UKCA UKTA-0836 22/6195 | ICC ES AC233 ESR-4645 | CE ETA-11/0030

DGZ

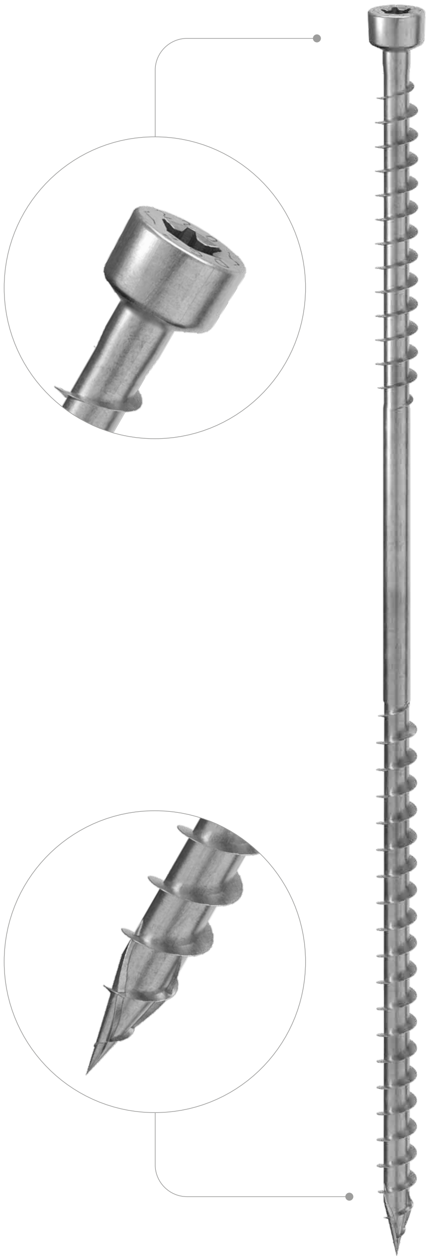
DOUBLE THREADED SCREW FOR INSULATION

CONTINUOUS INSULATION
Allows continuous, uninterrupted fastening of roof insulation package. Limits thermal bridges in compliance with energy saving regulations.
The cylindrical head is ideal for hidden insertion in the batten.
Screw also certified in versions with flange head (DGT) and countersunk head (DGS).

CERTIFICATION
Connector for hard and soft insulation, for roofing and façade applications, 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.

3 THORNS TIP
Thanks to the 3 THORNS tip, minimum installation distances are reduced. More screws can be used in less space and larger screws in smaller elements. Costs and time for project implementation are reduced.

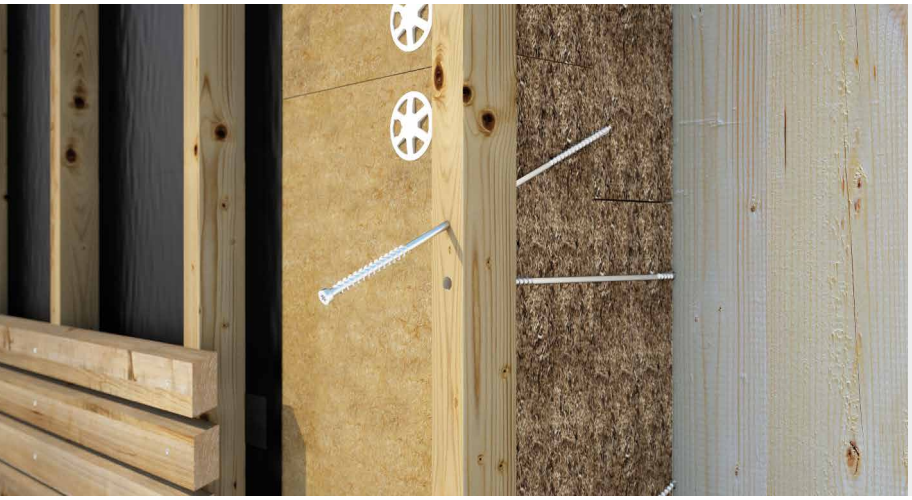


MY PROJECT SOFTWARE

BIT INCLUDED

DIAMETER [mm]	6 · 7 – 9 · 9
LENGTH [mm]	80 · 220 – 520 · 520
SERVICE CLASS	SC1, SC2
ATMOSPHERIC CORROSIVITY	C1, C2
WOOD CORROSIVITY	T1, T2
MATERIAL	Zn ELECTRO PLATED – electrogalvanized carbon steel

FIELDS OF USE
- timber based panels
- solid timber
- glulam (Glued Laminated Timber)
- CLT, LVL
- engineered timbers



