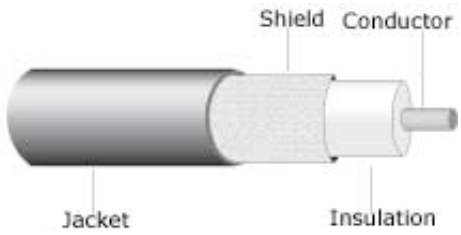
APPLICATION NOTE

04 February 2014

SHIELDING METHODOLOGY



BRAID SHIELD

The most common method of shielding, this can be accomplished by crossing layers of individual metal stands (typically copper or aluminum metal) over a cable core or an insulated conductor.

SERVE OR SPIRAL SHIELD

Spiral Shields can be manufactured by applying metallic strands in a helical fashion around a cable core or an insulated conductor.

ALUMINUM FOIL SHIELDING TAPES

These tapes can be constructed in either single sided, dual sided or 100% aluminum configurations. This method allows 100% effective coverage and is an excellent shield for ESD problem applications.

CONDUCTIVE NYLON TAPES

Although conductive mylar tape has problems with inconsistent conductivity, it is widely used for reducing turboelectric noise, especially in audio frequency applications.

CONDUCTIVE PLASTICS

Conductive plastics have been used as shields and also as a means to reduce corona problems on very high voltage cables. Because of inherent inconsistent conductivity, these conductive plastics should be used only in conjunction with another shielding method.

CONDUCTIVE TEXTILES

This new method employs textile threads that have been metal plated. These threads are then braided or served over the item to be shielded. It should be used only when flexibility warrants.

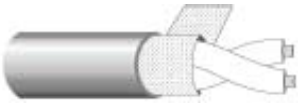
IO Lab Corp.
P.O. Box 414, Littleton CO 80160 USA
2329 West Main Street, Suite 211, Littleton CO 80120 USA
303-347-8150 | Fax 303-347-8160 | http://www.iolabcorp.com

BRAID SHIELD

A braid shield consists of groups of tinned or bare copper or aluminum strands, one set woven in a clockwise direction and interwoven with another set in a counterclockwise direction. Braid shields provide superior structural integrity, while maintaining good flexibility and flex life. These shields are ideal for minimizing low frequency interference and have lower dc resistance than foil. Braid shields are effective at audio, as well as FR ranges. Typically, the higher the braid coverage, the greater the shield effectiveness.

The trade-off between cost and braid coverage must be considered. Typical braid coverage is between 80% and 95%. Coverage of 100% is unattainable with a braid shield. Other features to consider when choosing a braid shield are the weave angle, strand diameter, number of carriers (strand groups) and the number of ends (strands).

Braid shields are generally bulkier and heavier than other shields and, in some cases, harder to terminate because the braid must be combed out and pigtailed.



SPIRAL/SERVE SHIELD

A spiral/serve shield consists of wire (usually copper) wrapped in a spiral around the inner cable core.

Superior flexibility and flex life, ease of termination and up to 97% coverage are the advantages of spiral shields. They are best suited for audio applications. As a rule, spiral shields are not effective above the audio frequency range due to the coil effect produced by the inductance or served wire strands.

FOIL SHIELDS

Foil Shields consist of aluminum foil laminated to a polyester or polypropylene film. The film gives the shield mechanical strength and bonus insulation. Foil shields provide 100% cable coverage, necessary for electrostatic shield protection. Because of their small size, foil shields are commonly used to shield individual pairs of multi-pair data cables to reduce crosstalk. They have less weight, bulk and cost less than spiral or braid shields and are generally more effective than braid shields in FR ranges. Foil shields are more flexible than braid but have a shorter flex life than spiral or braid.

Drain wires are used with foil shields to make termination easier and to ground electrostatic discharges. The shortcomings in using the foil shield include higher de-resistance and lower mechanical strength than braid or spiral shields.