

PERFORMANCE DATA

Ultimate Load Capacities for Powder Actuated Fasteners in Normal-Weight Concrete^{1,2,3,4,5}

Pin Description	Minimum Embedment Depth h _v in. (mm)	Minimum Concrete Compressive Strength (f'c)											
		2,000psi		2,500psi		3,000psi		4,000psi		4,500psi		5,000psi	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin (0.150" Shank)	5/8 (15.9)	370 (1.6)	590 (2.6)	-	-	610 (2.7)	810 (3.6)	610 (2.7)	800 (3.6)	-	-	590 (2.6)	780 (3.5)
	3/4 (19.1)	480 (2.1)	770 (3.4)	-	-	660 (2.9)	940 (4.2)	680 (3)	980 (4.4)	-	-	700 (3.1)	1,020 (4.5)
Ballistic Point Pin (0.181"/0.150" Shank)	1 (25.4)	690 (3.1)	1,130 (5)	-	-	770 (3.4)	1,200 (5.3)	820 (3.6)	1,350 (6)	-	-	870 (3.9)	1,500 (6.7)
	1 1/4 (31.8)	810 (3.6)	1,460 (6.5)	-	-	1,130 (5)	1,490 (6.6)	1,380 (6.1)	1,680 (7.5)	-	-	7,620 (33.9)	1,890 (8.4)
	1 1/2 (38.1)	920 (4.1)	1,780 (7.9)	-	-	1,490 (6.6)	1,780 (7.9)	1,930 (8.6)	2,020 (9)	-	-	2,370 (10.5)	2,250 (10)
0.300" Head Drive Pin 8mm Head Drive Pin 1/4"-20 Threaded Stud (0.145" Shank)	5/8 (15.9)	300 (1.3)	475 (2.1)	-	-	300 (1.3)	475 (2.1)	300 (1.3)	475 (2.1)	-	-	300 (1.3)	475 (2.1)
	3/4 (19.1)	300 (1.3)	475 (2.1)	-	-	475 (2.1)	625 (2.8)	475 (2.1)	625 (2.8)	-	-	500 (2.2)	625 (2.8)
	1 (25.4)	500 (2.2)	700 (3.1)	-	-	650 (2.9)	775 (3.4)	775 (3.4)	775 (3.4)	-	-	870 (3.9)	1,000 (4.4)
	1 1/4 (31.8)	550 (2.4)	775 (3.4)	-	-	775 (3.4)	825 (3.7)	975 (4.3)	825 (3.7)	-	-	1,175 (5.2)	1,000 (4.4)
	1 1/2 (38.1)	575 (2.6)	875 (3.9)	-	-	900 (4)	875 (3.9)	1,175 (5.2)	1,175 (5.2)	-	-	1,450 (6.4)	1,000 (4.4)
8mm head Spiral CSI Pin (0.157" Shank)	3/4 (19.1)	-	-	750 (3.3)	850 (3.8)	670 (3)	960 (4.3)	670 (3)	960 (4.3)	-	-	670 (3)	960 (4.3)
	1 (25.4)	-	-	-	-	1,710 (7.6)	2,100 (9.3)	1,710 (7.6)	2,100 (9.3)	-	-	1,710 (7.6)	2,100 (9.3)
	1 1/4 (31.8)	-	-	1,550 (6.9)	1,925 (8.6)	-	-	-	-	-	-	-	-
10mm Head Drive Pin (0.177" Shank)	3/4 (19.1)	-	-	350 (1.6)	475 (2.1)	525 (2.3)	725 (3.2)	540 (2.4)	740 (3.3)	350 (1.6)	500 (2.2)	550 (2.4)	750 (3.3)
	1 (25.4)	-	-	-	-	875 (3.9)	925 (4.1)	890 (4)	940 (4.2)	-	-	900 (4)	950 (4.2)
	1 1/4 (31.8)	-	-	1,075 (4.8)	1,050 (4.7)	1,225 (5.4)	1,125 (5)	1,225 (5.4)	1,125 (5)	800 (3.6)	850 (3.8)	1,225 (5.4)	1,125 (5)
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	475 (2.1)	675 (3)	-	-	475 (2.1)	675 (3)	800 (3.6)	675 (3)	-	-	800 (3.6)	675 (3)
	1 1/4 (31.8)	850 (3.8)	1,100 (4.9)	-	-	850 (3.8)	1,100 (4.9)	1,000 (4.4)	1,600 (7.1)	-	-	1,000 (4.4)	1,600 (7.1)
	1 1/2 (38.1)	1,150 (5.1)	1,375 (6.1)	-	-	1,375 (6.1)	1,625 (7.2)	1,475 (6.6)	1,975 (8.8)	-	-	1,475 (6.6)	1,975 (8.8)
3/8" Head Drive Pin (0.172" Shank)	1 1/4 (31.8)	930 (4.1)	1,780 (7.9)	-	-	1,160 (5.2)	2,120 (9.4)	1,310 (5.8)	2,120 (9.4)	-	-	1,600 (7.1)	2,120 (9.4)
	1 1/2 (38.1)	1,470 (6.5)	2,540 (11.3)	-	-	2,040 (9.1)	2,540 (11.3)	2,040 (9.1)	2,540 (11.3)	-	-	2,040 (9.1)	2,540 (11.3)
Ceiling Clips - Spiral CSI Pin (0.157" Shank)	3/4 (19.1)	-	-	-	-	700 (3.1)	1,000 (4.4)	700 (3.1)	1,000 (4.4)	-	-	-	-
Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	300 (1.3)	475 (2.1)	-	-	325 (1.4)	525 (2.3)	350 (1.6)	725 (3.2)	-	-	350 (1.6)	725 (3.2)
	1 (25.4)	300 (1.3)	550 (2.4)	-	-	475 (2.1)	600 (2.7)	500 (2.2)	800 (3.6)	-	-	500 (2.2)	800 (3.6)
Economy Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	250 (1.1)	475 (2.1)	-	-	300 (1.3)	525 (2.3)	350 (1.6)	725 (3.2)	-	-	350 (1.6)	725 (3.2)
	1 (25.4)	250 (1.1)	600 (2.7)	-	-	300 (1.3)	600 (2.7)	500 (2.2)	750 (3.3)	-	-	500 (2.2)	750 (3.3)
Ballistic Point Ceiling Clip (0.181"/0.150" Shank)	3/4 (19.1)	-	-	-	-	500 (2.2)	1,020 (4.5)	-	-	-	-	-	-
Ceiling Clips - LADD Pin (0.152" Shank)	1 1/8 (28.6)	250 (1.1)	250 (1.1)	-	-	250 (1.1)	650 (2.9)	675 (3)	800 (3.6)	-	-	675 (3)	800 (3.6)
Rod Hanger Ceiling Clip (0.145" Shank)	1 (25.4)	-	-	-	-	900 (4)	-	900 (4)	-	-	-	-	-

