DGZ

DOUBLE THREADED SCREW FOR INSULATION

AC233
ESR-4645

BIT INCLUDED

SOFTWARE

ETA-11/0030

CONTINUOUS INSULATION

Allows continuous, uninterrupted fastening of roof insulation package. Prevents thermal bridges in compliance with energy saving regulations.

CERTIFICATION

Connector for hard, soft and façade insulation, CE certified according to ETA-11/0030. Available in two diameters (7 and 9 mm) to optimize the number of fasteners.

MYPROJECT

Free MyProject software for customized fastening calculation, accompanied by a calculation report.

CYLINDRICAL HEAD

Cylindrical head countersunk in the joist. Also certified in versions with flange head (DGT) and countersunk head (DGS).

CHARACTERISTICS

FOCUS	insulation package fasteners
HEAD	cylindrical, countersunk
DIAMETER	7,0 | 9,0 mm
LENGTH	from 220 to 520 mm

MATERIAL

Galvanized carbon steel.

FIELDS OF USE

- timber based panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT, LVL
- high density woods

Service classes 1 and 2.

THERMAL BRIDGES

Thanks to the double thread, the roof insulation package can be fixed to the supporting structure without any interruptions, thus preventing thermal bridges. Certification specific for fastening on both hard and soft insulation.

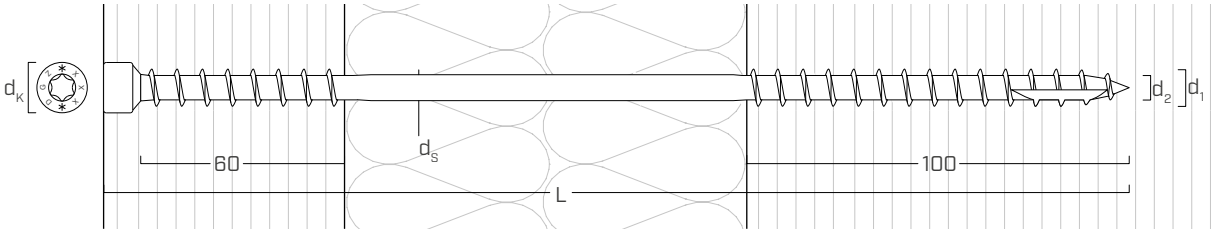
VENTILATED FAÇADES

Also tested, certified and calculated on façade joists and with high density woods such as Microllam® LVL.

Fastening of hard insulation on a flat roof.

Ideal for fastening hard insulation, even of great thickness.

GEOMETRY AND MECHANICAL CHARACTERISTICS



Nominal diameter	**d_1**	**[mm]**	**7**	**9**
Head diameter	d_K	[mm]	9,5	11,5
Tip diameter	d_2	[mm]	4,60	5,90
Shank diameter	d_S	[mm]	5,00	6,50
Characteristic yield moment	$M_{y,k}$	[Nm]	14,2	27,2
Characteristic withdrawal-resistance parameter(1)	$f_{ax,k}$	[N/mm^2]	11,7	11,7
Associated density	ρ_a	[kg/m^3]	350	350
Characteristic tensile strength	$f_{tens,k}$	[kN]	15,4	25,4

(1) Valid for softwood - maximum density 440 kg/m^3.

CODES AND DIMENSIONS

d_1 [mm] *[in]*	CODE	L [mm]	L *[in]*	pcs
7 *0.28* TX 30	DGZ7220	220	*8 5/8*	50
	DGZ7260	260	*10 1/4*	50
	DGZ7300	300	*11 3/4*	50
	DGZ7340	340	*13 3/8*	50
	DGZ7380	380	*15*	50

d_1 [mm] *[in]*	CODE	L [mm]	L *[in]*	pcs
9 *0.36* TX 40	DGZ9240	240	*9 1/2*	50
	DGZ9280	280	*11*	50
	DGZ9320	320	*12 5/8*	50
	DGZ9360	360	*14 1/4*	50
	DGZ9400	400	*15 3/4*	50
	DGZ9440	440	*17 1/4*	50
	DGZ9480	480	*19*	50
	DGZ9520	520	*20 1/2*	50

NOTES: upon request, EVO version is available.

