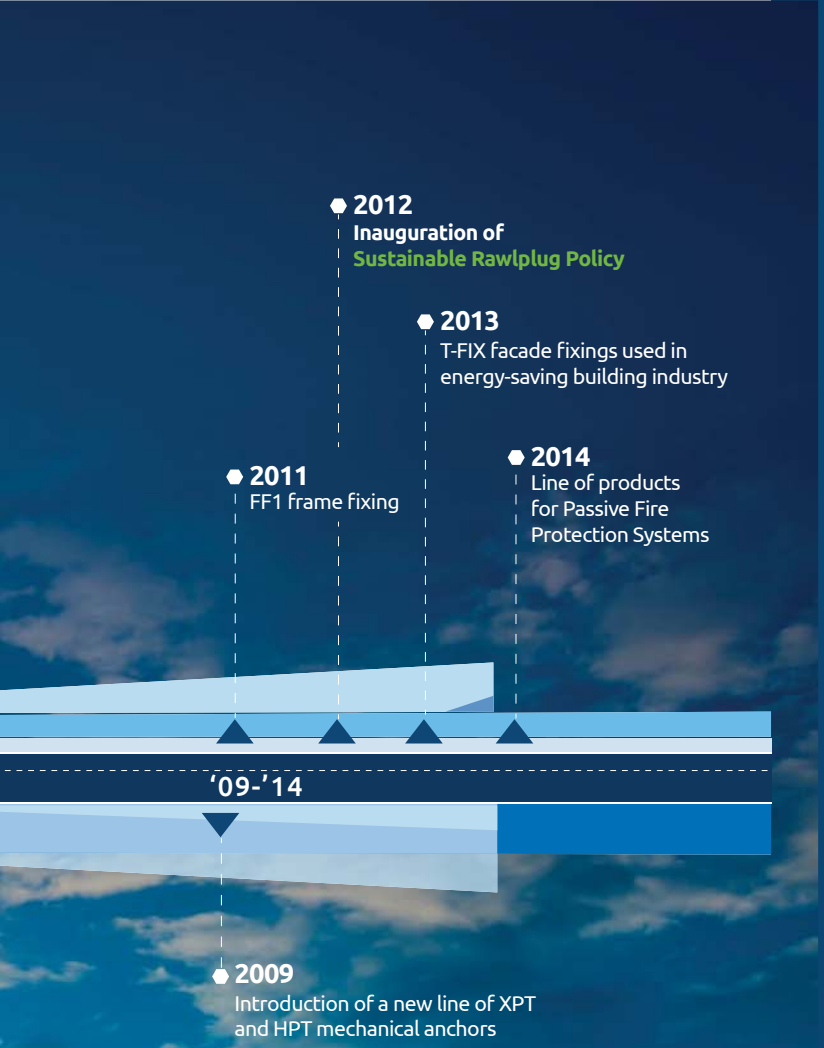
RAWLPLUG®

Roofing Insulation Fixings

Trust & Innovation


1887- 1897
RAWLINGS BROTHERS started out in London as a small firm of plumbers
1912
RAWLPLUG® Trademark registration
1919
Rawlings Brothers changed company name to THE RAWLPLUG COMPANY LTD
1948
The world's first metal anchor for drywall
1980's
Extension of the offer of Safety Plus and R-HPT mechanical anchors
1998
RAWLPLUG became first UK manufacturer with ETA
2007
Rawlplug Cartridge Free System
1887
1912-'20
'20-'50
'50-'80
'80-'07
1910
JOHN RAWLINGS invented the world's first expansion plug
1911
THE WORLD'S FIRST EXPANSION PLUG
Patent filed by Rawlings Brothers
1930's
Invention of the first ever mechanical anchor - RAWLBOLT®
1969
First production of expansion plastic plugs in GLASGOW factory
1993
First hammer-in fixing in Central Europe
2004
Debut on Warsaw Stock Exchange
2005
Uno® Plug no. 1 in UK



- Since 1911, when John Rawlings invented and filed an application to patent the world's first wall plug, the history of fixings has been inextricably linked with the RAWLPLUG® brand. Following the tremendous success of this revolutionary product in Europe, the RAWLPLUG company was founded in 1919 and quickly became renowned across the world for its innovative and reliable fixings.

  Over the years, a small family company became an international organisation whose power is reflected in **13 companies** on four continents, over **1.900 employees** and almost **30.000 lines**, making up our diverse range of products. The Group's present-day know-how is a synergy of knowledge and experience based on the best practices of its subsidiaries whose main activity is developing innovative solutions in the field of fixing technologies, including their **design, production and distribution.**

  Since it was founded, Rawlplug has placed great emphasis on the **quality and innovation** of its products, developing research centres in Glasgow, Wroclaw and Lancut. R&D teams consisting of experienced engineers, in the quest to find innovative solutions, design products intended for a wide range of substrates and applications. Pioneering Rawlplug solutions, imitated all over the world, have been defining the direction for the entire fixings industry for over 100 years.

- Nowadays Rawlplug's® products are used in construction, automotive, machine and electro-machine, mining, shipyard, road, timber and power industries, including around 30.000 product listings divided into 3 key groups:

  Fixings & Anchors

  Thermal insulation fixings for facades and roofs, self- drilling screws, lightweight & domestic fixings, frame fixings, medium & heavy-duty anchors, resin-bonded anchors and many others.

  Fasteners

  DIN bolts, nuts & washers, special bolts and many others (including bespoke solutions).

  Tools

  Hand & power tools, power tool accessories (drills, saws, chisels, etc.) and direct fastening systems.

Today Rawlplug continues in its fine tradition of innovation through constant research and development of technologies and processes that minimise the company's impact on the natural environment, making sustainable development one of the pillars of its existence.

Sustainable Rawlplug:

- employs a strategy of successful management and ethical business practices;
- builds long-lasting relationships based on common respect and trust with customers, suppliers and business partners thanks to an effectively designed and operated supply chain;
- cares for its employees and provides help and support to develop local communities;
- is concerned for the natural environment, focusing on areas involving production processes, employee education and cooperation with experts in the field of waste management.

Thanks to its constant emphasis on innovative solutions and customer care together with keen concern over sustainable development and environmental issues, RAWLPLUG'S® products continue to be acknowledged around the globe making them a world-class, first choice for the fixings industry.

Sustainable RAWLPLUG

Complete flat roof thermal insulation solutions

Rawlplug has been uniquely associated with innovations in the field of fixings for over 100 years. For more than 30 years our mission has been to design, manufacture and distribute fixings for flat roof insulation applications. Our company prides itself on recognizing the needs of contractors and manufacturers of these specialist systems by cooperating and continually developing new fastening technologies.

Amazon Logistics Center
Wrocław, Poznań/Poland.
Plastic sleeves GOK-PLUS-N + WX

Hong Kong International Airport:
Hong Kong/China.
Plastic sleeves GOK + WX, WBT

photo: Wikipedia

Olympic park, Sochi
Sochi/Russia. Plastic sleeves GOK+WX+WBT

Thanks to decades of experience, our customer-orientated approach, quality products and client relationships built on trust, RAWLPLUG® are proud to have supplied roofing insulation solutions for use on many high-profile projects, including:

PFI Community Schools Project
Coventry, United Kingdom. Plastic Sleeve GOK + WBT, GOK75 + WW

Bonarka Shopping Center
Krakow, Poland. Plastic Sleeve GOK + WX, WBT

Prologis
Czech, Slovakia. Hungary. Polsand.
Plastic Sleeve GOK + WX

Tesco Poland
Poland. Plastic Sleeve GOK + WX, WBT

King Cros Shopping Center
Poznan, Poland. Plastic Sleeve GOK + WX

Volkswagen Manufacturing Facility
Poznań. Plastic Sleeve GOK + WX

Panorama Retail /Entertainment Center.
Wilno, Lithuania. Plastic Sleeve GOK + WX, WBT

Olympic Training Center for Equestrian Sports
Minsk, Belarus. Plastic Sleeve GOK + WX

Baths of Maltese
Poznan, Poland. Plastic Sleeve GOK+WO.

Cardiff Bay Ice Arena
Cardiff, United Kingdom. Plastic Sleeve GOK+WBT.

And many more...

RAWLPLUG®
Trust & Innovation. Since 1919.

Contents

Fixing Assortment

	ROOFING SCREWS:	WBT	WCS	WB	WO	WX	WX-A4	WX-5.8	WW
TELESCOPIC TUBES & WASHERS	GOK	✓	-	-	✓	✓	✓	✓	✓
	GOK-PLUS	✓	-	-	✓	✓	✓	✓	✓
	GOK-75	✓	-	-	✓	✓	✓	✓	✓
	GOW	✓	-	-	✓	✓	✓	✓	✓
	GOW-PLUS	✓	-	-	✓	✓	✓	✓	✓
	POK-041	✓	✓	✓	✓	✓	✓	✓	✓
	POW-05	-	-	✓	✓	✓	✓	✓	✓
	POW-07	✓	✓	✓	✓	✓	✓	✓	✓
SIZE	SCREW LENGTH [mm]	50-300	28-230	80-220	60-300	50-300	50-100	40-300	20-120
	SCREW THREAD DIAMETER [mm]	6.1	6.3	4.8	4.8	4.8	4.8	5.8	5.0
	TELESCOPIC RANGE [mm]	15-725	-	-	15-725	15-725	15-725	15-725	15-725
BASE MATERIALS	CONCRETE	✓	✓	-	WO +K08L	-	-	-	-
	THIN-WALLED CONCRETE SLABS	✓	✓	-	-	-	-	-	-
	STEEL	-	-	✓	✓	✓	✓	✓	-
	TIMBER	✓	-	-	✓	-	-	✓	✓
	ORIENTED STRAND BOARD	-	-	-	✓	-	-	✓	✓
	PLYWOOD	-	-	-	-	-	-	-	✓
APPROVALS		✓	✓	✓	✓	✓	-	-	✓
	CE	✓	✓	✓	✓	✓	-	-	✓

Overview of our range

ROOFING INSULATION FASTENERS			
TELESCOPIC SYSTEM		**RIGID SYSTEM**	
Telescopic system of fixing for flat roofs enables the fixing to change shape together with the substrate, This type of fixing prevents flat roof hydroinsulation and thermal insulation from damage.		Rigid system with washers for hard roof insulations is dedicated to fixings where application of flexible fitting of insulation layers is not necessary.	
PLATE TYPE			
Round	Oval	Round	Oval
			
FEATURES AND BENEFITS:			
▪ Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures. ▪ Internal sleeve design allows pre-assembly with screws. ▪ Optimized cone shape to end of fastener for fast installation. ▪ Multiple combinations allow applications to all types of substrate.		▪ Washers produced with ALUZINC coating for corrosion resistance. ▪ Washers with different profiles adapted for specific applications.	
ROOFING PRODUCTS AVAILABLE:			
GOK, GOK-PLUS	GOW, GOW-PLUS	POK	POW
RECOMMENDED SCREW:			
WBT, WX, WO, WW		WCS, WBT, WX, WO, WW	

Quality and control.

Rawlplug products are subject to stringent quality control measures throughout all stages of production. Tests are carried out against well-established criteria aligned with international quality standards, ensuring our customers receive quality on a consistent basis.

Much of our testing is carried out by independent laboratories and approval bodies across Europe, ensuring unbiased assessment of characteristics such as:

- Performance under static/dynamic loading
- Installation & torque requirements
- Corrosion resistance / Quality of surface coatings
- Chemical composition of materials
- Effects of ageing of plastics
- Impact resistance

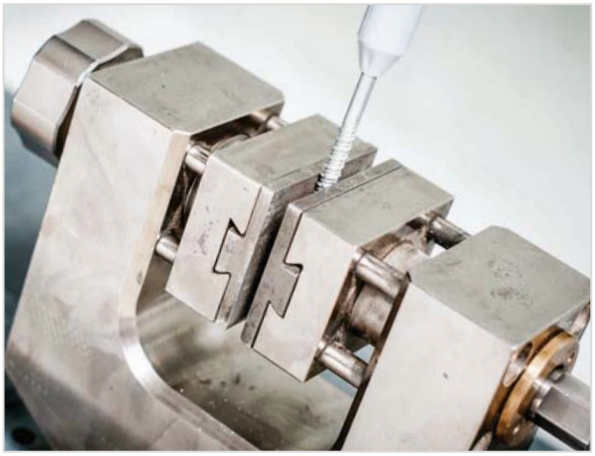
By specifying RAWLPLUG fixings for your roofing insulation project, you can expect to benefit from the highest quality products, backed up by years of experience and accumulated technical knowledge. Our fixing solutions have been developed over the years through close cooperation with roofing systems manufacturers. This, paired with our understanding of the needs of contractors, has helped us to become an industry leader in the European market.

Introduction

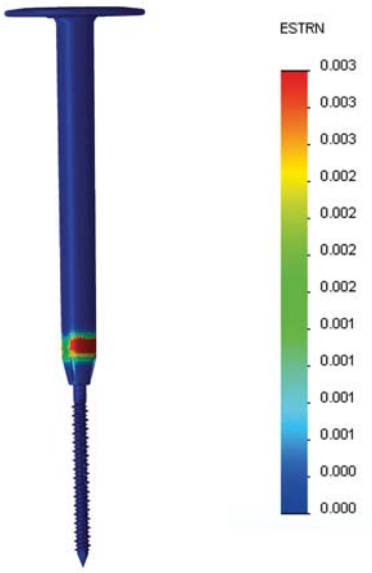
Why choose Rawlplug?

First-class design and market-leading quality. Specially formulated materials. Resistance to high loads and dynamic environmental factors. Time-efficient self-drilling screws. Solutions for a huge array of roofing applications (with insulation thickness up to 990mm). These are reasons to choose Rawlplug roofing insulation fixings.

Our telescopic sleeve connectors (the GOK and GOW ranges) have been specially designed to deliver two major functional benefits. Their form allows primarily for a degree of compression at the insulation surface, eliminating leaks by ensuring separation between the waterproof membrane and the head of the screw. At the same time, the form of the product acts to minimise thermal bridging through the insulation layer.



Stress analysis under tensile loading (GOK telescopic sleeve with WBT screw)



Our policies of rigorous testing and continuous improvement make Rawlplug roofing fixings thoroughly reliable solutions for any roofing insulation or waterproofing project.

Corrosion & coatings

Anti-corrosion protection in Rawlplug fixings

Environment is the major factor determining the durability of fixings throughout their working life. RAWLPLUG roofing screws are manufactured from high quality hardened carbon steel, ensuring maintenance of their static and dynamic security. Condensation present in roofing insulation panels causes steel connectors to be exposed to moisture, which can lead to accelerated corrosion.

RAWLPLUG roofing screws benefit from an innovative, multi-layer anti-corrosion system. This advanced coating technology, sealed on the external surface by a special organic layer, is subjected to one of the most challenging industry standards in accelerated corrosion assessment - Kesternich testing. This is a very aggressive test method, in which connectors are subjected to the action of sulphur dioxide (SO_2). The test is conducted in a closed chamber with high humidity, acidic conditions followed by drying, thus replicating cyclic exposure to acid rain.

European industry standards require, among other things, corrosion resistance of 15 Kesternich cycles for all roofing screws - a requirement met by RAWLPLUG products. Particular attention should be paid during the selection of any fixing to its anti-corrosion protection, an important consideration for all applications. Specific guidelines can be found in the European standard EN ISO 12944-2.

There are two basic types of corrosion - atmospheric and galvanic.

Galvanic corrosion always occurs at the junction of two different materials. The galvanic link creates then, which causes deterioration of one of the elements.

The following table shows the various listings of the found metals in the construction connections as the materials of the connectors and the base as well as directions of the expected outbreak of corrosion:

- in the first column of the table the types of metal of the attached element are provided
- in the header row of the table the types of metal of attachment (connector) is provided

Metal of the connector ➤ / Metal of the attached element ▼	Stainless steel	Galvanized zinc steel	Zinc coated steel	Low carbon steel	Lead	Brass
Stainless steel	■	⬆	⬆	⬆	⬆	⬆
Galvanized zinc steel	⬅	■	■	■	⬅	⬅
Zinc coated steel	⬅	■	■	■	■	⬅
Low carbon steel	⬅	⬆	⬆	⬆	■	⬅
Aluminium alloys	⬅	⬆	⬆	⬆	■	■
Zinc alloys	⬅	■	■	■	⬅	⬅

■ Contact between the two metals is possible ⬆ Metal of the connector is attacked ⬅ Metal of the attached element is attached

Notes:

- Metal of the attached element is not prone to galvanic corrosion and actually uses galvanic protection phenomenon (low, when the electrochemical potential difference is small, and higher with the increased potential difference).
- The galvanic effect is influenced by the size of the surface area of these two metals:

- if the surface of the substrate of the material (steel sheet or structure) is smaller, corrosion is accelerated;
- if the surface of the substrate of the material is larger, corrosion is slower.

This effect is much more prominent if the difference in potential between the two surfaces is greater.

Corrosion & coatings/ Fixings theory

Atmospheric corrosion is an action of the air and its compounds on metal. It occurs always, and its speed depends on the concentrations of chemical compounds and air humidity.

In accordance with ISO 21207: 2004 (table 1) there are different classes of atmospheric corrosion depending on the location, but the phenomenon can also occur in other conditions. Therefore, it is important to define working conditions of the designed connectors and used materials to ensure the correct operation of the facility.

RAWLPLUG company applies, to protect their products against atmospheric corrosion, in addition to the standard methods as galvanic galvanized, other, more effective methods. These include traditional methods such as hot-dip galvanized or stainless steel materials of which the products are made. Modern protective coatings are also used, e.g. Deltatone (a type of ceramic coating) or Zinc flake.

Classification of atmospheric corrosion. Categories	Common examples of corrosion		Recommended materials			
	In the open area	Inside the premises	Galvanised	Zink flake	A2	A4
C1 Very poor	-	Inside the air conditioned buildings with clean atmosphere (such as shops, offices, hotels)	5-10 µm	■	■	■
C1 Poor	Atmosphere with low content of impurities and dry climate; predominantly rural areas	Unheated buildings with the possibility of condensation (e.g. warehouse)	5-10 µm	■	■	■
C3 Average	Urban and industrial atmosphere, average contaminated with SO2. Coastal areas; atmosphere with low salinity	Light industry with air humidity and pollution (food production, laundries, etc.)	40 µm	■	□	■
C4 High	Industrial and coastal areas; average salty atmosphere	Chemical plants, swimming pools, coastal shipping vessels, etc.	40 µm	□	-	■
C5-I/M Very high (atmospheric /marine)	Industrial areas with high air humidity and pollution with high corrosion aggressiveness /coastal areas, atmosphere with high salinity	Buildings and areas with condensation of humidity and large atmosphere contamination	40 µm	□	-	■

■ Recommended use □ Possible recommendation, recommended consultation with a technical advisor - Non-recommended use

Fixings theory & technical guidance

Single or multi-layer waterproofing membranes (hot applied, self-adhesive, PVC, TPO, EPDM and other types) can be applied to flat roofs by using Rawlplug's special connector systems. Thermal insulation can also be applied as part of the system in many applications.

