

This selection guide is designed to assist you with the selection of components and planning for installation of Glenair polymer plastic and composite convoluted tubing and fittings. Convoluted tubing wire protection assemblies are made up of lengths of bulk convoluted tubing, and various combinations of conduit fittings and adapters that allow the user to efficiently terminate the tubing and attach the assembly to connectors and other interconnect interfaces. There are three basic tasks in the selection process:

- (1) Specify the size of bulk tubing which meets the volume requirements of the application.
- (2) Specify the style of bulk tubing which meets the environmental, electrical and mechanical requirements of the application.
- (3) Select the transition fittings and connector adapters that satisfy the routing and interconnect requirements of the application.

### Step 1: Select Tubing Size

Conduit size is identified by its inside diameter (ID) expressed in inches and fractions. Most of our tubing products range from 3/16 of an inch to 2 inches. The ID is referenced with a numerical size code which is used in the part number.

Convoluted tubing wire protection systems are normally filled to 80% of the inside diameter of the tube. You will need to verify the diameter of the cable or wire bundle to be housed in the tubing before selecting the tubing size in order to insure it adequately accommodates your wiring.



In some applications, such as when the tubing will ultimately be attached to a bulkhead feed-through or a stuffing tube, the diameter of the feed-through fitting needs to be taken into account when selecting the tubing size. Obviously, if the tubing needs to terminate to a one inch feed-through fitting, you should select one inch tubing. In fact, in a well-designed system, the diameter of the conduit, any necessary transition fittings, connector adapters, feed-throughs etc. should all be the same size.

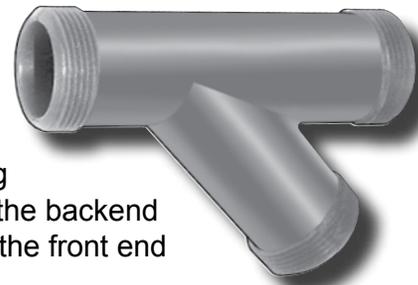
### Step 2: Select Tubing Style

Glenair manufactures a wide range of high-temperature tolerant polymer plastic convoluted tubing products, such as PFA, FEP, PTFE, ETFE and PEEK. Each material has specific performance attributes that are summarized in the accompanying table. Selection is most often based on one or more attributes such as crush resistance, strength or cost.

The other decision point in tubing style selection has to do with the addition of outer layers of EMI shielding and/or environmental jacketing to the core material. Braided shielding provides a conductive path for EMI and also adds pull strength to the final assembly. Various flavors of environmental jacketing, summarized in the accompanying table, protect the assembly from moisture and caustic chemicals.

### Step 3: Select Transition Fittings and Connector Adapters

Multi-branch convoluted tubing wire protection assemblies utilize various composite plastic transition fittings, in straight, "T," "Y," and "+" configurations, to facilitate routing. The tubing is terminated into the backend of the fitting while the front end



is equipped with an appropriate thread profile and coupler for the attachment of the necessary transition. The assemblies also utilize connector adapters, in straight 45° and 90° configurations, for the incorporation of circular and rectangular connectors.



Selection is easy. The size of the fitting or adapter is indicated with a "dash number" or numeric size code that, just like the tubing, corresponds to the shell size of the part in inches and fractions. The appropriate sized fitting for a

one inch tube, for example, would be a number "32." Conveniently, this is the same number used for one inch bulk tubing. So selection is a simple matter of matching the size code in the fitting part number with the size code of the selected conduit. Your selection of a straight, 45°, 90°, "T," "Y," or "+" configuration part will depend on the routing requirements of your system.

**NOTE 1:** Glenair recommends the use of our TG70 strap wrench, or appropriately sized 600-157 series holding tools for use fitting-to-fitting, or connector-to-adapter assembly.

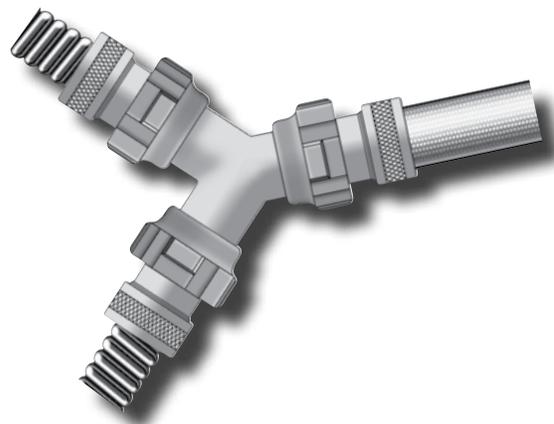
**NOTE 2:** Glenair also recommends the use of torque wrenches to ensure adapters and connectors are mated with the optimal amount of torque.



*Conduit-to-Connector adapters allow for easy integration of industry standard interconnects and convuluted tubing.*

## A Note On Braided Shielding

Glenair is able to provide turnkey convoluted tubing wire protection systems—complete with braided shielding and jacketing. Braided shields are effective at minimizing low frequency interference at audio and RF ranges. Braided shields also provide additional structural integrity while maintaining good flexibility and flex life. In use, the reduction of EMI is dependent upon the signal amplitude and frequency in relation to the many combinations of mesh count, wire diameter and the braid material. Generally, the higher the percentage of braid coverage, the more effective the shield against high-frequency emissions. Available materials include tin-plated copper, nickel-plated copper and tin-plated iron/copper as well as metal-clad composite materials such as AmberStrand®. Depending on the ratio of metal braid to composite plastic, Glenair's composite braided shielding product can reduce the weight of EMI shielding up to 75%.



*Glenair takes a systems approach to the design and manufacture of our composite and polymer plastic wire protection systems. The following pages present all the necessary component products to create 100% composite/plastic wire protection systems optimized for the most extreme environmental, mechanical, and electrical performance requirements. Please do not hesitate to contact our factory for free application engineering and assistance in the design of your next assembly.*