SCREW SELECTION

MINIMUM SCREW LENGTH DGZ Ø7

insulation + wooden planking thickness [mm]	batten thickness(*) [mm] s = 30 A DGZ at 60° L_{min} [mm]	s = 30 B DGZ at 90° L_{min} [mm]	s = 40 A DGZ at 60° L_{min} [mm]	s = 40 B DGZ at 90° L_{min} [mm]	s = 50 A DGZ at 60° L_{min} [mm]	s = 50 B DGZ at 90° L_{min} [mm]	s = 60 A DGZ at 60° L_{min} [mm]	s = 60 B DGZ at 90° L_{min} [mm]	s = 80 A DGZ at 60° L_{min} [mm]	s = 80 B DGZ at 90° L_{min} [mm]
60	220	220	220	220	220	220	220	220	260	220
80	220	220	220	220	220	220	260	220	260	220
100	220	220	260	220	260	220	260	220	300	260
120	260	220	260	220	260	260	300	260	300	260
140	260	260	300	260	300	260	300	260	340	300
160	300	260	300	260	340	300	340	300	340	300
180	340	300	340	300	340	300	340	300	380	340
200	340	300	340	300	380	340	380	340	-	340
220	380	340	380	340	380	340	380	340	-	380
240	380	340	380	340	-	380	-	380	-	380
260	-	380	-	380	-	380	-	380	-	-
280	-	380	-	380	-	-	-	-	-	-

(*) Minimum batten thicknesses: DGZ Ø7 mm: base/height = 50/30 mm.

MINIMUM SCREW LENGTH DGZ Ø9

insulation + wooden planking thickness [mm]	batten thickness(*) [mm] s = 30 A DGZ at 60° L_{min} [mm]	s = 30 B DGZ at 90° L_{min} [mm]	s = 40 A DGZ at 60° L_{min} [mm]	s = 40 B DGZ at 90° L_{min} [mm]	s = 50 A DGZ at 60° L_{min} [mm]	s = 50 B DGZ at 90° L_{min} [mm]	s = 60 A DGZ at 60° L_{min} [mm]	s = 60 B DGZ at 90° L_{min} [mm]	s = 80 A DGZ at 60° L_{min} [mm]	s = 80 B DGZ at 90° L_{min} [mm]
60	-	-	240	240	240	240	240	240	240	240
80	-	-	240	240	240	240	240	240	280	240
100	-	-	240	240	240	240	280	240	280	240
120	-	-	280	240	280	240	280	240	320	280
140	-	-	280	240	320	280	320	280	320	280
160	-	-	320	280	320	280	320	280	360	320
180	-	-	320	280	360	320	360	320	400	320
200	-	-	360	320	360	320	400	320	400	360
220	-	-	400	320	400	360	400	360	440	360
240	-	-	400	360	400	360	440	360	440	400
260	-	-	440	360	440	400	440	400	480	400
280	-	-	440	400	480	400	480	400	480	440
300	-	-	480	400	480	400	480	440	520	440
320	-	-	520	440	520	440	520	480	520	480
340	-	-	520	480	520	480	-	-	-	-

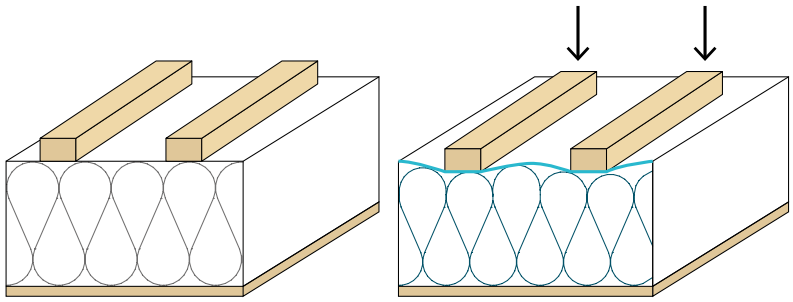
(*) Minimum batten thicknesses: DGZ Ø9 mm: base/height = 60/40 mm.

NOTE: check that the screw tip does not stick out from the rafter.

