

# 5505L FLANGE BOLT DISCS

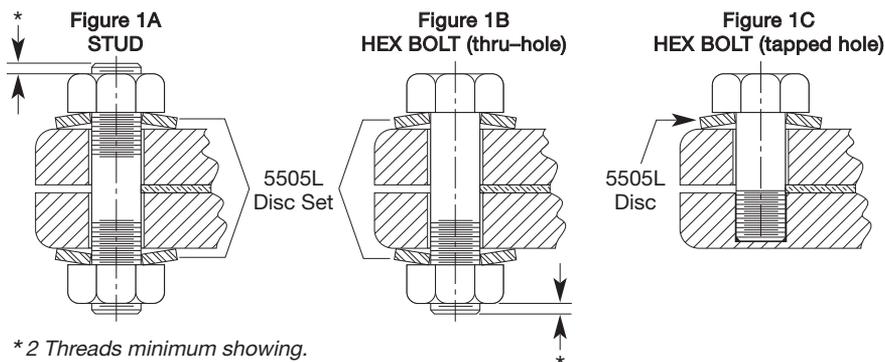
## PREPARATION

Ensure stud threads are long enough to allow nuts to make contact with metal faces.

### Precaution:

- Good bolting practice requires a minimum of two threads above the nut after final torquing to insure all threads are fully engaged (**Figures 1A and 1B**).
- For a bolt or stud in a tapped hole, the general rule is 1 to 1.5 times the bolt diameter of full thread engagement in the hole (**Figure 1C**).
- All threaded fasteners should be cleaned and inspected prior to reinstallation. Wire brush the bolts/studs and nuts to remove any rust, dirt or old lubricant. The nuts should turn freely by hand the entire length of the threaded portion. Use a clean-up tap or die nut if necessary to remove burrs.

*Fasteners that have broken, chipped or missing threads, or exhibit corrosion or other defects are not acceptable for use. Replace damaged fasteners with the same grade material and to the same specification as the originals. Use of damaged bolts/studs or nuts can result in insufficient gasket stresses and chronic leakage problems with the flange.*



## CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with the equipment, with flange bolt discs and with the requirements of the plant for the successful installation of live loading. If you have questions contact your supervisor, plant contact or Chesterton Specialist for assistance. The system or equipment should be shut down, depressurized, drained and cool before proceeding with installation. Observe all plant safety requirements.

## INSTALLATION

---

1. All thread contact areas, nut faces and discs should be liberally lubricated on all surfaces with nickel anti-seize compound or parting lubricant. Chesterton recommends Chesterton 725, 772 Nickel Anti-Seize Compound or 785 Parting Lubricant.
2. Place one disc on each end of the bolt or stud (**see Figures 1A, 1B & 1C**) and hand-tighten.
3. Tighten bolt or nut in a cross diagonal bolting pattern\*.
4. Torque should be applied incrementally\*\*.
  - Pass 1 – Bring all nuts up hand-tight; then snug-tight evenly
  - Pass 2 – Torque to a maximum of 30% of final torque.Check that flange is bearing uniformly on gasket.
  - Pass 3 – Torque to a maximum of 60% of final torque.
  - Pass 4 – Torque to 100% of torque
5. After the four basic torquing passes are complete, continue torquing the nuts using the final 100% torque in a clockwise manner around the flange until no further rotation of the nut is observed. This process may require an additional five to seven passes.

\*Refer to Various Bolting Patterns.

\*\*Refer to Torque and Disc Selection Tables.

## NOTES

---

1. Torque calculations based on thread lube with a .17 coefficient of friction (K factor). To adjust torque for other lubricants, divide the torque given by .17 and multiply by the K factor of the lube being used. See example (using a K factor of .16):

### EXAMPLE

- a.) Recommended torque = 274 N·M
  - b.)  $\frac{274 \text{ N}\cdot\text{M}}{.17} = 1612$
  - c.)  $1612 \times .16 = 258 \text{ N}\cdot\text{M}$
  - d.) Recommended new torque: 258 N·M
2. 5505L Discs are not intended for repeated installation and removal.
  3. For Heat Exchanger or other critical applications, contact a Chesterton Representative for full review of the sealing system to determine optimum bolt torque values for the gasket used.
  4. Avoid the use of 5505L Discs in the presence of hydrogen sulfide (H<sub>2</sub>S) and hydrofluoric acid (HF).

