

Figure 4 V-Tie™

The AB-Clip is manufactured from 16 gauge (1.61 mm [0.063"] thick) sheet metal, conforming to ASTM A570. The AB-Clip is available in hot dipped galvanized finish (conforming to CSA CAN3-A370-04 and ASTM A153 requirement of 458 g/m²/side [1.5 oz/ft²/side] of zinc coating).

The V-Tie™ is manufactured from 4.76 mm (0.19") diameter wire, conforming to CSA Standard G30.3. V-Tie™ lengths of 60 (2.4"), 80 (3.1"), 100 (3.9"), 120 (4.7"), 140 (5.5"), 160 (6.3"), 180 (7.1"), 200 (7.9"), 225 (8.9") and 250 mm (9.8") are available. The V-Tie™ is available in hot dipped galvanized finish (conforming to CSA CAN3-A370-04 and ASTM A153 requirement of 458 g/m²/side [1.5 oz/ft²/side] of zinc coating) and stainless steel.

Structural Performance of the V-Tie™

The unique configuration of the V-Tie™ provides for much greater pull-out (or push-out) capacity from the mortar joint of the brick veneer than similar ties currently on the market. The area of mortar effective in providing support to the V-Tie™ is illustrated in Figure 5. The effective mortar for a number of typical ties is also shown in the figure. A comparison of the pull-out capacities of the various tie types is presented in Table 1.

Table 1 Comparison of Tie Pull-Out Capacity in 90 mm (3.5") Brick Application

Tie Type	Effective Mortar Area mm ² (in ²)	% of V-Tie™ Pull-Out Capacity
FERO V-Tie™	7250 (11.24")	100
Z-Tie	4275 (6.63")	59
Rectangular Tie	4275 (6.63")	59
Triangular Tie	5400 (8.37")	74

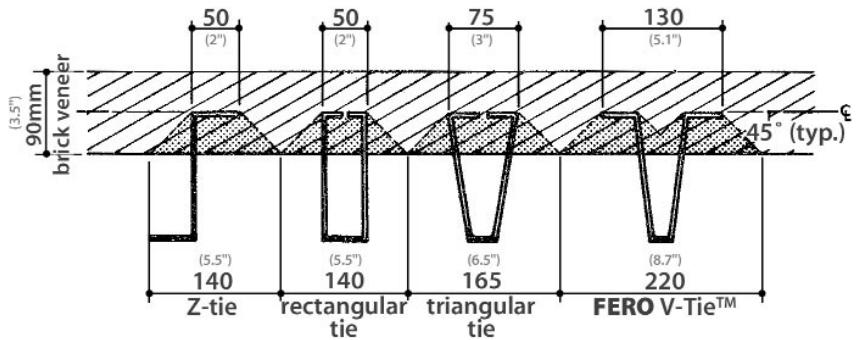


Figure 5 Effective Mortar Joint Area Pull-Out Resistance

Air Leakage Results

Air leakage tests were conducted in accordance with ASTM E283 "Standard Test Methods for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors." The 2000 mm x 2000 mm (6.6' x 6.6') test specimen assembly was identical to the wall configuration presented in *Figure 1*, with the exception of the BVTS tie system (22 ga. strip tie with one fastener) being used.

Twenty five 65 mm (2.56") BVTS (spaced at 600 mm [24"] o.c. vertically and 400 mm [16"] o.c. horizontally) were inserted through the 52 mm (2") rigid insulation, vapour barrier and 12 mm (0.5") gypsum sheathing onto the metal studs and fastened to the metal studs with 4.8 mm (0.19") diameter self-tapping sheet metal screws. The vapour barrier consisted of Perm-A-Barrier (W.R. Grace) and was applied on the exterior face of the gypsum sheathing.

Positive and negative test pressures were placed on the wall specimen. At pressures up to 500 Pa (0.0725 psi), the air leakage was less than the least detectable value of 0.02 l/s/m² (0.025 gal/min/ft²) (as dictated by the monitoring system equipment). At pressures up to 1250 Pa (0.18 psi), the air leakage was less than the detectable value of 0.1 l/s/m² (0.123 gal/min/ft²). The equivalent wind velocity comparable to a 1250 Pa (0.18 psi) pressure is 158 km/h (98 mph). Note that ASTM E283 provides a default test pressure of only 75 Pa (0.01 psi).

Recommended Design Load and Deflections

1. Free Play (maximum):	0.74 mm (0.029")	
2. 0.45 kN (100 lbs) Deflection		
- free play not included:	0.45 mm (0.018")	
- including free play:	1.19 mm (max) (0.047")	
3. Recommended Design Load:	0.67 kN (150 lbs)	
4. Recommended Design Load Deflection		
- free play not included:	0.76 mm (0.03")	
5. Maximum Recommended Spacing:	Horizontal:	Vertical:
	400 mm (16")	600 mm (24")

Notes

- (i) The above design values reflect both the windward and leeward capacity of the Adjustable BVTS tie system, with the governing values listed.
- (ii) The tabulated tie system design values were formulated using working stress design following the procedures of CSA CAN3-A370-04 "Connectors for Masonry", ACI/ASCE/TMS/518 and U.B.C. The values have been reduced to account for test result variation, and reflect a factor of safety of 2.25 (i.e., 75% of 3.0), as per Table 3 (A370).
- (iii) The allowable mortar pull-out and push-out design load for the V-Tie™ embedded at the center line of 90 mm (3.5") brick veneer utilizing Type M, S or N mortar, exceeds or equals the recommended design load listed above.
- (iv) The above design values relate to the capacity of the FERRO tie components. Compatible fasteners capable of resisting the design load must be selected.
- (v) The above design values are based on test results utilizing 78 mm (3.07") BVTS and a 100 mm (4") cavity. No insulation or drywall sheathing was used. Note that for smaller cavity widths and/or with the addition of insulation and gypsum sheathing providing lateral tie support, increased tie system design loads and reduced tie system deflections may be realized.

Adjustable BVTS Specification Guidelines

BVTS: BVTS are available in 21 (0.83"), 31 (1.22"), 40 (1.57"), 52 (2"), 65 (2.56") and 78 mm (3.07") heights.

For penetrating only sheet insulation (i.e., fastening onto plywood sheathing, concrete block, concrete or clay brick), order the BVTS size to be the thickness of the insulation.

For penetrating only gypsum sheathing, order the BVTS size to be the thickness of the gypsum sheathing.

For penetrating gypsum sheathing and sheet insulation, order the BVTS size to be the sum of the thickness of the gypsum sheathing and sheet insulation.

AB-Clip: The AB-Clip is standard.

V-Tie™: The V-Tie™ is available in 60 (2.4"), 80 (3.1"), 100 (3.9"), 120 (4.7"), 140 (5.5"), 160 (6.3"), 180 (7.1"), 200 (7.9"), 225 (8.9") and 250 mm (9.8") lengths, and should be specified as the distance from the exterior face of the BVTS to the center line of the brick veneer.

BVTS Installation Caution: Ensure that all legs of the BVTS are in contact with the structural backup wall systems.



Fero Corporation