FASTENINGS FOR CONTINUOUS INSULATION

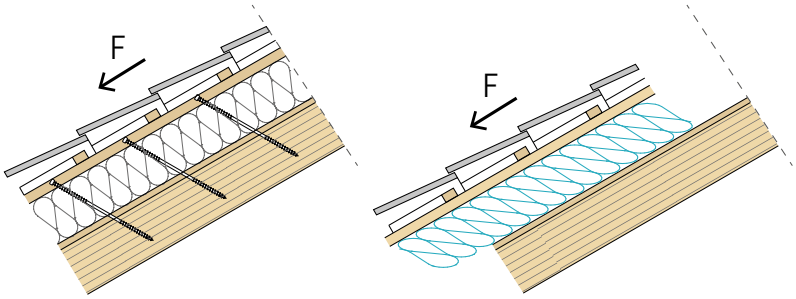
Installation of a continuous layer of insulation guarantees excellent energy performance, eliminating thermal bridges. Efficacy is limited by the proper use of appropriate fastening systems, calculated correctly.

CRUSHING OF THE INSULATION



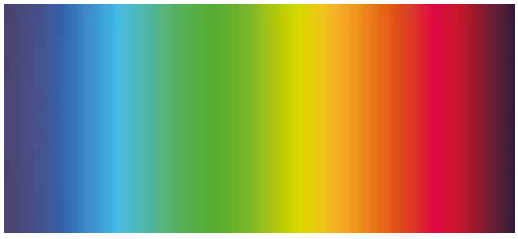
Crushing of the insulation (for very heavy loads) leads to a reduction in the ventilation chamber. As a result, aeration in the hollow space, and thus its efficacy, is reduced.
Additionally, it is possible that the insulating power of the package is diminished, with the thickness being reduced after the crushing. To prevent this problem, it is necessary to verify that the compression resistance of the insulation σ (10%) is sufficient to resist the stresses in question. Alternatively, it is possible to place screws tilted in the two directions so that the load is entirely transferred by the connectors and does not deform the layer of insulation in any way.

SLIP OF THE INSULATION AND THE COATING



The load applied to the structure has a component parallel to the layer/façade which leads, if not restrained (for example through "type A" screws), to a possible shift in the external layers, causing probable damage to the cover surface and the insulating power. Clear thermal, aesthetic and waterproofing problems then result.

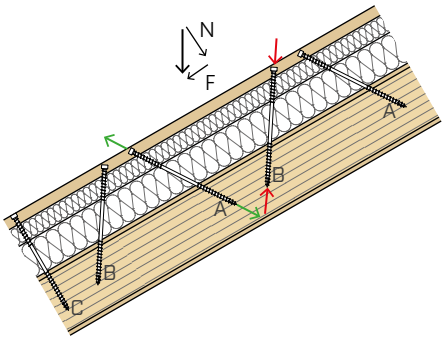
THERMAL BRIDGES



it is important that the insulation be continuous, without breaks or cracks, to optimise performance and minimise thermal bridges. Thermal bridges due to over frequent anchoring or those placed erroneously are also to be avoided.

COVER

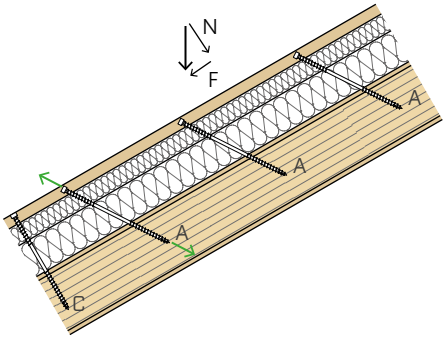
SOFT INSULATION



Low compression resistance ($\sigma_{(10\%)}$ < 50 kPa - EN 826)

- the insulation does not support the load component perpendicular to the layer (N);
- screws are subject to tensile (A) and compression (B) stresses;
- for very high negative wind pressure loads, additional screws are inserted (C);
- adequate batten thickness makes it possible to optimise the number of fastenings.

