APPLICATION DATA SHEET

COPPER • BRASS • BRONZE

Using Flexible Copper Gas Tubing

INTRODUCTION

Copper Gas Tubing—the *flexible* approach for supplying today's homes with clean, comfortable fuel gas. Copper tubing means convenience, safety, and ease of installation for plumbers, builders and homeowners alike.

For decades, the excellent performance of copper tube has been demonstrated in many applications: water supply and drainage; medical gas; heating, ventilating and air conditioning (HVAC); and automaic fire sprinkler systems.

Now flexible, convenient, copper tubing is demonstrating its value again, in supplying natural gas and liquefied petroleum (LP) gas—today's fuels of choice for residences.

ADVANTAGES OF FLEXIBLE COPPER TUBING

Copper tubing gives builders and contractors all these advantages, as compared to traditional black iron pipe:

- Copper tube's flexibility allows sharper bends and easier installation, particularly in confined spaces.
- Flexible copper tubing can be snaked and routed easily through typical wall and ceiling construction. This makes it easier and more economical to bring all the advantages of modern natural gas service to more locations throughout new and renovated residences. For example, safe, convenient gas fireplaces can easily be located in upstairs bedrooms, or a quick-connect outlet installed outdoors on the deck for a gas barbecue grill.
- Easy joining means a faster, less expensive installation as compared to traditional black iron pipe.
- Long lengths (up to 100 feet standard) make it possible to eliminate joints in walls, floors and ceilings. This improves safety by minimizing the potential for leaks.

TIME AND MONEY

These advantages add up to an easier, faster, less expensive installation. For new one- and two-family dwellings, copper gas systems are often the least expensive solution. For multistory buildings, use of flexible copper tubing can make installation of natural gas service competitive with electricity for heating, laundry and cooking. Copper tubing's smaller size also makes it easier to sub-meter individual apartments and condominiums, since utility meters can be grouped closely together.

For present gas consumers, copper tube offers maximum ease for retrofit installation of new gas equipment and appliances (such as a quick-connect outlet for an outdoor gas barbecue or a gas fireplace in the master bedroom).

The bottom line: increased gas service for both new and existing residences.

HIGH AND LOW

Copper tubing can be used to supply both low-pressure natural gas systems (those operating at less than 14" water column or 0.5 pounds per square inch gauge) and elevated-pressure systems (up to 5 psig). Currently, 2 psig systems are the most common elevated-pressure systems used for residential and light commercial installations. Since elevated-pressure means smaller pipe diameters, gas supply systems operating at 2 psig and higher are a perfect application for flexible copper gas tubing.

DESIGNING RESIDENTIAL GAS SYSTEMS

There are two main types of natural gas distribution layouts. One uses a main run with lines branching off to supply gas to individual appliances. The other uses individual runs of flexible copper gas tubing, sometimes called "home runs," to each appliance from a gas distribution manifold (**Figures 1** and **2**). Combinations of these two basic types of systems are also used.

Figure 3 shows a typical layout for a multi-unit building. The use of flexible copper gas tubing makes it simple and economical to provide individual gas metering for condominium or apartment units.

INSTALLING COPPER FUEL GAS SYSTEMS

Installing interior fuel gas systems using flexible, durable copper tubing is quick and easy compared with traditional systems based on threaded iron pipe.

Tubing run horizontally is fastened to joists or beams using clips spaced a

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Figure 1. Low pressure system with individual runs.

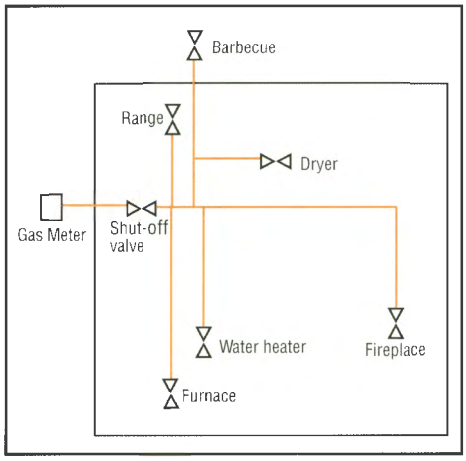


Figure 2. Single-regulated elevated pressure system with individual runs.

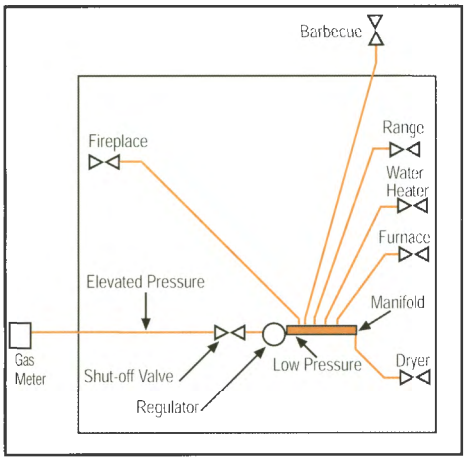


Figure 3. Example of verticle subdivision in a multistory residential building.

