

# MEXFLOW ACCESSORIES



COPPER FITTINGS



ID TAPE



MUNSEN RINGS



BRAZING FILLER METAL

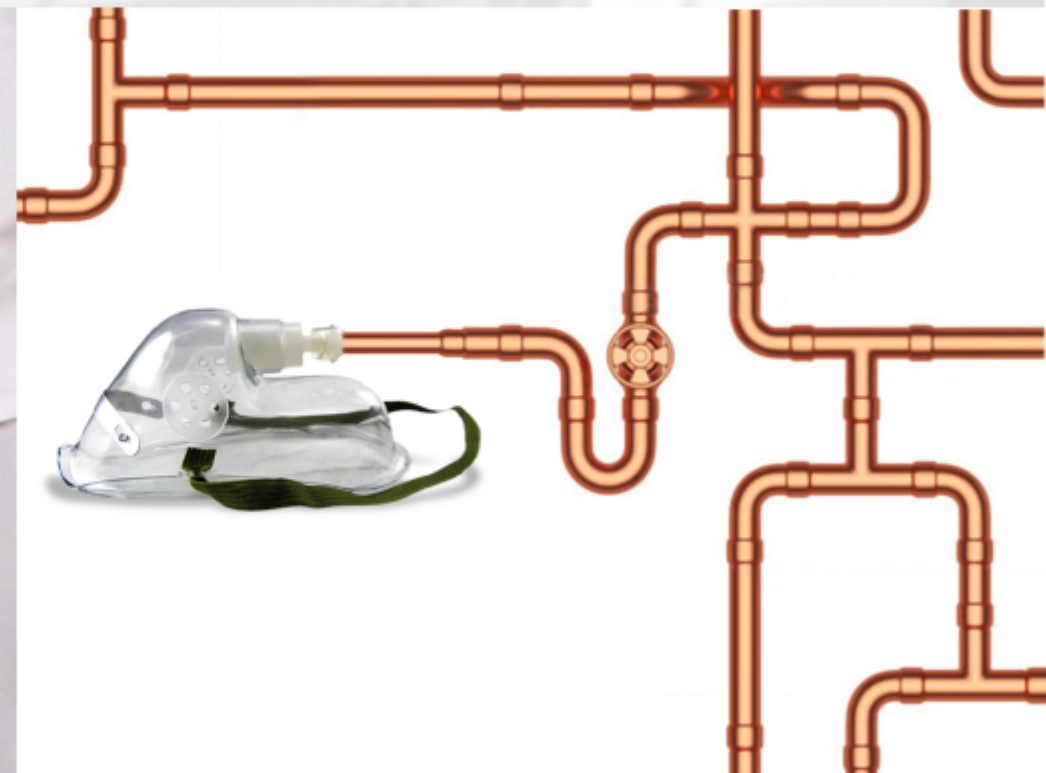


PLASTIC SADDLES



*No Worries*

*Breath Safe*



MEXFLOW PRODUCTS ARE APPROVED BY NUMEROUS STANDARDS AUTHORITIES AND CERTIFICATION BOARDS.  
FOR MORE DETAILS ON THIS PRODUCT RANGE PLEASE EMAIL US.



**Mehta Group - The Radiant Star of Indian Copper Industry**

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**CARBON  
FREE  
Tubes**

with

**MEXFLOW<sup>®</sup>**  
COPPER TUBES



# About Us



MEXFLOW brand, our products are exported to over 25 countries worldwide including USA, Latin America, Europe and Australia.

Since our inception we have continually strived to achieve high quality, reliable and safe by adopting latest technology in manufacturing of copper tubes and state of the art testing facilities. We pioneered manufacturing of Medical Grade Copper Tubes in India 25 years ago and since then Mexflow is the most relied and trusted brand in India amongst Hospitals, Consultants and Contractors.

We understand the importance and criticality of Medical Gas tubing both for the patients and the hospitals, through the years; we have successfully developed a culture of safety to ensure we always deliver right quality material with utmost cleanliness to our clients.