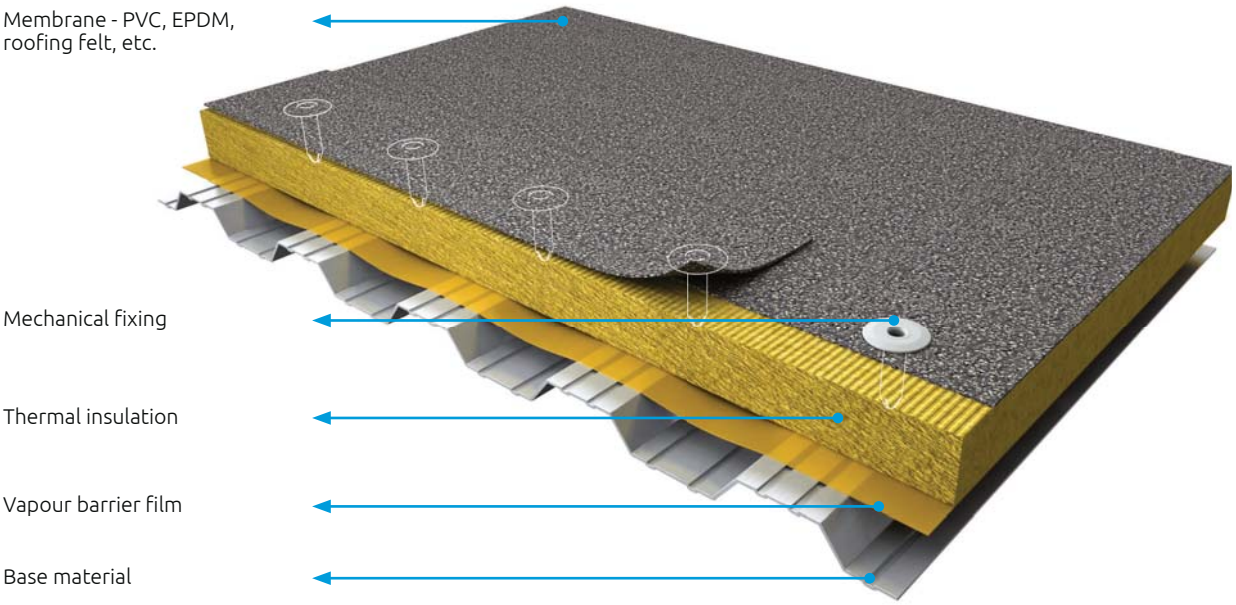
During design of anchorages, take care to consider and identify the failure mode giving the lowest load bearing capacity.

Possible failure modes include:
- Failure of the base material (pull-out from substrate)
- Failure of the metal connector (screw)
- Failure of the insulation retainer material(plastic sleeve or metal washer)
- Pull-through of the screw head through the body of insulation retainer

To ensure optimum anchorage design, consider carefully:
- The base material (characteristics and strength)
- The required quantity of fixing points for satisfactory load bearing capacity (dependent on roof area)
- Correct assembly of the overall system, taking particular care in the arrangement of membrane layers at fixing locations (see following sections)

Fixings theory & technical guidance

Layers of a typical roofing insulation system



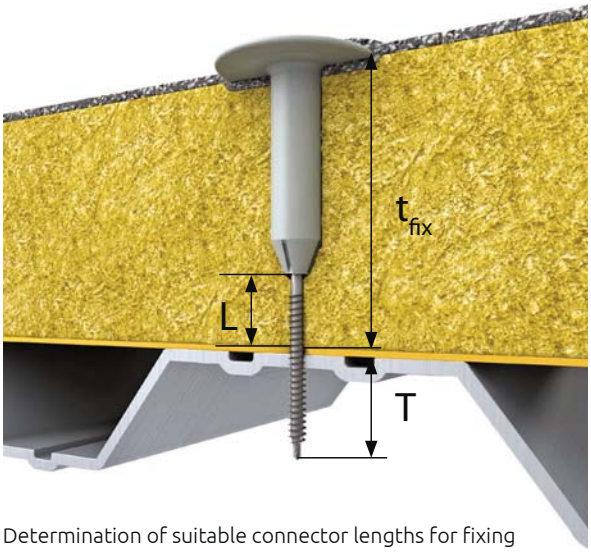
Fixing to steel profiles

When fixing to steel sheeting (in many cases trapezoidal profiles), the designer must ensure that the minimum steel thickness of 0.7mm is satisfied. Screws must also always be installed into the upper steel profile, where several exist.

When considering the overall system design, note that any two fixings with an axial spacing of less than 120mm (in the same sheet) must be treated as a single connection.

To ensure correct load distribution, fixings must be arranged in lines that follow the direction of the steel profile form.

Also note that in cases where a rigid fixing system is used (e.g. screw with steel washer) the increased probability of 'thermal bridging' must be considered. Conduction of heat within the fixings and through the insulation layers can lead to condensation, which then may cause accumulation of moisture around the underlying steel structures.



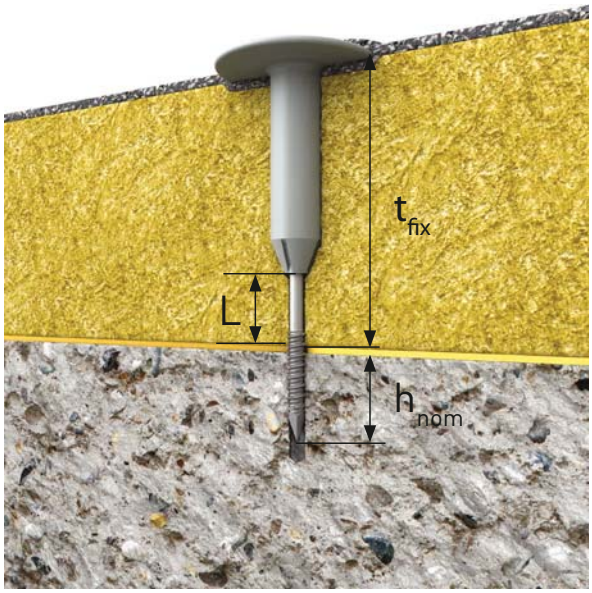
Determination of suitable connector lengths for fixing in steel profiles:

- Total length (assembled sleeve + screw) = min. t_{fix}+30-35mm
- L = min. 15mm or 10% isolation thickness
- T = min. 15-20mm

Fixings theory & technical guidance

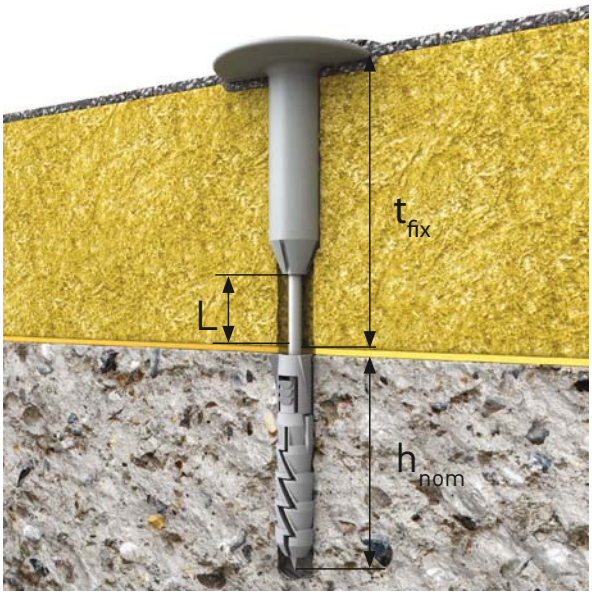
Fixing to concrete

The critical requirement when fixing in to concrete as a base material is to achieve the correct depth of anchorage (also known as embedment or installation depth). Follow installation data provided to ensure adequate hole depth, thus avoiding 'bottoming out' on any debris in the hole.
Consider carefully the base material, its characteristics and its strength parameters.



Determination of suitable connector lengths for fixing in concrete:
- Total length (assembled sleeve + screw) = min. t_{fix}+35-45mm
- L = min. 15mm
- h_{nom} = min. 20/30mm (see data tables)

In some circumstances it may be desirable to install into concrete using an additional expansion plug. This forms a particularly sturdy anchorage in concrete.



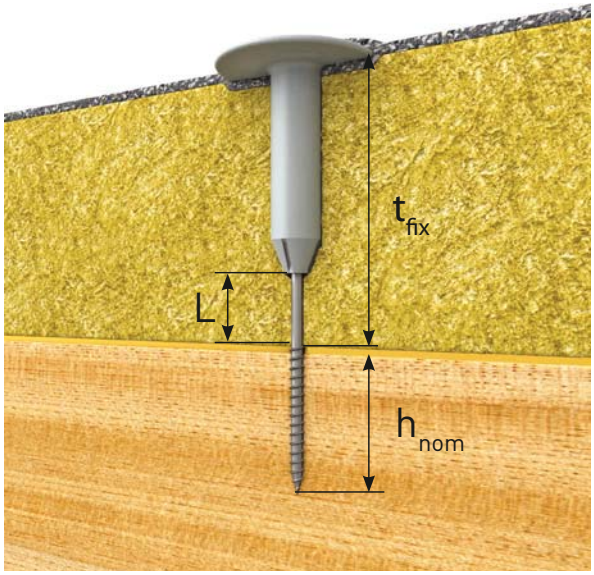
Determination of suitable connector lengths for fixing in concrete with an expansion plug:
- Total length (assembled sleeve + screw + plug) = min. t_{fix}+55mm
- L = min. 15mm
- h_{nom} = min. 40mm

Fixing to timber

Timber roofing structures can comprise many localised variations (joints, gaps and knots) in the material, which gives added importance to correct fixing practice. Wood can also be strongly affected by environmental factors such as heat and moisture, potentially affecting the load bearing capacity of each fixing.

To ensure correct load distribution, fixings must be arranged in lines that run perpendicular to the direction of the wood boards or timber beams. (If parallel alignment is unavoidable then joints between boards must be avoided.)

Minimum thicknesses of wooden substrates:
- Structural timber: 24mm
- OSB (Oriented Strand Board): 18mm
- Plywood: 20mm



Determination of suitable connector lengths for fixing in structural timber:
- Total length (assembled sleeve + screw) = min. t_{fix}+40mm
- L = min. 15mm
- h_{nom} = min. 24mm (OSB & Plywood differ)

Fixings theory & technical guidance

Unidentified base materials

In cases where the substrate (or its general parameters) are unknown, we recommend that you contact our Technical Advisory Service.

Our team of advisors can provide guidance or, when necessary, arrange for an engineer to conduct an on-site assessment whereby tensile pull-out tests can be conducted. This is the best way to verify the conditions, enabling a secure anchorage to be designed utilising the most suitable fixing products for the application.

Rawlplug Technical Advisory Service:
rawltech@rawlplug.co.uk

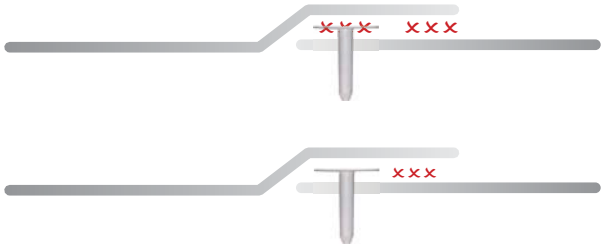
Fixing techniques for waterproofing

When laying waterproofing membranes as part of a flat roofing system, sheets are commonly overlapped to achieve a watertight finish. Laps can be torched (bituminous membranes), hot air welded (plastic membranes), or sealed with an adhesive.

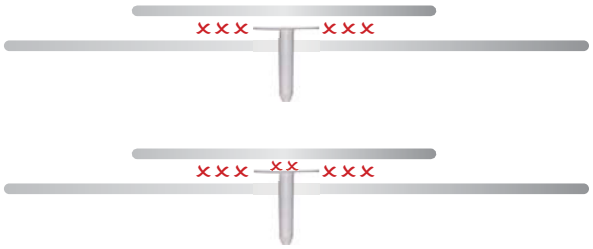
However, in mechanically fixed systems consideration must be given to the arrangement of the membranes to ensure a watertight finish.

Here we look at some of the options, showing the membranes, the connector and the area(s) of sealing.

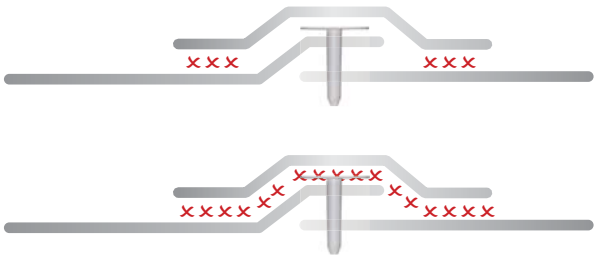
1. Fixings integrated into laps.
   Linear arrangement of fixings along the edge of lower membrane, covered within lap and sealed.



2. Individual covered fixings away from membrane edges.
   Single fixings penetrating the centre of membrane sheets, covered with additional membrane material and sealed.

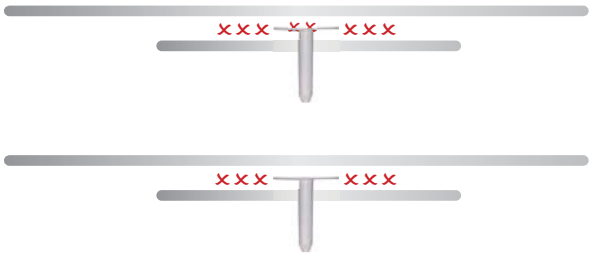


3. Covered fixings in the area of laps.
   Linear arrangement of fixings penetrating through lapped membranes, covered with additional membrane material and sealed.



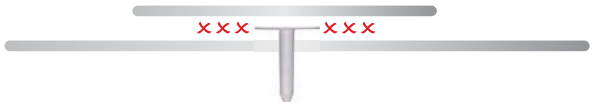
Fixings theory & technical guidance

4. Fixing on the underside of membrane.
   Fixings installed through patches or strips of waterproofing material, then covered under the main membrane sheet with sealing as shown.

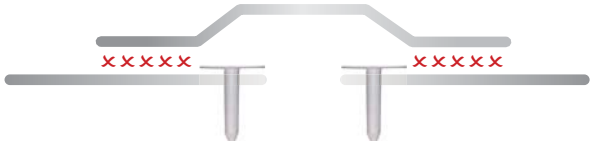


Key:
Lap seal/adhesive
Membranes
Figures according to ETAG 006

5. Linear fixing patterns away from membrane edges.
   Linear arrangement of fixings penetrating the centre of membrane sheets, covered with additional strips of material and sealed.



6. Covered fixings at membrane seams.
   Fixing of adjacent membrane sheets without overlap, covered by upper membrane strip and sealed.



Quality and durability

When it comes to reliable performance and durability, RAWLPLUG roofing fixings meet the various challenges that may be encountered.

Roof structures, particularly flat roofing systems, are exposed to dynamic and potentially damaging forces throughout their lifetime. All components of the roof may be subject to several of the following environmental factors:

- Wind / wind uplift - Positive and negative pressures acting on the roof
- Temperature - Heating and cooling leading to tensile forces during expansion
- Precipitation - Action of rainwater and snow leading to compression loading

All of the above challenges require proven methods and solutions to ensure a lasting, fit-for-purpose structure.

There are many case studies, throughout Europe and the rest of the World, where RAWLPLUG roofing fixings have been successfully put to use for both thermal and hydro-insulation projects. The quality, suitability and performance of our products are backed up by numerous approvals and certificates encompassing:

- Load bearing capacities
- Corrosion resistance (Kesternich testing - DIN 50018)
- Dynamic wind loading
- Consistent quality via process control and batch tracking

All our roofing insulation fixings are guaranteed by Allianz (the multinational insurance company), reflecting their quality as well as the professionalism and responsible practices of the RAWLPLUG Group companies.

Realisation of a successful application can be ensured by the following actions:

a) calculation of the optimum fixings quantity

A deficit of fixings can be dangerous due to wind suction forces as well as the additional work demands on roofing in changeable weather conditions. Conversely, a surplus may cause excessive perforation and, in the case of POK and POW aluminium washer solutions, extensive thermal bridging. The optimum quantity of fixings should be calculated according to wind standard EN 1991-1-4:2005 (Eurocode 1). When the calculation is not possible, the quantity can – after consultation with our technical department – be assumed, according to wind standard DIN 1055, as being:

- in corner areas – 9 pcs/m^2
- in edge areas – 6 pcs/m^2
- in middle area – 3 pcs/m^2

b) seeking recommendations for selection of installation equipment:

Please always contact our technical advisors regarding:

- screwdriver coupling settings
- selection of appropriate installation bits
- training in the use of appropriate installation tools by one of our technical advisors, who will pay you visit

Fixings theory & technical guidance

Installation tips

1. Fixings must always be installed perpendicular to the substrate surface.
2. Use of a driver with adjustable torque setting is strongly recommended.
3. Selection and installation of the fixings should be carried out based upon the requirements of the specific application..

Note that fixings of this nature cannot be adjusted after installation of the system, as this could damage the waterproof finish.

Insufficient tightening

Optimum installation

Overtightened

Application examples and product selection

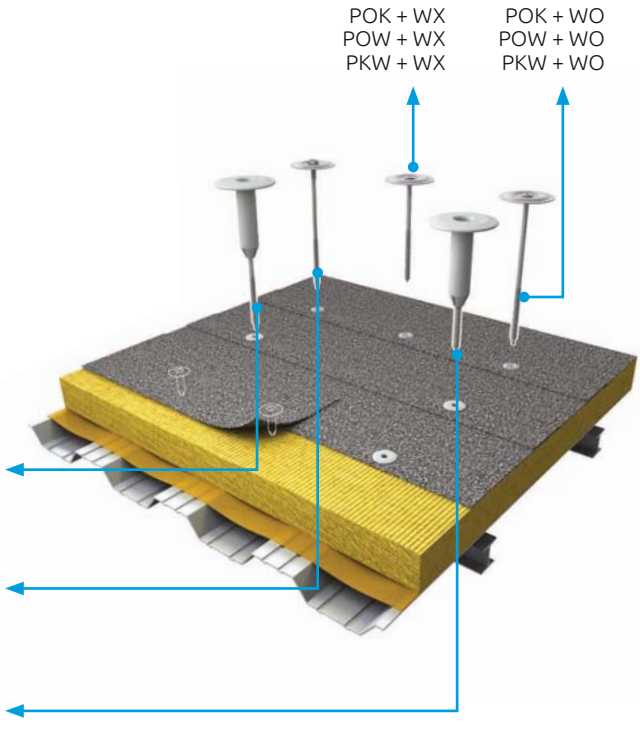
There are two main types of fixings that can be used in roofing insulation systems:

Telescopic
Plastic sleeves that allow for a degree of compression at the surface of the insulation (e.g. Rawlplug GOK or GOW ranges), combined with a screw suited to the base material.

Rigid
Metal washers such as the Rawlplug POK and POW ranges, again combined with the optimum screw for the base material.

The following illustrations show a number of common applications and the recommended Rawlplug fixing combinations in each case.

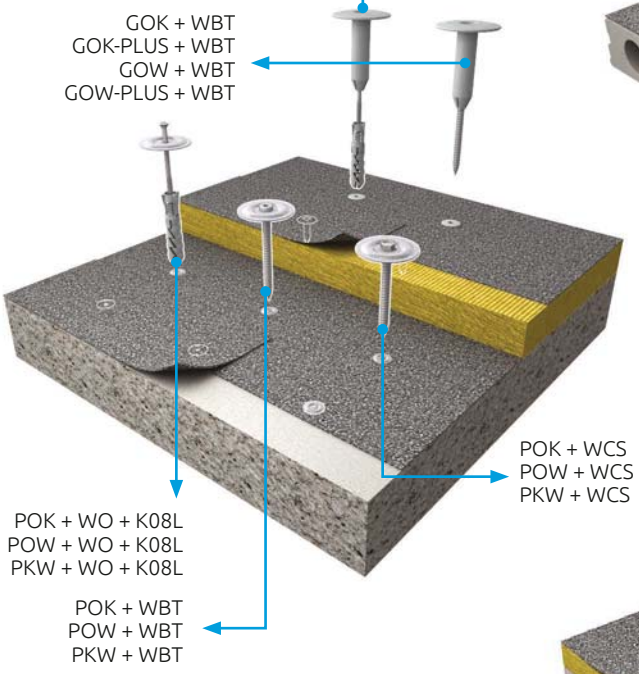
Fixing to steel profiles



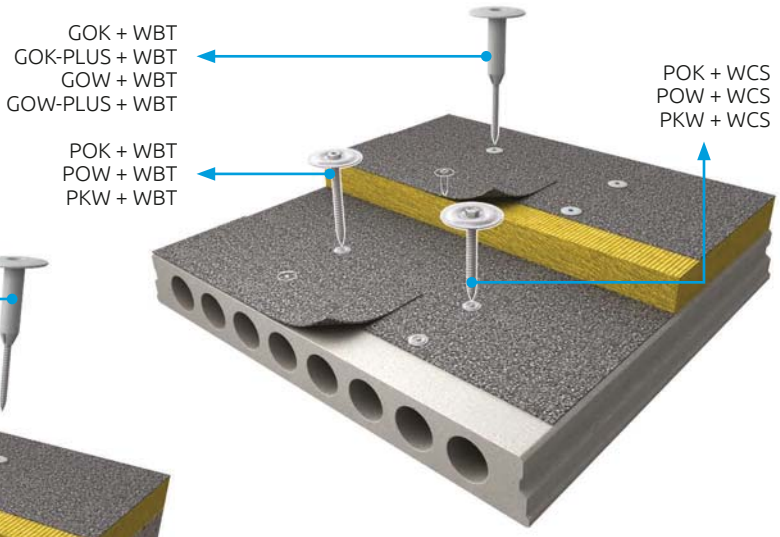
Fixings theory & technical guidance

Application examples and product selection (cont.)

