

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 (0.16 and 0.18 inch) to optimize the number of fasteners.

MYPROJECT

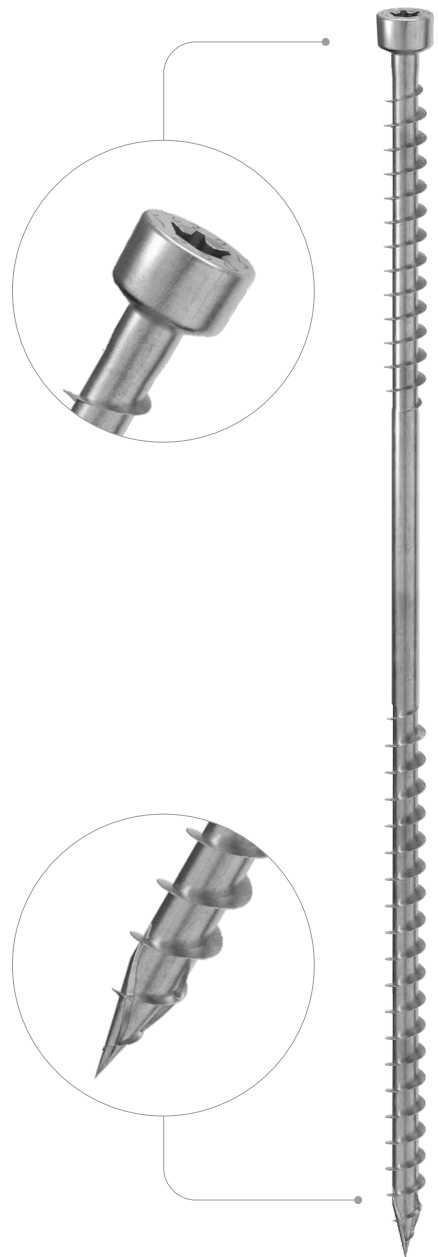
Free MyProject software for customized fastening calculation, accompanied by a calculation report.

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.

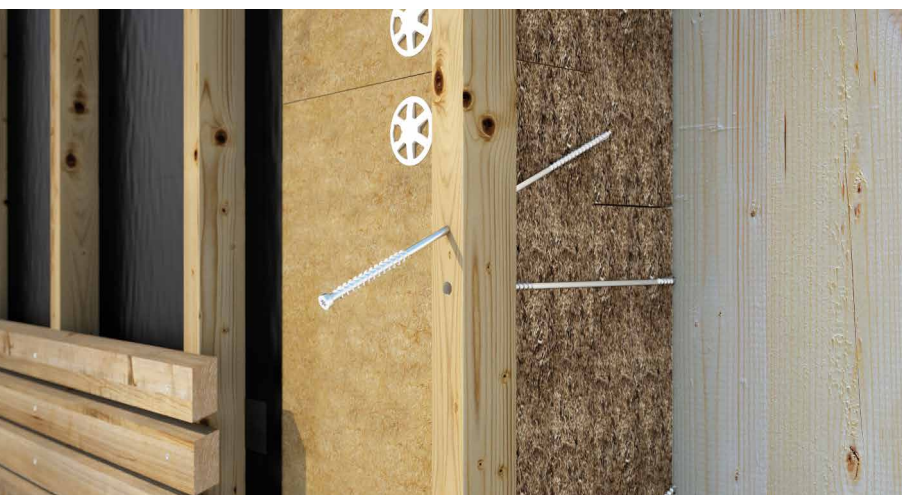


DIAMETER [in]	0.24	0.28	0.36	0.36
LENGTH [in]	3 1/8	8 5/8	20 1/2	20 1/2
EXPOSURE CONDITION	EC1	EC2	EC3	EC4
ATMOSPHERIC CORROSIVITY	C1	C2	C3	C4
WOOD CORROSIVITY	T1	T2	T3	T4
MATERIAL	Zn ELECTRO PLATED electrogalvanized carbon steel			