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
 2. Concrete thickness must be a minimum of three times the embedment depth.
 3. The ultimate tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
 4. The values listed above are ultimate load capacities which should be reduced by a factor of safety to determine the allowable working load. For allowable load capacities, see the allowable load tables.
 5. Multiple fasteners are recommended for any attachment for increased reliability.

**POWDER
ACTUATED**

PERFORMANCE DATA

Allowable Load Capacities for Powder Actuated Fasteners in Normal-Weight Concrete^{1,2,3,4,5}

Pin Description	Minimum Embedment Depth h/v in. (mm)	Minimum Concrete Compressive Strength (f'c)											
		2,000psi		2,500psi		3,000psi		4,000psi		4,500psi		5,000psi	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin(0.150" Shank)	5/8 (15.9)	45 (0.2)	75 (0.3)	-	-	75 (0.3)	100 (0.4)	75 (0.3)	100 (0.4)	-	-	75 (0.3)	100 (0.4)
	3/4 (19.1)	60 (0.3)	95 (0.4)	-	-	85 (0.4)	120 (0.5)	85 (0.4)	125 (0.6)	-	-	90 (0.4)	130 (0.6)
Ballistic Point Pin (0.181"/0.150" Shank)	1 (25.4)	85 (0.4)	140 (0.6)	-	-	95 (0.4)	150 (0.7)	105 (0.5)	170 (0.8)	-	-	110 (0.5)	190 (0.8)
	1 1/4 (31.8)	100 (0.4)	185 (0.8)	-	-	140 (0.6)	185 (0.8)	175 (0.8)	210 (0.9)	-	-	205 (0.9)	240 (1.1)
	1 1/2 (38.1)	115 (0.5)	225 (1)	-	-	185 (0.8)	225 (1)	240 (1.1)	255 (1.1)	-	-	295 (1.3)	280 (1.2)
0.300" Head Drive Pin 8mm Head Drive Pin 1/4"-20 Threaded Stud (0.145" Shank)	5/8 (15.9)	25 (0.1)	45 (0.2)	-	-	60 (0.3)	95 (0.4)	45 (0.2)	95 (0.4)	-	-	25 (0.1)	95 (0.4)
	3/4 (19.1)	60 (0.3)	95 (0.4)	-	-	95 (0.4)	125 (0.6)	95 (0.4)	125 (0.6)	-	-	100 (0.4)	125 (0.6)
	1 (25.4)	100 (0.4)	140 (0.6)	-	-	130 (0.6)	155 (0.7)	155 (0.7)	155 (0.7)	-	-	180 (0.8)	200 (0.9)
	1 1/4 (31.8)	110 (0.5)	155 (0.7)	-	-	155 (0.7)	165 (0.7)	195 (0.9)	165 (0.7)	-	-	235 (1)	200 (0.9)
	1 1/2 (38.1)	115 (0.5)	175 (0.8)	-	-	180 (0.8)	175 (0.8)	235 (1)	175 (0.8)	-	-	290 (1.3)	200 (0.9)
