

Copper is....

Copper is....

Copper is the metal of civilization

Copper is essential for modern living. It delivers electricity and clean water into our homes and cities and makes an important contribution to sustainable development. More than that, it is essential for life itself.

Copper is interwoven with the story of humanity's progress. Its crucial role in our homes, in transportation, as well as in infrastructure and in our industries is omnipresent. So, what are the special features of this metal that make it indispensable in the modern world?

This publication from the Copper Development Association Inc. looks at the properties and applications of one of our planet's most versatile resources: copper, along with its value to our society, today and tomorrow.



Copper is....

A Family of Alloys

For many applications, properties of copper can be readily customized. This is achieved by alloying: making a new metal out of two or more different metals. The most well-known copper alloy families are brass (copper-zinc), bronze (copper-tin) and copper-nickel. These actually represent families of alloys, all made by varying the amount of specific alloying elements. Alloys can be made to achieve certain colors, improve strength or corrosion resistance, improve forming or joining properties, or achieve any number of specific demands that the individual elements can't achieve on their own. By combining copper with other metals and adjusting the percentages, alloys are made to fit almost any application.

Copper is....

Essential



Copper is an essential trace element vital to the health of all living organisms.

Copper nutrition is important for pregnant women, the developing fetus and newborn babies. In our bodies, copper enhances bone strength, red and white blood cell maturation, iron transport, cholesterol and glucose metabolism, heart muscle contraction and brain development. Avoiding copper deficiency requires a recommended daily intake of about 1mg. Good dietary sources of copper include dark chocolate, nuts, seafood, legumes, liver and green leafy vegetables.

Copper is....

A Natural Element



We're in no danger of running out of copper. Worldwide resources of this important and valuable metal are estimated at more than 8.1 trillion pounds of which only about 1.1 trillion (~13.6%) have been mined throughout history. Copper's ability to be recycled, again and again, without any loss in performance, is an important sustainable benefit.

Copper's technical and social values, combined with its infinite recyclability, make it one of the important materials for building a sustainable world.



BANKING
HOURS
10 AM TO 2 PM
SATURDAYS
10 AM TO 12 NOON

This is NOT
the Museum
Building

Copper is....

Sustainable

Among the hundreds of wonderful things copper is used for in and around our homes, it is probably recognized first as a plumbing material. Copper plumbing requires no maintenance, meets or exceeds building codes in all 50 states, won't burn or break down, and can last for the life of your building.

Additionally, the spires and roofs from the celebrated castles and cathedrals of Europe to the solid copper "Golden Temple" in Kunming, China, or the famous baptistery doors of Italy's Florence Cathedral, copper and its alloys, bronze and brass, continue to serve as decorative and functional elements on some of the world's oldest and most famous architecture.

Copper is....