## TORQUE AND DISC SELECTION TABLES

### ABOUT TORQUE AND DISC SELECTION TABLES:

- Bolt torque values are predicated on bolt material only (see Note 3).
- Values in **bold** are generally recommended for pipe flange applications.

BOLT MATERIAL: ASTM A193, <b>GRADE B7 &amp; B16</b> BOLT YIELD STRENGTH (ALL SIZES 2.5" AND UNDER): 105,000 psi, 720 N/mm <sup>2</sup>						
Bolt Size	Disc Class	Nominal Bolt Stress		Disc Reorder Number	Recommended Bolt Torque to Achieve Nominal Bolt Stress	
		psi	N/mm <sup>2</sup>		lb-ft	N-M
M24	CLASS A	30,000	207	003086	219	297
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003159</b>	<b>328</b>	<b>445</b>
1"	CLASS A	30,000	207	003088	258	349
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003192</b>	<b>386</b>	<b>524</b>
M27	CLASS A	30,000	207	003090	321	436
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003195</b>	<b>482</b>	<b>653</b>
1 1/8"	CLASS A	30,000	207	003091	378	512
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003196</b>	<b>567</b>	<b>768</b>
M30	CLASS A	30,000	207	003092	436	591
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003197</b>	<b>653</b>	<b>885</b>
1 1/4"	CLASS A	30,000	207	003093	531	720
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003199</b>	<b>797</b>	<b>1,080</b>
M33	CLASS A	30,000	207	003573	593	805
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003206</b>	<b>889</b>	<b>1,205</b>
1 3/8"	CLASS A	30,000	207	003095	720	977
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003240</b>	<b>1,081</b>	<b>1,465</b>
M36	CLASS A	30,000	207	003096	762	1,033
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003247</b>	<b>1,141</b>	<b>1,547</b>
1 1/2"	CLASS A	30,000	207	003097	951	1,290
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003248</b>	<b>1,427</b>	<b>1,935</b>
M39	CLASS A	30,000	207	003120	986	1,337
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003249</b>	<b>1,478</b>	<b>2,003</b>

**TORQUE AND DISC SELECTION TABLES (continued)**

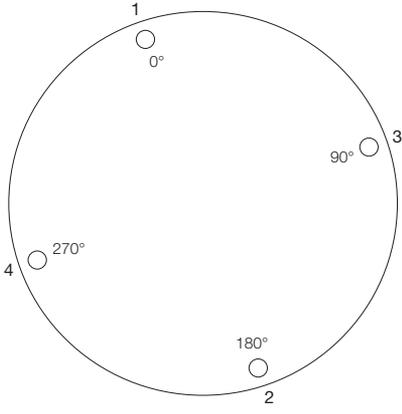
BOLT MATERIAL: DIN EN ISO 898-1, <b>CLASS 8.8</b> BOLT YIELD STRENGTH (ALL SIZES THROUGH 1.5"): 92,000 psi, 640 N/mm <sup>2</sup>						
Bolt Size	Disc Class	Nominal Bolt Stress		Disc Reorder Number	Recommended Bolt Torque to Achieve Nominal Bolt Stress	
		psi	N/mm <sup>2</sup>		lb-ft	N-M
M24	CLASS A	30,000	207	003086	220	298
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003159</b>	<b>329</b>	<b>447</b>
1"	CLASS A	30,000	207	003088	258	349
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003192</b>	<b>386</b>	<b>524</b>
M27	CLASS A	30,000	207	003090	322	437
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003195</b>	<b>483</b>	<b>655</b>
1 1/8"	CLASS A	30,000	207	003091	378	512
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003196</b>	<b>567</b>	<b>768</b>
M30	CLASS A	30,000	207	003092	437	592
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003197</b>	<b>655</b>	<b>888</b>
1 1/4"	CLASS A	30,000	207	003093	531	720
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003199</b>	<b>797</b>	<b>1,081</b>
M33	CLASS A	30,000	207	003573	595	806
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003206</b>	<b>892</b>	<b>1,209</b>
1 3/8"	CLASS A	30,000	207	003095	721	977
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003240</b>	<b>1,081</b>	<b>1,466</b>
M36	CLASS A	30,000	207	003096	763	1,035
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003247</b>	<b>1,145</b>	<b>1,552</b>
1 1/2"	CLASS A	30,000	207	003097	951	1,290
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003248</b>	<b>1,427</b>	<b>1,935</b>
M39	CLASS A	30,000	207	003120	988	1,340
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003249</b>	<b>1,482</b>	<b>2,009</b>