8mm head Spiral CSI Pin (0.157" Shank)	3/4 (19.1)	-	-	120 (0.5)	170 (0.8)	134 (0.6)	192 (0.9)	134 (0.6)	192 (0.9)	-	-	134 (0.6)	192 (0.9)
	1 (25.4)	-	-	-	-	342 (1.5)	420 (1.9)	342 (1.5)	420 (1.9)	-	-	342 (1.5)	420 (1.9)
	1 1/4 (31.8)	-	-	310 (1.4)	385 (1.7)	-	-	-	-	-	-	-	-
10mm Head Drive Pin (0.177" Shank)	3/4 (19.1)	-	-	70 (0.3)	95 (0.4)	105 (0.5)	145 (0.6)	108 (0.5)	148 (0.7)	70 (0.3)	100 (0.4)	110 (0.5)	150 (0.7)
	1 (25.4)	-	-	-	-	175 (0.8)	185 (0.8)	178 (0.8)	188 (0.8)	-	-	180 (0.8)	190 (0.8)
	1 1/4 (31.8)	-	-	215 (1)	210 (0.9)	245 (1.1)	225 (1)	245 (1.1)	225 (1)	160 (0.7)	170 (0.8)	245 (1.1)	225 (1)
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	95 (0.4)	135 (0.6)	-	-	80 (0.4)	135 (0.6)	160 (0.7)	110 (0.5)	-	-	160 (0.7)	110 (0.5)
	1 1/4 (31.8)	170 (0.8)	220 (1)	-	-	165 (0.7)	220 (1)	200 (0.9)	320 (1.4)	-	-	200 (0.9)	320 (1.4)
	1 1/2 (38.1)	230 (1)	275 (1.2)	-	-	275 (1.2)	325 (1.4)	295 (1.3)	395 (1.8)	-	-	295 (1.3)	395 (1.8)
3/8" Head Drive Pin (0.172" Shank)	1 1/4 (31.8)	135 (0.6)	225 (1)	-	-	145 (0.6)	240 (1.1)	200 (0.9)	260 (1.2)	-	-	200 (0.9)	260 (1.2)
	1 1/2 (38.1)	185 (0.8)	280 (1.2)	-	-	230 (1)	305 (1.4)	230 (1)	305 (1.4)	-	-	230 (1)	305 (1.4)
Ceiling Clips - Spiral CSI Pin (0.157" Shank)	3/4 (19.1)	-	-	-	-	140 (0.6)	200 (0.9)	140 (0.6)	200 (0.9)	-	-	-	-
Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	40 (0.2)	65 (0.3)	-	-	65 (0.3)	105 (0.5)	70 (0.3)	145 (0.6)	-	-	70 (0.3)	145 (0.6)
	1 (25.4)	40 (0.2)	110 (0.5)	-	-	95 (0.4)	120 (0.5)	100 (0.4)	160 (0.7)	-	-	90 (0.4)	160 (0.7)
Economy Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	40 (0.2)	75 (0.3)	-	-	40 (0.2)	75 (0.3)	70 (0.3)	145 (0.6)	-	-	70 (0.3)	145 (0.6)
	1 (25.4)	40 (0.2)	120 (0.5)	-	-	40 (0.2)	150 (0.7)	100 (0.4)	150 (0.7)	-	-	105 (0.5)	150 (0.7)
Ballistic Point Ceiling Clip (0.181"/0.150" Shank)	3/4 (19.1)	-	-	-	-	100 (0.4)	204 (0.9)	-	-	-	-	-	-
Ceiling Clips - LADD Pin (0.152" Shank)	1 1/8 (28.6)	50 (0.2)	50 (0.2)	-	-	50 (0.2)	130 (0.6)	135 (0.6)	160 (0.7)	-	-	135 (0.6)	160 (0.7)
Rod Hanger Ceiling Clip (0.145" Shank)	1 (25.4)	-	-	-	-	180 (0.8)	-	180 (0.8)	-	-	-	-	-