Conductive

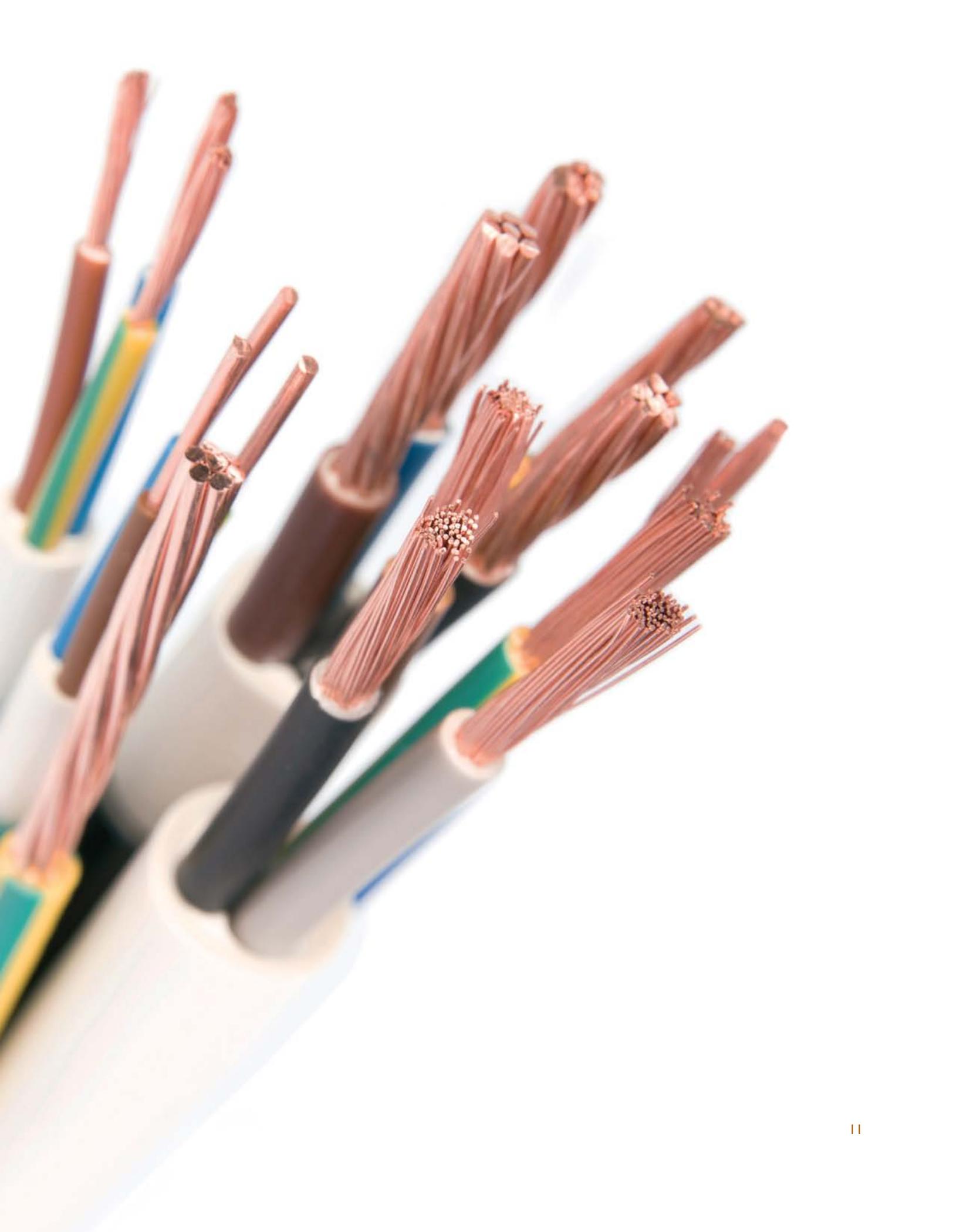


Conductive of heat:

Copper has the highest thermal conductivity of any engineering metal. When good heat transfer is essential, as in heat sinks and refrigeration units, copper and brass are excellent choices. Top-quality saucepans are copper-bottomed to provide uniform heating and are, still today, the choice of professional chefs.

Conductive of electricity:

Copper has the highest electrical conductivity of any engineering metal, with this property accounting for nearly 65% of its use. It reduces electrical energy losses, improves energy efficiency, and optimum use can reduce the lifetime operating cost. From high voltage transmission to micro-electronics, and from gigawatt generators to personal computers, in every aspect of electricity generation, transmission and use, copper is the vital, energy-efficient, reliable metal.



Copper is....

Colorful



No other metal has a range of attractive colors comparable to copper and its alloys. The red of copper and its green patina, the gold of the brasses and aluminum bronzes, the chocolate-brown of manganese bronzes and the shiny white nickel-silvers enable designers to exploit their artistic talents. Surface treatments can provide even more colors if desired.

Copper is....

Antifouling

Biofouling is the gathering of undesirable materials, such as algae and barnacles, on wet surfaces, like the undersides of boats. It can lead to intake pipes getting blocked and ship hulls being completely coated with materials that create drag as the boat moves through the water. In the 18th Century, copper cladding was used on wooden ships to combat biofouling and attack by the notorious Teredo Worm. Today, copper-nickel alloys are used to protect offshore platforms, boat hulls, seawater pipework and desalination units. Modern fish farms are starting to use copper alloy cages to hold fish while keeping out predators. These require minimal maintenance and provide a safe and healthy environment for fish to grow.

Copper is...

Durable

Indoors, copper and its alloys will very slowly darken in color, but they will not rust. This darkening does not damage their function, which is very important for items such as water and gas pipes, taps and electrical wires. If desired, decorative items such as jewelry, light fixtures and door hardware are easily polished to restore a bright surface.

Outdoors, copper and its alloys will gradually attain an attractive, stable patina that enhances the appearance of statues, roofs and other decorative and architectural items.

It is no wonder that architects and designers choose copper time and again.



Copper is....

