

**Tension and shear design strengths for Sure-Bolt<sup>®</sup> in cracked concrete**

Nominal anchor diameter (in.)	Nominal embed. $h_{nom}$ (in.)	Minimum concrete compressive strength									
		2,500 psi		$f'_c = 3,000$ psi		$f'_c = 4,000$ psi		$f'_c = 6,000$ psi		$f'_c = 8,000$ psi	
		$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)
3/8	2 1/2	1.390	1.497	1.523	1.640	1.759	1.894	2.154	2.319	2.487	2.678
	3 1/4	2.171	2.338	2.378	2.561	2.746	2.957	3.363	3.151	3.883	3.151
1/2	3	2.095	2.415	2.163	2.645	2.275	3.054	2.442	3.741	2.568	4.320
	4 1/4	3.267	6.091	3.579	6.091	4.133	6.091	5.061	6.091	5.844	6.091
5/8	3 1/4	2.003	2.157	2.194	2.363	2.534	2.729	3.103	3.342	3.583	3.859
	5	4.147	8.278	4.572	8.278	5.279	8.278	6.466	8.278	7.466	8.278
3/4	4	2.828	6.091	3.098	6.672	3.577	7.704	4.381	9.255	5.059	9.255
	6 1/4	5.974	9.255	6.545	9.255	7.557	9.266	9.256	9.255	10.687	9.255

**Tension and shear design strengths for Sure-Bolt<sup>®</sup> in uncracked concrete**

Nominal anchor diameter (in.)	Nominal embed. $h_{nom}$ (in.)	Minimum concrete compressive strength									
		$f'_c = 2,500$ psi		$f'_c = 3,000$ psi		$f'_c = 4,000$ psi		$f'_c = 6,000$ psi		$f'_c = 8,000$ psi	
		$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)	$\Phi N_n$ Tension (lb.)	$\Phi V_n$ Shear (lb.)
3/8	2 1/2	2.208	2.378	2.419	2.605	2.793	3.008	3.421	3.131	3.950	3.131
	3 1/4	3.448	3.151	3.777	3.151	4.361	3.151	5.341	3.151	6.168	3.151
1/2	3	2.883	3.105	3.158	3.401	3.647	3.927	4.466	4.724	5.157	4.724
	4 1/4	4.612	6.091	5.053	6.091	5.834	6.091	7.145	6.091	8.251	6.091
5/8	3 1/4	2.828	3.045	3.098	3.336	3.577	3.852	4.381	4.718	5.059	5.448
	5	5.892	8.278	6.455	8.278	7.453	8.278	9.128	8.278	10.540	8.278
3/4	4	3.992	8.599	4.373	9.255	5.050	9.255	6.185	9.255	7.142	9.255
	6 1/4	8.434	9.255	9.240	9.255	10.669	9.255	13.067	9.255	15.088	9.255

### Converted allowable loads for Sure-Bolt<sup>®</sup> in cracked concrete

Nominal anchor diameter (in.)	Nominal embed. $h_{nom}$ (in.)	Minimum concrete compressive strength									
		2,500 psi		3,000 psi		4,000 psi		6,000 psi		8,000 psi	
		$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)
3/8	2 1/2	939	1.012	1.029	1.108	1.188	1.280	1.455	1.567	1.680	1.810
	3 1/4	1.467	1.580	1.607	1.730	1.855	1.998	2.272	2.129	2.624	2.129
1/2	3	1.415	1.632	1.461	1.787	1.537	2.064	1.650	2.528	1.735	2.919
	4 1/4	2.207	4.116	2.418	4.116	2.792	4.116	3.420	4.116	3.949	4.116
5/8	3 1/4	1.353	1.458	1.483	1.597	1.712	1.844	2.097	2.258	2.421	2.607
	5	2.820	5.594	3.089	5.594	3.587	5.594	4.369	5.594	5.045	5.594
3/4	4	1.911	4.115	2.093	4.508	2.417	5.206	2.960	6.253	3.418	6.253
	6 1/4	4.037	6.253	4.422	6.253	5.106	6.253	6.254	6.253	7.221	6.253

1. Allowable load values are calculated using a conversion factor,  $\alpha$ , from factored design strengths.  
2. Tabulated allowable load values assume 30% dead load and 70% live load, with controlling load combination 1,2D + 1,6L. Calculated weighted average for the conversion factor,  $\alpha = 1,2*(0,3) + 1,6*(0,7) = 1,48$ .

### Converted allowable loads for Sure-Bolt<sup>®</sup> in uncracked concrete

Nominal anchor diameter (in.)	Nominal embed. $h_{nom}$ (in.)	Minimum concrete compressive strength									
		2,500 psi		3,000 psi		4,000 psi		6,000 psi		8,000 psi	
		$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)	$T_{allowable ASD}$ Tension (lb)	$V_{allowable ASD}$ Shear (lb)
3/8	2 1/2	1.492	1.607	1.634	1760	1.887	2.032	2.311	2.116	2.669	2.116
	3 1/4	2.330	2.129	2.552	2.129	2.947	2.129	3.609	2.129	4.167	2.129
1/2	3	1.948	2.098	2.134	2.298	2.464	2.653	3.018	3.192	3.485	3.192
	4 1/4	3.116	4.116	3.414	4.116	3.942	4.116	4.828	4.116	5.575	4.116
5/8	3 1/4	1.911	2.058	2.093	2.254	2.417	2.603	2.960	3.188	3.418	3.681
	5	3.981	5.594	4.361	5.594	5.036	5.594	6.168	5.594	7.122	5.594
3/4	4	2.698	5.810	2.955	6.253	3.412	6.253	4.179	6.253	4.826	6.253
	6 1/4	5.699	6.253	6.243	6.253	7.209	6.253	8.829	6.253	10.195	6.253

1. Allowable load values are calculated using a conversion factor,  $\alpha$ , from factored design strengths.  
2. Tabulated allowable load values assume 30% dead load and 70% live load, with controlling load combination 1,2D + 1,6L. Calculated weighted average for the conversion factor,  $\alpha = 1,2*(0,3) + 1,6*(0,7) = 1,48$ .

### Sure-Bolt<sup>®</sup> Carbon Steel Zinc Plated 1/2 x 3 2,000 psi in uncracked concrete

Anchor diameter (in.)	Embed. (in.)	Ultimate Tension (lb)	Ultimate Shear (lb)	Allowable Tension (lb.)	Allowable Shear (lb.)
1/2" CB123000CF	2"	2130	4488	533	1122