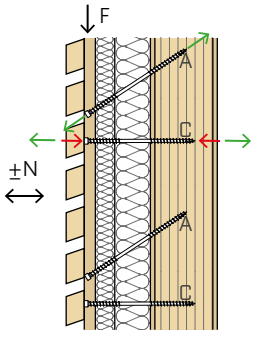
HARD INSULATION



High compression resistance ($\sigma_{(10\%)} \geq$ 50 kPa - EN 826)

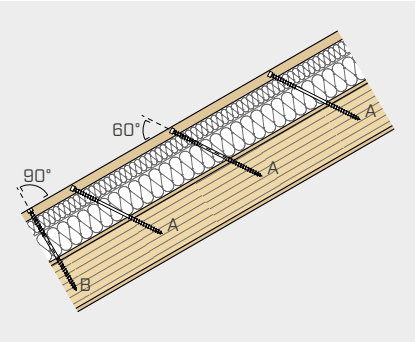
- the insulation supports the load component perpendicular to the layer (N);
- the screws are subject only to tensile stress (A);
- for very high negative wind pressure loads, additional screws are inserted (C);
- adequate batten thickness makes it possible to optimise the number of fastenings.

FAÇADE

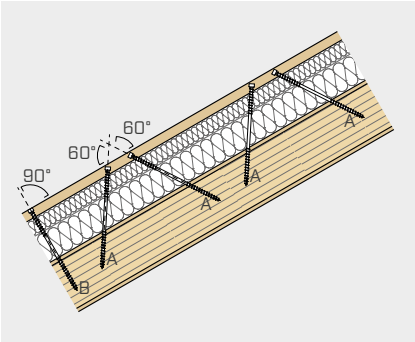


- the screws must support both positive and negative wind pressure loads (±N) and vertical forces (F);
- installation: one screw in tension(A) and one perpendicular to the façade (C), tense or compressed as a function of N, or screws inclined in the 2 directions;
- the screws (C) must support both the positive and negative wind pressure loads (±N) and are alternatively subjected to compression and tensile stresses.

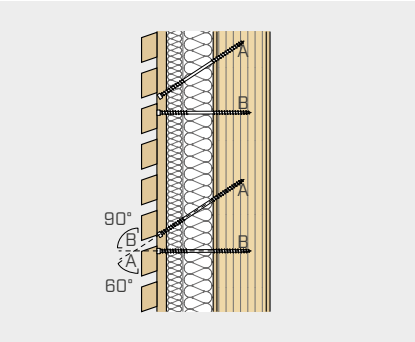
POSSIBLE CONFIGURATIONS



RIGID ROOF INSULATION
$\sigma_{(10\%)} \geq 50$ kPa (EN826)



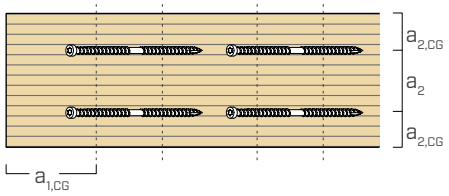
SOFT ROOF INSULATION
$\sigma_{(10\%)} < 50$ kPa (EN826)

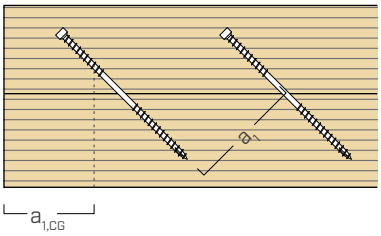


FACADE INSULATION

NOTE: The number and placement of the fastenings depends on the geometry of the surfaces, the type of insulation and the loads acting on them.

MINIMUM DISTANCES FOR AXIAL STRESSES [1]





		SCREWS INSERTED WITH AND WITHOUT PRE-DRILLING HOLE		
d_1	**[mm]**		**7**	**9**
a_1	[mm]	**5·d**	35	45
a_2	[mm]	**5·d**	35	45
$a_{1,CG}$	[mm]	**10·d**	70	90
$a_{2,CG}$	[mm]	**4·d**	28	36

d = nominal screw diameter

NOTES:

