



Photo courtesy of Ecossea

## MARINE METAL OF HONOR

For over a half century, copper alloys, and particularly the copper-nickel alloys, have proved to be important metals in the marine industry, helping to control salt-water corrosion and the growth of barnacles and algae on boat hulls and marine apparatus.

Developed to prevent seawater corrosion in marine piping systems, the marine industry soon recognized that Cu-Ni alloys have natural antifouling properties that prevent the buildup of waterborne organisms on ship hulls and offshore marine equipment. Ships that use copper-nickel cladding on their hulls do not require the application of special antifouling coatings or extensive cleaning regimes to remove biofouling agents. With fewer clinging barnacles, vessels move faster through the water and use less fuel.

Manufacturers have developed various methods of applying copper to boat hulls — the most recent is a granular copper-nickel application epoxied to hulls called Cuprotect™ developed by Ecossea, a British company.

For more information visit [www.coppernickel.org](http://www.coppernickel.org) or visit the CDA Web site at [www.copper.org](http://www.copper.org) (Applications/Marine.) **Cu**

## An Important New Ally in Fight Against Germs

The spread of infectious and often deadly diseases in our hospitals has been deemed a major threat to patient safety by the U.S. Centers for Disease Control (CDC), which estimates that infections acquired in healthcare facilities result in nearly 88,000 deaths each year in the USA.

As the CDC advocates improved sanitary procedures to ensure the health and safety of patients, there is important new research that shows copper and its alloys, such as bronze and brass, can be valuable allies in the fight against infection.

Every year, nearly 2 million patients are infected while receiving health care in U.S. hospitals. Most infections are spread from direct or indirect contact with an infected healthcare worker and are especially common in intensive care units where the use of body-invasive equipment makes transmission of germs much easier.

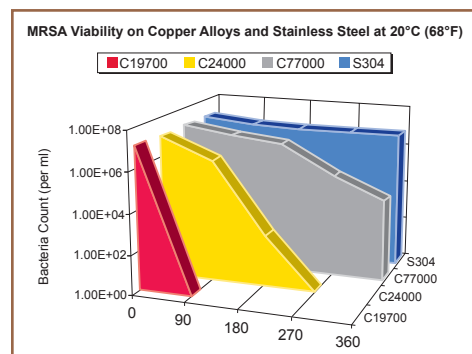
### A Growing Threat: Drug-Resistant Bacteria

Adding to the problem, hospital infections are growing more resistant to antimicrobial drugs. One of the deadliest bacteria found in hospitals today is Methicillin Resistant *Staphylococcus Aureus* (MRSA), a so-called “superbug,” which does not respond to conventional antibiotics.

Drs. C. William Keevil and J.O. Noyce of the University of Southampton in England recently announced exciting new findings that could help prevent the spread of MRSA bacteria.

At the annual meeting of the American Society for Microbiology last May, they reported that copper is able to stop the spread of MRSA by limiting the time the bacteria are able to stay alive on its surface.

Their study determined that MRSA can survive for only 90 minutes on a sur-



MRSA bacteria thrive on stainless steel (blue) but die off quickly on copper (red) and copper alloy surfaces.

face made from 99% copper, yet stays alive for 72 hours or more on stainless steel — the most common metal used in healthcare facilities today.

### Preventing Foodborne Illness

A similar study demonstrates that copper is also effective at eliminating *Listeria monocytogenes* — a bacterium that originates in soil and water and is spread during food handling.

Some 500 people die from *Listeria* contamination every year, according to the CDC, and approximately 2,500 get sick. Eliminating bacteria like *Listeria* is one of the reasons we rinse raw vegetables and fruits before eating and are instructed to cook all meat and poultry thoroughly.

When *Listeria* bacteria are placed on a copper, brass or bronze surface, they survive only 60 minutes, the study found. However, the bacteria can survive for up to several days on stainless steel, the predominant work surface used in restaurants.

Research is continuing, but these and other studies suggest that a better choice for both food handling and hospital applications would be doorknobs, push plates, work surfaces, and other hardware products made from durable, cost-competitive copper alloys.

For more information on copper's antimicrobial properties, visit [www.copper.org/environment/homepage.html](http://www.copper.org/environment/homepage.html). **Cu**

# Cu Newsbriefs

## A LITTLE COPPER GOES A LONG WAY

Although our bodies require only a small amount of copper—the Recommended Dietary Allowance (RDA) of copper is 0.9 milligrams per day for adults—its contribution to human health is undeniable and as essential as calcium, iron and zinc.

As a nutrient present in our bodies from conception, copper helps to form a developing infant's heart, skeletal and nervous systems, as well as arteries and

blood vessels. For this reason, expectant mothers should increase copper intake to at least 1 mg per day; a nursing mother's RDA is 1.3 mg (not to exceed 8 mg per day).

Copper continues to play a vital role in our bodies as we age — keeping our hair and skin in good condition while repairing and maintaining connective tissue in our hearts and arteries. It also facilitates absorption and utilization of iron and enables cells to use the energy present in carbohydrates, proteins and fats.

A lack of intake or improper balance

of copper, iron and zinc can result in poor copper status, which over time may lead to heart and circulatory problems, bone abnormalities and complications in the immune system. A consistent, well-balanced diet that contains a variety of foods will assure you're getting the right amount of copper and other essential nutrients on a daily basis. Seafood, nuts, whole grain products, wheat bran cereals, organ meats (such as liver), raisins and chocolate are all dietary sources of copper.

More information on copper and health is available at the Copper Development Association's *Copper In Your Home* Web site under "Environment and Health" at [www.copper.org/copperhome](http://www.copper.org/copperhome). **Cu**

## ROYAL NAVY FLEET FIRST TO USE COPPER

The British first developed the technique of applying copper sheathing to ship bottoms to improve sailing performance. The first wooden ship to be fully sheathed in copper was the 32-gun English frigate, the *HMS Alarm*, in 1761.

By 1782, 82 British Navy capital ships had been coppered, along with 115 frigates and 102 sloops and cutters. In the process, the British fleet solved another of its biggest problems — the corrosion of a ship's iron bolts. It discovered that bolts made from an alloy of copper and zinc had the strength and corrosion-resistance to solve the problem.

Using copper sheets below the waterline was an innovative development that helped the British battle its numerous naval opponents in the American Revolution, including France and Spain, who had combined forces to fight against the British in the young colonies' struggle for independence. **Cu**

### RESOURCES:

This edition of Discover Copper is also available online at [www.copper.org](http://www.copper.org). For more information on the companies mentioned in this newsletter go to:

[www.nutrition.gov](http://www.nutrition.gov) — A guide to nutrition and health information available on Federal Government Web sites.

[www.BabyCenter.com](http://www.BabyCenter.com) — Pregnancy/Nutrition

[www.eco-sea.com](http://www.eco-sea.com) — Copper-nickel boat hulls

