HPOIL GAS PRIVATE LIMITED

(A Joint Venture of HPCL & OIL)

SUPPLY OF COPPER TUBES AT KOLHAPUR GA

TECHNICAL VOLUME

Tender No.: HOGPL/2022-23/C&P/026

Date: 21.03.2023

DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order.

PROJECT: City Gas Distribution Project of Kolhapur District

OWNER/COMPANY/PURCHASER/CLIENT: HPOIL GAS PRIVATE LIMITED (HOGPL)

VENDOR/BIDDER/SUPPLIER/CONTRACTOR: The party, who manufactures and supplies equipment and Provide services to the OWNER or to CONTRACTOR.

MR: Material Requisition.

Section I: MATERIAL REQUISITION

1.0. SCOPE OF SUPPLY & SERVICES

The Scope includes manufacturing & supply of Cu tube on FOT site / warehouse basis conforming to BS EN 1057 (latest edition) specifications and Meeting other technical requirements as specified in tender document. The scope includes getting approvals from Purchaser /Consultant for QAP / documents, procurement of raw material, manufacturing, testing & Inspection (includes manufacturer appointed TPI inspection), packing, forwarding & transportation, unloading and stacking of Cu tube to the designated warehouse / Storage yard at HPOIL Gas Pvt Ltd Kolhapur GA towards usage for Natural Gas with Working Temperature between 0 to 50 Deg Celsius, as per tender terms & conditions.

This specification covers the requirements for 12 mm OD X 0.6 mm wall thickness Copper tube, Half Hard. Unless modified by this specification, requirement of BS EN 1057 (latest), Half Hard, shall be valid, with the recommended changes in physical properties to suit wrinkle free bend ability.

SOR Item No.	Description of item	Unit	Quantity
1	Design, Engineering, Manufacturing, Inspection, Testing, Supply, Transportation, loading & unloading and stacking at Kolhapur (HOGPL) site/store of Cu Tubes as per technical volume of Tender document complete in all respects. 12 mm OD X 0.6 mm wall thickness Copper tube, Half Hard. Unless modified by this specification, requirement of BS EN 1057 (latest) & as per tender terms.	Mtrs	61,000

2.0. MATERIAL SPECIFICATION

2.1 MATERIAL

The material used for the manufacturer of copper tube shall confirm to BS EN 1057(latest), Grade Cu - DHP or CW024A.

- **Mechanical Properties:**

  Ultimate Tensile Strength-250N/ sq.mm(min)

  Elongation 30% (min)

  Hardness 75 to 100 on HV scale.

- **Chemical Properties:**

In Each heat one no. of the copper tube will be tested for chemical properties to confirm to non-arsenical Cu DHP/ CW024A as per BS EN 1057 to have the following chemical composition:

Copper Percentage including silver	:	Min 99.9%
Phosphorus Percentage	:	0.015 to 0.040%

2.2 DIMENSIONALTOLERANCES

The mean outside Diameter of the tube shall not vary from the specified outside diameter by more than the amount of tolerances specified in table 4 of BS EN 1057. The tolerance on the wall thickness shall be as specified in table 5 of BS EN 1057.

The length of the tube shall be 3 m. Allowable tolerance shall be (-0, +0.5 mm).

2.3 MANUFACTURE

The tubes shall be solid drawn by the process of melting, extrusion, and thereafter Bright annealing. The ends shall be cut clean & square with the axis of the tube in no case shall tubes be redrawn from old or used tubes.

2.4 FREEDOM FROM DEFECTS

- The tubes shall be free from internal & external fins, flaws, skin defects, blow holes etc. or other irregularities which might restrict the free flow of fluid and shall be so designed that resistance to the flow of fluid through the tubes is minimized.

- All tubes will be supplied 100% Eddy Current tested as per ASTM E243 and BS EN 1057 Eddy Current testing is a computer aided test, wherein the tube passes through a probe & an electromagnetic field is created around the peripheral of the tube to detect any flaw or blow hole which may not be visible to the naked eye. The manufacturer must have in-house Eddy Current testing facilities to supply to HOGPL. HOGPL reserves the right to witness the Eddy Current facility at the manufacturer's factory premises.

2.5 HYDROSTATIC TEST

Hydrostatic test shall be carried out minimum 35 bar pressure for a period of 10 second as per EN 1057 (latest).

2.6 DRIFT EXPANDING TEST

Drift expanding test shall be carried out as per EN 1057. The O.D. of the tube end shall be expanded by 30% using a conical mandrel (at angle 45°) with no wrinkles, cracks, break or any form of defect should occur on the tube during & after the test.

2.7 CARBON FILM TEST

Copper tubes to be tested for carbon film test & the manufacturer will certify that the tubes meet the requirement of clause 8.5 of BS EN 1057.