Established in 1988, Mehta Tubes Ltd., is India's largest Copper and Copper Alloy Tubes manufacturer with head office in Mumbai and manufacturing facilities in South Gujarat and Daman. We offer wide range of Copper and Copper Alloys products for domestic, commercial, industrial and shipbuilding applications under

# Medical Grade Copper Tubes



dispatch of the tubes to hospital site.

At Mehta Tubes, we are fully equipped with qualified manpower and required testing facilities in house to ensure that we consistently deliver the best quality Medical Grade Tubes with internal residue not exceeding 0.20mg/dm<sup>2</sup> as per HTM 02 01/ EN 13348/ISO 7396-1.

The internal cleanliness of medical gas tubes in an Oxygen application is critical in order to prevent gas contamination and potential explosions. Oxygen under pressure may cause spontaneous combustion of residual organic drawing oils if they remain inside the tube after manufacturing. Oil and other contaminants may also cause patients serious respiratory problems if not removed prior to



# Manufacturing Standards

**BS EN 13348:2008** - Copper and copper alloys – Seamless, round copper tubes for medical gases or vacuum

**BS EN 1057: 2010** - Copper and copper alloys Seamless, round copper tubes for water and gas in sanitary and heating applications (mainly used for plumbing applications).

**ASRTM B819-00** - Seamless Copper Tube for Medical Gas Systems



# Material Analysis

**Material Grade:** Phosphorus de-oxidised copper; Cu-DHP or CW024A Minimum Copper Content 99.90 % (including silver), Phosphorus 0.015-0.040 %

**Copper Melting Point:** 1083°C

**Copper Density:** 8.9 gm/cc

**Temper Condition:** Half Hard (R250)

**Tensile strength:** 250 MPa minimum.

**Elongation:** 30% minimum.

**Hardness (Indicative) at HV 5 scale:** 75 to 100

**Cleanliness:** Maximum total carbon content 0.20 mg/dm2. The determination of lubricant residue as total carbon is carried out with the help of Carbon Determinator using reference method described in EN 723. (Combustion Method)

**Freedom from defect test:** 100% Tubes are subjected to an Eddy Current Test for detection of local defects in accordance with EN:1971

**Packaging:** Each tube individually end capped, polythene wrapped in bundles and sealed.

**Marking:** Sizes 12 -108mm Mexflow Copper Tubes are marked with: (Both Durable and Permanent Marking)

- Tube size
- BSI Kite mark/ Lloyds (as per order)
- EN 13348
- Temper (Half Hard R250)
- Manufacturer
- Date & Batch Code 12mm to 108mm sizes are also inkjet marked with additional data to enable traceability

Table 2- Nominal outside diameters and wall thickness as per BS EN 13348									
value in milimeters									
Nominal Outside	Nominal Wall Thickness								
d	0,7	0,8	0,9	1,0	1,2	1,5	2,0	2,5	3,0
6	---	---	---	X	---	---	---	---	---
8	---	R	---	R	---	---	---	---	---
10	---	R	---	R	---	---	---	---	---
12	---	X	---	R	---	---	---	---	---
14	---	---	---	X	---	---	---	---	---
15	R	---	---	R	X	---	---	---	---
16	---	---	---	X	---	---	---	---	---
18	---	---	---	R	X	---	---	---	---
22	---	---	R	R	X	R	---	---	---
28	---	---	R	R	X	R	---	---	---
35	---	---	---	X	R	R	X	---	---
42	---	---	---	X	R	R	X	---	---
54	---	---	---	X	R	R	R	---	---
64	---	---	---	---	---	---	R	---	---
66,7	---	---	---	---	R	---	R	---	---
70	---	---	---	---	---	---	X	---	---
76,1	---	---	---	---	---	R	R	---	---
80	---	---	---	---	---	---	X	---	---
88,9	---	---	---	---	---	---	R	---	---
104	---	---	---	---	---	---	X	---	---
108	---	---	---	---	---	R	---	R	---
133	---	---	---	---	---	---	---	---	X
R Indicates the European recommends dimensions									
X Indicates other european dimension									