POWDER ACTUATED

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
 2. Concrete thickness must be a minimum of three times the embedment depth.
 3. The allowable tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
 4. The values listed above are allowable load capacities. The values are based on minimum required factors of safety. Consideration of additional safety factors may be necessary depending on the application, such as life safety or overhead.
 5. Multiple fasteners are recommended for any attachment for increased reliability.

PERFORMANCE DATA

Ultimate Load Capacities for Powder Actuated Fasteners in Lightweight Concrete^{1,2,3,4,6}

Pin Description	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)							
		3,000psi Lightweight Concrete			3,000psi Lightweight Concrete, Over 20 Gage Deck				
				Lower Flute		Upper Flute		Top of Slab	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin (0.150" Shank)	3/4 (19.1)	560 (2.5)	600 (2.7)	350 (1.6)	1,310 (5.8)	350 (1.6)	1,310 (5.8)	-	-
Ballistic Point Pin (0.181"/0.150" Shank)	1 (25.4)	570 (2.5)	1,000 (4.4)	550 (2.4)	1,350 (6.1)	550 (2.4)	1,350 (6.1)	-	-
	1-1/4 (31.8)	810 (3.6)	1,220 (5.4)	700 (3.1)	1,380 (6.1)	700 (3.1)	1,380 (6.1)	-	-
	1-1/2 (38.1)	1,040 (4.6)	1,440 (6.4)	840 (3.7)	1,400 (6.2)	840 (3.7)	1,400 (6.2)	-	-
0.300" Head Drive Pin 8mm Head Drive Pin (0.145" Shank)	3/4 (19.1)	-	-	-	-	-	-	445 (2)	465 (2.1)
	1 (25.4)	350 (1.6)	625 (2.8)	600 (2.7)	1,450 (6.4)	880 (3.9)	1,450 (6.4)	1,000 (4.4)	1,075 (4.8)
	1-1/4 (31.8)	650 (2.9)	900 (4)	960 (4.3)	1,695 (7.5)	1,415 (6.3)	1,695 (7.5)	1,250 (5.6)	1,525 (6.8)
	1-1/2 (38.1)	650 (2.9)	900 (4)	1,190 (5.3)	1,895 (8.4)	1,190 (5.3)	1,895 (8.4)	1,700 (7.6)	1,875 (8.3)
1/4"-20 Threaded Stud (0.145" Shank)	1 (25.4)	350 (1.6)	625 (2.8)	350 (1.6)	850 (3.8)	350 (1.6)	850 (3.8)	-	-
	1-1/4 (31.8)	650 (2.9)	900 (4)	525 (2.3)	875 (3.9)	525 (2.3)	875 (3.9)	-	-
3/8" Head Drive Pin (0.172" Shank)	1-1/4 (31.8)	650 (2.9)	1,540 (6.9)	620 (2.8)	1,830 (8.1)	1,415 (6.3)	1,830 (8.1)	-	-
	1-1/2 (38.1)	1,210 (5.4)	1,620 (7.2)	860 (3.8)	1,930 (8.6)	860 (3.8)	1,930 (8.6)	-	-
10mm Head Drive Pin ⁵ (0.177" Shank)	1-1/4 (31.8)	1,150 (5.1)	1,200 (5.3)	875 (3.9)	1,475 (6.6)	1,415 (6.3)	1,865 (8.3)	-	-
	13/8 (34.9)	1,575 (7)	1,575 (7)	1,025 (4.6)	1,575 (7)	1,025 (4.6)	1,575 (7)	-	-
	1-1/2 (38.1)	1,850 (8.2)	1,850 (8.2)	1,175 (5.2)	1,700 (7.6)	1,175 (5.2)	1,700 (7.6)	-	-
	1-5/8 (41.3)	2,400 (10.7)	2,325 (10.3)	1,325 (5.9)	1,800 (8)	2,330 (10.4)	3,130 (13.9)	-	-
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	350 (1.6)	-	650 (2.9)	350 (1.6)	-	825 (3.7)	350 (1.6)	825 (3.7)
	1 1/4 (31.8)	850 (3.8)	-	1,325 (5.9)	425 (1.9)	-	1,125 (5)	425 (1.9)	1,125 (5)

Ultimate Load Capacities for Powder Actuated Fastener Ceiling Clips in Lightweight Concrete^{1,2,3,4,6}

Pin Description	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)								
		3,000psi Lightweight Concrete			3,000psi Lightweight Concrete, Over 20 Gage Deck					
				45°		Lower Flute			Upper Flute	
		Tension lbs. (kN)	45° lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	45° lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	
Ceiling Clips - w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	250 (1.1)	200 (0.9)	400 (1.8)	200 (0.9)	200 (0.9)	600 (2.7)	200 (0.9)	600 (2.7)	
	1 (25.4)	300 (1.3)	200 (0.9)	400 (1.8)	225 (1)	350 (1.6)	600 (2.7)	225 (1)	600 (2.7)	
	1 1/8 (28.6)	300 (1.3)	200 (0.9)	400 (1.8)	605 (2.7)	350 (1.6)	600 (2.7)	680 (3)	600 (2.7)	
Economy Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	250 (1.1)	225 (1)	400 (1.8)	200 (0.9)	200 (0.9)	600 (2.7)	200 (0.9)	600 (2.7)	
	1 (25.4)	300 (1.3)	450 (2)	400 (1.8)	225 (1)	225 (1)	600 (2.7)	225 (1)	600 (2.7)	
Ballistic Point Ceiling Clip (0.181"/0.150" Shank)	3/4 (19.1)	-	-	-	300 (1.3)	-	1,300 (5.8)	300 (1.3)	1,300 (5.8)	
Ceiling Clips - LADD Pin (0.152" Shank)	1 1/8 (28.6)	475 (2.1)	525 (2.3)	725 (3.2)	440 (2)	400 (1.8)	625 (2.8)	440 (2)	625 (2.8)	

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
2. Concrete thickness must be a minimum of three times the embedment depth.
3. The ultimate tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
4. The values listed above are ultimate load capacities which should be reduced by a factor of safety to determine the allowable working load. For allowable load capacities, see the allowable load tables.
5. The shear load listed is perpendicular to the flute. The shear value parallel to the flute is 2,025 lbs (9.1 kN).
6. Multiple fasteners are recommended for any attachment for increased reliability.

POWDER ACTUATED

PERFORMANCE DATA
Allowable Load Capacities for Powder Actuated Fasteners in Lightweight Concrete^{1,2,3,4,6}

