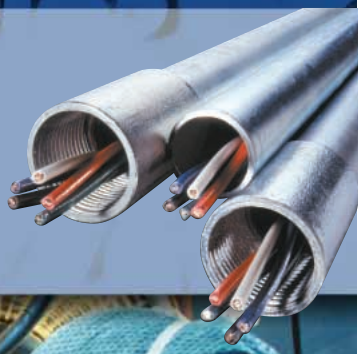
STEEL CONDUIT



The Perfect Prescription for EMI

Operating Room, Major Hospital, New York City

‘ONCE YOU SHOW THEM HOW STEEL CONDUIT R

Larry Maltin knows the high cost of retrofitting buildings to eliminate the effects of electromagnetic fields (EMF) on computer terminals and other sophisticated electronic equipment.

He should. His company, Amuneal Manufacturing Corporation, designs and installs shielding using low-carbon-steel or AMUMETAL plates to eliminate the electromagnetic interference (EMI) caused by electromagnetic fields at DC and 60Hz levels. These problems range from distortion of images on monitors, loss of data integrity and disruption of vital communication links.

Larry’s also a firm believer in the old adage about an ounce of prevention. That’s why Amuneal, whenever it can, recommends steel conduit to reduce these electromagnetic fields.

“It’s far more cost-effective to use steel conduit to carry a building’s electrical conductors in the first place than it is to have to come back later and install shielding,” he says. “Once you show them how steel conduit reduces EMI, it becomes the obvious choice.”

A growing portion of Amuneal’s business comes from consulting services aimed at eliminating EMF problems before they occur. Its services are backed by the expertise built up over 30 years of trouble-shooting assignments dealing with low-frequency magnetic interferences.

The Philadelphia company is held in high regard by major electric utilities such as Philadelphia Electric Company, Consolidated Edison Company of New York and Commonwealth Edison Company of Chicago. That’s led those utilities to recommend Amuneal to customers planning major new building projects.

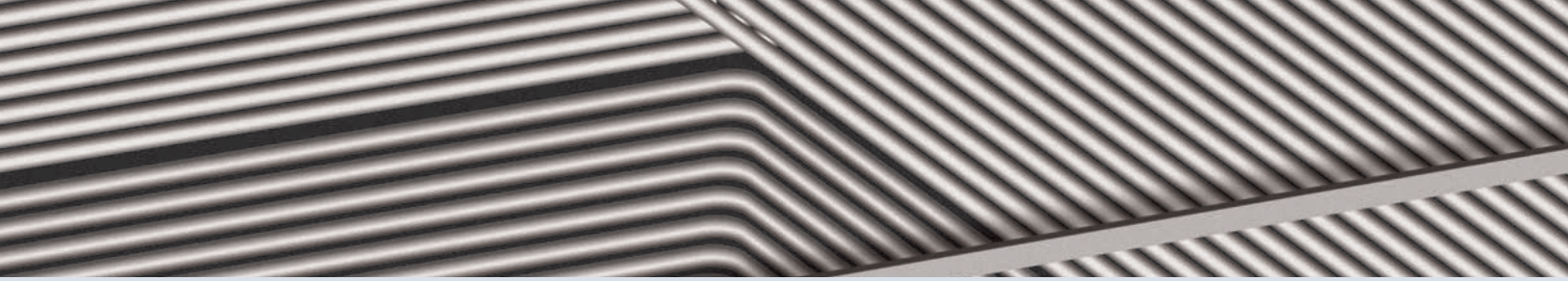
Conduit Pays Off In Two Building Upgrades

Two recent consulting projects in New York City illustrate Amuneal’s reliance on steel conduit.

Amuneal was called in to review the plans developed by a major hospital in New York City to upgrade its operating room facilities. The work involved installation of 500-KVA and 1,000-KVA transformers on the floor above the operating rooms, and all the conductors used to distribute the power to the facility.