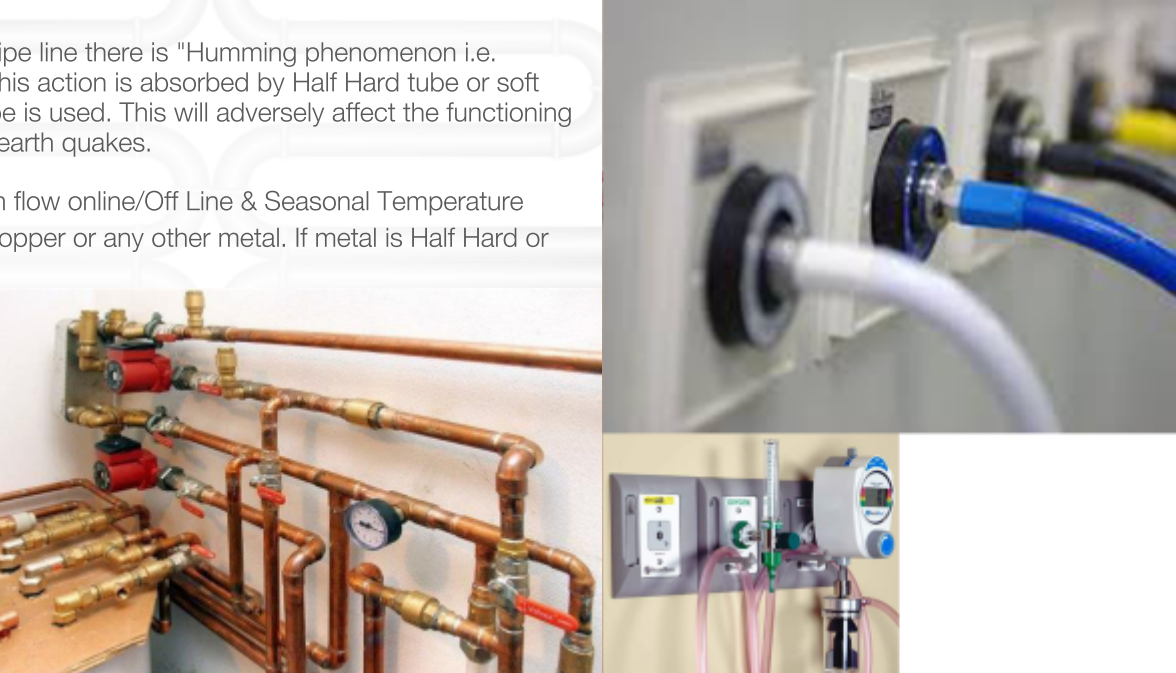
## \*The importance of Half Hard Tempered Copper Tubes in MGPS

Half Hard Temper R250 Copper Tubes are resistant to long time stress cracking unlike Hard drawn copper tubes R290. Half hard copper tubes (R250 temper) can easily be adapted to be installed on uneven surfaces.

While conveying any fluid (Gas or liquid) through any pipe line there is "Humming phenomenon i.e. hammering action / vibration of pipeline while in use. This action is absorbed by Half Hard tube or soft tube only. Joints may break if Hard Drawn Copper Tube is used. This will adversely affect the functioning of hospital as a whole. Similar effect can occur during earth quakes.

Temperature difference in the Copper Pipeline (Oxygen flow online/Off Line & Seasonal Temperature difference).Co-efficient Expanding & Contracting the Copper or any other metal. If metal is Half Hard or Annealed, the Expansion & Contraction is absorbed by the metal due to inherent ductility.

**HARD DRAWN TUBES ON THE OTHER HAND CANNOT WITHSTAND EXPANSION & CONTRACTION**



# Important Guidelines on Pipeline Design & Installation

An MGPS is designed to provide a safe and effective method of delivering medical gases, medical air and surgical air from the source of supply to the appropriate terminal unit. It is essential to ensure that there is no possibility of a cross-connection between any system and that all parts of each system to which connections can be made by users are gas – specific. MGPS should not be used to supply pathology department departments, general workshops or mechanical services.

General information is required to design an MGPS are:

Schedule of provision of terminal units, Design flow rate and pressure requirements at each terminal unit, Diversified flows for each section of the pipeline system & Total flow.