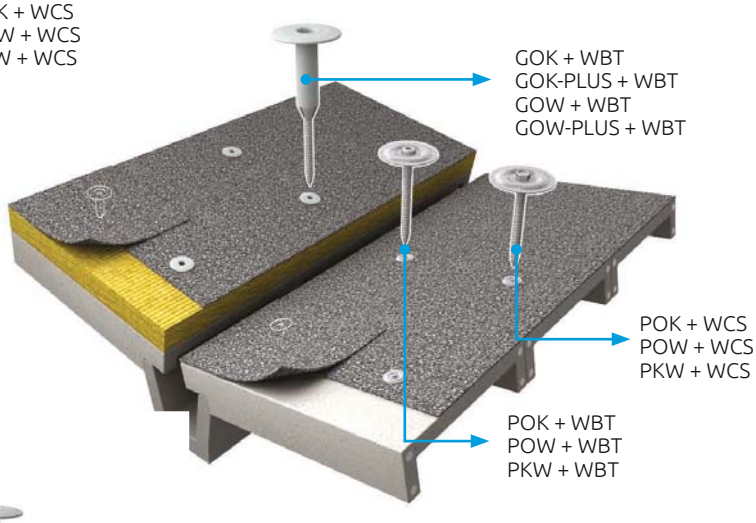
Fixing to concrete



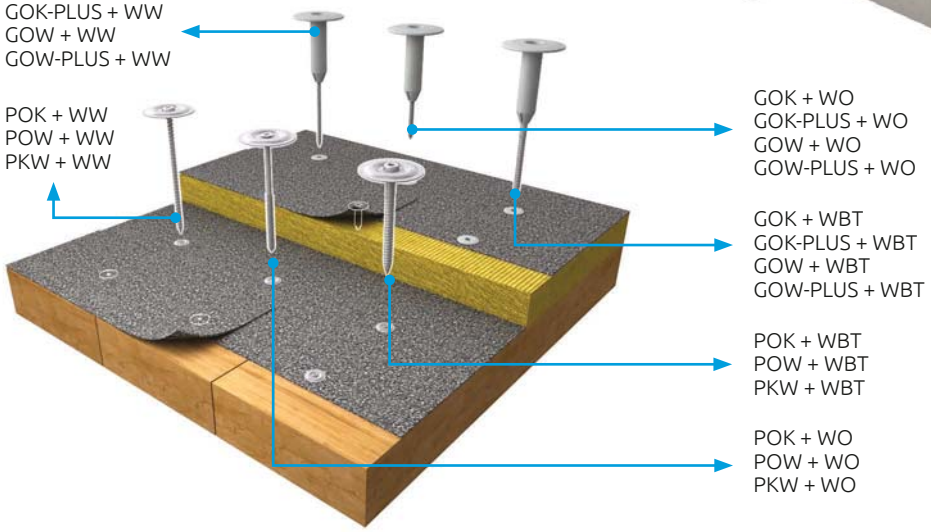
Fixing to hollow-core concrete slab



Fixing to thin-walled concrete slabs



Fixing to timber (or wooden material)



Wind loading & design calculations

Calculation of loading on roof structures

During the design of roofing structures all applicable forces must be calculated in accordance with the relevant standards. In the case of flat roofs wind and snow loading are particularly important, although snow loading does not have a direct effect on mechanical fixings. The critical factor for mechanically-fixed flat roof insulation systems is, therefore, wind loading.

For correct design and selection of fixing systems it is necessary to calculate all positive and negative pressures acting on areas of the roof due to wind. For this purpose the guidance in EN 1991-1-4 (Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions), as well as relevant National Annexes, may be applied.

Additionally, national wind maps and wind factor graphs can be found within the relevant National Annexes. A selection of these maps can be seen here in Figures 1-8.

Consideration factors for accurate calculation of total wind loading include:

- basic wind speed,
- initial value of the top dynamic pressure,
- aerodynamic pressure coefficients for roofs (internal and external),
- effectiveness of internal and external loads,
- load coefficient for wind load, theoretical wind load.

Fig. 1 - Simplified wind map for United Kingdom

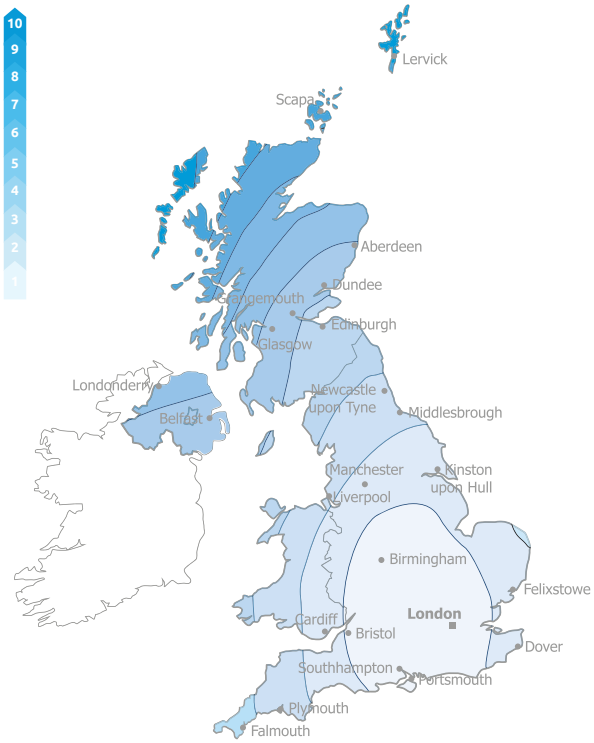
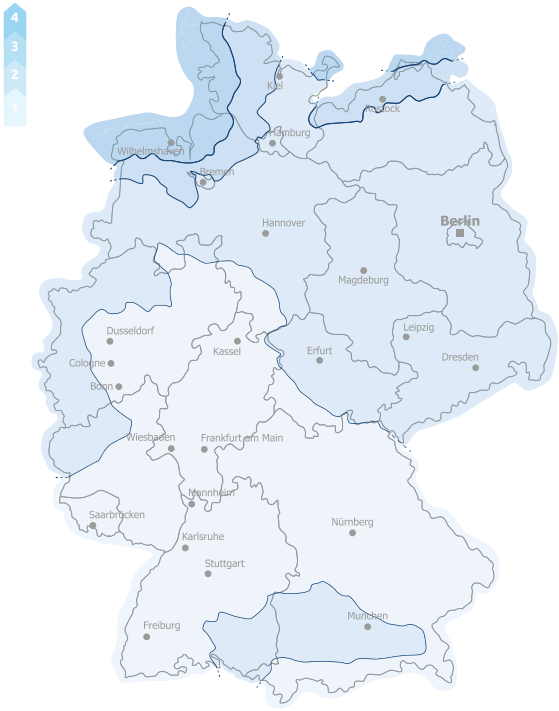


Fig. 2 - Simplified wind map for Poland

Fig. 3 - Simplified wind map for Germany



Wind loading & design calculations

Fig. 4 - Simplified wind map for Ireland

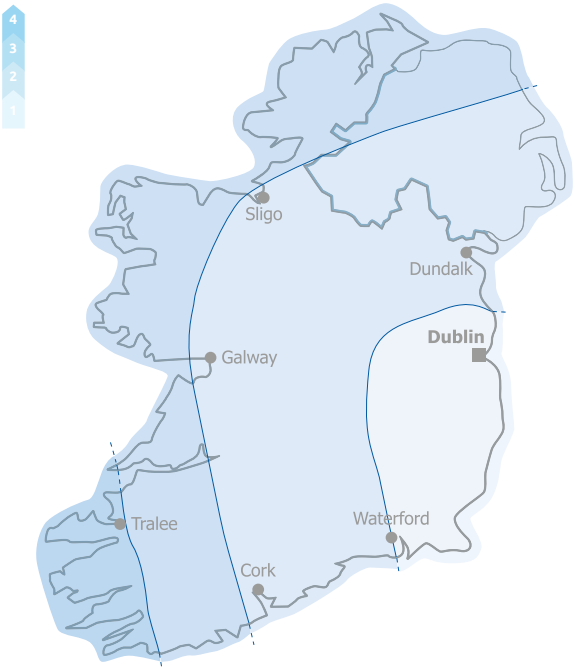


Fig. 5 - Simplified wind map for Sweden

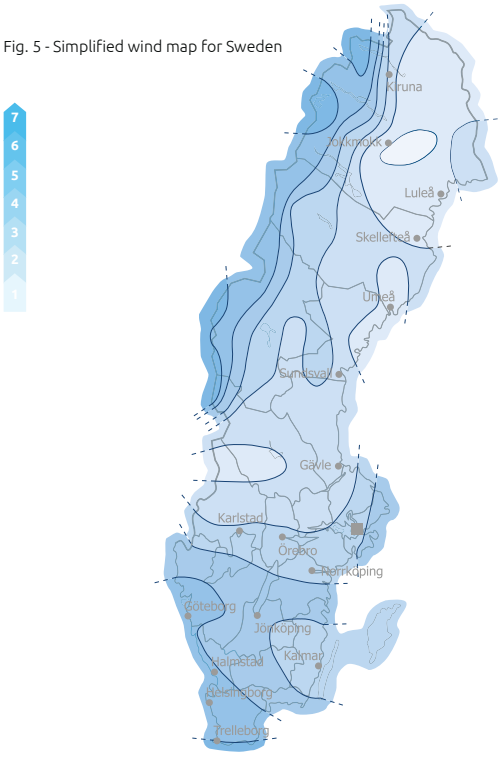


Fig. 6 - Simplified wind map for Denmark

Fig. 7 - Simplified wind map for the Czech Republic

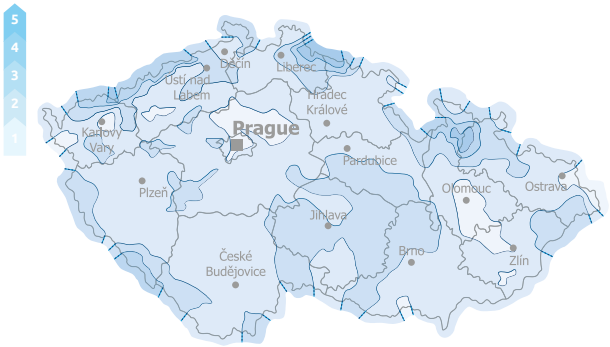
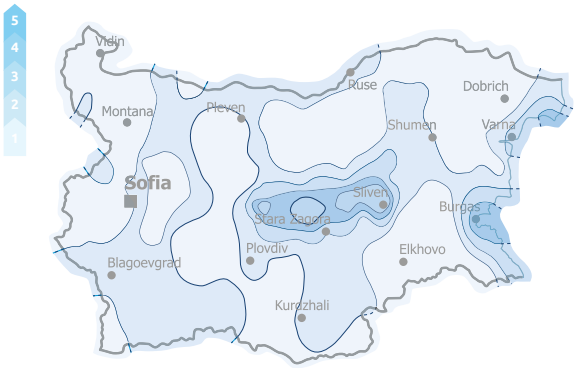


Fig. 8 - Simplified wind map for Bulgaria



Wind loading & design calculations

Basic wind velocity is the fundamental basic wind velocity modified to account for the direction of the wind being considered and the season.

Fundamental basic wind velocity is the 10 minute mean wind velocity with an annual risk of being exceeded of 0.02, irrespective of wind direction, at a height of 10m above flat open country terrain and accounting for altitude effects. This value may be found in the relevant National Annex to the Eurocode.

$$v_b = c_{dir} \times c_{season} \times V_{b,0} \text{ [m/s]}$$

where:
V_b – basic wind velocity, defined as a function of wind direction and time of year at 10m above the ground of terrain category II [m/s]
$V_{b,0}$ – fundamental value of the basic wind velocity [m/s] - See also Table 1 below
c_{dir} – the directional factor, may be given in the National Annex
c_{season} – the season factor, may be given in the National Annex.
For permanent structures the standard recommends that both factors cdir and cseason equal 1.0.

The mean wind velocity should be determined from the basic wind velocity vb and the height variation of the wind determined from the terrain roughness and orography.

$$v_m(z) = c_r(z) \times c_0(z) \times v_b \text{ [m/s]}$$

vm(z) - mean wind velocity at height z [m] above the terrain,
cr(z) - roughness factor
cO(z) - orography factor.

Terrain categories and terrain parameters are given in Table 2 below.

Table 1. Fundamental basic wind velocity and reference mean velocity pressure in zones

Zone	[m/s]		q_b [kN/m²]	
	A ≤ 300 m	A > 300 m	A ≤ 300 m	A > 300 m
1	22	22×[1+0.0006(A–300)]	0.30	0.30×[1+0.0006(A–300)]²
2	26	26	0.42	0.42
3	22	22×[1+0.0006(A–300)]	0.30	$0.30\times[1+0.0006(A-300)]\left[\frac{20\,000-A}{20\,000+A}\right]$

Note: A - height above sea level [m]

Table 2. Terrain categories and terrain parameters (according to EN 1991-1-4, Table 4.1)

	Terrain category	z_0 [m]	z_{min} [m]
0	Sea or coastal area exposed to the open sea	0.003	1
I	Lakes or flat and horizontal area with negligible vegetation and without obstacles	0.01	1
II	Area with low vegetation such as grass and isolated obstacles (trees, buildings) with separations of at least 20 obstacle heights	0.05	2
III	Area with regular cover of vegetation or buildings or with isolated obstacles with separations of maximum 20 obstacle heights (such as villages, suburban terrain, permanent forest)	0.3	5
IV	Area in which at least 15% of the surface is covered with buildings and their average height exceeds 15 m	1.0	10

Note: Terrain categories are illustrated in Annex A of EN 1991-1-4, Section A.1

Wind loading & design calculations

The roughness factor accounts for the variability of the mean wind velocity at the site of the structure due to the height above ground level and the roughness of the terrain upwind.

$$c_r(z) = k_r \times \ln\left(\frac{z}{z_0}\right) \quad \text{for} \quad z_{min} \le z \le z_{max}$$

$$c_r(z) = c_r(z_{min}) \quad \text{for} \quad z \le z_{min}$$

z_0 – the roughness length (see Table 2),
z_{min} – the minimum height defined in Table 2,
z_{max} – taken as 200m,
k_r – the terrain factor, calculated as follows:

$$k_r = 0.19 \times \left(\frac{z_0}{z_{0,II}}\right)^{0.07}$$

$z_{0,II}$ - 0.05m (terrain category II - see Table 2 for other values)

In accordance with the recommendations of the Eurocode and the relevant National Annexes, the terrain category should be assessed based on the roughness and distance with uniform roughness in a 30º angular sector around the wind direction. If there is a choice between two or more categories, then select the area with the lowest roughness length.

The standard orography factor cO should be taken as 1. However, in cases where the wind velocities are increased by more than 5% due to orography, then the factor can be determined by following the procedure in Annex A, Section 3 of the Eurocode and in the relevant National Annex.

EN 1991-1-4 also provides guidance for calculation of the influence of neighbouring structures. If the structure is more than twice the average height have of the neighbouring buildings, then the design of those nearby structures may be based on the peak velocity pressure at height zn (ze = zn) above ground:

$$z_n = \tfrac{1}{2}r \quad \text{for} \quad x \le r$$

$$z_n = \tfrac{1}{2}\left[r - \left(1 - \frac{2 \times h_{low}}{r}\right) \times (x - r)\right] \quad \text{for} \quad r < x < 2r$$

$$z_n = h_{low} \quad \text{for} \quad x \ge 2r$$

where:
$r = h_{high}$ if $h_{high} \le 2d_{large}$
$r = 2d_{large}$ if $h_{high} > 2d_{large}$
h_{low}, r, x, d_{small}, d_{large} – are defined in Figure 4

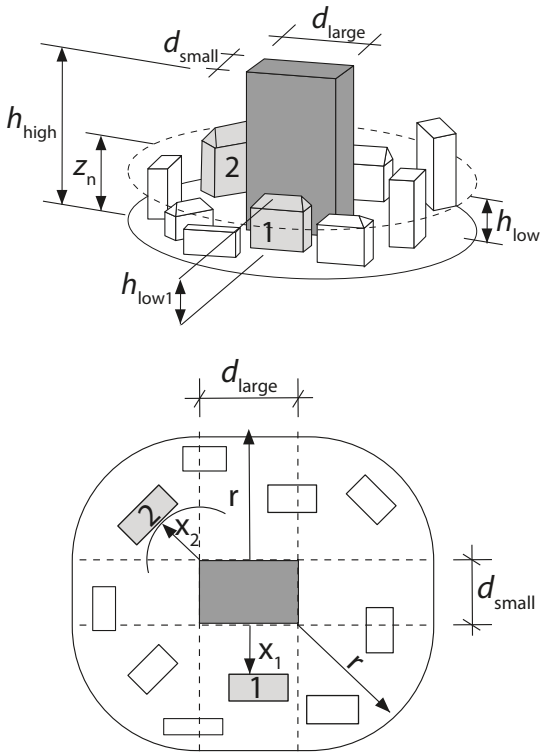


Figure 4. Influence of a high rise building on two neighbouring structures (based on EN 1991-1-4, Figure A.4)

In cases where $h_{low} > 0.5h_{high}$ increased wind velocities can be disregarded (i.e. $z_n = h_{low}$).

In special cases, wind tunnel testing may be requred.

Turbulence intensity $I_v(z)$ can be determined at height z using the following formula:

$$I_v(z) = \frac{\sigma_v}{v_m(z)} = \frac{k_l}{c_o(z) \times \ln(z/z_0)} \quad \text{for} \quad z_{min} \le z \le z_{max}$$

$$I_v(z) = I_v(z_{min}) \quad \text{for} \quad z \le z_{min}$$

k_l – the turbulence factor - recommended value is 1.0,
cO - the orography factor, described previously
z_0 – the roughness length, given in Table 2

Peak velocity pressure can be determined using:

$$q_p(z) = c_e(z) \times q_b$$

using the exposure factor ce(z) given in Table 3.

Wind loading & design calculations

Table 3. Roughness and exposure factors for each terrain category, with corresponding zmin and zmax

Terrain category	$c_r(z)$	$c_e(z)$	z_{min} [m]	z_{max} [m]
0	$1{,}3\left[\frac{z}{10}\right]^{0{,}11}$	$3{,}0\left[\frac{z}{10}\right]^{0{,}17}$	1	200
I	$1{,}2\left[\frac{z}{10}\right]^{0{,}13}$	$2{,}8\left[\frac{z}{10}\right]^{0{,}19}$	1	200
II	$1{,}0\left[\frac{z}{10}\right]^{0{,}17}$	$2{,}3\left[\frac{z}{10}\right]^{0{,}24}$	2	300
III	$0{,}8\left[\frac{z}{10}\right]^{0{,}19}$	$1{,}9\left[\frac{z}{10}\right]^{0{,}26}$	5	400
IV	$0{,}6\left[\frac{z}{10}\right]^{0{,}24}$	$1{,}5\left[\frac{z}{10}\right]^{0{,}29}$	10	500

Note: for a height z > zmax, cr(z) and c0(z) should be taken as for zmax

During determination of q_p calculations between different terrain roughness categories should be taken into account – if a structure with height h is situated closer than 30h from the beginning of a lower terrain category (than the one which directly surrounds the structure), then it should be assumed that structure sits within the lower terrain category.

The reference mean (basic) velocity pressure is calculated as follows:

$$q_b = ½ \times \rho \times v_b^2$$

ρ - air density, dependent on altitude, temperature and barometric pressure

Values for ρ may be taken from the relevant National Annex the recommended value is 1.25 kg/m³.

Determination of the wind loads and structural design should factor in both external and internal wind pressures.

