

**Technical Specification**  
**BHEL Enquiry No. E1433018**

**Enquiry items along with quantities:**

| It. No. | Size & Item description   | Technical requirement   | Nominal Qty in MR | GeM Quantity (with +5%) in MR | Quantity (with -5%) in MR |
|---------|---|---|-------------------|-------------------------------|---------------------------|
| 1       | COOLER TUBES(BARE)UNPLATED SIZE 1.5MM TKX30MM O/D AS PER BHEL SPEC BP10195 REV 11 | COOLER TUBES (BARE) UNPLATED SIZE 1.5 MM TK X 30 MM O/D AS PER BHEL SPECIFICATION BP10195 REV 11(TOTAL LENGTH 86767 METERS) TUBES SHALL BE SUPPLIED IN CUT TO LENGTH SIZE AS PER ANNEXURE-T | 86767             | 91105                         | 82429                     |

**Quantity variation as per below:**

**Item-1,** Supplies quantity are to be restricted between 82429 MR to 91105 MR

**Note:** Quantities specified in GeM Bid are inclusive of +5% tolerance. However, BHEL's regularization PO shall be placed on Nominal Quantity as mentioned above with +/-5% Quantity Variation.

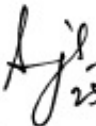
| Item No. | Description   | GeM Qty in MR | Delivery Period   |
|----------|---|---------------|---|
| 1        | COOLER TUBES(BARE)UNPLATED SIZE 1.5MM TKX30MM O/D AS PER BHEL SPEC BP10195 REV 11 | 91105         | <b>First Lot</b> – 48164 MR- 70 days from the date of GeM PO.<br><b>Second Lot</b> – 42941 MR- 71 to 98 days from the date of GeM PO. |


**Technical PQR for Cooler Tubes unplated Size 1.5 mm  
thickness x 30 mm OD as per Spec BP10195 Rev. 11**

| S. No | Description of Pre-Qualification Required   | Supporting Documents Required to accept Compliance   | Bidder's Response Complied (Yes/No) |
|-------|---|--|-------------------------------------|
| 1     | Bidders may be either Manufacturers or dealer / reseller / channel partner / distributor etc.   | Valid certificate of being Original manufacturer/OEM or valid Authorization dealer/vendor certificate from Manufacturer or approved distributor of Manufacturer (Sub-dealer certificate of authorised dealer / distributor etc. of manufacturer shall also be acceptable). All the necessary correlation for TC to be properly established and endorsed. |                                     |
| 2     | Offers of those parties will be considered who or their manufacturer has supplied atleast one PO of "Cooler Tubes/ ERW Tubes/ Seamless Steel Tubes" of similar kind in last 5 years from date of tender opening | Relevant Unpriced PO copy along with proof of supply (invoice copy / SRV/ completion certificate) to be submitted.   |                                     |
| 3     | Bidders must accept the Technical Requirement (Annexure-T) & BHEL standard specification BP10195 Rev. 11.   | Bidder to give their confirmation Pointwise of Clause S.No. 1 to 6 of Technical Requirement (Annexure-T).  |                                     |

**Notes:**

- Compliance to above Pre-qualification requirements are mandatory. In the absence of compliance of above requirement Bidder's Offer is liable to be rejected.
- Offers of vendors who are on BHEL MISCC/ unit/corporate level hold or banned/debarred, will not be considered.
- BHEL reserves the right to accept the offer in part or in full or cancel the tender enquiry without assigning any reason.
- BHEL has right to verify information / confirmation furnished by asking additional documents, proofs etc.
- All T&C shall be governed as per GeM Standard T&C. In case of discrepancies, T&C mentioned as above will be considered.

  
 25/05/2023  
 (SHREE PRAKASH)  
 DY. MGR. / FMM

  
 25/5/23  
 (G. K HIMANSHU)  
 MGR. / FMM

**MAKE IN INDIA format (to be filled by OeMs of the participating bidders)**

**BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL**

**MATERIAL MANAGEMENT – STEEL DIVISION**

*For this Procurement, Government of India Public Procurement (Preference to Make in India), Order 2017 with its amendments and subsequent Orders issued by the respective nodal ministries shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.*

*As per the Provisions of this order, please submit **a self-certification complying with the conditions below on company letterhead duly signed by competent authority.***

I ....., hereby declare on behalf of M/s. .... that we are participating in the Enquiry No. .... floated by BHEL, Bhopal (MP), India and shall comply with following:

1. Public Procurement (Preference to Make in India), Order 2017 *with its amendments* and subsequent Orders issued by the respective nodal ministries shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

(a) A supplier will be treated as “**Class-I Local Suppliers**”, if the items quoted by bidder have local content equal to or more than 50%.

