



# COPPER

## Tubing for Mechanical Systems

Large diameter or small, liquid system or gas, high pressure or low, in wide temperature ranges, you can depend on copper and reduce installed costs for any mechanical system. Turn the page for details.

 Copper builds confidence

## Copper's versatility is the key to its popularity.

Standardize on copper for superior performance throughout the job.

Copper is easy to work and has excellent thermal conductivity, corrosion resistance and durability. It is available in two basic types of tube—plumbing tube and air conditioning/refrigeration (ACR) tube, and in both drawn ("hard") and annealed ("soft") tempers. Copper tubing is also available in a wide range of diameters (from 1/8 inch to 10 inches) and wall thicknesses. And fittings to suit every design application are readily obtained.

## Copper is recommended for all these applications.

In mechanical systems of all kinds, copper does more than ever before.

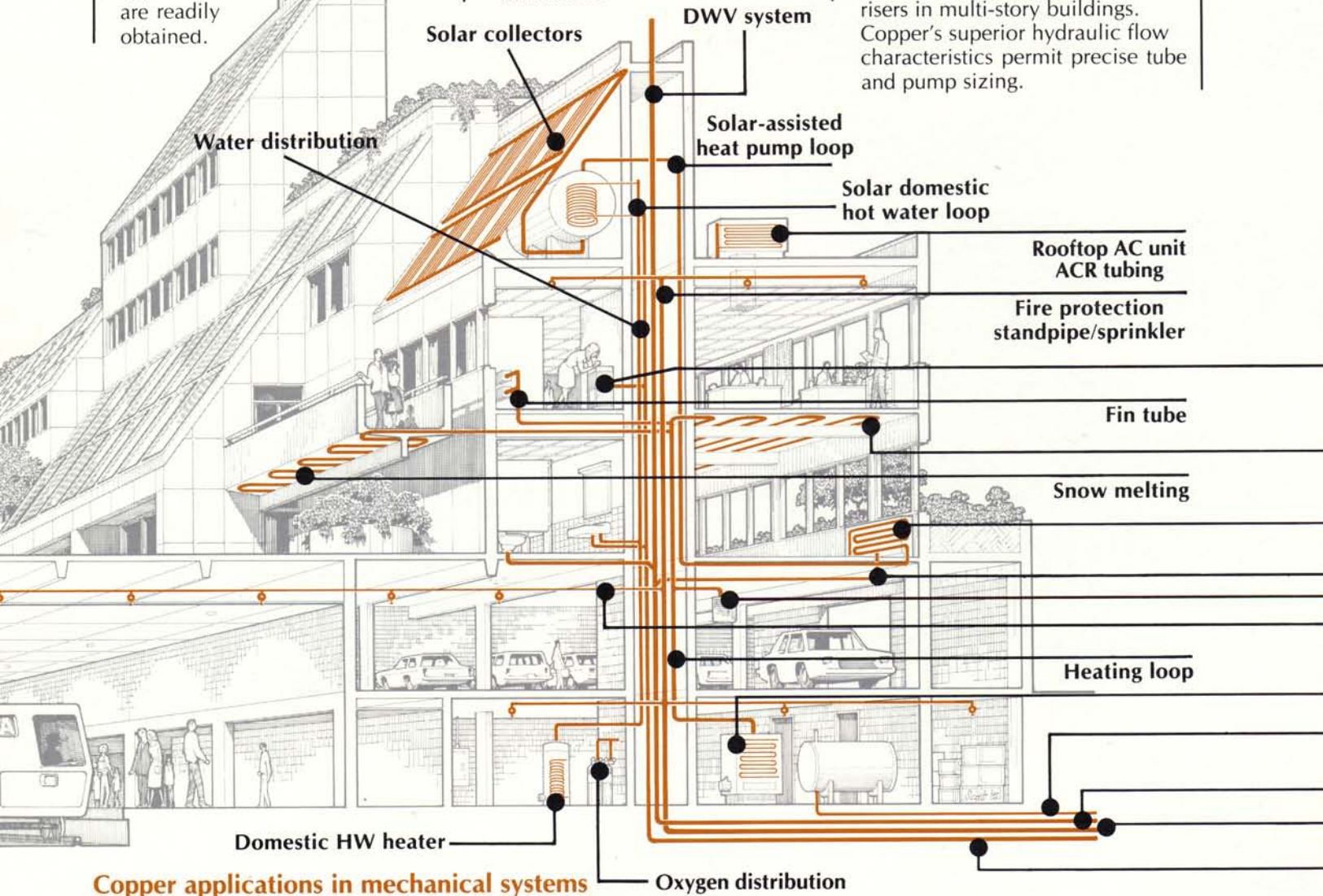
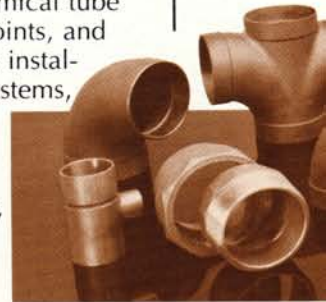
Today, copper has proven superior not only for underground water and gas services, water distribution systems and chilled water mains, but for drainage and vent systems, heating (including solar heating), fuel oil, and oxygen systems. Copper is durable enough to embed in concrete. In drainage systems, the copper Sovent™ single-stack configuration dramatically cuts plumbing costs for multi-story buildings. See the drawing below for a comprehensive list.

™ O.H.C. Messner.

## Copper's wide range of sizes gives you sizable advantages.

Large diameter or small, there is copper tube to fit every specification.