Pin Description	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)							
		3,000psi Lightweight Concrete		3,000psi Lightweight Concrete, Over 20 Gage Deck					
		Tension lbs. (kN)	Shear lbs. (kN)	Lower Flute		Upper Flute		Top of Slab	
Tension lbs. (kN)	Shear lbs. (kN)			Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)		
Ballistic Point Pin (0.150" Shank)	3/4 (19.1)	60 (0.3)	75 (0.3)	45 (0.2)	160 (0.7)	45 (0.2)	160 (0.7)	-	-
Ballistic Point Pin (0.181"/0.150" Shank)	1 (25.4)	70 (0.3)	125 (0.6)	70 (0.3)	165 (0.7)	70 (0.3)	165 (0.7)	-	-
	1 1/4 (31.8)	100 (0.4)	155 (0.7)	85 (0.4)	170 (0.8)	85 (0.4)	170 (0.8)	-	-
	1 1/2 (38.1)	130 (0.6)	180 (0.8)	105 (0.5)	175 (0.8)	105 (0.5)	175 (0.8)	-	-
0.300" Head Drive Pin 8mm Head Drive Pin (0.145" Shank)	3/4 (19.1)	-	-	-	-	-	-	70 (0.3)	70 (0.3)
	1 (25.4)	70 (0.3)	125 (0.6)	120 (0.5)	290 (1.3)	175 (0.8)	290 (1.3)	200 (0.9)	215 (1)
	1 1/4 (31.8)	130 (0.6)	180 (0.8)	190 (0.8)	340 (1.5)	280 (1.2)	340 (1.5)	250 (1.1)	305 (1.4)
	1 1/2 (38.1)	130 (0.6)	180 (0.8)	235 (1)	380 (1.7)	235 (1)	380 (1.7)	340 (1.5)	375 (1.7)
1/4"-20 Threaded Stud (0.145" Shank)	1 (25.4)	70 (0.3)	35 (0.2)	35 (0.2)	160 (0.7)	35 (0.2)	160 (0.7)	-	-
	1 1/4 (31.8)	70 (0.3)	125 (0.6)	65 (0.3)	170 (0.8)	65 (0.3)	170 (0.8)	-	-
3/8" Head Drive Pin (0.172" Shank)	1 1/4 (31.8)	65 (0.3)	195 (0.9)	35 (0.2)	225 (1)	35 (0.2)	225 (1)	-	-
	1 1/2 (38.1)	155 (0.7)	205 (0.9)	105 (0.5)	240 (1.1)	105 (0.5)	240 (1.1)	-	-
10mm Head Drive Pin ⁵ (0.177" Shank)	1 1/4 (31.8)	195 (0.9)	205 (0.9)	175 (0.8)	295 (1.3)	285 (1.3)	425 (1.9)	-	-
	1 3/8 (34.9)	315 (1.4)	315 (1.4)	205 (0.9)	315 (1.4)	205 (0.9)	315 (1.4)	-	-
	1 1/2 (38.1)	370 (1.6)	370 (1.6)	235 (1)	340 (1.5)	235 (1)	340 (1.5)	-	-
	1 5/8 (41.3)	410 (1.8)	395 (1.8)	265 (1.2)	360 (1.6)	315 (1.4)	485 (2.2)	-	-
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	70 (0.3)	130 (0.6)	45 (0.2)	165 (0.7)	45 (0.2)	165 (0.7)	-	-
	1 1/4 (31.8)	170 (0.8)	265 (1.2)	85 (0.4)	225 (1)	85 (0.4)	225 (1)	-	-

Allowable Load Capacities for Powder Actuated Fastener Ceiling Clips in Lightweight Concrete^{1,2,3,4,6}

Pin Description	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)							
		3,000psi Lightweight Concrete			3,000psi Lightweight Concrete, Over 20 Gage Deck				
		Tension lbs. (kN)	45° lbs. (kN)	Shear lbs. (kN)	Lower Flute		Upper Flute		
Tension lbs. (kN)	45° lbs. (kN)				Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)		
Ceiling Clips - w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	50 (0.2)	40 (0.2)	25 (0.1)	35 (0.2)	40 (0.2)	120 (0.5)	35 (0.2)	120 (0.5)
	1 (25.4)	60 (0.3)	40 (0.2)	80 (0.4)	45 (0.2)	70 (0.3)	120 (0.5)	45 (0.2)	120 (0.5)
	1 1/8 (28.6)	60 (0.3)	40 (0.2)	80 (0.4)	120 (0.5)	70 (0.3)	120 (0.5)	135 (0.6)	120 (0.5)
Economy Ceiling Clips - w/ 0.300" Head Pin (0.145" Shank)	3/4 (19.1)	35 (0.2)	45 (0.2)	30 (0.1)	30 (0.1)	40 (0.2)	135 (0.6)	30 (0.1)	135 (0.6)
	1 (25.4)	55 (0.2)	90 (0.4)	115 (0.5)	55 (0.2)	45 (0.2)	135 (0.6)	55 (0.2)	135 (0.6)
Ballistic Point Ceiling Clip (0.181"/0.150" Shank)	3/4 (19.1)	-	-	-	60 (0.3)	-	260 (1.2)	60 (0.3)	260 (1.2)
Ceiling Clips - LADD Pin (0.152" Shank)	1 1/8 (28.6)	95 (0.4)	105 (0.5)	145 (0.6)	55 (0.2)	80 (0.4)	125 (0.6)	55 (0.2)	125 (0.6)

1. Fasteners must not be driven until the concrete has reached the minimum designated compressive strength.
2. Concrete thickness must be a minimum of three times the embedment depth.
3. The tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
4. The values listed above are allowable load capacities. The values are based on minimum required factors of safety. Consideration of additional safety factors may be necessary depending on the application, such as life safety or overhead.
5. The shear load listed is perpendicular to the flute. The shear value parallel to the flute is 315 lbs (1.4 kN).
6. Multiple fasteners are recommended for any attachment for increased reliability.

