

BHEL - Spec

LME/PUR 10/101

DETAILS OF ALTERATIONS

95
Sheet 1

ALT. No	DATE	DESCRIPTION	SIGNATURE	REMARKS
A		clause 11.f. Shelf life added & clause 11.b modified.	<i>M. M. M.</i> 27.7.99	
B	18-1-94	Type 9A and 13A DELETED from 1994-95 production on board.	<i>H. K. S.</i> 18/1/94	

SPECIFICATION FOR
HEAT SHRINKAGE
SLEEVES

CH. M. R. N. (S. R.)
DY. CEE. (D)

चिन्नरंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
कार्य/ NO. : CLW/ES/2-15

ALT. A B

- 1.1 This specification covers the supply of Heat Shrinkable Sleeves as described in clause 13 for use in the 25 kv single Phase 50 C/S A.C. Electric Locomotives of the Indian Railways.

2.0 SERVICE CONDITION

- 2.1 The equipment shall be suitable for working satisfactorily in an ambient temperature varying from 0°C to 55°C and a maximum relative humidity of 100%.
- 2.2 The locomotive shall be required to operate in heavy rain and also with dusty storms. The equipment compartment of locomotive itself may have some oil fume. The design of equipment shall take due account of all these factors.

3.0 DEVIATION

- 3.1 Any deviation from the standard laid down with a view to improve the performance, utility, efficiency and reliability may be given due consideration provided full particulars and justifications thereof are furnished.

4.0 APPROVAL OF SAMPLES

- 4.1 The supplier shall offer the prototype of equipments proposed to be supplied by him for inspection and test at his works and advise Deputy Chief Electrical Engineer (DCE), Chittaranjan Locomotive Works, Chittaranjan, West Bengal, PIN-713331, India and Controller of Stores, Chittaranjan Locomotive Works, Chittaranjan, West Bengal, PIN-713331, India and RPSO, Manaknagar, Lucknow as and when he is ready with prototype and necessary testing and measuring apparatus and facilities for carrying out the tests.
- 4.2 After the above test, if it is considered necessary by the Deputy Chief Electrical Engineer (DCE) or his authorised representative to carry out further test or trials of the prototype at Chittaranjan, the supplier will arrange the same by the quickest means.
- 4.3 Any short coming or defects in the design and workmanship of the equipment shall be pointed out after the test, to enable the manufacturer to incorporate the necessary improvement before bulk manufacture is commenced without affecting the guaranteed delivery or guaranteed performance characteristics.
- 4.4 The supplier shall provide all facilities to the Inspecting Officer at his works, to inspect and test the equipment at various stages of manufacture and also of complete equipment.
- 4.5 Any testing and approval by the purchaser of the design, drawing and prototype shall in no way absolve the supplier of his responsibility under the terms of contract for the equipment supplied.

अनुमोदित
DRN.

अनुमोदित
CHKD.

SPECIFICATION FOR
HEAT SHINK SHRINKAGE
SLEEVES

डि. ई. ए. (अनि.)
DR. CEE (A)

चितरंजन रेल इंजन कारखाना
पिन 713331, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

क्रमांक NO. : 0144/85/T-15

पत्र/ALIAS

- 4.6 The supplier shall not offer any equipment of series production to the inspecting officer authorised under the contract until the prototype has been finally approved.

5.0 CONDITIONS OF CONTRACT

- 5.1 The standard I.F.S. condition of contract will be applicable for the supply of the equipment.

6.0 INSPECTION CLAUSE

- 5.1 After obtaining the final prototype clearance from Dy. Chief Electrical Engineer (D&D)'s office, equipment from series production shall be offered to inspecting authority authorised of Chittaranjan Locomotive works. The manufacturer shall provide all the necessary apparatus, measuring instrument and all necessary facilities at their works. The tests shall be carried out as per testing Annexure.

7.0 GUARANTEE

- 7.1 The supplier shall give a guarantee of clear 12 months from the date of commissioning or 18 months from the date of despatch whichever is earlier. Any design defect noticed during this period due to defective design/material/workmanship shall be replaced by the supplier free of cost.

3.0 SUBMISSION OF TENDER QUOTATION

- 8.1 All tender documents including the quotation shall be submitted in duplicate including any correspondence till contract is finalised.
- 8.2 The tenderer shall give sufficient information to prove that his factory has adequate facilities and capacity to manufacture the equipments to meet fully the technical requirements of the specifications and quality of materials and workmanship.
- 8.3 Quotation shall not be considered complete unless all ^{the} informations ~~are~~ furnished.
- 8.4 Clause-wise comments on the specification and test programme are essentially required alongwith tender quotation.

