

STR No TI/STR/024 (Revision-2)



सत्यमेव जयते

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS

TI/STR/024(Revision-2)

Schedule of Technical Requirements

For

Manufacturing, Testing Facilities

And

Quality Control Requirements

For

Short Neutral Section Assembly (Specification No. TI/SPC/OHE/SNS/0000)

Light Weight Section Insulator Assembly (Specification No. TI/SPC/OHE/LWTSI/0060)

For

25 k V ac OHE System

ISSUED BY

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**1.0 SCOPE:** This schedule covers the technical requirement for Manufacturing, Testing Facilities and quality control for the manufacturing of following equipment(s)-

S.N.	Equipment	RDSO's Specification No.
I	Short Neutral Section Assembly	TI/SPC/OHE/SNS/0000 (latest)
II	Light Weight Section Insulator Assembly	TI/SPC/OHE/LWTSI/0060 (latest)

Above referred Equipments involves Insulating component, runners, various fittings, associated end fittings, fasteners and cable hangers/droppers for contact wire and Catenary wire etc as per the relevant specification to suit 25 kV A.C. single phase Traction Overhead Equipment used in OHE.

Above referred applicable specifications should be read and understood by the manufacturer to understand the technical requirements of the equipment and facilities available should be of suitable capacity accordingly.

**2.0 Manufacturer should have following general infrastructure & manufacturing facilities of suitable capacity:**

i	Heat shrinking equipment for manufacturing of insulating components
ii	Trichloroethylene Bath
iii	Treading, Head Boring, Bench grinder, Saw, Turning, Drilling, Molding Machines
iv	Assembly Jig to align component/sub assembly.
v	Assembly bench for insulating components assembly
vi	Hydraulic press to crimp insulating component and End fitting
vii	Hand Press
viii	Oven
ix	Ladles for pouring molten metal (It is not required if work of this shall be done by other means )
x	Induction and annealing furnace
xi	Adequate covered accommodation for storing raw material, finished items/Equipments awaiting dispatch and arranging inspection.

Note: 1. if insulating component is not manufactured in-house, then machinery at S.N. (i),(ii) & (vi) of above list will not be essentially required. However, manufacturer has to submit Proof for the availability of these machines at the outsourced firms.

2. If fittings are not manufactured in-house, then machinery at S.N. (iii), (ix) & (x) of above list will not be essentially required. However, manufacturer has to submit Proof for the availability of these machines at the outsourced firms

**3.0 TESTING FACILITIES:** Following testing facilities of suitable capacity should be available.

A.	Chemical laboratory with adequate facilities and staff strength to test the raw materials and finished products.
B.	For insulating component: Testing shall be conducted as per applicable RDSO's Specification and IEC-61109.
i	International system of unit (SI) shall be adopted for measurements.
ii	Pulsating load test unit
iii	Single or separate UTM machine with suitable fixture for conducting tensile test of Components of the assembly, Sub assembly, Complete assembly, Metal test bars, stainless steel test bar and for bending test.
iv	Thermal mechanical test Equipment arrangement shown in IEC 61109 may be adopted with suitable modifications.
v	Water immersion test set up
vi	Test set up for test on control of the slope of the strength - time curve of the insulating component.
vii	Test set up for 1000 hour tracking and erosion test.
viii	Test set up for dye penetration test of the core material.
ix	Water diffusion test set up (for test of core material) as per IEC: 61109 (Figure 2.3 and 4).
x	High voltage test set up.
xi	Equipment to conduct sudden load release test at -20°C to -25°C. Arrangement shown in Fig B-1 of IEC: 61109 may be adopted with suitable device for this

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	test.
xii	Current test unit
C	For Fittings and Assembly: Facilities for tests on associated fittings shall be conducted as per RDSO's Specification No. TI/SPC/OHE/Fittings/0130(10/13) (latest)
i	Dynamometer (It is not required if work of dynamometer shall be done by UTM)
ii	Measuring equipment like Vernier caliper, screw gauges, Go & No-Go Gauge etc
iii	Hardness testing machine
iv	Magna flux testing machine.

Note: 1. If the chemical laboratory as mentioned at 3.0-A and the test facilities as mentioned at S.N. 3.0-B ((ii),(iv) to (xii)) & S.N. 3.0-C (iv) for fittings are not available in house then it can be out sourced to a NABL accredited laboratory and manufacturer has to submit the references of laboratories.

#### 4.0 QUALITY CONTROL REQUIREMENTS:

4.1. The firm should ensure compliance of RDSO ISO procedure 'QM-RF-7.1-3(latest)' & it covers Quality Assurance Plan (QAP). This document may be referred from RDSO website. The QAP shall be submitted to RDSO and got approved.

4.2 The firm should have acquired ISO: 9000 certification for the product for which an approval is sought and the product should be broadly covered in the scope of the certification for manufacture and supply.

4.3 Quality manual of the firm for ISO: 9000 should clearly indicate at any stage the control over manufacturing, quality control and testing of the said product.

4.4 There exists system of easy traceability of the product from raw material stage to finished product stage.

4.5 Each section shall be headed by a qualified staff with experience in the relevant field.

4.6 System and documentation should exist for documentation of the following.

4.6.1 Incoming raw material with TC reference of supplier as well as internal test/audit checking from outside agency wherever required.

4.6.2 Stage inspection and test result.

4.6.3 System for calibration of testing & measuring equipment and record.

4.6.4 Rejection at Customer end and Remedial action taken.

4.6.5 To ensure that the product conform to the requirements of above referred RDSO's specifications.

5.0 Drawing office facilities should be equipped preferably with AUTO CAD Software.

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