

# TORQUE TO ACHIEVE BOLT UTILIZATION

Unlubricated Bolts

Nominal Diameter (inches)	SAE J429 Grade 5 (ft/lbf)		SAE J429 Grade 8 (ft/lbf)		ASTM A193 Grade B7 (ft/lbf)		ASTM A193 Grade B8 Class 1 (ft/lbf)	
	50%	70%	50%	70%	50%	70%	50%	70%
1/4	9	12	12	17	10	14	3	4
5/16	17	24	25	34	20	28	6	9
3/8	30	42	42	59	33	47	11	15
7/16	45	65	66	92	53	74	17	23
1/2	75	105	105	145	84	120	27	37
9/16	105	150	150	210	120	165	38	53
5/8	145	205	205	290	165	230	53	74
3/4	255	360	360	505	290	405	92	130
7/8	410	575	575	805	460	645	150	205
1	615	860	860	1205	690	965	220	310

*The ability of a gasket to make and maintain a seal depends not only on the style and quality of the gasket material, but also on medium being sealed, the flange design, the amount of pressure applied to the gasket by the bolts and how the gasket is assembled onto the flanges and tightened. These factors are beyond the manufacturer's control.*

**KLINGER Thermoseal**

2350 Campbell Road, Sidney, Ohio 45365  
Tel: +1 937 498 2222

3803 S. Sam Houston Parkway W., Houston, Texas 77053  
Tel: +1 713 997 8111