Aesthetic



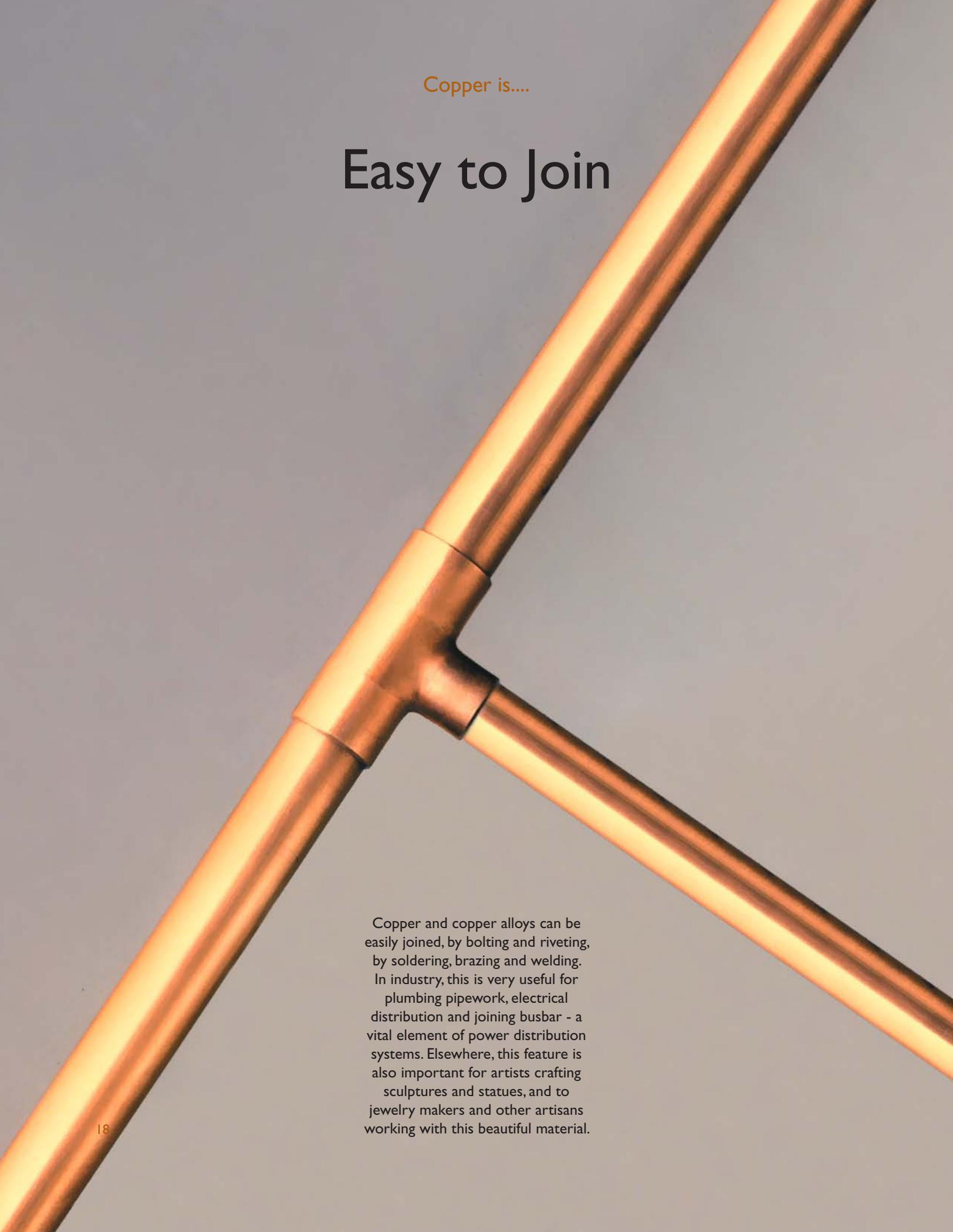
Copper has always fascinated people with its beauty and elegance. It respects tradition, but at the same time enables new and appealing architectural and design solutions. The pleasing appearance of copper and its alloys adds a feeling of quality, even prestige, to public spaces, furniture, design objects and decorative items for the home.

Copper is....

Antimicrobial



Humans have exploited the inherent antimicrobial properties of copper since the dawn of civilization. Scientific research demonstrates copper's antimicrobial effect and supports its use in applications where control of contamination benefits society, such as healthcare, heating & air-conditioning and public transport. Copper alloys are the only solid surfaces registered with the U.S. Environmental Protection Agency as antimicrobial public health products.



