



EMI Shielding of Festoon Cables

A customer requested a solution to an EMI-hardening problem on pre-existing festoon cables. The new easy-to-install EMI Shield jacket supplied to the customer did the job.

PROBLEM:

A customer requested a solution to an EMI-hardening problem on pre-existing festoon cables. The cabling followed a lifting crane across the top of a missile assembly building. The customer noted that the crane gantry would move unexpectedly and erratically when the building doors were open. It was discovered that the movement occurred when the doors were open and a local radar tracking system was in operation.

REQUIREMENTS:

The crane cabling consisted of multiple, 4-5 inch diameter bundles which were located 200 feet above the assembly floor and were approximately 100 feet long. Any solution had to be very flexible so as to not restrict the crane movement as the cables extended and retracted. The solution had to be retrofitted in place by a technician in a safety harness with no installation tooling that might be dropped by the installer. The shielding was required to provide 40+ dB of attenuation at a frequency range of 500 MHz to 1 GHz. Finally, the assembly building facility was located along an ocean coastline with a salt atmosphere. The shielding material was required to be very corrosion resistant.

SOLUTION:

The Zippertubing Company utilized its existing corrosion-resistant 304 Stainless Steel knitted-wire mesh EMI material known as SHX-4 (S/S). The material was knitted in a wide width to accommodate the large bundle diameter. Like all zip-on type EMI shields from Zippertubing, the product incorporated an internal overlap flap of the mesh shield to insure no EMI leakage at the closure seam. A heavy duty Delrin-toothed zipper was utilized as the closure mechanism so that the installer needed no tooling to close the jacket around the cabling or remove the shield should future cable repairs be required. The knitted-mesh shield was insulated with a highly flexible outer jacket material of high-dielectric Polyurethane film known as PFR-18. The assembly ends featured a sewn in, Hook & Loop-closed, Nylon webbing loop to allow jacket assembly attachment to the cable termination hardware. The retention loops insured that the EMI Shield jacket assembly did not pull back from the cable ends during operation.

CONCLUSION:

The solution above surpassed all the customer's requirements and was successfully retrofitted with excellent EMI shielding results. This design concept of a toothed-zipper closure on a knitted-mesh EMI jacket has become very popular with numerous customers to date. It has evolved into a Zippertubing standard product family known as "Zipper-Mesh." Zipper-Mesh is available with Sn/Cu Mesh, Sn/Cu/Fe Mesh or Stainless Steel mesh and with or without an outer jacket. It is available in cable diameters from ½ inch and larger. The specific product that applies to this article is Zippertubing's Zipper-Mesh (PFR).

