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(Seal of the Company).

Annexure – III

SALIENT TECHNICAL REQUIREMENTS

1. SCOPE OF WORK:

The scope of work covered in this enquiry is supply of pressed steel radiators assy. of 1.00 and 1.2 mm CRCA ( Cold Rolled Continously annealed) sheet of grade D of IS:513 & 513A and generally as per BHEL Drawings for radiator assembly & Specification on finish basis.

The radiators are to be sand blasted as per IS:6501-1 / grade SA 2.5 of ISO 8501 before painting.

For welding radiating elements, seam welding conforming to IS:1261 shall be employed.

Name & Signature of Authorized  
Rep. Of Bidder.....  
.....  
Name of Company.....  
Date: .....

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TR 15077R



TITLE **Salient Technical Requirements for Radiators:**

**1.0 SCOPE OF WORK:**

The scope of work covered in this enquiry is supply of pressed steel radiators assembly of 1.00 and 1.25 mm CRCA (Cold rolled continuously annealed) sheet conforming to grade D of IS: 513 & IS 513A and generally as per BHEL Drawings for radiator assembly & Specification on finish basis.

The radiators are to be sand blasted as per IS: 6501-1/ grade SA 2.5 of ISO 8501 before painting/galvanizing.

For welding radiating elements, seam welding conforming to IS: 1261 shall be employed.

**2.0 Surface preparation & Painting:**

**2.1: Cleaning:**

**External surface** including weld & flux to be thoroughly cleaned, followed by a coat of chemical agent for derusting, degreasing and phosphating, leaving the surface uniform with a micro-crystalline coat of iron phosphate.

**Internal surface** to be thoroughly cleaned, followed by a coat of chemical agent for derusting, degreasing and phosphating, leaving the surface uniform with a micro-crystalline coat of iron phosphate.

To ensure the proper surface preparation, peel-off test will be conducted on the painted surface.

**2.2: Painting:**

After cleaning, internal surface shall be flush coated with phenolic based varnish conforming to class A of IS: 350 and compatible with transformer oil at a temp of 105 deg C, thinned to a viscosity level allowing for 15 sec flow in a FORD-4 Cup Viscometer.

External Surface: As required in the P.O (Thickness of paint shall be from 70 to 80 microns).

**3.0 COOLING SYSTEM:** The radiating elements (Cooling fins) shall be 55 mm apart. The start and end-up of the flutes in an element shall be atleast 65 mm from top and 65 mm before bottom respectively. Weld should be leak proof all around.

**4.0 TESTING:**

4.1: Visual Check

4.2: Dimensional Check

4.2(a): Diagonality check

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**Salient Technical Requirements for Radiators:**

4.2(b): Straightness check

4.3 (a): Thickness of CRCA sheet

(b) Flange thickness

(c) PCD & hole size

(d) Pipe/header

4.4: Peel off test on each radiator: Paint adherence, thickness and shade.

**4.5: Routine Test:**

All radiators shall be pressure tested individually for leak proofness, under water at an air pressure of 2 kg/cm<sup>2</sup> for a minimum period of 30 minutes. Manufacturer shall furnish test certificate for routine test.

**4.6: Type test:**

Radiators of each size and order shall be type tested to withstand a vacuum of 5 mm Hg absolute for one hour. Permanent deflection measured at the centre of section shall not exceed + 0.5 mm.

Radiators of each size and order shall be type tested for leak proofness against transformer oil, maintained at a temperature of 105 deg. C and pressure of 1 kg/cm<sup>2</sup> for 12 hours.

**5.0: INSPECTION:**

Radiators shall be inspected by representatives of BHEL/Third party inspection agency/Customer with respect to the approved drawings.

**6.0: PACKING AND MARKING:**

End plate of each radiator shall be embossed with manufacturer's name/ trade mark and punched with customer reference and manufacturer's serial number.

The proper identification mark i.e. material code, PO no. and supplier name shall be mentioned on header's pipe as well as wooden crate packing with black paint.

For shipment of radiators refer typical packing arrangement generally to drawing no. 24994300023. The header pipe shall be closed with plastic caps. Packing should be robust such to avoid transit/storage damages. Not more than three radiators be packed in a wooden crate.

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