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Technical Bulletin

Sealing of FRP Flanges Against Raised Face Steel Flanges

Whenever it is necessary to mate FRP composite flanges with raised face steel flanges, steel butterfly or check valves having partial liner facings, VanStone hub flanges, wafer valves, lined pipe, and other equipment flanges which do not have a full flat flanged face, then special installation considerations and actions are necessary.

Where possible, always order those valves and steel flanges without a raised face. Where raised face flanges cannot be avoided, a filler ring of metal or suitable hard material must be used around the raised face of the mating steel flange. Failure to fill that annual space between the FRP flat flange face and the raised face steel flange can result in damage, lack of seal, or flange failure. The purpose of the spacer ring is to fill the gap around the outside of the raised face of the mating steel flanges or valves, to prevent flange bolt loads from bending and breaking the FRP composite flange from the pipe.

Even with the use of the filler ring, we recommend that you also use a full faced elastomeric gasket at such flange connections. This gasket should be a minimum 1/8" thick; having a durometer of 50-70. (Of course, the gasket should be made out of a material that is suitable for the service environment.)

For those flanges that are mating FRP composites to steel, we also recommend that you initially tighten the flange bolts to only 15-20 foot pounds torque. Then, continue tightening those bolts in increments of 10 foot pounds, until the proper seal is obtained.

It is imperative on all sized flanges, especially for the larger diameter flanges, that you follow the proper torque sequencing for all bolts; as shown on the attached Product Catalog pages #95 and #96.

5.0 APPLYING TORQUE

All nuts must be torqued in increments and sequence as shown in Table 3.0. Proceed through the tightening sequence applying torque increments until the recommended torque is attained. Recheck the torque on each bolt in the same sequence as bolts previously tightened may have relaxed through the torque sequence.

6.0 SEALING AGAINST RAISED FACE STEEL FLANGES AND OTHER FLANGES

Industrial Fiberglass Specialties filament-wound 150 lb. flanges can be bolted to raised-face steel flanges provided bolt torque is applied in increments and sequence as indicated in Table 3.0. Flanges rated less than 150 lb. require the use of a spacer ring to fill the annular space between the filament-wound flange face and raised face steel flange or damage will occur. Valves are often supplied with elastomeric sealing surfaces built into the body of the valve. Due to the wide variety of sealing surfaces and configurations used on valves, Industrial Fiberglass Specialties recommends the use of a 1/8-inch thick elastomeric full-faced gasket at all flanged valve connections.

TABLE 3.0

Bolt Torque Increment and Sequence Flanges Drilled to ANSI B16.5, 150lb.

Nominal Flange Diameter (in.)	Torque Increments (Ft.-lbs.)	Recommended Torque for Full-Pressure Seal (ft.-lbs.)
1/2	5	20
3/4	5	20
1	5	20
1-1/2	5	20
2	5	20
2-1/2	5	20
3	5	20
4	5	20
5	10	30
6	10	30
8	10	30
10	10	30
12	10	30
14	10	50
16	10	50
18	10	60
20	10	60
24	15	75
30	15	75
36	15	75

TABLE 3.0 (continued)

Bolt Torque Increment and Sequence Flanges Drilled to ANSI B16.5, 150lb.

Torque Sequence