



## INSTALLATION INSTRUCTIONS FOR NIRON FLANGES

Niron flanges are considered Lap Joint Flanges as they are two-part flanges which consist of a polypropylene stub flange adapter together with a loose backing ring. This type of flange also has been referred to in some cases as a Van Stone Flange. The advantage of this type of flange arrangement is that the ring can always be rotated to align with the holes of the mating flange, regardless of whether the flange is connecting to a one-piece flange arrangement or another mating Niron flange. Niron PP-RCT flanges in North America are offered with ANSI B16.5 150# hole patterns and dimensions, which is the most common flange type. Our flanges are designed in the smallest sizes with an integral O-ring, and in larger sizes designed to be joined using a 1/8<sup>th</sup> inch soft gasket having a Durometer in ideal the range of 65 to 75. Niron PP-RCT is too stiff of a material to allow the flanges to be used without an O-ring or gasket.

### PRELIMINARY STEPS

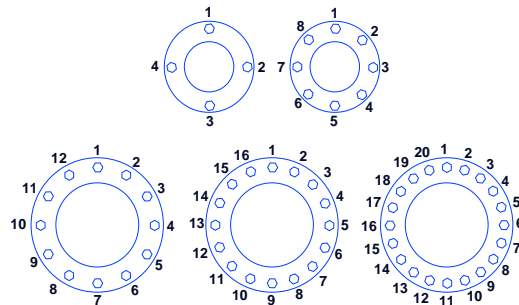
Before fit-up, lubricate flange bolt threads, washers, and nuts with a non-liquid lubricant grease. Gasket and flange sealing surfaces must be clean and free of significant cuts or gouges. Fit the flange components together loosely. Tighten all bolts by hand and recheck alignment. Use pinch bars to assist with alignment and adjust alignment if necessary. Mating flanges must be aligned and centered to each other and sealing surfaces must be vertically and horizontally parallel and in straight angular alignment. A misaligned flange can cause leakage or pipe/flange failure.

### HARDWARE

Two washers are to be used for each flange bolt assembly, one at the bolt head, and one at the nut. Heavy hex nuts bolts and nuts are to be used in the assembly. Course thread shall meet ASME B1.1 requirements.

### NUMBER THE BOLTS FOR BEFORE STARTING THE TIGHTENING SEQUENCE

Number the bolt holes in rotation around the lap-joint flange circumference in a clockwise order, beginning with the first bolt at the top in the nominal 12:00 position, the second being the next bolt to the right, the third being the next bolt to the right, etc., until all bolts are numbered sequentially. Five bolt hole numbering illustrations are shown in **FIGURE 1**, 1) Flanges in sizes ½" through 3" requiring 4 bolts, 2) Flanges in sizes 4" through 8" requiring 8 bolts, 3) Flanges in sizes 10" through 14" requiring 12 bolts, 4) Flanges sizes 16" through 18" requiring 16 bolts, and 5) Flanges in sizes 20" through 24" requiring 20 bolts.



**Figure 1 – Bolt Numbering Pattern**

**TORQUE BOLTS BY ROUND IN A CRISS-CROSS BOLT PATTERN**

Utilize the crisscross bolt tightening pattern described in **TABLE 1** to perform bolt tightening.

Example: For a 4" flange, number the 8 bolt holes as shown in **Figure 1**. Using **Table 1** you torque bolts 1, then 5, then 3, then 7, then 2, then 6, then 4, and then 8 for the first round of bolt tightening.

**TABLE 1 – Criss-Cross Bolt Torque Pattern for Flanges Shown in Figure 1**

NUMBER OF BOLTS	CRISS-CROSS PATTERN TIGHTENING SEQUENCE
4 (½" through 3")	1-3-2-4
8 (4" through 8")	1-5-3-7 >> 2-6-4-8
12 (10" through 14")	1-7-4-10 >> 2-8-5-11 >> 3-9-6-12
16 (16", 18")	1-9-5-13 >> 3-11-7-15 >> 2-10-6-14 >> 4-12-8-16
20 (20" through 24")	1-11-6-16 >> 3-13-8-18 >> 5-10-15-20 >> 2-12-7-17 >> 4-14-9-19



**INCREASE TORQUES WITH EACH ROUND OF TIGHTENING**

The effectiveness of the seal is strongly dependent on the field assembly technique. Utilize a torque wrench to tighten bolts. Torque wrenches should be calibrated no more than 4 months prior to use. A bolt is not to be immediately tightened to the final torque, but in increments specific to the current round of tightening. For each round of bolt tightening the torque is increased in increments equal to 25% of the final torque value for the 1<sup>st</sup> Round, 50% of the final torque value for the 2<sup>nd</sup> Round, 75% of the final torque value for the 3<sup>rd</sup> Round, and to the final torque value for the 4<sup>th</sup> Round. Use the crisscross torque pattern for all four rounds of tightening. Upon completing the final crisscross torque tightening round, torque bolts once more, this time going clockwise around the flange to assure all bolts are equally torqued.

Torque values and instructions are provided in **TABLES 2, 3, and 4**. **TABLE 2** provide turns, and torques requirements for the **NIRON O-Ring** flange assemblies, and **TABLE 3** provide torques for **NIRON Energizer Gaskets** flange assemblies. **TABLE 4** provides torques for ASME B16.21 gaskets having a thickness of 1/8 inch, and durometer of 65 to 70. Should other gasket material be used bolts should be tightened to the gasket manufacturer’s recommended torque for the selected gasket and particular application conditions. If the gasket manufacturer’s recommended torque exceeds the maximum recommended value in **Table 10** a different gasket will be required. Note the maximum torque values in **Table 10** are based on ASME B16.21 flat face gasket dimensions, therefore if the manufacturer’s gaskets do not meet ASME B16.21 flat face gasket dimensions, the maximum torque value will need to be calculated and verified to be acceptable.

**Tables for Typical Flange Bolt Torque (Lubricated Bolts)**

**TABLE 2 - Niron Flanges with Integral O-Rings:**

Flange Size	1st Round Tightening	2nd Round Tightening	3rd Round Tightening	4th Round Tightening	
				Minimum	Maximum
Inch				Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>
1	Slight Bolt Turn	Slight Bolt Turn	Slight Bolt Turn	0.6	1.1
1 1/4	1/4 Bolt Turn	1/4 Bolt Turn	1/4 Bolt Turn	1.6	2.0
1 1/2	1/4 Bolt Turn	1/4 Bolt Turn	1/4 Bolt Turn	2.0	2.4
2	1/4 Bolt Turn	1/4 Bolt Turn	1/4 Bolt Turn	1.4	3.8
2 1/2	1/4 Bolt Turn	1/4 Bolt Turn	1/4 Bolt Turn	0.7	4.5

Note: If 1/2-inch bolts with 13 threads per inch are not use the number and quantity of turns will vary from above. Be careful not to over tighten the assemblies. O-ring assemblies require much less torque than the gasketed assemblies.



