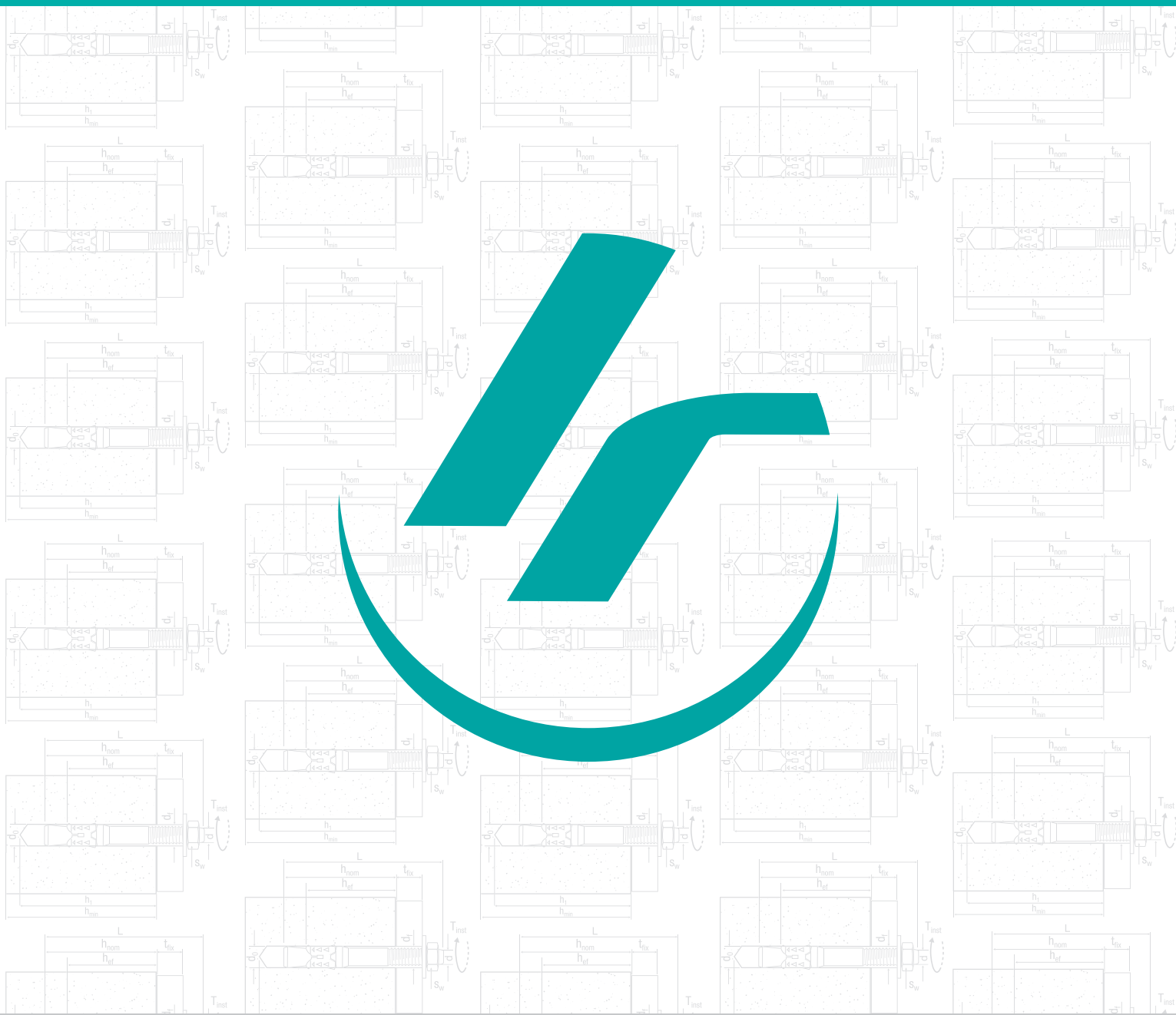
ETANCO®

PRODUCTS CATALOG



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ASELO AS

HISTORY OF ETANCO

Intensive acquisitions

1952 — **Establish Les Ateliers LR Etanco by grandfather the current CEO**

1964 — **PLASTIFORM'S** Takeover
New activity directions

1989 — **LRD** Rise
Large investments, including the development of the Aubergenville logistics center.

1990-1996 — **ETANCO BNL** Rise
The decade of the 90s is a dynamic expansions outside France (e.g. Germany, Italy, Belgium)

BOL-FM Takeover
Si. COP Etanco It Rise
R-FIXations Rise

2000 — **LRM Industries** Rise
Large investments in new technologies: Plastics moulding, Zamac technology

2007 — **Etanco LE PECQ** New headquarters
Dynamic development: New Headquarter erection in Le Pecq near Paris. Management office, competence centers, product development.

2008 — **FRIULSIDER** Takeover
The second big brand in the Etanco group. Factory located in Italy.

2017 — **Etanco Polska** (ex Gunnebo fastening Polska)
We are in the Etanco Group!
Acquisition of Gunnebo Fastening System Polska.

2018 — **IT FIXINGS** Takeover
Acquisition ot the innovative manufacturer fasteners thermal insulation.

ETANCO IN EUROPE

SALES OFFICES

FRANCE
- Head office Etanco
- Etanco France
- R-FIX - Reunion island

ITALY
- Si. Cop Etanco s.r.l
- Friulsider SpA - Italy

POLAND
- Etanco PL

BELGIUM
- Etanco Benelux

GERMANY
- Etanco GmbH

GREAT BRITAIN
- Friulsider UK

ROMANIA
- Etanco RO

SPAIN
- Etanco

PRODUCTION PLANTS ETANCO

LEGEND: Sale office Production plant

FRANCE

Aubergenville (ETANCO & LRMI)
- Plastic moulding
- Screws production
- Zamac injection technology
- Light ventilated facade

Magnac-Bourg (Plastiform's)
- Polymer foams working

St Germain-les-Belles (LRD)
- Co-extrusion
- Stamping

ITALY

San Giovanni al Natisone (Friulsider)
- Anchor production
- Plastic moulding
- Screws production

POLAND

Orneta (Etanco Poland)
- Screws production
- Plastic moulding

ETANCO IN POLAND

ORNETA
Production plant
Customer service office

ul. Olsztyńska 30
11-130 Orneta

+48 55 242 29 26
info@etanco.pl

WARSZAWA
Sales, Marketing,
Product development

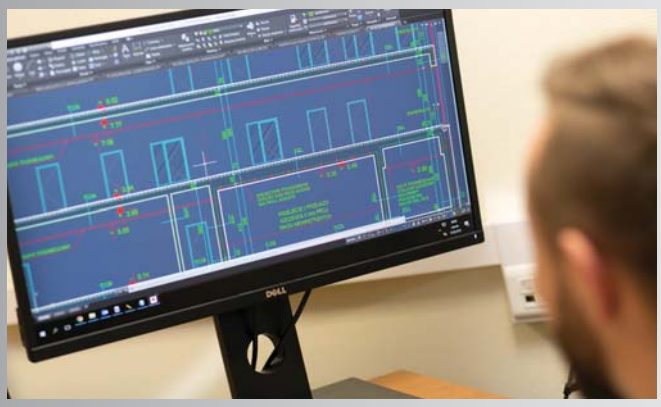
Karczunkowska
Office Park
ul. Karczunkowska 46
02-871 Warszawa

+48 22 506 52 02
info@etanco.pl

ETANCO Poland – Production plant in Orneta has been the manufacturer of fasteners since 1997. ETANCO customers are supported by a strong and well-coordinated teams of salesforces, customer service department and technical office at every phase of the investment. The management is located in Orneta and in Warsaw.

Product development department is constantly working on new innovative products and continuously improvement of the existing products range. Researches, analyzes, surveys, meetings – all activities focused on meeting the needs of ETANCO customers. During product development process, the company uses own experience gained on the basis of many years of activities on the market as well as the experience of European partners present in the group.

Thanks to Poland's joining the ETANCO group, new markets and new opportunities are discovered. Elements of the substructure of ventilated facades, safety systems for people working at height are new product lines available soon. Considerable attention is paid to the development of the range of professional anchor products from sister brand FRIULSIDER, which are successively implemented on the Polish market under the ETANCO brand.



ETANCO is distinguished by professional service provided by **Technical office**. A competent and experienced team of engineers supports the client at every stage of the investment. Starting from consultation at the tender stage, through calculations and quantitative product specification, ending with installation instructions and trainings.

Technical support of regional sales forces in the field ensure quick and individual contact at each jobsite location.

Customer Service Department located directly at the manufacturing plant in Orneta is responsible for execution of orders and providing current information about products and logistic.

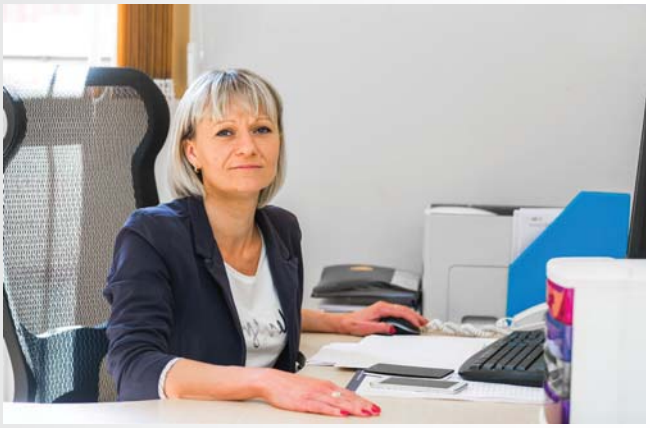
Technical support of regional sales forces in combination with stationary handling of orders are the basis for effective production planning which is reflected in optimal logistics and fast orders execution.

Innovation and creativity

Research and development department is constantly working on providing new innovative solutions.

Customer satisfaction

Our client, whoever it is, mobilizes all necessary departments and engage all expert knowledge for realization of project, regardless of its size and potential. Customer satisfaction is our daily priority.



Key competitive advantage of ETANCO fasteners is their quality. It is the derivative of several decades of experience in production of building fasteners and continuous improvement of production process carried out in all plants of the Etanco group, including Poland.

The highest possible quality standards at all stages of production guarantee a reliable fastening. When you look at the final product, you don't even suspect how complex processes it has undergone to be able to retain its usable properties for many years.

Galvanization

Galvanizing is performed based on technology of low-acid and alkaline, on automatic lines which allows achieving repeatability of the process, the highest quality parameters and high production efficiency.

Annealing of screws

All galvanized products undergo annealing process. Annealing process releases hydrogen from the material the screws have been produced from, thereby eliminating the corrosive phenomenon called "hydrogen embrittlement".

Assembling of washers

Washers are assembled automatically on screws before powder coating process.

Powder coating

Powder coating provides not only durable, UV resistant color, but also additional protection against corrosion. Modern technology of Powder.coat painting ensures durability of the coat during installation and long service life.

Packing

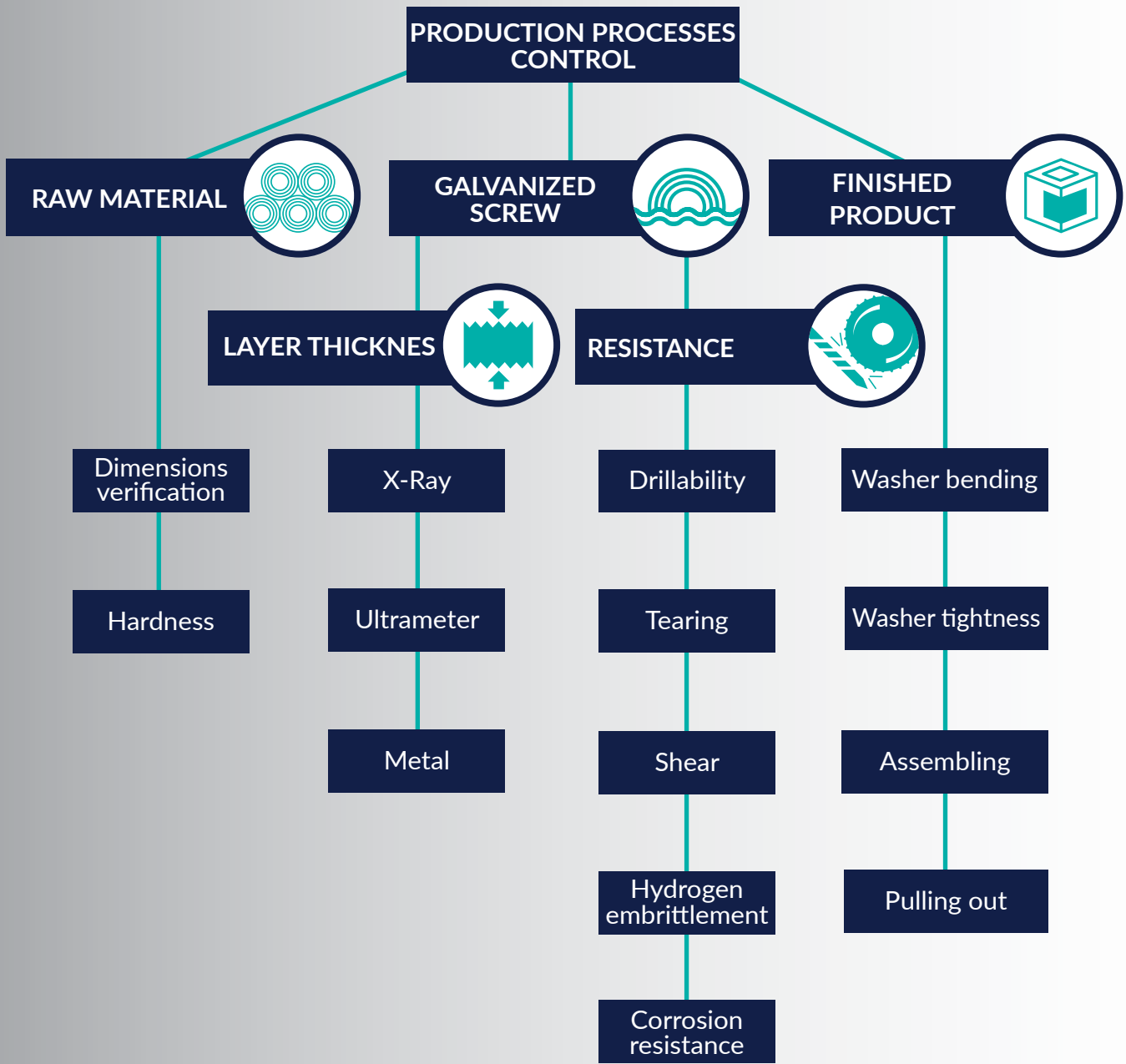
Large series of products are packed automatically. ETANCO can produce 5.5 million units of packaging supplies per year. Manual packaging provides the flexibility, which enables production of short product series.

Plastic moulding

Modern injection molding machines are used for the production of polypropylene telescopic sleeves, polyamide telescopic sleeves and expansion plugs. In total, it is already working at the plant in Orneta 5 modern injection molding machines with servo drive.

Strict quality policy of ETANCO would not be possible without proper laboratory background. Quality control laboratory is equipped with modern, certified control and measurement instrumentation of renowned producers. Quality control department monitors and registers every production stage. This practice guarantees the highest quality of ETANCO products.

Chart of quality control processes



Farmer Screws

Farmer screws are intended for fixing metal profiled sheets to a timber structure or for overlapping. The screws have a reduced drilling point or a sharp point and wood thread.

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Self-drilling and self-tapping screws for sheets

Self-drilling, self-tapping screws are intended for fixing profiled steel sheets to steel or concrete structures and for overlapping sheets. They have a drilling point from 3 to 25 mm and a thread for steel or a sharp end with a special thread for concrete.

Self-drilling and self-tapping screws for fixing sandwich panels with accessories

page 68

Double-thread screws are intended for fastening sandwich panels for steel or concrete structures.They have a drilling point from 6 to 25 mm and a thread for steel or a sharp end with a special thread for concrete. Accessories - saddle washers, longitudinal washers, caps, seals, etc.

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Fastening of flat roof hydro and thermal insulations

Plastic telescopic sleeves with self-drilling or self-tapping screws for steel, wood or concrete. The screws are covered with a special gRey.coat that ensures corrosion resistance of 15 Kesternich cycles (according to EAD).

Injection resins for anchoring in concrete and masonry as well as for post-installed rebars

Modern polyester, vinylester, hybrid and epoxy resins intended for anchoring threaded rods and rebars in concrete or masonry. Accessories - threaded rods, mesh sleeves, mixers, dispensers, etc.

page 138

FM 753

page 144

Wedge anchors for installation in cracked and non-cracked concrete

Universal wedge expansion anchors for use in cracked and non-cracked concrete (option 1 or option 7 according to EAD) Galvanized or Stainless steel A4.

Plastic anchors for all substrate categories

Frame anchors for use in all substrate categories (A B C and D according to EAD). High parameters in strong solid base materials, segment expansion in weak and hole substrates. Plastic plugs made of the highest quality polyamide.
A special screw is available galvanized or made of A4 stainless steel.

X3

page 146

FM X5

CORROSION AND PROTECTIVE COATINGS

Building fasteners are often responsible for the safety of the structure, therefore they must be made of the highest quality materials to ensure the required load resistance and durability parameters. The fastening, like all building elements, is constantly influenced by weather conditions. Connectors have relatively small dimensions, therefore they are primarily damaged by corrosion. The destruction of fasteners may even result in the loss of stability of the structure, therefore their durability is extremely important.

ETANCO fasteners are delivered with various anti-corrosion protections, corresponding to the corrosivity class of the environment and the planned durability period. In addition to traditional zinc coatings, or A2 or A4 stainless steel, the screws are also delivered with the innovative gRey coating. The fasteners covered with the gRey.coat show increased resistance to salt, water, chemical compounds, high temperature as well as contact galvanic corrosion.

The Powder.coat, paint coating on the screw heads provides additional protection against corrosion. The possibility of using the RAL palette allows for perfect adaptation to the painted elements.

In the quality control department, each production batch is checked for corrosion resistance through special tests in a salt chamber or Kesternich chamber, depending on technical requirements.

Correct selection of fasteners for the corrosive environment in which they are to be used is a key parameter influencing the safety of the structure. There are many types of corrosion. Fasteners for fastening elements of lightweight wall and roof cladding are particularly exposed to its two types: atmospheric and galvanic corrosion.

The selection of fasteners for the corrosive environment due to the aggressiveness of the atmosphere can be made on the basis of the EN-ISO 12944-2 standard. The description of individual corrosive environments is presented in Table 1.

When selecting fasteners should also be aware of galvanic corrosion. Galvanic corrosion occurs when there are at least two different metals in a corrosive environment that are in electrical contact. Then a galvanic cell is created in which one of the metals is the anode, the other is the cathode. The corrosion failure of a joint depends on several factors:

- positions of both metals in the voltage series (potential difference),
- surfaces of metal parts, contacting,
- the presence of a corrosive solution (e.g. sea water).

In the process of selecting fasteners, one should aim for a situation in which there are small cathode regions and large anode regions. This is the so-called cathodic protection. In practice, this means that the fasteners should always be made of a more noble material than the fixed elements of the structure. Table 2 presents unfavorable or neutral pairs, together with a commentary.

Table no. 1 Corrosivity categories according to EN-ISO-12944.2

Corrosivity category	Coating thickness weight loss (after 1 year of exposure)				Examples of typical environments in a temperate climate	
	Carbon steel		Zinc coating		outdoors	indoors
	g/m²	µm	g/m²	µm		
C1 Very low	< 10	< 1,3	< 0,7	< 0,1	Not present.	Heated building with a clean atmosphere, e.g. offices, shops, schools, hotels.
C2 Low	10 ÷ 200	1,3 ÷ 25	0,7 ÷ 5	0,4 ÷ 0,7	Atmosphere of small amount of impurities, mostly in rural areas	Unheated buildings where condensation may occur, such as warehouses, sport halls.
C3 Average	200 ÷ 400	25 ÷ 50	5 ÷ 15	0,7 ÷ 2,1	Urban and industrial atmosphere with an average amount of pollution With sulphur and carbon dioxide. Coastal areas with low salinity.	Production halls of high humidity level and low contamination of air, e.g. food, Production companies, breweries, laundries, dairy milk plants.
C4 High	400 ÷ 650	50 ÷ 80	15 ÷ 30	2,1 ÷ 4,2	Industrial and waterfront areas with medium salinity.	Chemical plants, swimming pools, shipyards and ports.
C5-I (industrial) Very high	650 ÷ 1500	80 ÷ 200	30 ÷ 60	4,2 ÷ 8,4	Industrial areas with high humidity and aggressive atmosphere	Buildings and other facilities with almost uninterrupted condensation and considerable air pollution.
C5-M (sea) Very high	650 ÷ 1500	80 ÷ 200	30 ÷ 60	4,2 ÷ 8,4	Coastal areas and islands of high salinity.	Buildings and other facilities with almost uninterrupted condensation and considerable air pollution.

Table no. 2 Selection of fasteners due to galvanic corrosion

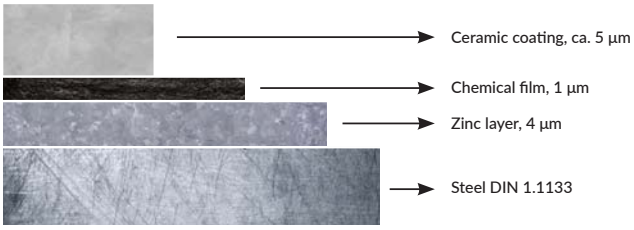
Structure material	Fastener material			
	Austenitic stainless steel	Galvanized steel	gRey.coat / 3DG	Brass
Austenitic stainless steel	AA	X	X	X
Galvanized steel	B	AA	AA	B
Steel and cast iron	B	AA	AA	B
Aluminum	B	X	A	A

AA No corrosion
A Possible fastener corrosion, contact in some cases allowed
B Possible structure material corrosion
X Possible fastener corrosion, contact not recommended

gRey.coat t:1000h Triple corrosion protection

Special triple layers gRey.coat protect steel fasteners against harmful environmental phenomena, as: acid rain, salt contamination etc.

gRey.coat layers t:1000h:



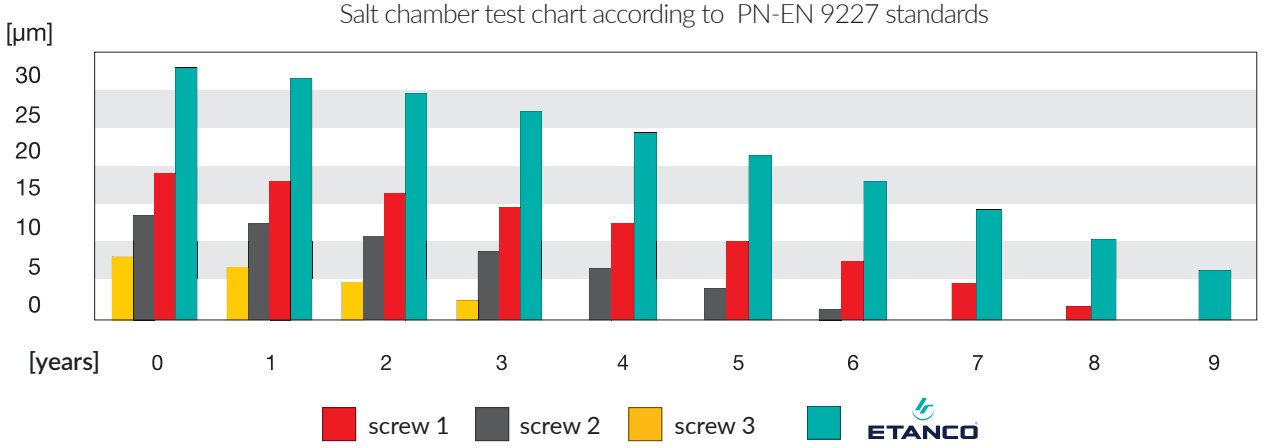
Characteristic of gRey.coat t:1000h:

- very high resistance to salt, water, chemicals, weather changes, etc.
- resistance for high temperatures, up to 200°C
- the highest resistance to corrosive gases
- salt chamber test up to 1000 h
- reduced risk of corrosion in contact with other material
- permanently adheres even to elements with complex shapes
- zinc protects steel against red corrosion
- chemical film makes the zinc porous, resulting better adhesion of the outer ceramic coating
- ceramic coating prevents against red corrosion and suppresses white corrosion

Objective research perform by independent, renowned laboratory confirm high quality of screws produced by ETANCO. The tested ETANCO fasteners, even after 72 hours in the salt chamber, retain their anti-corrosion properties and do not expose the roofing elements to rust at the fixing point. In the case of other fasteners with lower anti-corrosion protection, the roof might be repaired after a few years. Below a simulation of the corrosion resistance depending on the protective coating is presented. Modern research methods and the ISO 9001 quality system ensure continuous and strict control of the manufactured products and their repeatability.

Anticorrosion coating durability in average aggressive environments, depending on its thickness.

Salt chamber test chart according to PN-EN 9227 standards



Corrosion resistance chart

LEGEND

- Structure material: steel
- Structure material: profiled steel sheet
- Structure material: concrete
- Structure material: masonry
- Structure material: Timber
- Structure material: autoclaved concrete
- Thermal insulation
- Structure material: Cold-rolled steel profile
- Structure material: hot rolled steel
- Cross-socket head type PH
- Hex head
- Head with TORX socket
- Head with pozidriv PZ socket
- Head height 1mm
- Hex head with TORX socket
- Maximum drilling capacity for overlapping
- Maximum drilling capacity
- Thickness of HDG zinc coating
- Thickness of galvanized coating
- Additional corrosive protection: gRey.coat
- Product made from hardened carbon steel
- Product made of stainless steel
- Special anti-corrosion coating corresponding to at least 15 Kesternich cycles
- Product made of aluminum
- Product made of copper
- Made of high-quality nylon (polyamide)
- Made of high quality polypropylene
- The product contains UV stabilizers
- Product made of two materials, aluminum and stainless steel
- Product coated with aluminum-zinc
- Bimetal screw (dril point with hardened steel on stainless steel bolt)
- The ring-shank of the nail
- The twisted shank of the nail
- Rolled nail shank
- The square profile (swedish)
- The thickness of the powder painting coat
- The thickness on epoxy paint finish
- Can be paint with epoxy paint
- Can be paint with powder paint
- Powder ammunition in disk
- Nails for powder dynamic actuation
- This product requires pre-drilling
- This product does not require pre-drilling
- Torque
- The recommended screwdriver rpm for screw installation
- Minimum thickness of the fixing layers
- Maximum thickness of fixing elements.
- Maximum drilling capacity of the screw.
- Minimum anchoring depth
- Minimum thickness of the sheet applied to timber substrate
- Maximum drilling capacity for two elements
- Maximum thickness of fixing elements MTmax
- Maximum drilling capacity of two elements: Sandwich panel to the steel structure
- Thickness range of used sandwich panels
- Maximum drilling capacity for two elements: steel sheet to steel structure
- Minimum thickness of steel structure
- Ribbed cup head, milling
- Countersunk head, milling
- Cut point prevents wood splitting
- Milling cuts
- Ribbed shank
- Round shank profile
- Structure material: aluminum
- C1 Seismic certificate
- C1 and C2 Seismic certificate
- Calculation engineering software
- Diamond core drilling
- Cracked concrete
- Post-installed rebar

HOW TO READ THE TABELS?

Article number in the ETANCO designation system

Approvals and certificates

Descriptive product name

Description of fastener features

Approximate product image

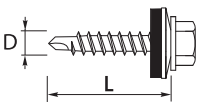
Description of the application of product

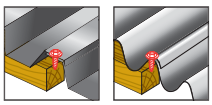
GTX FO2 S14

BIMETAL STAINLESS FARMER EPDM SCREW

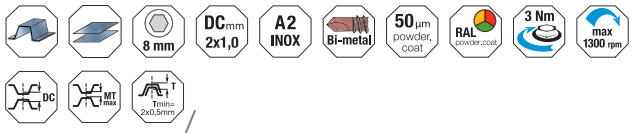
Drilling, self-tapping screws made of austenitic steel, with reduced drilling point, wood thread and hex washer head, provided with a stainless washer with vulcanized.

Designed for OVERLAPPING of thin profiled steel sheets. In aggressive environments.





Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170200PL	4.8	20	8	7	2x1.00	S	14	250/6/1500



Pictures for potential applications of fasteners

Icon characterizing the key features parameters of the fasteners (see the key)

Number of pieces in an individual package/ number of individual package in carton/ total number of carton

Simplified technical drawing with basic dimensions

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170200PL	4.8	20	8	7	2x1.00	S	14	250/6/1500

Artilce numer in ETANCO designation system

Basic dimensions of the product in milimeters

Maximum thickness of the fastened material

Maximum drilling capacity

Washer material, size

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4. FIXINGS FOR WOOD STRUCTURES

5. CONSTRUCTION FIXINGS - NAILS

FASTENING SYSTEMS FOR ROOFS AND CLADDING

SELF-DRILLING AND SELF-TAPPING SCREWS

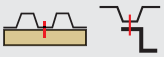
- FARMER SCREW
- SELF-TAPPING SCREW
- MONTAGE SCREW
- SELF-DRILLING SCREW
- SELF-TAPPING SCREWS FOR CONCRETE AND TIMBER
- SELF-DRILLING SCREWS FOR SANDWICH PANELS
- ACCESSORIES

SELECTION OF FASTENERS [1]

ROOF PROFILED SHEETS FIXING

Application type	Example of fixing	Minimum thickness of the fixed steel sheets	Maximum thickness of the fixed steel sheets	Environment corrosion class*		
		T min	T max	C3**	C4	C5 I/M
overlapping		2 x 0,5 mm	2 x 1,0 mm	LR GTF 02 P GT O2	–	GTX FO2
		2 x 0,5 mm	2 x 0,63 mm	–	GTZ FO2	–
fixing of steel on timber structure		1 x 0,5 mm	2 x 1,0 mm	LR GTF HD GTF P	–	GTX F2
		hef min. 20 mm				
		1 x 0,5 mm	2 x 0,75 mm	GT FS	–	–
		hef min. 20 mm				
fixing of aluminum roof profiled sheets on timber structure		1 x 0,5 mm	2 x 1,0 mm	–	GTZ F2	–
		hef min. 20 mm				

OVERLAPPING OF STEEL SHEETS AND FIXING TO STEEL OR TIMBER STRUCTURE

Application type	Example of fixing	Minimum thickness of the fixed steel sheets	Maximum thickness of the fixed steel sheets	Environment corrosion class*		
		T min	T max	C3**	C4	C5 I/M
overlapping		2 x 0,50 mm	2 x 1,00 mm	GT O2	GTR O2	GTX FO2
		2 x 0,75 mm	2 x 1,25 mm	GT O3 FH	–	–
fixing of steel sheets to steel thin-wall or timber structure		2 x 0,63 mm	2 x 1,50 mm	GT A	–	–
		hef min. 30 mm				

FIXING OF PROFILED STEEL SHEET TO STEEL STRUCTURE

Application type	Example of fixing	Minimum structure thickness	Maximum structure thickness	Environment corrosion class *		
		T min	T max	C3**	C4	C5 I/M
fixing steel sheets to steel thin-wall structure		1,00 mm	3,00 mm	–	GTS-STAR	–
		1,00 mm	3,00 mm	GT 3 GT 3 HD	GTR 3	GTX 3
		1,50 mm	5,00 mm	GT 5	GTR 5	–
		1,50 mm	5,00 mm	GT 5 FH	–	GTX 5
		2,50 mm	6,00 mm	GT 6	–	–
fixing steel sheets to hot-rolled steel construction		2,00 mm	8,00 mm	GT 8	GTR 8	–
		4,00 mm	12,00 mm	GT 12 GT 12 FH	GTR 12	GTX 12
		5,00 mm	16,00 mm	–	GTR 16	–
		5,00 mm	25,00 mm	–	GTR 25	–
		3,00 mm	limited maximum fastener threading capacity depending on steel grade	GT B	–	–

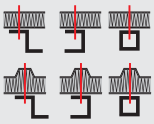
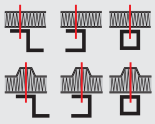
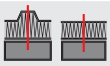
1) the following classification of fasteners to a given corrosivity class of the environment C1, C2, C3, C4, C5 I / M applies to the case where only the heads of the fasteners are exposed to the corrosive environment.

SELECTION OF FASTENERS [1]

FIXING THIN STEEL SHEET AND PLASTIC ELEMENTS

Application type	Example of fixing	Minimum thickness of the fixed steel sheets	Maximum thickness of the fixed steel sheets	Environment corrosion class*		
		T min	T max	C2	C3	C4
fastening very thin steel and plastic elements to wooden elements or steel profiles		0,50 mm	0,90 mm	GM-S	–	–
		0,50 mm	0,90 mm	GM-S	–	–
fastening thin steel elements or to steel profiles or overlapping		0,50 mm	2,25 mm	GM-B	–	–
fixing thin aluminum elements to wooden elements		0,50 mm	0,90 mm	–	–	GMZ-S

SANDWICH PANEL INSTALLING

Application type	Example of fixing	Minimum structure thickness	Maximum structure thickness	Environment corrosion class *		
		T min	T max	C3**	C4	C5 I/M
fixing of sandwich panels to steel thin-wall structure		1,20 mm	4,00 mm	–	–	DRILLNOX DF 4
		1,00 mm	6,00 mm	GT 6 SP	GTR 6 SP	GTX 6 SP
fixing of sandwich panels to hot rolled steel structure		3,00 mm	12,00 mm	GT 12 SP	GTR 12 SP	GTX 12 SP
		4,00 mm	12,50 mm	–	–	DRILLNOX DF 12,5
			16,00 mm	–	GTR 16 SP	–
			25,00 mm	–	GTR 25 SP	–
fixing of sandwich panels to concrete		60 mm (hef 30 mm)	–	–	GTR W SP	–
fixing of sandwich panels to timber		30 mm (hef 30 mm)	–	–	GTR W SP	–

STEEL SHEETS INSTALLING ON ALUMINUM

Application type	Example of fixing	Minimum structure thickness	Maximum base thickness	Environment corrosion class *		
		T min	T max	C3	C4	C5 I/M
fixing of aluminum sheets to aluminum		1,00 mm	3,00 mm	–	–	GTX 3 AL
fixing glazing facade systems mullion-transom to the aluminum structure		1,50 mm	5,00 mm	–	GTZ5 AGF	GTZ5 AGF

STEEL SHEETS INSTALLING

Application type	Example of fixing	Minimum thickness of fixed steel sheets	Maximum thickenss of the fixed steel sheets	Environment corrosion class *		
		T min	T max	C3	C4	C5 I/M
for fixing steel sheets in concrete*** or timber		0,63 mm	2,0 mm	–	GTR W GTR W FH	-
		0,63 mm	2,0 mm	–	GTR W GTR W FH	-
		hef min. 30 mm				

* fasteners qualified for a higher corrosivity class may be used in lower environmental corrosivity classes

** applies to fasteners protected with a powder.coat polyester paint coating with a minimum thickness of 50 µm. Fasteners without paint coating are intended for use in environments with atmospheric corrosivity categories C1, C2.