(b) ‘**Local Content**’ means the amount of value added in India, which shall be total value of item quoted (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, **in percent**.

2. I hereby declare that our firm qualifies as “**Class-I Local Suppliers**”.

**a. The Local Content in the items quoted under this Enquiry is ..... Percent**

**b. Details of location(s) in India where this value addition shall be done, is/are as follows:**

- (a) .....
- (b) .....
- (c) .....

(.....)

For M/s. ....

(Seal & Sign)

**TECHNICAL REQUIREMENT (ANNEXURE-T)**

**Cooler Tubes (Bare) unplated size 1.5 mm thickness x 30 mm OD (Qty-86,767 Meters)**

- (1) Cooler Tubes (Bare) to be supplied as per BHEL Bhopal standard BP10195 Rev. 11.
- (2) Only One Vendor is required for supply of above Cooler Tubes. Rate to be quoted in Rs. Per Meter (Inclusive of GST).
- (3) Mill Test Certificate in Original  
**OR**  
Test certificate duly cleared by NABL approved Lab covering all Mechanical & Chemical properties must be submitted alongwith supply as per BHEL Bhopal standard BP10195 Rev. 11.
- (4) Bundling and packaging of tubes to be done as specified in BHEL Bhopal plant standard BP10195 Rev. 11.
- (5) For the ease of carrying manually, a bundle of tubes must not contain more than 10 tubes.
- (6) Vendor have to supply size-wise quantities (in Nos./Meters) of tubes as Lot 1 within 10 weeks from PO date & Lot 2 within 14 weeks from PO date as per detailed table below. Early delivery is acceptable to us.

| S.No.        | Tube Length (in mm) | Total Quantity (in Nos.) | Total Quantity (in Meters) | Lot-1 Delivery Required (Within 10 Weeks from PO date) (in Meters) | Lot -2 Delivery Required (Within 14 Weeks from PO date) (in Meters) |
|--------------|---------------------|--------------------------|----------------------------|--|---|
| 1            | 1526                | 4500                     | 6867                       | 6867   | 0   |
| 2            | 1666                | 10000                    | 16660                      | 6664   | 9996  |
| 3            | 1840                | 3000                     | 5520                       | 5520   | 0   |
| 4            | 1866                | 20000                    | 37320                      | 18660  | 18660   |
| 5            | 2040                | 10000                    | 20400                      | 8160   | 12240   |
| <b>Total</b> |                     | <b>47500</b>             | <b>86767</b>               | <b>45871</b>   | <b>40896</b>  |



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BHOPAL**

**BP 10195**

**Rev. No. 11**

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**SUPERSEDES  
BP 10195 Rev. 10**

**WELDED AND SIZED PRECISION STEEL TUBE NORMALISED**

**1. GENERAL:**

This specification governs the quality of welded and sized precision steel tubes normalized.

**2. APPLICATION:**

Cooler tubes of motors.

**3. CONDITION OF DELIVERY:**

Tubes shall be welded, sized and normalized, tubes shall be supplied with plain ends, and shall be cut at right angles to the tube axis, and shall be free from burrs. Tubes shall be supplied in random lengths, or in fixed lengths as specified in order. Tubes shall be supplied with a surface protection by painting the tubes to BP 067 41 72.

NOTE: In case unpainted tubes are to be supplied the tubes shall be given clear TRP coating (Black TRP is not acceptable) to avoid corrosion during transit / storage.

**4. COMPLIANCE WITH NATIONAL STANDARDS:**

There is no Indian Standard covering this type of material.

**5. DIMENSIONS AND TOLERANCES:**

**5.1 Sizes:**

Our order shall clearly state the outside diameter & wall thickness of the tube required. Tubes shall be supplied in random lengths of 5 to 7 meters unless exact lengths are called for.

**Revision :**  
Reviewed & brought up to date.

**Issued by :**  
  
**STANDARDS AND MATERIALS GROUP  
TECHNICAL SERVICES DEPARTMENT**

**Rev.11**

**Date: 12.03.2022**

**Date of first issue Feb. 1984**



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### 5.2 Tolerances:

5.2.1 Outside Diameter: Tube about 20 mm up to 30 mm  $\pm$  10% of tube thickness. This Permissible deviation includes eccentricity.

5.2.2 Straightness: 0.25% of the measured length, between the tube and a straight line (chord) connecting two arbitrarily chosen points 1000mm apart.

