FT

Timber Frame Wall Tie

FT−100

Tested Values

	Compression (kN)	Y_m	Tension (kN)	Y_m
Nail end (as received)	0.522		0.756 (nail withdrawal)	1.3[1]
(24mm movement)	0.504	1.15[3] (buckling of tie − steel failure)	0.840	
Masonry end	1.417	1.15[3] (buckling of tie − steel failure)	0.943 (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	0.504	1.15	1.1	0.482
Tension	0.756	1.3	1.1	0.639
Tension	0.943	3	1.1	0.345
Compression	1.417	1.15	1.1	1.355
				0.345

*An instantaneous action (kmod value − 1.1) has been used.

Maximum net surface wind pressure for the FT−100

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−100	2.55	7.4	1.89	5.5	1.51	4.4	1.27	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)	0.345 x 7.4 = 2.55kN/m²	0.345 x 5.5 = 1.89kN/m²	0.345 x 4.4 = 1.51kN/m²	0.345 x 3.7 = 1.27kN/m²
Peak velocity pressure (kN/m²)	1.54	1.14	0.91	0.76

Based on the above values this could be worked backwards
Provide a maximum wind load for 3.7 ties/m² = (1.27/1.1/1.5) = 0.76kN/m² peak velocity pressure

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