



**Garlock Sealing Technologies**  
**Garlock Inc**  
1666 Division Street  
Palmyra, New York 14522-9350  
800-448-6688  
315-597-4811  
Fax: 800-543-0598  
<http://www.garlock.net>

## *Factors Affecting Gasket Performance*

A gasket has one basic function: to create a positive seal between two relatively stationary parts. The gasket must do a number of different jobs well to function properly - first, create an initial seal; second, maintain the seal over a desired length of time; third, be easily removed and replaced. Varying degrees of success are dependent on how well the gasket does the following:

1. Seals system fluid.
2. Chemically resists the system fluid to prevent serious impairment of its physical properties.
3. Deforms enough to flow into the imperfections on the gasket seating surfaces to provide intimate contact between the gasket and the sealing surfaces.
4. Withstands system temperatures without serious impairments of its performance properties.
5. Is resilient and creep resistant enough to maintain an adequate portion of the applied load.
6. Has sufficient strength to resist crushing under the applied load, and maintain its integrity when being handled and installed.
7. Does not contaminate the system fluid.
8. Does not promote corrosion of the gasket seating surfaces.
9. Is easily and cleanly removable at the time of replacement.

During the gasket product selection process that follows, we recommend that these nine (9) factors be used as a checklist from the viewpoint of the user's degree of need for each factor and the manufacturer's degree of compliance.

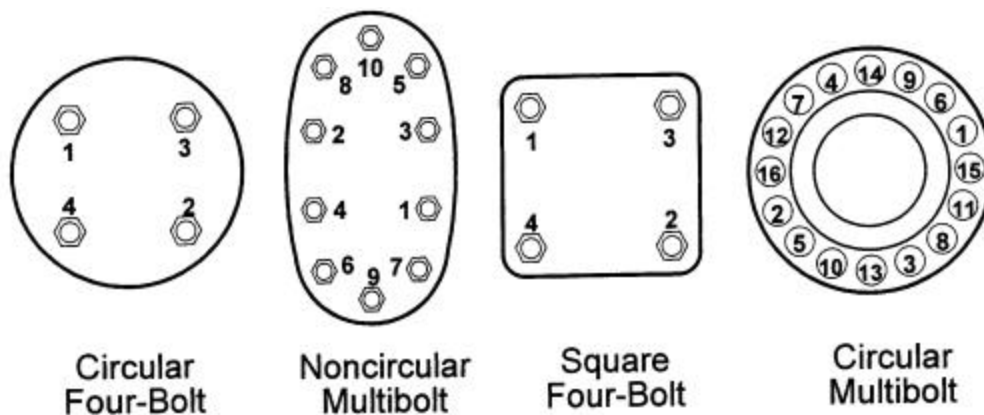
## *Installation*

A few simple precautionary measures must be observed during installation to ensure the most satisfactory joint.

- Center the gasket on the flange. This is extremely vital where raised faces are involved.
- Be sure surface finish and flatness are satisfactory.
- Tighten the bolts to compress the gasket uniformly. This means going from side to side around the joint. See Figure 1.
- Use a torque wrench, well-lubricated fasteners, and hardened flat washers to ensure correct initial loading.
- All bolts should be tightened in one-third increments, according to proper bolting patterns.
- Make a final check pass at the target torque value moving consecutively from bolt to bolt.
- Retorque 12 to 24 hours after initial installation, whenever possible. All applicable safety standards including lockout/tagout procedures should be observed.
- Never use liquid or metallic based anti-stick or lubricating compounds on the gaskets. Premature failure could occur as a result.

## *Correct Bolting Patterns*

Figure 1





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**Bolt Torque Values for ASME B16.5 Class 150# Raised Face Flanges**  
**with A193 Grade B7 Bolts**  
 for **GYLON®** and **Compressed Sheet** gaskets