2.8 CARBON CONTENT TEST

Copper tubes to be tested for carbon content test to ensure a carbon level to avoid the formation of carbon film during installation. Max. Carbon level shall be permitted as per clause 6.5 of BS EN1057.

2.9 MARKING

Each tube shall be permanently marked every meter with HOGPL's Logo, manufactures name & size and specification of the tube.

Each packing containing tubes shall carry the following, stamped or written in indelible ink.

- Manufacturer's name or trademark
- Designation of tubes (OD x wall thk)
- Lot number.
- No. of the standard (EN1057)

2.9 INSPECTION/ DOCUMENTS

Inspection shall be carried out as per HOGPL Technical Specifications, relevant codes/standard and Inspection Plan/ QAP. Vendor to prepare detailed QAP and submit the same for approval of HOGPL/ HOGPL's Authorized Representative.

HOGPL representative or third-party inspection agency appointed by HOGPL shall carry out stage wise inspection during manufacturing/ final inspection.

Vendor shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports as per HOGPL Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.

Even after third party inspection, HOGPL reserves the right to select a sample of tube randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in HOGPL Technical specification, then HOGPL reserves the rights to reject all production supplied from the batch.

For control test examination required under the supervision of any or TPIA/owner/owner's representative, latter shall be informed in writing one (1) week in advance by vendor about inspection date & place along with production schedule.

2.10 PACKAGING

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Packing size shall be approved by owner / owner's representative before packing the material. The vendor shall submit the packaging details during QAP and also complied with at the time of delivery.

3.0 QUALITY ASSURANCE PLAN

	QUALITY ASSURANCE PLAN COPPER TUBE							
						INSPECTION		
SR. No	**DESCRIPTION**	**QUANTUM OF CHECK**	**PROCEDURE**	**ACCEPTANCE CRITERIA (As per EN 1057/ PTS)**	**FORMAT OF RECORD**	**VEND OR**	**TPIA/ CLIENT**	**REMARKS**
1	Raw material: Chemical Requirement	As per EN 1057 (Minimum One Sample per Heat)	As per EN 1057	Material grade Cu-DHP/ CW 024A Cu + Ag: Min 99.9% P: 0.0015% TO 0.040%	MTC	P	R	
2	Final product: Chemical Requirement	As per EN 1057	As per EN 1057		Inspection Report	P	R	
3	Physical test - Ultimate Tensile Strength, % Elongation & Hardness Test	As per EN 1057 (Minimum 2 samples per Lot)	As per EN 1057	UTS- Min. 250 N/ Sq.mm Elongation - Min 30% Hardness- 75 to 100 HV	Inspection Report	P	W	
4	Physical test - Bend Test	As per EN 1057 (Minimum 2 samples per Lot)	As per EN 1057	As per EN 1057/PTS	Inspection Report	P	W	
5	Carbon film test	As per EN 1057	As per EN 1057	Maximum Residual carbon- 0.20 mm/ sq. dm	Inspection Report	P	W	
6	Carbon content test	As per EN 1057	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	W	
7	Drift expanding test	As per EN 1057 (Minimum 1 sample. per L			Inspection Report	P	W	

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8	Hydrostatic test	As per EN 1057 - 100%	As per EN 1057	Min 35 bar/ 10 second	Inspection Report	P	W	
9	Eddy current test	As per EN 1057 – 100%	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	W	
10	Dimensional Inspection (O.D, Wall thk, Length etc.)	As per EN 1057 – 100%	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	W	
11	Visual Inspection (Free from defect) Surface – External & Internal	As per EN 1057	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	R	
12	Marking	As per EN 1057	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	R	
13	Documentation	-	As per EN 1057	As per EN 1057/ PTS	Inspection Report	P	R	

LEGENDS H-HOLD W- WITNESS P- PERFORM TPIA- THIRD PARTY INSPECTION AGENCY
CA- CONTROL AUTHOIRTY

1. The above testing and acceptance criteria are minimum requirements; however, manufacturer shall ensure that the product shall also comply to the additional requirements as per specification.
2. The supplier shall submit their own detailed ITP prepared on the basis of above I Technical specification for approval of Owner / Owner's representative.
3. Owner/ Owner representative shall review/ approve all the documents related to ITP / Quality manuals / Drawings etc. submitted by supplier
4. Contractor shall in coordination with Supplier / Sub vendor issue detailed Production and Inspection schedule indicating the dates and the locations to facilitate Owner / Owner's representative and TPIA
5. Special manufacturing procedures have to be specially approved or only previously approved procedures have to be used, in case of conflict between specifications more stringent
6. Owner / Owner's representative including TPIA will have the right to inspect any activity of manufacturing at any time.
7. All reference Codes / Standards. Documents, P.O. Copies shall be arranged by vendor I supplier for reference of TPIA/ HOGPL Consortium at the time of inspection.
8. At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note, dispatch clearance note & MTC.

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