FT

Timber Frame Wall Tie

FT–50

Tested Values

	Compression (kN)	Y_m	Tension (kN)	Y_m
Nail end (as received)	1.057		0.648 (nail withdrawal)	1.3(1)
(24mm movement)	0.612	1.15 (3) (buckling of tie – steel failure)	0.690	
Masonry end	0.954	1.15(3) (buckling of tie – steel failure)	1.836 (masonry withdrawal)	3(2)

(1) from BS EN1995-1-1 table 2.3 connections (fixing withdrawal of tie)
(2) from NA to BS EN1996-1-1 table NA.1 (mortar failure of tie)
(3) from NA to BS EN1995-1-1 table NA.3 (steel buckling of tie)

Based on the following criteria the following calculations have been done:

In the following examples a factored windload of 1.65kN/m² is suggested

Partial factor for variable action		1.5
Combined pressure coefficient		1.1
Peak velocity pressure		= 1.0 kN/m²
Applied wind load on gable panel	= 1.5 x 1.1 x 1.0	= 1.65 kN/m²

Failure	Test Result (kN)	Y_m	kmod*	Result x kmod / Y_m (kN)
Compression	0.612	1.15	1.1	0.585
Tension	0.648	1.3	1.1	0.548
Tension	1.836	3	1.1	0.673
Compression	0.954	1.15	1.1	0.912
				0.548

*An instantaneous action (kmod value – 1.1) has be used.

Maximum net surface wind pressure for the FT–50

Product Code	Vertical Tie Spacing (mm)							
	225		300		375		450	
	Stud Centres (mm)							
	600		600		600		600	
	Maximum Net Surface Wind Pressure							
	kN/m²	ties/m²	kN/m²	ties/m²	kN/m²	ties/m²	kN/m²	ties/m²
FT–50	4.05	7.4	3.01	5.5	2.41	4.4	2.02	3.7

	1000/225 = 4.4444 4.4444x(1000/600) = 7.4 ties/m²	1000/300 = 3.3333 3.3333x(1000/600) = 5.5 ties/m²	1000/375 = 2.6666 2.6666x(1000/600) = 4.4 ties/m²	1000/450 = 2.2222 2.2222x(1000/600) = 3.7ties/m²
Lowest failure (with Ym & kmod applied)	0.548 x 7.4 = 4.05kN/m²	0.548 x 5.5 = 3.01kN/m²	0.548 x 4.4 = 2.41kN/m²	0.548 x 3.7 = 2.02kN/m²
Peak velocity pressure (kN/m²)	2.45	1.82	1.46	1.22

Based on the above values this could be worked backwards
Provide a maximum wind load for 3.7 ties/m2 = (2.02/1.1/1.5) = 1.22kN/m2 peak velocity pressure