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

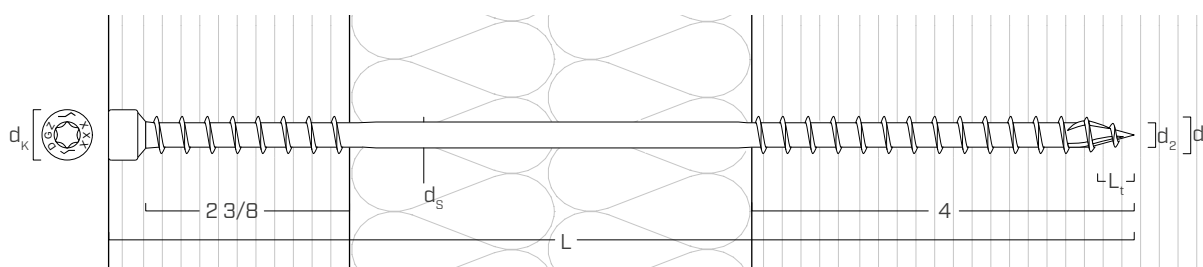
Also tested, certified and calculated on façade joists and with engineered woods such as LVL, Plywood or other laminated veneer products.

CODES AND DIMENSIONS

d ₁	CODE	L		pcs
[mm] [in]		[mm]	[in]	
7 0.28 #16 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	CODE	L		pcs
[mm] [in]		[mm]	[in]	
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

GEOMETRY AND MECHANICAL CHARACTERISTICS



GEOMETRY

Nominal diameter	d ₁	[in] ⁽¹⁾	0.28	0.36
Outer thread diameter	d ₁	[mm]	7	9
		[in]	0.276	0.354
Head diameter	d _k	[in]	0.374	0.453
Root diameter	d ₂	[in]	0.181	0.232
Shank diameter	d _s	[in]	0.197	0.256
Tip length	L _t	[in]	0.276	0.354

⁽¹⁾ The nominal diameter of the screw is converted into imperial units and rounded up to the nearest decimal point.

MECHANICAL PARAMETERS

Nominal diameter	d ₁	[in]	0.28	0.36
Tensile strength (allowable)	f _{tens}	[lbf]	1750	2900
Bending yield strength (specified)	F _{y,b}	[psi]	195000	180000

Nominal diameter	d ₁	[in]	0.28	0.36
Withdrawal (design value)	W ₉₀	[lbf/in]	G = 0.35	141
			G = 0.42	164
			G = 0.49	185
			G = 0.55	203
minimum embedded length		[in]	1 5/8	2 1/8
Head pull-through (design value)	W _H	[lbf]	G = 0.35	191
			G = 0.42	220
			G = 0.49	248
			G = 0.55	270
minimum side member thickness		[in]	1 1/2	1 1/2

SCREW SELECTION

MINIMUM SCREW LENGTH DGZ 0.28 inch [7 mm]

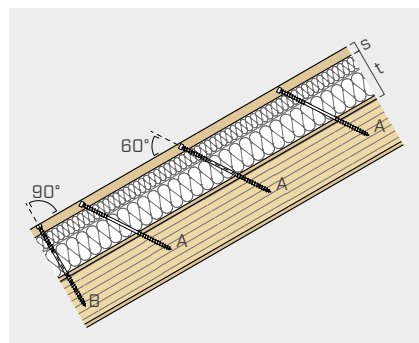
insulation + wooden planking thickness t [in]	batten thickness ^(*)									
	s = 1 3/16		s = 1 9/16		s = 2		s = 2 3/8		s = 3 1/8	
	A	B	A	B	A	B	A	B	A	B
	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°
L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]
2 3/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	10 1/4	8 5/8
3 1/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	8 5/8	10 1/4	8 5/8	10 1/4	8 5/8
4	8 5/8	8 5/8	10 1/4	8 5/8	10 1/4	8 5/8	10 1/4	8 5/8	11 3/4	10 1/4
4 3/4	10 1/4	8 5/8	10 1/4	8 5/8	10 1/4	10 1/4	11 3/4	10 1/4	11 3/4	10 1/4
5 1/2	10 1/4	10 1/4	11 3/4	10 1/4	11 3/4	10 1/4	11 3/4	10 1/4	13 3/8	11 3/4
6 1/4	11 3/4	10 1/4	11 3/4	10 1/4	13 3/8	11 3/4	13 3/8	11 3/4	13 3/8	11 3/4
7 1/8	13 3/8	11 3/4	13 3/8	11 3/4	13 3/8	11 3/4	13 3/8	11 3/4	15	13 3/8
8	13 3/8	11 3/4	13 3/8	11 3/4	15	13 3/8	15	13 3/8	-	13 3/8
8 5/8	15	13 3/8	15	13 3/8	15	13 3/8	15	13 3/8	-	15
9 1/2	15	13 3/8	15	13 3/8	-	15	-	15	-	15
10 1/4	-	15	-	15	-	15	-	15	-	-
11	-	15	-	15	-	-	-	-	-	-