PERFORMANCE DATA

Ultimate Load Capacities for Powder Actuated Fasteners used to Install Sill Plates onto Normal-Weight Concrete^{1,2}

Pin Description	Minimum Embedment Depth h_V in. (mm)	Minimum Concrete Compressive Strength (f'_c)		
		$f'_c \geq 2,000$ psi (13.8 MPa)		
		Tension	Shear	
		lbs. (kN)	Perpendicular to Concrete lbs. (kN)	Parallel to Concrete lbs. (kN)
Ballistic Point Pin	1 1/2 (38.1)	920 (4.1)	1,060 (4.7)	1,200 (5.3)
0.300" / 8mm Head Drive Pin or 1/4" -20 Threaded Stud (0.145" Shank)	1 1/2 (38.1)	600 (2.7)	900 (4.0)	1,150 (5.1)
3/8" Head Drive Pin (0.172" Shank)	1 1/2 (38.1)	900 (4.0)	960 (4.3)	1,150 (5.1)

- The values listed above are ultimate load capacities which should be reduced by a minimum factor of safety of 5.0 or greater to determine the allowable working load. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
- Multiple fasteners are recommended for any attachment for increased reliability.

Ultimate Load Capacities for Powder Actuated Fasteners in ASTM A36 Steel^{1,2,3,5}

Pin Description	Shank Type	Nominal Steel Thickness									
		1/8"		3/16"		1/4"		3/8"		1/2" ⁴	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin (0.150" Shank)	Smooth	590 (2.6)	2,090 (9.3)	910 (4.0)	3,030 (13.5)	1,560 (6.9)	2,730 (12.1)	2,250 (10.0)	2,625 (11.7)	-	-
0.300" Head Drive Pin 8mm Head Drive Pin (0.145" Shank)	Knurled	1,100 (4.9)	990 (4.4)	1,705 (7.6)	3,050 (13.6)	2,240 (10.0)	2,800 (12.5)	2,600 (11.6)	3,025 (13.5)	2,650 (11.8)	2,875 (12.8)
	Smooth	865 (3.8)	1,325 (5.9)	1,775 (7.9)	2,825 (12.6)	2,050 (9.1)	2,800 (12.5)	2,410 (10.7)	2,620 (11.7)	1,970 (8.8)	2,600 (11.6)
8mm head CSI Pin (0.157" Shank)	Spiral Knurled	-	-	-	-	4,810 (21.4)	3,199 (14.2)	3,390 (15.1)	2,925 (13.0)	2,675 (11.9)	2,825 (12.6)
1/4" -20 Threaded Stud (0.145" Shank)	Knurled	1,100 (4.9)	2,230 (9.9)	1,630 (7.3)	2,770 (12.3)	2,160 (9.6)	3,300 (14.7)	2,560 (11.4)	3,760 (16.7)	-	-
3/8" Head Drive Pin (0.172" Shank)	Smooth	950 (4.2)	2,700 (12.0)	1,490 (6.6)	3,700 (16.5)	1,820 (8.1)	3,890 (17.3)	3,020 (13.4)	4,230 (18.8)	-	-
10mm Head Drive Pin (0.177" Shank)	Smooth	-	-	850 (3.8)	4,150 (18.5)	1,300 (5.8)	4,150 (18.5)	1,900 (8.5)	4,400 (19.6)	3,675 (16.3)	4,075 (18.1)
3/8" -16 Threaded Stud (0.205" Shank)	Knurled	1,120 (5.0)	2,770 (12.3)	2,700 (12.0)	5,460 (24.3)	3,730 (16.6)	8,090 (36.0)	-	-	-	-
Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	Smooth	1,030 (4.6)	1,190 (5.3)	1,090 (4.8)	1,190 (5.3)	1,090 (4.8)	1,190 (5.3)	1,090 (4.8)	1,190 (5.3)	-	-
Economy Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	Smooth	950 (4.2)	1,290 (5.7)	1,090 (4.8)	1,290 (5.7)	1,090 (4.8)	1,290 (5.7)	1,090 (4.8)	1,290 (5.7)	-	-
Ceiling Clips - LADD Pin (0.152" Shank)	Smooth	1,180 (5.2)	1,200 (5.3)	1,180 (5.2)	1,200 (5.3)	1,180 (5.2)	1,200 (5.3)	1,180 (5.2)	1,200 (5.3)	-	-

- The ultimate tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
- The values listed above are ultimate load capacities which should be reduced by a factor of safety to determine the allowable working load. For allowable load capacities, see the allowable load tables.
- Fasteners must be driven to obtain an embedment equivalent to the nominal steel thickness with the point of the fastener penetrating through the steel base material.
- Fasteners must be driven to obtain a minimum embedment of 1/2". The point of the fastener does not need to penetrate through the steel base material.
- Multiple fasteners are recommended for any attachment for increased reliability.