*** In concrete structure should be pre-drilled hole with diameter: 5 [mm]

FARMER SCREW

PAINT COAT POWDER.COAT 50MM

- significant additional protection against corrosion allowing the use of fasteners in an environment of corrosive atmosphere C3
- perfect match to the color of the roofing
- UV stabilizers - unchanged color even a dozen years after
- modern technology of Powder.coat painting assures durability of the coating in the process of installation and long service life

ETANCO

- European manufacturer of fasteners & systems for the envelope of the buildings.
- characteristic marking of ETANCO products allows their easy identification
- strict production control carried out by the in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification
- all products have valid reference documents developed in collaboration with renowned research institutes

STEEL WASHER

- special shape of aluminum washer guarantees proper alignment of sealing material EPDM

ZINC COATING DURA.ZINC

- most basic protection against corrosion
- zinc coating thickness of 20 microns guarantees high quality
- modern galvanizing plant ensures the highest quality of protective coating against corrosion

EPDM WASHER

- made of the best sealing material
- does not lose elasticity in time, very long period of ageing
- resistant to changing weather conditions and UV radiation
- self-vulcanizes on the sheet after installation, forming a tight connection
- retains its properties under the influence of temperature in the range of -50°C to +100°C

SELF-DRILLING TIP DRILL.POINT

- special design of self-drilling tip ETANCO Drill.point
- optimal steel sheet drilling in shortest time
- protective layer of zinc coating does not wear off during sheet drilling
- drillability DC max 2 x 1,0 mm

FARMER SCREWS PAN HEAD

PAINT COAT POWDER.COAT 50µm

- significant additional protection against corrosion allowing the use of fasteners in an environment of corrosive atmosphere C3
- perfect match to the color of the roofing
- UV stabilizers - unchanged color even a dozen years after
- modern technology of Powder.coat painting assures durability of the coating in the process of installation and long service life

ETANCO

- European manufacturer of fasteners & systems for the envelope of the buildings.
- characteristic marking of ETANCO products allows their easy identification
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- each production batch is assigned a unique number, which allows its precise identification
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HEAD SHAPE

- modern shape of the head with TX-20 socket gives aesthetic look to the connection
- It adapts perfectly to the surface of a fixture
- design of the underside of the head is closely fitted to shape of the profiled washer

METAL WASHER

- special shape of aluminum washer ensures proper placement of the EPDM on the surface of the fixed element
- material of the washer provides extra resistance against long use

ZINC COATING DURA.ZINC

- key basic protection against corrosion
- zinc coating thickness of 20 microns guarantees high quality
- modern galvanizing plant ensures the highest quality of protective coating against

EPDM WASHER

- made of the best sealing material
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- self-vulcanizes on the sheet after installation, forming a tight connection
- retains its properties under the influence of temperature in the range of -50°C to +100°C

SELF-DRILLING TIP DRILL.POINT

- specially designed self-drilling tip ETANCO Drill.point
- optimum plate drilling in a short time
- protective layer of zinc coating does not peel during sheet drilling
- drillability 2 x 1,0 mm

THREAD

- shape of the thread optimally matched to the structure of roof truss, ensuring the highest strength parameters

SELF-DRILLING SCREWS FOR SANDWICH PANELS

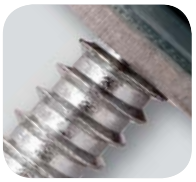
ETANCO

- European manufacturer of fasteners & systems for the envelope of the buildings.
- the ETANCO products can be easily identified through their characteristic marking

- strict production control carried out by the in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification
- all products have valid reference documents developed in collaboration with renowned research institutes

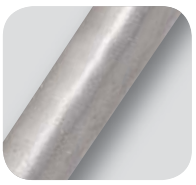
METAL WASHER

- special shape of steel washer ensures proper placement of the EPDM sealing material.



THREAD UNDER SCREW HEAD

- additional thread of larger diameter ensures proper placement of EPDM washers on thin steel sheets of sandwich panels



CERAMIC COATING GREY.COAT

- is the best protection against corrosion with high drilling capacities
- enables the use of fasteners in adverse conditions
- for use in environments with corrosivity classes C1– C4

GTR W SP

- specially designed drilling point together with hilo thread, allows direct installing in timber and concrete (in case of concrete structure, predrilling with 5mm hole diameter is required).
- in conjunction with ULTRA expansion plug you can fix the screw in soft masonry materials such as silicate block, ceramic brick, hollow brick, aerated concrete.

WASHER EPDM

- made of the best sealing material - EPDM
- does not lose its flexibility over time. Very long period of ageing
- resistant to changing weather conditions and UV radiation
- self-vulcanizes on the sheet after installation, forming a tight connection
- retains its properties in temperatures between -50°C to +100°C

PAINT COATING POWDER.COAT

- Significant additional protection against corrosion
- a perfect match to the color of roofing material in the palette of RAL/NCS
- UV stabilizers - the unchanged color even after several years
- modern technology of Powder.coat painting ensures durability of the coat during installation and long service life

GTR 25 SP

- increased height of the head - protects the screw against breaking off of the head during installation
- increased diameter of the washer pressed under the head - ensures the proper distribution of the stresses
- the maximum capacity of the drilling DC=25 mm

- the 6,3 mm diameter of the fastener thread ensures very high tensile and shear strength

ETANCO

- European manufacturer of fasteners & systems for the envelope of the buildings
- the ETANCO products can be easily identified through their characteristic marking
- strict production control carried out by in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification
- products have ITB Technical Approval and confirmation of their quality is the certificate of Factory Production Control

EPDM WASHER

- made of the best sealing material - EPDM
- does not lose its flexibility over time. Very long period of ageing
- resistant to changing weather conditions and UV radiation
- self-vulcanizes on the sheet after installation, forming a tight connection
- retains its properties in temperatures between -50°C to +100°C

CERAMIC COATING GREY.COAT

- is the best protection against corrosion with high drilling capacities
- enables the use of fasteners in adverse conditions
- for use in environments with corrosivity classes C1-C4

INTEGRATED FLANGE HEAD

- integrated flange head increases the bearing surface of the fastener to the metal sheet, which increases the strength of tearing metal from the screw head

SPECIAL HILO THREAD

- specially designed hilo thread, allows direct installing in timber and concrete (in case of concrete structure, predrilling with 5mm hole diameter is required)

PRODUCT DESIGNATION

TYPE OF FASTENER:
- **T** TECNICA
- **M** montage screw

G T R 16 SP D x L

Material of the fastener:
- **No designation** - fastener made of ordinary carbon steel, galvanized
- **A** - aluminum screw
- **R** - screw made of standard carbon steel covered with gRey.coat
- **X** - BIMETAL screw made of stainless steel 1.4301
- **Z** - screw made of stainless steel 1.4301

Functions:
FARMER SCREWS:
- **F2** farmer screw
- **F02** farmer screws for overlapping
- **FS** fastener with sharp point

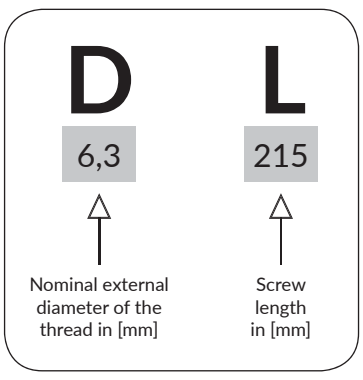
SELF TAPPING FASTENERS:
- **A** screw for timber or thin steel structures up to 3 mm
- **B** screw for steel structure thickness from 3 mm

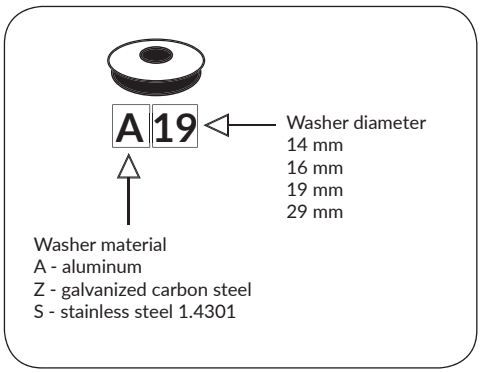
MONTAGE SCREWS:
- **S** montage screw without a drill
- **B** montage screw with a drill

SELF-DRILLING SCREWS:
- **3,5,6,8,12,16,25**
  Maximum drilling capacity of the screw
- **02,03**
  For overlapping steel sheets

SELF-DRILLING SCREWS FOR SANDWICH PANELS:
- **6,12,16,25**
  Maximum drilling capacity of the screw
- **W**
  For fixing in concrete or timber

Special features:
- **FH - FLANGE HEAD**
  Flange head screw
- **SP - SANDWICH PANEL**
  Screw for sandwich panels
- **AL - ALUMINUM**
  Screw for aluminum structures
- **AGF - ALUMINUM GLASS FACADES**
  Screw for aluminum-glass facades
- **HD - HEAVY DUTY**
  Screw with increased diameter
- **P - PANELS**
  Screw intended for fastening roof panels
- **STAR**
  Screw with flat hexagonal head



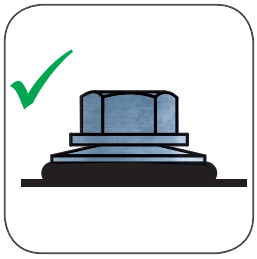


Installation guidelines

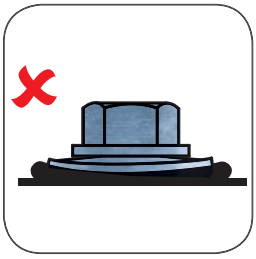
- fastener installation should always be perpendicular to the structure,
- fastener installation should be done by using a screwdriver equipped with adjustable clutch or embedding depth stop,
- during installation of the fastener, you should follow all recommended parameters for the type of fastener,
- any modification of fasteners, including cutting, is not allowed,
- in the event of any damage to the anticorrosion coating, defects must be secured (touched up),
- for installation of fasteners coated with paint it is recommended to use only ball-spring sockets.

WASHER SETTING RECOMMENDATION (FIXING OF THE STEEL SHEET)

Under driven

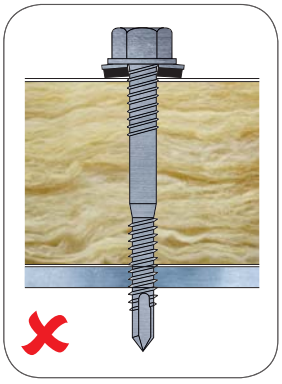


Correct

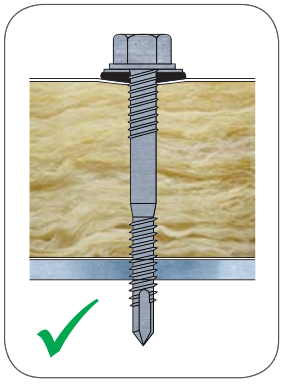


Over driven

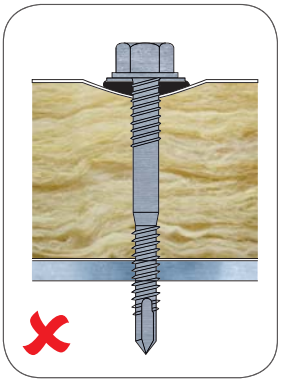
WASHER SETTING RECOMMENDATION (SANDWICH PANEL FIXING)



Under driven

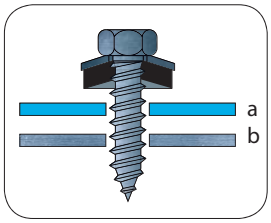


Correct

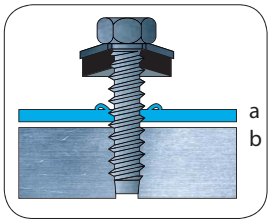


Over driven

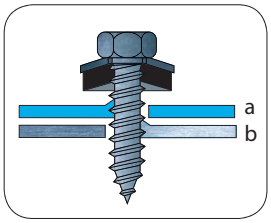
Self-tapping screws



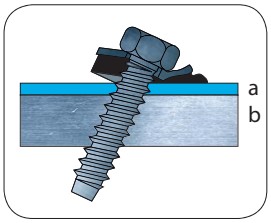
Too large diameter of the pre-drilling.
Result: no full load capacity of connection.



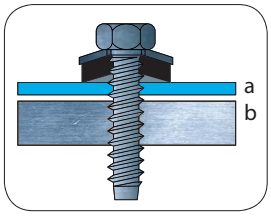
Too small diameter of pre-drilling. No tapping by fastener. Result: destruction of the thread, fastener fracture.



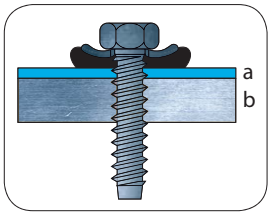
Hole shifted towards the screw axis. Result: no full load capacity of connection or broken



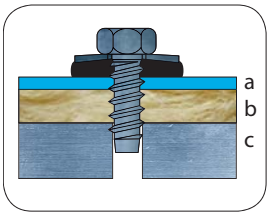
Installation at an angle.
Result: lack of tightness, no full load capacity



Fastener tightened with too little torque.
Result: lack of tightness in connection.

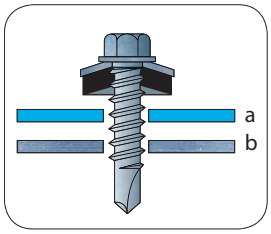


Fastener tightened with too much torque.
Result: lack of tightness in connection reduced load capacity of connection.

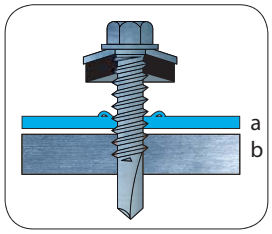


Fastener too short for the application.
Result: no full load capacity of connection.

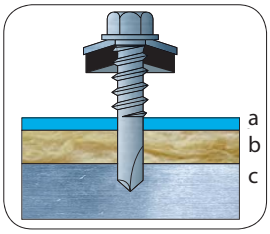
Self-drilling and self-tapping screws



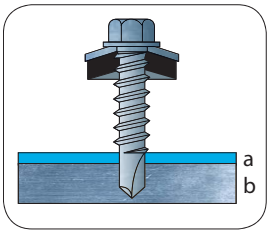
Drill point too large for the structure thickness.
Result: no full load capacity of connection.



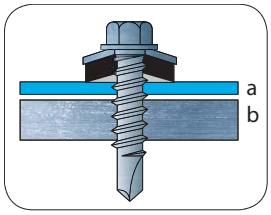
Drill point too short for the structure thickness. Broken fastener or partial destruction of the thread - reduced load capacity



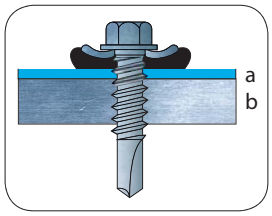
Drilling point too short. Threading of component "a" began, drilling in component "b" was not completed. Result: thread destruction, destruction of component "a", reduced load capacity.



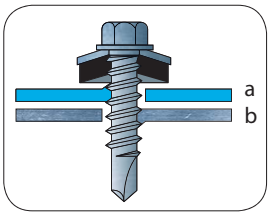
Drilling point too short. Drilling through component "b" impossible.



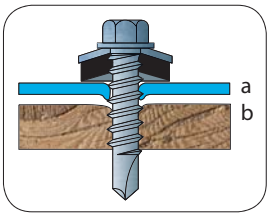
Fastener tightened with too little torque. Result: lack of tightness in connection.



Fastener tightened with too much torque. Result: lack of tightness in connection, reduced load capacity of connection.

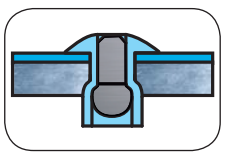


Hole shifted towards the screw axis. Result: no full load capacity of connection or broken fastener.

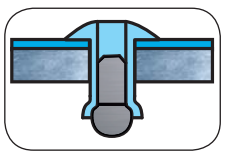


Fastener stuck into the structure. Result: bent, broken wood fibers, no tightness, no full load capacity.

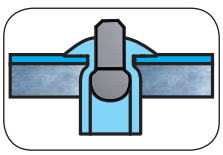
Rivets



Rivet fastened too tightly. Result: reduced load capacity of connection, possible



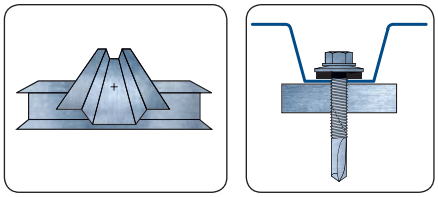
Rivet fastened too loose. Result: no durability of connection.



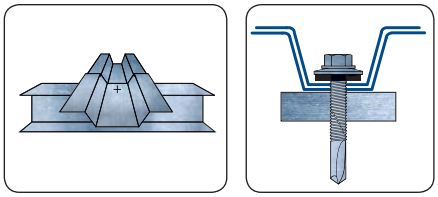
Installation hole of too large diameter. Result: no connection of components.

Possible fixing pattern

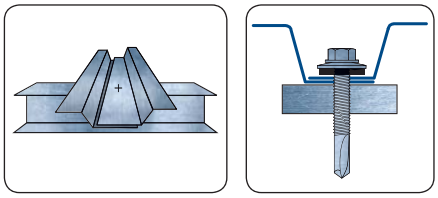
Fixing of one sheet



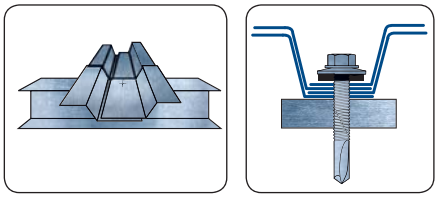
Fixing of two sheets with a crosswise overlap



Fixing of two sheets with a lengthwise overlap

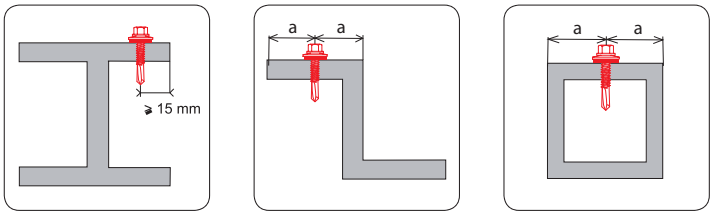


Fixing of four sheets with a lengthwise and crosswise overlap

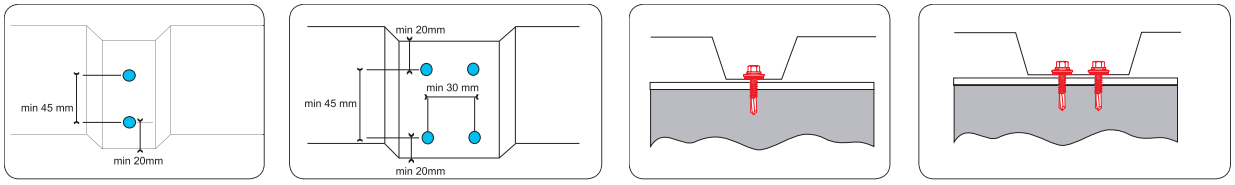


Rules for fixing metal sheets to structures (fixing point location)*

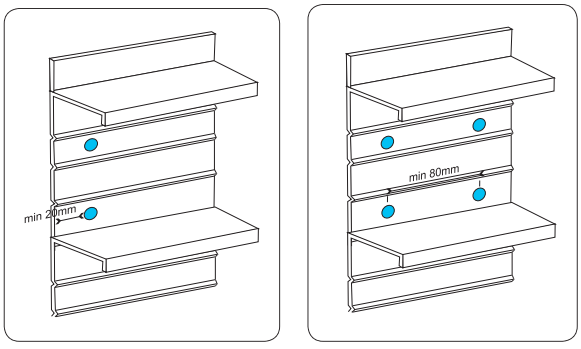
I. RECOMMENDED FASTENER DISTANCE FROM THE PROFILE EDGE



II. RECOMMENDED LOCATION FOR PROFILED STRUCTURAL TRAPEZE STEEL SHEETS



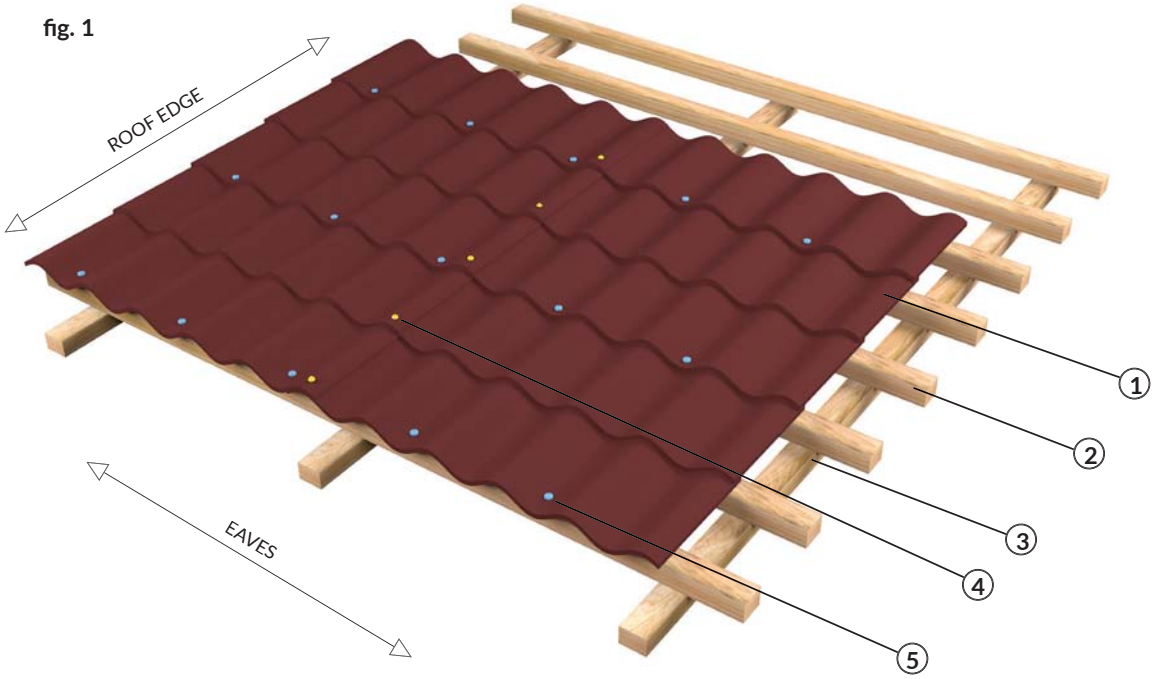
III. RECOMMENDED LOCATION OF WALL CASSETTE FIXING TO STEEL



*the number of screws according to the construction design

USE OF FARMER SCREWS FOR INSTALLATION OF ROOF PROFILED SHEETS ON TIMBER STRUCTURE

fig. 1



1. Roof profiled sheet
2. Batten
3. Rafter
4. Farmer screws for overlapping roof sheets (e.g. G 4,8 x 20) ●
5. Farmer screws for fixing of roof sheets on timber substrate (e.g. G 4,8 x 35) ●

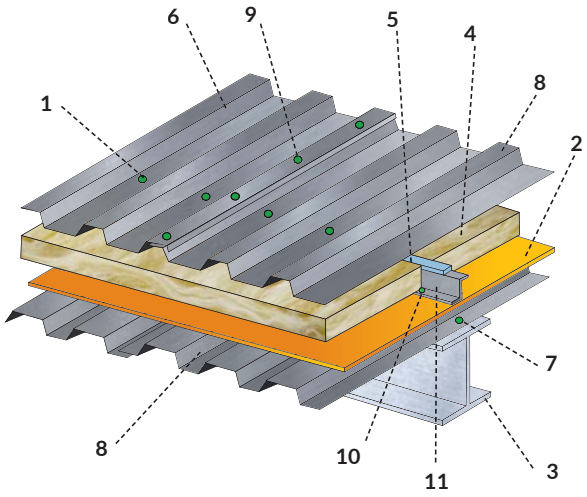
* average consumption of fasteners 6 - 7 pcs/m² of roofing

fig. 2

fig. 3

Figure 1 shows the recommended spacing of farmer screws. Roof sheet is fixed to the structure by farmer screws 4,8 * 35 in the lowest point of the wave (fig. 2). Roof sheets sections on lengthwise overlaps must be connected with 4,8 *20 screws at the highest point of the wave, just before the cross-embossing of the sheet.
On lengthwise overlaps of the roof sheets the screw must be placed above the capillary groove existing on the sheet underneath (fig. 3).
Roof profiled sheets must be fastened to timber structure to every second batten. On the fastening line the screws must be placed on every second wave. Screws for overlapping should be placed in every row of roof sheets on the overlap.
At the edge of the roof, roof sheets must be fixed to each batten. At the ridge the roof sheets must be fastened at each bottom wave. At the eaves line it should be fastened to at least every other bottom wave of the sheet. The cross overlap of the sheeting should be fastened to the batten at every bottom wave of the sheet. This way of installation ensures optimum functionality of the roofing. The presented method of fixing is an example and may not apply to all roofs.
If the roof profiled sheets manufacturer's installation instructions recommend other placement of screws than presented above, installation should be carried out in accordance with the instructions of the manufacturer of the roof sheets. If in doubt, take advice from the engineer or the technical department of the roof sheets manufacturer.

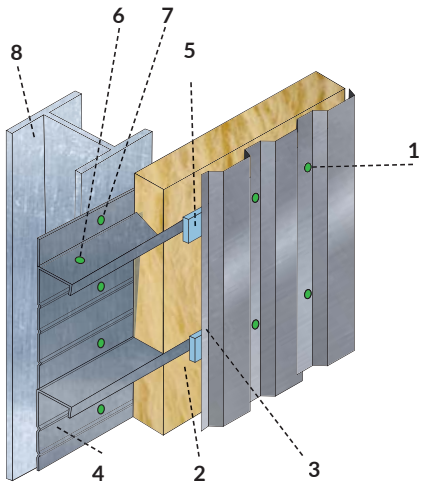
Example of roof covering structure



1. Screw for fixing steel sheet to steel structure*
2. Steam insulation
3. Purlin – double T profile
4. Thermal insulation
5. Insulating PE tape
6. Profiled steel sheet
7. Screw for fastening trapeze structural steel sheet to steel structure*
8. Profiled steel sheet
9. Screw for overlapping (e.g. GT O2)*
10. Spacing profile screw*
11. Z type cold bent spacing profile

* the screw type should be selected taking into account the required fixing parameters contained in the structural calculation and the information contained in the technical assessment.

Example of wall structure

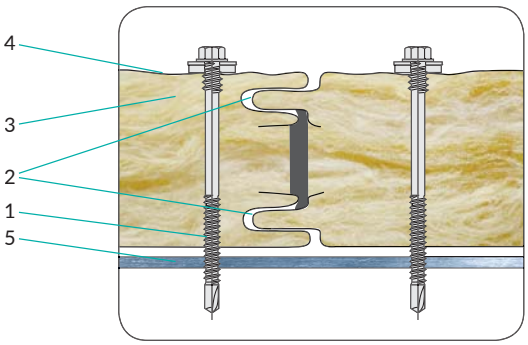


1. Screw for fixing the steel sheet to the cassette*
2. Thermal insulation
3. Profiled steel sheet
4. Wall cassette
5. PE insolation
6. Screw for overlapping (e.g. GT02)*
7. Screw for fastening profiled structural steel sheet to steel structure*
8. Pillar - double T profile

* the screw type should be selected taking into account the required fixing parameters contained in the structural calculation and the information contained in the technical assessment.

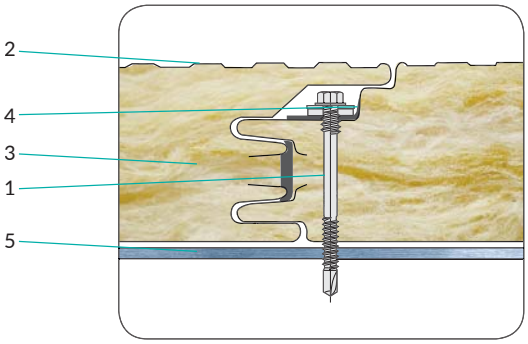
EXAMPLES OF USE OF FASTENERS FOR FIXING OF SANDWICH PANELS*

Fixing of a wall sandwich panel



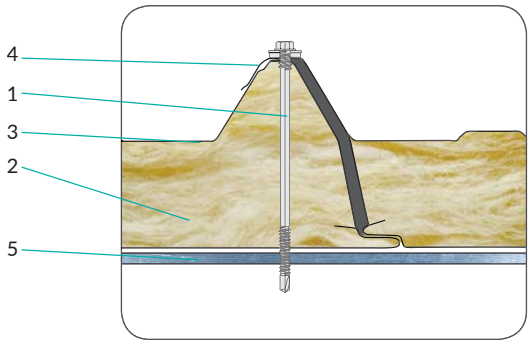
1. Screw
2. Panel scarf joint
3. Panel core (insulating material)
4. Panel lining
5. Substrate

Fixing of a wall sandwich panel with a covered joint

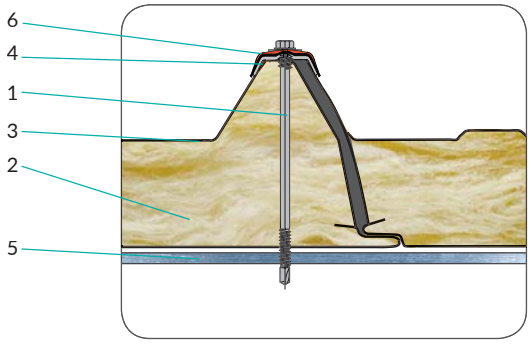


1. Screw
2. Panel lining
3. Panel core (insulating material)
4. Covered fastening
5. Substrate

Fixing of a roof sandwich panel



1. Screw
2. Panel core (insulating material)
3. Panel lining
4. Top scarf joint of the roof panel
5. Substrate

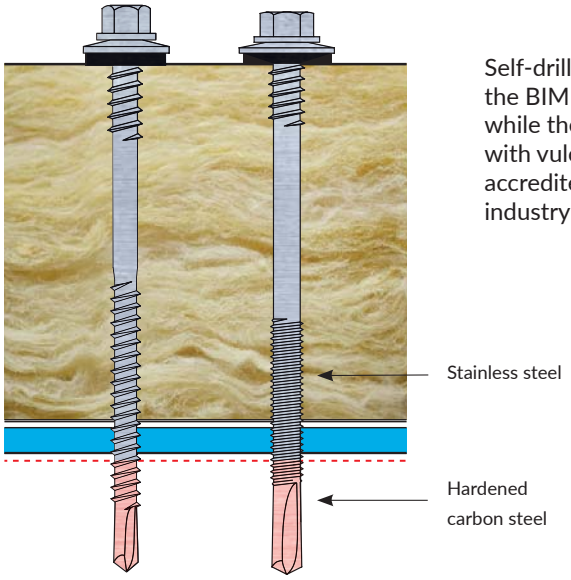


1. Screw
2. Panel core (insulating material)
3. Panel lining
4. Top scarf joint of the roof panel
5. Substrate
6. Saddle washer

* fixing point location according to the recommendations of the panel manufacturer

Use of fasteners for fixing sandwich panels in cold stores

Stainless steel self-drilling and self-tapping screws: GTX 6 SP and GTX 12 SP have undergone thermal conductivity assessment. Assessment included thermal insulation, resistance to freezing and water condensation. Assessment report confirms directly that screws GTX6 SP and GTX 12 SP are well-suited for installing sandwich panels in cold stores and freezers.



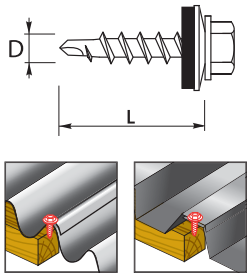
Self-drilling and self-tapping screws GTX and GTX SP are produced in the BIMETAL technology. The drilling element is made of carbon steel, while the tapping part and head of the screw together with washer with vulcanized EPDM are made of stainless steel. These fasteners are accredited by the National Institute of Hygiene for their use in the food industry and cooling (with no contact with food).

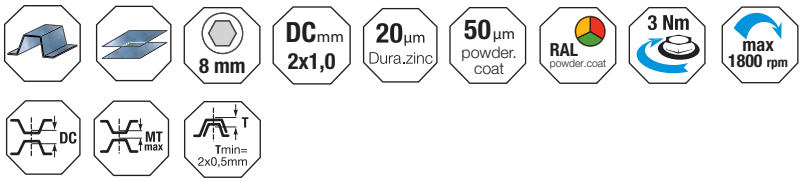
FARMER SCREW
WITH ALUMINUM WASHER

Self-drilling and tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point and hex head, with pre-assembled aluminum washer with vulcanized EPDM.

Intended for overlapping metal flat and profiled steel sheets.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P140200PL	4.8	20	8	7	2x1.00	A	14	250/6/1500



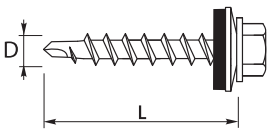


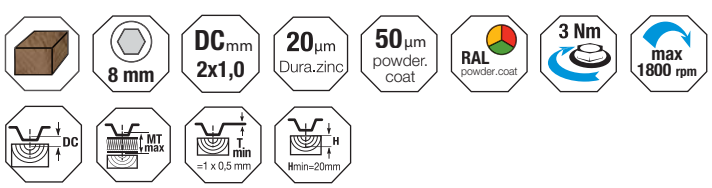
FARMER SCREW
WITH ALUMINUM WASHER

Self-drilling and tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point, thread for timber and hex head, with pre-assembled aluminum washer with vulcanized EPDM.

