

# Engineering Specifications

## COPPER TUBING AND FITTINGS FOR FUEL GAS PIPING SYSTEMS

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Copper Tubing and ProPress G Fittings for Fuel Gas Piping Systems

#### 1.2 REFERENCES

- A. ASME A13.1 Scheme for the Identification of Piping Systems
- B. ASME B1.20.1 Pipe Threads, General Purpose (Inch)
- C. ASTM B88 Standard Specification for Seamless Copper Water Tube
- D. ASTM B280 Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
- E. IAPMO Uniform Plumbing Code
- F. ICC International Fuel Gas Code
- G. ICC PMG-1036
- H. MSS-SP-58 Pipe Hangers and Supports - Materials, Design and Manufacture
- I. MSS-SP-69 Pipe Hangers and Supports - Selection and Application
- J. NFPA 54 National Fuel Gas Code

#### 1.3 QUALITY ASSURANCE

- A. The installer shall be a qualified installer, licensed within the jurisdiction, and familiar with the installation of copper tubing.
- B. The installation of copper tubing for fuel gas piping systems shall conform to the requirements of the ICC International Fuel Gas Code, IAPMO Uniform Plumbing Code, or NFPA54, the National Fuel Gas Code.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

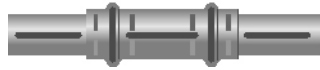
- A. Copper tubing shall be shipped to the job site on truck or in such a manner to protect the tubing. The tubing and fittings shall not be roughly handled during shipment. The tubing and fittings shall be unloaded with reasonable care.
- B. Protect the stored tubing from moisture and dirt. Elevate above grade. When stored inside, do not exceed the structural capacity of the floor.
- C. Protect fittings and piping specialties from moisture and dirt.

#### 1.5 PROJECT CONDITIONS

- A. Verify length of tubing required by field measurements.

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### 1.6 WARRANTY

- A. The tubing and fittings manufacturer shall warrant that the tubing and fittings are free from defects and conform to the designated standard. The warranty shall only be applicable to tubing and fittings installed in accordance with the manufacturer's installation instructions.
- B. The manufacturer of the tubing and fittings shall not be responsible for the improper use, handling, or installation of the product.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Copper Press  
Gas Fittings:  
ProPress G Fittings  
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#### 2.2 MATERIAL

- A. Tubing Standard: Copper tubing shall be either Type K or L conform to ASTM B88 or ASTM B280.
- B. Press Fitting: Copper and copper alloy press fittings shall conform to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of CSA International Requirement No. 1-02 US. Sealing elements for press fittings shall be HNBR. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer. Press end shall have SC (Smart Connect) feature design (leakage path). Smart Connect (SC Feature) In ProPress 1/2" to 4" dimensions the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.
- C. Threaded Fittings: Pipe Threads shall conform to ASME B1.20.1.
- D. Hanger Standard: Hangers and supports shall conform to MSS-SP-58.

#### 2.3 SOURCE QUALITY CONTROL

- A. Copper gas fittings shall be listed by a third party agency as being acceptable for fuel gas piping systems.

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## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. The installing contractor shall examine the copper tubing and fittings for defects, sand holes, or cracks. There shall be no defects of the tubing or fittings. Any damaged tubing or fittings shall be rejected.

### 3.2 PREPARATION

- A. Copper tubing shall be cut with a wheeled tubing cutter or approved copper tubing cutting tool. The tubing shall be cut square to permit proper joining with the fittings.
- B. Remove scale, slag, dirt, and debris from inside and outside of tubing and fittings before assembly. The tubing end shall be wiped clean and dry. The burrs on the tubing shall be reamed with a deburring or reaming tool.

### 3.3 INSTALLATION GENERAL LOCATION

- A. Plans indicate general location and arrangement of piping systems. Identified locations and arrangements are used to size tubing and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.

### 3.4 INSTALLATION, COPPER TUBING

- A. Pressure Rating: Install components having a pressure rating equal to or greater than the system operating pressure.
- B. Install piping free of sags, bends, and kinks.
- C. Change in Direction: Install fittings for changes in direction and branch connections. Changes in direction may also be made by bending of Types K and L tube.
- D. Press Connections: ProPress G fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer.
- E. Threaded Joints: Threaded joints shall have pipe joint compound or teflon tape applied to the male threads only. Tighten joint with a wrench and backup wrench as required.
- F. Flared Joints: Flared copper tube joints shall be made by the appropriate use of cast copper alloy fittings. Flared ends of copper tube shall be of the 45-degree flare type and shall only be made with a flaring tool designed specifically for that purpose.

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- G. Pipe Protection: Provide protection against abrasion where copper tubing is in contact with other building members by wrapping with an approved tape, pipe insulation or otherwise suitable method of isolation.
- H. Penetration Protection: When located within 1 inch of the finished wall or ceiling, provide safety plates a minimum of 18 gauge extending 1 inch beyond the tubing penetration. Provide allowance for thermal expansion and contraction of copper tubing passing through a wall, floor, ceiling or partition by wrapping with an approved tape or pipe insulation, or by installing through an appropriately sized sleeve. Penetrations of fire resistance rated assemblies shall maintain the rating of the assembly.
- I. Backfill Material: Backfill material shall not include any ashes, cinders, refuse, stones, boulders or other materials which can damage or break the tubing or promote corrosive action in any trench or excavation in which tubing is installed.
- J. Horizontal Support: Install hangers for horizontal piping in accordance with MSS-SP-69 or the following maximum spacing and minimum rod sizes:

Nominal Tube Size (inches)	Copper Tube Max. Span (feet)	Minimum Rod Diameter (inches)
Up to 3/4	5	3/8
1	6	3/8
1-1/4	7	3/8
1-1/2	8	3/8
2	8	3/8

- K. Vertical Support: Vertical copper tubing shall be supported at each floor.
- L. Galvanic Corrosion: Hangers and supports shall be either copper or vinyl coated to prevent galvanic corrosion between the tubing and the supporting member.

### 3.6 PURGING

- A. Purging: Air shall be purged from the gas piping. The air shall be displaced with the fuel gas.

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