**Tables for Typical Flange Bolt Torque (Lubricated Bolts) - Continued**

**TABLE 3 – Torque Ranges for Niron Energizer Gaskets**

**Niron Energizer Gasket**

Flange Size	1st Round Tightening (25% Torque)		2nd Round Tightening (50% Torque)		3rd Round Tightening (75% Torque)		Final (100% Torque)	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Inch	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>
1	2		3		5		7	
1 1/4	2		4		6		8	
1 1/2	2		5		7		10	
2	4		9		13		17	
2 1/2	6		12		18		24	
3	6		13		19		26	
3 1/2	5		9		14		18	
4	4		7		11		14	
6	9		19		28		37	
8	13		26		39		52	
10	12		24		36		48	
12	16	18	32	35	48	53	64	70
14	23	25	46	51	69	76	93	102
16	20	22	41	45	61	67	81	89
16BV	23	25	45	50	68	74	90	99
18	29	32	57	63	86	95	115	126
20	27	30	54	60	82	90	109	120
22								
24	28	31	57	62	85	94	114	125



**TABLE 4 – Torque Ranges for Flat Faced EPDM, 150 Class, ASME 16.21 Gaskets**

**Flat Faced 75 Durometer 1/8 inch Thick Gasket**

Flange Size	1st Round Tightening (25% Torque)		2nd Round Tightening (50% Torque)		3rd Round Tightening (75% Torque)		Final (100% Torque)	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Inch	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>	Ft-lb <sub>f</sub>
1	3		6		9		12	
1 1/4	3		7		10		14	
1 1/2	4		8		13		17	
2	8		15		23		30	
2 1/2	11		21		32		43	
3	14		28		42		55	
3 1/2	9		18		27		35	
4	11		21		32		43	
6	13		27		40		54	
8	19		37		56		75	
10	16		33		49		65	
12	23	25	46	51	69	76	92	101
14	39	43	77	85	116	128	155	170
16	34	37	67	74	101	111	135	148
16BV	38	41	75	83	113	124	151	166
18	49	54	98	108	147	162	196	215
20	47	52	94	104	141	155	188	207
22								
24	49	53	97	107	146	160	194	213



## RETIGHTENING:

Niron PP-RCT and the gasket will undergo some compression set that may loosen the bolts. About an hour or so after the first tightening to the final torque value, retighten each flange bolt nut to the final torque value. Retighten in a circular pattern and in increments of 10 ft-lbs. or less. For 12" and smaller flange adapters a second retightening after 4 hours is recommended. For flange adapters greater than 12", environmentally sensitive, or critical pipelines, the second retightening is recommended after an additional 12 to 24 hours.

## BUTTERFLY VALVES

When joining a Niron flange adapter or stub-end to a flanged butterfly valve, the inside diameter of the pipe flange should be checked for valve disk rotation clearance because the open valve disk may extend into the pipe flange. Valve operation may be restricted or prevented if the pipe flange interferes with the disk. Niron socket fusion stub flanges normally contain enough clearance for most butterfly valve types and therefore really are not that much of a concern. Plain End Niron stub flanges are manufactured with an internal 55° bevel. Fitting selection can be important as some Plain End Niron stub flanges are available with a greater bevel angles in certain pipe sizes. With the products available, the Plain End Niron stub flanges typically avoid disc interference with most of the manufacturer's butterfly valves. However, in some rare circumstances, some combinations of valve brands result in interference with certain sizes. As such, the butterfly valve should be checked for interference. Be sure to contact NUPI to check in each case as to whether the specific brand of butterfly valves will result in interference or not. NUPI provides this service free of charge. However, if disk rotation clearance is a problem, a tubular spacer may be installed between the mating flanges. When the tubular spacer is used the flange bolt length will need to be increased by the width of the tubular spacer.

Butterfly valves must be centered in the flange for proper operation. Installing a butterfly valve with the valve disk rotated open may assist with alignment. After fitting up and tightening flange bolts to the 5 ft-lbs. initial torque value, operate the valve to ensure that the valve disk can rotate without interference. Realign, if necessary, then tighten to the final torque value using crisscross torque patterns in **Figure 1**. The torque values required for sealing are the function of the sealing liner of the butterfly valve manufacturer, so please consult with the valve manufacturer for the required recommendation. Note, most butterfly valve manufactures do not require a separate gasket when installing Niron Flanges with their butterfly valves, however some manufactures do require this. Always follow the butterfly valve manufacturer's recommendations.

Most butterfly valves for use in commercial installations are fitted with lugs to allow bolting from each side. Note that valves equipped with lugs require two sets of shorter fasteners.



**BOLTING HARDWARE**

Refer to the **TABLES 5 -9** below for fastener sizes and bolting requirements pertaining to NUPI Niron Clima flange assemblies.

**TABLE 5A – 5D** provides fastener sizes, and requirements for bolting NUPI Niron Clima fittings to two different types of flange assemblies, 1) NUPI Niron Clima Stub Flange + Niron Clima Backing Ring + 1/8” thick gasket to NUPI Niron Clima Stub Flange + Niron Clima Backing Ring, and 2) NUPI Niron Clima Stub Flange + Niron Clima Backing Ring + 1/8” thick gasket to a 150# Steel Flange. Tables are specific to the four backing rings offerings provided by NUPI Americas, FR-PP Encapsulated Ductile Iron Backing Ring (Part No. “FLAACPP”) assemblies shown **Table 5A**, Machined Steel Backing Ring (Part No. “FLAACPP”) assemblies shown **Table 5B**, Epoxy Coated Ductile Iron Backing Ring (Part No. “FLAVN”) assemblies shown **Table 5C**, and Galvanized Steel Backing Ring (Part No. “FLAAC”) assemblies shown in **Table 5D**. Steel flange widths are based on ASME B16.5, Table 8C, "Minimum Dimension of 150 Class Flange".

