SOCKET SET SCREWS ■ Torsional and Axial Holding Power

SIZE SELECTION OF SOCKET SET SCREWS

The user of a set-screw-fastened assembly is primarily buying static holding power. The data in this chart offers a simplified means for selecting diameter and seating torque of a set screw on a given diameter shaft.

Torsional holding power in inch-pounds and axial holding power in pounds are tabulated for various cup point socket screws, seated at recommended installation torques. Shafting used was hardened to Rockwell C15. Test involved Class 3A screw threads in Class 2B tapped holes. Data was determined experimentally in a long series of tests in which holding power was defined as the minimum load to produce 0.010 inch relative movement of shaft and collar.

From this basic chart, values can be modified by percentage factors to yield suitable design data for almost any standard set screw application.

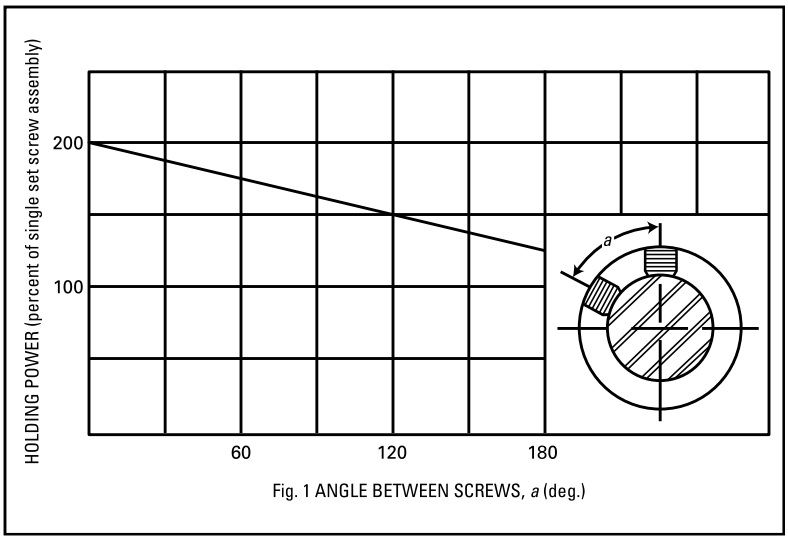

Fig. 1 ANGLE BETWEEN SCREWS, *a* (deg.)

NOTES

Tabulated axial and torsional holding powers are typical strengths and should be used accordingly, with specific safety factors appropriate to the given application and load conditions. Good results have been obtained with a factor of 1.5-2.0 under static load conditions (i.e., where a collar is supporting a vertical load on a post) and of 4.0-8.0 for various dynamic situations.

Values in bold type in the chart indicate recommended set screw sizes on the basis that screw diameter should be roughly one-half shaft diameter.

TORSIONAL and AXIAL HOLDING POWER (Based on Recommended Seating Torques – Inch-Lbs.)

nom. size	seating torque inch-lbs.	axial holding power (pounds)	shaft diameter (shaft hardness Rc 15 to Rc 35)											
			1/16	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	9/16
			torsional holding power inch-lbs.											
#0	1.0	50	**1.5**	2.3	3.1	3.9	4.7	5.4	6.2					
#1	1.8	65	2.0	**3.0**	4.0	5.0	6.1	7.1	8.1	10.0				
#2	1.8	85	2.6	4.0	**5.3**	6.6	8.0	9.3	10.6	13.2	16.0			
#3	5	120	3.2	5.6	7.5	**9.3**	11.3	13.0	15.0	18.7	22.5	26.3		
#4	5	160		7.5	10.0	12.5	**15.0**	17.5	20.0	25.0	30.0	35.0	40.0	
#5	10	200			12.5	15.6	18.7	**21.8**	**25.0**	31.2	37.5	43.7	50.0	56.2
#6	10	250				19	23	27	31	**39**	47	55	62	70
#8	20	385				30	36	42	48	60	**72**	84	96	108
#10	36	540					51	59	68	84	101	**118**	135	152
1/4	87	1,000							125	156	187	218	**250**	**281**
5/16	165	1,500								234	280	327	375	421
3/8	290	2,000									375	437	500	562
7/16	430	2,500										545	625	702
1/2	620	3,000											750	843
9/16	620	3,500												985
5/8	1,325	4,000												
3/4	2,400	5,000												
7/8	3,600	5,600												
1	5,000	6,500												