In the case of multi-skin walls and roofs with an impermeable outer skin and an impermeable, more rigid inner skin, the wind force on the outer skin may be calculated from $c_{p,net} = c_{pe}$ (according to Section 7.2.10 of EN 1991-1-4).

The roof structure should be divided in to zones as shown in Figure 5, while the pressure coefficient cpe can be taken from Table 4. The reference height ze for roofs with curved or mansard eaves should be taken as equal to h. The reference height for roofs with parapets is defined in Figure 5.

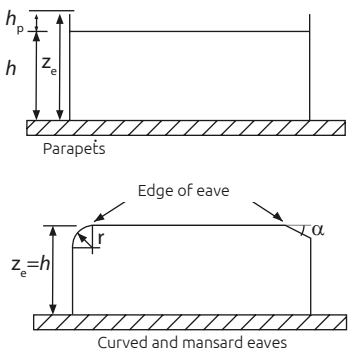
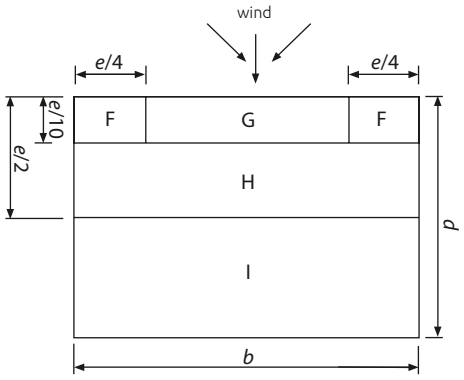


Figure 5. Flat roof definitions according to EN 1991-1-4, Figure 7.6



e = b or 2h (whichever is smaller)
b: crosswind dimension

Wind loading & design calculations

All parts of the structure subject to the influence of wind must be considered, unless there is no influence from a specific wind direction.

As a result, a number of wind load zones (generally three or four distinct zones, depending on the size and form of the building) can be defined:

- exposed zone (F)
- external edge zone (G)
- internal edge zone (H)
- inner zone (I)

These are illustrated in Figure 5.

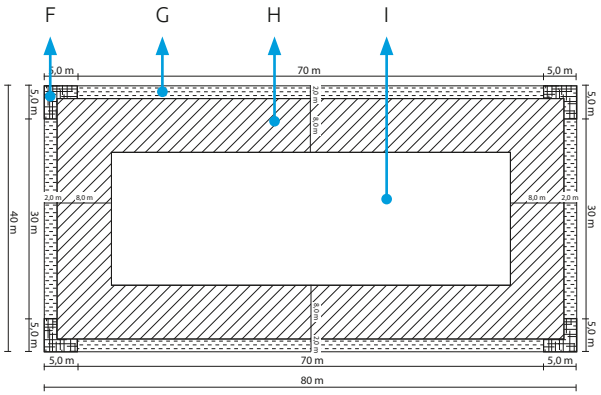


Figure 6. Example of flat roof zone designation

Table 4. External pressure coefficients for flat roofs (according to Table 7.2 of EN 1991-1-4)

Roof type		Zone							
		F		G		H		I	
		$c_{pe,10}$	$c_{pe,1}$	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,10}$	$c_{pe,1}$
Sharp eaves		−1,8	−2,5	−1,2	−2,0	−0,7	−1,2	+0,2	
								−0,2	
With parapets	$h_p/h = 0,025$	−1,6	−2,2	−1,1	−1,8	−0,7	−1,2	+0,2	
								−0,2	
	$h_p/h = 0,05$	−1,4	−2,0	−0,9	−1,6	−0,7	−1,2	+0,2	
								−0,2	
	$h_p/h = 0,10$	−1,2	−1,8	−0,8	−1,4	−0,7	−1,2	+0,2	
								−0,2	
Curved eaves	r/h = 0,05	−1,0	−1,5	−1,2	−1,8	−0,4		+0,2	
								−0,2	
	r/h = 0,10	−0,7	−1,2	−0,8	−1,4	−0,3		+0,2	
								−0,2	
	r/h = 0,20	−0,5	−0,8	−0,5	−0,8	−0,3		+0,2	
								−0,2	
Mansard eaves	α = 30°	−1,0	−1,5	−1,0	−1,5	−0,3		+0,2	
								−0,2	
	α = 45°	−1,2	−1,8	−1,3	−1,9	−0,4		+0,2	
								−0,2	
	α = 60°	−1,3	−1,9	−1,3	−1,9	−0,5		+0,2	
								−0,2	

NOTE 1 - For roofs with parapets or curved eaves, linear interpolation may be used for intermediate values of h_p/h and r/h

NOTE 2 - For roofs with mansard eaves linear interpolation may also be used between α = 30°, 45° and 60°. For α > 60° linear interpolation between the values for α = 60° and the values for flat roofs with sharp eaves may be used.

NOTE 3 - In Zone I, where positive and negative values are given, both values shall be considered.

NOTE 4 - For the mansard eave itself, the external pressure coefficients are given in EN 1991-1-4, Table 7.4a "External pressure coefficients for duopitch roofs: wind direction 0°", Zone F and G, depending on the pitch angle of the mansard eave.

NOTE 5 - For the curved eave itself, the external pressure coefficients are given by linear interpolation along the curve, between values on the wall and on the roof.

Wind loading & design calculations

The pressure acting on the external surfaces we can be calculated as follows:

$$w_e = q_p(z_e) \times c_{pe}$$

$q_p(z_e)$ – the peak velocity pressure
z_e – the reference height for the external pressure (see Figure 5)
c_{pe} – external pressure coefficient

The wind force fw acting on the structure may be determined by vectorial summation of the forces $F_{w,e}$, $F_{w,i}$ and F_{fr} calculated from the external and internal pressures, as well as the frictional forces resulting from the friction of the wind parallel to the external surfaces.
For external forces:

$$F_{w,e} = c_s c_d \times \sum_{surfaces} w_e \times A_{ref}$$

$c_s c_d$ - structural factor
w_e - external pressure
A_{ref} - reference area of the individual surface

The structural factor cscd is fully defined in Section 6 of EN 1991-1-4, but the following basic guidelines apply:

a) For buildings with a height less than 15m the value of cscd may be taken as 1.
b) For roof elements having a natural frequency greater than 5Hz, the value of cscd may be taken as 1.

Note: One example of b) would be glazing spans shorter than 3m.

Finally, by comparing the wind force Fw,e (derived from external pressure) for each part of the roof with the load bearing capacities of insulation fixings (stated in this product catalogue), it is possible to assess the suitability of each fixing for the specific roofing application.

ROOFIX Design Software

At RAWLPLUG we have used our extensive knowledge and experience to develop a powerful calculation tool for the convenience of our clients. Our "ROOFIX" design software allows the user to quickly and easily determine the type of fixings and the minimum quantity required for their roofing insulation application.

The programme is able to factor in many key parameters of the structure:
- Dimensions of the roof
- The base material
- The dimensions of the roofing system (e.g. insulating layers)

As well as geographical factors such as:
- Location
- Altitude
- Localised wind speeds

The following page gives a preview of the software and its intuitive user interface. If you would like to utilise this powerful tool on your project, contact us and our technical team will be happy to help.

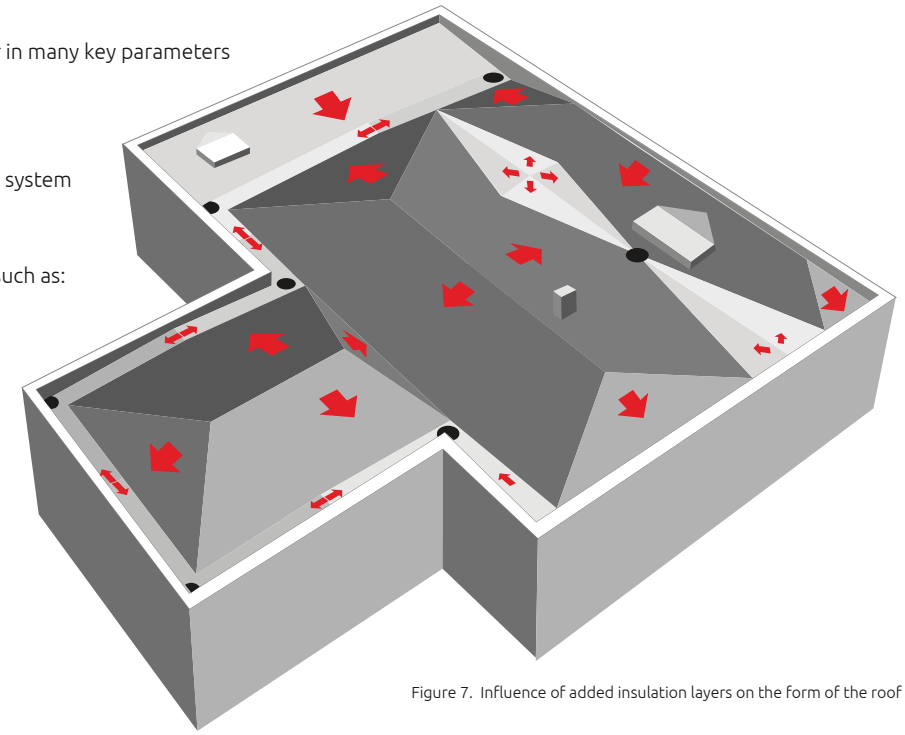
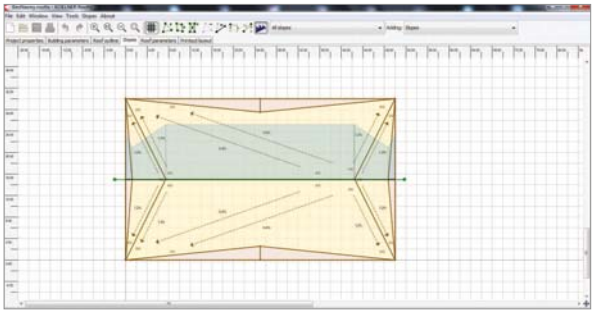
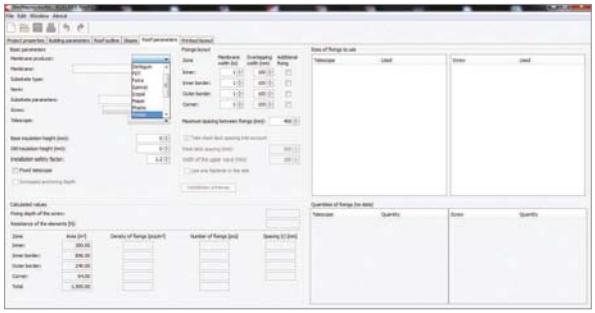
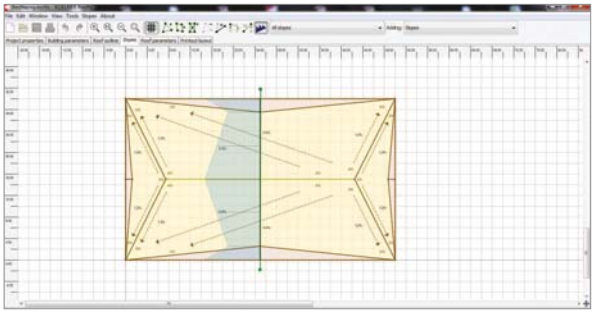


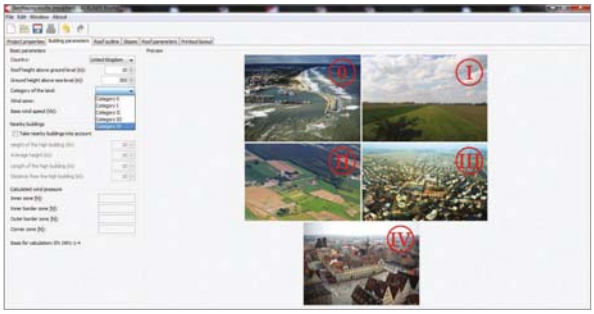
Figure 7. Influence of added insulation layers on the form of the roof

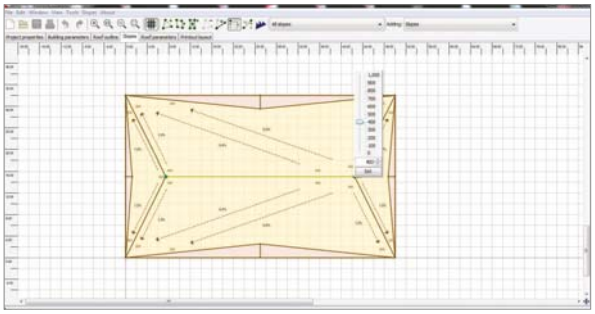
Wind loading & design calculations

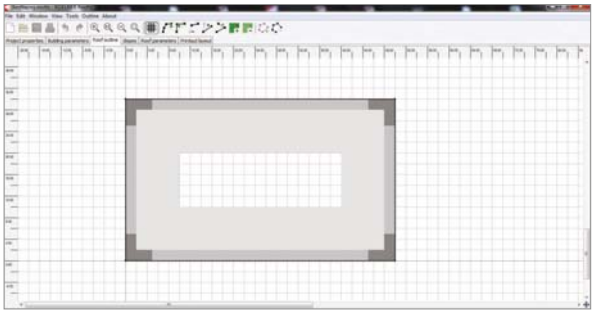


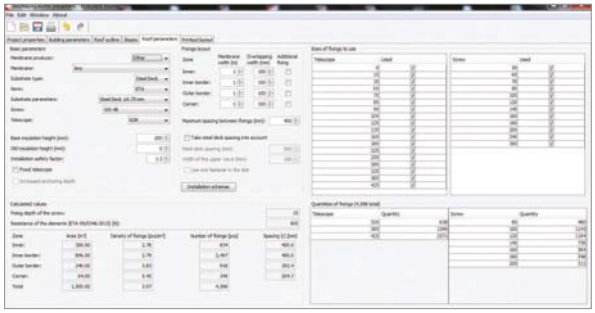


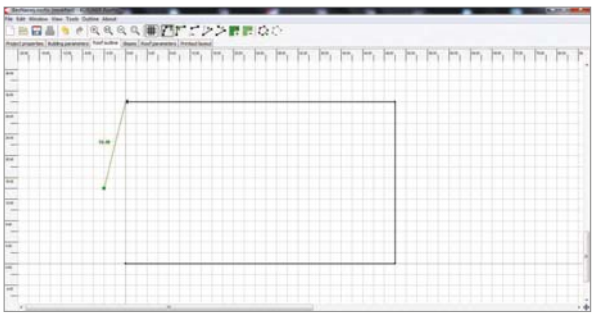












Product identification

Understanding Rawlplug product codes

GOK - 165 - N

Sleeve type:
GOK - circular head
GOW - oval head
GOK-PLUS - circular head with grip features
GOW-PLUS - oval head with grip features
GOK75 - 75mm diameter circular head

Sleeve length:
15mm - **725**mm

Material:
N: Nylon
Without "-N": Polypropylene

WX - 48T060 - ZN

Screw type:
WX, WX-A4, WB or **WO** for steel substrates
WBT or **WCS** for concrete
WW, WO or **WBT** for timber and wood

Screw thread diameter:
4.8 mm
5.0 mm
5.8 mm
6.1 mm
6.3 mm

Drive type:
T: Hexalobular drive (TX25)

Screw length:
50mm - **300**mm

Coating type:
ZN - galvanization
"without marking" - covering of Zinc Flake type
A4 - stainless steel

RAWLPLUG - Professional service

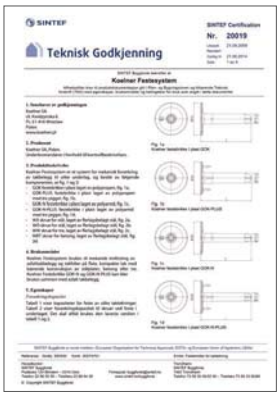
Products of high standard and quality

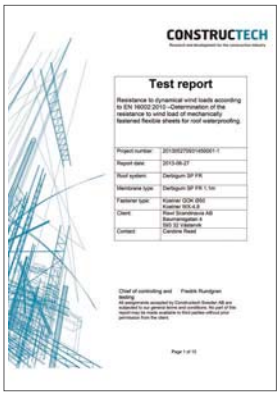
At Rawlplug we offer a full range of services and customer support, investing in the development of strong relationships with our clients. Furthermore, our sales team work to serve customers throughout Europe and beyond and we are committed to delivering solutions when and where they are required.

Our team of RAWLPLUG engineers are ready and equipped to provide direct professional support. This may be in the form of expert guidance in the selection of fixings or, when necessary, site testing may be carried out to establish load bearing capacities in specific applications.

With the collective knowledge and experience of our engineers, technical advisors and customer service team, RAWLPLUG are fully prepared to provide the guidance and support required for the success of any roofing insulation project.

Approvals and certification





PLASTIC SLEEVES

- GOK
- GOK-N
- GOK75
- GOK-PLUS
- GOK-PLUS-N
- GOW
- GOW-PLUS-N

High-quality material used for the production of telescopic fasteners, ensures constant mechanical properties for many years. Retains its properties over a wide temperature range.

Round plate eliminates the need for positioning during assembly, the bottom part of the connection sleeve is designed to carry very heavy loads during operation of the roof.

The combination of the connector together with the corresponding screw allows application to all types of substrates. Inner part of the sleeve is designed to allow pre-assembling fastener with the screw.

The lower part of the telescopic fastener was designed in the shape of a cone with an optimal angle of inclination which provides fast installation.

GOK, GOK-N

Telescopic sleeve with 50mm diameter head

Approvals and Reports

- ETA-09/0346

Versions:

- GOK - Polypropylene
- GOK-N - Nylon

Product information

Features and benefits

- Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures
- Circular plate requires no alignment
- Internal sleeve design allows pre-assembly with screws
- Optimized cone shape designed externally for fast installation and internally for highest loads
- Years of manufacturing experience confirmed by static and dynamic load tests carried out by the most renowned European Institutes ensures 100% safety in use

Applications

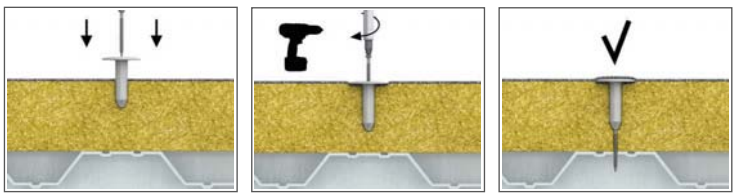
- Insulation layers to flat roofs

Base materials

Approved for use in:

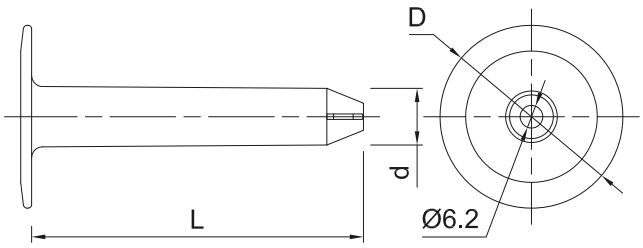
- Concrete
- Concrete Slab
- Metal Sheet & Profiles
- Timber
- Plywood
- Chipboard

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Plastic sleeve			Fixture
	Diameter	Length	Plate diameter	Min. thickness
	d	L	D	t_{fix}
	[mm]	[mm]	[mm]	[mm]
R-GOK-015/R-GOK-015-N	15.5	15	50	30
R-GOK-035/R-GOK-035-N	15.5	35	50	50
R-GOK-065/R-GOK-065-N	15.5	65	50	80
R-GOK-075/R-GOK-075-N	15.5	75	50	90
R-GOK-085/R-GOK-085-N	15.5	85	50	100
R-GOK-095/R-GOK-095-N	15.5	95	50	110
R-GOK-105/R-GOK-105-N	15.5	105	50	120
R-GOK-125/R-GOK-125-N	15.5	125	50	140
R-GOK-135/R-GOK-135-N	15.5	135	50	150
R-GOK-165/R-GOK-165-N	15.5	165	50	180
R-GOK-185/R-GOK-185-N	15.5	185	50	200
R-GOK-225/R-GOK-225-N	15.5	225	50	240
R-GOK-235/R-GOK-255-N	15.5	255	50	270
R-GOK-285/R-GOK-285-N	15.5	285	50	300
R-GOK-325/R-GOK-325-N	15.5	325	50	340
R-GOK-385/R-GOK-385-N	15.5	385	50	400
R-GOK-425/R-GOK-425-N	15.5	425	50	440
- / R-GOK-525-N	15.5	525	50	540
- / R-GOK-625-N	15.5	625	50	640
- / R-GOK-725 -N	15.5	725	50	740

Product commercial data

Product Code	Plastic sleeve		Quantity [pcs]		Weight [kg]		Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Box	Outer	
GOK							
R-GOK-015	15.5	15	1100	1100	3.2	3.2	5906675115993
R-GOK-035	15.5	35	600	600	4.5	4.5	5906675220246
R-GOK-065	15.5	65	400	400	4.3	4.3	5906675116006
R-GOK-075	15.5	75	300	300	3.3	3.3	5906675116013
R-GOK-085	15.5	85	300	300	3.3	3.3	5906675220444
R-GOK-095	15.5	95	250	250	3.4	3.4	5906675117874
R-GOK-105	15.5	105	250	250	2.8	2.8	5906675220543
R-GOK-125	15.5	125	200	200	3.1	3.1	5906675116020
R-GOK-135	15.5	135	200	200	3.5	3.5	5906675220642
R-GOK-165	15.5	165	150	150	3.2	3.2	5906675116037
R-GOK-185	15.5	185	100	100	1.40	1.40	5906675220840
R-GOK-225	15.5	225	100	100	1.91	1.91	5906675116044
R-GOK-255	15.5	255	75	75	1.91	1.91	5906675116051
R-GOK-285	15.5	285	75	75	1.91	1.91	5906675220048

Product commercial data (cont.)