POWDER
ACTUATED

PERFORMANCE DATA
Allowable Load Capacities for Powder Actuated Fasteners in ASTM A36 Steel^{1,2,3,5}

Pin Description	Shank Type	Nominal Steel Thickness									
		1/8"		3/16"		1/4"		3/8"		1/2" ⁴	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin (0.150" Shank)	Smooth	120 (0.5)	420 (1.9)	180 (0.8)	605 (2.7)	310 (1.4)	545 (2.4)	450 (2.0)	525 (2.3)	-	-
0.300" Head Drive Pin 8mm Head Drive Pin (0.145" Shank)	Knurled	220 (1.0)	200 (0.9)	340 (1.5)	610 (2.7)	445 (2.0)	560 (2.5)	520 (2.3)	605 (2.7)	490 (2.2)	575 (2.6)
	Smooth	170 (0.8)	265 (1.2)	355 (1.6)	565 (2.5)	410 (1.8)	560 (2.5)	465 (2.1)	390 (1.7)	390 (1.7)	520 (2.3)
8mm head Spiral CSI Pin (0.157" Shank)	Spiral	280 (1.2)	540 (2.4)	515 (2.3)	585 (2.6)	735 (3.3)	535 (2.4)	615 (2.7)	495 (2.2)	535 (2.4)	565 (2.5)
	Knurled	280 (1.2)	540 (2.4)	515 (2.3)	585 (2.6)	735 (3.3)	535 (2.4)	615 (2.7)	495 (2.2)	535 (2.4)	565 (2.5)
1/4"-20 Threaded Stud (0.145" Shank)	Knurled	220 (1.0)	445 (2.0)	325 (1.4)	555 (2.5)	430 (1.9)	660 (2.9)	510 (2.3)	750 (3.3)	-	-
3/8" Head Drive Pin (0.172" Shank)	Smooth	190 (0.8)	540 (2.4)	300 (1.3)	740 (3.3)	365 (1.6)	780 (3.5)	605 (2.7)	845 (3.8)	-	-
10mm Head Drive Pin (0.177" Shank)	Smooth	-	-	95 (0.4)	545 (2.4)	150 (0.7)	545 (2.4)	245 (1.1)	755 (3.4)	640 (2.8)	600 (2.7)
3/8"-16 Threaded Stud (0.205" Shank)	Knurled	225 (1.0)	555 (2.5)	540 (2.4)	1,090 (4.8)	745 (3.3)	620 (2.8)	-	-	-	-
Ceiling Clips - w/ 0.300" Head Pin (0.145" Shank)	Smooth	205 (0.9)	240 (1.1)	220 (1.0)	240 (1.1)	220 (1.0)	240 (1.1)	220 (1.0)	240 (1.1)	-	-
Economy Ceiling Clips w/ 0.300" Head Pin (0.145" Shank)	Smooth	190 (0.8)	260 (1.2)	210 (0.9)	260 (1.2)	210 (0.9)	260 (1.2)	210 (0.9)	260 (1.2)	-	-
Ceiling Clips - LADD Pin (0.152" Shank)	Smooth	235 (1.0)	240 (1.1)	240 (1.1)	240 (1.1)	235 (1.0)	240 (1.1)	235 (1.0)	240 (1.1)	-	-

- The allowable tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
- The values listed above are allowable load capacities. The values are based on minimum required factors of safety. Consideration of additional safety factors may be necessary depending on the application, such as life safety or overhead.
- Fasteners must be driven to obtain an embedment equivalent to the nominal steel thickness with the point of the fastener penetrating through the steel base material.
- Fasteners must be driven to obtain a minimum embedment of 1/2". The point of the fastener does not need to penetrate through the steel base material.
- Multiple fasteners are recommended for any attachment for increased reliability.

PERFORMANCE DATA

Ultimate Load Capacities for Powder Actuated Fasteners in ASTM A572 Steel^{1,2,3,5}

Pin Description	Shank Type	Nominal Steel Thickness									
		1/8"		3/16"		1/4"		3/8"		1/2" ⁴	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
10mm Head Drive Pin (0.177" Shank)	Smooth	1,275 (5.7)	3,850 (17.1)	1,075 (4.8)	3,250 (14.5)	1,800 (8.0)	3,900 (17.3)	2,275 (10.1)	4,250 (18.9)	-	-
8mm head CSI Pin (0.157" Shank)	Spiral Knurled	1,625 (7.2)	2,550 (11.3)	2,750 (12.2)	3,150 (14.0)	3,975 (17.7)	2,900 (12.9)	3,300 (14.7)	2,675 (11.9)	2,900 (12.9)	3,050 (13.6)

- The ultimate tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
- The values listed above are ultimate load capacities which should be reduced by a factor of safety to determine the allowable working load. For allowable load capacities, see the allowable load tables.
- Fasteners must be driven to obtain an embedment equivalent to the nominal steel thickness with the point of the fastener penetrating through the steel base material.
- 8mm head CSI pin and 10mm head drive pin fasteners must be driven to obtain a minimum embedment of 1/2". The point of the fastener does not need to penetrate through the steel base material.
- Multiple fasteners are recommended for any attachment for increased reliability.

Allowable Load Capacities for Powder Actuated Fasteners in ASTM A572 Steel^{1,2,3,5}

Pin Description	Shank Type	Nominal Steel Thickness									
		1/8"		3/16"		1/4"		3/8"		1/2" ⁴	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
10mm Head Drive Pin (0.177" Shank)	Smooth	255 (1.1)	770 (3.4)	215 (1.0)	650 (2.9)	295 (1.3)	735 (3.3)	355 (1.6)	785 (3.5)	-	-
8mm head CSI Pin (0.157" Shank)	Spiral Knurled	325 (1.4)	510 (2.2)	550 (2.4)	630 (2.8)	795 (3.5)	580 (2.6)	660 (2.9)	535 (2.4)	580 (2.6)	610 (2.7)

- The allowable tension and shear values are for fasteners only. Steel or wood members connected to the substrate must be investigated for compliance with the applicable code.
- The values listed above are allowable load capacities. The values are based on minimum required factors of safety. Consideration of additional safety factors may be necessary depending on the application, such as life safety or overhead.
- Fasteners must be driven to obtain an embedment equivalent to the nominal steel thickness with the point of the fastener penetrating through the steel base material.
- 8mm head CSI pin and 10mm head drive pin fasteners must be driven to obtain a minimum embedment of 1/2". The point of the fastener does not need to penetrate through the steel base material.
- Multiple fasteners are recommended for any attachment for increased reliability.

