

Heli-Tie™ Design Information

Guide Tension Loads in Various Base Materials

Size in. (mm)	Base Material	Anchor Location	Drill Bit Diameter in.	Min. Embed. Depth in. (mm)	Tension Load ¹		
					Ultimate ² lb. (kN)	Load at Max. Permitted Displ. ³ lb. (kN)	Standard Deviation lb. (kN)
3/8 (9.0)	Solid brick ⁴	Mortar bed joint	7/32	3 (76)	570 (2.5)	240 (1.1)	79 (0.4)
			1/4		365 (1.6)	130 (0.6)	46 (0.2)
		Brick face	7/32		1,310 (5.8)	565 (2.5)	84 (0.4)
			1/4		815 (3.6)	350 (1.6)	60 (0.3)
	Hollow brick ⁵	Mortar bed joint	7/32		530 (2.4)	285 (1.3)	79 (0.4)
			7/32		775 (3.4)	405 (1.8)	47 (0.2)
		Brick face	1/4		510 (2.3)	185 (0.8)	20 (0.1)
	Grout-filled CMU ⁶	Center of face shell	7/32		2 3/4 (70)	1,170 (5.2)	405 (1.8)
			1/4	830 (3.7)		350 (1.6)	60 (0.3)
		Web	7/32	1,160 (5.2)		440 (2.0)	56 (0.2)
			1/4	810 (3.6)		330 (1.5)	100 (0.4)
		Mortar bed joint	7/32	720 (3.2)		320 (1.4)	71 (0.3)
			1/4	530 (2.4)		205 (0.9)	58 (0.3)
	Hollow CMU ⁷	Center of face shell	7/32	790 (3.5)	305 (1.4)	56 (0.2)	
			1/4	505 (2.2)	255 (1.1)	46 (0.2)	
		Web	7/32	1,200 (5.3)	445 (2.0)	50 (0.2)	
			1/4	675 (3.0)	385 (1.7)	96 (0.4)	
	Normal-weight concrete ⁸	—	7/32	1 3/4 (44)	880 (3.9)	410 (1.8)	76 (0.3)
			1/4	2 3/4 (70)	990 (4.4)	380 (1.7)	96 (0.4)
	2x4 wood stud ^{9,11}	Center of thin edge	7/32	2 3/4 (70)	590 (2.6)	370 (1.6)	24 (0.1)
1/4			450 (2.0)		260 (1.2)	6 (0.0)	
Metal stud ^{10,11}	Center of flange	7/32	1 (25)	200 (0.9)	120 (0.5)	8 (0.0)	
		1/4		155 (0.7)	95 (0.4)	2 (0.0)	

Caution: Loads are guide values based on laboratory testing. Onsite testing shall be performed for verification of capacity since base material quality can vary widely.

1. Tabulated loads are guide values based on laboratory testing. Onsite testing shall be performed for verification of capacity since base material quality can vary widely.
2. Ultimate load is average load at failure of the base material. Heli-Tie fastener average ultimate steel strength is 3,885 lb. and does not govern.
3. Load at maximum permitted displacement is average load at displacement of 0.157 inches (4 mm). The designer shall apply a suitable factor of safety to these numbers to derive allowable service loads.
4. Solid brick values for nominal 4-inch-wide solid brick conforming to ASTM C62/C216, Grade SW, Type N mortar is prepared in accordance with IBC Section 2103.2.
5. Hollow brick values for nominal 4-inch-wide hollow brick conforming to ASTM C216/C652, Grade SW, Type HBS, Class H40V. Mortar is prepared in accordance with IBC Section 2103.2.
6. Grout-filled CMU values for nominal 8-inch-wide lightweight, medium-weight and normal-weight concrete masonry units. The masonry units must be fully grouted. Values for nominal 8-inch-wide concrete masonry units (CMU) with a minimum specified compressive strength of masonry, f'_m , at 28 days is 1,500 psi.
7. Hollow CMU values for 8-inch-wide lightweight, medium-weight and normal-weight concrete masonry units.
8. Normal-weight concrete values for concrete with minimum specified compressive strength of 2,500 psi.
9. 2x4 wood stud values for nominal 2x4 Spruce-Pine-Fir.
10. Metal stud values for 20-gauge C-shape metal stud.
11. For retrofits, due to difficulty of locating center of 2x4 or metal stud flange, install Heli-Tie from interior of building.
12. For new construction, anchor one end of tie into backup material. Embed other end into veneer mortar joint.

Heli-Tie™ Design Information

Compression (Buckling) Loads¹

Size in. (mm)	Unsupported Length in. (mm)	Ultimate Compression Load ¹ lb. (kN)
3/8 (9.0)	1 (25)	1,905 (8.5)
	2 (50)	1,310 (5.8)
	4 (100)	980 (4.4)
	6 (150)	785 (3.5)

1. The designer shall apply a suitable factor of safety to these numbers to derive allowable service loads.

Heli-Tie Fastener Installation Tool — Model HELITool37A

Required for correct installation of Heli-Tie wall ties. Speeds up installation and automatically countersinks the tie into the façade material.



HELITool37A

Heli-Tie Wall Tie Tension Tester — Model HELITEST37A

Recommended equipment for onsite testing to accurately determine load values in any specific structure, the Heli-Tie wall tie tension tester features a key specifically designed to grip the Heli-Tie fastener and provide accurate results. Replacement test keys sold separately (Model HELIKEY37A).

Contact Simpson Strong-Tie for Heli-Tie onsite testing procedures.



HELITEST37A



HELIKEY37A

For more information see strongtie.com/helitie.