#### 5.2.3 Lengths:

Random Lengths: Upto 10% of the ordered quantity may be supplied in the form of Under lengths  $\geq$  2 meters, & these are made into separate bundles.  
Fixed Lengths: as specified on the order.

5.2.4 Tube Ends: Tubes shall be parted as accurately as possible, right angles to the axis of the tube. The tube ends (ID & OD) shall be free from burrs.

### 6.0 MANUFACTURE:

The tubes to be manufactured from open hearth, electric or basic oxygen steel.  
Tubes shall not be manually welded.

### 7.0 HEAT TREATMENT:

Tubes shall be supplied in the normalized condition.

### 8.0 SURFACE CONDITION:

Tubes shall be cleanly finished, free from scale. The tubes shall have a smooth surface suitable for painting. Any surface defects or the removal of such defects must not cause the wall thickness going below the min. the peak to Valley height, "RZ" in the longitudinal direction on the outside surface shall be  $\leq$  25 Microns, for tubes less the 120mm OD or less then 6mm wall thickness. The peak to Valley heights cannot be ensured in the region of the weld.

### 9.0 CHEMICAL COMPOSITION:

The ladle analysis of the steel shall be as follows:

| Element     | Percent (max) |
|-------------|---------------|
| Carbon      | 0.17          |
| Phosphorous | 0.05          |
| Sulphur     | 0.05          |

**NOTE:** Slight departures from the ladle analysis are permissible provided the properties of the steel are not there by affected.



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**10.0 TEST SAMPLES:**

Tube made from the same steel grade, and of the same dimensions are to be divided into batches of 200 tubes. Remainders of between 20 & 200 tubes shall constitute a complete batch. One tube per batch so constituted, shall be selected at random for testing of tensile test, flattening test & drift expanding test.

**11. MECHANICAL PROPERTIES:****11.1 TENSILE:**

When tested sample shall show the following properties.

|                          |                                |
|--------------------------|--------------------------------|
| Tensile strength         | 340 - 470 N/mm <sup>2</sup>    |
| Yield stress             | 235 N/mm <sup>2</sup> Minimum* |
| Elongation on 5.65√SO GL | 25% Minimum                    |

**Note:**

1. The yield stress can be lower by 10 N/mm<sup>2</sup>, from the min. specified value, When the outside diameter & wall thickness of the tubes are ≤ 30mm and 3mm respectively.
2. The strip specimen from the tube shall be taken from a part tube circumference which is free from weld seam.

**11.2 FLATTENING TEST:**

In this test the specimen or the end of the tubes must be compressed to such an extent that a defined distance "H" is obtained between the two pressure plates.

This distance is defined as follows:

$$H = \frac{[(1 + c) \times S]}{[c + (S/d_a)]}$$

Where: S = is the wall thickness in mm.

da = is the outside diameter of the tube in mm.

c = is a constant.

A value of 0.09 must be used for "c". During testing, the specimen must not exhibit any unallowable defects attributable to inadequate deformability.



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**11.3 DRIFT EXPANDING TEST:**

The tubes shall be expanded by means of taper drift having an included Angle of 45° until the outside diameter of expanded end exceeds the original outside diameter by 10% when subjected to this test the tube shall show no sign of cracking.

**12. LEAK TEST (Optional):**

When specified, on the order, the tubes shall be subjected to a leak test, by means of an internal pressure test using water. Our order shall clearly specify the test pressure to be applied and minimum time period for the same.

**13. RETESTS:**

If the specimen selected fails in the test specified in Cl.11, two other tubes shall be selected from the same batch both of which have to satisfy the test to the batch to be accepted.

**14. SURFACE PROTECTION:**

The tubes shall be given a surface protection, both inside & outside by painting in accordance with plant standard BP 067 41 72.

**15. TEST CERTIFICATE:**

Unless otherwise specified, three copies of test certificates shall be supplied. In addition, the supplier shall ensure to enclose one copy of test certificate along with their dispatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information: -

BHEL Reference:

BP 10195 (Rev.11): Welded and Sized Precision Steel Tube Normalized.

Our order No.

Supplier's References:

Name

Batch No.

Results of Tests:

Results of chemical, Mechanical & surface protection test called for in this specification.



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**16. PACKING AND MARKING:**

Each tube shall be plugged at both the ends by means of tight fitting end caps. The tube shall be suitably packed in crates to prevent damage in the straightness of the tubes & corrosion during the transit.

Each bundle/package shall bear the following information:

BP10195: Welded and Sized Precision Steel Tube Normalized.

Our Order No.

Identification No.

Size & Weight.

Supplier's Name.