.H. lay) where applicable	First Layer (L.H. lay)	Second layer (R.H. lay)
1	WMA2	2	5.9	Twisted Pair	-	Red, Blue	-
2	WMA3	3	6.2	Three Cores Twisted	-	Red, Blue, Green	-
3	WMA4	4	6.7	Four Cores laid up	-	Red, Blue, Green, Yellow	-
4	WMA6	6	7.8	Six Cores laid up around central dummy	Dummy	Red, Blue Green, Yellow White, Black	-
5	WMA12	12	10.0	Three Central Cores twisted nine Cores in first layer	Red, Blue, Green	Yellow, White, Black, Brown Violet, Orange Pink, Light green Grey	-
6	WMA18	18	11.9	Central Dummy Cores, first layer 6 Cores, 2nd layer 12 Cores	Dummy	Red, Blue, Green Yellow, White Black	Brown, Violet Orange, Pink, Light green Grey, Red / Blue Red / Green, Red / Yellow, Red / White, Red / Black Red / Brown
7	WMA25	25	13.4	3 Central 1st layer 8 Cores 2nd layer 14 Cores	Red, Blue, Green	Yellow, White Black, Brown Violet, Orange Pink, Light green	Grey, RED / Blue RED / Green Red / YELLOW Red / WHITE RED / Black RED / Brown Blue / YELLOW Blue / WHITE BLUE / Black Blue / ORANGE Green /YELLOW Green / WHITE Green /ORANGE