THERMAL BRIDGES

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

VENTILATED FAÇADES

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

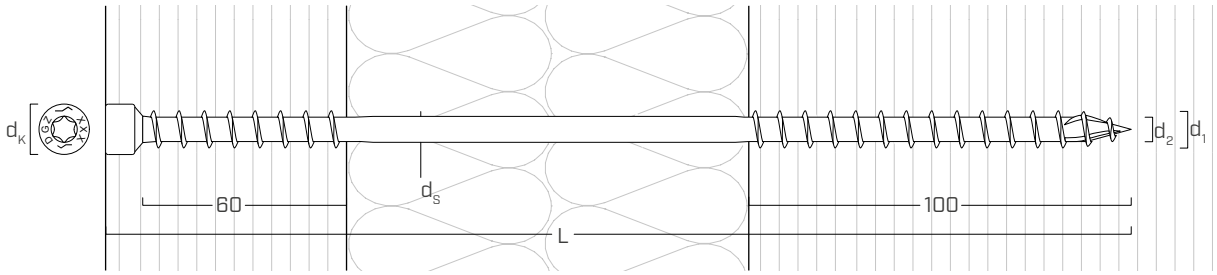
CODES AND DIMENSIONS

d_1 [mm]	CODE	L [mm]	pcs
7 TX 30	DGZ7220	220	50
	DGZ7260	260	50
	DGZ7300	300	50
	DGZ7340	340	50
	DGZ7380	380	50

NOTES: upon request, EVO version is available.

d_1 [mm]	CODE	L [mm]	pcs
9 TX 40	DGZ9240	240	50
	DGZ9280	280	50
	DGZ9320	320	50
	DGZ9360	360	50
	DGZ9400	400	50
	DGZ9440	440	50
	DGZ9480	480	50
	DGZ9520	520	50

GEOMETRY AND MECHANICAL CHARACTERISTICS



GEOMETRY

Nominal diameter	**d_1**	**[mm]**	**7**	**9**
Head diameter	d_K	[mm]	9,50	11,50
Thread diameter	d_2	[mm]	4,60	5,90
Shank diameter	d_S	[mm]	5,00	6,50

CHARACTERISTIC MECHANICAL PARAMETERS

Nominal diameter	**d_1**	**[mm]**	**7**	**9**
Tensile strength	$f_{tens,k}$	[kN]	15,4	25,4
Yield moment	$M_{y,k}$	[Nm]	14,2	27,2

Refer to ETA-11/0030 for the instability resistance values of screws as a function of their effective length.

			softwood *(softwood)*	**LVL softwood** *(LVL softwood)*
Withdrawal resistance parameter	$f_{ax,k}$	[N/mm²]	11,7	15,0
Associated density	ρ_a	[kg/m³]	350	500
Calculation density	ρ_k	*[kg/m³]*	*≤ 440*	*410 ÷ 550*

For applications with different materials please see ETA-11/0030.

SCREW SELECTION

MINIMUM SCREW LENGTH DGZ Ø7

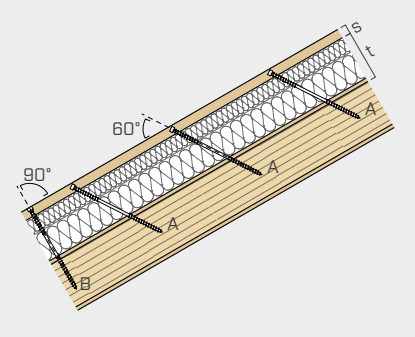
insulation + wooden planking thickness t [mm]	batten height(*) s = 30 mm		s = 40 mm		s = 50 mm		s = 60 mm		s = 80 mm	
	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	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.

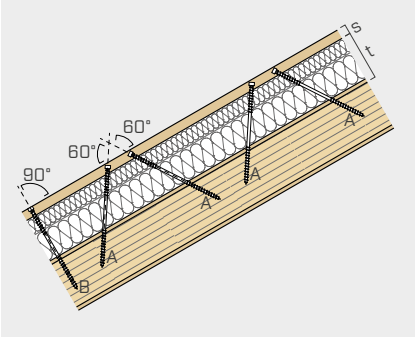
MINIMUM SCREW LENGTH DGZ Ø9

insulation + wooden planking thickness t [mm]	batten height(*) s = 30 mm		s = 40 mm		s = 50 mm		s = 60 mm		s = 80 mm	
	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	B DGZ at 90° L_{min} [mm]	A DGZ at 60° L_{min} [mm]	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	-	-	-	-

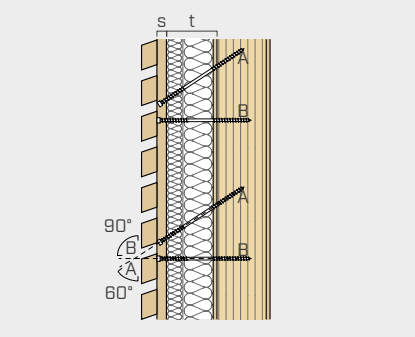
(*) Minimum batten thicknesses: DGZ Ø9 mm: base/height = 60/40 mm.



