

PERFORMANCE TABLES

Fasteners in Normal Weight Concrete

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	INSTALLED IN STONE AGGREGATE CONCRETE CONCRETE COMPRESSIVE STRENGTH ALLOWABLE LOAD – <i>Ultimate Load</i>									
			2000 PSI				4000 PSI				6000 PSI	
			TENSION (LBS)		SHEAR (LBS)		TENSION (LBS)		SHEAR (LBS)		TENSION (LBS)	SHEAR (LBS)
1500/ 1600 SERIES	0.145	3/4	50 <i>655</i>	66 <i>739</i>	100 <i>511</i>	104 <i>552</i>	-----	-----	-----	-----		
		1	152 <i>943</i>	166 <i>1229</i>	157 <i>937</i>	182 <i>1342</i>	-----	-----	-----	-----		
		1-1/4	159 <i>1078</i>	265 <i>1665</i>	179 <i>1043</i>	267 <i>1538</i>	-----	-----	-----	-----		
		1-1/2	154 <i>1450</i>	340 <i>2027</i>	209 <i>1357</i>	342 <i>1712</i>	-----	-----	-----	-----		
SP	0.150	3/4	-----	-----	150 <i>803</i>	105 <i>786</i>	81 <i>493</i>	82 <i>454</i>				
SP SERIES	.150/.180	1	154 <i>1043</i>	200 <i>1173</i>	243 <i>1307</i>	175 <i>1037</i>	189 <i>1125</i>	210 <i>1177</i>				
		1-1/4	207 <i>1553</i>	230 <i>1636</i>	298 <i>1749</i>	218 <i>1471</i>	213 <i>1568</i>	305 <i>1780</i>				
		1-1/2	-----	-----	384 <i>2126</i>	391 <i>1957</i>	239 <i>1886</i>	594 <i>2968</i>				
3300 SERIES	0.180	1	196 <i>1084</i>	100 <i>1328</i>	255 <i>1504</i>	284 <i>1557</i>	-----	-----	-----			
		1-1/4	241 <i>1207</i>	329 <i>1710</i>	294 <i>1574</i>	373 <i>2104</i>	-----	-----	-----			
		1-1/2	254 <i>1601</i>	379 <i>1971</i>	419 <i>2239</i>	501 <i>2505</i>	-----	-----	-----			
1900	0.145	3/4	105 <i>694</i>	71 <i>458</i>	101 <i>685</i>	99 <i>627</i>	-----	-----	-----			
9100 STUD	0.205	1	187 <i>988</i>	212 <i>1385</i>	186 <i>1070</i>	303 <i>1618</i>	-----	-----	-----			
		1-1/4	262 <i>1450</i>	304 <i>1674</i>	335 <i>2161</i>	400 <i>2000</i>	-----	-----	-----			

Note 1: ALLOWABLE loads are shown in the **LARGE BOLD** font, *Ultimate* loads are shown in *smaller italic* font. **Note 2:** Testing conducted in accordance with ICC AC70 & ASTM E1190. **Note 3:** Safety factors are based on coefficient of variation. In accordance with ICC AC70, the safety factor will be no less than 5. **Note 4:** Values shown in concrete are for the fastener only. Connected members must be investigated separately. **Note 5:** Cyclic, fatigue, shock loads, and other design criteria may require a different safety factor. **Note 6:** Job site testing may be required to determine actual job site values. **Note 7:** Minimum edge distance is 3 inches unless otherwise approved. **Note 8:** For Sl: 1 lbf = 4.448 N, 1 inch = 25.4 mm, 1 ksi = 6.89MPa

Powder-Actuated Pin Performance

PART NUMBER	ALLOWABLE LOADS IN NORMAL WEIGHT CONCRETE - 4000 PSI 1" EMBEDMENT	
	TENSION	SHEAR
RAMSET TE	228	241
HILTI X-U	170	225