Product Code	Plastic sleeve		Quantity [pcs]		Weight [kg]		Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Box	Outer	
R-GOK-325	15.5	325	50	50	2.0	2.0	5906675116068
R-GOK-385	15.5	385	50	50	2.0	2.0	5906675116075
R-GOK-425	15.5	425	50	50	2.3	2.3	5906675116082
GOK-N							
R-GOK-015-N	15.5	15	1100	1100	3.2	3.2	5906675006543
R-GOK-035-N	15.5	35	600	600	4.8	4.8	5906675006550
R-GOK-065-N	15.5	65	400	400	4.3	4.3	5906675006567
R-GOK-075-N	15.5	75	300	300	2.9	2.9	5906675006574
R-GOK-085-N	15.5	85	300	300	3.1	3.1	5906675006581
R-GOK-095-N	15.5	95	250	250	3.4	3.4	5906675006598
R-GOK-105-N	15.5	105	250	250	3.0	3.0	5906675006604
R-GOK-125-N	15.5	125	200	200	3.0	3.0	5906675006611
R-GOK-135-N	15.5	135	200	200	2.7	2.7	5906675006628
R-GOK-165-N	15.5	165	150	150	4.0	4.0	5906675006635
R-GOK-185-N	15.5	185	100	100	1.82	1.82	5906675006642
R-GOK-225-N	15.5	225	100	100	2.4	2.4	5906675006659
R-GOK-255-N	15.5	255	75	75	2.6	2.6	5906675006666
R-GOK-285-N	15.5	285	75	75	1.58	1.58	5906675006673
R-GOK-325-N	15.5	325	50	50	2.0	2.0	5906675006680
R-GOK-385-N	15.5	385	50	50	2.0	2.0	5906675006697
R-GOK-425-N	15.5	425	50	50	2.3	2.3	5906675006703
R-GOK-525-N	15.5	525	50	50	2.3	2.3	5906675113883
R-GOK-625-N	15.5	625	50	50	2.3	2.3	5906675113890
R-GOK-725-N	15.5	725	50	50	2.3	2.3	5906675113876

GOK75

Telescopic sleeve with 75mm diameter head

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures
- Circular plate requires no alignment
- Internal sleeve design allows pre-assembly with screws
- Optimized cone shape designed externally for fast installation and internally for highest loads
- Years of manufacturing experience confirmed by static and dynamic load tests carried out by the most renowned European Institutes ensures 100% safety in use

Applications

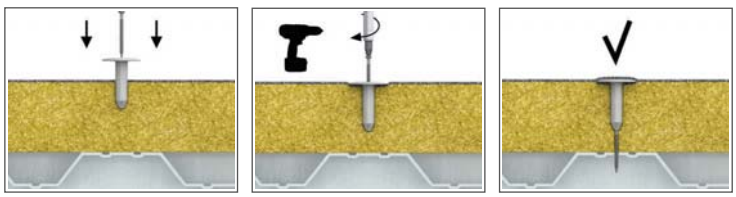
- Insulation layers to flat roofs.

Base materials

Approved for use in:

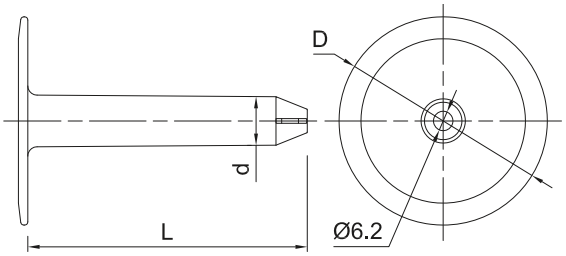
- Concrete
- Concrete Slab
- Metal Sheet & Profiles
- Timber
- Plywood
- Chipboard

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Plastic sleeve			Fixture
	Diameter	Length	Plate diameter	Min. thickness
	d	L	D	t_{fix}
	[mm]	[mm]	[mm]	[mm]
R-GOK75-015	15.5	15	75	30
R-GOK75-035	15.5	35	75	50
R-GOK75-065	15.5	65	75	80
R-GOK75-075	15.5	75	75	90
R-GOK75-085	15.5	85	75	100
R-GOK75-095	15.5	95	75	110
R-GOK75-105	15.5	105	75	120
R-GOK75-125	15.5	125	75	140
R-GOK75-135	15.5	135	75	150
R-GOK75-165	15.5	165	75	180
R-GOK75-185	15.5	185	75	200
R-GOK75-225	15.5	225	75	240

Product commercial data

Product Code	Plastic sleeve		Quantity [pcs]		Weight [kg]		Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Box	Outer	
R-GOK75-015	15.5	15	1100	1100	12.9	12.9	5906675006253
R-GOK75-035	15.5	35	600	600	7.8	7.8	5906675006260
R-GOK75-065	15.5	65	400	400	6.4	6.4	5906675006277
R-GOK75-075	15.5	75	300	300	4.8	4.8	5906675006284
R-GOK75-085	15.5	85	300	300	5.1	5.1	5906675116099
R-GOK75-095	15.5	95	250	250	4.4	4.4	5906675006291
R-GOK75-105	15.5	105	250	250	4.9	4.9	5906675116105
R-GOK75-125	15.5	125	200	200	4.0	4.0	5906675116112
R-GOK75-135	15.5	135	200	200	4.4	4.4	5906675116129
R-GOK75-165	15.5	165	150	150	3.7	3.7	5906675116136
R-GOK75-185	15.5	185	100	100	2.6	2.6	5906675116143
R-GOK75-225	15.5	225	100	100	2.9	2.9	5906675116150

GOK-PLUS, GOK-PLUS-N

Telescopic sleeve with 50mm diameter head and additional clamping spikes

Approvals and Reports

- ETA-09/0346

Versions:

- GOK-PLUS - Polypropylene
- GOK-PLUS-N - Nylon

Product information

Features and benefits

- Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures
- Circular plate requires no alignment
- Internal sleeve design allows pre-assembly with screws
- Optimized cone shape designed externally for fast installation and internally for highest loads
- Years of manufacturing experience confirmed by static and dynamic load tests carried out by the most renowned European Institutes ensures 100% safety in use
- Special under-head spikes for higher load resistance

Applications

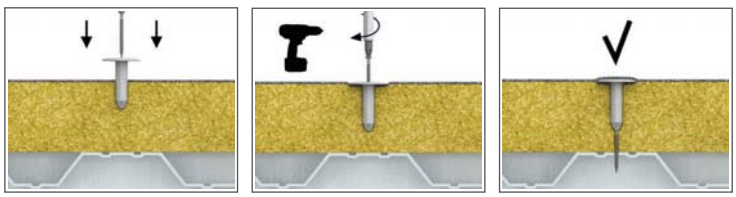
- Insulation layers to flat roofs.

Base materials

Approved for use in:

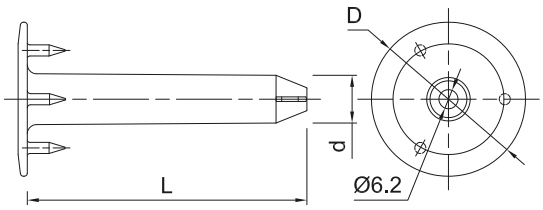
- Concrete
- Concrete Slab
- Metal Sheet & Profiles
- Timber
- Plywood
- Chipboard

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Plastic sleeve			Fixture
	Diameter	Length	Plate diameter	Min. thickness
	d	L	D	t_{Fix}
	[mm]	[mm]	[mm]	[mm]
R-GOK-PLUS-015/R-GOK-PLUS-015-N	15.5	15	50	30
R-GOK-PLUS-035/R-GOK-PLUS-035-N	15.5	35	50	50
R-GOK-PLUS-065/R-GOK-PLUS-065-N	15.5	65	50	80
R-GOK-PLUS-075/R-GOK-PLUS-075-N	15.5	75	50	90
R-GOK-PLUS-085/R-GOK-PLUS-085-N	15.5	85	50	100
R-GOK-PLUS-095/R-GOK-PLUS-095-N	15.5	95	50	110
R-GOK-PLUS-105/R-GOK-PLUS-105-N	15.5	105	50	120
R-GOK-PLUS-125/R-GOK-PLUS-125-N	15.5	125	50	140
R-GOK-PLUS-135/R-GOK-PLUS-135-N	15.5	135	50	150
R-GOK-PLUS-165/R-GOK-PLUS-165-N	15.5	165	50	180
R-GOK-PLUS-185/R-GOK-PLUS-185-N	15.5	185	50	200
R-GOK-PLUS-225/R-GOK-PLUS-225-N	15.5	225	50	240
R-GOK-PLUS-255/R-GOK-PLUS-255-N	15.5	255	50	270
R-GOK-PLUS-285/R-GOK-PLUS-285-N	15.5	285	50	300
R-GOK-PLUS-325/R-GOK-PLUS-325-N	15.5	325	50	340
R-GOK-PLUS-385/R-GOK-PLUS-385-N	15.5	385	50	400
R-GOK-PLUS-425/R-GOK-PLUS-425-N	15.5	425	50	440

Product commercial data

Product Code	Quantity [pcs]		Weight [kg]		Bar Codes for GOK-PLUS	Bar Codes for GOK-PLUS-N
	Box	Outer	Box	Outer		
R-GOK-PLUS-015/R-GOK-PLUS-015-N	1100	1100	3.4	3.4	5906675006086	5906675006710
R-GOK-PLUS-035/R-GOK-PLUS-035-N	600	600	5.3	5.3	5906675006093	5906675006727
R-GOK-PLUS-065/R-GOK-PLUS-065-N	400	400	3.2	3.2	5906675006109	5906675006734
R-GOK-PLUS-075/R-GOK-PLUS-075-N	300	300	4.3	4.3	5906675006116	5906675006741
R-GOK-PLUS-085/R-GOK-PLUS-085-N	300	300	3.2	3.2	5906675006123	5906675006758
R-GOK-PLUS-095/R-GOK-PLUS-095-N	250	250	2.6	2.6	5906675006130	5906675006765
R-GOK-PLUS-105/R-GOK-PLUS-105-N	250	250	3.5	3.5	5906675006147	5906675006772
R-GOK-PLUS-125/R-GOK-PLUS-125-N	200	200	3.0	3.0	5906675006154	5906675006789
R-GOK-PLUS-135/R-GOK-PLUS-135-N	200	200	2.8	2.8	5906675006161	5906675006796
R-GOK-PLUS-165/R-GOK-PLUS-165-N	150	150	2.7	2.7	5906675006178	5906675006802
R-GOK-PLUS-185/R-GOK-PLUS-185-N	100	100	2.2	2.2	5906675006185	5906675006819
R-GOK-PLUS-225/R-GOK-PLUS-225-N	100	100	2.0	2.0	5906675006192	5906675006826
R-GOK-PLUS-255/R-GOK-PLUS-255-N	75	75	2.3	2.3	5906675006208	5906675006833
R-GOK-PLUS-285/R-GOK-PLUS-285-N	75	75	3.2	3.2	5906675006215	5906675006840
R-GOK-PLUS-325/R-GOK-PLUS-325-N	50	50	2.0	2.0	5906675006222	5906675006857
R-GOK-PLUS-385/R-GOK-PLUS-385-N	50	50	2.0	2.0	5906675006239	5906675006864
R-GOK-PLUS-425/R-GOK-PLUS-425-N	50	50	2.3	2.3	5906675006246	5906675006871

GOW

Telescopic sleeve with 80 x 40 head

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures.
- Internal sleeve design allows pre-assembly with screws
- Optimized cone shape designed externally for fast installation and internally for highest loads
- Years of manufacturing experience confirmed by static and dynamic load tests carried out by the most renowned European Institutes ensures 100% safety in use

Applications

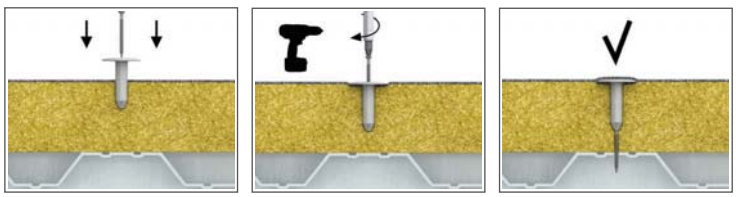
- Insulation layers to flat roofs.

Base materials

Approved for use in:

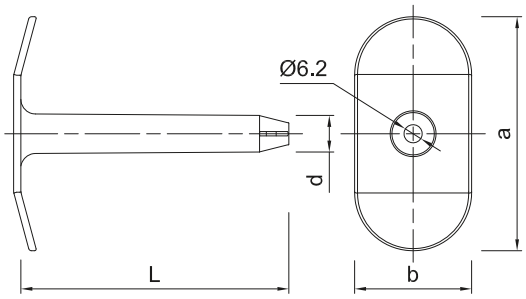
- Concrete
- Concrete Slab
- Metal Sheet & Profiles
- Timber
- Plywood
- Chipboard

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Plastic sleeve			Fixture
	Diameter	Length	Plate diameter	Min. thickness
	d	L	D	t_{fix}
	[mm]	[mm]	[mm]	[mm]
R-GOW-015	15.5	15	80x40	30
R-GOW-035	15.5	35	80x40	50
R-GOW-065	15.5	65	80x40	80
R-GOW-075	15.5	75	80x40	90
R-GOW-085	15.5	85	80x40	100
R-GOW-095	15.5	95	80x40	110
R-GOW-105	15.5	105	80x40	120
R-GOW-125	15.5	125	80x40	140
R-GOW-135	15.5	135	80x40	150
R-GOW-165	15.5	165	80x40	180
R-GOW-185	15.5	185	80x40	200
R-GOW-225	15.5	225	80x40	240

Product commercial data

Product Code	Plastic sleeve			Quantity [pcs]		Weight [kg]		Bar Code
	Diameter [mm]	Length [mm]	Plate diameter [mm]	Box	Outer	Box	Outer	
R-GOW-015	15.5	15	80x40	1100	1100	3.2	3.2	5906675006307
R-GOW-035	15.5	35	80x40	600	600	4.5	4.5	5906675006314
R-GOW-065	15.5	65	80x40	350	350	4.3	4.3	5906675100050
R-GOW-075	15.5	75	80x40	300	300	3.3	3.3	5906675006321
R-GOW-085	15.5	85	80x40	300	300	3.3	3.3	5906675006338
R-GOW-095	15.5	95	80x40	250	250	3.4	3.4	5906675006345
R-GOW-105	15.5	105	80x40	250	250	2.8	2.8	5906675116259
R-GOW-125	15.5	125	80x40	200	200	3.1	3.1	5906675006352
R-GOW-135	15.5	135	80x40	150	150	3.5	3.5	5906675116266
R-GOW-165	15.5	165	80x40	150	150	3.2	3.2	5906675116273
R-GOW-185	15.5	185	80x40	100	100	1.40	1.40	5906675116280
R-GOW-225	15.5	225	80x40	100	100	1.91	1.91	5906675116297

GOW-PLUS-N

Telescopic sleeve with 80 x 40 head and additional clamping spikes

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Produced from the highest quality raw material to ensure constant mechanical properties and stable parameters across a wide range of working temperatures
- Internal sleeve design allows pre-assembly with screws
- Optimized cone shape designed externally for fast installation and internally for highest loads
- Years of manufacturing experience confirmed by static and dynamic load tests carried out by the most renowned European Institutes ensures 100% safety in use
- Special under-head spikes for higher load resistance

Applications

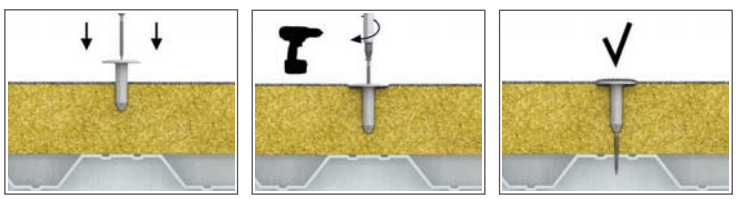
- Insulation layers to flat roofs.

