

DESIGN CONSIDERATIONS

Effective design of shielded cable assemblies involves careful attention to tradeoffs to optimize specific characteristics of the end design. In addition to flexibility, primary design consideration areas include performance in both electrical and magnetic fields, weight and cost.

Performance -- Electrical (E-Field)

Usually expressed in terms of shielding effectiveness (dB) and specified band width over which shielding requirements are to be met. Primary tradeoffs include:

- Number of layers of shielding used
- Types of shielding used in each layer
- Percent coverage of each shielding layer

E-Field performance test data is included in this section for the main types of shielding used by Vermillion. Use of this test data will allow the designer to maximize performance in his critical area of interest (i.e., voice range, high frequency, etc.). Test samples can then be built up and evaluated to verify performance characteristics.

Performance -- Magnetic (H-Field)

Also expressed in terms of shielding effectiveness but using "effective loop area" (square inches) instead of attenuation (dB). Primary tradeoffs are similar to those discussed for E-Field above, although permeability of the shielding material is more of a factor in designing an effective shield for a given frequency band coverage.

Weight

Data for the unit weights of various type and size shielded cables made by Vermillion is also contained in this section. This data can be used to obtain total cable weight by knowing the length of cable used. As previously noted, the Vermalloy[®] 3948 ribbon-type shielding reduces the weight of conventional woven shielding by 70-80%. Another way of reducing the cable weight is by decreasing the percent coverage of a shielding layer on a given cable. The tables also contain information for calculating the effect of reduced shielding coverage.

Cost

Generally most directly related to performance criteria; such as type of shielding used and number of layers. To a lesser extent weight factors such as use of ribbon shielding also affect cost.

Solderability of Vermalloy

Mechanical type terminations of Vermalloy shielding are recommended. Vermalloy shielding can be terminated using high temperature solder sleeves listed in military specifications: MIL-S-83519, NAS 1744-05, 08 and NAS 1745-5, 22. The application of MIL-F-14256 type RMA solder flux is permissible. Thorough cleaning of the shield prior to soldering is advisable. Both the solder sleeves and the RMA flux are allowed per MIL-STD-2000 soldering requirements.

