



Industrial Fiberglass Specialties, Inc.

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Bolts, Nuts and Washers

The recommended type of hex head bolts, nuts and washers for Industrial Fiberglass Specialties' flanges is shown below. If all-thread studs are used, add the thickness of the nut plus the length of three threads to the bolt lengths shown.

For the assembly of two flanges not shown below, hex head bolt length may be calculated by adding the total of the thickness of the two flanges being joined plus the gasket thickness, plus two times (2x) the washer thickness plus the thickness of the nut plus the length of three threads. Flange thicknesses for all Industrial Fiberglass Specialties' flanges are shown in the Industrial Fiberglass Specialties' catalog.

Industrial Fiberglass Specialties' Flanges ANSI B16.5 Class 150 Drilling

Nominal Flange Size (in.)	Bolt Diameter (in.)	Number of Bolts	Bolt Lengths (1)		Washer O.D. (in.)	Washer Thickness (in.)	Nut Thickness (in.)
			Filament-Wound To Filament-Wound	Filament-Wound To Steel			
1/2	1/2	4	2-1/2	2	1.06	.12	.44
3/4	1/2	4	2-1/2	2	1.06	.12	.44
1	1/2	4	2-1/2	2-1/2	1.06	.12	.44
1-1/2	1/2	4	3	2-1/2	1.06	.12	.44
2	5/8	4	3	2-3/4	1.31	.12	.55
2-1/2	5/8	4	3	3	1.31	.12	.55
3	5/8	4	3-1/2	3-1/4	1.31	.12	.55
4	5/8	8	3-1/2	3-1/2	1.31	.12	.55
5	3/4	8	3-1/2	3-3/4	1.47	.16	.64
6	3/4	8	4-1/2	4	1.47	.16	.64
8	3/4	8	5	4-1/4	1.47	.16	.64
10	7/8	12	5-1/2	4-3/4	1.75	.16	.75
12	7/8	12	5-1/2	5	1.75	.16	.75
14	1	12	6-1/2	5-1/2	2.00	.16	.86
16	1	16	7	5-3/4	2.00	.16	.86
18	1-1/8	16	7-3/4	6-1/4	2.25	.16	.97
20	1-1/8	20	9-3/4	7-1/2	2.25	.16	.97
24	1-1/4	20	10-1/4	8	2.50	.16	1.06
30	1-1/4	28	8-1/2	7-1/4	2.50	.16	1.06
36	1-1/2	32	8-1/2	7-3/4	3.00	.16	1.28

1. Regular Hex Head Bolts, ANSI B18.2.1-1972
2. Regular Hex Nuts ANSI B18.2.2-1972
3. Type A Plain, Narrow Series ANSI B18.22.1-R-1981
(Dimensions agree with "SAE Standard" and ANSI/ASTM Specification F436.)
4. Maintain end point clearance of bolts on inside radius of 2-, 3- and 4-inch Industrial Fiberglass Specialties' flanged ANSI 45° elbows by using additional washers or shims under bolt heads as required.



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Table 1.0

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

Nominal Flange Diameter	Torque Increments	Recommended Torque For Full-Pressure Seal
In.	ft.-lbs.	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

TORQUE SEQUENCE CHART