TECHNICAL SPECIFICATION

6.0 SCOPE

This specification covers supply of heat shrinkable sleeves. It shall be made from specially formulated, radiation cross linked polyolefin material or equivalent materials to comply with the requirements indicated in para II (properties). The sleeves are required for protection of cable identification numbers fixed on each end of the cable, for insulating shunt of the cable

जारी CHKO.	on each end of the cable, for insulating shunt of the same	चित्ररंजन रेल इंजन कारखाना पश्चिम बंगाल भारत CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL INDIA
आदेशित DRN.	SPECIFICATION FOR HEAT SHRINKAGE SLEEVES	उप. म. नि. प्र. (अभि.) DY. CEE. (D)
		पंजीय/NO. : C/W/25/1-15 जि. एल. टी. ए. बी.

sockets and for protection of cable insulation and sheath from climatic conditions.

10.0 PROCESS OF USE

The sleeves shall be cut into small pieces (depending on the size of sleeve and cable) and slipped loose over cable ends having cable identification number and cable socket. The sleeve will be then heated to a temperature of approximately $120^{\circ}\text{C} - 150^{\circ}\text{C}$. On account of heat application, the sleeve should shrink tight and fit snugly on cable & socket.

11.0 PROPERTIES

The sleeves shall have following properties:

- Colour - Transparent and clear.
- The sleeve shall be flame-retardant, anti-corrosive, resistant to acid, and oil/alkalies and self-extinguishable.
- The sleeves shall be suitable for ambient temperature $0^{\circ} - 55^{\circ}\text{C}$.
- The sleeve shall retain transparent properties and flexibility after heating and shrinkage.
- The sleeve shall have adequate mechanical and physical properties to take care of handling and connections to which the cable ends would be subjected. The wall of the sleeve shall not tear off on account of these stresses.
- The sleeves shall have indefinite shelf life when stored at 40°C .

12. DIAMETER OF CABLES ON WHICH H.S. SLEEVES SHALL BE USED.

The outside diameter of the cables on which the cut pieces of appropriate sleeves would be slipped over and subsequently made snug-fit after application of heat are indicated below :

Sl. No.	Cable size & Voltage grade	Outside diameter of the cable	Type of sleeves used for
1.	3mm ² x 750 V	5.5 ± 0.5	5A
2.	3mm ² x 1500 V	10.6 ± 0.7	6A
3.	10mm ² x 1500 V	11.3 ± 0.7	7A
4.	10mm ² x 750 V	9.3 ± 0.7	6A
5.	25mm ² x 750 V	13.5 ± 0.8	7A
6.	50mm ² x 1500 V	18.5 ± 1.0	8A (B)
7.	120mm ² x 750 V	23.8 ± 1.0	
8.	150mm ² x 1500 V	27.2 ± 1.0	10A
9.	225mm ² x 1500 V	32.0 ± 1.1	11A
10.	270mm ² x 1500 V	35.5 ± 1.2	12A
11.	300mm ² x 1500 V	37.9 ± 1.5	13A (B)

SPECIFICATION FOR
HEAT SHRINKAGE
SLEEVES

उप.पु. नि.न. (वति.)
Dr. CEE (D)

चित्ररंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL INDIA
समीक्ष/ NO. : CHW/PB/T-15
जर्नल/ALTA/B

SCHEDULE OF PARTICULARS OF HEAT SHRINKAGE SLEEVES1. GENERAL FEATURES

- Name of the manufacturer
- Type of sleeve(Include Catalogue & Literature)
- Material
- Tensile strength
- Temperature range
- Shrink Temperature °C.
- Shrink Ratio.
- Dielectric Strength kv/mm
- Elongation %
- Longitudinal change -
- Water absorption
- Flammability
- Resistance to acid and alkalies
- Resistance to corrosion
- Specific gravity
- Colours
- Volume Resistivity
- Heat Ageing
- Corrosion

LAST-SHEET

END.

Specification for Heat
Shrinkage sleeves.

Sd/-
उप.मु.वि.अ.(अभि.)
DY. CEE. (D)

चिन्नरंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
क्रमांक/NO. CIW/ES/1-15
दिनांक/DATE: ALT- B

चौक
CHKOअर्थिक
DRN