Intended for fastening profiled metal sheets to timber structures.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1400280PL	4.8	28	8	20	5	2x1.00	A	14	250/6/1500
P140350PL	4.8	35	8	20	12	2x1.00	A	14	250/6/1500
P1400600PL	4.8	60	8	20	37	2x1.00	A	14	100/6/600
P1400800PL	4.8	80	8	20	57	2x1.00	A	14	100/6/600





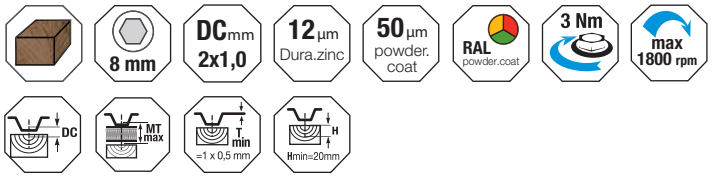
Self-drilling and tapping carbon steel screws, surface-hardened galvanized, with reduced drilling point, thread for timber and hex head, with pre-assembled steel washer with vulcanized EPDM.

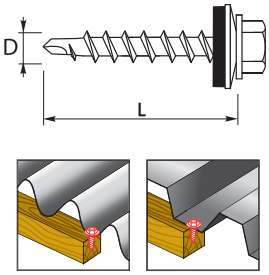
GT F2 Z14

FARMER SCREW
WITH STEEL WASHER

Intended for fastening profiled metal sheets to timber structures.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	Anchoring depth		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P140028OFA	4.8	28	8	20	5	2x1.00	Z	14	250/6/1500
P14035OFA	4.8	35	8	20	12	2x1.00	Z	14	250/6/1500
P140050OFA	4.8	50	8	20	27	2x1.00	Z	14	100/6/600
P140060OFA	4.8	60	8	20	37	2x1.00	Z	14	100/6/600
P140070OFA	4.8	70	8	20	47	2x1.00	Z	14	100/6/600
P140080OFA	4.8	80	8	20	57	2x1.00	Z	14	100/6/600
P140100OFA	4.8	100	8	20	77	2x1.00	Z	14	100/6/600





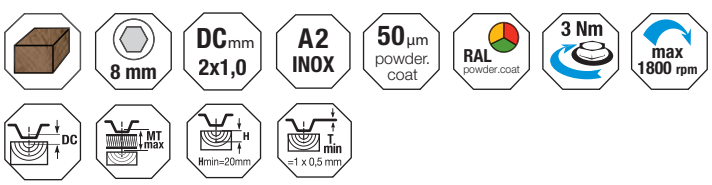
Self-drilling, tapping stainless steel screws, galvanized, with reduced drilling point, thread for timber and hex head, with pre-assembled steel washer with vulcanized EPDM.

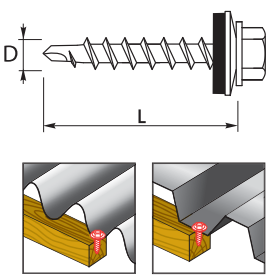
GTZ F2 S14

STAINLESS FARMER SCREW
WITH STAINLESS WASHER

Intended for fastening profiled aluminum sheets to timber structures.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	mm	[mm]	[mm]	-	[mm]	
P1740350PL	4.8	35	8	20	12	2x1.00	S	14	250/6/1500





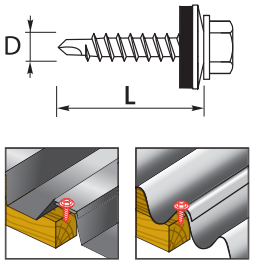
GTX FO2 S14

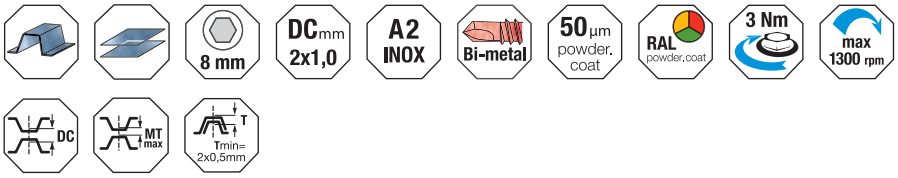
BIMETAL STAINLESS FARMER SCREWS WITH STAINLESS WASHER

Drilling, self-tapping screws made of austenitic steel, (BIMETAL) with a reduce drilling point, timber thread and hex washer head, provided with a stainless washer with vulcanized EPDM.

Intended for overlapping of thin profiled steel sheets in aggressive environments.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170200PL	4.8	20	8	7	2x1.00	S	14	250/6/1500





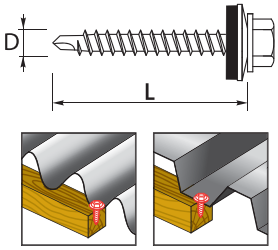
GTX F2 S14

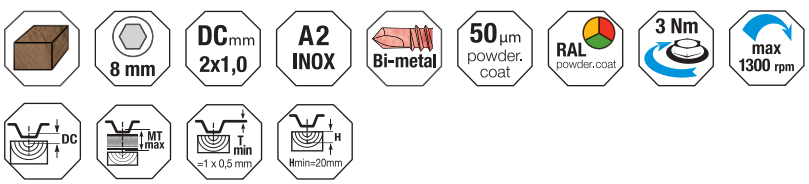
BIMETAL FARMER STAINLESS SCREWS WITH STAINLESS WASHER

Drilling, self-tapping screws made of austenitic steel (BIMETAL), with a reduce drilling point, timber thread and hex washer head, provided with a stainless washer with vulcanized EPDM.

Intended for fastening profiled metal sheets to timber structures, in the environment requiring increased anti-corrosion performance.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	mm	[mm]	[mm]	-	[mm]	
P170350PL	4.8	35	8	20	12	2x1.00	S	14	250/6/1500





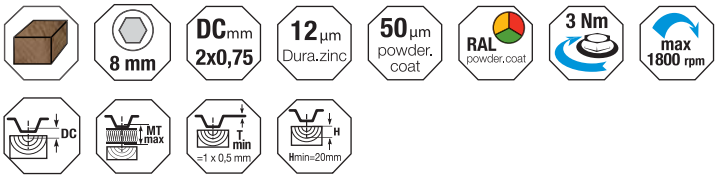
Drilling carbon steel screws, surface-hardened, galvanized, with thread for timber and hex head, with pre-assembled steel washer with vulcanized EPDM.

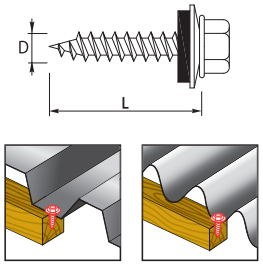
GT FS Z14

FARMER SCREWS WITH STEEL WASHER WITHOUT A DRILL POINT

Intended for fastening thin roof steel sheets to a timber structure.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P140025OFA	4.8	25	8	20	2	2x0.75	Z	14	250/6/1500





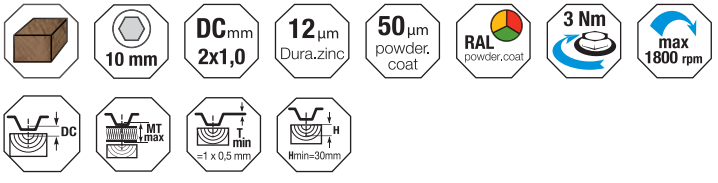
Self-drilling and self-tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point, thread for timber and hex head, with pre-assembled steel washer with vulcanized EPDM.

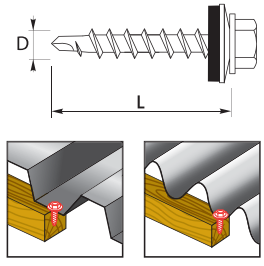
GT F HD Z16

FARMER SCREWS WITH STEEL WASHER

Intended for fastening roof platforms and communication elements to timber structure or as repair after removing the screws with the smaller diameter.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1416450OFA	6,4	50	10	30	16	2x1.00	Z	16	100/6/600
P1416470OFA	6,4	70	10	30	36	2x1.00	Z	16	100/6/600





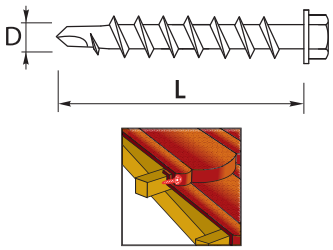
GT F2 P

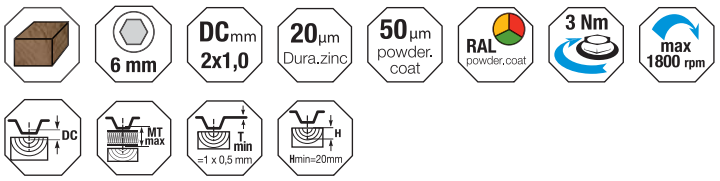
FARMER SCREWS WITHOUT WASHER FOR ROOFING PANELS

Self-drilling and tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point, thread for timber and hex head 6 mm.

Intended for fastening profiled metal sheets to timber structures

Index	Screw				MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	hef		DC	Mat.	Size	
	[mm]	[mm]	[mm]	mm	[mm]	[mm]	-	[mm]	
P14035M63PL	4,8	35	6	20	15	2x1.00	-	-	500/6/3000





GTF P

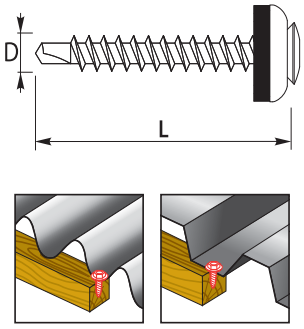
FARMER SCREWS PANHEAD WITH ALUMINUM WASHER

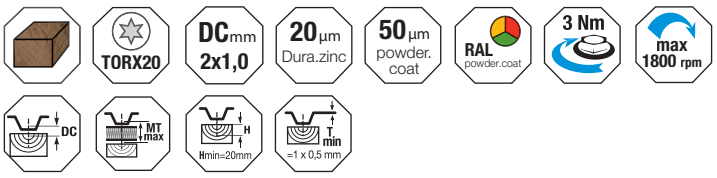
Self-drilling and tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point, thread for timber and oval head with TX-20 socket. With pre-assembled aluminum washer with vulcanized EPDM layer.

Intended for fastening profiled metal sheets to timber structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	TX		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P140028PH	4,8	28	20	2	2x1.00	A	14	250/6/1500
P14035PH	4,8	35	20	9	2x1.00	A	14	250/6/1500
P140060PH	4,8	60	20	34	2x1.00	A	14	100/6/600
P140080PH	4,8	80	20	54	2x1.00	A	14	100/6/600

Installation with a dedicated ETANCO holder.
ACCESSORIES - page 83.





Self-drilling and tapping carbon steel screws, surface-hardened, galvanized, with reduced drilling point and oval head with TX-20 socket. With pre-assembled aluminum washer with vulcanized EPDM layer.

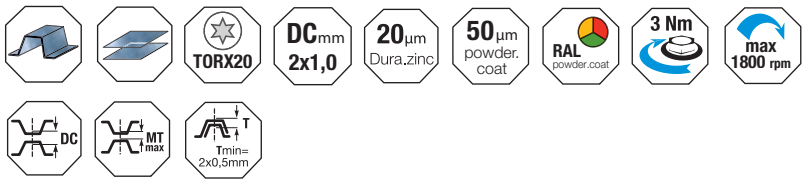
GTF 02 P

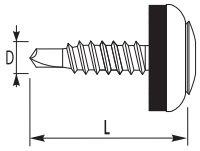
FARMER SCREWS WITH ALUMINUM WASHER

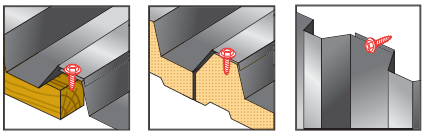
Intended for overlapping metal flat and profiled steel sheets.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	TX		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P14020PH	4.8	20	20	7	2x1.00	A	14	250/6/1500

Installation with a dedicated ETANCO holder.
ACCESSORIES - page 83.







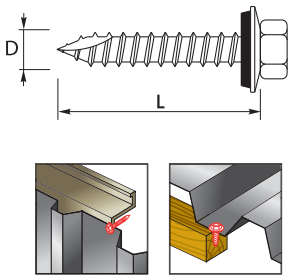
GT A Z16

SELF-TAPPING SCREWS TYPE A WITH STEEL WASHER

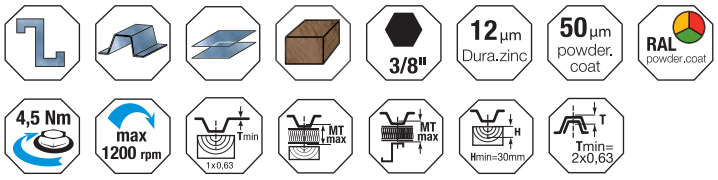
Self-tapping carbon steel screws, surface-hardened, galvanized, with coarse thread and hex head, with pre-assembled steel washer with vulcanized EPDM.

Intended for fastening profiled construction steel sheets to timber structures and steel structures (max 2 x 1.50 mm). Short sizes can be used for overlapping or as repair connections.

Index	Screw				MTmax		Washer		Packaging Single/ Qty/Collective [pcs]
							Mat.	Size	
	D	L	Sw	hef	timber	steel	-	-	
	[mm]	[mm]	[mm]	mm	[mm]	[mm]	-	[mm]	
P2513250PL	6,5	25	3/8”	30	-	16	Z	16	250/4/1000
P2513320PL	6,5	32	3/8”	30	-	23	Z	16	250/4/1000
P2513380PL	6,5	38	3/8”	30	4	29	Z	16	100/4/400
P2513500PL	6,5	50	3/8”	30	16	41	Z	16	100/4/400
P2513750PL	6,5	75	3/8”	30	41	66	Z	16	100/4/400



Steel con-struction	Ø drill bit
0,63	3,5
0,75	4,0
0,88 - 1,25	4,5
1,5	5,0
2,0	5,5



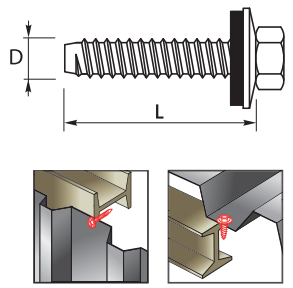
GT B Z16

SELF-TAPPING SCREWS TYPE B WITH STEEL WASHER

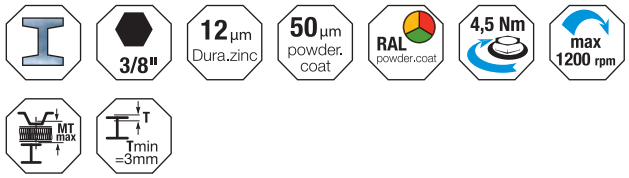
Self-tapping screws made of surface-hardened carbon steel, galvanized, with fine thread and a hex head, provided with a steel washer with vulcanized EPDM.

Intended for fastening construction profiled steel sheets to steel structures. The maximum thickness of the substrate is determined by tapping capacity of the screw.

Index	Screw			MTmax	Washer		Packaging Single/ Qty/Collective [pcs]
					Mat.	Size	
	D	L	Sw		-	-	
	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P2533250PL	6,3	25	3/8”	15	Z	16	250/4/1000
P2533320PL	6,3	32	3/8”	22	Z	16	250/4/1000
P2533380PL	6,3	38	3/8”	28	Z	16	100/6/600
P2533500PL	6,3	50	3/8”	40	Z	16	100/4/400
P2533750PL	6,3	75	3/8”	65	Z	16	100/4/400



Steel construc-tion	Ø drill bit
3,0 - 5,0	5,3
6,0	5,5
8,00 - ∞	5,7



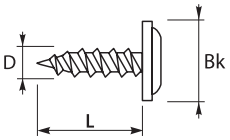
Drilling montage screws made of surface-hardened carbon steel, galvanized, with a drilling tip, fine thread, and a 12 mm flat head with PH2 socket.

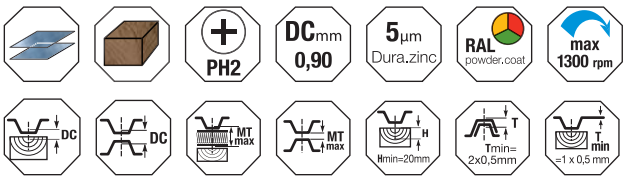
GM-S

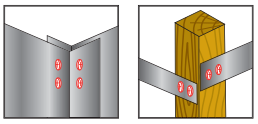
UNIVERSAL DRILLING MONTAGE SCREWS

Intended for fastening very thin steel elements or plastic elements to timber and steel profiles (up to 0.9 mm), and also for overlapping.

Index	Screw			hef	Fixed element MTmax		Drilling capacity	Thread length	Packaging Single/ Qty/Collective [pcs]
	D	L	Bk	timber	steel	timber	DC	L1	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P20131410PL	4.2	14	12	20	8	-	0,90	14	500/8/4000
P20131610PL	4.2	16	12	20	10	-	0,90	16	500/8/4000
P20131910PL	4.2	19	12	20	13	-	0.90	19	500/8/4000
P20132510PL	4.2	25	12	20	19	5	0,90	25	500/8/4000
P20133010PL	4.2	30	12	20	24	10	0,90	30	500/6/3000
P2013380PL	4.2	38	12	20	32	18	0,90	38	250/8/2000
P2013500PL	4.2	50	12	20	44	30	0,90	50	250/6/1500
P2013650PL	4.2	65	12	20	59	45	0.90	20	250/6/1500
P2013750PL	4.2	75	12	20	69	55	0,90	25	250/6/1500
P2013850PL	4.2	85	12	20	79	65	0,90	25	250/6/1500







Montage drilling austenitic stainless steel screws with drilling tip, fine thread and flat head with a diameter of 12 mm and PH2 socket.

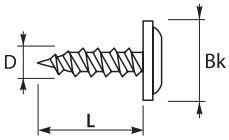
GMZ-S

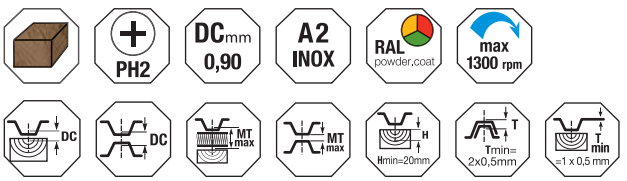
UNIVERSAL STAINLESS DRILLING MONTAGE SCREWS

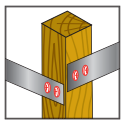
Intended for fastening very thin steel elements and plastic elements to timber and steel profiles (up to 0.9 mm), and also for overlapping.

Carbon steel sheets drilling not possible

Index	Screw			hef	Fixed element MTmax		Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Bk	timber	steel	timber	DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P20142510PL	4,2	25	12	20	19	5	0.90	500/8/4000







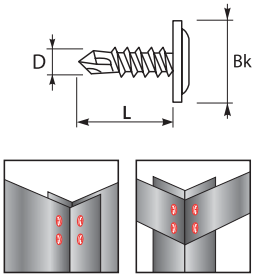
GM-B

SELF-DRILLING
MONTAGE SCREWS

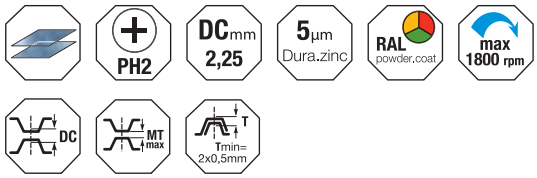
Drilling, self-tapping montage screws made of surface-hardened carbon steel, galvanized, with a drilling point, fine thread, and a 12 mm flat head with PH2 slot.

Intended for fastening very thin steel elements and plastic components to steel profiles (up to 2.25 mm), and also for overlapping of these components.

Index	Screw			Fixed element	Drilling capa-city	Packaging Single/ Qty/Collective [pcs]
	D	L	Bk	MTmax	DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P20121310PL	4,2	13	12	2	2,25	500/8/4000
P20121610PL	4,2	16	12	5	2,25	500/8/4000
P20121910PL	4,2	19	12	8	2,25	500/8/4000
P20122010PL	4,2	25	12	14	2,25	500/8/4000
P20123210PL	4,2	32	12	21	2,25	500/8/4000
P2012400PL	4,2	40	12	29	2,25	250/6/1500
P2012650PL	4,2	65	12	54	2,25	250/6/1500



Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



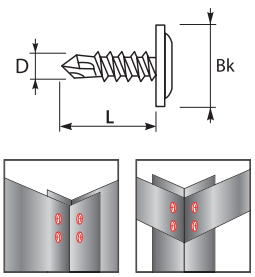
GMR-B

SELF-DRILLING
MONTAGE SCREWS

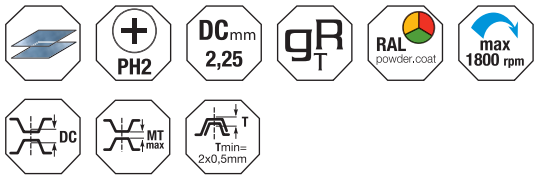
Drilling, self-tapping montage screws made of surface-hardened carbon steel, with a drilling point, fine thread, and a 12 mm flat head with PH2 socket. With additional anti-corrosion protection, gRey.coat.

Intended for fastening very thin steel elements or plastic elements to steel profiles (up to 2.25 mm), and also for overlapping.

Index	Screw			Fixed element	Drilling capa-city	Packaging Single/ Qty/Collective [pcs]
	D	L	Bk	MTmax	DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P201216R10PL	4,2	16	12	5	2,25	500/8/4000
P201219R10PL	4,2	19	12	8	2,25	500/8/4000
P201225R10PL	4,2	25	12	14	2,25	500/8/4000



Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



GT O2

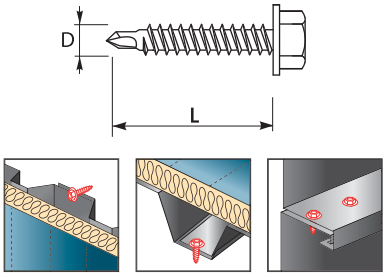
SCREWS WITHOUT WASHER FOR OVERLAPPING

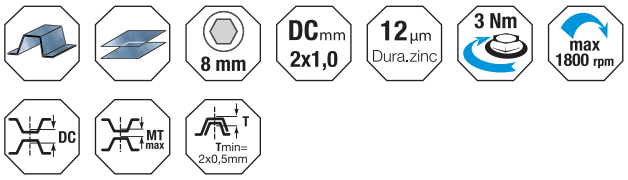
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point, fine thread and a hex head, without a washer.

Intended for overlapping of thin profiled construction steel sheets and sandwich roofs panels.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15048203PL	4.8	20	8	10	2x1.00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GT O2 Z14

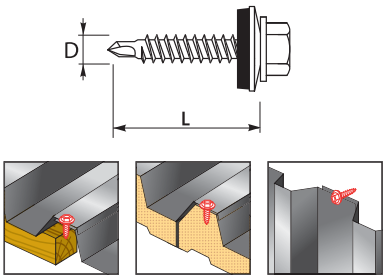
SCREWS WITH WASHER FOR OVERLAPPING

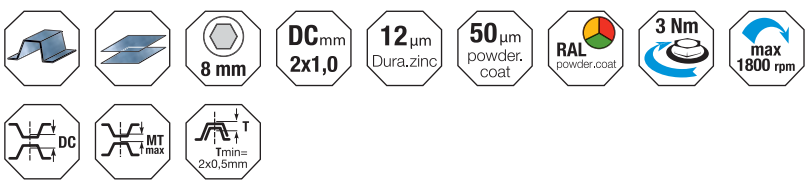
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point, fine thread and a hex head, with pre-assembled steel washer with vulcanized EPDM layer.

Intended for overlapping steel sheets and for sandwich roofs panels.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15048200PL	4.8	20	8	7	2x1.00	Z	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTR O2

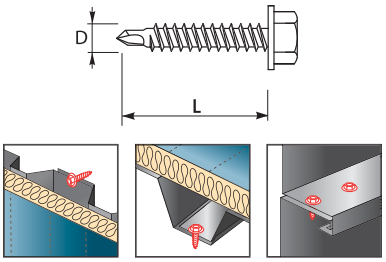
SCREWS WITHOUT WASHER
FOR OVERLAPPING

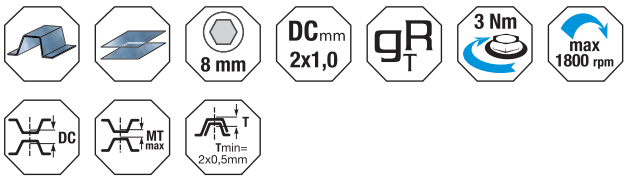
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with a reduced drilling point, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

Intended for overlapping of thin profiled construction steel sheets and sandwich roofs panels.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P1504820R3PL	4.8	20	8	10	2x1.00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTR O2 A14

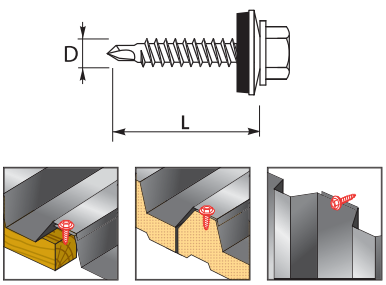
FASTENERS WITH WASHER
FOR OVERLAPPING

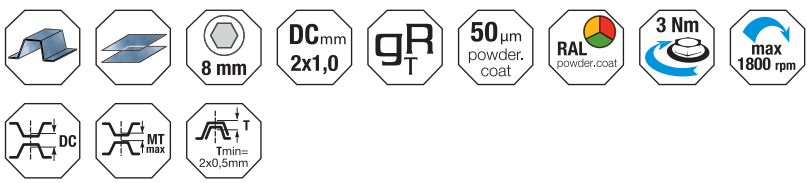
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with a reduced drilling point, fine thread and a hex head, with an pre-assembled aluminum washer with vulcanized EPDM. Additional corrosion protection: gRey.coat.

Intended for overlapping of profiled construction steel sheets and sandwich roofs panels.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1504820R0PL	4.8	20	8	7	2x1.00	A	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





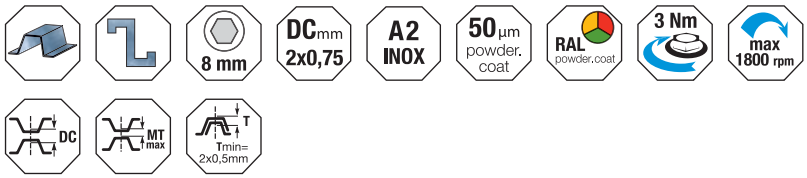
Self-drilling, self-tapping screws made of stainless steel, with a reduced drilling point and a hex head, with pre-assembled stainless-steel washer with vulcanized EPDM.

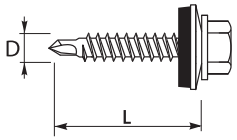
GTZ FO2

STAINLESS FARMER SCREWS WITH STAINLESS WASHER

Intended for overlapping flat and profiled aluminum sheets.

Index	Screw			Fixed element	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	SW	MTmax	DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1740200PL	4,8	20	8	7	2 x 0,75	S	14	250/6/1500





Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point, fine thread and a hex head, with flange.

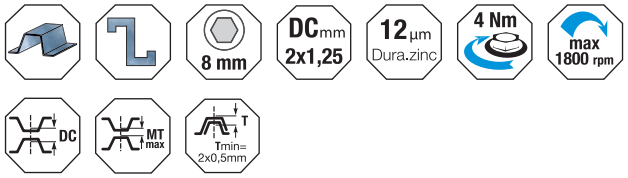
GT O3 FH

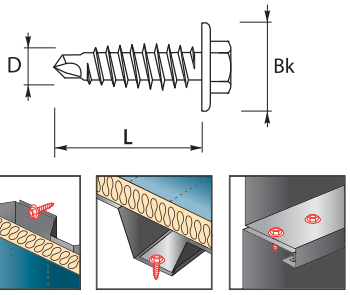
SELF-DRILLING SCREWS WITH FLANGE HEAD FOR OVERLAPPING

Intended for overlapping of profiled construction steel sheets and for fastening construction steel sheets to thin steel structures.

Index	Screw				MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	Bk		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P15063223PL	6,3	22	8	15	6	2x1.25	500/4/2000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





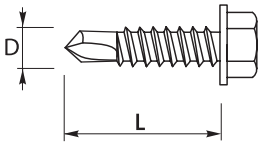
GT 3

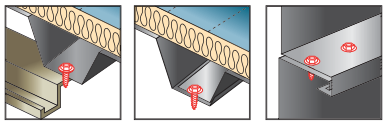
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point #2, fine thread and a hex head, without a washer.

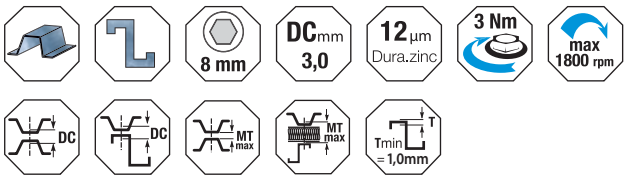
Intended for fastening profiled construction steel sheets to steel structures and for overlapping construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150153PL	4.8	16	8	3	3,00	1000/6/6000
P150173PL	4.8	19	8	6	3,00	1000/4/4000
P150213PL	4.8	22	8	9	3,00	1000/4/4000
P150233PL	4.8	25	8	12	3,00	1000/4/4000
P150313PL	4.8	32	8	19	3,00	500/6/3000
P150363PL	4.8	35	8	22	3,00	500/4/2000
P150453PL	4.8	45	8	32	3,00	500/4/2000
P150543PL	4.8	55	8	42	3,00	250/6/1500





Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



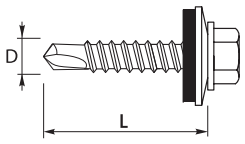
GT 3 Z14

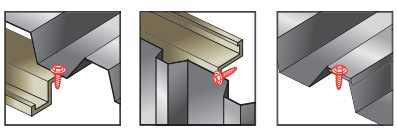
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

Self-drilling, self-tapping screws made of surface-hardened carbon steel, with a reduced drilling point #2, fine thread and a hex head, with pre-assembled steel washer with vulcanized EPDM.

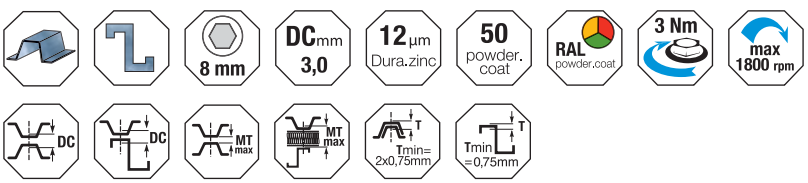
Intended for fastening profiled construction steel sheets to steel structures and for overlapping construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P2594160PL	4.8	16	8	0	3,00	Z	14	250/6/1500
P2594190PL	4.8	19	8	3	3,00	Z	14	250/6/1500
P2594220PL	4.8	22	8	6	3,00	Z	14	250/6/1500
P2594250PL	4.8	25	8	9	3,00	Z	14	250/6/1500
P2594320PL	4.8	32	8	16	3,00	Z	14	250/6/1500
P2594350PL	4.8	35	8	19	3,00	Z	14	250/6/1500
P2594450PL	4.8	45	8	29	3,00	Z	14	250/6/1500
P2594550PL	4.8	55	8	39	3,00	Z	14	250/4/1000





Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



GT 3 HD

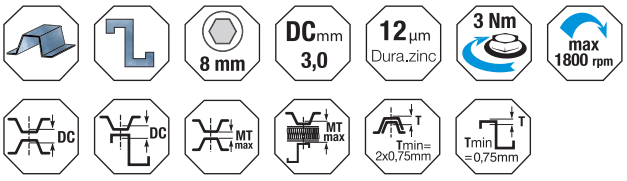
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

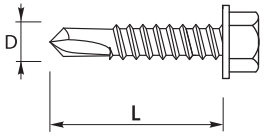
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point #2, fine thread and a hex head, without a washer.

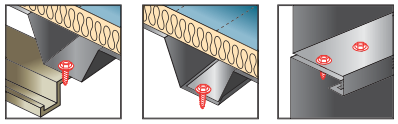
Intended for fastening profiled construction steel sheets to steel structures and for overlapping construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15025GT33PL	5.5	25	8	11	3,00	500/6/3000
P15032GT33PL	5.5	32	8	18	3,00	500/4/2000
P15038GT33PL	5.5	38	8	24	3,00	500/4/2000
P15050GT33PL	5.5	50	8	36	3,00	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GT 3 HD Z14

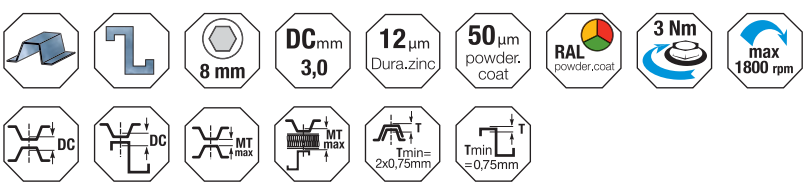
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

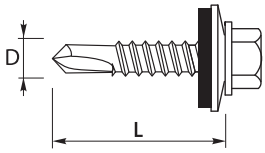
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, drilling point #2, with fine thread and hex head, with pre-assembled steel washer with vulcanized EPDM.

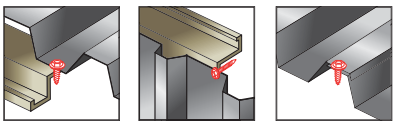
Intended for fastening profiled construction steel sheets to steel structures and for overlapping thick construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15025GT30PL	5.5	25	8	8	3,00	Z	14	250/6/1500
P15032GT30PL	5.5	32	8	15	3,00	Z	14	250/6/1500
P15038GT30PL	5.5	38	8	21	3,00	Z	14	250/4/1000
P15050GT30PL	5.5	50	8	33	3,00	Z	14	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTR 3

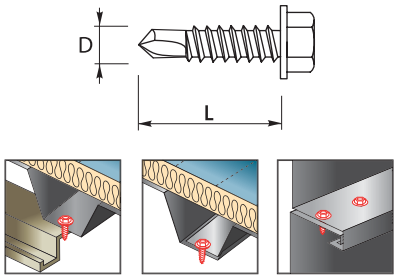
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

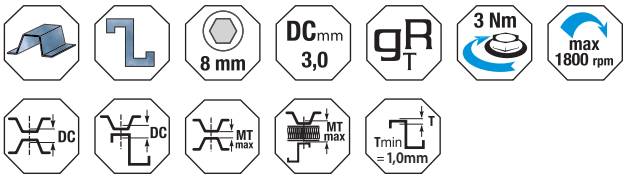
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #2, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

Intended for fastening profiled construction steel sheets to steel structures and for overlapping construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15015R3PL	4.8	16	8	3	3,00	1000/4/4000
P15017R3PL	4.8	19	8	6	3,00	1000/4/4000
P15023R3PL	4.8	25	8	12	3,00	1000/4/4000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTR 3 A14

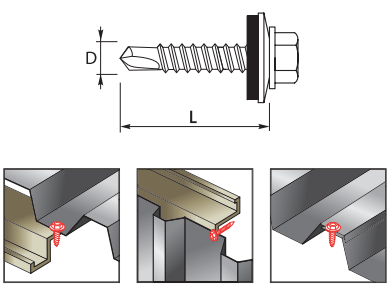
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

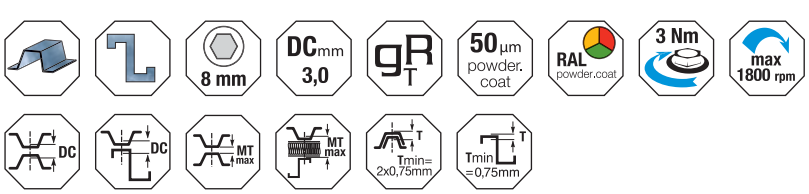
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with a drilling point #2, fine thread and a hex head, with an pre-assembled washer with vulcanized EPDM. Additional corrosion protection: gRey.coat.