## The Safety of an MGPS is Dependent on Four Basic Principals

**Identity, Adequacy, Continuity & Quality of Supply.**

**MGPS should be kept away from areas where they may be subject to:**

**A. Mechanical damage**

**B. Chemical damage**

**C. Excessive heat**

**D. Splashing, dripping or permanent contact with oil, grease, bituminous compounds & electrical sparks etc.**

## Pipeline Component Specifications

### Copper Tubes:

The Copper Tube shall be manufactured from Phosphorus deoxidised non-arsenical Copper to grade CW 024A (Cu-DHP) conforming to BS EN: 13348 / ASTM: B 819 in Half Hard Temper Condition. Copper Tubes shall be Degreased & Suitable for Oxygen use with both ends Capped and Protectively packed.

Copper Tubes manufacturing units shall be registered in accordance with **ISO 9001: 2008**

Marking for sizes up to 108 mm shall be permanently and durably marked at regular intervals along with it's lengths with following information:

- **The harmonised standard number EN 13348;**
- **BSI Kite Marked to EN 13348:2008**
- **Nominal dimensions, diameter x wall thickness;**
- **Temper designation R 250 to EN 1173;**
- **Manufacturer's identification;**
- **Date of production: year and month (1 to 12)**
- **Lot No.**

### Copper Fittings:

Medical Gas Pipeline Fittings shall be end feed type, manufactured from the same grade of copper as the tubes and be in accordance with the requirements of BS EN 1254-1:1998 Part 1. The manufacturing company should comply with BS EN ISO 9001:2008 and should be Kite Marked to EN 1254-1 (up to 54mm). Fittings should be factory degreased suitable for oxygen use and be supplied individually sealed in protective polythene bags. Fittings should be certified for medical use and accompany with oil analysis certificate and conformity certificate indicating suitability for medical use.

### Installation Guidelines:

Brazing shall be carried out using Oxy-acetylene (DA) flame source capable of achieving brazing temperatures of above 600 degrees and below the melting point of the base metal. LPG should not be used as heat source to braze copper tubes.

Brazed Pipeline Joints (Copper to copper) should be made using a silver-copper-phosphorous brazing alloy CP104 (5% Silver Brazing Filler metals Rod) to BS EN 1044- 1999, no flux to be used.

Brazing Copper to Brass/ Gun Metal/ Bronze is not carried out on site; use AG 203 (43% Silver & Cadmium free Brazing Filler metal Rod) to EN 1044 with an appropriate flux. The flux residue should be chemically removed and if necessary the complete assembly is cleaned and degreased for oxygen service.

Where pipes are cut on site, the wheel cutter should be used to prevent ingress of Copper particles (avoid using hacksaw blade) and should be cut square and de-burred, re-rounded and cleaned off before use. Expanded joints shall not be used as this will reduce tube wall thickness and precise capillary space will not be made for capillary action to occur for achieving a leak free joint. Also bending of pipes shall not be carried out as this will result in reduction of tubes wall thickness.

**Brazing should be carried out using Oxygen free Nitrogen as an internal inert gas shield to prevent the formation of oxides on the inside of the tubes and fittings. The continuous purging with Oxygen Free Nitrogen should be carried out while brazing and should be allowed to flow until the joint cools down, a wet cloth may be used to cool the joints faster. A slight burnishing may occur in some cases. However post installation purging is still required to remove other particulate matter not associated with Brazing operation. Nitrogen purging is not required for AGS disposal systems.**

### Penetration:

Due to tolerance of the capillary space on these Copper Tubes & Fittings, full penetration of the Brazing filler metal may not occur and is not necessary. The minimum penetration at any point on the joint must be three times the wall thickness of the tube or 3 mm whichever is greater. The Tube should be fully inserted up to the shoulder of the fitting.

**Oxygen-free nitrogen should be supplied to the inside of the pre-assembled, unbrazed pipework through a pressure regulator and flow controller or flow-regulating device. Nitrogen purging is not required for AGS disposal systems.**

**Safety:** If working for prolonged period in very confined spaces, precautions must be taken to avoid excessive build-up of nitrogen by ventilating the space. Oxygen content of the ambient air should be monitored when brazing in a confined space.