(*) Minimum batten dimensions: DGZ 0.28 inch (7 mm): base = 2 inch (50 mm), height = 1 3/16 inch (30 mm).

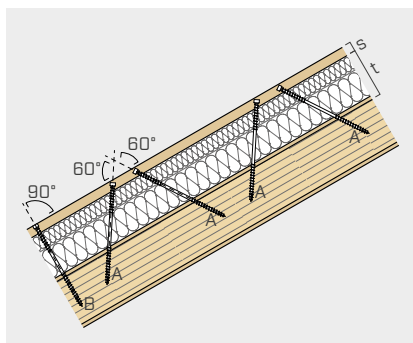
MINIMUM SCREW LENGTH DGZ 0.36 inch [9 mm]

insulation + wooden planking thickness t [in]	batten thickness ^(*)									
	s = 1 3/16		s = 1 9/16		s = 2		s = 2 3/8		s = 3 1/8	
	A	B	A	B	A	B	A	B	A	B
	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°	DGZ at 60°	DGZ at 90°
L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]	L _{min} [in]
2 3/8	-	-	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2
3 1/8	-	-	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	11	9 1/2
4	-	-	9 1/2	9 1/2	9 1/2	9 1/2	11	9 1/2	11	9 1/2
4 3/4	-	-	11	9 1/2	11	9 1/2	11	9 1/2	12 5/8	11
5 1/2	-	-	11	9 1/2	12 5/8	11	12 5/8	11	12 5/8	11
6 1/4	-	-	12 5/8	11	12 5/8	11	12 5/8	11	14 1/4	12 5/8
7 1/8	-	-	12 5/8	11	14 1/4	12 5/8	14 1/4	12 5/8	15 3/4	12 5/8
8	-	-	14 1/4	12 5/8	14 1/4	12 5/8	15 3/4	12 5/8	15 3/4	14 1/4
8 5/8	-	-	15 3/4	12 5/8	15 3/4	14 1/4	15 3/4	14 1/4	17 1/4	14 1/4
9 1/2	-	-	15 3/4	14 1/4	15 3/4	14 1/4	17 1/4	14 1/4	17 1/4	15 3/4
10 1/4	-	-	17 1/4	14 1/4	17 1/4	15 3/4	17 1/4	15 3/4	19	15 3/4
11	-	-	17 1/4	15 3/4	19	15 3/4	19	15 3/4	19	17 1/4
11 3/4	-	-	19	15 3/4	19	17 1/4	19	17 1/4	20 1/2	17 1/4
12 5/8	-	-	20 1/2	17 1/4	20 1/2	17 1/4	20 1/2	19	20 1/2	19
13 3/8	-	-	20 1/2	19	20 1/2	19	-	-	-	-

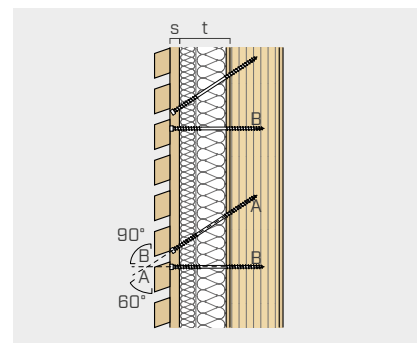
(*) Minimum batten dimensions: DGZ 0.36 inch (9 mm): base = 2 3/8 inch (60 mm), height = 1 9/16 inch (40 mm).



