RECOMMENDED BONDING PROCEDURES

PURPOSE: This document will explain the proper methods and procedures used to bond carbon fiber tubes and plates to various substrates.

STEP 1: SURFACE PREPARATION

Surface preparation is critical to achieving a strong and complete bond between two mating surfaces. Surface preparation starts with proper abrading of the mating surfaces. There are two ways of abrading the surface. The first method is grit blasting. Grit blasting is the best way to uniformly abrade both metal and carbon surfaces. We recommend grit blasting with 80 grit Durablast at 100psi. It is only necessary to abrade the bonding area until the surface becomes completely dull with no shiny surfaces. Remember to tape off any areas that you do not want abraded. The second method of surface abrading is sandpaper. Sandpaper has the disadvantage of abrading the surface in a less uniform manner when compared to grit blasting. If care is taken sandpaper can be used effectively. We recommend abrading the bond surface with 200 grit sandpaper first. When abrading your bond surface you must use consistent pressure while moving the sandpaper in a circular motion. The surface of the substrate should have a uniformly dull surface finish when complete.

STEP 2: CLEANING

Once you have properly prepared the substrate surface it is necessary to clean and de-grease the bond locations. Pour a small amount of acetone on a high quality, low lint paper towel. Next, wipe the abraded areas that will be bonded with the paper towel. Repeat this step until your towel comes back clean after wiping the surface. Error on the side of caution to ensure a high strength bond. It helps to use latex gloves so the part stays free of any oils that may be on your hands. Once the surfaces are cleaned, move on to the bonding step.

STEP 3: BONDING

The epoxy we recommend using for general bonding is Hysol 9430, 2 part epoxy made by Loctite Corp. Some of the features that distinguish this product are the following:

High peel and high shear strength
Room temperature cure
Bonds variety of substrates
Long pot life
Excellent low temperature properties

See Product description sheet for specific properties, storage, and mixing instruction. Before bonding verify that the bonding surfaces are free of any carbon dust or debris. Mix resin and hardener per the product description document. Remember the pot life for 9430 is about 50 mins when mixed. Apply the resin with a spatula or brush to the appropriate areas. Once applied the bonded parts need to be pressed together by way of a clamp or other means until the resin has developed handling strength. Be careful not to clamp the surfaces together too tightly so that an adequate bond line is present. Wipe off any excess epoxy with acetone and a paper towel. After this point no load should be applied until full cure takes place. Full cure at room temp takes approximately 5 days. This time may be reduced to one hour by way of a post cure at 180F. Immediately clean all tools with acetone.

Special consideration needs to be applied to bonding tubes into ferrules. For bonding tubes into ferrules we recommend a .010"-.020" bond gap when using 9430. This means the difference between the ferrule inside diameter and the tube outside diameter should ideally not be less than .020" and no greater than .040". For example when bonding a 1" OD tube into a ferrule the ID of the ferrule could be anywhere between 1.020" and 1.040". This recommended bond gap may not apply to different viscosity resin systems.