

COMMERCIAL DOCUMENTATION



SANDWICH PANEL ANCHOR SYSTEM | TVH PANEL TIE - STRAIGHT HAIRPIN

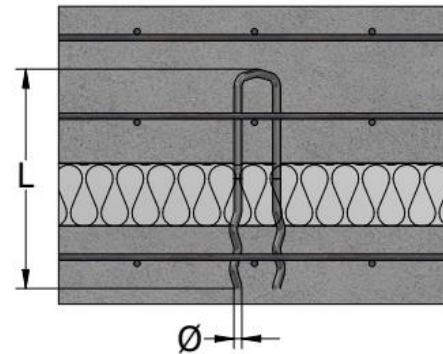


PANEL TIE – STRAIGHT HAIRPIN "TVH"

The straight TVH hairpin is made of stainless steel AISI 316 wire (W1.4401 – A4 quality) or AISI 304 wire (1.4301), available in diameters 3.0 mm, 4.0 mm and 5.0 mm and bent into a "U" shape.

The straight TVH hairpin is mainly used in the negative production method for sandwich panels.

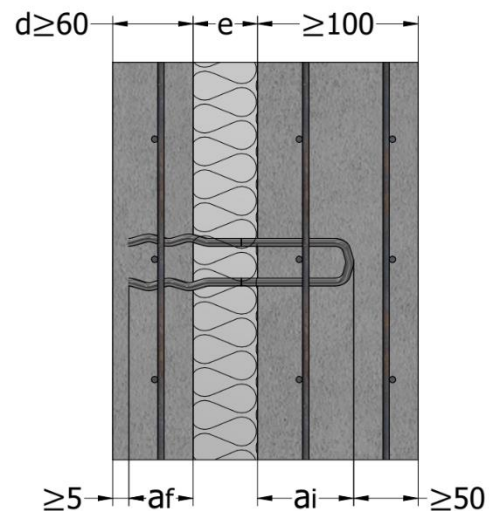
PANEL TIE - HAIRPIN
"TVH"



The available TVH panel ties are presented in the next table.

Table 38

Wire diameter Ø mm	Straight hairpin TVH	Product no.	Length L mm
3	3.0 -120	43374	120
	3.0 -140	43375	140
	3.0 -160	43376	160
	3.0 -180	63780	180
	3.0 -200	43377	200
	3.0 -220	43378	220
	3.0 -240	43379	240
4	4.0 -160	43380	160
	4.0 -180	65825	180
	4.0 -200	43381	200
	4.0 -220	65949	220
	4.0 -230	43382	230
	4.0 -240	65826	240
	4.0 -250	43383	250
	4.0 -260	65827	260
	4.0 -280	43384	280
5	5.0 -185	45852	185
	5.0 -200	43385	200
	5.0 -230	43386	230
	5.0 -240	62515	240
	5.0 -250	43387	250
	5.0 -260	62516	260
	5.0 -280	43388	280
	5.0 -300	62517	300
	5.0 -320	43389	320
	5.0 -340	65828	340
	5.0 -360	65829	360
	5.0 -380	47006	380
	6	6.5 -340	65954
6.5 -360		65955	360
6.5 -380		65956	380
6.5 -400		65957	400
6.5 -420		65958	420



Note:
 $a_f \geq 55$ mm, $a_i \geq 50$ mm.

Concrete quality:
Façade layer \geq C30/37
Load bearing layer \geq C30/37.

Reinforcement:
Reinforcing mesh B500B
Rebar reinforcement B500B

Minimum reinforcement for the façade layer:
Square reinforcement mesh 1.3 cm²/m

The straight TVH hairpin dimensions depend on the outer layer thickness and the insulation layer thickness. The maximum value for the distance between the hairpin and the anchorage centre (fulcrum) $S_{h,max}$ in m are indicated in Table 39. These values for " S_h " ensure sufficient mobility of hairpin TVH and prevent the deterioration caused by the additional constraining

forces. If the permissible values are exceeded, an additional insulation strip must be added in the hairpin area in order to guarantee the necessary mobility.

Table 39

d mm		The insulation layer thickness e mm													
		30	40	50	60	70	80	90	100	110	120	130	140	150	
60	Ø - L	3 -140		3 -160		4 -180		4 -200		4 -220		4 -240		5 -260	
	S _{hmax}	1.6	2.6	3.8	4.0	5.3	6.7	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
70	Ø - L	3 -160		3 -180		4 -200		4 -220		4 -240		5 -260		5 -280	
	S _{hmax}	1.3	2.0	2.9	4.0	5.3	6.7	8.3	8.3	8.3	8.3	8.3	8.3	8.3	7.0
80	Ø - L	3 -160		3 -200		4 -200		4 -240		5 -260		5 -280		5 -320	
	S _{hmax}	1.3	2.0	2.9	4.0	5.3	6.7	8.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0
90	Ø - L	4 -180		4 -200		4 -220		4 -240		5 -260		5 -280		5 -300	
	S _{hmax}	1.3	2.0	2.9	4.0	5.3	6.7	8.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0
100	Ø - L	4 -180		4 -200		4 -220		5 -240		5 -260		5 -280		5 -300	
	S _{hmax}	1.3	2.0	2.9	4.0	5.3	6.7	8.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0
110	Ø - L			5 -240		5 -260		5 -280		5 -300		5 -320			
	S _{hmax}														
120	Ø - L			5 -240		5 -260		5 -280		5 -300		5 -320		6 -340	
	S _{hmax}			2.5	3.4	4.4	5.6	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0

The approximate minimum length of the hairpin can be calculated using the formula:
 $L = d$ (façade layer thickness) + e (insulation layer thickness) + a (embedded length)

The embedded length of the supporting anchor –Table 40:

Table 40

d mm	e mm	
	30 - 90	100 - 150
60	50	55
70	55	62
80	60	70
90	60	70
100	60	70
120	60	70

Proposed load values for hairpin TVH are provided in Table 41 below:

Table 41

Wire diameter TVH	Pressure kN	Suction kN
3.0 mm	1.98 kN for d = 60 mm	3.32
4.0 mm	3.92 kN for d = 90 mm	3.92
5.0 mm	5.85 kN for d = 120 mm	3.92

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