## TORQUE AND DISC SELECTION TABLES (continued)

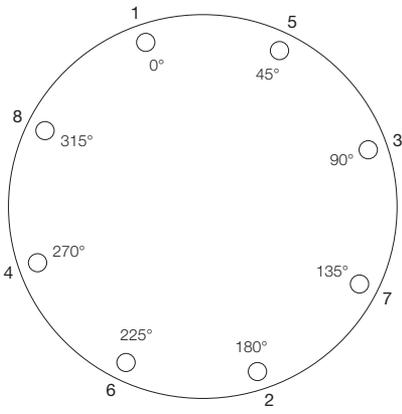
BOLT MATERIAL: DIN EN 10269, 1.7218, <b>GRADE 25CrMo4</b> BOLT YIELD STRENGTH: 64,000 psi, 440 N/mm <sup>2</sup>						
Bolt Size	Disc Class	Nominal Bolt Stress		Disc Reorder Number	Recommended Bolt Torque to Achieve Nominal Bolt Stress	
		psi	N/mm <sup>2</sup>		lb-ft	N-M
M24	CLASS A	30,000	207	003086	219	297
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003159</b>	<b>329</b>	<b>446</b>
1"	CLASS A	30,000	207	003088	258	349
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003192</b>	<b>386</b>	<b>524</b>
M27	CLASS A	30,000	207	003090	322	436
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003195</b>	<b>482</b>	<b>654</b>
1 1/8"	CLASS A	30,000	207	003091	378	512
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003196</b>	<b>567</b>	<b>768</b>
M30	CLASS A	30,000	207	003092	436	591
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003197</b>	<b>654</b>	<b>887</b>
1 1/4"	CLASS A	30,000	207	003093	532	721
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003199</b>	<b>797</b>	<b>1,081</b>
M33	CLASS A	30,000	207	003573	594	805
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003206</b>	<b>891</b>	<b>1,208</b>
1 3/8"	CLASS A	30,000	207	003095	721	977
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003240</b>	<b>1,081</b>	<b>1,466</b>
M36	CLASS A	30,000	207	003096	762	1,034
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003247</b>	<b>1,144</b>	<b>1,550</b>
1 1/2"	CLASS A	30,000	207	003097	952	1,290
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003248</b>	<b>1,427</b>	<b>1,935</b>
M39	CLASS A	30,000	207	003120	987	1,338
	<b>CLASS B</b>	<b>45,000</b>	<b>310</b>	<b>003249</b>	<b>1,480</b>	<b>2,007</b>