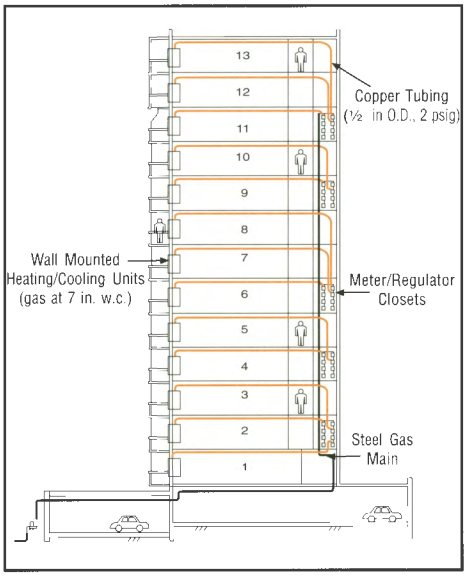
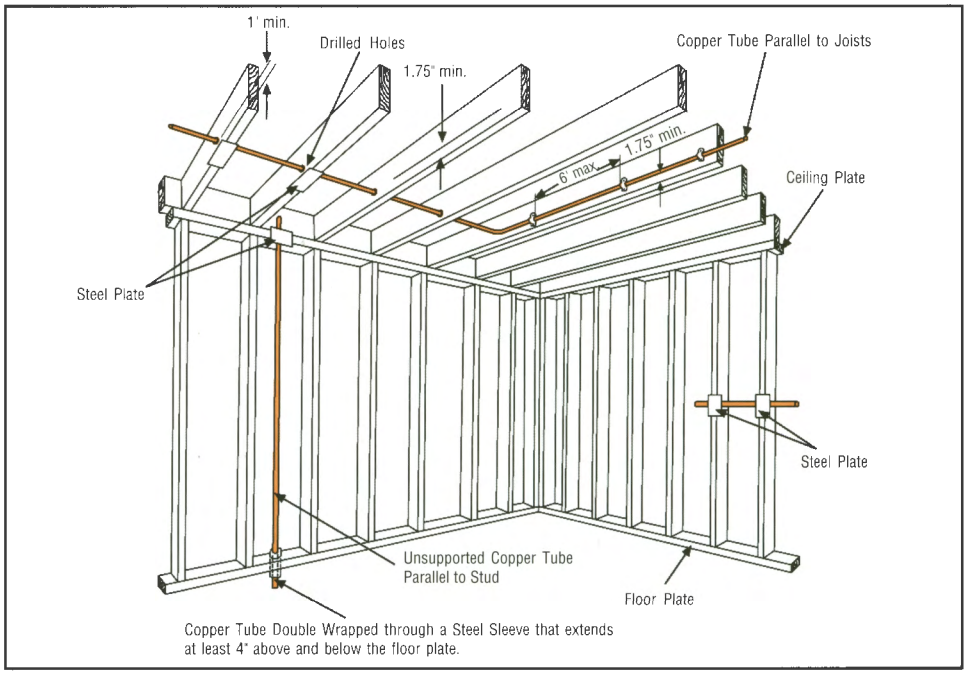


Figure 4. Example of verticle subdivision in a multistory residential building.



maximum of 6 feet apart. Tubing run vertically through wall construction does not need to be supported. Where tubing runs through holes drilled in joists, studs or other wood structural members, it is protected with steel sleeves or striker plates if the edge of the tube is 1-3/4 inches or less from an exposed edge; this is for protection against accidental nail damage. **Figure 4** shows the most common gas copper tubing installation conditions.

Flexible copper tubing systems require fewer joints than black iron pipe, particularly when using distribution manifolds with individual runs of copper tube to each appliance. Required connections can be made with either mechanical brass fittings or (where permitted by local codes) brazed joints. Interior copper tubing is connected to the gas company's steel supply pipe using a special threaded-to-flared adapter fitting.

CODES AND STANDARDS

Flexible copper tubing has been used successfully with natural and LP gas systems for over 30 years in the United States and Canada. Its use is permitted by both countries' regulatory standards, the **National Fuel Gas Code** (**ANSI Z223.1/NFPA 54**) and the **National Gas Installation Code** (**CAN/CGA B149.1**).

Copper tubing for fuel gas supply systems is manufactured to the following ASTM specifications:

Type K	underground	ASTM B 88
Type L	interior	ASTM B 88
Type G	above ground	ASTM B 837

Type Gas copper tubing is recommended for all new installations of interior fuel gas systems. It is available in standard straight lengths up to 20 feet (3/8-inch to 1-1/8 inch diameter), and in coils up to 100 feet (3/8-inch to 7/8-inch diameter).

FOR MORE INFORMATION

For more detailed technical information about designing and installing interior fuel gas systems, see the Copper Development Association design guide, **Fuel Gas Distribution Systems: Copper Tube** (Publication no. A4006-96/96).