**TABLE 5A - NUPI Flange to NUPI Flange, and NUPI Flange to Steel Flange Fastener Size Requirements**  
**Flange Connections - Using FLAACPP Backing Rings**

Description	No. Bolts	Bolt Dia.	Washers Required	Bolt Length (inches)	
				NUPI Flange to Flange	NUPI Flange to Steel
1" (32 mm) Socket Fusion SDR 7.3	4	1/2	Yes	3.25	2.75
1 1/4" (40 mm) Socket Fusion SDR 7.3	4	1/2	Yes	3.50	3.00
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	3.75	3.25
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	4.00	3.50
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	4.00	3.75
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	4.50	3.75
3 1/2" (110 mm) Socket Fusion SDR 7.3	8	5/8	Yes	5.50	4.50
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	5.50	4.50
3 1/2" (110 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	5.00	4.50
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	7.50	6.00
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	9.00	6.50
1" (32 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	3.25	2.75
1 1/4" (40 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	3.50	3.00
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	4.50	3.50
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.50	4.00
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.50	4.00



3 1/2" (110 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	5.00	4.50
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	7.50	6.00
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	9.00	6.50
3 1/2" (110 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	5.00	4.50
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	7.00	5.50
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	8.50	6.50
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	9.00	6.50
1" (32 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	3.25	2.75
1 1/4" (40 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	3.50	3.00
1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	3.75	3.25
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	4.50	4.00
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	4.50	4.00
3 1/2" (110 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	5.00	4.50
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	7.50	6.00
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	9.00	6.50
1" (32 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	3.25	2.75
1 1/4" (40 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	3.50	3.00
1 1/2" (50 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	3.75	3.25
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	4.50	3.75
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	4.50	4.00
3 1/2" (110 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	5.00	4.50
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	5.00	4.00
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	7.50	6.00
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	12.50	9.50
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	4.50	3.75
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	4.50	3.75
3 1/2" (110 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	5.00	4.00
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	5.00	4.00
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	6.00	5.00





8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	7.50	6.00
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	12.50	9.50

**TABLE 5B - NUPI Flange to NUPI Flange, and NUPI Flange to Steel Flange Fastener Size Requirements**  
**Flange Connections - FLAACPP Backing Rings of Machined Steel**

Description	No. Bolts	Bolt Dia.	Washers Required	Bolt Length (inches)	
				NUPI Flange to Flange	NUPI Flange to Steel
5" (125 mm) ANSI SDR 7.3, 9, 11, and 17	8	3/4	Yes	6.50	5.00

**TABLE 5C - NUPI Flange to NUPI Flange, and NUPI Flange to Steel Flange Fastener Size Requirements**  
**Flange Connections - Using FLAVN Backing Rings**

Description	No. Bolts	Bolt Dia.	Washers Required	Bolt Length (inches)	
				NUPI Flange to Flange	NUPI Flange to Steel
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	4.50	3.50
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	4.50	3.75
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	5.00	4.00
3 1/2" (110 mm) Socket Fusion SDR 7.3	8	5/8	Yes	5.50	4.50
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	6.00	4.50
3 1/2" (110 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	8.50	6.50
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	9.00	7.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	5.00	4.00
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	5.00	4.50
3 1/2" (110 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	8.50	6.50
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	9.00	7.00



3 1/2" (110 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	7.00	5.50
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	8.00	6.00
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	8.50	6.50
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	8.00	6.00
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	8.50	6.50
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	5.00	4.00
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	5.00	4.50
3 1/2" (110 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	5.50	4.50
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	8.50	6.50
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	9.00	7.00
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	8.50	6.50
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	8.50	6.50
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	9.50	7.00
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	10.50	8.00
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	11.00	8.50
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	4.50	4.00
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	5.00	4.00
3 1/2" (110 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	5.00	4.50
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	6.50	5.00
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	7.00	5.50
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	8.50	6.50
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	8.50	6.50
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	9.50	7.00
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	12.50	8.50
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	10.50	8.00
18" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	12.50	9.00



20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	11.00	8.50
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	8.00	6.50
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	9.50	7.00
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	9.50	7.50
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	10.00	8.00
22" (560 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	10.50	8.50
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	10.50	8.50
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	4.50	3.75
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	4.50	4.00
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	5.00	4.00
3 1/2" (110 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	5.00	4.00
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	5.50	4.50
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	6.50	5.50
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	7.00	5.50
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	8.50	6.50
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	8.00	6.50
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	9.50	7.00
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	12.50	8.50
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	9.50	7.50
20" (500 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	10.00	8.00
22" (560 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	10.50	8.50
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	10.50	8.50

**TABLE 5D - NUPI Flange to NUPI Flange, and NUPI Flange to Steel Flange Fastener Size Requirements  
Flange Connections - Using FLAAC Backing Rings**

Description	No. Bolts	Bolt Dia.	Washers Required	Bolt Length (inches)	
				NUPI Flange to Flange	NUPI Flange to Steel
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	3.00	2.75
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	3.50	3.25
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	3.50	3.50



3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	3.75	3.50
3 1/2" (110 mm) Socket Fusion SDR 7.3	8	5/8	Yes	4.50	3.75
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	4.50	4.00
3 1/2" (110 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	4.50	3.75
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	4.50	3.75
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	5.00	4.50
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	6.00	5.00
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	7.00	5.50
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	7.50	6.00
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	3.50	3.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	3.75	3.50
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.00	3.75
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	4.00	3.75
3 1/2" (110 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	4.50	3.75
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	4.50	3.75
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	5.00	4.50
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	6.00	5.00
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	7.00	5.50
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	7.50	6.00
3 1/2" (110 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	4.50	3.75
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	4.50	3.75
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	6.00	5.00
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	7.00	5.50
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	7.00	5.50
12" 315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	6.50	5.50
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	6.50	6.00
1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	3.00	2.75
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	3.75	3.50
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	4.00	3.75
3" (90 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	4.00	3.75
3 1/2" (110 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	4.50	3.75
4" (125 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	4.50	3.75
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	5.00	4.50
8" (110 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	6.00	5.00
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	7.00	5.50
12" 315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	7.50	6.00
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	6.50	6.00
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	6.50	6.00
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	7.00	6.00



18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	8.50	7.00
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	8.50	7.00
1 1/2" (50 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	3.00	2.75
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	3.75	3.25
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	3.75	3.50
3" (90 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	3.75	3.50
3 1/2" (110 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	4.00	3.75
4" (125 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	4.00	3.75
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	4.50	4.50
8" (110 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	5.50	4.50
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	5.50	5.00
12" (315 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	7.00	5.50
14" (255 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	6.50	6.00
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	7.00	6.00
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	10.00	7.50
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	8.50	7.00
18" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	10.50	8.00
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	8.50	7.00
24" (630 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	9.00	7.50
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	6.00	5.50
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	7.00	6.00
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	7.50	6.50
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	7.50	6.50
22" (560 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	8.00	7.00
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	8.00	7.00
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	3.75	3.25
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	3.75	3.50
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	3.75	3.50
3 1/2" (110 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	3.75	3.50
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	4.00	3.75
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	4.50	4.50



8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	5.50	5.00
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	5.50	5.00
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	7.00	5.50
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	6.00	5.50
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	7.00	6.00
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	10.00	7.50
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	7.50	6.50
20" (500 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	7.50	6.50
22" (560 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	8.00	7.00
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	8.00	7.00