Intended for fastening profiled construction steel sheets to steel structures and for overlapping construction steel sheets.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P259416A14R0PL	4.8	16	8	1	3,00	A	14	250/6/1500
P259419A14R0PL	4.8	19	8	3	3,00	A	14	250/6/1500
P259425A14R0PL	4.8	25	8	9	3,00	A	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTS-STAR

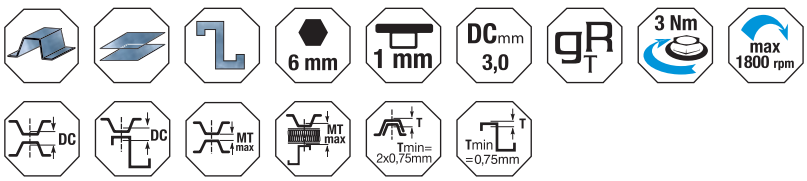
SELF-DRILLING SCREWS FOR FIXING STEEL PROFILES

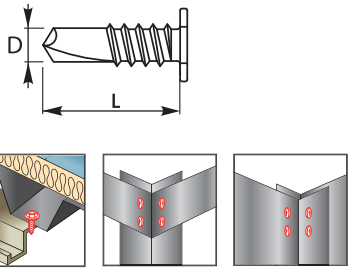
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #2, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

Intended for fastening thin steel profiles.
Flat head provides good contact of drywall to steel structure. The threaded part under the head enables correct fastening of one element to another.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150153S0PL	4,8	16	6	4	3.00	500/8/4000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.
Installation with a dedicated ETANCO bit.
ACCESSORIES - page 83.





GTX 3

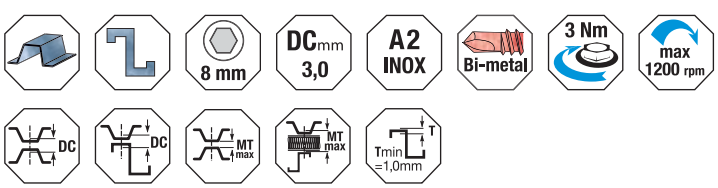
BIMETAL STAINLESS STEEL SCREWS WITHOUT WASHER FOR FIXING THE STEEL SHEETS

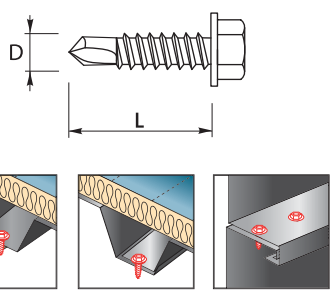
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #2, fine thread and a hex head, without a washer.

Intended for fastening profiled construction steel sheets to steel structures and for overlapping thick construction steel sheets in aggressive environments.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P170223PL	4,8	25	8	13	3,00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



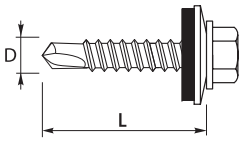


GTX 3 S14

BIMETAL STAINLESS STEEL SELF DRILLING SCREWS WITH WASHER FOR STEEL SHEETS FIXING

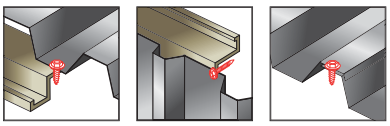
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #2, fine thread and a hex head, with pre-assembled stainless washer with vulcanized EPDM layer.

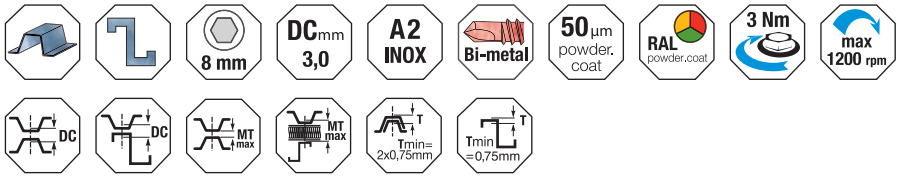
Intended for fastening profiled construction steel sheets to thin steel structures and for overlapping of construction steel sheets.



Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170220PL	4,8	25	8	10	3,00	S	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



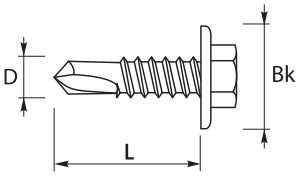


GT 5 FH

SCREWS WITH FLANGE HEAD FOR FIXING STEEL SHEETS

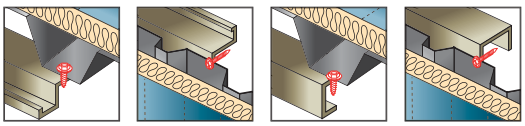
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #3, fine thread and a hex head, with flange.

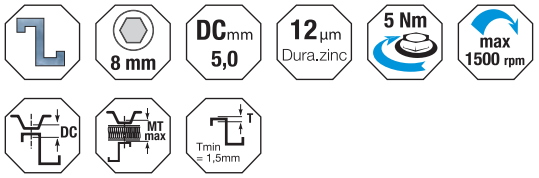
Intended for fastening construction profiled steel sheets to steel structures in specific application types.



Index	Screw				MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw	Bk		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P15019FH3PL	5.5	19	8	15	3	5.00	500/4/2000
P15025FH3PL	5.5	25	8	15	9	5.00	500/4/2000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with drilling point #3, fine thread and a hex head, without a washer.

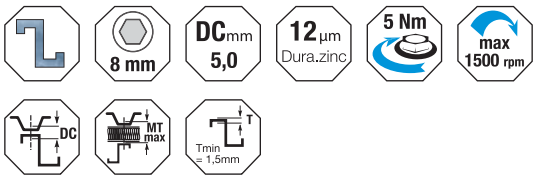
GT 5

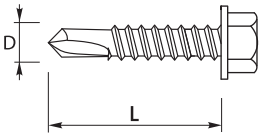
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

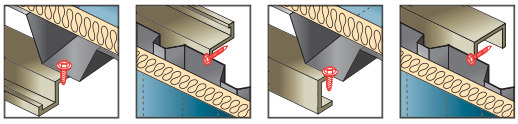
Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150193PL	5.5	19	8	3	5.00	500/6/3000
P150253PL	5.5	25	8	9	5.00	500/6/3000
P150323PL	5.5	32	8	16	5.00	500/4/2000
P150383PL	5.5	38	8	22	5.00	500/4/2000
P150503PL	5.5	50	8	34	5.00	250/4/1000
P150603PL	5.5	60	8	44	5.00	250/4/1000
P150703PL	5.5	70	8	54	5.00	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GT 5 Z14/Z16

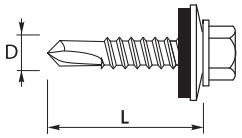
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

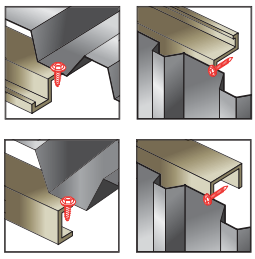
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, drilling point #3, with fine thread and hex washer head, with pre-assembled steel washer with vulcanized EPDM layer

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P150190PL	5.5	19	8	0	5.00	Z	14	250/6/1500
P150250PL	5.5	25	8	6	5.00	Z	14	250/6/1500
P150320PL	5.5	32	8	13	5.00	Z	14	250/6/1500
P150380PL	5.5	38	8	19	5.00	Z	14	250/4/1000
P150500PL	5.5	50	8	31	5.00	Z	14	250/4/1000
P150600PL	5.5	60	8	41	5.00	Z	14	100/6/600
P150700PL	5.5	70	8	51	5.00	Z	14	100/6/600

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15019160PL	5.5	19	8	1	5.00	Z	16	250/6/1500
P15025160PL	5.5	25	8	5	5.00	Z	16	250/6/1500
P15032160PL	5.5	32	8	12	5.00	Z	16	250/6/1500
P15038160PL	5.5	38	8	18	5.00	Z	16	250/4/1000
P15050160PL	5.5	50	8	30	5.00	Z	16	250/4/1000
P15060160PL	5.5	60	8	40	5.00	Z	16	100/6/600
P15070160PL	5.5	70	8	50	5.00	Z	16	100/6/600





Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.

Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #3, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

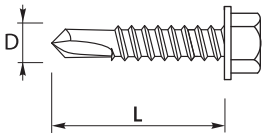
GTR 5

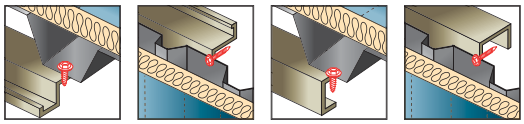
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15025R3PL	5.5	25	8	9	5.00	500/6/3000
P15032R3PL	5.5	32	8	16	5.00	500/4/2000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





Self-drilling, self-tapping screws made of surface-hardened carbon steel, with a drilling point #3, fine thread and a hex head, with an pre-assembled washerwith vulcanized EPDM. Additional corrosion protection: gRey.coat.

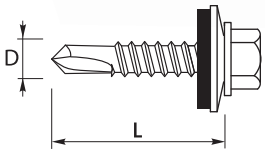
GTR 5 A14

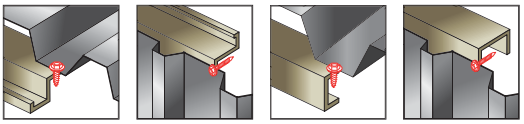
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15025A14R0PL	5.5	25	8	6	5.00	A	14	250/6/1500
P15032A14R0PL	5.5	32	8	13	5.00	A	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTX 5

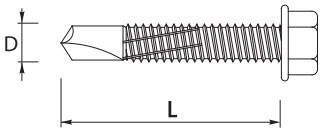
BIMETAL, SELF-DRILLING STAINLESS STEEL SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

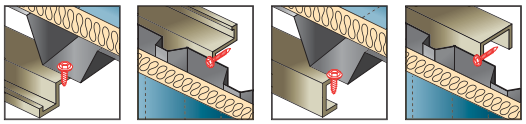
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #3, fine thread and a hex head, without a washer.

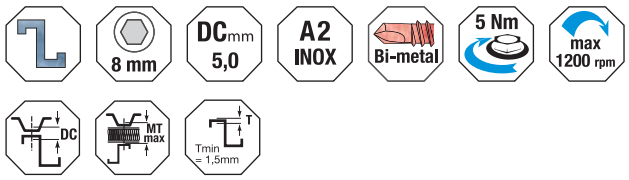
Intended for fastening construction profiled steel sheets to steel structures in aggressive environments.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P170263PL	5.5	25	8	8	5.00	500/6/3000
P170323PL	5.5	32	8	15	5.00	500/6/3000
P170383PL	5.5	38	8	21	5.00	500/4/2000
P170503PL	5.5	50	8	33	5.00	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTX 5 S14

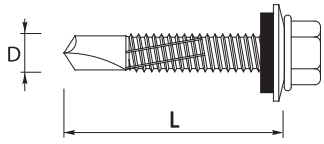
BIMETAL, SELF-DRILLING STAINLESS STEEL SCREWS WITH WASHER FOR FIXING STEEL SHEETS

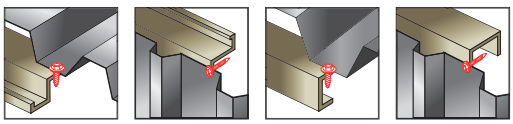
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #3, fine thread and a hex head, with an pre-assembled stainless steel washer with vulcanized EPDM layer.

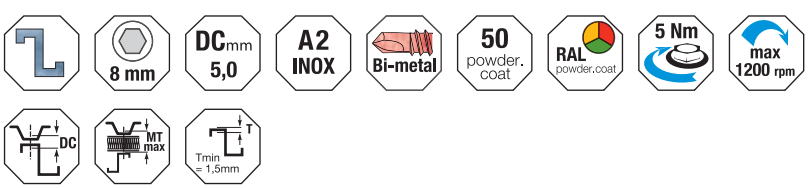
Intended for fastening construction profiled steel sheets to steel structures in aggressive environments.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	
	D	L	Sw		DC	-	-	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170260PL	5.5	25	8	5	5.00	S	14	250/6/1500
P170320PL	5.5	32	8	12	5.00	S	14	250/6/1500
P170380PL	5.5	38	8	18	5.00	S	14	250/6/1500
P170500PL	5.5	50	8	30	5.00	S	14	100/6/600

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point #3, fine thread and a hex head, without a washer.

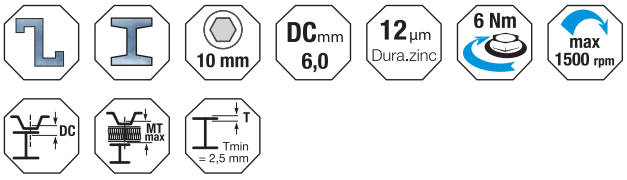
GT 6

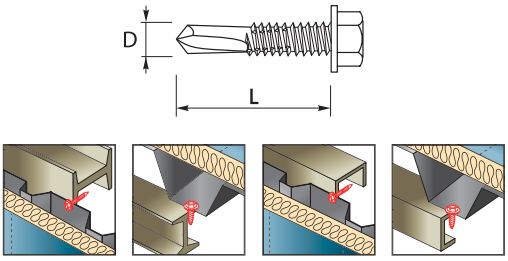
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150203PL	6,3	19	10	1	6.00	500/4/2000
P150223PL	6,3	22	10	4	6.00	500/4/2000
P150263PL	6,3	25	10	7	6.00	500/4/2000
P150333PL	6,3	32	10	14	6.00	250/4/1000
P150393PL	6,3	38	10	20	6.00	250/4/1000
P150523PL	6,3	50	10	32	6.00	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #3, fine thread and a hex head, with an pre-assembled aluminum washer with vulcanized EPDM.

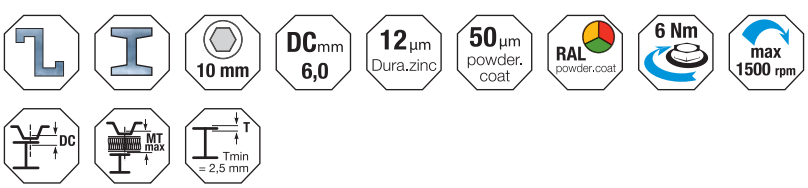
GT 6 Z16

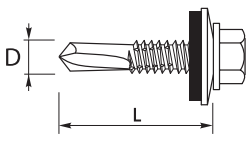
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	
	D	L	Sw		DC	-	-	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P150220PL	6,3	22	10	1	6.00	Z	16	250/6/1500
P150260PL	6,3	25	10	3	6.00	Z	16	250/4/1000
P150330PL	6,3	32	10	10	6.00	Z	16	250/4/1000
P150390PL	6,3	38	10	16	6.00	Z	16	250/4/1000
P150520PL	6,3	50	10	28	6.00	Z	16	100/6/600

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GT 8

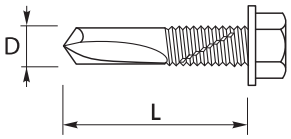
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

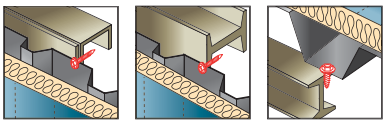
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with drilling point #4, fine thread and a hex head, without a washer.

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150243PL	5,5	24	8	1	8.00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





8 mm | DC mm 8,0 | 12 µm Dura.zinc | 5 Nm | max 1500 rpm | DC | MT max | Tmin = 2,0 mm

GT 8 Z14/Z16

SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

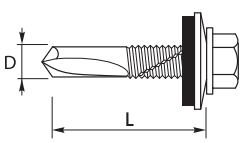
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, drilling point #4, with fine thread and hex head, with pre-assembled steel washer with vulcanized EPDM.

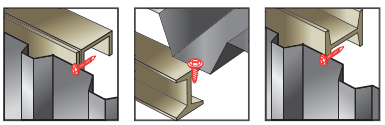
Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat. -	Size -	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P150240PL	5,5	24	8	2	8.00	Z	14	250/6/1500

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat. -	Size -	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15024160PL	5,5	24	8	3	8.00	Z	16	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





8 mm | DC mm 8,0 | 12 µm Dura.zinc | 50 µm powder. coat | RAL powder.coat | 5 Nm | max 1500 rpm | DC | MT max | Tmin = 2,0 mm

GTR 8

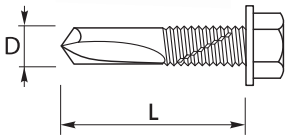
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

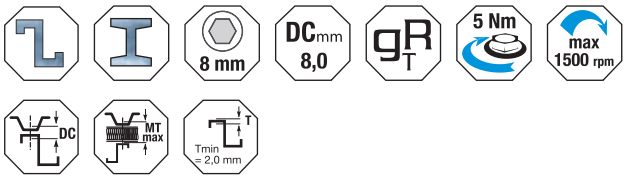
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #4, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

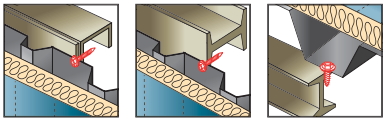
Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15024R3PL	5,5	24	8	1	8.00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTR 8 A14/A16

SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

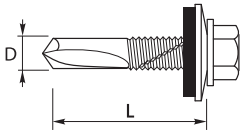
Self-drilling, self-tapping screws made of surface-hardened carbon steel, drilling point #4, with fine thread and hex head, with pre-assembled aluminum washer with vulcanized EPDM. Additional corrosion protection: gRey.coat.

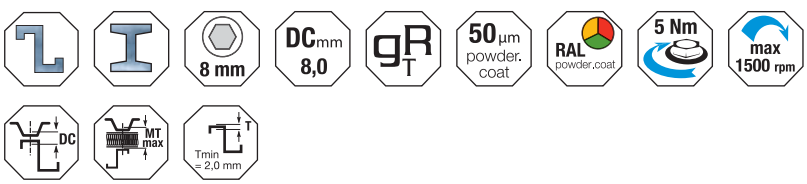
Intended for fastening construction profiled steel sheets to steel structures.

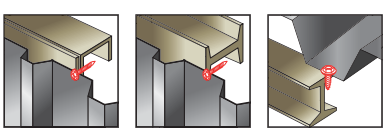
Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15024A14R0PL	5,5	24	8	2	8.00	A	14	250/6/1500

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15024A16R0PL	5,5	24	8	2	8.00	A	16	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



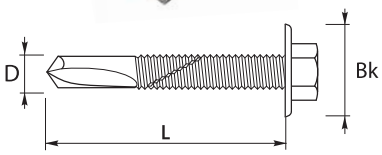


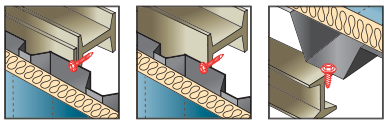


GT 12 FH

FASTENERS WITH FLANGE HEAD FOR FIXING STEEL SHEETS

Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with drilling point #5, fine thread and a hex head, with flange.

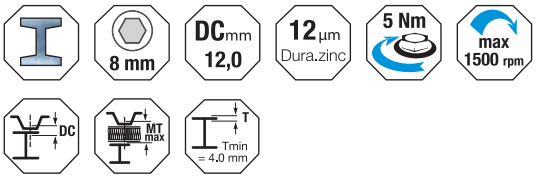




Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw				MTmax	Drilling capacity	Packaging
	D	L	Sw	Bk		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P150373PL	5,5	35	8	14	4	12.00	500/4/2000

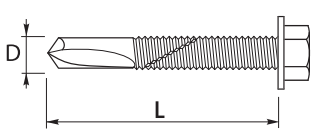
Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.

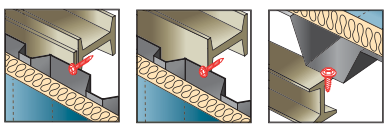


GT 12

SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, with a reduced drilling point #5, fine thread and a hex head, without a washer.

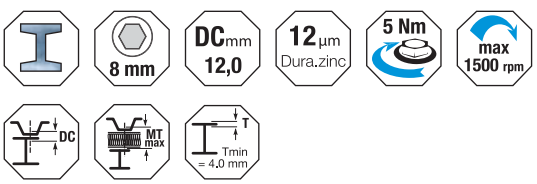




Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P150353PL	5,5	35	8	4	12.00	500/4/2000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



GT 12 Z14/Z16

SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

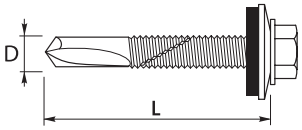
Self-drilling, self-tapping screws made of surface-hardened carbon steel, galvanized, drilling point #5, with fine thread and hex head, with pre-assembled steel washer with vulcanized EPDM.

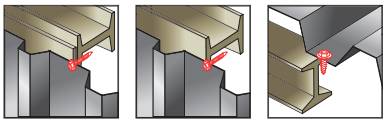
Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P150350PL	5,5	35	8	1	12.00	Z	14	250/6/1500

Index	Screw			MTmax	Drilling capacity	Washer		Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	Mat.	Size	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15035160PL	5,5	35	8	1	12.00	Z	16	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTR 12

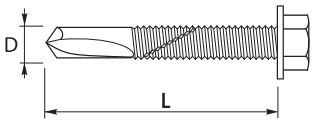
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

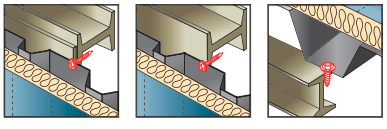
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #5, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

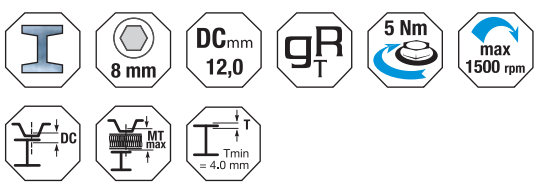
Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15035R3PL	5,5	35	8	4	12.00	500/4/2000
P15051R3PL	5.5	51	8	20	12.00	250/6/1500
P15067R3PL	5.5	67	8	36	12.00	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





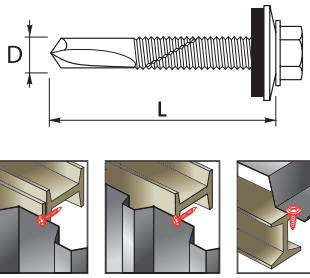


GTR 12 A14/A16

SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #5, fine thread and a hex head, with pre-assembled aluminum washer with vulcanized EPDM layer.
Additional corrosion protection: gRey.coat.

Intended for fastening construction profiled steel sheets to steel structures.



Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw		DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15035A14R0PL	5.5	35	8	1	12.00	A	14	250/6/1500
P15051A14R0PL	5.5	51	8	17	12.00	A	14	100/6/600
P15067A14R0PL	5.5	67	8	33	12.00	A	14	100/6/600

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw		DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15035A16R0PL	5.5	35	8	1	12.00	A	16	250/6/1500
P15051A16R0PL	5.5	51	8	16	12.00	A	16	100/6/600
P15067A16R0PL	5.5	67	8	32	12.00	A	16	100/6/600

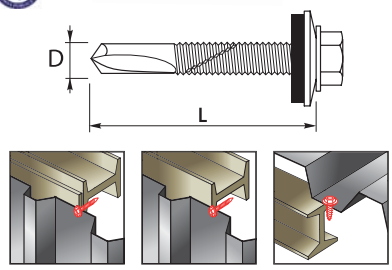
Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.

GTX 12 S14

BIMETAL SELF-DRILLING STAINLESS STEEL SCREWS WITH WASHER FOR FIXING STEEL SHEETS

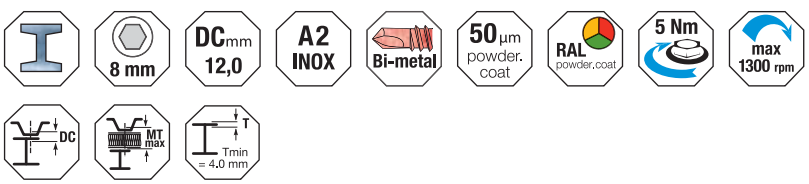
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #5, fine thread and a hex head, with pre-assembled stainless steel washer with vulcanized EPDM layer.

Intended for fastening construction profiled steel sheets to steel structures in aggressive environments.



Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw		DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170400PL	5,5	40	8	6	12.00	S	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



GTX 12

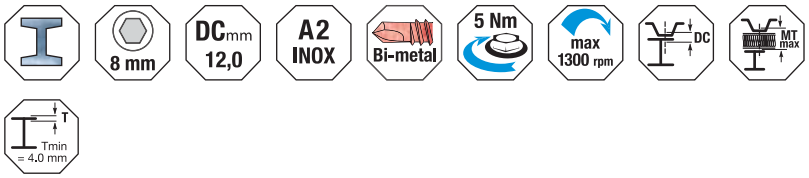
BIMETAL, SELF-DRILLING STAINLESS STEEL SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

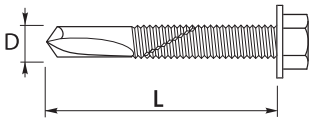
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #5, fine thread and a hex head, without a washer.

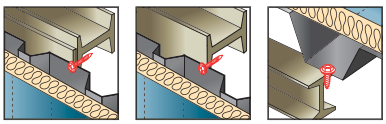
Intended for fastening construction profiled steel sheets to steel structures in aggressive environments.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P170403PL	5,5	40	8	9	12.00	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTR 16

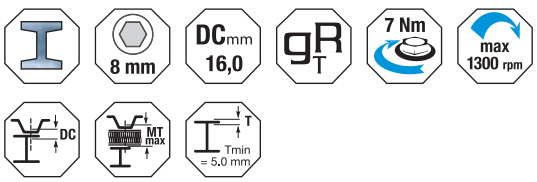
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

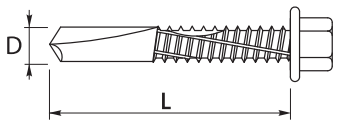
Self-drilling, self-tapping screws made of surface-hardened carbon steel, with drilling point #6, fine thread and a hex head, without a washer. Additional corrosion protection: gRey.coat.

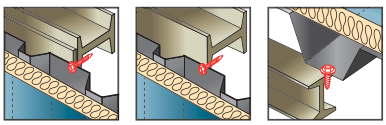
Intended for fastening construction profiled steel sheets to thick steel structures.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P157040GC3PL	6,3	40	8	3	16.00	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTR 16 A16

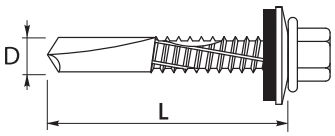
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

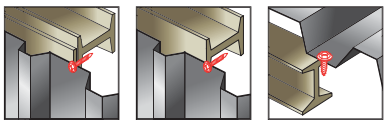
Self-drilling, self-tapping screws made of surface-hardened carbon steel, drilling point #6, with fine thread and hex head, with pre-assembled aluminum washer with vulcanized EPDM. Additional corrosion protection: gRey.coat.

Intended for fastening construction profiled steel sheets to steel structures.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
						Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw		DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P157040A16GC0PL	6,3	40	8	1	16.00	A	16	250/4/1000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTR 25

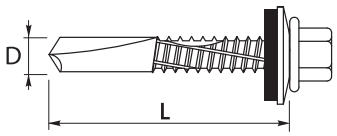
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS

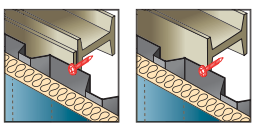
Self-drilling, self-tapping fasteners with a fine thread, made of surface-hardened carbon steel, with a drilling point #8, with a hexagonal head, without a washer. Additional corrosion protection: gRey.coat.

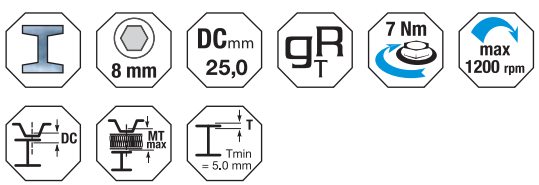
Intended for fastening profiled structural steel sheets for thick steel structures.
Intended for use in environment with atmosphere corrosive categories C1, C2, C3, C4 according to PN-EN ISO 12944-2:2001

Index	Screw			MTmax	Drilling capacity	Packaging
						Single/ Qty/Collective [pcs]
	D	L	Sw		DC	
	[mm]	[mm]	[mm]	[mm]	[mm]	
P15157R3PL	6,3	57	8	4	25.00	100/4/400

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.
Due to the high thickness of the substrate and the diversity of materials on the construction site, it is recommended to perform drilling tests each time.
Maximum drilling thickness is given for the horizontal position of the screw only.







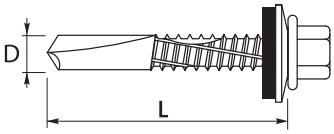
GTR 25 A16

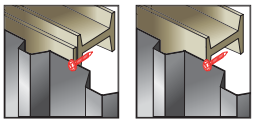
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS

Self-drilling, self-tapping fasteners with a fine thread, made of surface-hardened carbon steel, with a drilling point #8, with a hexagonal head, with assembled aluminum washer with vulcanized EPDM.
Additional corrosion protection: gRey.coat.

Intended for fastening profiled structural steel sheets for thick steel structures.
Intended for use in environment with atmosphere corrosive categories C1, C2, C3, C4 according to PN-EN ISO 12944-2:2001

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P15157A16R0PL	6,3	57	8	1	25.00	A	16	100/4/400





Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.
Due to the high thickness of the substrate and the diversity of materials on the construction site, it is recommended to perform drilling tests each time.
Maximum drilling thickness is given for the horizontal position of the screw only.

GTX 3 AL

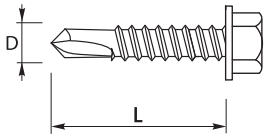
BIMETAL STAINLESS STEEL SCREWS FOR ALUMINUM STRUCTURES

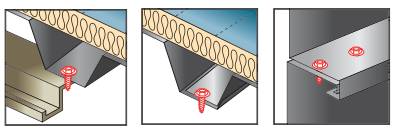
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #2, fine thread and a hex head, without a washer.

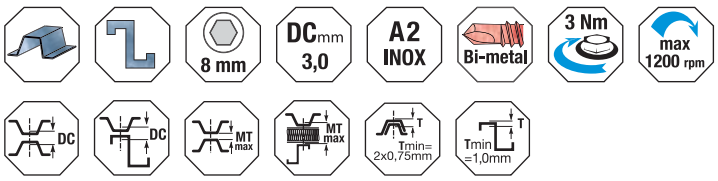
Intended for fastening elements of aluminum structures also for aggressive environments.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P170233PL	5.5	25	8	11	3.00	500/6/3000
P170373PL	5.5	38	8	24	3.00	500/6/3000

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTX 3 AL S14

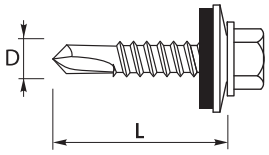
BIMETAL STAINLESS SCREWS WITH STAINLESS WASHER FOR ALUMINUM STRUCTURES

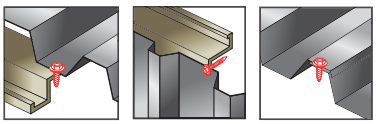
Self-drilling, self-tapping screws made of austenitic stainless steel (BIMETAL), with drilling point #2, fine thread and a hex head, with an pre-assembled stainless steel washer with vulcanized EPDM layer.

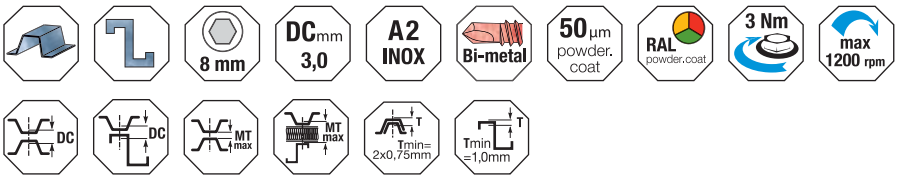
Intended for fastening elements of aluminum structures also for aggressive environments.

Index	Screw			MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P170230PL	5.5	25	8	8	3.00	S	14	250/6/1500
P170370PL	5.5	38	8	21	3.00	S	14	250/6/1500

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTZ 5 AGF S16

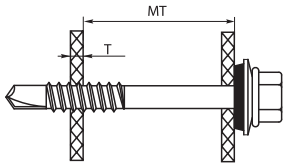
SELF-DRILLING SCREWS FOR GLAZING FIXING IN FACADE SYSTEMS

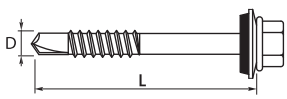
Self-drilling and self-tapping stainless steel screws, with reduced drilling point, fine thread and hex head, with pre-assembled stainless steel washer with vulcanized EPDM.