Base materials

Approved for use in:

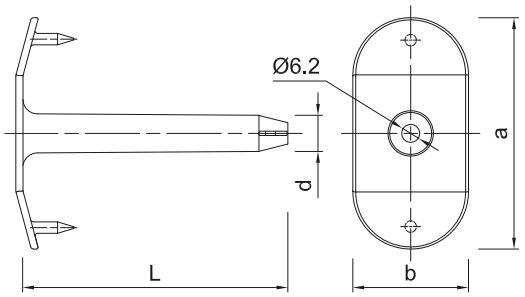
- Concrete
- Concrete Slab
- Metal Sheet & Profiles
- Timber
- Plywood
- Chipboard

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



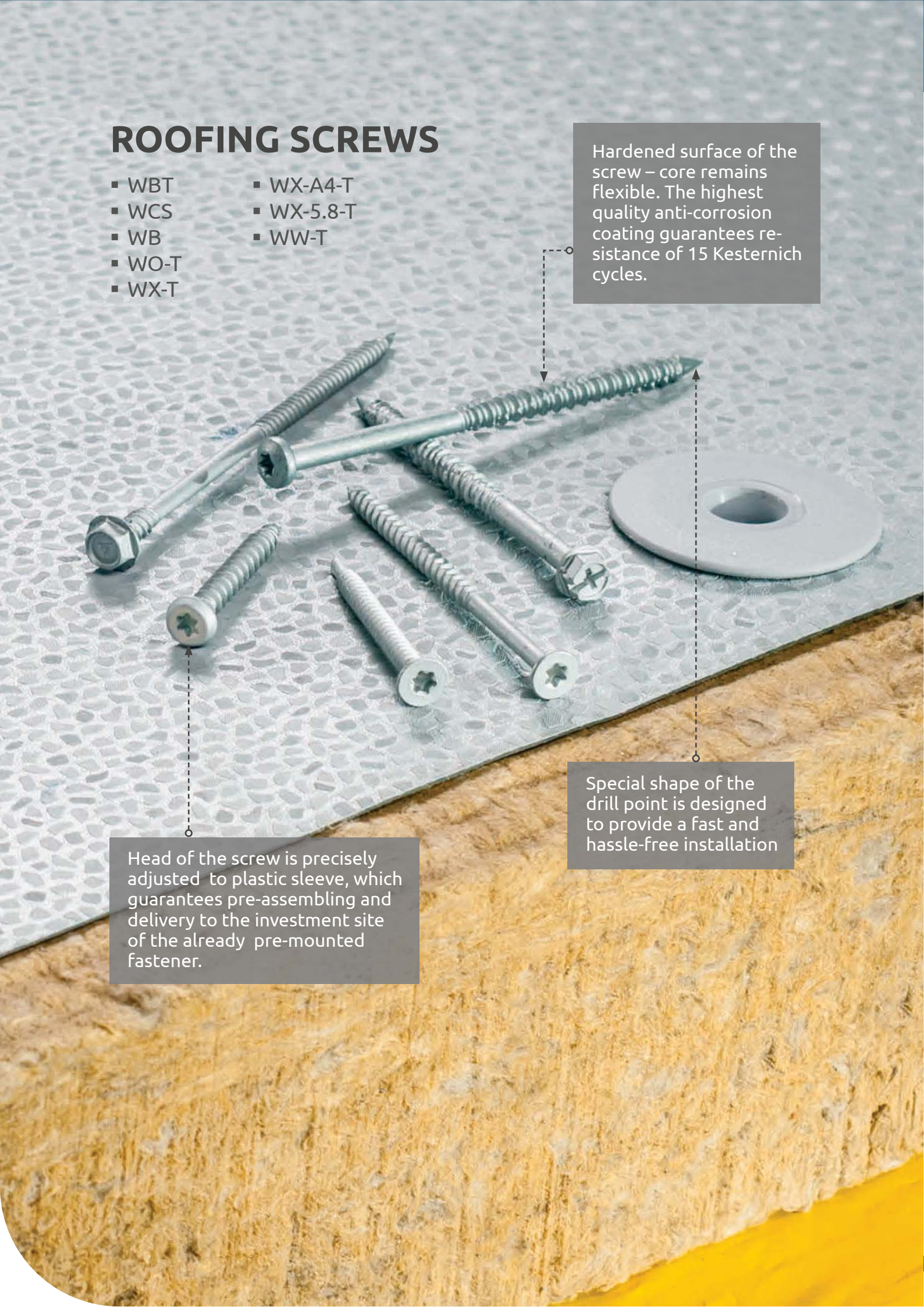
Product Code	Plastic sleeve			Fixture
	Diameter	Length	Plate diameter	Min. thickness
	d	L	a x b	t_{fix}
	[mm]	[mm]	[mm]	[mm]
R-GOW-PLUS-015-N	15.5	15	80x40	30
R-GOW-PLUS-035-N	15.5	35	80x40	50
R-GOW-PLUS-065-N	15.5	65	80x40	80
R-GOW-PLUS-075-N	15.5	75	80x40	90
R-GOW-PLUS-085-N	15.5	85	80x40	100
R-GOW-PLUS-095-N	15.5	95	80x40	110
R-GOW-PLUS-105-N	15.5	105	80x40	120
R-GOW-PLUS-125-N	15.5	125	80x40	140
R-GOW-PLUS-135-N	15.5	135	80x40	150
R-GOW-PLUS-165-N	15.5	165	80x40	180
R-GOW-PLUS-185-N	15.5	185	80x40	200
R-GOW-PLUS-225-N	15.5	225	80x40	240

Product commercial data

Product Code	Plastic sleeve			Quantity [pcs]		Weight [kg]		Bar Codes
	Diameter [mm]	Length [mm]	Plate diameter [mm]	Box	Outer	Box	Outer	
R-GOW-PLUS-015-N	15.5	15	80x40	1100	1100	3.2	3.2	5906675007229
R-GOW-PLUS-035-N	15.5	35	80x40	600	600	4.5	4.5	5906675007236
R-GOW-PLUS-065-N	15.5	65	80x40	400	400	4.3	4.3	5906675007243
R-GOW-PLUS-075-N	15.5	75	80x40	300	300	3.3	3.3	5906675007250
R-GOW-PLUS-085-N	15.5	85	80x40	300	300	3.3	3.3	5906675007267
R-GOW-PLUS-095-N	15.5	95	80x40	250	250	3.4	3.4	5906675007274
R-GOW-PLUS-105-N	15.5	105	80x40	250	250	2.8	2.8	5906675007281
R-GOW-PLUS-125-N	15.5	125	80x40	200	200	3.1	3.1	5906675007298
R-GOW-PLUS-135-N	15.5	135	80x40	200	200	3.5	3.5	5906675007304
R-GOW-PLUS-165-N	15.5	165	80x40	150	150	3.2	3.2	5906675007311
R-GOW-PLUS-185-N	15.5	185	80x40	100	100	1.40	1.40	5906675007328
R-GOW-PLUS-225-N	15.5	225	80x40	100	100	1.91	1.91	5906675007335

ROOFING SCREWS

- WBT
- WCS
- WB
- WO-T
- WX-T
- WX-A4-T
- WX-5.8-T
- WW-T



Hardened surface of the screw – core remains flexible. The highest quality anti-corrosion coating guarantees resistance of 15 Kesternich cycles.

Special shape of the drill point is designed to provide a fast and hassle-free installation

Head of the screw is precisely adjusted to plastic sleeve, which guarantees pre-assembling and delivery to the investment site of the already pre-mounted fastener.

WBT Screw for concrete & timber

Screw with TX 25 drive, specially designed thread allows use in concrete and timber

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Pre-drill 5mm hole for installation in concrete
- TX drive head for effortless installation
- Hardened thread surface
- High quality anti-corrosion coating tested to 15 Kesternich cycles.
- Specially designed thread for use in concrete & timber
- Sharp point for quick centering and easy installation
- Can be pre-assembled with telescopic tubes

Applications

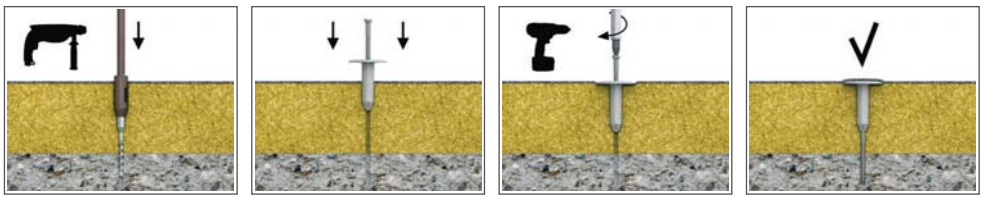
- Insulation materials in flat roof applications in conjunction with telescopic connector and steel washer

Base materials

Approved for use in:

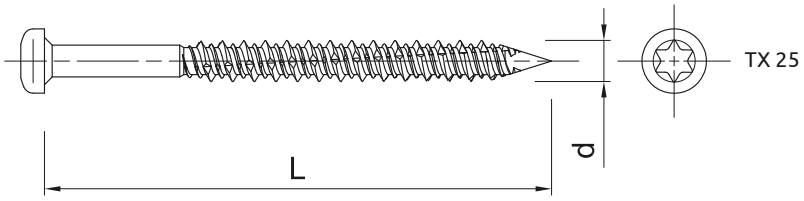
- Concrete
- Concrete Slab
- Timber

Installation guide



1. Drill the hole of required diameter and depth (where applicable)
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the WBT screw into substrate until fixing depth is reached

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WBT-61075	6.1	75
R-WBT-61090	6.1	90
R-WBT-61100	6.1	100
R-WBT-61120	6.1	120
R-WBT-61140	6.1	140
R-WBT-61160	6.1	160
R-WBT-61180	6.1	180
R-WBT-61200	6.1	200
R-WBT-61220	6.1	220
R-WBT-61240	6.1	240
R-WBT-61260	6.1	260
R-WBT-61300	6.1	300

Installation data

Substrate			Concrete C20/25	Thin-walled slab C16/20	Timber
Screw diameter	d	[mm]	6.1	6.1	6.1
Installation depth	h_{nom}	[mm]	30	20	30
Min. substrate thickness	h_{min}	[mm]	35	20	30
Min. spacing	s_{min}	[mm]	120	120	120
Min. edge distance	c_{min}	[mm]	30	30	50

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Codes
		Length [mm]	Box	Outer	Box	Outer	
Ø6.1	R-WBT-61075	75	100	1600	1.15	18.4	5906675116785
	R-WBT-61090	90	100	1600	2.8	44.8	5906675116792
	R-WBT-61100	100	100	1600	2.8	44.8	5906675116808
	R-WBT-61120	120	100	1200	2.8	33.6	5906675116815
	R-WBT-61140	140	100	1200	3.6	43.5	5906675116839
	R-WBT-61160	160	100	1200	3.6	43.5	5906675116846
	R-WBT-61180	180	100	100	2.8	2.8	5906675116853
	R-WBT-61200	200	100	800	2.8	22.4	5906675116860
	R-WBT-61220	220	100	100	2.8	2.8	5906675116877
	R-WBT-61240	240	100	100	2.8	2.8	5906675116884
	R-WBT-61260	260	100	800	3.6	29.1	5906675116891
	R-WBT-61300	300	100	500	4.2	21.0	5906675116907

WCS Screw for concrete

Hex drive screw with cross recess, special designed thread for self tapping into concrete

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Hex drive head with cross recess
- Hardened thread surface
- High quality anti-corrosion coating tested to15 Kesternich cycles
- Shape and type of the thread specially design to allow connecting to concrete
- Sharp point of the drill prevents movement of the surface of the fixture

Applications

- Speedy anchoring of different kind of material in concrete on roofs and facades

Base materials

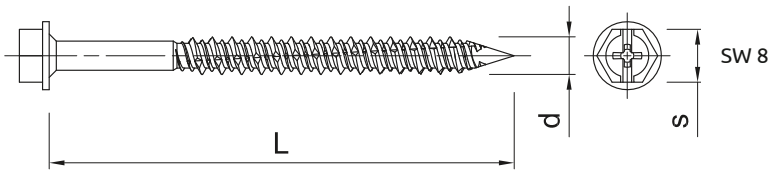
Approved for use in:

- Concrete
- Concrete Slab

Installation guide

1. Drill the hole of required diameter and depth (where applicable)
2. Position POW washer on insulation and insert WCS screw.
3. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Screw		
	Diameter	Length	Head size
	d	L	s
	[mm]	[mm]	[mm]
R-WCS-63028	6.3	28	8
R-WCS-63035	6.3	35	8
R-WCS-63045	6.3	45	8
R-WCS-63080	6.3	80	8
R-WCS-63100	6.3	100	8
R-WCS-63130	6.3	130	8
R-WCS-63150	6.3	150	8
R-WCS-63180	6.3	180	8
R-WCS-63230	6.3	230	8

Installation data

Substrate			Concrete
Screw diameter	d	[mm]	6.3
Hole diameter in substrate	d_0	[mm]	5
Min. hole depth in substrate	h_0	[mm]	35
Installation depth	h_{nom}	[mm]	30
Min. substrate thickness	h_{min}	[mm]	35
Min. spacing	s_{min}	[mm]	120
Min. edge distance	c_{min}	[mm]	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø6.3	R-WCS-63028	28	250	4000	1.26	20.2	5906675117058
	R-WCS-63035	35	250	4000	1.54	24.6	5906675117065
	R-WCS-63045	45	200	3200	1.52	24.3	5906675117072
	R-WCS-63080	80	100	1600	1.29	20.6	5906675117089
	R-WCS-63100	100	100	1600	1.57	25.1	5906675117096
	R-WCS-63130	130	100	1200	1.57	18.8	5906675117102
	R-WCS-63150	150	100	1200	1.57	18.8	5906675117119
	R-WCS-63180	180	100	1200	1.57	18.8	5906675117126
	R-WCS-63230	230	100	100	1.57	1.57	5906675117133

WB Self-drilling screws for steel

Hi-thread screw for trapezoidal steel sheet – max thickness of 2 x 1.25mm

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- 8 mm hex drive
- Hardened thread surface
- High quality anti-corrosion coating tested to 15 Kesternich cycles
- Special thread designed specifically for connecting to metal sheets
- Drilll point is designed to prevent skating and ensures quick installation
- Reduced drilling point ensures correct hole diameter in thin metal sheets
- Hi thread secures to separate metal washers avoiding compression under foot traffic

Applications

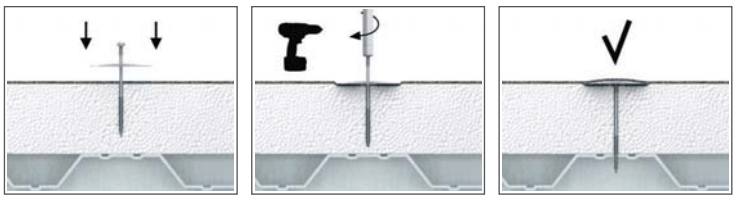
- Installing insulation layers on flat roofs in conjunction with steel washer, which remains stable thanks to the double thread

Base materials

Approved for use in:

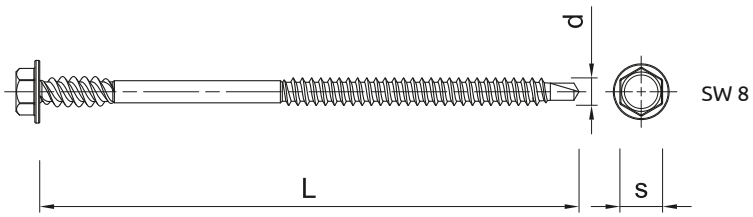
- Metal Sheet & Profiles

Installation guide



1. Position POW washer on insulation and insert WB screw
2. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product Code	Screw		
	Diameter	Length	Head size
	d	L	s
	[mm]	[mm]	[mm]
R-WB-48100	4.8	100	8
R-WB-48120	4.8	120	8
R-WB-48140	4.8	140	8
R-WB-48160	4.8	160	8
R-WB-48170	4.8	170	8
R-WB-48180	4.8	180	8
R-WB-48200	4.8	200	8
R-WB-48220	4.8	220	8

Installation data

Substrate			Steel
Screw diameter	d	[mm]	4.8
Min. substrate thickness	h_{min}	[mm]	0.75
Min. spacing	s_{min}	[mm]	120
Min. edge distance	c_{min}	[mm]	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Codes
		Length [mm]	Box	Outer	Box	Outer	
Ø4.8	R-WB-48100	100	100	1200	2.8	33.6	5906675226125
	R-WB-48120	120	100	1200	2.8	33.6	5906675226224
	R-WB-48140	140	100	1200	2.8	33.6	5906675100111
	R-WB-48160	160	100	1200	2.8	33.6	5906675100135
	R-WB-48170	170	100	1200	2.8	33.6	5906675226521
	R-WB-48180	180	100	100	2.8	2.8	5906675100166
	R-WB-48200	200	100	100	2.8	2.8	5906675100203
	R-WB-48220	220	100	100	2.8	2.8	5906675100210

WO-T Screws for steel, timber, ply & OSB

Screw for trapezoidal steel sheet; max thickness of 0.9 mm, timber, ply & OSB

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Hardened thread surface
- High quality anti-corrosion coating tested to 15 Kesternich cycles
- Special thread design specifically for thin sheet steel and timber
- Sharp drill point reduces skating and ensures quick installation
- Can be pre-assembled with telescopic tubes

Applications

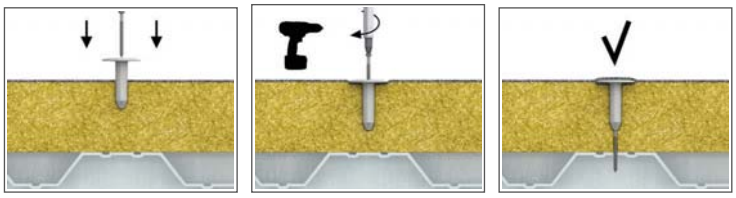
- Insulation layers on flat roofs together with a appropriate telescopic or steel washer

Base materials

Approved for use in:

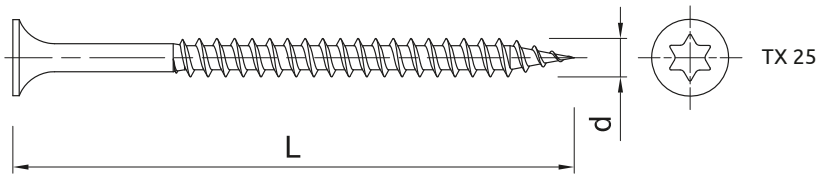
- Metal Sheet & Profiles
- Timber
- Chipboard
- Oriented Strand Board

Installation guide



1. Lightly insert plastic sleeve into insulation material
2. Using screw gun, drive the WO screw into substrate until fixing depth is reached

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WO-48T060	4.8	60
R-WO-48T080	4.8	80
R-WO-48T100	4.8	100
R-WO-48T120	4.8	120
R-WO-48T140	4.8	140
R-WO-48T160	4.8	160
R-WO-48T180	4.8	180
R-WO-48T200	4.8	200
R-WO-48T240	4.8	240
R-WO-48T300	4.8	300

Installation data

Substrate			Steel	Chipboard OSB	Timber, grade C24
Screw diameter	d	[mm]	4.8	4.8	4.8
Installation depth	h_{nom}	[mm]	-	18	19
Min. substrate thickness	h_{min}	[mm]	0.5	18	19
Min. spacing	s_{min}	[mm]	120	120	120
Min. edge distance	c_{min}	[mm]	30	30	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø4.8	R-WO-48T060	60	250	4000	1.35	21.6	5906675116488
	R-WO-48T080	80	250	3000	1.83	22.0	5906675116495
	R-WO-48T100	100	200	3200	2.7	43.2	5906675227320
	R-WO-48T120	120	200	3200	2.3	36.6	5906675227429
	R-WO-48T140	140	200	3200	2.7	42.4	5906675227528
	R-WO-48T160	160	100	1600	1.60	25.6	5906675227627
	R-WO-48T180	180	100	100	1.76	1.76	5906675227726
	R-WO-48T200	200	100	100	2.0	2.0	5906675116556
	R-WO-48T240	240	100	500	2.0	10.0	5906675227023
	R-WO-48T300	300	100	500	2.0	10.0	5906675007687

WX-T Self-drilling screws for steel

Screw 4.8mm dia for trapezoidal steel sheet – max thickness of 2 x 1.25mm

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Hardened thread surface
- High quality anti-corrosion coating tested to 15 Kesternich cycles
- Special thread design specifically to provide consistent loads in thin sheet steel
- Sharp drill point reduces skating and ensures quick installation
- Reduced drilling point ensures and correct hole diameter in thin metal sheets
- Can be pre-assembled with telescopic tubes

Applications

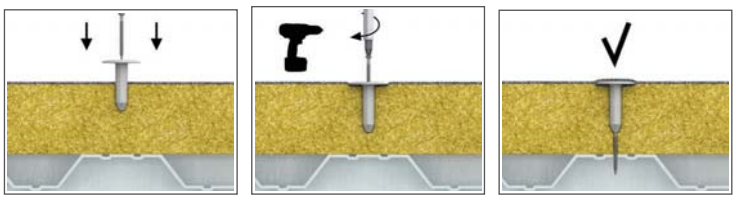
- Insulation layers on flat roofs together with a appropriate telescopic or steel washer

Base materials

Approved for use in:

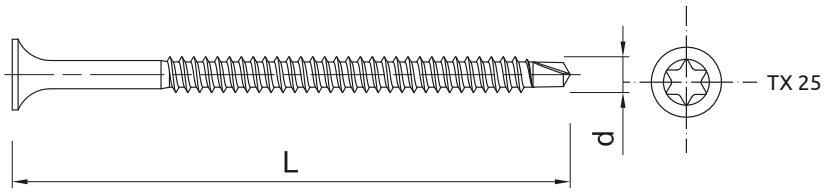
- Metal Sheet & Profiles

Installation guide



1. Lightly insert plastic sleeve into insulation material
2. Using screw gun, drive the WX screw into substrate until fixing depth is reached

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WX-48T050	4.8	50
R-WX-48T060	4.8	60
R-WX-48T070	4.8	70
R-WX-48T080	4.8	80
R-WX-48T100	4.8	100
R-WX-48T120	4.8	120
R-WX-48T140	4.8	140
R-WX-48T160	4.8	160
R-WX-48T180	4.8	180
R-WX-48T200	4.8	200
R-WX-48T240	4.8	240
R-WX-48T300	4.8	300

