



What are the important hidden differences in FRP Composite Male NPT threaded nipples, adapters, and fittings?

From time to time, we are asked: "What makes Industrial Fiberglass' FRP Male NPT threaded fittings our customer's best buy?" When you look at one male NPT threaded adapter, nipple, or fitting - compared to that made from another manufacturer, externally they often all look alike. But, there are hidden differences in quality of threaded FRP composite fittings that are very important in providing trouble-free life and satisfaction to the end user. After all, these threaded fittings are often used in very corrosive and demanding service environments.

The Hidden Differences:

1. Industrial Fiberglass builds the filament wound FRP composite nipple stock used to make threaded fittings utilizing a unique and exclusive "double wind" angle. The FRP nipple stock pipe is first made with a complete internal corrosion liner; the same as is used in all of our filament wound pipe and fittings. We then first wind with a 54-3/4° filament winding pattern. This wind angle provides what is known in the industry as a "balanced" reinforcement, with a 2 to 1 ratio of hoop strength to axial strength.

There are other manufacturers of threaded composite nipples and adapters that simply wind with a circumferential or hoop wind. This type of hoop winding pattern, even if interspersed with other types of fiberglass reinforcement, does not provide the axial strength that is so especially important for threaded FRP nipples and adapters. Again, the exclusive 54-3/4° wind angle for the inner structural laminate of our composite nipple stock does provide that balance of axial versus hoop strength.

2. The axial wind pattern is continued through the FRP nipple pipe wall to just underneath the bottom of that will be the male NPT pipe threads. At that point, we stop the helical winding. We then change the winding machine to a wind angle that approximates the wind angle of the pitch angle of the threads. We then proceed to wind the balance of the FRP composite nipple stock pipe with that much higher wind angle - out to the point where we can get a full "clean-up" in preparation of machining the threads.

With this exclusive second winding angle used to make our composite nipple stock pipe, when the threads are machined on the nipples and adapters, we are not cutting across the pattern of the fiberglass reinforcements. Instead, we are machining **with** those reinforcements. As a result, we end up with much stronger FRP threads - compared to those manufacturers that attempt to machine "across" fiberglass reinforcements. And, some manufacturers are even just machining into



"gunk" molding compound that has been applied to the end of the pipe areas to be threaded.

3. The third step in our manufacturing process that is again not always obvious - is the method of our machining the threads. Instead of just using a cutter bit, and a lathe to machine those threads (known in the trade as "single pointing"), we "grind" our male FRP threads; using a specifically made high speed diamond grinding wheel. That grinding wheel has a shape that is the same as the male NPT threads. Thus, when we "machine" our threads, we are not getting the "tearing" and stresses in the FRP threads, that occur with lathe cutting.

The result is a thread that is much stronger, with a very smooth thread finish, that is less likely to have porosity and loose FRP fibers. In addition to using the diamond cutting wheel, we also machine all of those threads under water. The water acts as a lubricant during the threading operation. Again, this extra production technique reduces the amount of tearing and stresses on the threads during the machining operation; providing a superior and clean male NPT FRP composite thread.

The end result of all of these extra manufacturing steps, many of which are concealed or not readily apparent to the casual observer - provides you the industry's strongest, and best looking NPT threaded FRP composite nipples, adapters and fittings. These extra features increase the service life of our male NPT threaded composite fittings - thus providing our customer their lowest cost per year of service life. Our customers have consistently found that our NPT threaded FRP composite fittings are well worth any small initial cost premium.

By providing you with this information, hopefully now those differences in the manufacturing techniques of making "first class" FRP threaded fittings will no longer be "hidden".