RIGID ROOF INSULATION



SOFT ROOF INSULATION



FACADE INSULATION

NOTES:

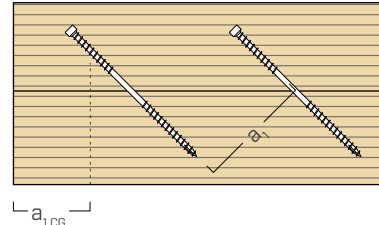
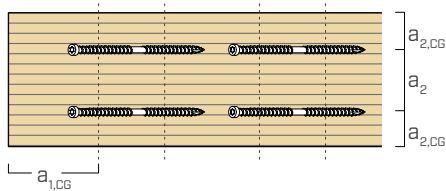
- Check that the screw length is compatible with the size of the structural wooden element and that the tip does not stick out from the rafter.
- The number and placement of the fastenings depends on the geometry of the surfaces, the type of insulation and the loads acting on them.

MINIMUM DISTANCES FOR AXIAL STRESSES | TIMBER

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

d_1	[in]	0.28	0.36
	[mm]	7	9
a_1	[in]	$7 \cdot d$	$1 \frac{15}{16}$
a_2	[in]	$4 \cdot d$	$1 \frac{7}{16}$
$a_{1,CG}$	[in]	$10 \cdot d$	$3 \frac{1}{2}$
$a_{2,CG}$	[in]	$4 \cdot d$	$1 \frac{7}{16}$

d_1	[in]	0.28	0.36
	[mm]	7	9
a_1	[in]	$7 \cdot d$	$1 \frac{15}{16}$
a_2	[in]	$3 \cdot d$	$1 \frac{1}{16}$
$a_{1,CG}$	[in]	$7 \cdot d$	$2 \frac{1}{2}$
$a_{2,CG}$	[in]	$3 \cdot d$	$1 \frac{1}{16}$



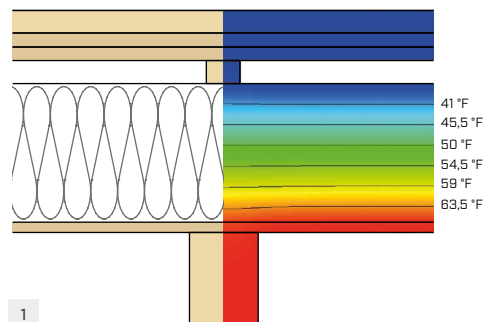
NOTES:

- The minimum spacing and distances comply with Table 9 of ESR-4645, where d refers to the nominal diameter of the screw.
- Wood member stresses must be checked in accordance with Section 11.1.2 and Appendix E of the NDS, and end distances, edge distances and fastener spacing may need to be increased accordingly.

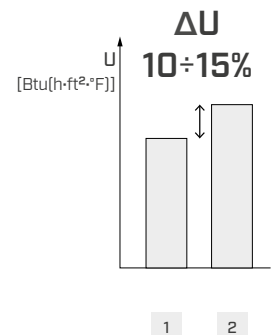
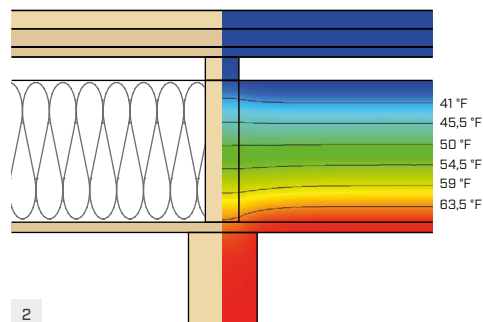
RESEARCH & DEVELOPMENT