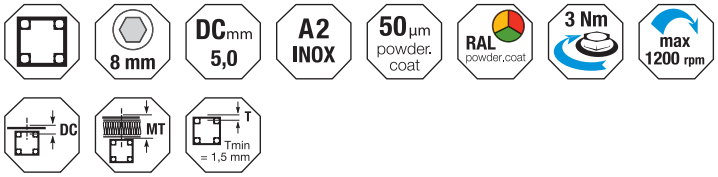
Screws intended for fastening in aluminum substrate only. Together with the relevant elements of the system, they are used for fastening the mullion-transom façade glazing systems made of aluminum. The length of the screw should be selected depending on the requirements of the system.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P17404516AGF0PL	5.5	45	8	24	26	5.00	S	16	100/6/600
P17404916AGF0PL	5.5	49	8	28	30	5.00	S	16	100/6/600
P17405316AGF0PL	5.5	53	8	32	34	5.00	S	16	100/6/600
P17405716AGF0PL	5.5	57	8	36	38	5.00	S	16	100/6/600
P17407316AGF0PL	5.5	73	8	52	54	5.00	S	16	100/6/600

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







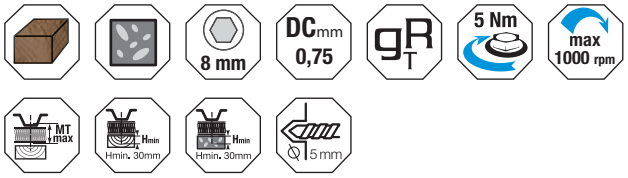
GTR W FH

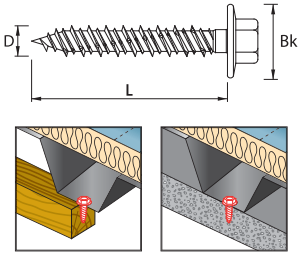
SELF-DRILLING SCREWS WITH FLANGE HEAD FOR FIXING STEEL SHEETS IN CONCRETE OR TIMBER

Self-tapping screws made of surface-hardened carbon steel, with cutting point for timber, hilo thread and hex head with flange.
Additional corrosion protection: gRey.coat.

Intended for fastening profiled steel sheet in concrete and timber substrates. Direct fastening in concrete and timber. Installation in concrete require fi 5 mm pre-drilling.

Index	Screw					MTmax	Drilling capacity	Packaging
	D	L	Sw	Bk	Anchoring depth		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
P159033FHGC3PL	6,4	33	8	15	30	3	0,75	500/1/500
P159041FHGC3PL	6,4	41	8	15	30	11	0,75	500/1/500





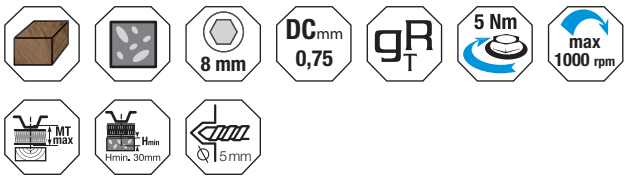
GTR W

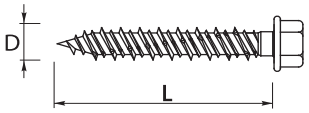
SELF-DRILLING SCREWS WITHOUT WASHER FOR FIXING STEEL SHEETS IN CONCRETE AND TIMBER

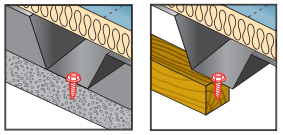
Self-tapping surface-hardened carbon steel screw with cutting point for timber, hilo thread and hex head without washer. Additional corrosion protection: gRey.coat.

Intended for fastening profiled steel sheet in concrete and timber substrate. Direct fastening in concrete and timber. Installation in concrete require fi 5 mm pre-drilling.

Index	Screw			MTmax	Drilling capacity	Packaging
	D	L	Sw		DC	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	
P159033GC3PL	6,4	33	8	3	0,75	500/4/2000
P159041GC3PL	6,4	41	8	11	0,75	500/1/500
P159057GC3PL	6,4	57	8	27	0,75	500/1/500



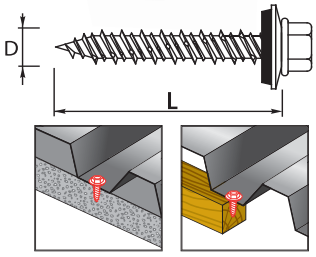




GTR W A16

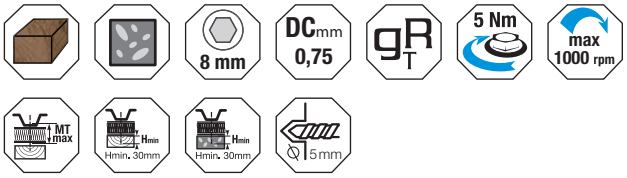
SELF-DRILLING SCREWS WITH WASHER FOR FIXING STEEL SHEETS IN CONCRETE OR TIMBER

Self-tapping surface-hardened carbon steel screw with cutting point for timber, hilo thread and hex head with pre-assembled aluminum washer with vulcanized EPDM layer.
Additional corrosion protection: gRey.coat.



Intended for fastening profiled steel sheet in concrete and timber substrate. Direct fastening in concrete and timber. Installation in concrete require fi 5 mm pre-drilling.

Index	Screw				MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw	hef		DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P159041GC0PL	6,4	41	8	30	7	0,75	A	16	250/4/1000
P159057GC0PL	6,4	57	8	30	23	0,75	A	16	250/1/250



GT 6 SP Z19

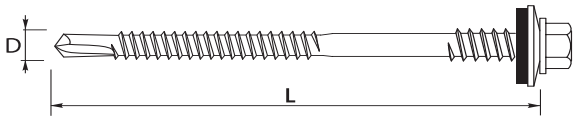
SELF-DRILLING SCREWS WITH WASHER FOR SANDWICH PANEL FIXING

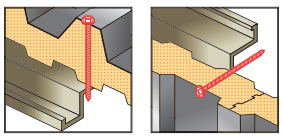
Self-drilling, self-tapping screws (double thread) made of surface-hardened carbon steel, galvanized, drilling point #3, with fine thread and hex head, with a pre-assembled steel washer with vulcanized EPDM layer.

Intended for fastening the sandwich panels to steel structures.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1530650PL	5,5/6,3	65	8	20	40	6.00	Z	19	100/1/100
P1530900PL	5,5/6,3	90	8	35	65	6.00	Z	19	100/1/100
P1531100PL	5,5/6,3	110	8	55	85	6.00	Z	19	100/1/100
P1531250PL	5,5/6,3	125	8	70	100	6.00	Z	19	100/1/100
P1531500PL	5,5/6,3	150	8	95	125	6.00	Z	19	100/1/100
P1531750PL	5,5/6,3	175	8	120	150	6.00	Z	19	100/1/100
P1532000PL	5,5/6,3	200	8	145	175	6.00	Z	19	100/1/100
P1532300PL	5,5/6,3	230	8	155	205	6.00	Z	19	100/1/100
P1532750PL	5,5/6,3	275	8	200	250	6.00	Z	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





Self-drilling, self-tapping screws (double thread) made of surface-hardened carbon steel, drilling point #3, with fine thread and hex head, with a pre-assembled aluminum washer with vulcanized EPDM.
Additional corrosion protection: gRey.coat.

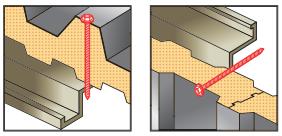
GTR 6 SP A19

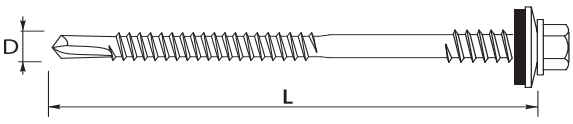
SELF-DRILLING SCREWS WITH A WASHER FOR SANDWICH PANELS FIXING

Intended for fastening sandwich panels to steel structures.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P153065R0PL	5,5/6,3	65	8	20	40	6.00	A	19	100/4/400
P153090R0PL	5,5/6,3	90	8	35	65	6.00	A	19	100/4/400
P153110R0PL	5,5/6,3	110	8	55	85	6.00	A	19	100/1/100
P153125R0PL	5,5/6,3	125	8	70	100	6.00	A	19	100/1/100
P153150R0PL	5,5/6,3	150	8	95	125	6.00	A	19	100/1/100
P153175R0PL	5,5/6,3	175	8	120	150	6.00	A	19	100/1/100
P153200R0PL	5,5/6,3	200	8	145	175	6.00	A	19	100/1/100
P153230R0PL	5,5/6,3	230	8	155	205	6.00	A	19	100/1/100
P153275R0PL	5,5/6,3	275	8	200	250	6.00	A	19	100/1/100
P153320R0PL	5,5/6,3	320	8	245	295	6.00	A	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTX 6 SP S19 S29

BIMETAL SELF-DRILLING STAINLESS STEEL SCREWS WITH WASHER FOR FIXING SANDWICH PANELS

Self-drilling, self-tapping screws (double thread) made of austenitic stainless steel (BIMETAL), with drilling point #3, fine thread and a hex head, with a pre-assembled stainless steel washer with vulcanized EPDM layer.

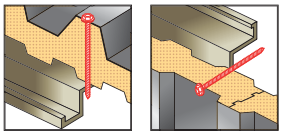
Intended for fastening sandwich panels to steel structures in aggressive environments.

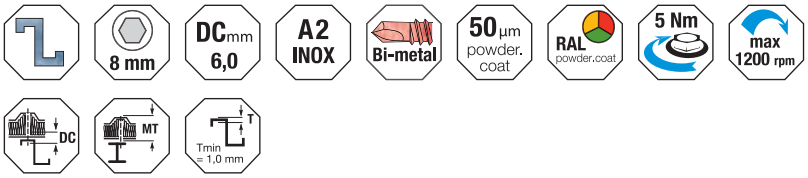
Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1730850PL	5,5/6,3	85	8	35	65	6.00	S	19	100/4/400
P1731100PL	5,5/6,3	110	8	60	85	6.00	S	19	100/1/100
P1731300PL	5,5/6,3	130	8	80	105	6.00	S	19	100/1/100
P1731500PL	5,5/6,3	150	8	100	125	6.00	S	19	100/1/100
P1731700PL	5,5/6,3	170	8	120	145	6.00	S	19	100/1/100
P1731950PL	5,5/6,3	195	8	145	175	6.00	S	19	100/1/100
P1732250PL	5,5/6,3	225	8	175	200	6.00	S	19	100/1/100
P1732400PL	5,5/6,3	240	8	190	215	6.00	S	19	100/1/100
P1732650PL	5,5/6,3	265	8	215	240	6.00	S	19	100/1/100

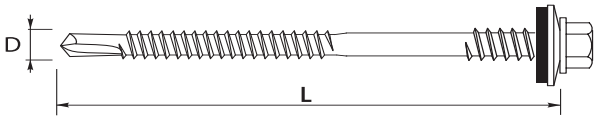
Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P17308520PL	5,5/6,3	85	8	35	65	6.00	S	29	100/1/100
P17311020PL	5,5/6,3	110	8	60	85	6.00	S	29	100/1/100
P17313020PL	5,5/6,3	130	8	80	105	6.00	S	29	100/1/100
P17315020PL	5,5/6,3	150	8	100	125	6.00	S	29	100/1/100
P17317020PL	5,5/6,3	170	8	120	145	6.00	S	29	100/1/100
P17319520PL	5,5/6,3	195	8	145	175	6.00	S	29	100/1/100
P17322520PL	5,5/6,3	225	8	175	200	6.00	S	29	100/1/100
P17324020PL	5,5/6,3	240	8	190	215	6.00	S	29	100/1/100
P17326520PL	5,5/6,3	265	8	215	240	6.00	S	29	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.

In special cases, it is recommended to pre-drill the sandwich panels







Self-drilling, self-tapping screws (double thread) made of surface-hardened carbon steel, galvanized, drilling point #5, with very fine thread and hex head, with a pre-assembled steel washer with vulcanized EPDM layer.

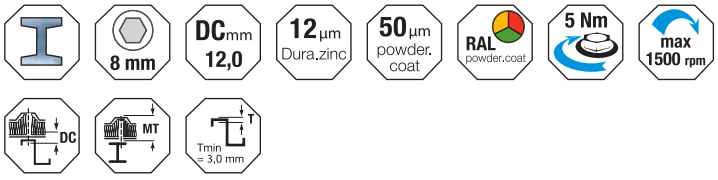
GT 12 SP Z19

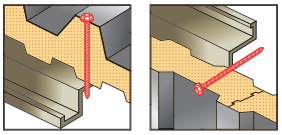
SELF-DRILLING SCREWS WITH WASHER FOR SANDWICH PANELS

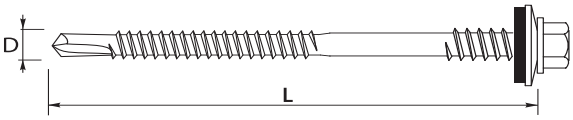
Intended for fastening sandwich panels to steel structures.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1550700PL	5,5/6,3	70	8	25	35	12	Z	19	100/4/400
P1550900PL	5,5/6,3	90	8	25	55	12	Z	19	100/4/400
P1551100PL	5,5/6,3	110	8	45	75	12	Z	19	100/1/100
P1551300PL	5,5/6,3	130	8	65	95	12	Z	19	100/1/100
P1551400PL	5,5/6,3	140	8	75	105	12	Z	19	100/1/100
P1551500PL	5,5/6,3	150	8	85	115	12	Z	19	100/1/100
P1551600PL	5,5/6,3	160	8	95	125	12	Z	19	100/1/100
P1551750PL	5,5/6,3	175	8	110	140	12	Z	19	100/1/100
P1551850PL	5,5/6,3	185	8	110	150	12	Z	19	100/1/100
P1552000PL	5,5/6,3	200	8	125	165	12	Z	19	100/1/100
P1552300PL	5,5/6,3	230	8	155	195	12	Z	19	100/1/100
P1552400PL	5,5/6,3	240	8	165	205	12	Z	19	100/1/100
P1552850PL	5,5/6,3	285	8	200	250	12	Z	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.







GTR 12 SP A19

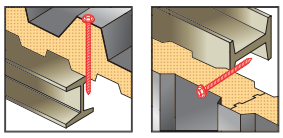
SELF-DRILLING SCREWS WITH WASHER FOR SANDWICH PANELS

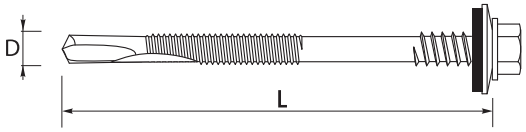
Self-drilling, self-tapping screws (double thread) made of surface-hardened carbon steel, drilling point #5, with very fine thread and hex head, with a pre-assembled aluminum washer with vulcanized EPDM layer.
Additional corrosion protection: gRey.coat.

Intended for fastening sandwich panels to steel structures.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P155070R0PL	5,5/6,3	70	8	25	30	12.00	A	19	100/4/400
P155090R0PL	5,5/6,3	90	8	25	50	12.00	A	19	100/4/400
P155110R0PL	5,5/6,3	110	8	45	70	12.00	A	19	100/1/100
P155130R0PL	5,5/6,3	130	8	65	90	12.00	A	19	100/1/100
P155140R0PL	5,5/6,3	140	8	75	100	12.00	A	19	100/1/100
P155150R0PL	5,5/6,3	150	8	85	110	12.00	A	19	100/1/100
P155160R0PL	5,5/6,3	160	8	95	120	12.00	A	19	100/1/100
P155175R0PL	5,5/6,3	175	8	110	135	12.00	A	19	100/1/100
P155185R0PL	5,5/6,3	185	8	110	145	12.00	A	19	100/1/100
P155190R0PL	5,5/6,3	190	8	115	150	12.00	A	19	100/1/100
P155200R0PL	5,5/6,3	200	8	125	160	12.00	A	19	100/1/100
P155230R0PL	5,5/6,3	230	8	155	190	12.00	A	19	100/1/100
P155240R0PL	5,5/6,3	240	8	165	200	12.00	A	19	100/1/100
P155285R0PL	5,5/6,3	285	8	200	245	12.00	A	19	100/1/100
P155330R0PL	5,5/6,3	330	8	245	290	12.00	A	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





GTX 12 SP S19 S29

BIMETAL STAINLESS STEEL
SELFDRILLING SCREWS WITH WASHER
FOR FIXING SANDWICH PANELS

Self-drilling, self-tapping screws (double thread) made of austenitic stainless steel (BIMETAL), with drilling point #5, very fine thread and a hex head, with a pre-assembled stainless steel washer with vulcanized EPDM layer.

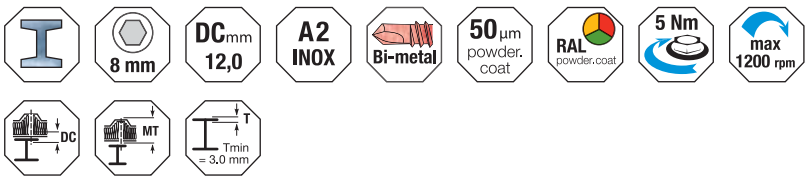
Intended for fastening sandwich panels to steel structures in aggressive environments.

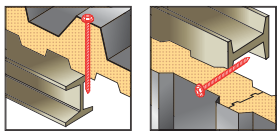
Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P1750950PL	5,5/6,3	95	8	35	65	12.00	S	19	100/4/400
P1751250PL	5,5/6,3	125	8	65	90	12.00	S	19	100/1/100
P1751500PL	5,5/6,3	150	8	90	115	12.00	S	19	100/1/100
P1751750PL	5,5/6,3	175	8	115	140	12.00	S	19	100/1/100
P1751850PL	5,5/6,3	185	8	125	150	12.00	S	19	100/1/100
P1752100PL	5,5/6,3	210	8	150	175	12.00	S	19	100/1/100
P1752350PL	5,5/6,3	235	8	175	200	12.00	S	19	100/1/100
P1752500PL	5,5/6,3	250	8	190	215	12.00	S	19	100/1/100
P1752750PL	5,5/6,3	275	8	215	240	12.00	S	19	100/1/100

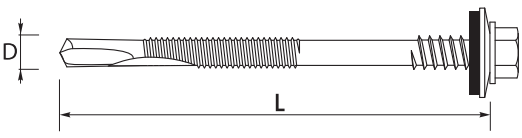
Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P17509520PL	5,5/6,3	95	8	35	65	12.00	S	29	100/1/100
P17512520PL	5,5/6,3	125	8	65	90	12.00	S	29	100/1/100
P17515020PL	5,5/6,3	150	8	90	115	12.00	S	29	100/1/100
P17517520PL	5,5/6,3	175	8	115	140	12.00	S	29	100/1/100
P17518520PL	5,5/6,3	185	8	125	150	12.00	S	29	100/1/100
P17521020PL	5,5/6,3	210	8	150	175	12.00	S	29	100/1/100
P17523520PL	5,5/6,3	235	8	175	200	12.00	S	29	100/1/100
P17525020PL	5,5/6,3	250	8	190	215	12.00	S	29	100/1/100
P17527520PL	5,5/6,3	275	8	215	240	12.00	S	29	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.

In special cases, it is recommended to pre-drill the sandwich panels.







GTR 16 SP A19

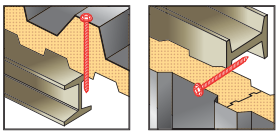
SELF-DRILLING SCREWS
FOR SANDWICH PANELS

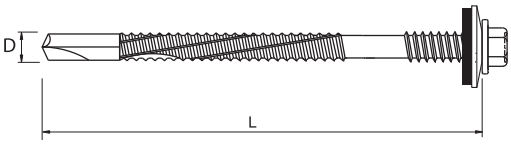
Self-drilling, self-tapping screws (double thread) made of surface-hardened carbon steel, drilling point #6, with fine thread and enlarged hex head, with a pre-assembled aluminum washer with vulcanized EPDM. Additional corrosion protection: gRey.coat.

Intended for fastening sandwich panels to thick steel structures.
Installation bit included.

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P157085R0PL	6,3/7,0	85	8	35	40	16.00	A	19	100/4/400
P157105R0PL	6,3/7,0	105	8	55	60	16.00	A	19	100/1/100
P157125R0PL	6,3/7,0	125	8	50	80	16.00	A	19	100/1/100
P157135R0PL	6,3/7,0	135	8	60	90	16.00	A	19	100/1/100
P157155R0PL	6,3/7,0	155	8	65	110	16.00	A	19	100/1/100
P157160R0PL	6,3/7,0	160	8	70	115	16.00	A	19	100/1/100
P157180R0PL	6,3/7,0	180	8	90	135	16.00	A	19	100/1/100
P157190R0PL	6,3/7,0	190	8	100	145	16.00	A	19	100/1/100
P157215R0PL	6,3/7,0	215	8	125	170	16.00	A	19	100/1/100
P157250R0PL	6,3/7,0	250	8	160	205	16.00	A	19	100/1/100
P157280R0PL	6,3/7,0	280	8	190	235	16.00	A	19	100/1/100
P157315R0PL	6,3/7,0	315	8	225	270	16.00	A	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.





Self-drilling, self-tapping (double-thread) fasteners with a fine thread, made of surface-hardened carbon steel, with drilling point # 8, and an enlarged hexagonal head, with a pre-assembled aluminum washer with vulcanized EPDM. Protected with anti-corrosive gRey.coat.

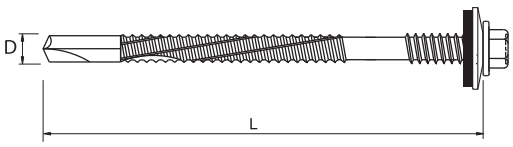
GTR 25 SP A19

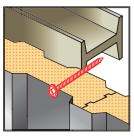
SELF-DRILLING SCREWS FOR SANDWICH PANELS

Intended for fastening sandwich panels to steel structures.
Intended for use in environment with atmosphere corrosive categories C1, C2, C3, C4 according to PN-EN ISO 12944-2:2001

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P151160R0PL	6,3/7,0	160	8	45	95	25.00	A	19	100/1/100
P151200R0PL	6,3/7,0	200	8	85	135	25.00	A	19	100/1/100
P151240R0PL	6,3/7,0	240	8	125	175	25.00	A	19	100/1/100
P151280R0PL	6,3/7,0	280	8	165	215	25.00	A	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.
Due to the high thickness of the substrate and the diversity of materials on the construction site, it is recommended to perform drilling tests each time.
Maximum drilling thickness is given for the horizontal position of the screw only.





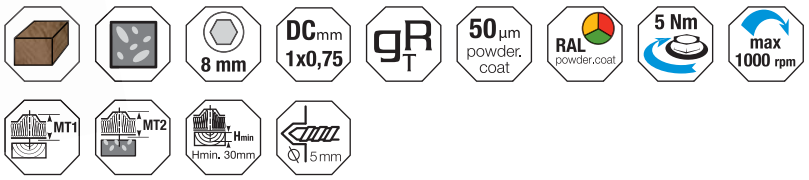
GTR W SP A19

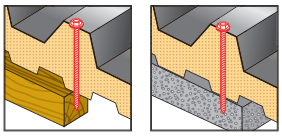
SELF-TAPPING SCREWS WITH WASHER FOR SANDWICH PANELS

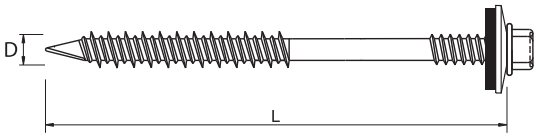
Self-tapping screws (double thread) made of surface-hardened carbon steel, with cutting point for timber, hilo thread and hex head with a pre-assembled aluminum washer with vulcanized EPDM washer.
Additional corrosion protection: gRey.coat.

Intended for fastening sandwich panels in solid materials such as timber, concrete, aerated concrete, masonry. Direct fastening in concrete and timber. Installation in concrete require fi 5 mm pre-drilling.
Installation in masonry or aerated concrete with expansion sleeve type ULTRA

Index	Screw				MTmin	MTmax	Drilling capacity	Washer		Packaging
	D	L	Sw	hef			DC	Mat.	Size	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P150100R0PL	6,4/7,0	100	8	30	40	65	0.75	A	19	100/1/100
P150120R0PL	6,4/7,0	120	8	30	60	85	0.75	A	19	100/1/100
P150140R0PL	6,4/7,0	140	8	30	80	105	0.75	A	19	100/1/100
P150160R0PL	6,4/7,0	160	8	30	100	125	0.75	A	19	100/1/100
P150190R0PL	6,4/7,0	190	8	30	130	155	0.75	A	19	100/1/100
P150210R0PL	6,4/7,0	210	8	30	150	175	0.75	A	19	100/1/100
P150240R0PL	6,4/7,0	240	8	30	180	205	0.75	A	19	100/1/100
P150260R0PL	6,4/7,0	260	8	30	200	225	0.75	A	19	100/1/100
P150280R0PL	6,4/7,0	280	8	30	220	245	0.75	A	19	100/1/100
P150310R0PL	6,4/7,0	310	8	30	250	275	0.75	A	19	100/1/100







Self-drilling, self-tapping (double thread) fasteners made of austenitic steel (BIMETAL), with drilling point # 3, fine working thread and a hexagonal head, with a pre-assembled stainless washer with vulcanized EPDM.

DRILLNOX

BIMETAL STAINLESS SCREW WITH A WASHER FOR FIXING SANDWICH PANELS

Intended for fastening sandwich panels to steel structures in aggressive environments.

ETA

CE

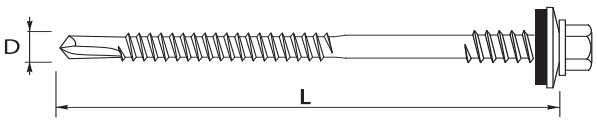
DRILLNOX DF4

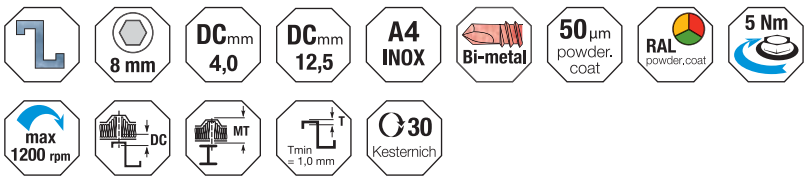
Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
							Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw			DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P374506	5,5/6,3	70	8	25	49	4	S	19	100/1/100
P374508	5,5/6,3	85	8	40	64	4	S	19	100/1/100
P374511	5,5/6,3	110	8	65	89	4	S	19	100/1/100
P374525	5,5/6,3	125	8	50	104	4	S	19	100/1/100
P374527	5,5/6,3	145	8	70	124	4	S	19	100/1/100
P374529	5,5/6,3	175	8	100	154	4	S	19	100/1/100
P374661	5,5/6,3	195	8	120	174	4	S	19	100/1/100
P374666	5,5/6,3	215	8	140	194	4	S	19	100/1/100
P374671	5,5/6,3	235	8	160	214	4	S	19	100/1/100
P374686	5,5/6,3	295	8	220	274	4	S	19	100/1/100

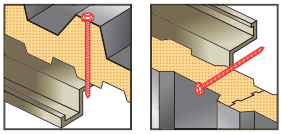
DRILLNOX DF12,5

Index	Screw			MTmin	MTmax	Drilling capacity	Washer		Packaging
							Mat.	Size	Single/ Qty/Collective [pcs]
	D	L	Sw			DC	-	-	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	-	[mm]	
P374531	5,5/6,3	80	8	23	47	12,5	S	19	100/1/100
P374533	5,5/6,3	95	8	38	62	12,5	S	19	100/1/100
P374535	5,5/6,3	115	8	58	82	12,5	S	19	100/1/100
P374537	5,5/6,3	135	8	78	102	12,5	S	19	100/1/100
P374539	5,5/6,3	155	8	98	122	12,5	S	19	100/1/100
P374541	5,5/6,3	190	8	113	157	12,5	S	19	100/1/100
P374731	5,5/6,3	200	8	123	167	12,5	S	19	100/1/100
P374736	5,5/6,3	220	8	143	187	12,5	S	19	100/1/100
P374741	5,5/6,3	240	8	163	207	12,5	S	19	100/1/100
P374746	5,5/6,3	260	8	183	227	12,5	S	19	100/1/100
P374751	5,5/6,3	280	8	203	247	12,5	S	19	100/1/100
P374756	5,5/6,3	300	8	223	267	12,5	S	19	100/1/100

Thickness of fixed elements MTmax is given for the maximum allowable thickness of the substrate.



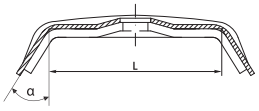


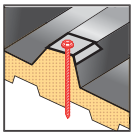


SADDLE WASHER

SPECIAL ALUMINIUM WASHERS
FOR SANDWICH PANELS FIXING

Saddle washers made of high quality aluminum with vulcanized EPDM layer.





Intended for fastening roof sandwich panels by using of GTR SP screws. Saddle washers increase the loading capacity of the connection thanks to larger contact surface area with the surface of sandwich panel. While vulcanized EPDM material provides excellent sealing properties and excellent flexibility.

Index	Saddle washer			Packaging
	Width	Length	Inclination angle	Single/ Qty/Collective [pcs]
	L	D	α	
	[mm]	[mm]	[°]	
PKAL2627	26	41,5	31	100/1/100
PKAL3225	30	41,5	27	100/1/100
PKAL4132	40	41,5	38	100/1/100

*available in RAL colors

50 µm powder. coat

RAL powder.coat

GSPW / GSPW A2

SYSTEM
WASHER FOR
SANDWICH PANELS

System washer for sandwich panels with a hidden fastening, made of carbon steel, galvanized (GSPW) or A2 stainless steel (GSPW A2).

Intended for use with sandwich panels with hidden fastening in combination:

- GSPW – screws GT and GTR
- GSPW A2- screws GTX

The shape is suitable to typical locks of sandwich panels.
High corrosion resistance thanks to the use of A2 stainless steel

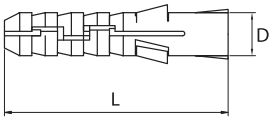
Index	Washer			Steel	Coating	Packaging
	Minimum thickness	Length	Number of holes			Single/ Qty/Collective [pcs]
	D	L	N			
	[mm]	[mm]	[mm]			
PGSPW8030	1,2	80	2	carbon steel	galvanized	25/1/25
PGSPW10025	1,2	100	3	carbon steel	galvanized	25/1/25
PGSPW15025	1,2	150	4	carbon steel	galvanized	25/1/25
PGSPW15030	1,2	150	4	carbon steel	galvanized	25/1/25
PGSPW8030A2	1,2	80	4	A2 stainless steel	-	25/1/25
PGSPW10025A2	1,2	100	4	A2 stainless steel	-	25/1/25
PGSPW15025A2	1,2	150	4	A2 stainless steel	-	25/1/25
PGSPW15030A2	1,2	150	4	A2 stainless steel	-	25/1/25

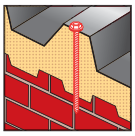
Expansion sleeves made of high-quality nylon.

ULTRA
EXPANSION SLEEVES

Intended for fastening sandwich panels in soft solid materials such as aerated concrete, or masonry in combination with GTR W SP screws.

Index	Sleeve		Packaging
	Length	Width	Single/ Qty/Collective [pcs]
	L	D	
	[mm]	[mm]	
PUP00792	50	10	50/1/50





PROTECTIVE CAP POINCO

Protective cap for the drilling point made of white soft PVC plastic.

Intended to secure the ends of screws Ø4.8 - Ø6.3 protruding from the structure after installation

- high aesthetics
- safety for people
- reducing the screw's contact with the environment

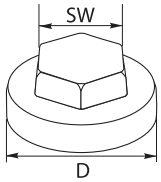
Index	Protective cap			Color	Packaging
	Diameter outside	Length	Screw diameter		Single/ Qty/Collective [pcs]
	Ø	L	D		
	[mm]	[mm]	[mm]		
P402103	7	25	4,8/5,5	white	100/1/100
P402102	9	35	6,3	white	100/1/100

COLOR HEAD CAPS

Masking caps made of a modified polyethylene containing UV stabilizers. The caps are avaiable in different RAL colors.

Intended for plugging on the heads of the screws to visually unify the color of screws to the color of the façade or roof of the building.

Index	Color cap			Packaging
	SW	D	Color	Single/ Qty/Collective [pcs]
	[mm]	[mm]	RAL	
P000011	8	19	1002	1000/1/1000
P000021	8	19	1015	1000/1/1000
P000081	8	19	9006	1000/1/1000
P000131	8	19	3016	1000/1/1000
P000171	8	19	9002	1000/1/1000
P000091	8	19	9010	1000/1/1000
P000243	8	19	7024	1000/1/1000



SPRAY PRIMERS

Acrylic paints in a container of 400 ml spray, contain UV stabilizers.
Paints are available in different RAL colors, in matt or gloss.

Intended for painting the damaged surface of the steel sheets and screws.
It is recommended to carefully remove the grease from surfaces to be painted and follow the instructions on the container.

Index	Color	Packaging
	RAL	Single/ Qty/Collective [pcs]
PFA1002	1002	1/12/12
PFA1015	1015	1/12/12
PFA3000	3000	1/12/12
PFA3005	3005	1/12/12
PFA3009	3009	1/12/12
PFA3011	3011	1/12/12
PFA3016	3016	1/12/12
PFA5002	5002	1/12/12
PFA5005	5005	1/12/12
PFA5010	5010	1/12/12
PFA6005	6005	1/12/12
PFA6011	6011	1/12/12
PFA6020	6020	1/12/12
PFA6029	6029	1/12/12
PFA7011	7011	1/12/12
PFA7024	7024	1/12/12
PFA7035	7035	1/12/12
PFA8004	8004	1/12/12
PFA8017	8017	1/12/12
PFA8019	8019	1/12/12
PFA9002	9002	1/12/12
PFA9003	9003	1/12/12
PFA9005	9005	1/12/12
PFA9006	9006	1/12/12
PFA9010	9010	1/12/12

UV RESISTANT

STICK PRIMERS

Acrylic paints in a container of 20 ml with a brush, contain UV stabilizers.
Paints are avaiable in different RAL colors, in matt or gloss.

Intended for spot repair of the damaged surface of the steel sheets and for screws.
It is recommended to carefully remove the grease from surfaces to be painted and follow the instructions on the container.