**TABLES 6A - 6D** provides fastener sizes, and requirements for bolting NUPI Niron Clima fittings to lug style butterfly valves utilizing four different styles of NUPI America Backing Rings. Tables are specific to the four backing rings offerings provided by NUPI Americas, FR-PP Encapsulated Ductile Iron Backing Ring (Part No. "FLAACPP") assemblies shown **Table 6A**, Machined Steel Backing Ring (Part No. "FLAACPP") assemblies shown **Table 6B**, Epoxy Coated Ductile Iron Backing Ring (Part No. "FLAVN") assemblies shown **Table 6C**, and Galvanized Steel Backing Ring (Part No. "FLAAC") assemblies shown in **Table 6D**. Steel flange widths are based on ASME B16.5, Table 8C, "Minimum Dimension of 150 Class Flange". Bolt lengths within the tables are based on the width of NUPI Niron Clima Stub Flange + NUPI Niron Clima Backing Ring + 1/8" thick gasket + the length of bolt insertion into a lug style butterfly valve. The bolt insertion length utilized in the tables equals one nominal bolt diameter. Always verify the actual bolt insertion depth for the specific lug butterfly valve being installed with the valve manufacturer before purchasing and installing bolts in the lug style butterfly valves. Greater bolt insertion depths may be required for some valves.

**TABLE 6A**  
**Lug Butterfly Valve Connection (NUPI ANSI/ASA 150#)**

Flange Connections - Using FLAACPP Backing Rings					Bolt Length
Description	No. Bolts Per Face	Bolt Dia.	Washer Required	Bolt Insertion Depth.	NUPI Flange to BFV Lug
				(inch)	(inch)
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	0.500	2.00
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.25
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.25
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.50
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.625	3.00
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	3.50
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	4.50
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	5.00
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	3.25
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	0.500	2.25
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.50
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	3.50
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	4.50



10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	0.875	5.00
4" (125 mm) BF SDR 9 Short Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) BF SDR 9 Short Spigot	8	3/4	Yes	0.750	3.75
8" (110 mm) BF SDR 9 Short Spigot	8	3/4	Yes	0.750	4.50
10" (250 mm) BF SDR 9 Short Spigot	12	7/8	Yes	0.875	5.00
1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	0.500	2.00
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.50
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	3.50
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	4.50
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	0.875	5.00
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.50
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	3.75
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	0.875	4.00
24" (630 mm) BF SDR 17 Short Spigot	20	1 1/4	Yes	1.250	7.00
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.50
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.625	2.75
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	3.75
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	0.875	4.00
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	1.250	7.00





**TABLE 6B**

**Lug Butterfly Valve Connection (NUPI ANSI/ASA 150#)**

<b>ANSI/ASA 150# Machined Steel Backing Ring</b>					<b>Bolt Length</b>
<b>Description</b>	<b>No. Bolts Per Face</b>	<b>Bolt Dia.</b>	<b>Washer Required</b>	<b>Bolt Insertion Depth.</b>	<b>NUPI Flange to BFV Lug</b>
				<b>(inch)</b>	<b>(inch)</b>
5" (125 mm) ANSI SDR 7.3, 9, 11, and 17	8	3/4	Yes	0.750	3.50

**TABLE 6C**

**Lug Butterfly Valve Connection (NUPI ANSI/ASA 150#)**

<b>Flange Connections - Using FLAVN Backing Rings</b>					<b>Bolt Length</b>
<b>Description</b>	<b>No. Bolts Per Face</b>	<b>Bolt Dia.</b>	<b>Washer Required</b>	<b>Bolt Insertion Depth.</b>	<b>NUPI Flange to BFV Lug</b>
				<b>(inch)</b>	<b>(inch)</b>
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.50
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.75
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.625	3.25
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	4.00
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	4.50
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	5.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.75
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.75
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	4.00
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	0.875	4.50
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	0.875	5.00
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	0.750	3.75
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	0.750	4.50



10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	0.875	5.00
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	0.875	4.50
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	1.000	5.00
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.75
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.75
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	4.00
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	0.875	4.50
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	0.875	5.00
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	1.000	5.00
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	1.000	5.00
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	1.000	5.00
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	6.00
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	6.50
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.75
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	3.50
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	0.875	4.00
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	0.875	4.50
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	1.000	5.00
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	1.000	5.00
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	1.000	6.50
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	1.250	6.00
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	1.250	6.50
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	1.000	4.50
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	1.000	5.00
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	1.250	5.50
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	1.250	5.50
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	1.250	6.00



2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.50
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.50
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.75
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.625	3.00
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	3.50
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	0.875	4.00
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	0.875	4.50
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	1.000	4.50
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	1.000	5.00
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	1.000	6.50
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	1.250	5.50
20" (500 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	1.250	5.50
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	1.250	6.00

**TABLE 6D**  
**Lug Butterfly Valve Connection (NUPI ANSI/ASA 150#)**

Flange Connections - Using FLAAC Backing Rings					Bolt Length
Description	No. Bolts Per Face	Bolt Dia.	Washer Required	Bolt Insertion Depth.	NUPI Flange to BFV Lug
				(inch)	(inch)
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	0.500	1.75
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.00
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.00
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	0.625	2.25
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.625	2.50
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	0.625	2.50
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	3.50
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	0.750	4.50
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	5.00
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	0.875	3.25
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	0.500	2.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.25
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.25



3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	0.625	2.25
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	0.625	2.50
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	2.75
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	0.750	3.50
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	0.875	3.75
4" (125 mm) BF SDR 9 Short Spigot	8	5/8	Yes	0.625	2.50
6" (160 mm) BF SDR 9 Short Spigot	8	3/4	Yes	0.750	3.25
8" (110 mm) BF SDR 9 Short Spigot	8	3/4	Yes	0.750	3.75
10" (250 mm) BF SDR 9 Short Spigot	12	7/8	Yes	0.875	3.75
1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	0.500	1.75
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.25
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.25
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	0.625	2.25
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	0.625	2.50
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	2.75
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	0.750	3.50
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	0.875	3.75
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	1.000	3.75
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	1.000	4.00
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	5.00
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	5.00
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.25
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.25
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	0.625	2.25
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	0.625	2.25
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	2.75
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	0.750	3.00
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	0.875	3.25
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	1.000	3.25
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	1.000	4.00
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	4.50
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	1.250	4.50
24" (630 mm) BF SDR 17 Short Spigot	20	1 1/4	Yes	1.250	4.50
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.25
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.25
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	0.625	2.25



---

4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.625	2.25
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	2.75
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.750	3.00
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	0.875	3.25
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	1.250	4.50