A major element of Amuneal’s recommendations was the use of rigid steel conduit to enclose two large conductors running on the ceiling

Steel Conduit. Get wired for the future.



REDUCES EMI, IT BECOMES THE OBVIOUS CHOICE'

slab of the operating room. Based on the size of the conductors, the firm recommended the use of dual steel conduit in which a 4" diameter steel conduit was run inside 6" diameter steel conduit.

"A single steel conduit might have done the job," Larry says, "But because of the critical use of computer monitors in the operating room, we felt that the extra safety factor provided by the dual steel conduit was well worth the added cost. The hospital agreed with our recommendations."

The operating room facility is now in service, and its sophisticated monitoring system is free of the effects of EMF from the nearby electrical equipment.

Amuneal was also called in to review plans for renovation of a major public building in New York City when a new electrical system was installed to serve the entire building.

A significant part of Amuneal's recommendations was the use of rigid steel conduit to carry multiple runs of conductors beneath the floors of areas where there would be widespread use of computers and display terminals. The project involved the installation of hundreds of feet of steel conduit. Once again, the facility's sophisticated computer equipment has been entirely free of EMI problems.

Best to Consider EMI During Planning Stage

Larry is enthusiastic about the role steel conduit can play in reducing EMF, and he notes that electromagnetic fields are an issue that should be considered when a building is in the planning stage.

"The point should be made early-on to consider the use of steel conduit to mitigate the effects of electromagnetic fields," he says. "It's always the first option of choice."

He explains that competitive bidding practices often lead engineers and designers to recommend the use of wiring methods other than steel conduit because of perceived lower cost. "But the long-term benefits of steel conduit will more than offset a slightly higher initial installed cost," he notes.

The potential long-term savings result in part from not having to retrofit EMF shielding. In addition, users of steel conduit save the cost of running an equipment grounding conductor, as the conduit itself serves this purpose.

"The cost of a shielding retrofit can be several times higher than the cost of incorporating EMF protection into the initial building design,"

he says. "Installing steel conduit as part of the original power distribution system provides shielding plus greater flexibility as room designs and system needs change over the years, especially with frequent changes in data and communications circuits."

Two Studies Confirm Life-Cycle Benefits

In convincing clients of the life-cycle benefits of steel conduit, Larry cites the results of a 1993 study by Montana State University and a more recent study by Georgia Institute of Technology. Both indicate that steel conduit, by a wide margin, is the most effective conduit for reducing electromagnetic field levels for encased power distribution circuits.

The Georgia Tech study shows that steel conduit can reduce electromagnetic fields at 60 Hz power frequency levels by as much as 95%. It also shows that aluminum conduit is largely ineffective in low power frequencies up to 60 Hz, reducing electromagnetic fields by only about 10%. Non-conductive plastic conduit such as PVC was determined to be ineffective in reducing field levels.

The Steel Tube Institute

The Steel Tube Institute was founded in 1930 and sponsors cooperative member efforts to improve manufacturing techniques for conduit and other tubular steel products and informs customers and fabricators about these products' utility and versatility. It is headquartered in Coral Gables, Florida.

Steel Conduit Provides Added Protection

Steel conduit protects electrical conductors against mechanical and electrical damage, and provides excellent grounding for electrical equipment. It also protects against electromagnetic fields (EMF) that could hurt the performance of nearby computers and other electronic equipment. There are three basic types: Rigid Steel Conduit (GRC); Intermediate Metal Conduit (IMC); and Electrical Metallic Tubing (EMT).

Free GEMI Analysis Software Available

The Georgia Tech study that confirms the EMI shielding advantages of steel conduit is incorporated in the Grounding and ElectroMagnetic Interference (GEMI) analysis software, available free from the Steel Tube Institute. The GEMI CD helps you accurately calculate the electromagnetic field density of a network design for conduit-enclosed circuits. It also helps you confirm that your system design complies with the equipment grounding requirements of the NEC.

For your free GEMI CD, contact the STI. Log onto www.steelconduit.org and download it at no cost.

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