Index	Color	Packaging
	RAL	Single/ Qty/Collective [pcs]
PFAS201002	1002	1/1/1
PFAS201015	1015	1/1/1
PFAS203000	3000	1/1/1
PFAS203005	3005	1/1/1
PFAS203009	3009	1/1/1
PFAS203011	3011	1/1/1
PFAS203016	3016	1/1/1
PFAS205002	5002	1/1/1
PFAS205005	5005	1/1/1
PFAS205010	5010	1/1/1
PFAS206005	6005	1/1/1
PFAS206011	6011	1/1/1
PFAS206020	6020	1/1/1
PFAS206029	6029	1/1/1
PFAS207011	7011	1/1/1
PFAS207024	7024	1/1/1
PFAS207035	7035	1/1/1
PFAS208004	8004	1/1/1
PFAS208017	8017	1/1/1
PFAS208019	8019	1/1/1
PFAS209002	9002	1/1/1
PFAS209003	9003	1/1/1
PFAS209005	9005	1/1/1
PFAS209006	9006	1/1/1
PFAS209010	9010	1/1/1

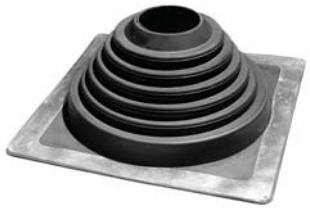
UV RESISTANT

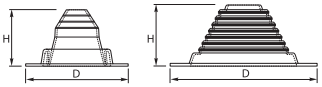
Collars with a square base, of various sizes, made of EPDM reinforced with aluminum tape

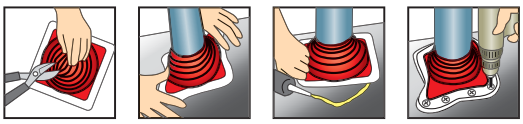
GUM SEALING FLANGES

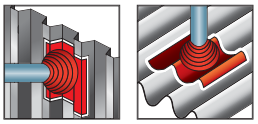
Intended for sealing the circular penetration holes of different types of building installation (chimneys, ventilation, water and waste water pipes, cables, etc.) in the facades or roofs made of profiled sheets. Installation of collars takes place by means of self-tapping screws and sealing silicone.
The hole in the gum flange should be about 20% smaller than of the sealed element.

Index	Flange				Packaging Single/ Qty/Collective [pcs]
	Height	Base width	Diameter of the element		
	H	D	min	max	
	[mm]	[mm]	[mm]	[mm]	
PGMF1	55	114	6	50	1/93/93
PGMF2	75	155	32	76	1/93/93
PGMF3	83	205	60	102	1/45/45
PGMF4	102	255	76	152	1/20/20
PGMF5	115	275	102	178	1/20/20
PGMF6	128	305	127	228	1/16/16
PGMF7	132	365	152	280	1/16/16
PGMF8	140	425	178	330	1/6/6









Self-adhesive wedge gasket for roofs made of polyurethane foam

UNIVERSAL GASKETS

Intended to fill the gap between the roof metal sheets and ridge profiles or in the area above the gutters

Index	Gasket					Packaging Single/ Qty/Collective [pcs]
	Type	Width	Height	Length	Color	
		D	H	L		
		[mm]	[mm]	[mm]		
P10003060S2	Wedge	60	30	1000	gray	200/1/200
P10003060C2	Wedge	60	30	1000	red	200/1/200
P10003060B2	Wedge	60	30	1000	brown	200/1/200

GASKETS FOR ROOF TILE SHEETS

Profiled roof tile sheet gaskets made of cross-linked polyethylene foam.

Intended for sealing gaps between the roof surface and metal flashings above the gutters, on the ridge, and in the roof valley.

Index	Gasket	Packaging
	Type	Single/ Qty/Collective [pcs]
PB2DP	ridge tile gasket	100/1/100

SEALING TAPE PES

Self-adhesive PE foam tape, graphite color (dark gray)

Intended to fill the gaps at the joints between a sandwich panel - sandwich panel or a sandwich panel - structure, sheet - structure or sheet - sheet.

- self-adhesive - easy and quick installation
- thermal sealing of the connection
- damping and silencing

Index	Sealing tape				Packaging
	Width	Thickness	Length	Color	Single/ Qty/Collective [pcs]
	s	d	L		
	[mm]	[mm]	[mb]		
PTPES20	20	3	30	graphite	1/50/50
PTPES30	30	3	30	graphite	1/30/30

PU GUN FOAM

One-component low-expansion polyurethane foam with a capacity of 750 ml.
PU foam application gun.

Polyurethane foam has excellent adhesion to typical construction materials.
An excellent thermal and acoustic insulation.
PU foam application gun.

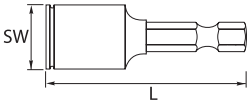
Index	Capacity [ml]	Packaging Single/ Qty/Collective [pcs]
PPIANA750ML	750	1/12/12
PPISTOLET	-	1/1

HEX SOCKETS

Screwdrivers bits are made of high quality chrome vanadium steel, surface hardened, protected from corrosion. Hexagonal shape, different sizes screw holding systems (magnetic with an internal or external spring).

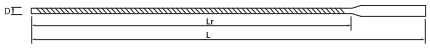
Intended for use in screwdrivers. Used for correct screwing hex head fasteners into the structure material. For GTX screws as well as painted screws it is recommended to use the bits with spring.

Index	Bit			Packaging Single/ Qty/Collective [pcs]
	SW [mm]	L [mm]	Type	
P181031	6	45	magnetic	1/1/1
P189903	6	45	ball-lock, dedicated bit for GTS-STAR screws	1/1/1
P189899	8	45	magnetic	1/1/1
P189898	8	45	ball-lock	1/1/1
P189900	8	65	magnetic	1/1/1
P181033	3/8"	-	magnetic	1/1/1
Z541851	-	-	dedicated holder for PAN HEAD screws	1/1/1
P189901	10	65	magnetic	1/1/1



CONCRETE DRILL BITS

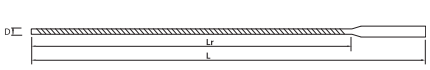
Drill bits for pre-drilling in concrete for self-tapping screws



Index	SDS+ Drill bit				Packaging
	L	Lr	D	Connection end	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	Type	
PSDS550110	110	50	5	SDS+	1/1/1
PSDS5100160	160	100	5	SDS+	1/1/1
PSDS5150210	210	150	5	SDS+	1/1/1
PSDS5200260	260	200	5	SDS+	1/1/1
PSDS5250310	310	250	5	SDS+	1/1/1
PSDS5300360	360	300	5	SDS+	1/1/1
PSDS5350410	410	350	5	SDS+	1/1/1
PSDS5550120	120	50	5,5	SDS+	1/1/1
PSDS55100160	160	100	5,5	SDS+	1/1/1
PSDS55150210	210	150	5,5	SDS+	1/1/1
PSDS55200260	260	200	5,5	SDS+	1/1/1
PSDS55250310	310	250	5,5	SDS+	1/1/1
PSDS55350410	410	350	5,5	SDS+	1/1/1

THREE- CUTTERS CONCRETE DRILL BITS

Drill bits for drilling in concrete.



Index	SDS+ Drill bit				Packaging
	L	Lr	D	Connection end	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	Type	
PSDS6100170	170	100	6	SDS+	1/1/1
PSDS8150220	220	150	8	SDS+	1/1/1
PSDS10150220	220	150	10	SDS+	1/1/1
PSDS12150220	220	150	12	SDS+	1/1/1
PSDS14150220	220	150	14	SDS+	1/1/1
PSDS14250320	320	250	14	SDS+	1/1/1
PSDS16150220	220	150	16	SDS+	1/1/1
PSDS16250320	320	250	16	SDS+	1/1/1
PSDS16400470	470	400	16	SDS+	1/1/1
PSDS20250320	320	250	20	SDS+	1/1/1
PSDS20400470	470	400	20	SDS+	1/1/1

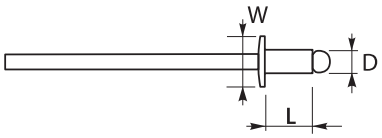
Three-cutter drill bits

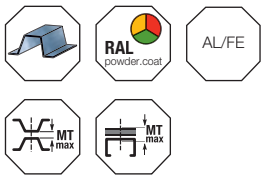
OPEN-END RIVETS AL/FE

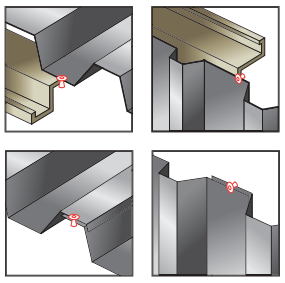
OPEN-END ALUMINUM - STEEL RIVETS

Intended for economical connection of different elements made of steel sheet or aluminum inside buildings (lack of moisture).

Index	Rivet			Recommended connection		Hole diameters		Packaging
	D	L	W	MTmin	MTmax	dh min.	dh. max	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
PN0124060PL	2,4	6	max. 5	2,00	4,00	2,50	2,60	500/8/4000
PN0124080PL	2,4	8	max. 5	4,00	6,00	2,50	2,60	500/8/4000
PN0124100PL	2,4	10	max. 5	6,00	8,00	2,50	2,60	500/8/4000
PN0124120PL	2,4	12	max. 5	8,00	9,50	2,50	2,60	500/8/4000
PN0132060PL	3,2	6	max. 6,7	1,50	3,50	3,30	3,40	500/8/4000
PN0132080PL	3,2	8	max. 6,7	3,50	5,00	3,30	3,40	500/8/4000
PN0132100PL	3,2	10	max. 6,7	5,00	7,00	3,30	3,40	500/8/4000
PN0132120PL	3,2	12	max. 6,7	7,00	9,00	3,30	3,40	500/8/4000
PN0132140PL	3,2	14	max. 6,7	7,00	11,00	3,30	3,40	500/8/4000
PN0140080PL	4	8	max. 8,4	3,00	5,00	4,10	4,20	500/8/4000
PN0140100PL	4	10	max. 8,4	5,00	6,50	4,10	4,20	500/8/4000
PN0140120PL	4	12	max. 8,4	6,50	8,50	4,10	4,20	500/8/4000
PN0140140PL	4	14	max. 8,4	7,00	11,00	4,10	4,20	500/8/4000
PN0140160PL	4	16	max. 8,4	8,50	12,50	4,10	4,20	500/8/4000
PN0148080PL	4,8	8	max. 10,1	2,50	4,00	4,90	5,00	500/8/4000
PN0148100PL	4,8	10	max. 10,1	4,00	6,00	4,90	5,00	500/8/4000
PN0148120PL	4,8	12	max. 10,1	6,00	8,00	4,90	5,00	500/8/4000
PN0148140PL	4,8	14	max. 10,1	7,00	11,00	4,90	5,00	500/8/4000
PN0148160PL	4,8	16	max. 10,1	8,00	12,00	4,90	5,00	500/8/4000
PN0148200PL	4,8	20	max. 10,1	12,00	15,00	4,90	5,00	500/8/4000
PN0160120PL	6	12	max. 12,6	5,00	7,00	6,10	6,20	500/8/4000
PN0160140PL	6	14	max. 12,6	7,00	11,00	6,10	6,20	500/8/4000
PN0160220PL	6	22	max. 12,6	11,00	18,00	6,10	6,20	500/8/4000
PN0160260PL	6	26	max. 12,6	17,00	20,00	6,10	6,20	500/8/4000







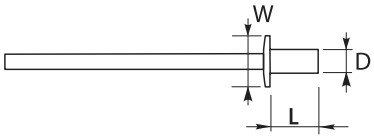
SEALED-END RIVETS AL/FE

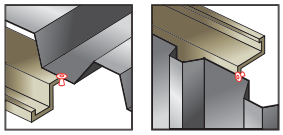
SEALED-END ALUMINUM - STEEL RIVETS

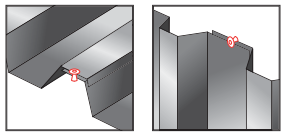
Sealed-end aluminum rivets with carbon steel shank.

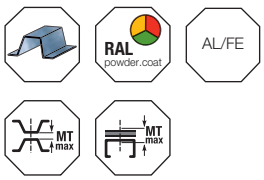
Intended for waterproof connecting of different elements made of steel sheet or aluminum.

Index	Rivet			Recommended connecting		Hole diameters		Packaging
	D	L	W	MTmin	MTmax	dh min.	dh. max	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
PN2632650PL	3,2	6,5	max. 6,7	0,50	2,00	3,30	3,40	500/8/4000
PN2632080PL	3,2	8	max. 6,7	2,00	3,50	3,30	3,40	500/8/4000
PN2632950PL	3,2	9,5	max. 6,7	3,50	5,00	3,30	3,40	500/8/4000
PN26321070PL	3,2	10,7	max. 6,7	3,50	5,00	3,30	3,40	500/8/4000
PN2632120PL	3,2	12,7	max. 6,7	6,50	8,00	3,30	3,40	500/8/4000
PN2640080PL	4	8	max. 8,4	0,50	3,50	4,10	4,20	500/8/4000
PN2640090PL	4	9,5	max. 8,4	3,50	5,00	4,10	4,20	500/8/4000
PN2640110PL	4	11	max. 8,4	5,00	6,50	4,10	4,20	500/8/4000
PN26401270PL	4	12,7	max. 8,4	6,50	8,00	4,10	4,20	500/8/4000
PN2640150PL	4	15	max. 8,4	8,00	10,00	4,10	4,20	500/8/4000
PN2648090PL	4,8	9,5	max. 10,1	3,50	5,00	4,90	5,00	500/8/4000
PN2640110PL	4,8	11	max. 10,1	5,00	6,50	4,90	5,00	500/8/4000
PN2648120PL	4,8	12,5	max. 10,1	6,50	8,00	4,90	5,00	500/8/4000
PN2648160PL	4,8	16	max. 10,1	9,50	11,00	4,90	5,00	500/8/4000
PN2648180PL	4,8	18	max. 10,1	11,00	13,00	4,90	5,00	500/8/4000
PN2648210PL	4,8	21	max. 10,1	13,00	16,00	4,90	5,00	500/8/4000
PN2664120PL	6,4	12,5	max. 13,4	1,50	6,50	6,50	6,60	500/8/4000
PN2664160PL	6,4	16	max. 13,4	6,50	9,50	6,50	6,60	500/8/4000









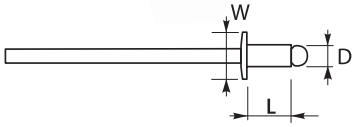
OPEN-END RIVETS AL/INOX

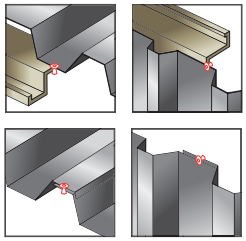
OPEN-END ALUMINIUM
- STAINLESS STEEL RIVETS

Aluminum open-end rivets with stainless steel shank.

Intended for economical conection of different elements made of steel sheet or aluminum in damp environments, for example finishings.

Index	Rivet			Recommended connections		Hole diameters		Packaging
	D	L	W	MTmin	MTmax	dh min.	dh. max	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
PN0832060PL	3,2	6	max. 6,7	0,50	3,00	3,30	3,40	500/8/4000
PN0832080PL	3,2	8	max. 6,7	3,00	5,00	3,30	3,40	500/8/4000
PN0832100PL	3,2	10	max. 6,7	5,00	6,50	3,30	3,40	500/8/4000
PN0832120PL	3,2	12	max. 6,7	6,50	8,50	3,30	3,40	500/8/4000
PN0840080PL	4	8	max. 8,4	2,50	4,50	4,10	4,20	500/8/4000
PN0840100PL	4	10	max. 8,4	4,50	6,50	4,10	4,20	500/8/4000
PN0840120PL	4	12	max. 8,4	6,50	8,50	4,10	4,20	500/8/4000
PN0840140PL	4	14	max. 8,4	8,50	10,00	4,10	4,20	500/8/4000
PN0840160PL	4	16	max. 8,4	10,00	12,00	4,10	4,20	500/8/4000
PN0848080PL	4,8	8	max. 10,1	2,00	4,00	4,90	5,00	500/8/4000
PN0848100PL	4,8	10	max. 10,1	4,00	6,00	4,90	5,00	500/8/4000
PN0848120PL	4,8	12	max. 10,1	6,00	8,00	4,90	5,00	500/8/4000
PN0848140PL	4,8	14	max. 10,1	6,00	10,00	4,90	5,00	500/8/4000
PN0848160PL	4,8	16	max. 10,1	8,00	11,00	4,90	5,00	500/8/4000
PN0848200PL	4,8	20	max. 10,1	13,00	16,00	4,90	5,00	500/8/4000





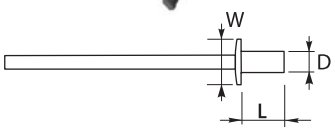
SEALED-END RIVETS AL/INOX

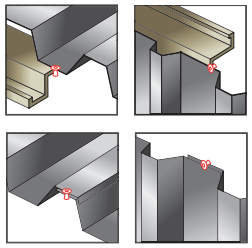
SEALED-END ALUMINUM
- STAINLESS STEEL RIVETS

Aluminum sealed-end rivets with austenitic steel shank.

Intended for waterproof connection of different elements made of steel sheet or aluminum in damp environments, for example finishings.

Index	Rivet			Recommended ragnes		Hole diameters		Packaging
	D	L	W	MTmin	MTmax	dh min.	dh. max	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
PN3032060PL	3,2	6,5	max. 6,7	0,50	2,00	3,30	3,40	500/8/4000
PN3032080PL	3,2	8	max. 6,7	0,50	3,50	3,30	3,40	500/8/4000
PN3032950PL	3,2	9,5	max. 6,7	3,50	5,00	3,30	3,40	500/8/4000
PN3032100PL	3,2	10,7	max. 6,7	5,00	6,50	3,30	3,40	500/8/4000
PN3032120PL	3,2	12,7	max. 6,7	6,50	8,00	3,30	3,40	500/8/4000
PN3040080PL	4	8	max. 8,4	2,50	4,50	4,10	4,20	500/8/4000
PN3040090PL	4	9,5	max. 8,4	1,00	5,00	4,10	4,20	500/8/4000
PN3040110PL	4	11	max. 8,4	5,00	6,50	4,10	4,20	500/8/4000
PN3040120PL	4	12,7	max. 8,4	6,50	8,00	4,10	4,20	500/8/4000
PN3048090PL	4,8	9,5	max. 10,1	3,50	5,00	4,90	5,00	500/8/4000
PN3048110PL	4,8	11	max. 10,1	3,50	6,50	4,90	5,00	500/8/4000
PN3048120PL	4,8	12,5	max. 10,1	6,50	8,00	4,90	5,00	500/8/4000
PN3048160PL	4,8	16	max. 10,1	9,00	11,00	4,90	5,00	500/8/4000
PN3048180PL	4,8	18	max. 10,1	9,50	13,50	4,90	5,00	500/8/4000
PN3048210PL	4,8	21	max. 10,1	13,00	16,00	4,90	5,00	500/8/4000





FASTENING OF FLAT ROOF FLEXIBLE THERMO- AND HYDRO-INSULATIONS

Yetico System of thermoinsulation for flat roof
Source: Yetico

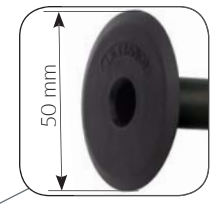
FASTENING OF FLAT ROOF INSULATIONS

- PLASTIC SLEEVE
- SCREWS
- STEEL WASHERS
- ACCESORIES

TELESCOPE SLEEVE

ETANCO

- european manufacturer of fasteners & systems for the envelope of the buildings
- the ETANCO products can be easily identified through their characteristic marking
- strict production control carried out by the in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification
- products have European Technical Assesment (ETA), and confirmation of their quality is the declaration of performance (DoP).



50 MM WASHER:

- increased washer diameter of 50 mm provides better material holding

BOTTOM HEAD

- G1 spiked
- G2 standard

- reinforcing ribs (washer + sleeve) guarantees high performance impact resistance according to ETAG 006

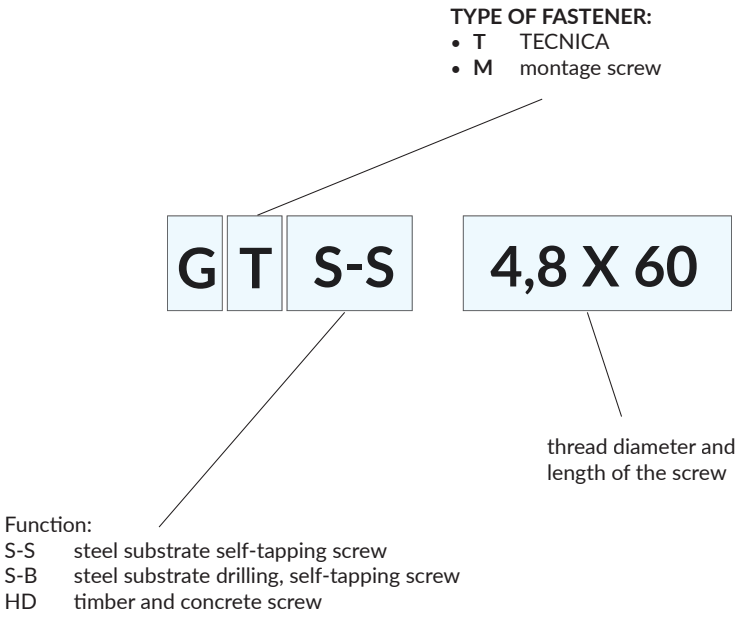
MATERIAL:

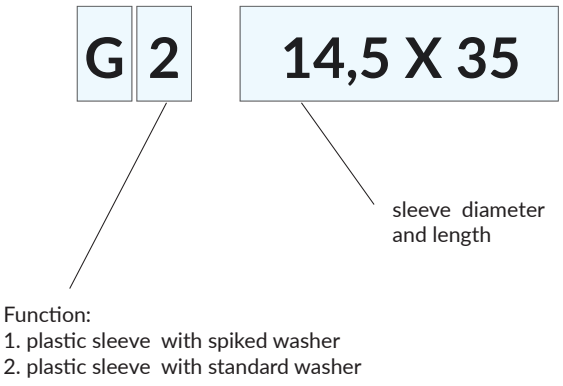
- high quality polyethylene copolymer guarantees constant mechanical properties for many years
- retains its properties under the influence of wide temperature range
- delivers high performance in tensile strength

CONE-SHAPED TIP:

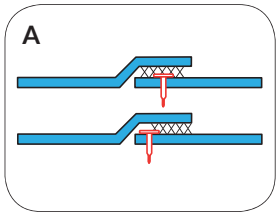
- specially intended conical end of the sleeve enables the delivery of pre-assembled sets (screw and a telescope) directly to the construction site

PRODUCT NOMENCLATURE

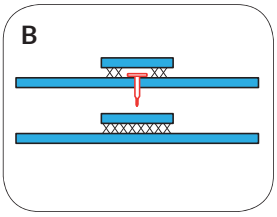




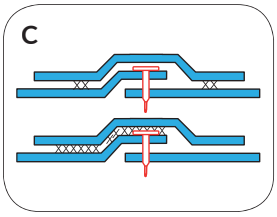
EXAMPLES OF FASTENING OF WATERPROOFING MATERIALS ACCORDING TO ETAG 006



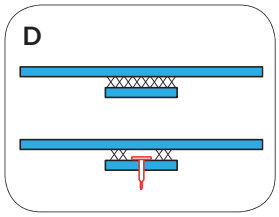
Fasteners at seams: Linear individual fastening in area of overlapping at edge of roofing



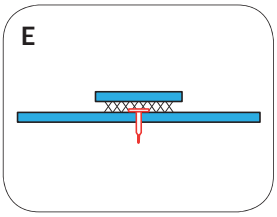
Non self-sealing fastening in the plane of the roof. Individual fastening, independent of seams penetrating the roofing and covered with plates or strips of roofing material welded thereon.



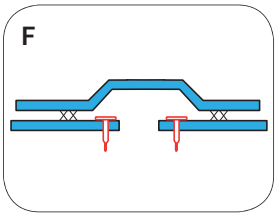
Covered fastenings at seams. Linear individual fastening of overlapping edges of roofing with welded-on strips.



Fastening at underside. Plates or strips of roofing material or composite sheet metal fixed by means of individual fastenings and covered with roofing roof waterproofing bonded or welded theron



Linear fastening bars Linest fastenings using profiles covered with strips of roofing welded thereon



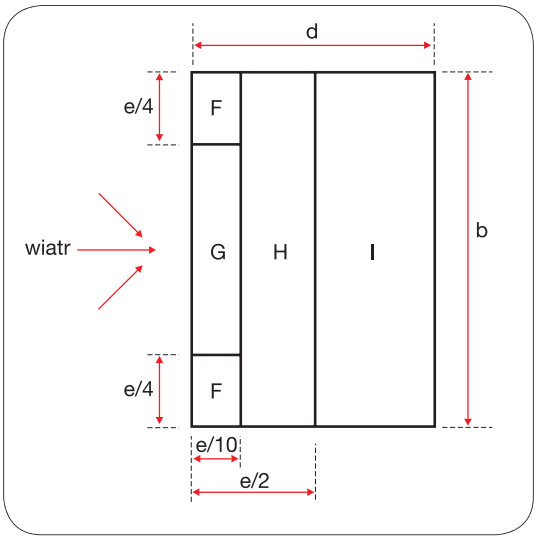
Covered fastenings at seams joint realized by end to end position of the sheets fixed on both sides and covered with a welded overlap strip

flexible waterproofing products (waterproofing)

xxxxxxxx bonding, welding

SCHEME OF INSTALLATION OF WATERPROOFING SHEETS ACCORDING TO PN-EN-1991-1-4:2008

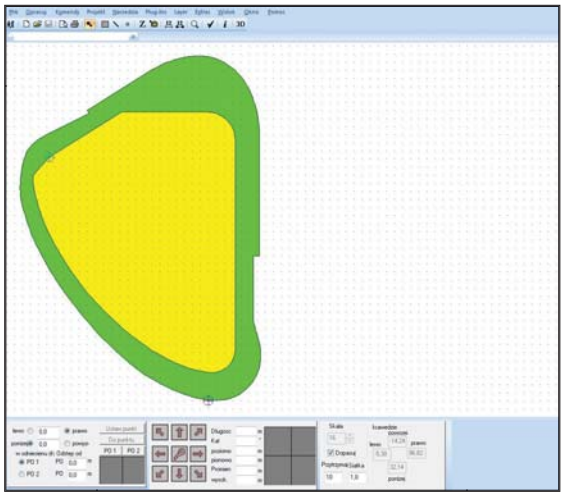
The harmonized standard EN-1991-1-4: 2008 contains guidelines for wind loading calculations of flat roofs. On this basis, a fixing plan is prepared. To prepare it, the number of detailed information of the structure and geographical location of the project is needed. The referenced standard assumes 4 areas of wind effect on a flat roof. Each area is shown in figure below.

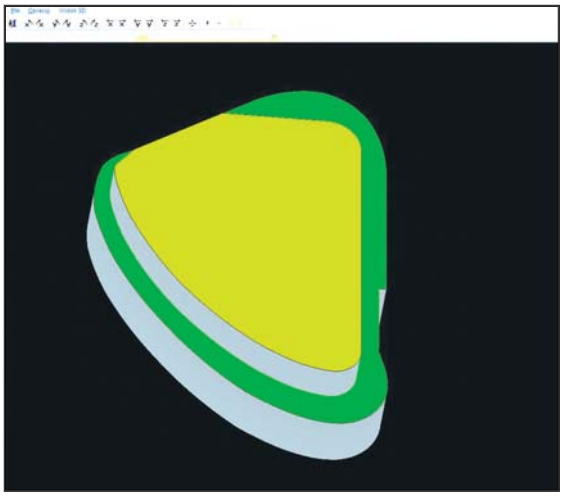


where:

- **e** = b or 2h (the lesser of the two)
- **b** transverse dimension to the wind direction
- **d** dimension along the wind
- **h** building height
- **F** corner area
- **G** edge area, external
- **H** edge area, internal
- **I** internal zone

In order to prepare the fixing plan please get in touch with ETANCO INDUSTRIES technical consultant. Using specialized software, a calculation will be prepared and the number of fasteners will be optimized. The calculation will contain all the information needed to fix the roofing. The pictures below presents an example of a object.





MECHANICAL FASTENING RULES OF THERMAL INSULATION AND WATERPROOFING SHEETS ON FLAT ROOFS

Flat roofs are roofs with a slope of up to 5° (range from -5° to 5°). Depending on the roof design, adequate mechanical fasteners must be used for installation of thermal insulation or waterproofing, or just waterproofing. Mechanical fixing can be used on most roofs, provided that the requirements for the structure of the substrate and the system are met. In some cases it may be necessary to apply different kind of fastening, for example, full-surface gluing. The information in the technical assessment of the product is used for verifying the correct application of the fastening system used.

Mechanical installation should be done based on fixing plan in accordance with the applicable standard such as PN-EN-1991-1-4:2008. If it is planned to put thermal insulation panels on the roof before waterproofing, these panels must be pre-fixed. Pre-fixation of the thermal insulation should be performed according to manufacturer's instructions, using no less than two fasteners per panel.

GENERAL INSTALLATION GUIDELINES:

a fastener installation should always be perpendicular to the roof structure

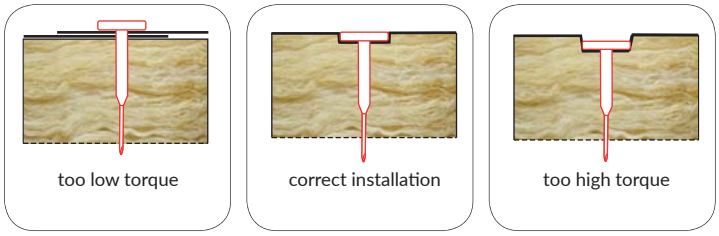
b installation should be done using a screwdriver equipped with adjustable clutch

c during installation of the fastener, you should follow all recommended parameters for the type of fastener,

d any modification of fasteners is not allowed

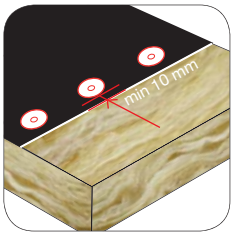
e the fastener must be properly embedded (fig.1).

fig. 1



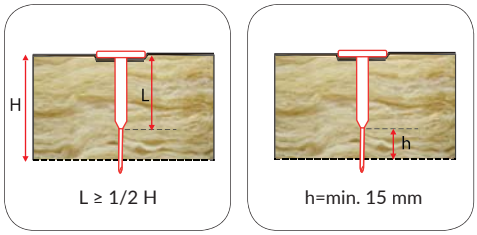
f fastener must be placed in proper distance from membrane edge (fig.2)

fig. 2



g fastener should be of sufficient length (fig. 3)

fig. 3

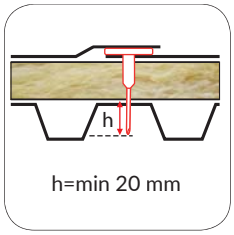


h = 15 mm or 10% of the maximum deflection of isolation* (larger of the two)
* applies to wool

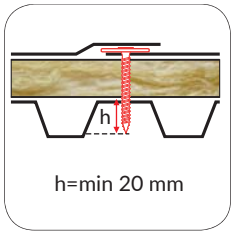
MECHANICAL FASTENING RULES OF THERMAL INSULATION AND WATERPROOFING SHEETS ON FLAT ROOFS

INSTALLATION ON STEEL

RECOMMENDATIONS:
- the insulating fastener type should be selected to match the thickness of the steel structure
- fasteners are always installed on the upper wave of the sheet
- installation lines should always be carried out perpendicular to the sheet embossing direction
- the insulation fastener should go through the steel sheet for a distance of at least 20 mm



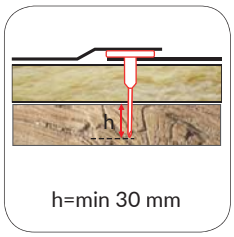
h=min 20 mm



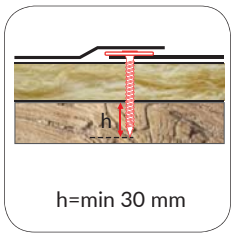
h=min 20 mm

INSTALLATION ON TIMBER

RECOMMENDATIONS:
- minimum class of timber structure - C24
- insulation fastener should be embedded in the structure at a depth of at least 30 mm (or 40 mm)
- making of a pre-drilling is not required
- thickness of the timber structure should meet the requirements of the technical approval
- Installation lines should always be carried out perpendicular to the direction of the planks. If it is not possible it should be ensured that the fixing lines do not line up with gaps between the planks.



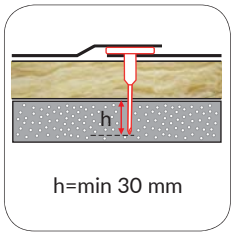
h=min 30 mm



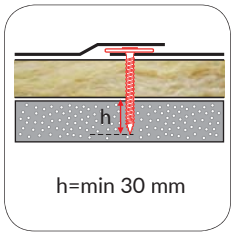
h=min 30 mm

INSTALLATION ON CONCRETE

RECOMMENDATIONS:
- the minimum class monolithic concrete slab should be C20/25
- insulation fastener should be embedded in the concrete at a depth of at least 30 mm
- the pre-drilling should be deeper by 10mm from the depth of fastener embedding
- thickness of the concrete structure should meet the requirements of the technical assessment



h=min 30 mm



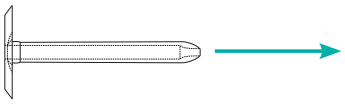
h=min 30 mm

FIXING ON STRUCTURE WITH UNKNOWN PARAMETERS

If the quality of the structure is not known, please contact the ETANCO technical consultant.
Tests performed on site using a portable pull-out tester will allow to define such parameters as:
- uniformity of the substrate (concrete substrate)
- recommended pull-out load of the fastener.

