Copper Provides Protection Underneath the Surface

A one-of-a-kind MRI machine
is held in a room completely lined with copper

If you've ever needed medical treatment for a severely sprained limb or been hampered by back pain, most likely you've undergone Magnetic Resonance Imaging, or as it's more commonly referred to as an MRI. An MRI uses a magnetic field and radio waves to create detailed images of the body, specifically contrasts between soft tissues of the body like tendons and muscles.

For accurate imaging and diagnosis, any potential source of interference to the MRI process must be eliminated. Patients being screened or imaged must remove all jewelry and metal objects. Further, the room that houses the MRI machine must be lined with copper or steel for magnetic shielding.

The Providence St. Vincent Medical Center in Portland, Oregon is home to one of the most advanced MRI systems in the world and they have it placed in a room entirely encased in copper.

The advanced neurosurgical imaging system is called an "IMRISneuro." The unit is housed within a fully integrated operating room with a truly one-of-a-kind movable MRI. This technology allows surgeons to safely capture images of patients undergoing complicated procedures such as brain surgery, directly in the operating room, providing real-time guidance and feedback for more precise results and better patient outcomes.

"IMRIS MR Imaging System leverages all of the diagnostic functionality of the MRI technology and combines it with the unique patented IMRIS technology, which transports and controls the MRI to clinical imaging locations," said IMRIS director of customer engineering & program management, Hong Yu. "The system provides the surgeon with high resolution, timely images for use in surgical planning, intra-operative assessment, and post-operative evaluation."

But all that makes this new technique successful can't be seen with the naked eye. Hidden behind the walls, floor and ceiling of the room housing the MRI is over 1 million square inches of copper sheet, and approximately 15,000 feet of soldered joints. This hidden, yet vital copper system provides electromagnetic shielding, also known as RF shielding, which is required for optimum MRI image quality.

Copper's ability to block radio waves, makes it ideal for smaller, but no less vital applications in the MRI room. The metal is also being used to shroud electron tubes, transistors and integrated circuits to prevent radio frequency interference.

"There is less magnetic pull force with copper than with other metals, particularly in the floor," Yu said. "Copper is also a better conductor and shielding material."

This particular type of MRI is not only rare for the west coast, or even the United States. Providence St. Vincent is only one of 16 in the world to have such a setup for this type of MRI, and allows foreign medical teams to come in and observe and train in the medical suite.

For such an important location for the medical world, it's only proper that it is encompassed by mankind's oldest and most reliable metal.

To learn more about copper and its use in making today's buildings more effective, more efficient and more durable, please visit www.copper.org.