**VARIOUS BOLTING PATTERNS**

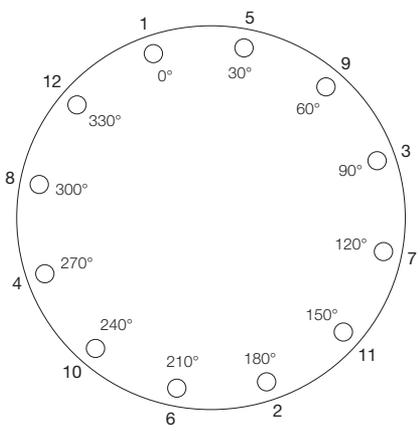
---



**Sequential Order — 4 BOLTS**  
 1 — 2      3 — 4

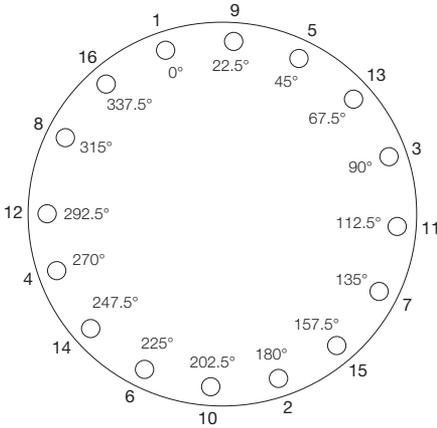


**Sequential Order — 8 BOLTS**  
 1 — 2      3 — 4  
 5 — 6      7 — 8



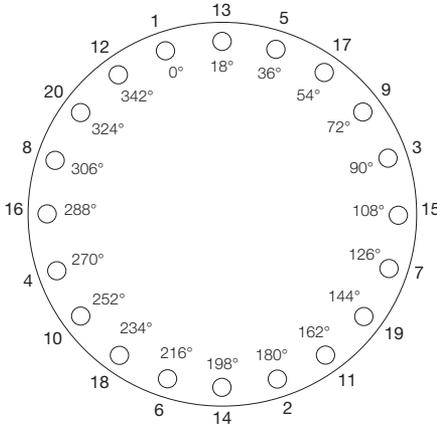
**Sequential Order — 12 BOLTS**  
 1 — 2      3 — 4  
 5 — 6      7 — 8  
 9 — 10      11 — 12

# VARIOUS BOLTING PATTERNS



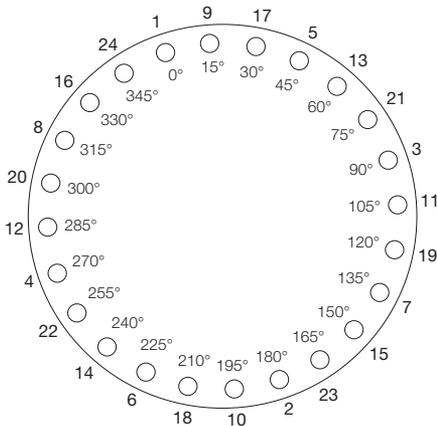
## Sequential Order — 16 BOLTS

- |         |         |
|---------|---------|
| 1 — 2   | 3 — 4   |
| 5 — 6   | 7 — 8   |
| 9 — 10  | 11 — 12 |
| 13 — 14 | 15 — 16 |



## Sequential Order — 20 BOLTS

- |         |         |
|---------|---------|
| 1 — 2   | 3 — 4   |
| 5 — 6   | 7 — 8   |
| 9 — 10  | 11 — 12 |
| 13 — 14 | 15 — 16 |
| 17 — 18 | 19 — 20 |



## Sequential Order — 24 BOLTS

- |         |         |
|---------|---------|
| 1 — 2   | 3 — 4   |
| 5 — 6   | 7 — 8   |
| 9 — 10  | 11 — 12 |
| 13 — 14 | 15 — 16 |
| 17 — 18 | 19 — 20 |
| 21 — 22 | 23 — 24 |



*Chesterton ISO Certifications available at [www.chesterton.com/corporate/iso](http://www.chesterton.com/corporate/iso)*

860 Salem Street  
Groveland, MA 01834 USA  
Telephone: 781-438-7000 Fax: 978-469-6528  
[www.chesterton.com](http://www.chesterton.com)

---

© A.W. Chesterton Company, 2010. All rights reserved.  
® Registered trademark owned and licensed by  
A.W. Chesterton Company in USA and other countries.

FORM NO. EN39983 REV. 1

PRINTED IN USA 04/10