SELECTION OF TELESCOPE FASTENER ROE INSULATION THICKNESS

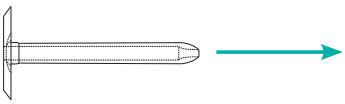
Steel



GTS-S	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
50		80	100	120	150	180	200	250	300	350	400	450
60		90	110	130	160	190	210	260	310	360	410	460
70		100	120	140	170	200	220	270	320	370	420	470
80		110	130	150	180	210	230	280	330	380	430	480
90		120	140	160	190	220	240	290	340	390	440	490
100		130	150	170	200	230	250	300	350	400	450	500
110			160	180	210	240	260	310	360	410	460	510
120			170	190	220	250	270	320	370	420	470	520
130				200	230	260	280	330	380	430	480	530
140				210	240	270	290	340	390	440	490	540
150					250	280	300	350	400	450	500	550
160					260	290	310	360	410	460	510	560
170					270	300	320	370	420	470	520	570
180						310	330	380	430	480	530	580
200						330	350	400	450	500	550	600
220							370	420	470	520	570	620
240								440	490	540	590	640
260								460	510	560	610	660
280									530	580	630	680
300									550	600	650	700

Total insulation layers thickness (polystyrene, pir)

Steel

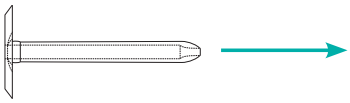


GTS-S	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
50	50	80	100	120	150							
60	60	90	110	130	160	190	210					
70	70	100	120	140	170	200	220	270	320			
80		110	130	150	180	210	230	280	330	380	430	
90		120	140	160	190	220	240	290	340	390	440	490
100		130	150	170	200	230	250	300	350	400	450	500
110			160	180	210	240	260	310	360	410	460	510
120			170	190	220	250	270	320	370	420	470	520
130				200	230	260	280	330	380	430	480	530
140				210	240	270	290	340	390	440	490	540
150					250	280	300	350	400	450	500	550
160					260	290	310	360	410	460	510	560
170					270	300	320	370	420	470	520	570
180						310	330	380	430	480	530	580
200						330	350	400	450	500	550	600
220							370	420	470	520	570	620
240								440	490	540	590	640
260								460	510	560	610	660
280									530	580	630	680
300									550	600	650	700

Total insulation layers thickness (wool)

SELECTION OF TELESCOPE FASTENER ROE INSULATION THICKNESS

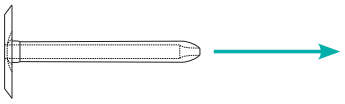
Steel



GTS-B		Sleeve length											
		35	65	85	105	135	165	185	235	285	335	385	435
Screw length	50	50	80	100	120	150	180	200	250	300	350	400	450
	60	60	90	110	130	160	190	210	260	310	360	410	460
	70	70	100	120	140	170	200	220	270	320	370	420	470
	80		110	130	150	180	210	230	280	330	380	430	480
	90		120	140	160	190	220	240	290	340	390	440	490
	100		130	150	170	200	230	250	300	350	400	450	500
	110			160	180	210	240	260	310	360	410	460	510
	120			170	190	220	250	270	320	370	420	470	520
	130				200	230	260	280	330	380	430	480	530
	140				210	240	270	290	340	390	440	490	540
	150					250	280	300	350	400	450	500	550
	180						310	330	380	430	480	530	580
	210							360	410	460	510	560	610
	240								440	490	540	590	640
	280									530	580	630	680
	300									550	600	650	700

Total insulation layers thickness (polystyrene, pir)

Steel

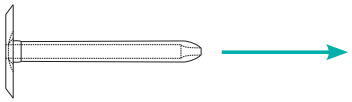


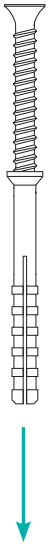
GTS-B		Sleeve length											
		35	65	85	105	135	165	185	235	285	335	385	435
Screw length	50	50	80	100	120	150							
	60	60	90	110	130	160	190	210					
	70	70	100	120	140	170	200	220	270	320			
	80		110	130	150	180	210	230	280	330	380	430	
	90		120	140	160	190	220	240	290	340	390	440	490
	100		130	150	170	200	230	250	300	350	400	450	500
	110			160	180	210	240	260	310	360	410	460	510
	120			170	190	220	250	270	320	370	420	470	520
	130				200	230	260	280	330	380	430	480	530
	140				210	240	270	290	340	390	440	490	540
	150					250	280	300	350	400	450	500	550
	180						310	330	380	430	480	530	580
	210							360	410	460	510	560	610
	240								440	490	540	590	640
	280								480	530	580	630	680
	300									550	600	650	700

Total insulation layers thickness (wool)

SELECTION OF TELESCOPE FASTENER ROE INSULATION THICKNESS

Concrete

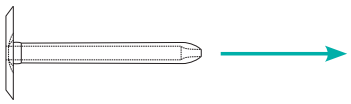


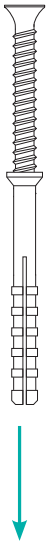


GTS-S + sleeve UZ-K	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
90	50	80	100	120	150	180	200	250	300	350	400	450
100	60	90	110	130	160	190	210	260	310	360	410	460
110	70	100	120	140	170	200	220	270	320	370	420	470
120		110	130	150	180	210	230	280	330	380	430	480
130		120	140	160	190	220	240	290	340	390	440	490
140		130	150	170	200	230	250	300	350	400	450	500
150			160	180	210	240	260	310	360	410	460	510
160			170	190	220	250	270	320	370	420	470	520
170				200	230	260	280	330	380	430	480	530
180				210	240	270	290	340	390	440	490	540
200					260	290	310	360	410	460	510	560
220						310	330	380	430	480	530	580
240						330	350	400	450	500	550	600
260							370	420	470	520	570	620
280								440	490	540	590	640
300								460	510	560	610	660

Total insulation layers thickness (polystyrene, pir)

Concrete



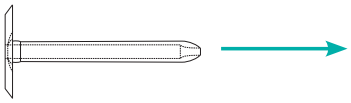


GTS-S + sleeve UZ-K	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
90	50	80	100	120	150							
100	60	90	110	130	160	190	210					
110	70	100	120	140	170	200	220	270	320			
120		110	130	150	180	210	230	280	330	380	430	
130		120	140	160	190	220	240	290	340	390	440	490
140		130	150	170	200	230	250	300	350	400	450	500
150			160	180	210	240	260	310	360	410	460	510
160			170	190	220	250	270	320	370	420	470	520
170				200	230	260	280	330	380	430	480	530
180				210	240	270	290	340	390	440	490	540
200					260	290	310	360	410	460	510	560
220						310	330	380	430	480	530	580
240						330	350	400	450	500	550	600
260							370	420	470	520	570	620
280								440	490	540	590	640
300								460	510	560	610	660

Total insulation layers thickness (wool)

SELECTION OF TELESCOPE FASTENER
ROE INSULATION THICKNESS

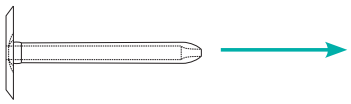
Concrete



GTHD		Sleeve length											
		35	65	85	105	135	165	185	235	285	335	385	435
Screw length	60	50	80	100	120	150	180	200	250	300	350	400	450
	70	60	90	110	130	160	190	210	260	310	360	410	460
	80	70	100	120	140	170	200	220	270	320	370	420	470
	90		110	130	150	180	210	230	280	330	380	430	480
	100		120	140	160	190	220	240	290	340	390	440	490
	130			170	190	220	250	270	320	370	420	470	520
	160					250	280	300	350	400	450	500	550
	180					270	300	320	370	420	470	520	570
	200						320	340	390	440	490	540	590
	220							360	410	460	510	560	610
	250								440	490	540	590	640
	280								470	520	570	620	670
	300									540	590	640	690

Total insulation layers thickness (polystyrene, pir)

Concrete

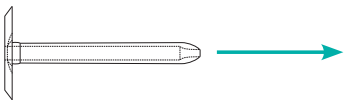


GTHD		Sleeve length											
		35	65	85	105	135	165	185	235	285	335	385	435
Screw length	60	50	80	100	120	150							
	70	60	90	110	130	160	190	210					
	80	70	100	120	140	170	200	220	270	320			
	90		110	130	150	180	210	230	280	330	380	430	
	100		120	140	160	190	220	240	290	340	390	440	490
	130			170	190	220	250	270	320	370	420	470	520
	160					250	280	300	350	400	450	500	550
	180					270	300	320	370	420	470	520	570
	200						320	340	390	440	490	540	590
	220							360	410	460	510	560	610
	250								440	490	540	590	640
	280								470	520	570	620	670
	300									540	590	640	690

Total insulation layers thickness (wool)

SELECTION OF TELESCOPE FASTENER ROE INSULATION THICKNESS

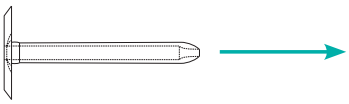
Timber



GTHD	Sleeve length											
	35	65	85	105	135	165	185	235	285	335	385	435
Screw length 60	50	80	100	120	150	180	200	250	300	350	400	450
70	60	90	110	130	160	190	210	260	310	360	410	460
80	70	100	120	140	170	200	220	270	320	370	420	470
90		110	130	150	180	210	230	280	330	380	430	480
100		120	140	160	190	220	240	290	340	390	440	490
130			170	190	220	250	270	320	370	420	470	520
160					250	280	300	350	400	450	500	550
180					270	300	320	370	420	470	520	570
200						320	340	390	440	490	540	590
220							360	410	460	510	560	610
250								440	490	540	590	640
280								470	520	570	620	670
300									540	590	640	690

Total insulation layers thickness (polystyrene, pir)

Timber

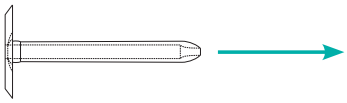


GTHD	Sleeve length											
	35	65	85	105	135	165	185	235	285	335	385	435
Screw length 60	50	80	100	120	150							
70	60	90	110	130	160	190	210					
80	70	100	120	140	170	200	220	270	320			
90		110	130	150	180	210	230	280	330	380	430	
100		120	140	160	190	220	240	290	340	390	440	490
130			170	190	220	250	270	320	370	420	470	520
160					250	280	300	350	400	450	500	550
180					270	300	320	370	420	470	520	570
200						320	340	390	440	490	540	590
220							360	410	460	510	560	610
250								440	490	540	590	640
280								470	520	570	620	670
300									540	590	640	690

Total insulation layers thickness (wool)

SELECTION OF TELESCOPE FASTENER
ROE INSULATION THICKNESS

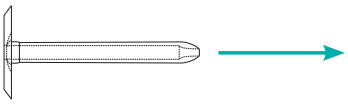
Timber



GTS-S	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
50	50	80	100	120	150	180	200	250	300	350	400	450
60	60	90	110	130	160	190	210	260	310	360	410	460
70	70	100	120	140	170	200	220	270	320	370	420	470
80		110	130	150	180	210	230	280	330	380	430	480
90		120	140	160	190	220	240	290	340	390	440	490
100		130	150	170	200	230	250	300	350	400	450	500
110			160	180	210	240	260	310	360	410	460	510
120			170	190	220	250	270	320	370	420	470	520
130				200	230	260	280	330	380	430	480	530
140				210	240	270	290	340	390	440	490	540
150					250	280	300	350	400	450	500	550
160					260	290	310	360	410	460	510	560
170					270	300	320	370	420	470	520	570
180						310	330	380	430	480	530	580
200						330	350	400	450	500	550	600
220							370	420	470	520	570	620
240								440	490	540	590	640
260								460	510	560	610	660
280									530	580	630	680
300									550	600	650	700

Total insulation layers thickness (polystyrene, pir)

Timber

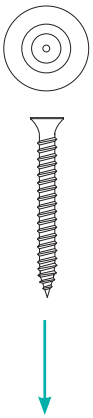


GTS-S	Sleeve length											
Screw length	35	65	85	105	135	165	185	235	285	335	385	435
50	50	80	100	120	150							
60	60	90	110	130	160	190	210					
70	70	100	120	140	170	200	220	270	320			
80		110	130	150	180	210	230	280	330	380	430	
90		120	140	160	190	220	240	290	340	390	440	490
100		130	150	170	200	230	250	300	350	400	450	500
110			160	180	210	240	260	310	360	410	460	510
120			170	190	220	250	270	320	370	420	470	520
130				200	230	260	280	330	380	430	480	530
140				210	240	270	290	340	390	440	490	540
150					250	280	300	350	400	450	500	550
160					260	290	310	360	410	460	510	560
170					270	300	320	370	420	470	520	570
180						310	330	380	430	480	530	580
200						330	350	400	450	500	550	600
220							370	420	470	520	570	620
240								440	490	540	590	640
260								460	510	560	610	660
280									530	580	630	680
300									550	600	650	700

Total insulation layers thickness (wool)

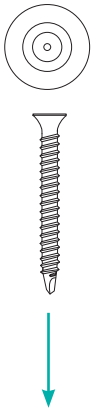
SELECTION OF THE WASHER FASTENER FOR INSULATION THICKNESS

Steel



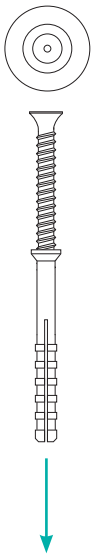
GTS-S+DVP		Scope of insulation thickness	
		min	max
Screw length	50	3	28
	60	8	38
	70	8	48
	80	8	58
	90	8	68
	100	18	78
	110	28	88
	120	38	98
	130	48	108
	140	58	118
	150	68	128
	160	78	138
	170	88	148
	180	98	158
	200	118	178
	220	138	198
	240	158	218
	260	178	238
	280	198	258
	300	218	278

Steel



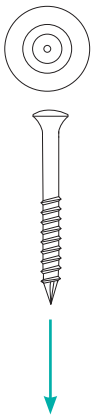
GTS-B+DVP		Scope of insulation thickness	
		min	max
Screw length	50	3	28
	60	8	38
	70	18	48
	80	28	58
	90	38	68
	100	48	78
	110	58	88
	120	68	98
	130	78	108
	140	88	118
	150	98	128
	180	128	158
	210	158	188
	240	188	218
	280	228	258
	300	248	278

Concrete



GTS-S + DVP + sleeve UZ-K		Scope of insulation thickness	
		min	max
Screw length	90	7	30
	100	17	40
	110	27	50
	120	37	60
	130	47	70
	140	57	80
	150	67	90
	160	77	100
	170	87	110
	180	97	120
	200	117	140
	220	137	160
	240	157	180
	260	177	200
	280	197	220
	300	217	240

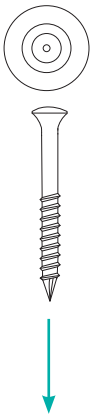
Concrete



GTHD + DVP		Scope of insulation thickness	
		min	max
Screw length	60	26	27
	70	26	37
	80	26	47
	90	26	57
	100	36	67
	130	66	97
	160	96	127
	180	116	147
	200	136	167
	220	156	187
	250	186	217
	280	216	247
	300	236	267

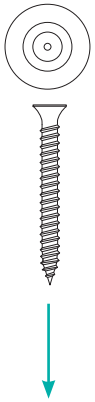
SELECTION OF THE WASHER FASTENER FOR INSULATION THICKNESS

Timber



GTHD + DVP		Scope of insulation thickness	
		min	max
Screw length	60	26	27
	70	26	37
	80	26	47
	90	26	57
	100	36	67
	130	66	97
	160	96	127
	180	116	147
	200	136	167
	220	156	187
	250	186	217
	280	216	247
	300	236	267

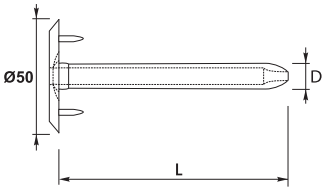
Timber

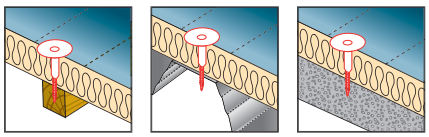


GTS-S + DVP		Scope of insulation thickness	
		min	max
Screw length	50	3	23
	60	8	33
	70	8	43
	80	8	53
	90	8	63
	100	18	73
	110	28	83
	120	38	93
	130	48	103
	140	58	113
	150	68	123
	160	78	133
	170	88	143
	180	98	153
	200	118	173
	220	138	193
	240	158	213
	260	178	233
	280	198	253
	300	218	273

G1
PLASTIC SLEEVE

Plastic sleeves with a round washer with a diameter of 50 mm, made from high quality polypropylene copolymer.



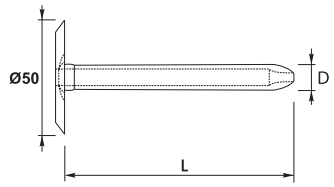


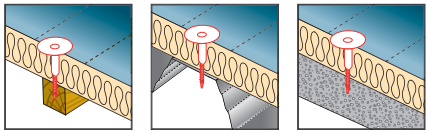
Intended for fastening insulation materials on flat roof applications, in combination with screws of type GTS-S, GTS-B, GTHD. Additional spikes provide higher loading capacity of the connection sleeve-membrane.

Index	Sleeve					Packaging Single/ Qty/Collective [pcs]
	Washer diameter	Sleeve diameter	Length	Min. insulation thickness		
	D	d	L	Polystyrene, PIR	Wool	
	[mm]	[mm]	[mm]	[mm]	[mm]	
PG145035	50	14,5	35	50	50	500/1/500
PG145065	50	14,5	65	80	80	500/1/500
PG145085	50	14,5	85	100	100	500/1/500
PG145105	50	14,5	105	120	120	400/1/400
PG145135	50	14,5	135	150	150	250/1/250
PG145165	50	14,5	165	180	190	250/1/250
PG145185	50	14,5	185	200	210	200/1/200
PG145235	50	14,5	235	250	270	150/1/150
PG145285	50	14,5	285	300	320	125/1/125
PG145335	50	14,5	335	350	380	60/1/60
PG145385	50	14,5	385	400	430	40/1/40
PG145435	50	14,5	435	450	490	40/1/40

G2
PLASTIC SLEEVE

Plastic sleeves with a round washer with a diameter of 50 mm, made from high quality polypropylene copolymer.





Intended for fastening insulation materials on flat roof applications, in combination with screws of type GTS-S, GTS-B, GTHD.

Index	Sleeve					Packaging Single/ Qty/Collective [pcs]
	Washer diameter	Sleeve diameter	Length	Min. insulation thickness		
	D	d	L	Polystyrene, PIR	Wool	
	[mm]	[mm]	[mm]	[mm]	[mm]	
PG245035	50	14,5	35	50	50	500/1/500
PG245065	50	14,5	65	80	80	500/1/500
PG245085	50	14,5	85	100	100	500/1/500
PG245105	50	14,5	105	120	120	400/1/400
PG245135	50	14,5	135	150	150	250/1/250
PG245165	50	14,5	165	180	190	250/1/250
PG245185	50	14,5	185	200	210	200/1/200
PG245235	50	14,5	235	250	270	150/1/150
PG245285	50	14,5	285	300	320	125/1/125
PG245335	50	14,5	335	350	380	60/1/60
PG245385	50	14,5	385	400	430	40/1/40
PG245435	50	14,5	435	450	490	40/1/40

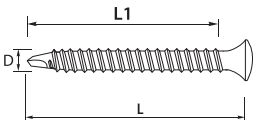
Screws made of surface-hardened carbon steel, with a sharp tip, fine thread, and bugle head with TORX 25 socket. Covered with an additional corrosion protection gRey.coat.

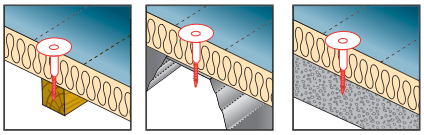
GTS-S

SELF-TAPPING INSULATION SCREWS

Intended for fastening insulation materials in applications of flat roofs in combination with a plastic sleeve for profiled structural steel sheets (up to 2 x 0.88 mm).
In combination with expansion plug for concrete.

Index	Screw				Drilling capacity	Minimum drilling thickness	Packaging Single/ Qty/Collective [pcs]
	D	L	L1	Type	DC	T	
	[mm]	[mm]	[mm]		[mm]	[mm]	
P152050T25GC0PL	4,8	50	45	T25	2x0,88	0,5	1000/1/1000
P152060T25GC0PL	4,8	60	50	T25	2x0,88	0,5	500/1/500
P152070T25GC0PL	4,8	70	60	T25	2x0,88	0,5	500/1/500
P152080T25GC0PL	4,8	80	70	T25	2x0,88	0,5	500/1/500
P152090T25GC0PL	4,8	90	80	T25	2x0,88	0,5	500/1/500
P152100T25GC0PL	4,8	100	80	T25	2x0,88	0,5	500/1/500
P152110T25GC0PL	4,8	110	80	T25	2x0,88	0,5	500/1/500
P152120T25GC0PL	4,8	120	80	T25	2x0,88	0,5	500/1/501
P152130T25GC0PL	4,8	130	80	T25	2x0,88	0,5	500/1/502
P152140T25GC0PL	4,8	140	80	T25	2x0,88	0,5	500/1/503
P152150T25GC0PL	4,8	150	80	T25	2x0,88	0,5	500/1/504
P152160T25GC0PL	4,8	160	80	T25	2x0,88	0,5	500/1/505
P152170T25GC0PL	4,8	170	80	T25	2x0,88	0,5	500/1/506
P152180T25GC0PL	4,8	180	80	T25	2x0,88	0,5	500/1/507
P152200T25GC0PL	4,8	200	80	T25	2x0,88	0,5	500/1/508
P152220T25GC0PL	4,8	220	80	T25	2x0,88	0,5	500/1/509
P152240T25GC0PL	4,8	240	80	T25	2x0,88	0,5	500/1/510
P152260T25GC0PL	4,8	260	80	T25	2x0,88	0,5	500/1/511
P152280T25GC0PL	4,8	280	80	T25	2x0,88	0,5	500/1/512
P152300T25GC0PL	4,8	300	80	T25	2x0,88	0,5	500/1/513
P152110T25GC3PL	4,8	110	80	T25	2x0,88	0,5	100/1/100
P152120T25GC3PL	4,8	120	80	T25	2x0,88	0,5	100/1/100
P152130T25GC3PL	4,8	130	80	T25	2x0,88	0,5	100/1/100
P152140T25GC3PL	4,8	140	80	T25	2x0,88	0,5	100/1/100
P152150T25GC3PL	4,8	150	80	T25	2x0,88	0,5	100/1/100
P152160T25GC3PL	4,8	160	80	T25	2x0,88	0,5	100/1/100
P152170T25GC3PL	4,8	170	80	T25	2x0,88	0,5	100/1/100
P152180T25GC3PL	4,8	180	80	T25	2x0,88	0,5	100/1/100
P152200T25GC3PL	4,8	200	80	T25	2x0,88	0,5	100/1/100
P152220T25GC3PL	4,8	220	80	T25	2x0,88	0,5	100/1/100
P152240T25GC3PL	4,8	240	80	T25	2x0,88	0,5	100/1/100
P152260T25GC3PL	4,8	260	80	T25	2x0,88	0,5	100/1/100
P152280T25GC3PL	4,8	280	80	T25	2x0,88	0,5	100/1/100
P152300T25GC3PL	4,8	300	80	T25	2x0,88	0,5	100/1/100





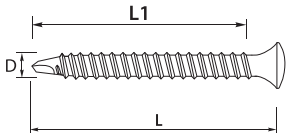
GTS-B

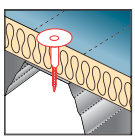
SELF-DRILLING, SELF-TAPPING
INSULATION SCREWS

Drilling, self-tapping screws made of surface-hardened carbon steel, with a reduced drilling point, fine thread, and bugle head with TORX25 socket. Covered with an additional corrosion protection gRey.coat.

Intended for fastening insulation materials in applications of flat roofs in combination with a plastic sleeve for profilled structural steel sheets (up to 2 x 1.25 mm)

Index	Screw				Drilling capacity	Minimum drilling thickness	Packaging Single/ Qty/Collective [pcs]
	D	L	L1	Type	DC	T	
	[mm]	[mm]	[mm]		[mm]	[mm]	
P153050T25GC0PL	4,8	50	45	T25	2x1,25	0,7	1000/1/1000
P153060T25GC0PL	4,8	60	50	T25	2x1,25	0,7	500/1/500
P153070T25GC0PL	4,8	70	50	T25	2x1,25	0,7	500/1/500
P153080T25GC0PL	4,8	80	50	T25	2x1,25	0,7	500/1/500
P153091T25GC0PL	4,8	90	50	T25	2x1,25	0,7	500/1/500
P153100T25GC0PL	4,8	100	50	T25	2x1,25	0,7	500/1/500
P153109T25GC0PL	4,8	110	50	T25	2x1,25	0,7	500/1/500
P153120T25GC0PL	4,8	120	50	T25	2x1,25	0,7	500/1/500
P153130T25GC0PL	4,8	130	50	T25	2x1,25	0,7	500/1/500
P153140T25GC0PL	4,8	140	50	T25	2x1,25	0,7	500/1/500
P153149T25GC0PL	4,8	150	50	T25	2x1,25	0,7	500/1/500
P153180T25GC0PL	4,8	180	50	T25	2x1,25	0,7	500/1/500
P153210T25GC0PL	4,8	210	50	T25	2x1,25	0,7	500/1/500
P153240T25GC0PL	4,8	240	50	T25	2x1,25	0,7	500/1/500
P153280T25GC0PL	4,8	280	50	T25	2x1,25	0,7	500/1/500
P153300T25GC0PL	4,8	300	50	T25	2x1,25	0,7	500/1/500
P153109T25GC3PL	4,8	110	50	T25	2x1,25	0,7	100/1/100
P153120T25GC3PL	4,8	120	50	T25	2x1,25	0,7	100/1/100
P153130T25GC3PL	4,8	130	50	T25	2x1,25	0,7	100/1/100
P153140T25GC3PL	4,8	140	50	T25	2x1,25	0,7	100/1/100
P153149T25GC3PL	4,8	150	50	T25	2x1,25	0,7	100/1/100
P153180T25GC3PL	4,8	180	50	T25	2x1,25	0,7	100/1/100
P153210T25GC3PL	4,8	210	50	T25	2x1,25	0,7	100/1/100
P153240T25GC3PL	4,8	240	50	T25	2x1,25	0,7	100/1/100
P153280T25GC3PL	4,8	280	50	T25	2x1,25	0,7	100/1/100
P153300T25GC3PL	4,8	300	50	T25	2x1,25	0,7	100/1/100





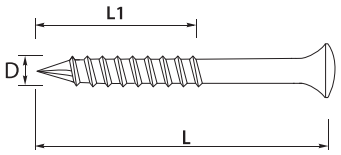
Screws made of surface-hardened carbon steel, with a Ricoh drilling point, coarse thread, and bugle head with TORX 25 socket.
Covered with an additional corrosion protection gRey.coat.

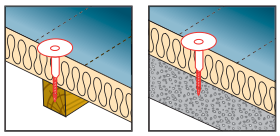
GTHD

INSULATION SCREWS
FOR CONCRETE

Intended for fastening insulation materials on flat roof applications, in combination with a plastic sleeve for concrete and timber structure.

Index	Screw				hef		Packaging
	D	L	L1	TX	H [mm]		Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]		concrete	timber	
P156060GC0PL	6,3	60	31	25	30	30	500/1/500
P156070GC0PL	6,3	70	41	25	30	30	500/1/500
P156080GC0PL	6,3	80	51	25	30	30	500/1/500
P156090GC0PL	6,3	90	61	25	30	30	500/1/500
P156100GC0PL	6,3	100	61	25	30	30	500/1/500
P156130GC0PL	6,3	130	61	25	30	30	500/1/500
P156160GC0PL	6,3	160	61	25	30	30	500/1/500
P156180GC0PL	6,3	180	61	25	30	30	500/1/500
P156200GC0PL	6,3	200	61	25	30	30	500/1/500
P156220GC0PL	6,3	220	61	25	30	30	500/1/500
P156250GC0PL	6,3	250	61	25	30	30	500/1/500
P156280GC0PL	6,3	280	61	25	30	30	500/1/500
P156300GC0PL	6,3	300	61	25	30	30	500/1/500
P156130GC3PL	6,3	130	61	25	30	30	100/1/100
P156160GC3PL	6,3	160	61	25	30	30	100/1/100
P156180GC3PL	6,3	180	61	25	30	30	100/1/100
P156200GC3PL	6,3	200	61	25	30	30	100/1/100
P156220GC3PL	6,3	220	61	25	30	30	100/1/100
P156250GC3PL	6,3	250	61	25	30	30	100/1/100
P156280GC3PL	6,3	280	61	25	30	30	100/1/100
P156300GC3PL	6,3	300	61	25	30	30	100/1/100





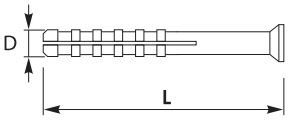
Nylon plugs with a collar made of high-quality polyamide.

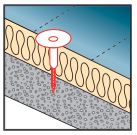
U-ZK

EXPANSION PLUG
FOR CONCRETE

Intended for fastening insulation materials on concrete in applications of flat roofs in combination with GTS-S screw. Long expansion zone ensures proper fastening even in lower class concrete.

Index	Plug			Packaging
	Type	L	D	Single/ Qty/Collective [pcs]
		[mm]	[mm]	
PBP80570PL	U-ZK	60	8,0	200/4/800





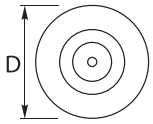
DVP

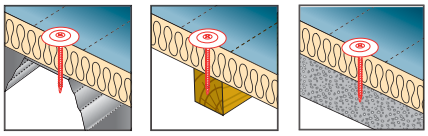
RECESSED, ROUND FLAT ROOF WASHERS

Round roof insulation washers made of steel sheet, covered with alu-zinc corrosion coating.

Intended for fastening insulation materials on flat roof applications, in combination with insulation screws.

Index	Washer			Packaging
	D	H	d	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	
PDVPEF5010D	50	1,0	7,0	1000/1/1000
PDVPEF7010D	70	1,0	7,0	500/1/500





ALU. ZINC

15 Kesternich

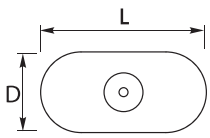
DVP

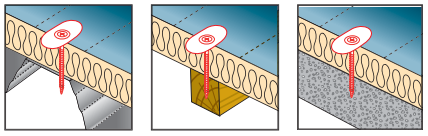
RECESSED, OVAL FLAT ROOF WASHERS

Oval roof insulation washers made of steel sheet, covered with alu-zinc corrosion coating.

Intended for fastening insulation materials on flat roof applications, in combination with insulation screws.

Index	Washer				Packaging
	D	L	H	d	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	
PDVPEF8040D	40	80	1,0	7	500/1/500





ALU. ZINC

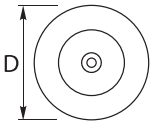
15 Kesternich

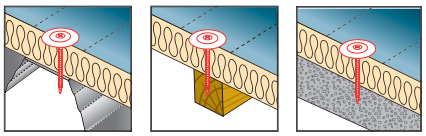
Round roof insulation washers made of steel sheet, covered with alu-zinc corrosion coating.

DVP
ROUND FLAT ROOF WASHERS

Intended for fastening insulation materials on flat roof applications, in combination with insulation screws.

Index	Washer			Packaging
	D	H	d	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	
PDVPEF4010N	40	1,0	7,0	1000/1/1000
PDVPEF5010N	50	1,0	7,0	1000/1/1000
PDVPEF7010N	70	1,0	7,0	500/1/500





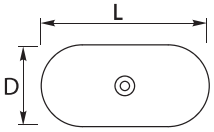
ALU. ZINC 15 Kesternich

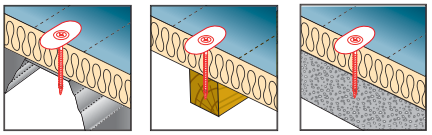
Oval roof insulation washers made of steel sheet, covered with alu-zinc corrosion coating.

DVP
OVAL FLAT ROOF WASHERS

Intended for fastening insulation materials on flat roof applications, in combination with insulation screws.

Index	Washer				Packaging
	D	L	H	d	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]	
PDVPEF8040N	40	80	1,0	7,0	500/1/500





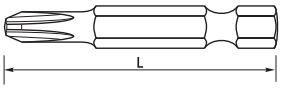
ALU. ZINC 15 Kesternich

SCREWDRIVER BITS PH2

Screwdrivers bits are made of high quality chrome vanadium steel, surface hardened, protected from corrosion.

Intended for use in screwdrivers. Used for correct screwing fasteners into the structure material.

Index	Bit		Packaging
	L [mm]	Type	Single/ Qty/Collective [pcs]
P189515	150	PH2	1/1/1
P189520	200	PH2	1/1/1
P189525	250	PH2	1/1/1
P189530	300	PH2	1/1/1
P189535	350	PH2	1/1/1

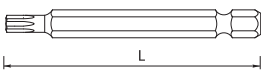


SCREWDRIVER BITS TORX

Screwdrivers bits are made of high quality chrome vanadium steel, surface hardened, protected from corrosion.

Intended for use in screwdrivers. Used for correct screwing fasteners into the structure material.

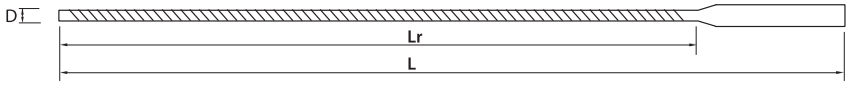
Index	Bit		Packaging
	L [mm]	Type	Single/ Qty/Collective [pcs]
P189002	150	TX25	1/1/1
P189003	200	TX25	1/1/1
P189004	250	TX25	1/1/1
P189005	300	TX25	1/1/1
P189008	350	TX25	1/1/1



Drill bits for pre-drilling in concrete.

CONCRETE DRILL BITS

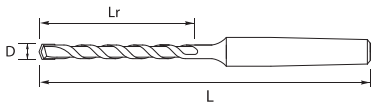
Index	Drill bit				Packaging Single/ Qty/Collective [pcs]
	L	Lr	D	Connection end	
	[mm]	[mm]	[mm]	Type	
PSDS550110	110	50	5	SDS+	1/1/1
PSDS5100160	160	100	5	SDS+	1/1/1
PSDS5150210	210	150	5	SDS+	1/1/1
PSDS5200260	260	200	5	SDS+	1/1/1
PSDS5250310	310	250	5	SDS+	1/1/1
PSDS5300360	360	300	5	SDS+	1/1/1
PSDS5350410	410	350	5	SDS+	1/1/1
PSDS5550120	120	50	5,5	SDS+	1/1/1
PSDS55100160	160	100	5,5	SDS+	1/1/1
PSDS55150210	210	150	5,5	SDS+	1/1/1
PSDS55200260	260	200	5,5	SDS+	1/1/1
PSDS55250310	310	250	5,5	SDS+	1/1/1
PSDS55350410	410	350	5,5	SDS+	1/1/1



Drill bits for pre-drilling in concrete.

CONCRETE CONE DRILL BITS

Index	Drill bit				Packaging Single/ Qty/Collective [pcs]
	L	Lr	D	Connection end	
	[mm]	[mm]	[mm]	Type	
PS550110	110	50	5	cone	1/1/1

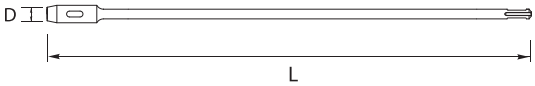


ADAPTER FOR CONE DRILL BITS

SDS adapter made of high-quality material designed for use with cone drill bits.

