

SPIROL[®] SUPPLEMENTAL DATA

BOLT SPECIFICATIONS

Common Inch Bolts per SAE J429						
Thread	Grade 2		Grade 5		Grade 8	
	Proof Load (Lbs.)	Clamping Load* (Lbs.)	Proof Load (Lbs.)	Clamping Load* (Lbs.)	Proof Load (Lbs.)	Clamping Load* (Lbs.)
#4-40	330	250	510	390	720	540
#4-48	360	270	560	420	790	600
#6-32	490	370	770	580	1,090	820
#6-40	550	420	860	650	1,210	910
#8-32	770	580	1,190	900	1,680	1,260
#8-36	810	610	1,250	940	1,760	1,320
#10-24	960	720	1,480	1,110	2,100	1,580
#10-32	1,100	830	1,700	1,280	2,400	1,800
1/4-20	1,750	1,320	2,700	2,020	3,800	2,860
1/4-28	2,000	1,500	3,100	2,320	4,350	3,260
5/16-18	2,900	2,180	4,450	3,340	6,300	4,720
5/16-24	3,200	2,400	4,900	3,700	6,950	5,220
3/8-16	4,250	3,200	6,600	4,940	9,300	7,000
3/8-24	4,800	3,600	7,450	5,600	10,500	7,900

*Note: The recommended clamping load is 75% of the proof load.

TORQUE SPECIFICATIONS

Typical tightening torque values to achieve recommended clamping loads based on the following formula:

$$T = K \times D \times P$$

Where:

- K** = torque-friction coefficient
- D** = nominal bolt diameter
- P** = bolt clamping load

Common Metric Bolts per ISO 898-1						
Thread	Class 5.8		Class 9.8		Class 10.9	
	Proof Load (kN)	Clamping Load* (kN)	Proof Load (kN)	Clamping Load* (kN)	Proof Load (kN)	Clamping Load* (kN)
M3 x 0.5	1.91	1.43	3.27	2.45	4.18	3.14
M4 x 0.7	3.34	2.51	5.71	4.28	7.29	5.47
M5 x 0.8	5.40	4.05	9.23	6.92	11.8	8.85
M6 x 1	7.64	5.73	13.1	9.83	16.7	12.5
M8 x 1.25	13.9	10.4	23.8	17.9	30.4	22.8
M10 x 1.5	22.0	16.5	37.7	28.3	48.1	36.1
M12 x 1.75	32.0	24.0	54.8	41.1	70.0	52.5

PHYSICAL PROPERTIES OF COMMON PLASTICS

Plastic Type	Modulus of Elasticity		Compressive Strength	
	MPa	psi	MPa	psi
Nylon 6	2,100	300,000	90	13,000
Nylon 6, 35% glass	9,000	1,300,000	130	19,000
Polycarbonate	2,100	300,000	90	13,000
Polycarbonate, 40% glass	11,000	1,600,000	140	20,000
ABS	2,750	400,000	70	10,000
ABS, 30% glass	5,500	800,000	140	20,000
PEEK, 20% carbon fiber	13,100	1,900,000	140	20,000
PEEK, 40% carbon fiber	25,500	3,700,000	220	32,000

Unified						
Thread	Grade 2		Grade 5		Grade 8	
	Tightening Torque		Tightening Torque		Tightening Torque	
	Dry K=0.20	Lub. K=0.15	Dry K=0.20	Lub. K=0.15	Dry K=0.20	Lub. K=0.15
#4-40	5.6 in•lbs	4.2 in•lbs	8.7 in•lbs	6.6 in•lbs	12.1 in•lbs	9.1 in•lbs
#4-48	6.0 in•lbs	4.5 in•lbs	9.4 in•lbs	7.1 in•lbs	13.4 in•lbs	10.1 in•lbs
#6-32	10.2 in•lbs	7.7 in•lbs	16.0 in•lbs	12.0 in•lbs	22.6 in•lbs	17.0 in•lbs
#6-40	11.6 in•lbs	8.7 in•lbs	17.9 in•lbs	13.5 in•lbs	25.1 in•lbs	18.8 in•lbs
#8-32	19 in•lbs	14 in•lbs	30 in•lbs	22 in•lbs	41 in•lbs	31 in•lbs
#8-36	20 in•lbs	15 in•lbs	31 in•lbs	23 in•lbs	43 in•lbs	32 in•lbs
#10-24	27 in•lbs	21 in•lbs	42 in•lbs	32 in•lbs	60 in•lbs	45 in•lbs
#10-32	32 in•lbs	24 in•lbs	49 in•lbs	36 in•lbs	68 in•lbs	51 in•lbs
1/4-20	66 in•lbs	50 in•lbs	102 in•lbs	77 in•lbs	143 in•lbs	107 in•lbs
1/4-28	75 in•lbs	56 in•lbs	117 in•lbs	88 in•lbs	164 in•lbs	123 in•lbs
5/16-18	11 ft•lbs	9 ft•lbs	17 ft•lbs	13 ft•lbs	25 ft•lbs	19 ft•lbs
5/16-24	13 ft•lbs	9 ft•lbs	19 ft•lbs	14 ft•lbs	27 ft•lbs	20 ft•lbs
3/8-16	20 ft•lbs	15 ft•lbs	31 ft•lbs	23 ft•lbs	44 ft•lbs	33 ft•lbs
3/8-24	23 ft•lbs	17 ft•lbs	35 ft•lbs	26 ft•lbs	49 ft•lbs	37 ft•lbs

Metric						
Thread	Class 5.8		Class 9.8		Class 10.9	
	Tightening Torque		Tightening Torque		Tightening Torque	
	Dry K=0.20	Lub. K=0.15	Dry K=0.20	Lub. K=0.15	Dry K=0.20	Lub. K=0.15
M3 x 0.5	0.9 N•m	0.6 N•m	1.5 N•m	1.1 N•m	1.9 N•m	1.4 N•m
M4 x 0.7	2.0 N•m	1.5 N•m	3.4 N•m	2.6 N•m	4.4 N•m	3.3 N•m
M5 x 0.8	4.1 N•m	3.0 N•m	6.9 N•m	5.2 N•m	8.9 N•m	6.6 N•m
M6 x 1	6.9 N•m	5.2 N•m	11.8 N•m	8.8 N•m	15.0 N•m	11.3 N•m
M8 x 1.25	16.7 N•m	12.5 N•m	28.6 N•m	21.4 N•m	36.5 N•m	27.4 N•m
M10 x 1.5	33.0 N•m	24.8 N•m	56.6 N•m	42.4 N•m	72.2 N•m	54.1 N•m
M12 x 1.75	57.6 N•m	43.2 N•m	98.6 N•m	74.0 N•m	126.0 N•m	94.5 N•m

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