**TABLES 7A-7D** provides fastener sizes, and requirements for bolting to narrow wafer style butterfly valves (BFV) with faces to face dimensions referenced from ASME B16.1, Table 8, “Classes 25 and 125 Cast Iron, and Classes 150 to 600 Steel Butterfly Valve, Face to Face Dimensions”. Each table provides two options for the bolted assemblies, 1) bolt lengths for bolting a valve assembly with (2 ea.) NUPI NIRON Clima Stub Flanges + (2 ea.) Backing Rings, and 2) bolting a valve with (1 ea.) 150# steel flange + (1 ea.) NUPI NIRON Clima Stub Flange + (1 ea.) Backing Ring. Always verify valve’s actual face to face width with that of the table to verify bolts lengths are correct before purchasing and installing. Tables are specific to the four backing rings offerings provided by NUPI Americas, FR-PP Encapsulated Ductile Iron Backing Ring (Part No. “FLAACPP”) assemblies shown **Table 7A**, Machined Steel Backing Ring (Part No. “FLAACPP”) assemblies shown **Table 7B**, Epoxy Coated Ductile Iron Backing Ring (Part No. “FLAVN”) assemblies shown **Table 7C**, and Galvanized Steel Backing Ring (Part No. “FLAAC”) assemblies shown in **Table 7D**.

**TABLE 7A**

**Wafer Butterfly Valve Connection (Narrow BFV)  
Using FR-PP Encapsulated Backing Ring -FLAACPP**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.299	5.00	4.50
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.693	6.00	5.00
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.00	5.50
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.00	5.50
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.000	5.50	4.50
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.047	7.50	6.50
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.047	7.00	6.00
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.205	8.50	7.00
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.362	10.00	8.00



**TABLE 7 A Continued:**

1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	2.677	11.50	9.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.299	5.50	4.50
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.693	6.00	5.50
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.50	5.50
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	1.811	6.50	6.00
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.047	7.00	6.00
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.205	8.50	7.00
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.362	10.00	8.00
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.677	11.50	9.00
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.047	7.00	6.00
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.205	9.00	7.50
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.362	10.50	8.50
1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	2.677	11.50	9.00
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.299	5.00	4.50
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.693	6.00	5.50
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.50	5.50
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	1.811	6.50	6.00
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.047	7.00	6.00
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.205	8.50	7.00
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.362	10.00	8.00
1 1/2" (50 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	2.677	11.50	9.00
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.299	5.00	4.50
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.693	6.00	5.50
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	6.00	5.50
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	1.811	6.50	5.50
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.047	7.00	6.00
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.205	8.00	7.00
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.362	9.00	7.50
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.677	10.00	8.50
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.693	6.00	5.50
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	6.00	5.50
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	1.811	6.00	5.50
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	0.000	5.00	4.00
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.047	7.00	6.00
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.205	8.00	7.00



**TABLE 7B**

**Wafer Butterfly Valve Connection (Narrow BFV)**

**ANSI/ASA 150# Machined Steel Backing Ring**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
5" (125 mm) ANSI SDR 7.3, 9, 11, and 17	8	3/4	Yes	2.205	8.50	7.00





**TABLE 7C**

**Wafer Butterfly Valve Connection (Narrow BFV)  
Using Epoxy Coated Backing Ring -FLAVN**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.693	6.000	5.500
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.000	5.500
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.500	6.000
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.047	7.500	6.500
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.047	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.362	9.500	8.000
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.677	11.000	9.000
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.071	12.000	9.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.693	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.500	6.000
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	7.000	6.000
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.047	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.362	9.500	8.000
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.677	11.000	9.000
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.071	12.000	9.500
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.047	7.500	6.500
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.205	9.000	7.500
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.362	10.500	8.500
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.677	11.000	9.000
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.071	11.000	9.000
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.071	11.500	9.500
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.693	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.500	6.000
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	7.000	6.000
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.047	7.500	6.500
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.362	9.500	8.000
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.677	11.000	9.000
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.071	12.000	9.500
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.071	11.500	9.500



**TABLE 7 C Continued:**

14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.071	11.500	9.500
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	3.110	12.500	10.000
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.016	14.500	12.000
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.370	15.500	12.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.693	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	6.500	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	6.500	6.000
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.047	7.000	6.500
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.362	8.500	7.500
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.677	9.500	8.500
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.071	11.500	9.500
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.071	11.500	9.500
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	3.110	12.500	10.000
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	3.110	15.500	11.500
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.016	14.500	12.000
18" (450 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	4.016	16.500	13.000
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.370	15.500	12.500
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.071	10.500	9.500
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	3.110	12.500	10.000
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.016	13.500	11.500
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.370	14.500	12.000
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.693	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	6.500	5.500
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	6.500	6.000
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.047	7.000	6.500
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.362	9.000	7.500
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.677	9.500	8.500
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.071	11.500	9.500
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.071	10.500	9.500
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	3.110	12.500	10.000
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	3.110	15.500	11.500
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.016	13.500	11.500
20" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.370	14.500	12.000



**TABLE 7D**

**Wafer Butterfly Valve Connection (Narrow BFV)**

**Using Galvanized Steel Backing Ring -FLAAC**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.299	4.500	4.000
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.693	5.000	5.000
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	5.500	5.000
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	5.500	5.500
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.047	6.500	6.000
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.047	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.362	8.500	7.500
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.677	9.500	8.000
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.071	10.500	9.000
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.299	4.500	4.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.693	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.047	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.362	8.500	7.500
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.677	9.500	8.000
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.071	10.500	9.000
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.047	6.500	6.000
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.205	8.000	7.000
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.362	9.000	7.500
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.677	9.500	8.500
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.071	9.000	8.500
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.071	9.500	8.500



**TABLE 7D Continued:**

1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.299	4.500	4.000
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.693	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.047	6.500	6.000
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.362	8.500	7.500
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.677	9.500	8.000
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.071	10.500	9.000
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.071	9.500	8.500
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.071	9.500	8.500
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	3.110	10.000	9.000
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.016	12.500	11.000
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.370	13.000	11.500
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.299	4.500	4.000
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.693	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	5.500	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	5.500	5.500
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.047	6.000	6.000
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.362	7.500	7.000
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.677	8.000	7.500
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.071	9.500	8.500
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.071	9.500	8.500
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	3.110	10.000	9.000
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	3.110	13.000	10.500
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.016	12.500	11.000
18" (450 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	4.016	14.500	12.000
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.370	13.000	11.500
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.071	9.000	8.500
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	3.110	10.000	9.000
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.016	11.500	10.500
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.370	12.000	11.000



TABLE 7D Continued:

2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.693	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	5.500	5.500
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	5.500	5.500
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.047	6.000	6.000
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.362	7.500	7.000
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.677	8.000	7.500
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.071	9.500	8.500
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.071	9.000	8.500
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	3.110	10.000	9.000
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	3.110	13.000	10.500
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.016	11.500	10.500
20" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.370	12.000	11.000

**TABLES 8A-8D** provides fastener sizes, and requirements for bolting to wide wafer style butterfly valves (BFV) with faces to face dimensions referenced from ASME B16.1, Table 8, "Classes 25 and 125 Cast Iron, and Classes 150 to 600 Steel Butterfly Valve, Face to Face Dimensions". Each table provides two options for the bolted assemblies, 1) bolt lengths for bolting a valve assembly with (2 ea.) NUPI NIRON Clima Stub Flanges + (2 ea.) Backing Rings, and 2) bolting a valve with (1 ea.) 150# steel flange + (1 ea.) NUPI NIRON Clima Stub Flange + (1 ea.) Backing Ring. Always verify valve's actual face to face width with that of the table to verify bolts lengths are correct before purchasing and installing. Tables are specific to the four backing rings offerings provided by NUPI Americas, FR-PP Encapsulated Ductile Iron Backing Ring (Part No. "FLAACPP") assemblies shown **Table 8A**, Machined Steel Backing Ring (Part No. "FLAACPP") assemblies shown **Table 8B**, Epoxy Coated Ductile Iron Backing Ring (Part No. "FLAVN") assemblies shown **Table 8C**, and Galvanized Steel Backing Ring (Part No. "FLAAC") assemblies shown in **Table 8D**.



**TABLE 8A:**

**Wafer Butterfly Valve Connection (Wide BFV)  
Using FR-PP Encapsulated Backing Ring -FLAACPP**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Wide BFV Wafer	NUPI Flange to Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.457	5.000	4.500
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	6.000	5.500
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	6.500	6.000
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.000	5.500	4.500
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.756	9.000	7.500
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.795	10.500	8.500
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	2.992	11.500	9.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.457	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	1.929	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.756	9.000	7.500
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.795	10.500	8.500
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.992	11.500	9.500
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.756	10.000	8.000
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.795	11.000	9.000



**TABLE 8A Continued:**

1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	2.992	12.000	9.500
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.457	5.000	4.500
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	1.929	6.500	6.000
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.205	7.000	6.500
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.756	9.000	7.500
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.795	10.500	8.500
1 1/2" (50 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	2.992	11.500	9.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.457	5.000	4.500
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	1.929	6.500	6.000
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.205	7.000	6.000
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.756	8.500	7.500
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.795	9.500	8.000
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	2.992	10.500	9.000
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.000	5.000	4.000
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.205	7.000	6.000
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.756	8.500	7.500
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.795	9.500	8.000
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	2.992	10.500	9.000

**TABLE 8B:**

**Wafer Butterfly Valve Connection (Wide BFV)**

**ANSI/ASA 150# Machined Steel Backing Ring**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Wide BFV Wafer	NUPI Flange to Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
5" (125 mm) ANSI SDR 7.3, 9, 11, and 17	8	3/4	Yes	2.520	8.50	7.50



**TABLE 8C:**

**Wafer Butterfly Valve Connection (Wide BFV)**

**Using Epoxy Coated Backing Ring -FLAVN**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Wide BFV Wafer	NUPI Flange to Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	6.500	6.000
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	7.000	6.000
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.205	8.000	6.500
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.756	9.000	7.500
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.795	10.000	8.500
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.992	11.500	9.500
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.268	12.000	10.000
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.929	7.000	6.000
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.929	7.000	6.000
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.756	9.000	7.500
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.795	10.000	8.500
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.992	11.500	9.500
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.268	12.000	10.000
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.756	9.500	8.000
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.795	10.500	8.500
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.992	11.500	9.500
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.268	11.000	9.500
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.622	12.000	10.000





TABLE 8C Continued:

2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.929	7.000	6.000
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.929	7.000	6.000
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.756	9.000	7.500
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.795	10.000	8.500
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.992	11.500	9.500
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.268	12.000	10.000
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.622	12.000	10.000
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.622	12.000	10.000
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	4.016	13.500	11.000
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.488	15.000	12.500
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	5.000	16.000	13.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.929	7.000	6.000
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.756	8.500	7.500
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.795	9.000	8.000
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.268	11.500	9.500
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.622	12.000	10.000
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	4.016	13.500	11.000
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	4.016	16.000	12.500
18" (450 mm) EF/BF SDR 11 Long Spigot	18	1 1/8	Yes	4.488	15.000	12.500
18" (450 mm) EF/BF SDR 11 Long Spigot BV	18	1 1/8	Yes	4.488	17.000	13.000
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	5.000	16.000	13.500
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.622	11.500	10.000
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	4.016	13.500	11.000
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.488	14.000	12.000
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	5.000	15.000	12.500
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	6.063	16.500	14.500



**TABLE 8C Continued:**

2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.732	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	6.500	6.000
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.205	7.500	6.500
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.756	8.500	7.500
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.795	9.000	8.000
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.268	11.500	9.500
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.622	11.500	10.000
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	4.016	13.500	11.000
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	4.016	16.000	12.500
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.488	14.000	12.000
20" (500 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	5.000	15.000	12.500
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.063	16.500	14.500



**TABLE 8D:**

**Wafer Butterfly Valve Connection (Wide BFV)  
Using Galvanized Steel Backing Ring -FLAAC**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.457	4.500	4.500
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.732	5.500	5.000
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	5.500	5.500
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.929	5.500	5.500
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.205	7.000	6.000
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.756	7.500	7.000
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.795	9.000	8.000
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.268	10.500	9.000
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.457	5.000	4.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.732	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.756	7.500	7.000
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.795	9.000	8.000
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.268	10.500	9.000
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.756	8.500	7.500
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.795	9.500	8.000
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.268	9.500	8.500
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.622	10.000	9.500



**TABLE 8D Continued:**

1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.457	4.500	4.500
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.732	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.756	7.500	7.000
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.795	9.000	8.000
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.992	10.000	8.500
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.268	10.500	9.000
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.622	10.000	9.500
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.622	10.000	9.500
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	4.016	11.000	10.000
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.488	13.000	11.500
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	5.000	13.500	12.000
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.457	4.500	4.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.732	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.929	5.500	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.929	6.000	5.500
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.756	7.500	7.000
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.795	8.000	7.500
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.992	8.500	8.000
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.268	10.000	9.000
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.622	10.000	9.500
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	4.016	11.000	10.000
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	4.016	14.000	11.500
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.488	13.000	11.500
18" (450 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	4.488	15.000	12.000
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	5.000	13.500	12.000
24" (630 mm) EF/BF SDR 11 Long Spigot	20	1 1/4	Yes	6.063	14.500	13.500