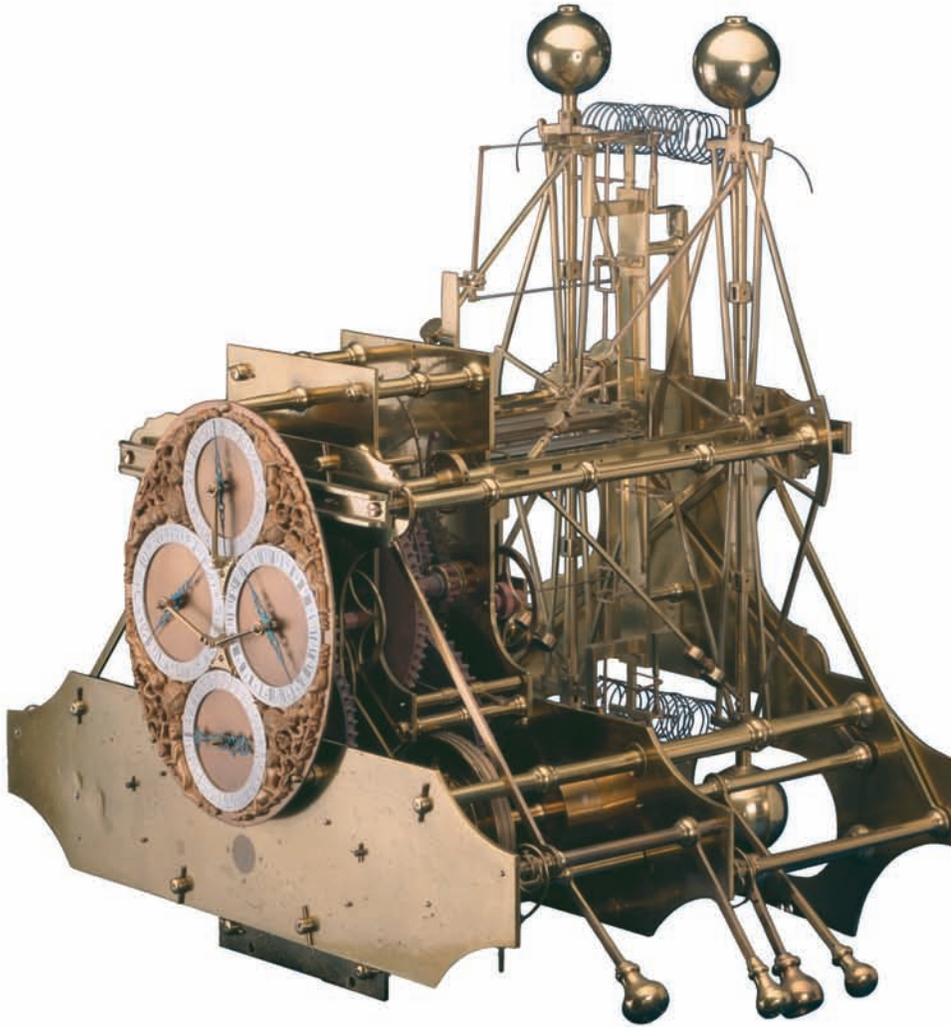
Copper is....

Easy to Join

Copper and copper alloys can be easily joined, by bolting and riveting, by soldering, brazing and welding. In industry, this is very useful for plumbing pipework, electrical distribution and joining busbar - a vital element of power distribution systems. Elsewhere, this feature is also important for artists crafting sculptures and statues, and to jewelry makers and other artisans working with this beautiful material.

Copper is....