PERFORMANCE TABLES

Fasteners in Steel

PART NUMBER SERIES	SHANK DIA. (INCH)	TYPE OF SHANK	INSTALLED IN A36 STRUCTURAL STEEL—STEEL THICKNESS (INCHES)									
			ALLOWABLE LOAD – <i>Ultimate Load</i>									
			3/16		1/4		3/8		1/2		3/4	
TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	
1500/1600	0.145	SMOOTH	81 <i>790</i>	373 <i>2039</i>	181 <i>1269</i>	273 <i>1642</i>	397 <i>2169</i>	489 <i>2771</i>	243 <i>1328⁸</i>	277 <i>1514⁸</i>	----	----
		KNURLED	296 <i>1633</i>	636 <i>3516</i>	584 <i>3384</i>	659 <i>3822</i>	680 <i>3755</i>	730 <i>4030</i>	253 <i>1459⁸</i>	293 <i>1632⁸</i>	----	----
SP	0.150	SMOOTH	385 <i>2107</i>	662 <i>3618</i>	445 <i>2549</i>	477 <i>2736</i>	393 <i>2145</i>	574 <i>3137</i>	948 <i>5180</i>	597 <i>3500</i>	234 <i>1244⁸</i>	356 <i>1895⁸</i>
3300	0.180	SMOOTH	281 <i>1536</i>	580 <i>3169</i>	385 <i>2212</i>	507 <i>2931</i>	460 <i>2631</i>	644 <i>3518</i>	641 <i>3499</i>	684 <i>3739</i>	----	----
9100	0.205	KNURLED	160 <i>1469</i>	931 <i>5084</i>	350 <i>3115</i>	617 <i>3542</i>	843 <i>4605</i>	803 <i>4391</i>	565 <i>3086⁹</i>	547 <i>3373⁹</i>	----	----

PART NUMBER SERIES	SHANK DIA. (INCH)	TYPE OF SHANK	INSTALLED IN A572 GRADE 50 STRUCTURAL STEEL—STEEL THICKNESS (INCHES)									
			ALLOWABLE LOAD – <i>Ultimate Load</i>									
			3/16		1/4		3/8		1/2		3/4	
TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	TENSION (LBS)	SHEAR (LBS)	
1500/1600	0.145	SMOOTH	----	----	----	----	----	----	----	----	----	----
		KNURLED	260 <i>1609</i>	499 <i>3182</i>	579 <i>3411</i>	725 <i>4272</i>	383 <i>2216⁷</i>	595 <i>3431⁷</i>	----	----	----	----
SP	0.150	SMOOTH	356 <i>2123</i>	569 <i>3394</i>	554 <i>3232</i>	637 <i>3710</i>	604 <i>3447</i>	602 <i>3437</i>	814 <i>4473⁹</i>	820 <i>4503⁹</i>	243 <i>1362⁸</i>	381 <i>2141⁸</i>
3300	0.180	SMOOTH	----	----	----	----	----	----	----	----	----	----
9100	0.205	KNURLED	365 <i>2175</i>	903 <i>5385</i>	697 <i>4061</i>	907 <i>5285</i>	155 <i>842⁷</i>	376 <i>2143⁷</i>	----	----	----	----

Note 1: ALLOWABLE loads are shown in the **LARGE BOLD** font, *Ultimate* loads are shown in *smaller italic* font. **Note 2:** Testing conducted in accordance with ICC AC70 & ASTM E1190. **Note 3:** Safety factors are based on coefficient of variation. In accordance with ICC AC70, the safety factor will be no less than 5. **Note 4:** Cyclic, fatigue, shock loads, and other design criteria may require a different safety factor. **Note 5:** Job site testing may be required to determine actual job site values. **Note 6:** Values shown are for fastenings that have the entire pointed end of the fastener driven through the steel plate; except as noted below. **Note 7:** Fastener penetration is 3/8" minimum. **Note 8:** Fastener penetration is 7/16" minimum. **Note 9:** Fastener penetration is 1/2" minimum. **Note 10:** For SI: 1 lbf = 4.448 N, 1 inch = 25.4 mm, 1 ksi = 6.89MPa

Fasteners in Lightweight Concrete

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	ALLOWABLE WORKING VALUES INSTALLED IN 3000 PSI LIGHTWEIGHT CONCRETE							
			ALLOWABLE LOAD – <i>Ultimate Load</i>							
			3000 PSI LIGHTWEIGHT W/DECKING				3000 PSI LIGHTWEIGHT			
			LOWER FLUTE TENSION		LOWER FLUTE SHEAR		TENSION		SHEAR	
1500 SERIES	0.145	3/4	76 <i>395</i>	260 <i>1409</i>	167 <i>837</i>	179 <i>894</i>	----	----		
		1	134 <i>668</i>	265 <i>1505</i>	200 <i>998</i>	228 <i>1141</i>	----	----		
		1-1/4	157 <i>784</i>	269 <i>1344</i>	333 <i>1664</i>	400 <i>2090</i>	----	----		
		1-1/2	233 <i>1163</i>	346 <i>1728</i>	391 <i>1957</i>	410 <i>2050</i>	----	----		
SP SERIES	.150/.180	1	119 <i>593</i>	336 <i>1679</i>	226 <i>1129</i>	250 <i>1249</i>	----	----		
		1-1/4	175 <i>957</i>	372 <i>1860</i>	329 <i>1644</i>	377 <i>1885</i>	----	----		
		1-1/2	179 <i>1055</i>	426 <i>2128</i>	406 <i>2030</i>	380 <i>1900</i>	----	----		
9100 SERIES	0.205	3/4	70 <i>351</i>	277 <i>1386</i>	----	----	----	----		
		1	112 <i>559</i>	378 <i>1891</i>	----	----	----	----		
		1-1/4	118 <i>689</i>	----	----	----	----			