**TABLE 8D Continued:**

14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.622	9.500	9.000
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	4.016	11.000	10.000
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.488	12.000	11.000
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	5.000	12.500	11.500
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.063	14.000	13.000
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.732	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	5.500	5.500
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.929	5.500	5.500
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.205	6.500	6.000
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.756	7.500	7.000
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.795	8.000	7.500
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	2.992	8.500	8.000
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.268	10.000	9.000
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.622	9.500	9.000
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	4.016	11.000	10.000
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	4.016	14.000	11.500
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.488	12.000	11.000
20" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	5.000	12.500	11.500
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.063	14.000	13.000

**TABLES 9A-9D** provides fastener sizes, and requirements for bolting to extra wide wafer style butterfly valves (BFV) with faces to face dimensions referenced from ASME B16.1, Table 8, "Classes 25 and 125 Cast Iron, and Classes 150 to 600 Steel Butterfly Valve, Face to Face Dimensions". Each table provides two options for the bolted assemblies, 1) bolt lengths for bolting a valve assembly with (2 ea.) NUPI NIRON Clima Stub Flanges + (2 ea.) Backing Rings, and 2) bolting a valve with (1 ea.) 150# steel flange + (1 ea.) NUPI NIRON Clima Stub Flange + (1 ea.) Backing Ring. Always verify valve's actual face to face width with that of the table to verify bolts lengths are correct before purchasing and installing. Tables are specific to the four backing rings offerings provided by NUPI Americas, FR-PP Encapsulated Ductile Iron Backing Ring (Part No. "FLAACPP") assemblies shown **Table 9A**, Machined Steel Backing Ring (Part No. "FLAACPP") assemblies shown **Table 9B**, Epoxy Coated Ductile Iron Backing Ring (Part No. "FLAVN") assemblies shown **Table 9C**, and Galvanized Steel Backing Ring (Part No. "FLAAC") assemblies shown in **Table 9D**.



**TABLE 9A:**

**Wafer Butterfly Valve Connection (Extra Wide BFV)  
Using FR-PP Encapsulated Backing Ring -FLAACPP**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Extra Wide BFV Wafer	NUPI Flange to Extra Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1 1/2" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.496	5.000	4.500
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.000	5.500
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	6.000	5.500
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	6.500	6.000
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	0.000	5.500	4.500
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.244	7.500	6.500
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.244	7.500	6.500
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.795	9.000	7.500
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	2.953	10.500	8.500
1 1/2" (50 mm) EF/BF SDR 7.3 Long Spigot	4	1/2	Yes	3.110	11.500	9.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.496	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.500	5.500
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	2.008	6.500	6.000
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.008	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.244	7.500	6.500
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.795	9.000	7.500
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	2.953	10.500	8.500
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	3.110	11.500	9.500
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.244	7.500	6.500
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.795	10.000	8.000
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	2.953	11.500	9.000



**TABLE 9A Continued:**

1 1/2" (50 mm) EF/BF SDR 9 Long Spigot	4	1/2	Yes	3.110	12.000	9.500
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.496	5.000	4.500
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	2.008	6.500	6.000
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.008	6.500	6.000
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.244	7.500	6.500
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.795	9.000	7.500
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	2.953	10.500	8.500
1 1/2" (50 mm) EF/BF SDR 11 Long Spigot	4	1/2	Yes	3.110	11.500	9.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.496	5.000	4.500
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	2.008	6.500	6.000
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.008	6.500	6.000
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.244	7.000	6.500
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.795	8.500	7.500
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	2.953	9.500	8.000
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	3.110	10.500	9.000
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	6.000	5.500
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	6.500	6.000
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	6.500	6.000
3 1/2" (110 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.000	5.000	4.000
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.244	7.000	6.500
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.795	8.500	7.500
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.953	10.000	8.500
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.110	10.500	9.000
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.181	19.000	15.500

**TABLE 9B:**

**Wafer Butterfly Valve Connection (Extra Wide BFV)**

**ANSI/ASA 150# Machined Steel Backing Ring**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Extra Wide BFV Wafer	NUPI Flange to Extra Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
5" (125 mm) ANSI SDR 7.3, 9, 11, and 17	8	3/4	Yes	2.559	9.00	7.50



**TABLE 9C:**

**Wafer Butterfly Valve Connection (Extra Wide BFV)  
Using Epoxy Coated Backing Ring -FLAVN**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Extra Wide BFV Wafer	NUPI Flange to Extra Wide BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	6.00	5.50
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	6.50	6.00
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	7.00	6.00
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.244	8.00	7.00
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.795	9.00	7.50
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.953	10.00	8.50
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.110	11.50	9.50
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.386	12.50	10.00
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	6.50	5.50
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.795	9.00	7.50
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.953	10.00	8.50
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.110	11.50	9.50
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.386	12.50	10.00
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.795	9.50	8.00
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.953	11.00	9.00
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.110	11.50	9.50
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.386	11.00	9.50
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.740	12.00	10.50





**TABLE 9C Continued:**

2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	6.50	5.50
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.795	9.00	7.50
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.953	10.00	8.50
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.110	11.50	9.50
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.386	12.50	10.00
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.740	12.00	10.50
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.740	12.00	10.50
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	4.134	13.50	11.00
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.606	15.00	12.50
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	5.118	16.00	13.50
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	6.00	5.50
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	2.008	6.50	6.00
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.795	8.50	7.50
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.953	9.00	8.00
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.110	10.00	8.50
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.386	11.50	9.50
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.740	12.00	10.50
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	4.134	13.50	11.00
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	4.134	16.50	12.50
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.606	15.00	12.50
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.606	17.00	13.50
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	5.118	16.00	13.50
14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.740	11.50	10.00
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	4.134	13.50	11.00
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.606	14.00	12.00
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	5.118	15.00	13.00
24" (630 mm) EF/BF SDR 17 Short Spigot	20	1 1/4	Yes	6.181	16.50	14.50



TABLE 9C Continued:

2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	6.00	5.50
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	6.50	6.00
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	7.00	6.00
3 1/2" (110 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	0.000	5.00	4.00
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.244	7.50	6.50
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.795	8.50	7.50
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.953	9.50	8.00
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.110	10.00	8.50
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.386	11.50	9.50
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.740	11.50	10.00
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	4.134	13.50	11.00
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	4.134	16.50	12.50
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.606	14.00	12.00
20" (500 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	5.118	15.00	13.00
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.181	16.50	14.50