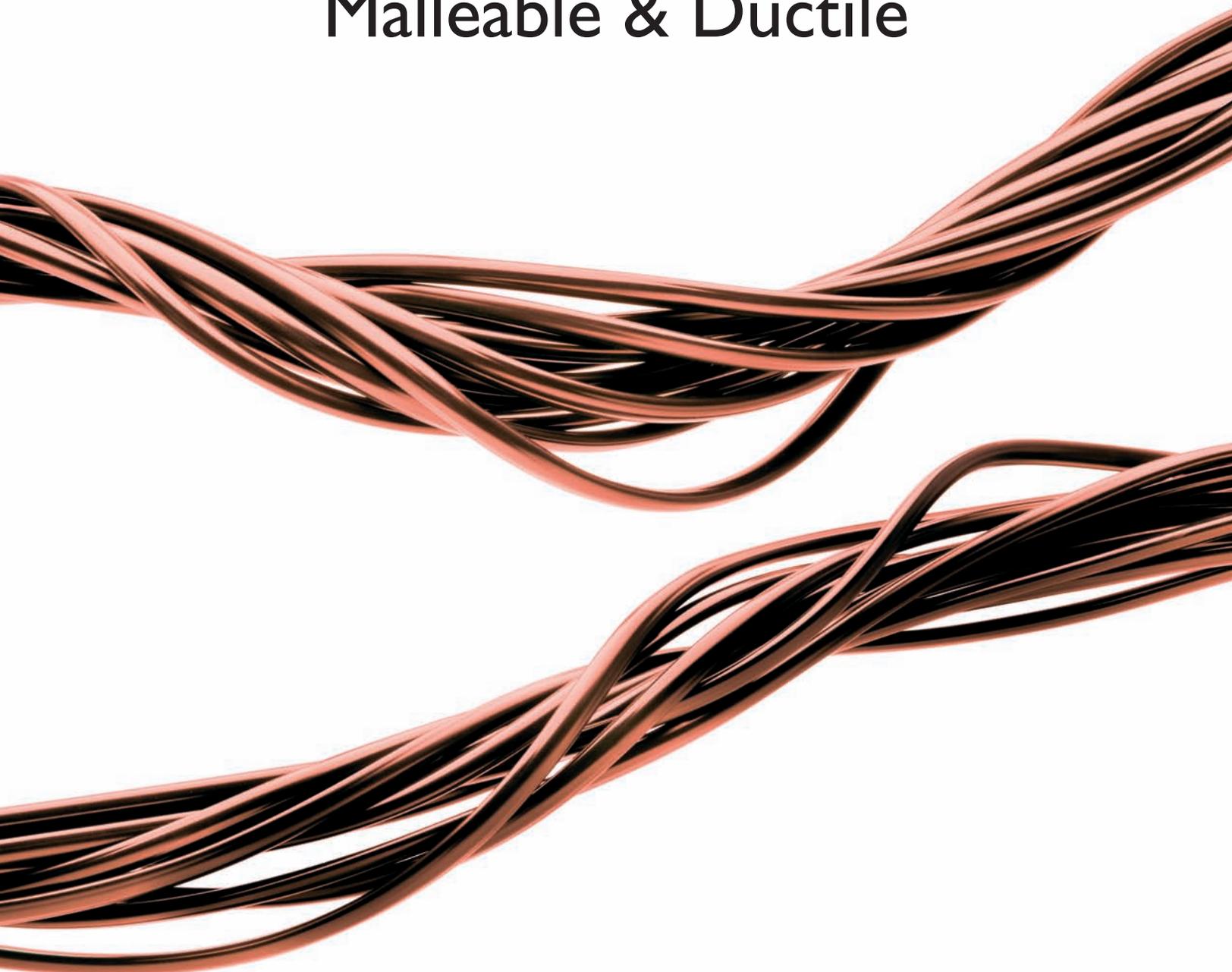
Versatile



In hazardous environments, copper is non-magnetic and non-sparking. Because of this, alloys such as beryllium copper are used for special tools where a spark would be dangerous, such as around flammable liquids or explosive gases. They are also important in military applications, such as minesweepers, which must have a low magnetic permeability. The famous sea clocks and watches made by John Harrison in the 18th Century, which helped solve the problem of longitude, could not have been made without extensive use of brass and tin bronze.

Copper is....

Malleable & Ductile



Copper can be formed and stretched into complex and intricate surfaces without breaking. This makes it possible to create spires, steeples, musical instruments, bowls, bed frames, tubes and a huge number of other useful and beautiful products. The very small diameter wires, which transmit power in cars, computers, televisions, lighting and mobile phones only exist because of the high ductility and malleability of copper.

Copper is....

Recyclable



Copper exists in naturally-occurring ores and, in the US, is mined primarily in the southwest. As copper is recycled, again and again, without any loss of performance, it is rarely lost from the world's resources. Today, around half of North America's demand for copper is met with recycled material.

Copper is....

Easily Shaped



Copper is very easy to work with, and can be shaped into nearly any form, offering cost-effective products for industrial and consumer applications alike. Along with its alloys, such as brass and bronze, it has been used for many centuries to produce tube, sheets for roofing and cladding of buildings, and wire for electrical applications and jewelry. It can be made into complex shapes, as demonstrated by the intricate curves of brass instruments. It is also cast to make faucets and valves, bells and statues that last for hundreds, or even thousands of years.

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