



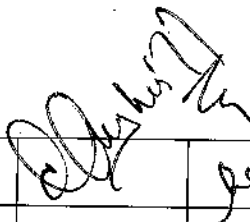
PTS- COPPER TUBE

IGL/ND/C&P/
P14089

INDRAPRASTHA GAS LTD.

CITY GAS DISTRIBUTION PROJECT IN LOW RISE & HIGH RISE SEGMENT IN NCT OF DELHI & NCR

PTS - COPPER TUBE

					
0	29.12.2016	Issued for Tender	MA	RU	GS
Rev.	Date	Subject of Revision	Author	Checked	Approved



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**1.0 SCOPE**

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.

2.0 MATERIAL

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

a. Mechanical Properties:

- i. Ultimate Tensile Strength-250N/sq.mm(min)
- ii. Elongation - 30% (min)
- iii. Hardness - 75 to 100 on HV scale.

b. 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%

3.0 DIMENSIONAL TOLERANCES

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).

4.0 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.

5.0 FREEDOM FROM DEFECTS

- a. 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.
- b. 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 IGL. IGL reserves the right to witness the Eddy Current facility at the manufacturer's factory premises.

6.0 HYDROSTATIC TEST

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

7.0 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

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tube during & after the test.

8.0 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.

9.0 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.

10.0 MARKING

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

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

- a) Manufacturers name or trademark
- b) Designation of tubes (OD x wall thk)
- c) Lot number.
- d) No. of the standard (EN1057)

11.0 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.

12.0 INSPECTION/ DOCUMENTS

- i. Inspection shall be carried out as per IGL Technical Specifications, relevant codes/standard and Inspection Plan/ QAP. Vendor to prepare detailed QAP and submit the same for approval of IGL / IGL's Authorized Representative.
- ii. IGL representative or third party inspection agency appointed by IGL shall carry out stage wise inspection during manufacturing/ final inspection.
- iii. 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 IGL Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.
- iv. Even after third party inspection, IGL 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 IGL Technical specification, then IGL reserves the rights to reject all production supplied from the batch.
- v. For any control test or examination required under the supervision of 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.



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