Nom. Pipe Size (Inches)	No. of Bolts	Size of Bolts (Inches)	Internal Pressure (psig)	Minimum Torque (ft.lbs.)	Preferred Torque (ft.lbs.)
1/2	4	1/2	300	9	28
3/4	4	1/2	300	13	40
1	4	1/2	300	17	53
1-1/4	4	1/2	300	26	60
1-1/2	4	1/2	300	35	60
2	4	5/8	300	69	120
2-1/2	4	5/8	300	81	120
3	4	5/8	300	119	120
3-1/2	8	5/8	300	66	120
4	8	5/8	300	84	120
5	8	3/4	300	117	200
6	8	3/4	300	148	200
8	8	3/4	300	200	200
10	12	7/8	300	188	320
12	12	7/8	300	250	320
14	12	1	300	317	490
16	16	1	300	301	490
18	16	1-1/8	300	448	710
20	20	1-1/8	300	395	710
24	20	1-1/4	300	563	1000



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**Bolt Torque Values for ASME B16.5 Class 300# Raised Face Flanges**  
**with A193 Grade B7 Bolts**  
 for **GYLON®** and **Compressed Sheet** gaskets

Nom. Pipe Size (Inches)	No. of Bolts	Size of Bolts (Inches)	Internal Pressure (psig)	Minimum Torque (ft.lbs.)	Preferred Torque (ft.lbs.)
1/2	4	1/2	800	12	28
3/4	4	5/8	800	21	51
1	4	5/8	800	28	67
1-1/4	4	5/8	800	43	102
1-1/2	4	3/4	800	64	151
2	8	5/8	800	46	108
2-1/2	8	3/4	800	60	141
3	8	3/4	800	88	200
3-1/2	8	3/4	800	99	200
4	8	3/4	800	125	200
5	8	3/4	800	156	200
6	12	3/4	800	131	200
8	12	7/8	800	205	320
10	16	1	800	219	490
12	16	1-1/8	800	319	710
14	20	1-1/8	800	287	652
16	16	1-1/4	800	401	912
18	24	1-1/4	800	439	1000
20	24	1-1/4	800	484	1000
24	24	1-1/2	800	662	1552



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**Bolt Torque Values for ASME B16.5 Class 150# Raised Face Flanges  
with A193 Grade B7 Bolts  
for **GRAPH-LOCK®** gaskets**

<b>Nom. Pipe Size (Inches)</b>	<b>No. of Bolts</b>	<b>Size of Bolts (Inches)</b>	<b>Internal Pressure (psig)</b>	<b>Minimum Torque (ft.lbs.)</b>	<b>Preferred Torque (ft.lbs.)</b>
1/2	4	1/2	300	9	20
3/4	4	1/2	300	13	27
1	4	1/2	300	17	35
1-1/4	4	1/2	300	26	54
1-1/2	4	1/2	300	35	60
2	4	5/8	300	69	120
2-1/2	4	5/8	300	81	120
3	4	5/8	300	119	120
3-1/2	8	5/8	300	66	120
4	8	5/8	300	84	120
5	8	3/4	300	117	200
6	8	3/4	300	148	200
8	8	3/4	300	200	200
10	12	7/8	300	188	320
12	12	7/8	300	250	320
14	12	1	300	317	490
16	16	1	300	301	490
18	16	1-1/8	300	448	710
20	20	1-1/8	300	395	710
24	20	1-1/4	300	563	1000



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**with A193 Grade B7 Bolts**  
 for **GRAPH-LOCK®** gaskets

<b>Nom. Pipe Size (Inches)</b>	<b>No. of Bolts</b>	<b>Size of Bolts (Inches)</b>	<b>Internal Pressure (psig)</b>	<b>Minimum Torque (ft.lbs.)</b>	<b>Preferred Torque (ft.lbs.)</b>
1/2	4	1/2	800	12	20
3/4	4	5/8	800	21	34
1	4	5/8	800	28	45
1-1/4	4	5/8	800	43	68
1-1/2	4	3/4	800	64	101
2	8	5/8	800	46	72
2-1/2	8	3/4	800	60	94
3	8	3/4	800	88	138
3-1/2	8	3/4	800	99	154
4	8	3/4	800	125	196
5	8	3/4	800	156	200
6	12	3/4	800	131	200
8	12	7/8	800	205	320
10	16	1	800	219	341
12	16	1-1/8	800	319	498
14	20	1-1/8	800	287	435
16	20	1-1/4	800	401	608
18	24	1-1/4	800	439	1000
20	24	1-1/4	800	484	1000
24	24	1-1/2	800	662	1035