Installation data

Substrate			Steel
Screw diameter	d	[mm]	4.8
Min. substrate thickness	h_{min}	[mm]	0.75
Min. spacing	s_{min}	[mm]	120
Min. edge distance	c_{min}	[mm]	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø4.8	R-WX-48T050	50	250	3000	1.07	12.8	5906675116570
	R-WX-48T060	60	250	3000	1.35	16.2	5906675116587
	R-WX-48T070	70	250	3000	1.35	16.2	5906675116594
	R-WX-48T080	80	250	3000	1.35	16.2	5906675116600
	R-WX-48T100	100	200	2400	1.80	21.6	5906675116617
	R-WX-48T120	120	200	2400	2.2	25.8	5906675224725
	R-WX-48T140	140	200	2400	2.2	25.8	5906675116631
	R-WX-48T160	160	100	1200	2.9	34.8	5906675224923
	R-WX-48T180	180	100	800	3.2	25.9	5906675116655
	R-WX-48T200	200	100	800	3.2	25.9	5906675224121
	R-WX-48T240	240	100	800	3.2	25.9	5906675251547
	R-WX-48T300	300	100	500	3.2	16.2	5906675007700

WX-5.8-T Self-drilling screws for steel and timber

Screw for trapezoidal steel sheet – max thickness of 2 x 1.25mm

Product information

Features and benefits

- 5.8mm diameter screw for increased loads and suitable for use in steel sheets and timber
- Hardened thread surface
- High quality anti-corrosion coating guarantees resistance of 15 Kesternich cycles
- Shape and type of the thread specially design to allow connecting to metal sheets
- The drill point is designed to provide a fast and hassle-free installation
- Reduced drilling point ensures optimal tightness and correct hole diameter in thin metal sheets
- Can be pre-assembled with telescopic tubes

Applications

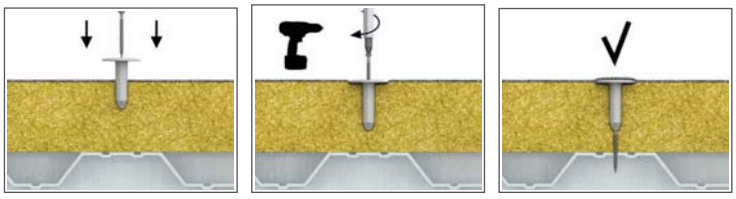
- Insulation layers on flat roofs together with a appropriate telescopic or steel washer

Base materials

Approved for use in:

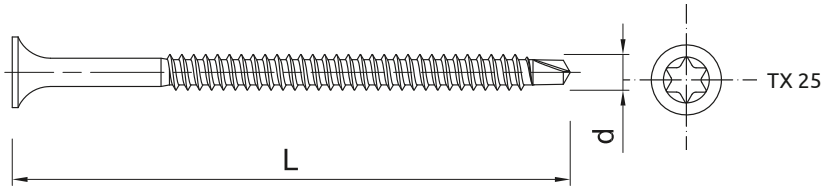
- Metal Sheet & Profiles
- Timber
- Oriented Strand Board
- Plywood

Installation guide



1. Lightly insert plastic sleeve into insulation material
2. Using screw gun, drive the WX screw into substrate until fixing depth is reached

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WX-58T040	5.8	40
R-WX-58T055	5.8	55
R-WX-58T065	5.8	65
R-WX-58T075	5.8	75
R-WX-58T085	5.8	85
R-WX-58T095	5.8	95
R-WX-58T105	5.8	105
R-WX-58T115	5.8	115
R-WX-58T125	5.8	125
R-WX-58T150	5.8	150
R-WX-58T175	5.8	175
R-WX-58T200	5.8	200
R-WX-58T250	5.8	250
R-WX-58T300	5.8	300

Installation data

Substrate			Steel	Chipboard OSB	Timber, grade C24
Screw diameter	d	[mm]	5.8	5.8	5.8
Installation depth	h_{nom}	[mm]	-	18	30
Min. substrate thickness	h_{min}	[mm]	0.7	18	30
Min. spacing	s_{min}	[mm]	120	120	120
Min. edge distance	c_{min}	[mm]	30	30	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø4.8	R-WX-58T040	40	250	3000	1.35	16.2	5906675156750
	R-WX-58T055	55	250	3000	1.07	12.8	5906675156774
	R-WX-58T065	65	250	3000	1.35	16.2	5906675156798
	R-WX-58T075	75	250	3000	1.35	16.2	5906675156811
	R-WX-58T085	85	250	3000	1.35	16.2	5906675156835
	R-WX-58T095	95	200	2400	1.80	21.6	5906675156859
	R-WX-58T105	105	200	2400	2.2	25.8	5906675156873
	R-WX-58T115	115	200	2400	2.2	25.8	5906675156897
	R-WX-58T125	125	100	1200	2.9	34.8	5906675156910
	R-WX-58T150	150	100	800	3.2	25.9	5906675156934
	R-WX-58T175	175	100	800	3.2	25.9	5906675156941
	R-WX-58T200	200	100	800	3.2	25.9	5906675156958
	R-WX-58T250	250	100	500	3.2	16.2	5906675156965
	R-WX-58T300	300	100	500	3.2	16.2	5906675156972

WX-A4-T Stainless steel self-drilling screws for steel

Stainless steel self-drilling screws for max 2.0mm thickness trapezoid sheet

Product information

Features and benefits

- A4 Stainless steel self-drilling screw for high corrosion resistance
- Hardened thread surface
- Shape and type of the thread specially design to allow connecting to metal sheets
- The drill point is designed to provide a fast and hassle-free installation
- Reduced drilling point ensures optimal tightness and correct hole diameter in thin metal sheets
- Can be pre-assembled with telescopic tubes

Applications

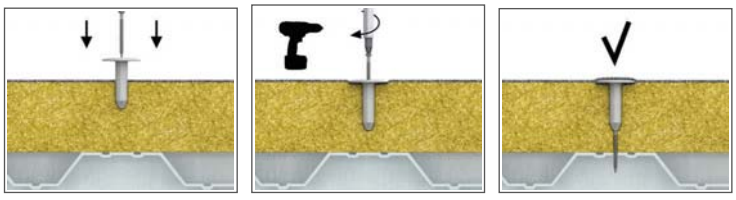
- Insulation layers on flat roofs together with a appropriate telescopic or steel washer

Base materials

Approved for use in:

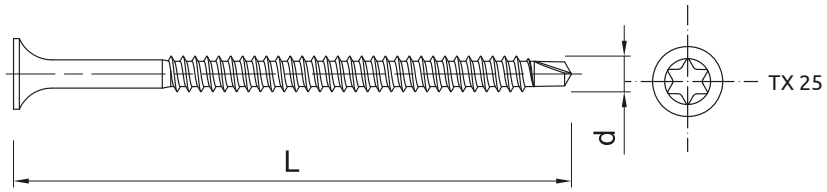
- Metal Sheet & Profiles

Installation guide



1. Lightly insert plastic sleeve into insulation material.
2. Using screw gun, drive the WX screw into substrate until fixing depth is reached.

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WX-A4-48T050	4.8	50
R-WX-A4-48T060	4.8	60
R-WX-A4-48T080	4.8	80
R-WX-A4-48T100	4.8	100

Installation data

Substrate			Steel
Screw diameter	d	[mm]	4.8
Min. substrate thickness	h_{min}	[mm]	0.75
Min. spacing	s_{min}	[mm]	120
Min. edge distance	c_{min}	[mm]	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø4.8	R-WX-A4-48T050	50	250	3000	1.07	12.8	5906675157238
	R-WX-A4-48T060	60	250	3000	1.35	16.2	5906675157252
	R-WX-A4-48T080	80	250	3000	1.35	16.2	5906675157276
	R-WX-A4-48T100	100	200	2400	1.80	21.6	5906675157283

WW-T Screws for timber

Thread configured specifically to provide highest loads when connecting to wood structures

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Hardened thread surface
- High quality anti-corrosion coating tested to 15 Kesternich cycles
- Thread configured for consistent high loads in timber structures
- Sharp point to prevent skating and ensure easy installation
- Can be pre-assembled with telescopic tubes

Applications

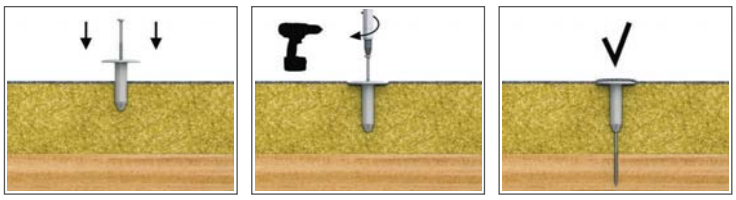
- Insulation materials in flat roof applications in conjunction with telescopic connector and steel washer

Base materials

Approved for use in:

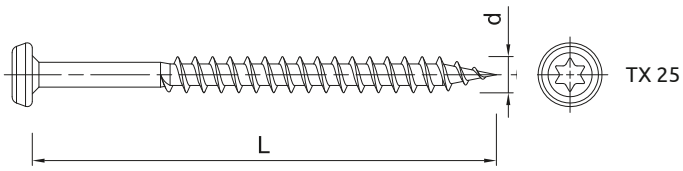
- Timber
- Plywood
- Chipboard
- Oriented Strand Board

Installation guide



1. Lightly insert plastic sleeve into insulation material
2. Using screw gun, drive the WW screw into substrate until fixing depth is reached

Product information



Product Code	Screw	
	Diameter	Length
	d	L
	[mm]	[mm]
R-WW-50T35	5	35
R-WW-50T45	5	45
R-WW-50T55	5	55
R-WW-50T75	5	75
R-WW-50T90	5	90
R-WW-5T120	5	120

Installation data

Substrate			Timber	Plywood	Chipboard OSB
Screw diameter	d	[mm]	5	5	5
Installation depth	h_{nom}	[mm]	24	20	18
Min. substrate thickness	h_{min}	[mm]	24	20	18
Min. spacing	s_{min}	[mm]	120	120	120
Min. edge distance	c_{min}	[mm]	30	30	30

Product commercial data

Size	Product Code	Screw	Quantity [pcs]		Weight [kg]		Bar Code
		Length [mm]	Box	Outer	Box	Outer	
Ø5.0	R-WW-50T35	35	500	9000	1.34	24.1	5906675280059
	R-WW-50T45	45	250	4000	1.34	21.4	5906675280066
	R-WW-50T55	55	200	2400	1.13	13.6	5906675280073
	R-WW-50T75	75	100	1800	1.34	24.1	5906675280080
	R-WW-50T90	90	100	1200	1.13	13.6	5906675280097
	R-WW-5T120	120	100	1200	1.13	13.6	5906675088020

STEEL WASHERS

- POK
- POW
- PKW

Form of a washer with its ribbed shape enable its simple mounting, making use of the screws dedicated to stiff mounting of hard top roof installation.

Washer made of aluminum and zinc sheet ensures a very high resistance against corrosion.

POK Steel washers

Steel washer with special form for roofing applications, for use with all types of roofing screws.

POK-040

POK-041

POK-06

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Aluzinc coating for corrosion resistance
- Formed profile for added stiffness
- Ideal for rigid insulation

Applications

- Insulation layers to flat roofs.

Base materials

Approved for use in:

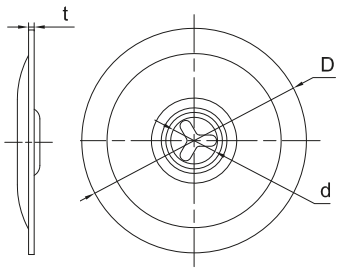
- Metal Sheet & Profiles
- Timber
- Chipboard
- Plywood
- Concrete
- Concrete Slab

Installation guide

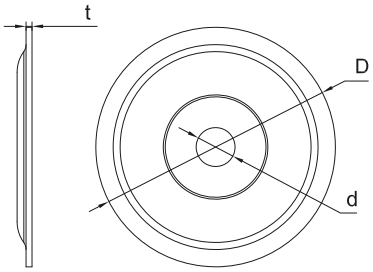
1. Position POK washer on insulation and insert: WCS,WW screw
2. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information

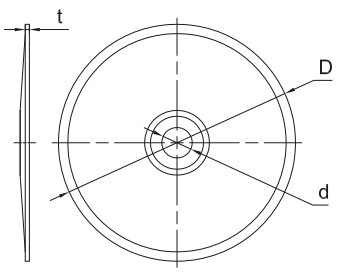
POK-040



POK-041



POK-06



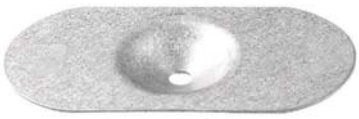
Product Code	Aluminum washer		
	Hole diameter	Plate diameter	Thickness
	d	D	t
	[mm]	[mm]	[mm]
R-POK-040-ALZN	2.5	40	0.7
R-POK-041-ALZN	7	40	0.7
R-POK-06	7	76	0.7

Product commercial data

Product Code	Aluminum washer		Quantity [pcs]		Weight [kg]		Bar Codes
	Hole diameter [mm]	Plate diameter [mm]	Box	Outer	Box	Outer	
POK-040							
R-POK-040-ALZN	2.5	40	1000	1000	3.4	3.4	5906675250212
POK-041							
R-POK-041-ALZN	7	40	100	1300	3.4	44.7	5906675200705
POK-06							
R-POK-06	7	76	100	100	3.4	3.4	5906675225227

POW Oval steel washers

Steel washer with special form for roofing applications, for use with all types of roofing screws.



POW-05

POW-07

Approvals and Reports

- ETA-09/0346

Product information

Features and benefits

- Aluzinc coating for corrosion resistance
- Formed profile for added stiffness
- Ideal for rigid insulation

Applications

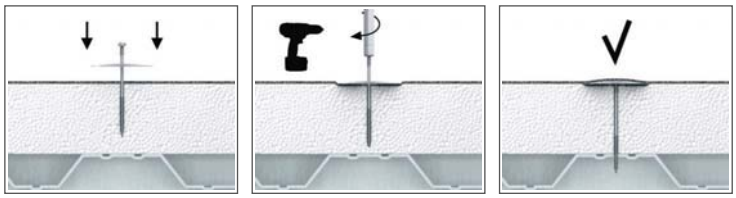
- Insulation layers to flat roofs.

Base materials

Approved for use in:

- Metal Sheet & Profiles
- Timber
- Chipboard
- Plywood
- Oriented Strand Board
- Concrete
- Concrete Slab

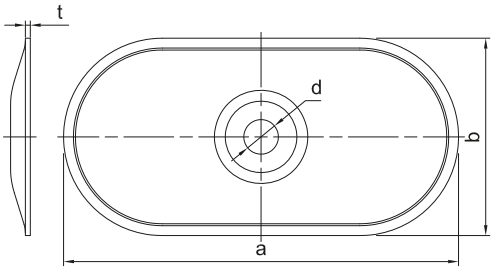
Installation guide



1. Position POW washer on insulation and insert: WBT, WCS,WW screw
2. Using drilling machine, drive the screw into substrate until fixing depth is reached

Product information

POW-05



Product Code	Aluminum washer			
	Hole diameter	Length	Width	Thickness
	d	a	b	t
	[mm]	[mm]	[mm]	[mm]
R-POW-05-ALZN	5	82	40	0.7
R-POW-07-ALZN	7	82	40	0.7

Product commercial data

Produkt	Aluminum washer			Quantity [pcs]		Weight [kg]		Bar Codes
	Hole diameter [mm]	Length [mm]	Width [mm]	Box	Outer	Box	Outer	
POW-05								
R-POW-05-ALZN	5	82	40	100	100	2.5	2.5	5906675007397
POW-07								
R-POW-07-ALZN	7	82	40	100	100	2.5	2.5	5906675116426

PKW-07 Square Steel Washer 64mm

Steel washer with special form for roofing applications, for use with all types of roofing screws.

Informacja o produkcie

Features and benefits

- Aluzinc coating for corrosion resistance
- Formed profile for added stiffness
- Ideal for rigid insulation

Applications

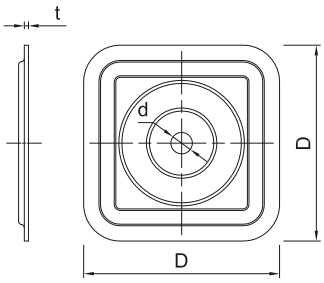
- Insulation layers to flat roofs.

Base materials

Approved for use in:

- Metal Sheet & Profiles
- Timber
- Chipboard
- Plywood
- Concrete
- Concrete Slab

Product information



Product commercial data

Produkt Code	Aluminum washer			Quantity [pcs]		Weight [kg]		Bar Codes
	Hole diameter [mm]	Plate diameter [mm]	Thickness [mm]	Box	Outer	Box	Outer	
R-PKW-07	7	64		100	100	2.5	2.5	5906675225326

Installation guide

1. Position PKW washer on insulation and insert: WCS,WW screw
2. Using drilling machine, drive the screw into substrate until fixing depth is reached

Adequate selection of proper roofing accessories facilitates the mounting process of the roofing insulation layers on flat roofs.

Special shape of drilling point ending allows performing high number of holes, which has direct influence on the pace of the works conducted.

ACCESSORIES

- Screw Driver Bits
- K08L Expansion Plug
- Adapters
- Aut-1 Fixings Installation Tool
- Drills

Screw driver bits

Dedicated bit for roofing insulation screws provides quick and easy installation

Product information

Features and benefits

- Dedicated range for roofing applications
- Hardened surface for long life

Applications

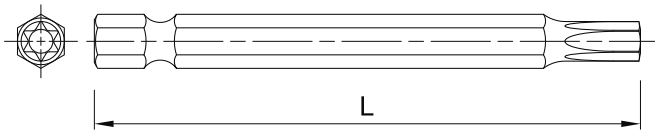
- Insulation layers on flat roofs together with screw

Base materials

Approved for use in:

- Concrete
- Metal Sheet & Profiles
- Wood

Product information



Product commercial data

Product Code	Length [mm]	Quantity [pcs]		Weight [kg]		Bar Codes
		Box	Outer	Box	Outer	
TX						
R-TORX-025/100	100	1	1	0.03	0.03	5906675008479
R-TORX-025/150	150	1	1	0.05	0.05	5906675008486
R-TORX-025/200	200	1	1	0.06	0.06	5906675008493
R-TORX-025/350	350	1	1	0.11	0.11	5906675008509
R-TORX-025/460	460	1	1	0.15	0.15	5906675008516

K08L Expansion plug

Easy-to-install plug giving exceptional performance in solid base materials

Product information

Features and benefits

- Suitable for fixing insulation materials to concrete in flat roofs applications in conjunction with WO screws
- Anti-rotation fins prevent spinning during tightening of the screw
- Engineered grip feature for extra holding power
- Two-way expansion mechanism provides a strong anchorage in solid base materials

Applications

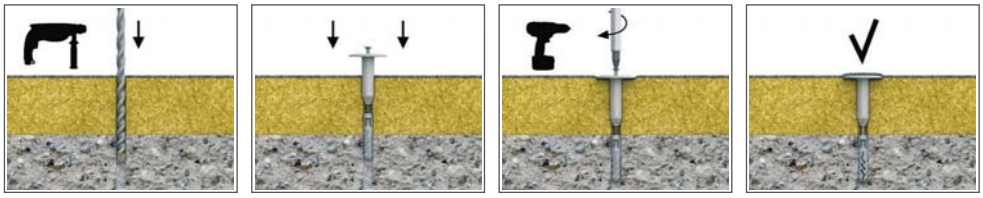
- Insulation layers to flat roofs.