**TABLE 9D:**

**Wafer Butterfly Valve Connection (Extra Wide BFV)  
Using Epoxy Coated Backing Ring -FLAAC**

Description	No. Bolts	Bolt Dia.	Washers Required	Valve Width	Bolt Length	
					2 NUPI Flanges to Narrow BFV Wafer	NUPI Flange to Narrow BFV Wafer and Steel Flange
				(inch)	(inch)	(inch)
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.496	4.500	4.500
2" (63 mm) Socket Fusion SDR 7.3	4	5/8	Yes	1.811	5.500	5.000
2 1/2" (75 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	5.500	5.500
3" (90 mm) Socket Fusion SDR 7.3	4	5/8	Yes	2.008	6.000	5.500
4" (125 mm) Socket Fusion SDR 7.3	8	5/8	Yes	2.244	7.000	6.000
4" (125 mm) EF/BF SDR 7.3 Short Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.795	7.500	7.000
8" (110 mm) EF/BF SDR 7.3 Short Spigot	8	3/4	Yes	2.953	9.000	8.000
10" (250 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.110	10.000	8.500
12" (315 mm) EF/BF SDR 7.3 Short Spigot	12	7/8	Yes	3.386	10.500	9.000
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.496	5.000	4.500
2" (63 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	1.811	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
3" (90 mm) EF/BF SDR 7.3 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
4" (125 mm) EF/BF SDR 7.3 Long Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.795	7.500	7.000
8" (110 mm) EF/BF SDR 7.3 Long Spigot	8	3/4	Yes	2.953	9.000	8.000
10" (250 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.110	10.000	8.500
12" (315 mm) EF/BF SDR 7.3 Long Spigot	12	7/8	Yes	3.386	10.500	9.000
4" (125 mm) EF/BF SDR 9 Short Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.795	8.500	7.500
8" (110 mm) EF/BF SDR 9 Short Spigot	8	3/4	Yes	2.953	10.000	8.500
10" (250 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.110	10.000	8.500
12" (315 mm) EF/BF SDR 9 Short Spigot	12	7/8	Yes	3.386	9.500	8.500
14" (355 mm) EF/BF SDR 9 Short Spigot	12	1	Yes	3.740	10.000	9.500



**TABLE 9D Continued:**

1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.496	4.500	4.500
2" (63 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	1.811	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
3" (90 mm) EF/BF SDR 9 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
4" (125 mm) EF/BF SDR 9 Long Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.795	7.500	7.000
8" (110 mm) EF/BF SDR 9 Long Spigot	8	3/4	Yes	2.953	9.000	8.000
10" (250 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.110	10.000	8.500
12" (315 mm) EF/BF SDR 9 Long Spigot	12	7/8	Yes	3.386	10.500	9.000
14" (355 mm) EF/BF SDR 9 Long Spigot	12	1	Yes	3.740	10.000	9.500
14" (355 mm) EF/BF SDR 11 Short Spigot	12	1	Yes	3.740	10.000	9.500
16" (400 mm) EF/BF SDR 11 Short Spigot	16	1	Yes	4.134	11.000	10.000
18" (450 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	4.606	13.000	11.500
20" (500 mm) EF/BF SDR 11 Short Spigot	16	1 1/8	Yes	5.118	13.500	12.000
1.5" (50 mm) Socket Fusion SDR 7.3	4	1/2	Yes	1.496	4.500	4.500
2" (63 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	1.811	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
3" (90 mm) EF/BF SDR 11 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
4" (125 mm) EF/BF SDR 11 Long Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.795	7.500	7.000
8" (110 mm) EF/BF SDR 11 Long Spigot	8	3/4	Yes	2.953	8.000	7.500
10" (250 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.110	8.500	8.000
12" (315 mm) EF/BF SDR 11 Long Spigot	12	7/8	Yes	3.386	10.000	9.000
14" (355 mm) EF/BF SDR 11 Long Spigot	12	1	Yes	3.740	10.000	9.500
16" (400 mm) EF/BF SDR 11 Long Spigot	16	1	Yes	4.134	11.000	10.000
16" (400 mm) EF/BF SDR 11 Long Spigot BV	16	1	Yes	4.134	14.000	11.500
18" (450 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	4.606	13.000	11.500
18" (450 mm) EF/BF SDR 11 Long Spigot BV	16	1 1/8	Yes	4.606	15.000	12.500
20" (500 mm) EF/BF SDR 11 Long Spigot	16	1 1/8	Yes	5.118	13.500	12.000
24" (630 mm) EF/BF SDR 11 Long Spigot	20	1 1/4	Yes	6.181	15.000	13.500



**TABLE 9D Continued:**

14" (355 mm) EF/BF SDR 17 Short Spigot	12	1	Yes	3.740	9.500	9.000
16" (400 mm) EF/BF SDR 17 Short Spigot	16	1	Yes	4.134	11.000	10.000
18" (450 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	4.606	12.000	11.000
20" (500 mm) EF/BF SDR 17 Short Spigot	16	1 1/8	Yes	5.118	12.500	11.500
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.181	14.000	13.000
2" (63 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	1.811	5.500	5.000
2 1/2" (75 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
3" (90 mm) EF/BF SDR 17 Long Spigot	4	5/8	Yes	2.008	6.000	5.500
4" (125 mm) EF/BF SDR 17 Long Spigot	8	5/8	Yes	2.244	6.500	6.000
6" (160 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.795	7.500	7.000
8" (110 mm) EF/BF SDR 17 Long Spigot	8	3/4	Yes	2.953	8.500	7.500
10" (250 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.110	8.500	8.000
12" (315 mm) EF/BF SDR 17 Long Spigot	12	7/8	Yes	3.386	10.000	9.000
14" (355 mm) EF/BF SDR 17 Long Spigot	12	1	Yes	3.740	9.500	9.000
16" (400 mm) EF/BF SDR 17 Long Spigot	16	1	Yes	4.134	11.000	10.000
16" (400 mm) EF/BF SDR 17 Long Spigot BV	16	1	Yes	4.134	14.000	11.500
18" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	4.606	12.000	11.000
20" (450 mm) EF/BF SDR 17 Long Spigot	16	1 1/8	Yes	5.118	12.500	11.500
24" (630 mm) EF/BF SDR 17 Long Spigot	20	1 1/4	Yes	6.181	14.000	13.000



**TABLE 10 – Maximum Bolt Torque**

**Table 10** provides the torque limits for flanging NUPI polypropylene material with ASME B16.21 flat faced gaskets. Exceeding these torque limits may cause damage to the flange adapter material.

Pipe Size		Maximum Bolt Torque Limit
(inch)	(mm)	(Ft-lb <sub>f</sub> )
1	32	19
1 1/4	40	23
1 1/2	50	28
2	63	50
2 1/2	75	71
3	90	75
3 1/2	110	53
4	125	42
6	160	89
8	200	124
10	250	108
12	315	152
14	355	257
16	400	224
16BV	400	250
18	450	325
20	500	312
22	560	
24	630	322