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



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



FACADE INSULATION

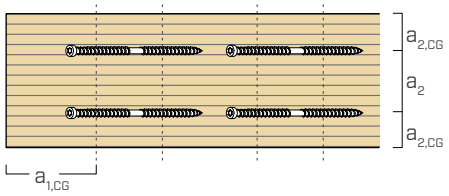
NOTE: Check that the screw length is compatible with the size of the structural timber element and that the tip does not protrude from the beam bottom.

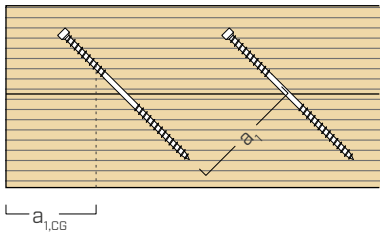
MINIMUM DISTANCES FOR AXIAL STRESSES [1]

screws inserted **WITH and WITHOUT pre-drilled hole**

d_1	[mm]		7	9
a_1	[mm]	**5·d**	35	45
a_2	[mm]	**5·d**	35	45
$a_{1,CG}$	[mm]	**8·d**	56	72
$a_{2,CG}$	[mm]	**3·d**	21	27

d = d_1 = nominal screw diameter





NOTES:

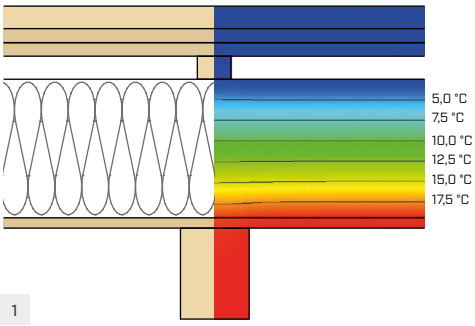
(1) The minimum distances for axially loaded connectors are independent of the insertion angle of the connector and the angle of the force with respect to the grain, in accordance with ETA-11/0030.

- For 3 THORNS tip the minimum distances in the table are derived from experimental tests; alternatively, adopt $a_{1,CG}$ = 10·d and $a_{2,CG}$ = 4·d in accordance with EN 1995:2014.

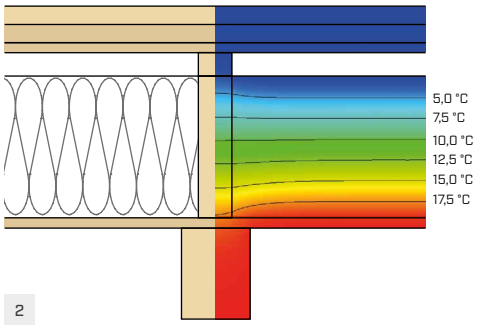
RESEARCH & DEVELOPMENT

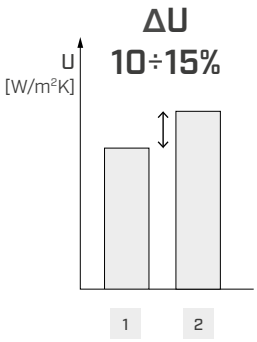
INSULATION AND INFLUENCE OF THERMAL BRIDGES

CONTINUOUS INSULATION



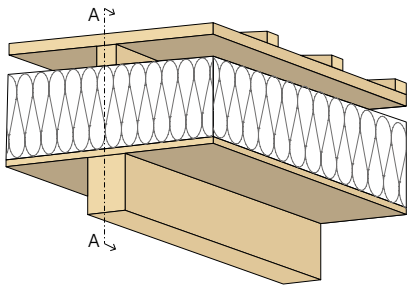
INTERRUPTED INSULATION

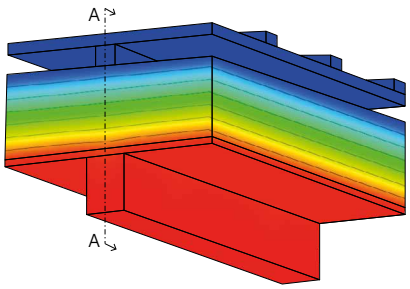


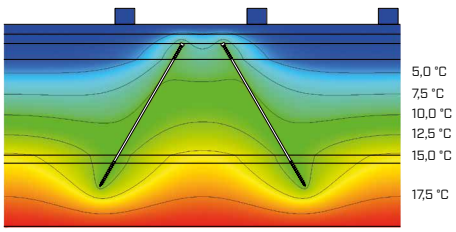


The use of continuous insulation helps to limit the presence of thermal bridges.
If the fastening of the package requires rigid elements within the insulation, there is a drop in thermal performance due to the presence of a thermal bridge distributed along the entire axis of the interposed secondary joists.
Moreover, in the case of interrupted insulation, local discontinuities between the elements present may be more frequent during installation, further aggravating the thermal bridge.