Ultimate Load Capacities for Powder Actuated Fasteners in Masonry ($f'm \geq 1,500$)^{1,2,3,4}

Pin Description	Minimum Embed. Depth h_v in. (mm)	Hollow CMU				Grout-filled Concrete Masonry	
		Face		Face		Mortar Joint	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
Ballistic Point Pin (0.181"/0.150" Shank)	1 (25.4)	320 (1.4)	740 (3.3)	570 (2.6)	900 (4.1)	510 (2.3)	960 (4.3)
.300"/8mm Head Drive Pin or 1/4"-20 Threaded Stud (0.145" Shank)	1 (25.4)	320 (1.4)	740 (3.3)	570 (2.6)	900 (4.1)	510 (2.3)	960 (4.3)
3/8" Head Drive Pin (0.172" Shank)	1 (25.4)	-	-	740 (3.3)	850 (3.8)	-	-
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	160 (0.7)	670 (3.0)	860 (3.9)	1,460 (6.6)	1,060 (4.8)	1,030 (4.6)

- Successful fastening to the face shell of Hollow CMU is typically done with the lightest powder load level.
- The values listed above are ultimate load capacities which should be reduced by a factor of safety to determine the allowable working load. For allowable load capacities, see the allowable load tables.
- Multiple fasteners are recommended for any attachment for increased reliability.
- Concrete masonry units are typical 8 x 8 x 16 inch units meeting the requirements of ASTM C90, Grade N, lightweight block.

POWDER ACTUATED

PERFORMANCE DATA
Allowable Load Capacities for Powder Actuated Fasteners in Masonry ($f'm \geq 1,500$)^{1,2,3,4}

Pin Description	Minimum Embedment Depth hv in. (mm)	Hollow CMU		Grout-Filled Concrete Masonry			
		Cell		Cell		Mortar Joint	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
0.300" / 8mm Head Drive Pin or 1/4"-20 Threaded Stud (0.145" Shank)	1 (25.4)	35 (0.2)	95 (0.4)	65 (0.3)	115 (0.5)	55 (0.2)	120 (0.5)
3.8" Head Drive Pin (0.172" Shank)	1 (25.4)	-	-	95 (0.4)	105 (0.5)	-	-
3/8"-16 Threaded Stud (0.205" Shank)	1 (25.4)	20 (0.1)	85 (0.4)	110 (0.5)	185 (0.8)	135 (0.6)	130 (0.6)

1. Successful fastening to the face shell of Hollow CMU is typically done with the lightest powder load level.
2. The values listed above are allowable load capacities. The values are based on minimum required factors of safety. Consideration of additional safety factors may be necessary depending on the application, such as life safety or overhead.
3. Multiple fasteners are recommended for any attachment for increased reliability.
4. Concrete masonry units are typical 8 x 8 x 16 inch units meeting the requirements of ASTM C90, Grade N, lightweight block.

Ultimate and Allowable Tensile Pullover Capacities for Light Steel Framing with Powder-Actuated Fasteners^{1,2,3}

Pin Description	Head/Shank Diameter	Minimum Thickness of Sheet Steel or Framing Member									
		16 Gage		18 Gage		20 Gage		22 Gage		25 Gage	
		Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)
8mm Top Hat Pin	0.315"/0.145"	2,650 (11.9)	530 (2.4)	2,470 (11.1)	495 (2.2)	1,210 (5.4)	240 (1.1)	895 (4.0)	180 (0.8)	580 (2.6)	115 (0.5)
8mm Pin without Washer	0.315"/0.145" 0.315"/0.157"	-	-	1,470 (6.6)	295 (1.3)	1,050 (4.7)	210 (0.9)	730 (3.3)	145 (0.7)	415 (1.9)	85 (0.4)
8mm Pin with 1" Washer	0.315"/0.145"	-	-	1,575 (7.1)	310 (1.4)	1,185 (5.3)	235 (1.1)	990 (4.5)	200 (0.9)	795 (3.6)	160 (0.7)
.300" Pin with 7/8" washer	0.300"/0.145"	-	-	-	-	790 (3.6)	160 (0.7)	645 (2.9)	130 (0.6)	500 (2.3)	100 (0.5)
10mm Pin without Washer	0.390"/0.177"	2,330 (10.5)	465 (2.1)	1,750 (7.9)	350 (1.6)	1,185 (5.3)	235 (1.1)	890 (4.0)	180 (0.8)	590 (2.7)	120 (0.5)

1. Tabulated allowable pullover load values were tested in accordance with ICC-ES AC70 and are based on an applied safety factor of 5.0.
2. Allowable pullover capacities of sheet steel or framing member should be compared to the fastener tensile load capacities in concrete, steel and masonry to determine the controlling resistance load.
3. For pins with washer assemblies, the washer thickness is 14 gage minimum.

POWDER ACTUATED