Note 1: ALLOWABLE loads are shown in the **LARGE BOLD** font, *Ultimate* loads are shown in *smaller italic* font. **Note 2:** Testing conducted in accordance with ICC AC70 & ASTM E1190. **Note 3:** Safety factors are based on coefficient of variation. In accordance with ICC AC70, the safety factor will be no less than 5. **Note 4:** Values shown in concrete are for the fastener only. Connected members must be investigated separately. **Note 5:** Cyclic, fatigue, shock loads, and other design criteria may require a different safety factor. **Note 6:** Job site testing may be required to determine actual job site values. **Note 7:** For SI: 1 lbf = 4.448 N, 1 inch = 25.4 mm, 1 ksi = 6.89MPa

PERFORMANCE TABLES

Angle Clip in Concrete

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	INSTALLED IN STONE AGGREGATE CONCRETE CONCRETE COMPRESSIVE STRENGTH ALLOWABLE LOAD – <i>Ultimate Load</i>								
			4000 PSI			6000 PSI					
			TENSION (LBS)	SHEAR (LBS)	OBLIQUE (LBS)	TENSION (LBS)	SHEAR (LBS)	OBLIQUE (LBS)	TENSION (LBS)	SHEAR (LBS)	OBLIQUE (LBS)
SDC100 SDC125	0.145	7/8	115 <i>575</i>	120 <i>1014</i>	145 <i>726</i>	-----	-----	-----	-----	-----	-----
SDC125	0.145	1-1/8	130 <i>744</i>	167 <i>1090</i>	205 <i>1032</i>	-----	-----	-----	-----	-----	-----
SPC78	0.150	3/4	155 <i>897</i>	188 <i>1050</i>	-----	150 <i>788</i>	153 <i>949</i>	140 <i>769</i>			
SPC114	.150/.180	1-1/8	127 <i>811</i>	226 <i>1130</i>	181 <i>904</i>	169 <i>853</i>	300 <i>1500</i>	223 <i>1114</i>			

PART NUMBER SERIES	SHANK DIAMETER (INCH)	MINIMUM PENETRATION (INCH)	ALLOWABLE WORKING VALUES INSTALLED IN 3000 PSI LIGHTWEIGHT CONCRETE ALLOWABLE LOAD – <i>Ultimate Load</i>										
			3000 PSI LIGHTWEIGHT WITH METAL DECKING										
			LOWER FLUTE TENSION (LBS)	LOWER FLUTE SHEAR (LBS)	LOWER FLUTE OBLIQUE (LBS)	UPPER FLUTE TENSION (LBS)	UPPER FLUTE SHEAR (LBS)	LOWER FLUTE TENSION (LBS)	LOWER FLUTE SHEAR (LBS)	LOWER FLUTE OBLIQUE (LBS)	UPPER FLUTE TENSION (LBS)	UPPER FLUTE SHEAR (LBS)	
SDC100	0.145	7/8	67 <i>335</i>	237 <i>1186</i>	90 <i>448</i>	104 <i>571</i>	310 <i>1678</i>						
SDC125	0.145	1-1/8	94 <i>471</i>	276 <i>1378</i>	119 <i>596</i>	106 <i>528</i>	319 <i>1597</i>						
SPC78	0.150	3/4	59 <i>293</i>	202 <i>1109</i>	65 <i>323</i>	84 <i>419</i>	324 <i>1622</i>						
SPC114	150/.180	1-1/8	157 <i>786</i>	272 <i>1358</i>	153 <i>766</i>	180 <i>899</i>	334 <i>1673</i>						

Note 1: ALLOWABLE loads are shown in the **LARGE BOLD** font, *Ultimate* loads are shown in *smaller italic* font. **Note 2:** Testing conducted in accordance with ICC AC70 & ASTM E1190. **Note 3:** Safety factors are based on coefficient of variation. In accordance with ICC AC70, the safety factor will be no less than 5. **Note 4:** Values shown in concrete are for the clip assembly only. Connected members must be investigated separately. **Note 5:** Cyclic, fatigue, shock loads, and other design criteria may require a different safety factor. **Note 6:** Job site testing may be required to determine actual job site values. **Note 7:** Minimum edge distance is 3 inches unless otherwise approved. **Note 8:** For SI: 1 lbf = 4.448 N, 1 inch = 25.4 mm, 1 ksi = 6.89MPa