INSULATION AND INFLUENCE OF THERMAL BRIDGES

CONTINUOUS INSULATION

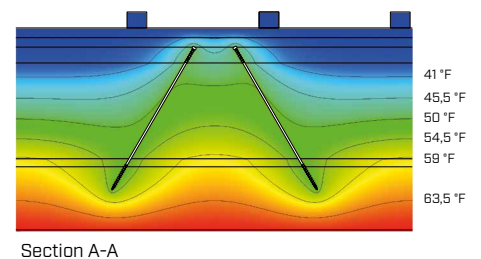
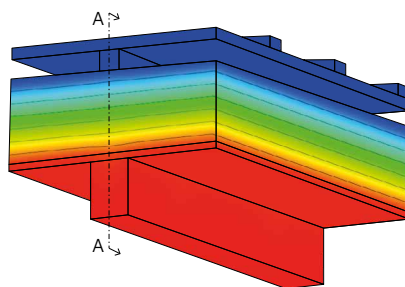
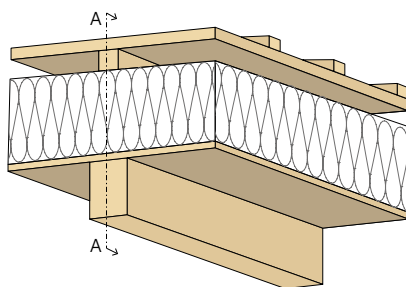


INTERRUPTED INSULATION



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



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 OF THE DGZ SCREWS RESISTANCE ON THE FAÇADE – SOFT INSULATION

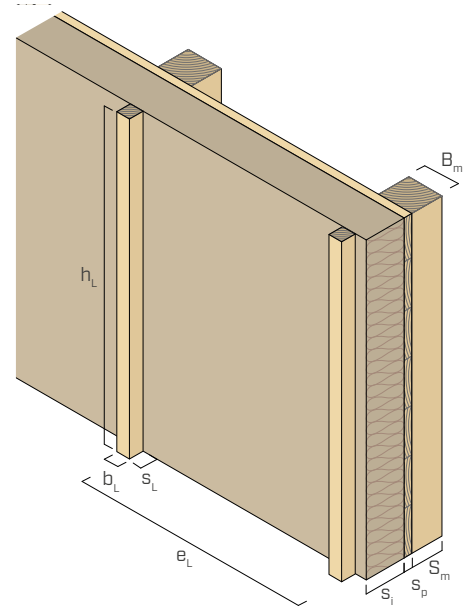
PROJECT DATA

FAÇADE LOADS

Dead load	D_L	24 lbs/ft ²
Total dead load on the batten	F_{DL}	320 lbs
Wind load	LL	21 lbs/ft ²
Total wind suction	F_{LL}	280 lbs

INSULATION PACKAGE FIGURES

Structural member	$B_m \times S_m$	3 1/2 in x 3 1/2 in
Sheathing	S_p	0.629 in
Thickness of the insulation	S_i	4 3/4 in
Compression resistance (SOFT)	σ (10%)	3.5 psi
Battens	$b_L \times s_L$	2 1/2 in x 1 1/2 in
Spacing between battens	e_L	15 15/16 in
Length of battens	h_L	10 ft



CONNECTOR SELECTION

HORIZONTAL SCREWS - DGZ Ø0.28

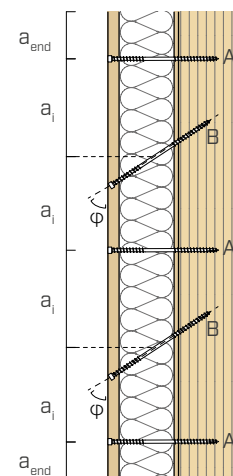
Thread diameter of the screw	d_1	0.28 in
Length of the screw	L	8 5/8 in

INCLINED SCREWS - DGZ Ø0.28

Thread diameter of the screw	d_1	0.28 in
Length of the screw	L	10 1/4 in
Angle to the vertical	ϕ	60°

DISTRIBUTION OF THE SCREWS

End distance	a_{end}	4 in
Spacing between connectors	a_i	18 11/16 in



NOTES:

- It is advised to place at least 2 perpendicular screws to withstand compression and/or tension forces. The screws can be located at the ends of the batten to install the inclined screws more easily. If more than 2 perpendicular screws are required, arrange the screws to create a truss layout (see picture).