FASTENING OF CONTINUOUS INSULATION WITH DGZ







Section A-A

The use of the DGZ screw allows the installation of continuous insulation, without interruptions and discontinuities.
In this case, the thermal bridge is localised and concentrated only at the connectors and therefore has an irrelevant contribution to the thermal performance of the package, which is therefore maintained.
Excessive anchoring or incorrect arrangements should be avoided in order not to compromise the thermal performance of the package.

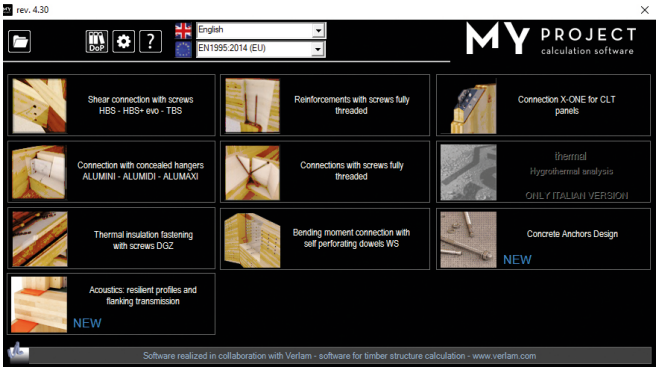
Calculation performed by EURAC Research as part of MEZeroE project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953157.
For more info www.mezeroe.eu

CALCULATION EXAMPLE: FASTENING OF CONTINUOUS INSULATION WITH DGZ

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

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

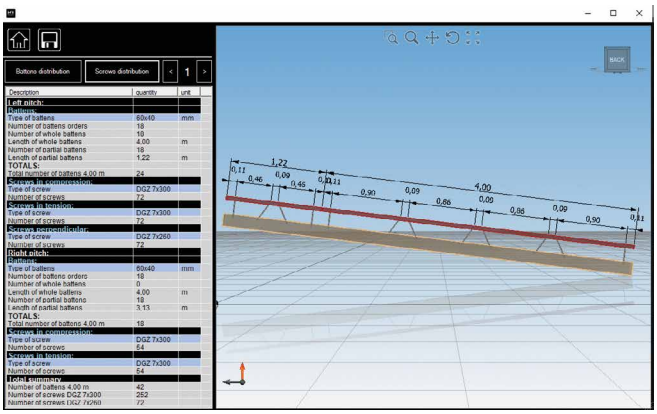
Joists GL24h	b_t x h_t	120 x 160 mm	Spacing	i	0,70 m
Wooden planking	S_1	20.00 mm			
Tile support battens	e_b	0,33 m			
Insulation layer	S_2	160.00 mm	Wood grain (soft)	$\sigma_{(10\%)}$	0,03 N/mm²
C24 battens	b_L x h_L	60 x 40 mm	Commercial length	L_L	4,00 m

CONNECTOR SELECTION - OPTION 1 - DGZ Ø7

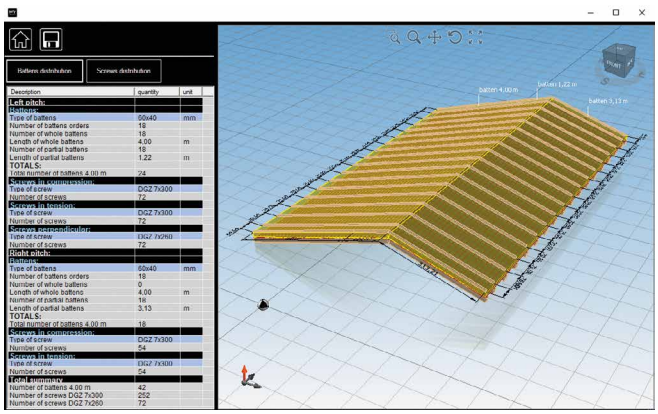
Screw under tension	7 x 300 mm	60° angle: 126 pcs
Compressed screw	7 x 300 mm	60° angle: 126 pcs
Perpendicular screw	7 x 260 mm	90° angle: 72 pcs

CONNECTOR SELECTION - OPTION 2 - DGZ Ø9

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



Connector placement diagram.



Roof batten calculation.