

# Why We Use Shielded Cable to Protect Against EMI Interference



In our increasingly connected and powered-on world, the potential for electromagnetic interference and the damage it can cause is higher than ever. In busy commercial facilities, cable shielding is an essential line of defense against these problems.

But what does cable shielding do, and why is it necessary? In this post, we cover the basics of how shielding works and some of its potential applications.

## What Is Electromagnetic Interference?

To understand the importance of cable shielding, we need to cover what it protects against. Electromagnetic interference (EMI) is any electromagnetic activity that produces unwanted effects on a device. These effects can include signal distortion, noise, diminished performance or outright failure, among other issues.

EMI can be narrowband or broadband, human-created or naturally occurring, continuous or impulsive. It may take the form of static noise, magnetic noise, common mode noise or crosstalk. Typical sources in a commercial environment include large AC motors, transformers, knife switches, power lines and wiring, transformers, relay controls and more.

It's possible to prevent some EMI through effective system design. However, many forms are inherent to a busy, wired environment. If it isn't possible to eliminate the problem, it is necessary to protect devices at the point of interference. That's where cable shielding comes in.



## What Does Cable Shielding Do?

Shielded cables contain a conductive sheath which protects against electromagnetic interference and other forms of signal noise. In addition to reducing the impact of EMI on the cable, they also reduce the amount of EMI the cable generates. Additionally, shielded cables tend to be thicker and more durable than non-shielded, which protects against physical damage that can potentially lead to more EMI.

Different types of cable shielding offer varying degrees of protection against EMI. These include:

- Foil shielding, which is lightweight, low-cost and 100% effective against high-frequency EMI. However, foil shielding is delicate, with limited flexibility and difficult termination.
- Braided shielding, typically consisting of a woven wire mesh. Braided shielding is up to 90% effective against low-to-mid frequency EMI. It is also highly durable, flexible and easy to terminate.
- Spiral shielding, which consists of metallic wiring wrapped around a core. Spiral shielding is up to 95% effective against low frequencies. It is typically lightweight and extremely flexible.

- Multishield cabling, which combines braided and foil shielding for full-spectrum EMI protection and superior durability. It is, however, heavier and more expensive than other shielding types.

As this brief overview demonstrates, there is no single "best" type of shielded cable. Knowing when to use cable shielding, and which type to use, requires careful consideration of your application, your environment and your budget.

## When to Use Shielded Cables

Unshielded cables feature twisted wires that offer some level of EMI cancellation on their own, making them suitable for most residential and light office environments. Upgrading to a shielded cable may be necessary if a high level of interference is present, or if delicate equipment requires additional protection. Typical applications include manufacturing and testing facilities, data centers, recording studios and more.

To learn more about the potential applications for shielded cables and the many products JEMIC Shielding Technology offers, contact us today.