Base materials

Approved for use in:

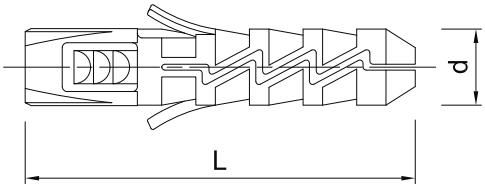
- Concrete

Installation guide



1. Drill the hole of required diameter and depth (where applicable)
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the WO screw with K08L040 into substrate until fixing depth is reached

Product information



Product commercial data

Rozmiar	Product Code	Expansion Plug		Quantity [pcs]		Weight [kg]		Bar Codes
		Diameter [mm]	Length [mm]	Box	Outer	Box	Outer	
Ø8	R-K08L040	8	40	200	2400	0.24	2.9	5906675293479

SDS+Extension Adaptor and taper drills

A robust adaptor and taper drill system for precision drilling

Product information

Features and benefits

- Allows drilling of small diameter holes through thick insulation layers
- Supplied with quick release wedge ejector
- Specially hardened steel for durability

Applications

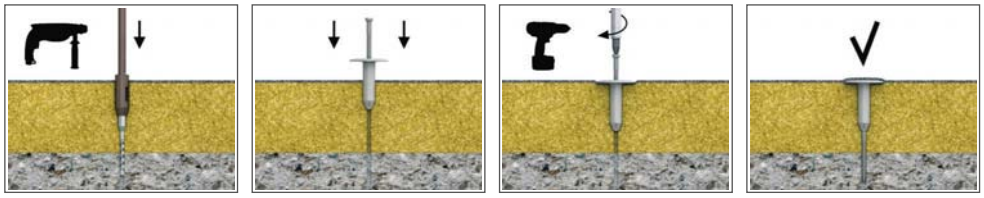
- Fixing insulation layers to flat roofs to concrete substrate

Base materials

Approved for use in:

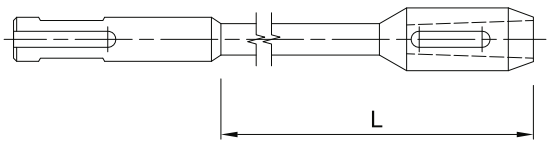
- Concrete

Installation guide



1. Drill the hole of required diameter and depth (where applicable)
2. Lightly insert plastic sleeve into insulation material
3. Using screw gun, drive the WBT screw into substrate until fixing depth is reached

Product information



Product commercial data

Product Code	Length [mm]	Quantity [pcs]		Weight [kg]		Bar Codes
		Box	Outer	Box	Outer	
R-ADAPTER500	500	1	10	0.52	5.2	5906675223469
R-ADAPTER800	800	1	10	0.83	8.3	5906675223476

ADAPTER-BIT

Adapter -bit for all common screwdrivers bit type: PH-2, TX-25

Product information

Features and benefits

- Adapter -bit for all common screwdrivers bit to the lenght of 25 and 50 mm
- Hardened for long life

Applications

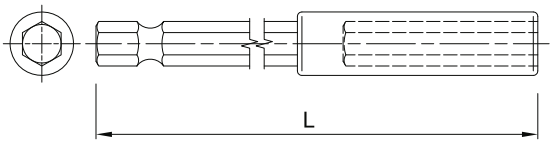
- Specialized bits dedicated for fixing insulation layers to flat roofs

Base materials

Approved for use in:

- Concrete
- Metal Sheet & Profiles
- Wood

Product information



Product commercial data

Product Code	Length [mm]	Quantity [pcs]		Weight [kg]		Bar Codes
		Box	Outer	Box	Outer	
R-ADAPTER-BIT-250	250	1	1	0.05	0.05	5906675274515
R-ADAPTER-BIT-460	460	1	1	0.05	0.05	5906675274522

ADAPTER-MAG For steel washers

Adapter for fixing steel washers type: POK-040 / POK-041

Product information

Features and benefits

- Special design of the tip assembly guaranteeing quick and firm installation of steel washers in substrates

Applications

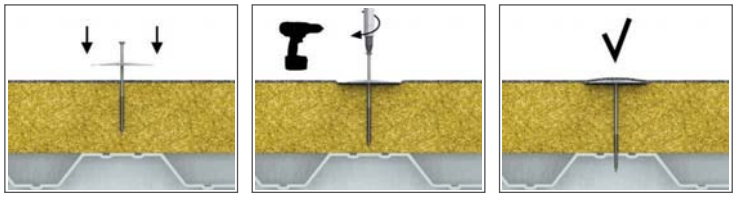
- Specialized bits dedicated for fixing insulation layers to flat roofs

Base materials

Approved for use in:

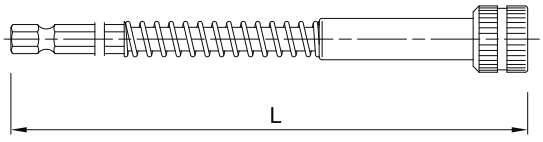
- Concrete
- Metal Sheet & Profiles
- Wood

Installation guide



1. Position POK washer on insulation and insert: WX screw
2. Using screw gun, drive the screw into substrate until fixing depth is reached

Product information



Product commercial data

Product Code	Length [mm]	Quantity [pcs]		Weight [kg]		Bar Codes
		Box	Outer	Box	Outer	
ADAPTER-MAG-55	550	1	1	0.05	0.05	5906675103457

AUT-1 Fixings installation tool

Machine for fixing insulations layers to the flat roofs to steel sheet substrates

Product information

Features and benefits

- Semi-automatic device that allows precise installation of GOK telescopic connectors into the steel roofing in conjunction with WX or WO screws
- Allows the operator to stand upright throughout the installation process
- Ensures good quality installations
- Vertical installation of the fixings on pitched roofs

Applications

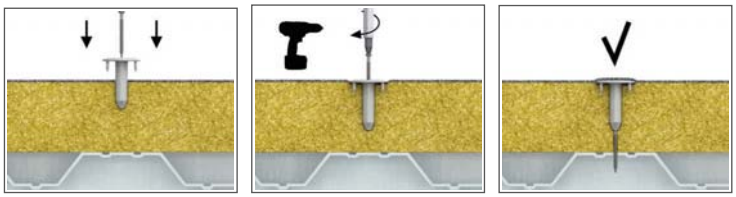
- Fixing insulation layers to flat roofs

Base materials

Approved for use in:

- Metal Sheet & Profiles

Installation guide



1. Select a suitable screw type for substrate
2. Lightly insert plastic sleeve into insulation material
3. Using automatic machine, drive the screw into substrate until fixing depth is reached

Product commercial data

Product Code	Voltage	Nominal efficiency	Initial efficiency	Quantity [pcs]	Weight [kg]	Bar Codes
	[V]	[W]	[W]	Box	Box	
AUT-1	220	600	300	1	25	5906675113913

RT-SDSA Aggressor SDS plus

Drill bits for fast drilling in concrete AGGRESSOR SDS plus

Product information

Features and benefits

- Self-aligning drill tip enables quick and easy start
- Optimised flute angle for increased drilling speed
- Deep seated carbide tip ensures quality and long life
- Aggressive flutes increase dust extraction and accelerate drilling
- Drilling speed increased by 30%
- Extremely high durability confirmed by the international certificate SicherSafe

Applications

- Fixing insulation layers to flat roofs to concrete substrate

Base materials

Approved for use in:

- Concrete
- Solid Brick
- Hollow Brick
- Natural Stone
- Aerated Concrete Block

Product commercial data

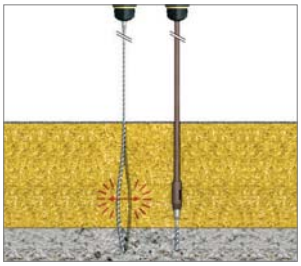
Product Code	Diameter	Length	Working length	Quantity [pcs]		Bar Codes
	[ø]	[mm]	[mm]	Box	Outer	
RT-SDSA-5/160	5	160	100	1	12	5906675027944
RT-SDSA-5/310	5	310	250	1	12	5906675063461
RT-SDSA-5/31B12	5	310	250	1	12	5906675063478

RT-TD, RT-TDC RoofSystem drill bits

Special drill bits for roof fasteners Roofsystem

RT-TD

RT-TDC



Informacja o produkcie

Features and benefits

- Self-aligning drill tip enables quick and easy start
- Tapered connection ensures 100% transfer of impact force
- RT-TDC incorporates depth stop for consistent drilling depth
- RT-TDC designed to cut cleanly through insulation

Applications

- Fixing insulation layers to flat roofs to concrete substrate

Base materials

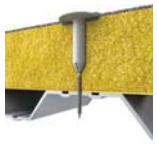
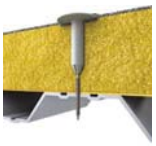
Approved for use in:

- Concrete
- Solid Brick
- Hollow Brick
- Natural Stone
- Aerated Concrete Block

Product commercial data

Product Code	Diameter	Length	Working length	Quantity [pcs]	Bar Codes
	[ø]	[mm]	[mm]	Box	
RT-TD					
RT-TD-50-110	5	110	50	1	5906675008936
RT-TD-50-160	5	160	100	1	5906675046396
RT-TDC					
RT-TDC-50-110/25	5	110	25	1	5906675097732
RT-TDC-50-110/35	5	110	35	1	5906675097749
RT-TDC-50-160/55	5	160	55	1	5906675097756

Fixing selection according to insulation thickness

	STEEL		CONCRETE		TIMBER/WOOD
					
	h_{nom} = 0.9 - 2.5mm	h_{nom} = 0.7 - 0.9mm	Self-tapping screws	With expansion plug	Self-tapping screws
[mm]	Index	Index	Index	Index	Index
60	R-GOK-035+R-WX-48T060	R-GOK-035+R-WO-48T060	R-GOK-035+R-WBT-61075	R-GOK-035+R-WO-48080+R-K08L40	R-GOK-035+R-WW-5075
80	R-GOK-065+R-WX-48T050	R-GOK-065+R-WO-48T060	R-GOK-035+R-WBT-61090	R-GOK-065+R-WO-48080+R-K08L40	R-GOK-065+R-WW-5055
100	R-GOK-085+R-WX-48T050	R-GOK-085+R-WO-48T060	R-GOK-075+R-WBT-61075	R-GOK-085+R-WO-48080+R-K08L40	R-GOK-085+R-WW-5055
120	R-GOK-105+R-WX-48T050	R-GOK-105+R-WO-48T060	R-GOK-095+R-WBT-61075	R-GOK-105+R-WO-48080+R-K08L40	R-GOK-105+R-WW-5055
140	R-GOK-125+R-WX-48T050	R-GOK-125+R-WO-48T060	R-GOK-105+R-WBT-61090	R-GOK-125+R-WO-48080+R-K08L40	R-GOK-125+R-WW-5055
160	R-GOK-135+R-WX-48T060	R-GOK-135+R-WO-48T060	R-GOK-135+R-WBT-61075	R-GOK-135+R-WO-48080+R-K08L40	R-GOK-135+R-WW-5075
180	R-GOK-165+R-WX-48T050	R-GOK-165+R-WO-48T060	R-GOK-135+R-WBT-61090	R-GOK-165+R-WO-48080+R-K08L40	R-GOK-165+R-WW-5055
200	R-GOK-185+R-WX-48T050	R-GOK-185+R-WO-48T060	R-GOK-165+R-WBT-61090	R-GOK-185+R-WO-48080+R-K08L40	R-GOK-185+R-WW-5055
220	R-GOK-185+R-WX-48T070	R-GOK-185+R-WO-48T080	R-GOK-185+R-WBT-61090	R-GOK-185+R-WO-48100+R-K08L40	R-GOK-185+R-WW-5075
240	R-GOK-225+R-WX-48T050	R-GOK-225+R-WO-48T060	R-GOK-035+R-WBT-61075	R-GOK-225+R-WO-48080+R-K08L40	R-GOK-225+R-WW-5055
260	R-GOK-225+R-WX-48T070	R-GOK-225+R-WO-48T080	R-GOK-225+R-WBT-61090	R-GOK-225+R-WO-48100+R-K08L40	R-GOK-225+R-WW-5075
280	R-GOK-255+R-WX-48T060	R-GOK-255+R-WO-48T060	R-GOK-255+R-WBT-61075	R-GOK-255+R-WO-48080+R-K08L40	R-GOK-255+R-WW-5075
300	R-GOK-285+R-WX-48T050	R-GOK-285+R-WO-48T060	R-GOK-255+R-WBT-61090	R-GOK-285+R-WO-48080+R-K08L40	R-GOK-285+R-WW-5055
320	R-GOK-285+R-WX-48T070	R-GOK-285+R-WO-48T080	R-GOK-285+R-WBT-61090	R-GOK-285+R-WO-48100+R-K08L40	R-GOK-285+R-WW-5075
340	R-GOK-325+R-WX-48T050	R-GOK-325+R-WO-48T060	R-GOK-285+R-WBT-61100	R-GOK-325+R-WO-48080+R-K08L40	R-GOK-325+R-WW-5055
360	R-GOK-325+R-WX-48T060	R-GOK-325+R-WO-48T080	R-GOK-325+R-WBT-61090	R-GOK-325+R-WO-48100+R-K08L40	R-GOK-325+R-WW-5075
380	R-GOK-325+R-WX-48T100	R-GOK-325+R-WO-48T100	R-GOK-325+R-WBT-61090	R-GOK-325+R-WO-48120+R-K08L40	R-GOK-325+R-WW-5055
400	R-GOK-385+R-WX-48T050	R-GOK-385+R-WO-48T060	R-GOK-385+R-WBT-61075	R-GOK-385+R-WO-48080+R-K08L40	R-GOK-385+R-WW-5055
420	R-GOK-385+R-WX-48T070	R-GOK-385+R-WO-48T080	R-GOK-385+R-WBT-61090	R-GOK-385+R-WO-48100+R-K08L40	R-GOK-385+R-WW-5055
440	R-GOK-425+R-WX-48T050	R-GOK-425+R-WO-48T060	R-GOK-385+R-WBT-61100	R-GOK-425+R-WO-48080+R-K08L40	R-GOK-425+R-WW-5055
460	R-GOK-425+R-WX-48T070	R-GOK-425+R-WO-48T080	R-GOK-425+R-WBT-61090	R-GOK-425+R-WO-48100+R-K08L40	R-GOK-425+R-WW-5075
480	R-GOK-425+R-WX-48T100	R-GOK-425+R-WO-48T100	R-GOK-425+R-WBT-61100	R-GOK-425+R-WO-48120+R-K08L40	R-GOK-425+R-WW-5090
500	R-GOK-425+R-WX-48T120	R-GOK-425+R-WO-48T120	R-GOK-425+R-WBT-61120	R-GOK-425+R-WO-48140+R-K08L40	R-GOK-425+R-WW-5120
520	R-GOK-425+R-WX-48T140	R-GOK-425+R-WO-48T140	R-GOK-425+R-WBT-61140	R-GOK-425+R-WO-48160+R-K08L40	R-GOK-425+R-WO-48140
540	R-GOK-525+R-WX-48T050	R-GOK-525+R-WO-48T060	R-GOK-525+R-WBT-61075	R-GOK-525+R-WO-48080+R-K08L40	R-GOK-525+R-WW-5055
560	R-GOK-525+R-WX-48T070	R-GOK-525+R-WO-48T080	R-GOK-525+R-WBT-61090	R-GOK-525+R-WO-48100+R-K08L40	R-GOK-525+R-WW-5075
580	R-GOK-525+R-WX-48T100	R-GOK-525+R-WO-48T100	R-GOK-525+R-WBT-61100	R-GOK-525+R-WO-48120+R-K08L40	R-GOK-525+R-WW-5090
600	R-GOK-525+R-WX-48T120	R-GOK-525+R-WO-48T120	R-GOK-525+R-WBT-61120	R-GOK-525+R-WO-48140+R-K08L40	R-GOK-525+R-WW-5120
620	R-GOK-525+R-WX-48T140	R-GOK-525+R-WO-48T140	R-GOK-525+R-WBT-61140	R-GOK-525+R-WO-48160+R-K08L40	R-GOK-525+R-WO-48140
640	R-GOK-625+R-WX-48T050	R-GOK-625+R-WO-48T060	R-GOK-625+R-WBT-61075	R-GOK-625+R-WO-48080+R-K08L40	R-GOK-625+R-WW-5055
660	R-GOK-625+R-WX-48T070	R-GOK-625+R-WO-48T080	R-GOK-625+R-WBT-61090	R-GOK-625+R-WO-48100+R-K08L40	R-GOK-625+R-WW-5075
680	R-GOK-625+R-WX-48T100	R-GOK-625+R-WO-48T100	R-GOK-625+R-WBT-61100	R-GOK-625+R-WO-48120+R-K08L40	R-GOK-625+R-WW-5090
700	R-GOK-625+R-WX-48T120	R-GOK-625+R-WO-48T120	R-GOK-625+R-WBT-61120	R-GOK-625+R-WO-48140+R-K08L40	R-GOK-625+R-WW-5120
720	R-GOK-625+R-WX-48T140	R-GOK-625+R-WO-48T140	R-GOK-625+R-WBT-61140	R-GOK-625+R-WO-48160+R-K08L40	R-GOK-625+R-WO-48140
740	R-GOK-725+R-WX-48T050	R-GOK-755+R-WO-48T060	R-GOK-725+R-WBT-61075	R-GOK-725+R-WO-48080+R-K08L40	R-GOK-725+R-WW-5055
760	R-GOK-725+R-WX-48T070	R-GOK-725+R-WO-48T080	R-GOK-725+R-WBT-61090	R-GOK-725+R-WO-48100+R-K08L40	R-GOK-725+R-WW-5075
780	R-GOK-725+R-WX-48T100	R-GOK-725+R-WO-48T100	R-GOK-725+R-WBT-61100	R-GOK-725+R-WO-48120+R-K08L40	R-GOK-725+R-WW-5090
800	R-GOK-725+R-WX-48T120	R-GOK-725+R-WO-48T120	R-GOK-725+R-WBT-61120	R-GOK-725+R-WO-48140+R-K08L40	R-GOK-725+R-WW-5120
820	R-GOK-725+R-WX-48T140	R-GOK-725+R-WO-48T140	R-GOK-725+R-WBT-61140	R-GOK-725+R-WO-48160+R-K08L40	R-GOK-725+R-WO-48140
840	R-GOK-725+R-WX-48T160	R-GOK-725+R-WO-48T160	R-GOK-725+R-WBT-61160	R-GOK-725+R-WO-48180+R-K08L40	R-GOK-725+R-WO-48160
860	R-GOK-725+R-WX-48T180	R-GOK-725+R-WO-48T180	R-GOK-725+R-WBT-61180	R-GOK-725+R-WO-48200+R-K08L40	R-GOK-725+R-WO-48180
880	R-GOK-725+R-WX-48T200	R-GOK-725+R-WO-48T200	R-GOK-725+R-WBT-61200	R-GOK-725+R-WO-48240+R-K08L40	R-GOK-725+R-WO-48200
900	R-GOK-725+R-WX-48T240	R-GOK-725+R-WO-48T240	R-GOK-725+R-WBT-61240	R-GOK-725+R-WO-48240+R-K08L40	R-GOK-725+R-WO-48240
920	R-GOK-725+R-WX-48T240	R-GOK-725+R-WO-48T240	R-GOK-725+R-WBT-61240	R-GOK-725+R-WO-48300+R-K08L40	R-GOK-725+R-WO-48240
940	R-GOK-725+R-WX-48T240	R-GOK-725+R-WO-48T240	R-GOK-725+R-WBT-61300	R-GOK-725+R-WO-48300+R-K08L40	R-GOK-725+R-WO-48300
960	R-GOK-725+R-WX-48T300	R-GOK-725+R-WO-48T300	R-GOK-725+R-WBT-61300	R-GOK-725+R-WO-48300+R-K08L40	R-GOK-725+R-WO-48300
980	R-GOK-725+R-WX-48T300	R-GOK-725+R-WO-48T300	R-GOK-725+R-WBT-61300	-	R-GOK-725+R-WO-48300
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Rawlplug® ***Fasteners*** guarantee reliability of connections and maximal weather resistance. Our products, thanks to the use of appropriate materials and adoption of modern anticorrosion coating, pass even the hardest tests, matching the expectations of the most demanding clients. In our rich offer of screws characterized by extraordinary ease of installation, one may find perfect kind of connection for any kind of material and substrate.

Save time and minimize costs

In our offer of ***Direct Fastening Systems*** you may find, among others, highly effective pneumatically and gas powered nailers with accessories, compressors and an innovative and ergonomic rebar tier. We invite you to familiarize yourselves with the capabilities of Rawlplug® tools, which can significantly increase the comfort and effectiveness of work at any construction site.

Maximal effect of optimal offer

In order to ease the application and proper use and installation of our products, we supplement the our assortment of fixings with a precisely composed offer of ***Power Tool Accessories***. They include, among others, European-made drills of the highest quality, as confirmed with a Sichersafe certificate. We invite you to familiarize yourselves with our offer of accessories for professional installation techniques of the Rawlplug® brand.

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Rawlplug ***POS Essential Offer*** it is a unique and complete solution designed for product exposition in building wholesale and retail stores. The POS system is based on easily configurable rack components enhanced with expansive information elements and additional decorations, as well as a combination of individual packages in form of innovative Rawlplug Bag and cutting-edge cardboard boxes.

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