Whatever the specifications, copper tube is available in the appropriate size. Forced circulation hot water heating systems use small and economical tube sizes with soldered joints, and require less space for installation. In drainage systems, Type DWV tube has been used successfully for many years. Larger diameter tube, joined by soldering or brazing, is cost-effective for water distribution and for fire protection risers in multi-story buildings. Copper's superior hydraulic flow characteristics permit precise tube and pump sizing.



Copper applications in mechanical systems

## All-copper mechanical systems mean no-problem performance.

Use of one material is good engineering practice.

The more copper used throughout an installation, the more you can count on depend-



able performance. Copper is known for its reliability. It has been used for plumbing and mechanical systems since metals were first employed in these applications. And its popularity in heating systems is further indication of copper's superiority to substitute materials. When copper alloys are used for all system components, there is no problem with compatibility.

## Copper is long-lasting and maintenance-free.

Copper has stood the test of time to earn customer satisfaction and wide code acceptance.

Copper, used for centuries, has gained new popularity in its modern form—light, strong, corrosion-resistant tube. Its long-lasting and maintenance-free characteristics make copper the leading choice for plumbing, heating, cooling and other mechanical systems. Copper systems never require painting for protection from corrosion. In addition, a thin film forms inside the tube, providing natural protection from corrosion. Copper's trouble-free service means satisfied customers. And its universal acceptability assures compliance with major building codes. Copper is safe, too. It will not burn or support combustion. So it will not carry fire through floors, walls and ceilings and it will not decompose into toxic gases.

## Copper has proven corrosion resistance.

Resistance to corrosion and scaling gives copper tube superior flow capacity.

Copper's excellent corrosion resistance is an important reason for its choice in so many applications. Solar energy systems, for example, benefit from copper's resistance to both atmospheric and aqueous corrosion. For water distribution and fire sprinkler systems, copper tube's



internal corrosion resistance results in superior flow capacity. When calculating flow capacities, other plumbing materials require additional allowances for corrosion, scaling, out-of-roundness, and smaller internal diameter when compared size-to-size with copper. Copper tube bores remain smooth, and internal diameters stay constant. Largely because of this, a copper fire sprinkler system can use smaller diameters to provide the same sprinkler coverage as a steel system—with significant savings in installed costs.

Water cooler  
ACR tubing

Radiant heating

Heat pump coils

DWV system

Fan coil unit

Sprinkler system

Heat exchanger

Fuel lines

Fire service

Building drain  
DWV system

Domestic water service

## Copper's high thermal conductivity is crucial in many applications.

### Copper conducts heat up to 8 times better than other metals.

In any application involving heat transfer—from radiant heating to snow melting to solar—copper's high thermal conductivity provides an advantage. Comparing copper, aluminum and steel, copper is by far the best conductor of heat...up to 8 times better. In solar energy systems, copper's superior thermal conductivity means that thinner copper sheet can collect the same heat as much thicker-gauge sheet of aluminum or steel. And it means that copper collector tubes can be more widely spaced.

## Copper is easy to join and install.

### Copper adds to system integrity while lowering installation costs.

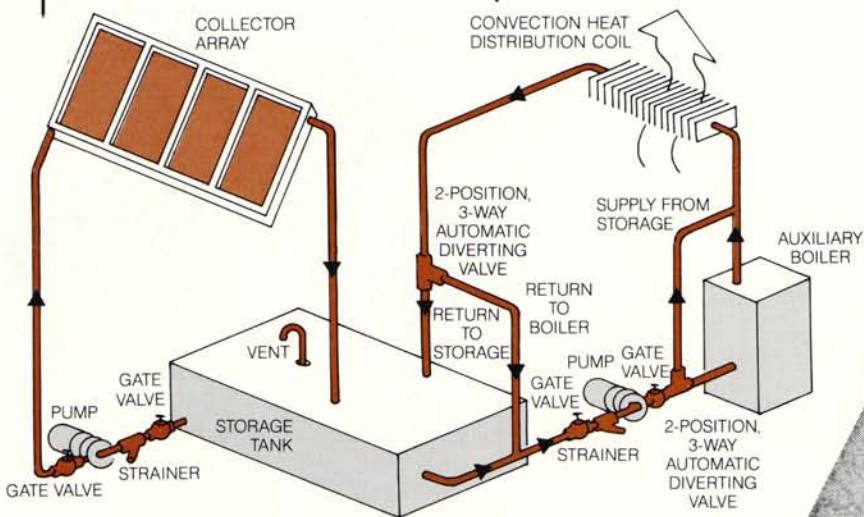
Copper's workability can cut installation time and reduce labor costs. Tubes and fittings are easily joined metallurgically by soldering or brazing. And copper is so ductile that it can be formed—frequently right on the job site—to fit most design configurations. Because of copper's formability, it is often possible to eliminate elbows and joints. Since copper is rigid as well as readily formable, it adds to total system integrity even when subjected to adverse conditions.

## Copper is abundantly available.

### U.S. copper supplies are sufficient for many hundreds of years.

If all the copper tube produced in the U.S. over the past 30 years were laid end to end, it would stretch 200 times around the earth! And—there's still much more copper available.

Since 1970, over 90% of the copper and copper alloys used in this country have been supplied from domestic sources. The U.S. will remain self-sufficient in copper for years to come. At present use rates, we still have resources plentiful enough to last hundreds of years. In addition, recycling keeps copper in good supply. Almost half the copper used in the U.S. comes from recycled scrap. This copper recovered from scrap can continue to be used over and over again in mechanical systems in all types of installations.



Solar energy system using water collection and storage with a series configuration in which heat is supplied by either the solar system or the auxiliary boiler.

Visualize the copper on earth as a hypothetical cone of resources. Until now, man has found, extracted and recycled only a slice off the tip of that cone.

