

REFERENCE COPY-I

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May 2001

Addendum & Corrigendum Slip No. 1

to

Technical specification No. ETI/C/5(5/88)

for

Flo-Coat Steel Tubes.

This specification, henceforth can be treated as a prototype specification for development purpose only.

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**REFERENCE COPY**

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS.

TECHNICAL SPECIFICATION  
FOR  
FLU-COAT STEEL TUBES  
FOR 25 KV a.c. TRACTION OVERHEAD EQUIPMENT.

SPECIFICATION NO. ETI/C/5 (5/88)

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RESEARCH, DESIGNS & STANDARDS ORGANISATION  
LUCKNOW-226011.

Specn No. ETI/C/5(5/88)

25 kV a.c. TRACTION OVERHEAD EQUIPMENT  
SPECIFICATION  
FOR  
FLO-COAT STEEL TUBES

1. SCOPE

1.1 This specification covers the requirements of structural steel tubes for industrial, saline and chemically polluted areas of 25 kV a.c. 50 Hz single phase traction overhead system on Indian Railways.

2 GOVERNING SPECIFICATION

2.1 The tubes shall generally conform to RDSO Specn ETI/OHE/11(9/83) as amended from time to time with its latest correction slips except in regard to the clause pertaining to galvanisation.

3 DEVIATION FROM SPECIFICATION

3.1 Any deviation from this specification calculated to improve the performance, efficiency and utility of the equipment proposed by the tenderer will be given due consideration provided full particulars with justification thereof are furnished.

4 DESIGNATION, SIZES AND TYPE OF TUBES

4.1 The designation, sizes and types of tubes covered in this specification are shown in Table-1. The tubes used for register arm and stay-arm are designated as 'small' tubes and those used for bracket arm are designated as 'standard' and 'large' tubes.

5 DIMENSIONS

5.1 The dimensions shall be as specified in Table-1.

TABLE-1

REQUIRED DIMENSIONS IN MILLIMETRES  
FOR FLO-COAT STEEL TUBES

Designation	Outside dia			Thickness		Inside dia		Type
	Standard	Max.	Min.	Standard	Min.	Standard	Min.	
Small	33.70	34.50	32.70	2.65	<u>2.34</u>	28.40	27.70	Cold drawn strips formed into tubes by radio frequency welding.*
Standard	38.00	38.32	37.80	4.05	<u>3.70</u>	29.90	29.58	
Large	49.00	49.32	48.80	4.05	<u>3.70</u>	40.90	40.58	

\* Internal/external due to welding shall be removed.

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6 MATERIAL

6.1 The tubes shall be manufactured from steel produced by any approved process. When analysed in accordance with the methods specified in +IS:228 (Pt.III)-1972 and \*IS:228 (Pt.IX)-1975, it shall not contain more than 0.06 percent sulphur and not more than 0.06 percent phosphorous.

7 PROTECTIVE COATINGS

7.1 Flo-coated tubes shall have adequate protective coatings both inside and outside. The tubes shall have a minimum thickness of 40 microns for ~~outside~~ coating and 100 microns for outside coating respectively.

*inside*

8 FABRICATION

8.1 Cutting or drilling of tubes, if required shall be done prior to application of the corrosion protection coatings through flo-coat process. If done after protective coatings, the cut/drilled surfaces shall be treated with zinc rich paint of approved quality.

9 TESTS

9.1 Tests shall generally be conducted in accordance with the governing specification.

9.2 Type test & Acceptance tests:

- i) Visual examination
- ii) Measurement of dimensions
- iii) Tensile test
- iv) Flattening test
- v) Cold bend test
- vi) Chemical composition of steel

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Routine test

Visual examination.

10 MARKING:

10.1 Each tube shall be suitably marked with the manufacturer's name or trade mark, class and grade.

\*IS:228(Pt. III)-1972 - Determination of phosphorous by alkallimetric method.

+IS:228(Pt. IX)-1975 - Determination of sulphur in plain carbon steels by evaluation method.