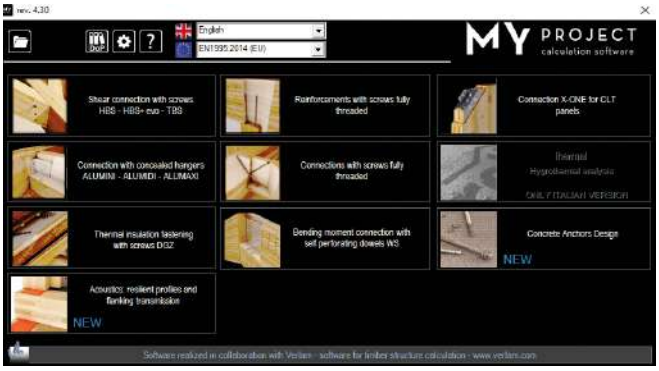
(1) The minimum distances for connectors stressed axially are independent of the insertion angle of the connector and the angle of the force with respect to the grain, in accordance with ETA-11/0030.

CALCULATION EXAMPLE: FASTENING OF CONTINUOUS INSULATION WITH DGZ

MY PROJECT SOFTWARE

PROJECT DATA

Roof loads		
Permanent load	g_k	0,45 kN/m²
Snow load	s	1,70 kN/m²
Positive wind pressure	w_e	0,30 kN/m²
Negative wind pressure	w_e	-0,30 kN/m²
Ridge piece height	z	8,00 m
Building dimensions		
Building length	L	11,50 m
Building width	B	8,00 m
Roof geometry		
Layer slope	α	30% = 16,7°
Ridge piece position	L_1	5,00 m



INSULATION PACKAGE FIGURES

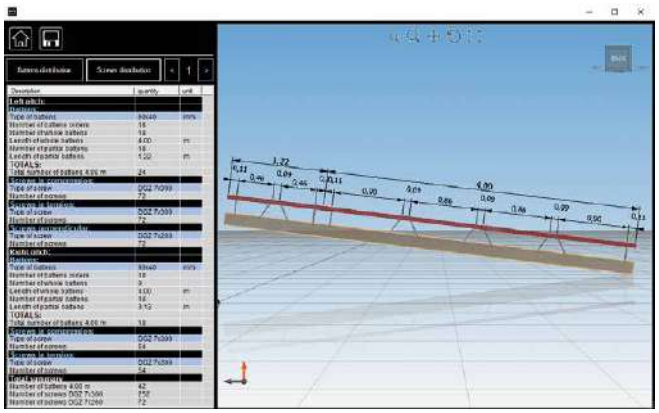
Rafters	b_t x h_t	120 x 160 mm	GL24h spacing	i	0,70 m
Wooden planking	S_1	20.00 mm			
Tile support battens	e_b	0,33 m			
Insulation layer	S_2	160.00 mm	Wood grain (soft)	$\sigma_{(10\%)}$	0,03 N/mm²
Battens	b_L x h_L	60 x 40 mm	C24 Commercial length	L_L	4,00 m

CONNECTOR SELECTION - OPTION 1 - DGZ Ø7

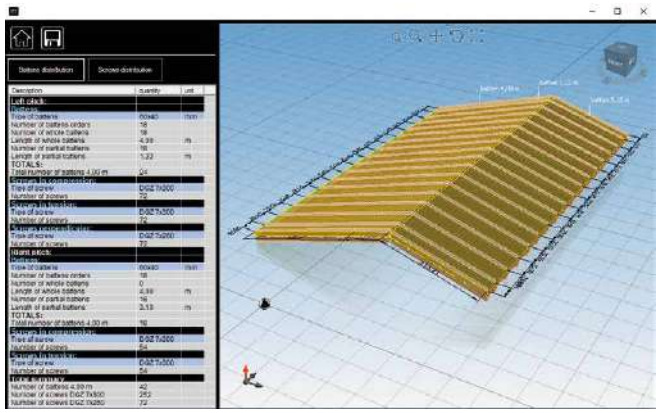
Screw under tension	7 x 300 mm	60° angle: 126 piece
Compressed screw	7 x 300 mm	60° angle: 126 piece
Perpendicular screw	7 x 260 mm	90° angle: 72 piece

CONNECTOR SELECTION - OPTION 2 - DGZ Ø9

Screw under tension	9 x 320 mm	60° angle: 108 piece
Compressed screw	9 x 320 mm	60° angle: 108 piece
Perpendicular screw	9 x 280 mm	90° angle: 36 piece



Connector placement diagram.



Roof batten calculation.