Comes with a wedge for disassembly cone drill bits

Index	Extension		Drill connection
	L	Connection end	
	[mm]	Type	Type
PZAK500	500	SDS+	Cone
PZAK800	800	SDS+	Cone

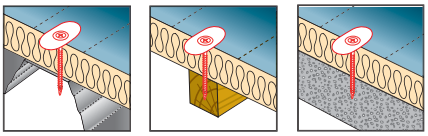


ADAPTER FOR SCREWDRIVER BITS

Adapter for screwdriver bits made of high-quality surface-hardened chrome steel, anti-corrosive protected

They are intended for use in screwdrivers for corect driving the screws into the substrate. Ideally suited for instaling sleeves used in flat roofs. The kit includes an extension, a short PH2 bit, a short TORX25 bit and a key for changing bits.

Index	L	Packaging
	[mm]	Single/ Qty/Collective [pcs]
P189010	500	1/1/1



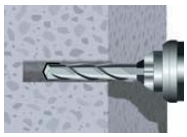
NOTES:

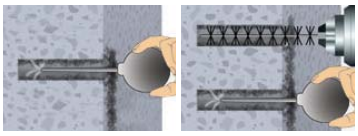
ANCHORS AND SPECIAL FASTENERS

ANCHORS AND SPECIAL FASTENERS

- CHEMICAL ANCHORS
- ANCHOR ACCESSORIES
- WEDGE ANCHORS
- FRAME PLASTIC ANCHORS
- SCREW ANCHORS
- DROP-IN ANCHORS
- POWDER ACTUATED TECHNIQUE

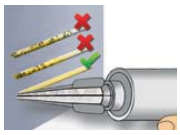
Installation in concrete and solid masonry without the use of a mesh sleeve:

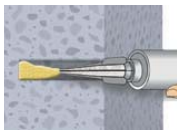


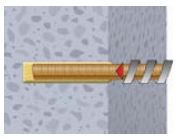


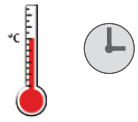
Preparation of the holes:

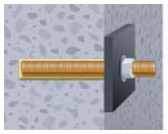
1. Holes should be drilled perpendicular to the surface of the base material, using a properly selected drill and drilling method, depending on the type of substrate, embedment depth and size of the anchor.
2. Before applying the resin, clean the holes with a pump and a brush.
    A. Blow the hole 4x with the pump, starting from the bottom.
    B. Brush the hole 4x with a properly selected brush diameter.
    C. Blow the hole 4x again with the pump.
    D. Repeat the procedure if necessary.











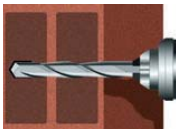
Resin application:

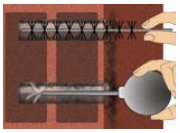
1. Attach the end of the dedicated mixer to the cartridge and place the cartridge in the appropriate dispenser.
2. Before starting the application of the resin to the hole, the ingredients should be properly mixed by discarding the first minimum 3 portions into the free space until a homogeneous mass is obtained.
3. Starting from the bottom of the cleaned hole, apply the resin so as to fill the hole 2/3 of its depth. Avoiding the formation of air bubbles. Use the gel and working times given in the approvals and in the instructions on the cartridge.
4. In the case of holes deeper than 190 mm, a special mixer extension should be used.
5. Insert the threaded rod or rebar into the hole by turning it several times. This will allow the mass to be evenly distributed in the hole. The anchor rod should be free from any dirt, grease, oil and other substances.
6. Make sure the anchor rod is fully inserted into the hole, the resin should be visible at the top of the hole.

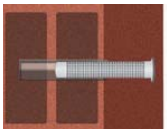
Curing a chemical anchor and installing a fixed element:

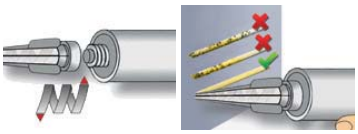
7. Allow the resin to cure completely before applying any load or torque. Do not twist or manipulate the inserted rod.
8. When fully cured, the element to be fastened can be put on and tightened to the maximum tightening torque appropriate for the size. Tightening must be done with a calibrated torque wrench.

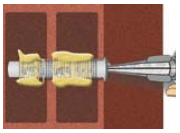
Installation in solid masonry and hole bricks with the use of a mesh sleeve.

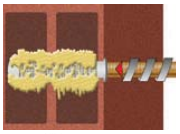


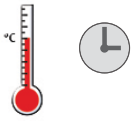


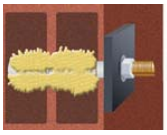












Preparation of the holes:

1. Holes should be drilled perpendicular to the surface of the base material, using a properly selected drill and drilling method, depending on the type of substrate, embedment depth and size of the anchor.
2. Before applying the resin, clean the holes with a pump and a brush.
   - A. Blow the hole 2x with the pump, starting from the bottom.
   - B. Brush the hole 2x with a properly selected brush diameter.
   - C. Blow the hole 2x again with the pump.
   - D. Repeat the procedure if necessary.

Resin and sleeve application:

1. Place a mesh sleeve of an appropriate length in the hole until it is flush with the surface of the base material, the plastic sleeves must not be cut.
2. Attach the end of the dedicated mixer to the cartridge and place the cartridge in the appropriate dispenser.
3. Before starting the application of the resin to the hole, the ingredients should be properly mixed by discarding the first minimum 3 portions into the free space until a homogeneous mass is obtained.
4. Starting from the bottom of the plastic sleeve, apply the resin in the amount specified in the installation instructions.
5. In the case of holes deeper than 130 mm, a special mixer extension should be used.
6. Insert the threaded rod into the sleeve by turning it several times. This will allow the mass to be evenly distributed in the hole. The anchor rod should be free from any dirt, grease, oil and other substances.
7. Make sure the anchor rod is fully inserted into the hole, the resin should be visible at the top of the hole.

Curing a chemical anchor and installing a fixed element:

8. Allow the resin to cure completely before applying any load or torque. Do not twist or manipulate the inserted rod.
9. When fully cured, the element to be fastened can be put on and tightened to the maximum tightening torque appropriate for the size. Tightening must be done with a calibrated torque wrench.

Steel loading resistance – threaded rod

Threaded rod					M8	M10	M12	M16	M20	M24	M27	M30
Cross-section area			A_s	mm^2	36.6	58	84.3	157	245	353	459	561
Section modulus			W_{el}	mm^3	31	62	109	277	541	935	1387	1874
Characteristic tension resistance $N_{rk,s} = As \times fuk$	$N_{rk,s}$	kN	Steel class	4.6/4.8	15	23	34	63	98	141	184	224
				5.6/5.8	18	29	42	78	122	176	230	280
				8.8	29	46	67	125	196	282	368	449
				A2, A4 i HCR, class 50	18	29	42	79	123	177	230	281
				A2, A4 i HCR, class 70	26	41	59	110	171	247	-	-
Characteristic shear resistance without lever arm $V_{rk,s} = 0,5 \times As \times fuk$	$V_{rk,s}$	kN	Steel class	4.6/4.8	7	12	17	31	49	71	92	112
				5.6/5.8	9	15	21	39	61	88	115	140
				8.8	15	23	34	63	98	141	184	224
				A2, A4 i HCR, class 50	9	15	21	39	61	88	115	140
				A2, A4 i HCR, class 70	13	20	30	55	86	124	-	-
Characteristic shear resistance with lever arm $M_{rk,s} = 1.2 \times Wel \times fuk$	$M_{rk,s}$	Nm	Steel class	4.6/4.8	15	30	52	133	260	449	666	900
				5.6/5.8	19	37	65	166	324	560	833	1123
				8.8	30	60	105	266	519	896	1333	1797
				A2, A4 i HCR, class 50	19	37	66	167	325	561	832	1125
				A2, A4 i HCR, class 70	26	52	92	232	454	784	-	-

Installation parameters in concrete C20/25 – threaded rod

Threaded rod	M8	M10	M12	M16	M20	M24	M27	M30
Nominal hole diameter d_0 [mm]	10	12	14	18	24	28	32	35
Minimum base material thickness [mm]	H_{ef} + 30 mm / ≥100 mm			$H_{ef} + 2d_0$				
Minimum edge distance [mm]	40	50	60	80	100	120	135	150
Minimum anchor spacing [mm]	40	50	60	80	100	120	135	150
Torque [Nm]	10	20	40	80	120	160	180	200

Steel loading resistance – rebar

Rebar					Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Cross-section area			A_s	mm^2	50	79	113	154	201	314	491	616	804
Section modulus			W_{el}	mm^3	50	98	170	269	402	785	1534	2155	3217
Characteristic tension resistance $N_{rk,s} = As \times fuk$	$N_{rk,s}$	kN	Steel class	BSt 500S	28	43	62	85	111	173	270	339	442
Characteristic shear resistance without lever arm $V_{rk,s} = 0,5 \times As \times fuk$	$V_{rk,s}$	kN			14	22	31	42	55	86	135	169	221
Characteristic shear resistance with lever arm $M_{rk,s} = 1.2 \times Wel \times fuk$	$M_{rk,s}$	Nm			33	64	112	177	265	518	1012	1422	2123

Installation parameters in concrete C20/25 – rebar

Rebar	Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Nominal hole diameter d_0 [mm]	12	14	16	18	20	24	32	35	40
Minimum base material thickness [mm]	H_{ef} + 30 mm / ≥100 mm		$H_{ef} + 2d_0$						
Minimum edge distance [mm]	40	50	60	70	80 (75)	100 (95)	125 (120)	140 (130)	160 (150)
Minimum anchor spacing [mm]	40 (35)	50 (40)	60 (45)	70 (50)	80 (50)	100 (60)	125 (70)	140 (75)	160 (85)

Temperature, working and curing time

Cartridge temperature	Concrete temp. [°C]	Working time [min]	Minimum curing time [min]
+15°C to +40°C	-5 to -1 °C	90	360
	0 to +4 °C	45	180
	+5 to +9 °C	25	120
	+10 to +14 °C	20	100
	+15 to +19 °C	15	80
	+20 to +29 °C	6	45
	+30 to +34 °C	4	25
	+35 to +39 °C	2	20

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1.5 h_{ef} acc. ETA-12/608

Threaded rod			M8		M10		M12		M16		M20		M24	
τ_{Rk}			8,5		8		8		8		8		8	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$											
			12.8	34.2	15.1	50.3	21.1	72.4	32.2	128.7	45.2	201.1	57.9	289.5
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$											
			23.5	102.2	23.5	142.8	29.6	187.8	36.1	289.1	43.1	404	47.5	531.1
Characteristic resistance c oncrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(Nrk,p;Nrk,c)$											
			25.6	68.4	30.2	100.5	59.2	144.8	72.3	257.4	86.2	402.1	95	579.1
Characteristic resistance concrete edge failure for C_1=1,5 h_{ef}	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$											
			17.8	97.7	17.7	145.1	23	200.4	28.6	333.8	32.7	444.6	38.4	684.8

Masonry base material – installation parameters
Installation parameters in autoclaved aerated concrete (AAC) and in solid masonry (without mesh sleeve)

Threaded rod			M8	M10	M12	M16
Nominal drill hole diameter	d_0	[mm]	10	12	14	18
Drill hole depth	h_0	[mm]	80	90	100	100
Effective embedment depth	$h_{ef} = h_{nom}$	[mm]	80	90	100	100
Minimum masonry thickness	h_{min}	[mm]	h_{ef} + 30			
Minimum edge distance			See masonry properties: Appendix C4 to C35, ETA-12/534			
Minimum anchor spacing						

Installation parameters in solid masonry and in hollow bricks (with mesh sleeve)

Threaded rod			M8	M10			M12/M16		
Mesh sleeve		[mm]	12x80	16x85	16x130	16x130/330	20x85	20x130	20x200
Nominal drill hole diameter		[mm]	12	16	16	16	20	20	20
Drill hole depth	h_0	[mm]	85	90	135	135	90	135	205
Effective embedment depth	$h_{ef} = h_{nom}$	[mm]	80	85	130	130	85	130	200
Minimum masonry thickness	h_{min}	[mm]	115	115	175	175	115	175	240
Minimum edge distance			See masonry properties: Appendix C4 to C35, ETA-12/534						
Minimum anchor spacing									

Loading resistance in masonry. Chosen base material, acc. ETA-12/534. The most favorable strength parameters of the materials were assumed. Temperature range 40/24 °C

Rod				T_{max}	N_{rk}*		V_{rk}*
Base material	Rod	Mesh sleeve	h_{ef}	d/d w/d w/w	d/d	w/d w/w	d/d w/d w/w
			mm	Nm	kN		kN
AAC	M8	-	80	2	2	2	5.5
	M10	-	90		3	2.5	9
	M12	-	100		4,5	3	9
	M16	-	100		5,5	3,5	11
Solid silicate brick KS-NF $f_b \geq 27$ N/mm²	M8	-	80	10	5,5		5
		SH 12x80	80		4,5		4,5
		SH 16x130	130		6,5		5,5
	M10	-	90	20	5,5		5,5
		SH 16x85	85		4,5		5,5
		SH 16x130	130		6,5		6,5
	M12	-	100		6,5		6
		SH 20x85	85		4,5		5,5
		SH 20x200	200		6,5		6,5
	M16	-	100		5,5		6
		SH 20x85	85		4,5		5,5
		SH 20x200	200		6,5		6,5
Hollow silicate brick KS L-3DF $f_b \geq 14$ N/mm²	M8	SH 12x80	80	8	2,5		3
		SH 16x130	130		4		5
	M10	SH 16x85	85		2,5		4
		SH 16x130	130		4		5
	M12	SH 20x85	85		2,5		4,5
		SH 20x200	200		4		5
	M16	SH 20x85	85		2,5		4,5
		SH 20x200	200		4		6
Solid ceramic brick Mz-DF $f_b \geq 28$ N/mm²	M8	-	80	6	3		5,5
		SH12x80	80		3,5		5
		SH16x130	130		5		5
	M10	-	90	10	3		6,5
		SH 16x85	85	8	3,5		6
		SH 16x130	130		5		6
	M12	-	100	10	2,5		9
		SH 20x85	85	8	3,5		6
		SH 20x200	200		5		6
	M16	-	100	10	4,5		9
		SH 20x85	85	8	3,5		6
		SH 20x200	200		5		6
Hollow ceramic brick HLz-16DF $f_b \geq 14$ N/mm²	M8	SH12x80	80	6	1,5		4
		SH16x130	130		3,5		6,5
	M10	SH 16x85	85		2,5		6
		SH 16x130	130		3,5		9
	M12	SH 20x85	85		3,5		6
		SH 20x200	200		3,5		9
	M16	SH 20x85	85		3,5		6
		SH 20x200	200		3,5		9
Hollow brick Calibric Th $f_b \geq 12$ N/mm²	M8	SH12x80	80	2	0,9		4
		SH16x130	130		1,2		5,5
	M10	SH 16x85	85		0,9		5,5
		SH 16x130	130		1,5		5,5
	M12	SH 20x85	85		0,9		8,5
		SH 20x130	200		1,5		8,5
	M16	SH 20x85	85		1,5		8,5
		SH 20x130	200		1,5		8,5

* The most favorable strength parameters of the materials were assumed. For other material parameters see: ETA-12/534

Temperature, working and curing time

Cartridge temperature	Concrete temp. [°C]	Working time [min]	Minimum curing time
+15°C do +40°C	0 do +4 °C	45	7 h
	+5 do +9 °C	25	2 h
	+10 do +19 °C	15	80 min
	+20 do +29 °C	6	45 min
	+30 do +34 °C	4	25 min
	+35 do +39 °C	2	20 min
	+40 °C	1,5	15 min

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-08/0383.

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			10		12		12		12		12		11		10		9	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480	108	540	120	600
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			15,1	40,2	22,6	75,4	31,7	108,6	48,3	193	67,9	301,6	79,6	398,1	91,6	458	101,8	508,9
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			23,5	102,2	23,5	142,8	29,6	187,8	36,1	289,1	43,1	404	47,5	531,1	56,7	633,7	66,4	742,2
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$															
			30,2	80,4	45,2	150,8	59,2	217,1	72,3	386	86,2	603,2	95	796,2	113,4	916,1	132,8	1017,9
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			15,6	68,4	16,1	98,4	20,8	132,5	26,5	212	32,7	305,1	37	410,8	44,9	497,9	53,5	591,4

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-08/0383

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			4		5		5,5		5,5		5,5		5,5		6,5		6,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480	108	540	120	600
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			6	16,1	9,4	31,4	14,5	49,8	22,1	88,5	31,1	138,2	39,8	199,1	59,5	297,7	73,5	367,6
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			16,7	72,9	16,7	101,8	21,1	133,9	25,8	206,1	30,7	288	33,9	378,6	40,4	451,7	47,3	529,1
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$															
			12,1	32,2	18,8	62,8	42,2	99,5	51,5	176,9	61,5	276,5	67,7	398,1	80,8	595,5	94,6	735,1
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			11,1	48,4	11,4	69,7	14,8	93,9	18,8	150,1	23,1	216,1	26,2	291	31,8	352,7	37,9	418,9

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-08/0383

Rod			Ø8		Ø10		Ø12		Ø14		Ø16		Ø20		Ø25		Ø28		Ø32	
τ_{Rk}			10		12		12		12		12		12		11		10		8,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	75	280	80	320	90	400	100	500	112	580	128	640
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$																	
			15,1	40,2	22,6	75,4	31,7	108,6	39,6	147,8	48,3	193	67,9	301,6	86,4	432	98,5	510,2	109,4	546,9
Characteristic resistance concrete pry-out failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$																	
			23,5	102,2	23,5	142,8	29,6	187,8	32,8	236,6	36,1	289,1	43,1	404	50,5	564,6	59,9	705,4	73,1	817,6
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(Nrk,p;Nrk,c)$																	
			30,2	80,4	45,2	150,8	59,2	217,1	65,6	295,6	72,3	386	86,2	603,2	101	863,9	119,7	1020,4	218,8	1093,8
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$																	
			15,6	68,4	16,1	98,4	20,8	132,5	23,6	170,4	26,5	212	32,7	305,1	39,6	439,2	47,7	556,7	59,5	657,1

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. wg: ETA-08/0383

Rod			Ø8		Ø10		Ø12		Ø14		Ø16		Ø20		Ø25		Ø28		Ø32	
τ_{Rk}			4		5		5,5		5,5		5,5		5,5		5,5		6,5		6,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	75	280	80	320	90	400	100	500	112	580	128	640
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$																	
			6	16,1	9,4	31,4	14,5	49,8	18,1	67,7	22,1	88,5	31,1	138,2	43,2	216	64	331,6	83,6	418,2
Characteristic resistance concrete pry-out failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$																	
			16,7	72,9	16,7	101,8	21,1	133,9	23,4	168,7	25,8	206,1	30,7	288	36	402,5	42,7	502,9	52,1	582,9
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$																	
			12,1	32,2	18,8	62,8	42,2	99,5	46,8	135,5	51,5	176,9	61,5	276,5	72	432	85,3	663,3	167,3	836,4
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$																	
			11,1	48,4	11,4	69,7	14,8	93,9	16,7	120,7	18,8	150,1	23,1	216,1	28	311,1	33,8	394,3	42,1	465,4

Masonry base material – installation parameters

Installation parameters in autoclaved aerated concrete (AAC) and in solid masonry (without mesh sleeve)

Threaded rod			M8	M10	M12	M16
Nominal drill hole diameter	d_0	[mm]	10	12	14	18
Drill hole depth	h_0	[mm]	80	90	100	100
Effective embedment depth	$h_{ef} = h_{nom}$	[mm]	80	90	100	100
Minimum masonry thickness	h_{min}	[mm]	h_{ef} + 30			
Minimum edge distance			See masonry properties: Appendix C4 to C35, ETA-12/0543			
Minimum anchor spacing						

Installation parameters in solid masonry and in hollow bricks (with mesh sleeve)

Threaded rod			M8	M/M10			M12/M16		
Mesh sleeve		[mm]	12x80	16x85	16x130	16x130/330	20x85	20x130	20x200
Nominal drill hole diameter		[mm]	12	16	16	16	20	20	20
Drill hole depth	h_0	[mm]	85	90	135	135	90	135	205
Effective embedment depth	$h_{ef} = h_{nom}$	[mm]	80	85	130	130	85	130	200
Minimum masonry thickness	h_{min}	[mm]	115	115	175	175	115	175	240
Minimum edge distance			See masonry properties: Appendix C4 to C35, ETA-12/0543						
Minimum anchor spacing									

Loading resistance in masonry. Chosen base material, acc. ETA-12/543. The most favorable strength parameters of the materials were assumed. Temperature range 40/24 °C

Rod				T_{max}	N_{rk}*		V_{rk}*
Base material	Rod	Mesh sleeve	h_{ef}	d/d w/d w/w	d/d	w/d w/w	d/d w/d w/w
			mm	Nm	kN		kN
AAC	M8	-	80	2	2,5	2,5	6
	M10	-	90		4	3,5	10
	M12	-	100		5	4,5	10
	M16	-	100		6,5	5,5	10
Solid silicate brick KS-NF $f_b \geq 27$ N/mm²	M8	-	80	2	7	6	4,5
		SH 12x80	80		6,5	5,5	4,5
		SH 16x130	130		5,5	5,5	4,5
	M10	-	90		7	6	5,5
		SH 16x85	85		5,5	5,5	4,5
		SH 16x130	130		5,5	5,5	4,5
	M12	-	100		7	6	4,5
		SH 20x85	85		5	5	4,5
		SH 20x200	200		5	5	4,5
	M16	-	100		6	6	4,5
		SH 20x85	85		5	5	4,5
		SH 20x200	200		5	5	4,5
Hollow silicate brick KS L-3DF $f_b \geq 14$ N/mm²	M8	SH 12x80	80	2	2,5	2	3,5
		SH 16x130	130		2,5	2,5	6
	M10	SH 16x85	85		2,5	2,5	6
		SH 16x130	130		2,5	2,5	6
	M12	SH 20x85	85		6,5	6,5	6
		SH 20x200	200		6,5	6,5	6
	M16	SH 20x85	85		6,5	6,5	6
		SH 20x200	200		6,5	6,5	6
Solid ceramic brick Mz-DF $f_b \geq 28$ N/mm²	M8	-	80	14	5,5		5,5
		SH12x80	80	2	5,5		5,5
		SH16x130	130		6		5,5
	M10	-	90	14	6		5,5
		SH 16x85	85	2	6		5,5
		SH 16x130	130		6		5,5
	M12	-	100	14	7		5,5
		SH 20x85	85	2	6		5,5
		SH 20x200	200		6		5,5
	M16	-	100	14	7		9
		SH 20x85	85	2	6		5,5
		SH 20x200	200		6		5,5
Hollow ceramic brick HLz-16DF $f_b \geq 14$ N/mm²	M8	SH12x80	80	2	4		4
		SH16x130	130		5,5		6,5
	M10	SH 16x85	85		4		6,5
		SH 16x130	130		5,5		6,5
	M12	SH 20x85	85		4		7
		SH 20x200	200		5,5		9
	M16	SH 20x85	85		4		7
		SH 20x200	200		5,5		9
Hollow brick Porotherm Homebric $f_b \geq 10$ N/mm²	M8	SH12x80	80	2	1,2		3
		SH16x130	130		1,5		3,5
	M10	SH 16x85	85		1,2		3
		SH 16x130	130		1,5		3,5
	M12	SH 20x85	85		1,2		4
		SH 20x130	130		1,5		4
	M16	SH 20x85	85		1,2		4
		SH 20x130	130		1,5		4

* The most favorable strength parameters of the materials were assumed. For other material parameters see: ETA-12/0543

Temperature, working and curing time

Cartridge temperature	Concrete temp. [°C]	Working time [min]	Minimum curing time
+5°C do +40°C	-5 do -1 °C	50 min	5 h
	0 do +4 °C	25 min	3,5 h
	+5 do +9 °C	15 min	2 h
	+10 do +14 °C	10 min	1 h
	+15 do +19 °C	6 min	40 min
	+20 do +29 °C	3 min	30 min
	+30 do +34 °C	2 min	30 min

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-16/0957

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			17		17		16		15		14		13		13		13	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480	108	540	120	600
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			25,6	68,4	32	106,8	42,2	144,8	60,3	241,3	79,2	351,9	94,1	470,5	119,1	595,5	147	735,1
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			23,5	102,2	23,5	142,8	29,6	187,8	36,1	289,1	43,1	404	47,5	531,1	56,7	633,7	66,4	742,2
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(Nrk,p;Nrk,c)$															
			51,3	136,7	64,1	213,6	59,2	289,5	72,3	482,5	86,2	703,7	95	941	113,4	1190,9	132,8	1470,3
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			15,6	68,4	16,1	98,4	20,8	132,5	26,5	212	32,7	305,1	37	410,8	44,9	497,9	53,5	591,4

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-09/0061

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			17		17		16		15		14		13		13		13	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480	108	540	120	600
Characteristic resistance Combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			9,8	26,1	13,2	44	19,8	67,9	34,2	136,7	48,1	213,6	61,5	307,6	77,9	389,3	96,1	480,7
Characteristic resistance Concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			16,7	72,9	16,7	101,8	21,1	133,9	25,8	206,1	30,7	288	33,9	378,6	40,4	451,7	47,3	529,1
Characteristic resistance Concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$															
			19,6	52,3	26,4	88	42,2	135,7	51,5	273,4	61,5	427,3	67,7	615,2	80,8	778,7	94,6	961,3
Characteristic resistance Concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			11,1	48,4	11,4	69,7	14,8	93,9	18,8	150,1	23,1	216,1	26,2	291	31,8	352,7	37,9	418,9

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 = 1,5 h_{ef} acc. ETA-16/0957

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			17		17		16		15		14		13		13		13	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	80	320	90	400	96	480	108	540	120	600
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			9,8	26,1	13,2	44	19,8	67,9	34,2	136,7	48,1	213,6	61,5	307,6	77,9	389,3	96,1	480,7
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			16,7	72,9	16,7	101,8	21,1	133,9	25,8	206,1	30,7	288	33,9	378,6	40,4	451,7	47,3	529,1
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$															
			19,6	52,3	26,4	88	42,2	135,7	51,5	273,4	61,5	427,3	67,7	615,2	80,8	778,7	94,6	961,3
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			11,1	48,4	11,4	69,7	14,8	93,9	18,8	150,1	23,1	216,1	26,2	291	31,8	352,7	37,9	418,9

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 = 1,5 h_{ef} acc. ETA-16/0957

Rod			Ø8		Ø10		Ø12		Ø14		Ø16		Ø20		Ø25		Ø28		Ø32	
τ_{Rk}			10		12		12		12		12		12		11		10		8,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	160	60	200	70	240	75	280	80	320	90	400	100	500	112	560	128	640
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$																	
			7,5	20,1	10,4	34,6	15,8	54,3	19,8	73,9	30,2	120,6	42,4	188,5	58,9	294,5	73,9	369,5	102,9	514,7
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$																	
			16,7	72,9	16,7	101,8	21,1	133,9	23,4	168,7	25,8	206,1	30,7	288	36	402,5	42,7	477,1	52,1	582,9
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$																	
			15,1	40,2	20,7	69,1	42,2	108,6	46,8	147,8	51,5	241,3	61,5	377	72	589	85,3	738,9	205,9	1029,4
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$																	
			11,1	48,4	11,4	69,7	14,8	93,9	16,7	120,7	18,8	150,1	23,1	216,1	28	311,1	33,8	374,3	42,1	465,4

Temperature, working and curing time

Cartridge temperature	Concrete temp. [°C]	Working time [min]	Minimum curing time [h]
+15°C do +40°C	+5 do +9 °C	120	50
	+10 do +19 °C	90	30
	+20 do +29 °C	30	10
	+30 do +39 °C	20	6
	+40 °C	12	4

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 = 1,5 h_{ef} acc. ETA-09/0061

Rod			M8		M10		M12		M16		M20		M24		M27		M30	
τ_{Rk}			15		15		15		14		13		12		12		12	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	96	60	120	70	144	80	192	90	240	96	288	108	324	120	360
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$															
			22,6	36,2	28,3	56,5	39,6	81,4	56,3	135,1	73,5	196	86,9	260,6	109,9	329,8	135,7	407,2
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$															
			23,5	47,5	23,5	66,4	29,6	87,3	36,1	134,4	43,1	187,8	47,5	246,8	56,7	294,5	66,4	344,9
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$															
			45,2	72,4	46,9	113,1	59,2	162,9	72,3	268,7	86,2	375,5	95	493,6	113,4	589	132,8	689,9
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$															
			15,6	31,7	16,1	45,7	20,8	61,7	26,5	98,8	32,7	142,4	37	191,9	44,9	232,7	53,5	276,6

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 = 1,5 h_{ef} acc. ETA-09/0061

Rod			M12		M16		M20		M24		M27		M30	
τ_{Rk}			7,5		6,5		6		5,5		5,5		5,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			70	144	80	192	90	240	96	288	108	324	120	360
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	Nrk,p=π x d x h_{ef} x τRk											
			19,8	40,7	26,1	62,7	33,9	90,5	39,8	119,4	50,4	151,2	62,2	186,6
Characteristic resistance concrete cone failure	N_{rkc}	kN	Nrk,c= k x √fck,cube x h_{ef}1,5											
			21,1	62,2	25,8	95,8	30,7	133,9	33,9	176	40,4	210	47,3	245,9
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$											
			42,2	81,4	51,5	125,5	61,5	181	67,7	238,9	80,8	302,3	94,6	373,2
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$											
			14,8	43,7	18,8	70	23,1	100,8	26,2	135,9	31,8	164,8	37,9	195,9

Tensile and shear resistance of the single anchor in non-cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc. ETA-09/0061

Rod			Ø8		Ø10		Ø12		Ø14		Ø16		Ø20		Ø25		Ø28		Ø32	
τ_{Rk}			10		12		12		12		12		12		11		10		8,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			60	96	60	120	70	144	75	168	80	192	90	240	100	300	112	336	128	384
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$																	
			21,1	33,8	26,4	52,8	34,3	70,6	42,9	96,1	48,3	115,8	67,9	181	86,4	259,2	108,4	325,1	141,5	424,6
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$																	
			23,5	47,5	23,5	66,4	29,6	87,3	32,8	110	36,1	134,4	43,1	187,8	50,5	262,4	59,9	311	73,1	380
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$																	
			42,2	67,6	52,8	105,6	59,2	141,1	65,6	192,1	72,3	231,6	86,2	361,9	101	518,4	119,7	650,2	283,1	849,3
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$																	
			15,6	31,7	16,1	45,7	20,8	61,7	23,6	79,4	26,5	98,8	32,7	142,4	39,6	205,2	47,7	247	59,5	307,4

Tensile and shear resistance of the single anchor in cracked concrete C20/25 with fulfilled installation parameters – characteristic values. Temperature range 40/24 °C. C_1 =1,5 h_{ef} acc.ETA-09/0061

Rod			Ø12		Ø14		Ø16		Ø20		Ø25		Ø28		Ø32	
τ_{Rk}			12		12		12		12		11		10		8,5	
Embedment depth		mm	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
			70	144	75	168	80	192	90	240	100	300	112	336	128	384
Characteristic resistance combined pull-out and concrete cone failure	$N_{rk,p}$	kN	$N_{rk,p}=\pi \times d \times h_{ef} \times \tau_{Rk}$													
			19,8	40,7	23,1	51,7	26,1	62,7	33,9	90,5	43,2	129,6	54,2	162,6	70,8	212,3
Characteristic resistance concrete cone failure	N_{rkc}	kN	$N_{rk,c}= k \times \sqrt{f_{ck,cube}} \times h_{ef}^{1,5}$													
			21,1	62,2	23,4	78,4	25,8	95,8	30,7	133,9	36	187,1	42,7	221,7	52,1	270,9
Characteristic resistance concrete pry-out failure	V_{rkp}	kN	$V_{rkp}= k \times \min(N_{rk,p};N_{rk,c})$													
			42,2	81,4	46,8	103,4	51,5	125,5	61,5	181	72	259,2	85,3	325,1	141,5	424,6
Characteristic resistance concrete Edge failure	$V_{rk,c}$	kN	$V_{rk,c}= k_1 \times d^{\alpha} \times h_{ef}^{\beta} \times \sqrt{f_{ck,cube}} \times c_1^{1,5}$													
			14,8	43,7	16,7	56,2	18,8	70	23,1	100,8	28	145,3	33,8	175	42,1	217,7

RESIN CONSUMPTION
INCLUDING LOSSES

Rebar size	Resin consumption (examples of embedment depths in the range specified in the ETA) [ml]																		
ø8	5.1	5.9	6.7	7.6	8.4	9.2	10.1	13.4											
ø10	6	7	8	9	10	11	12	16	20										
ø12		7.8	9	10.1	11.2	12.3	13.4	17.9	22.3	26.8									
ø14		8.9	10.2	11.5	12.8	14	15.3	20.4	25.5	30.6	35.6								
ø16			11.6	13.1	14.5	16	17.4	23.2	29	34.8	40.6	46.3							
ø20				15.9	17.7	19.5	21.2	28.3	35.3	42.4	49.5	56.5	63.6	70.6					
ø25					37.3	41	44.8	59.7	74.6	89.5	104.4	119.3	134.2	149.1	164	178,9			
ø28					41.2	45.3	49.4	65.9	82.3	98.8	115.3	131.7	148.2	164.6	181.1	197.5	222.2	246.9	
ø32							64.8	86.4	107.9	129.5	151.1	172.7	194.2	215.8	237.4	259	291.3	323.7	345.3
Effective embedment depth h_{ef} [mm]	60	70	80	90	100	110	120	160	200	240	280	320	360	400	440	480	540	600	640

Threaded rod size	Resin consumption (examples of embedment depths in the range specified in the ETA) [ml]																	
M8	3.3	3.8	4.4	4.9	5.5	6	6.6											
M10	4.2	4.9	5.6	6.3	7	7.7	8.4	11.2	14									
M12		5.9	6.7	7.5	8.3	9.2	10	13.3	16.6	20								
M16			9.2	10.3	11.5	12.6	13.7	18.3	22.9	27.4	32	36.6						
M20				21.6	24	26.4	28.8	38.4	48	57.6	67.2	76.8	86.4	95.9				
M24				25.8	28.7	31.5	34.4	45.8	57.3	68.7	80.2	91.6	103.1	114.5	125.9	137.4		
M27					38.2	42	45.8	61	76.3	91.5	106.7	122	137.2	152.5	167.7	183	205.8	
M30							52.5	70	87.5	105	122.5	140	157.5	174.9	192.4	209.9	236.2	262.4
Effective embedment depth h_{ef} [mm]	60	70	80	90	100	110	120	160	200	240	280	320	360	400	440	480	540	600

RESIN CONSUMPTION

EXCLUDING LOSSES

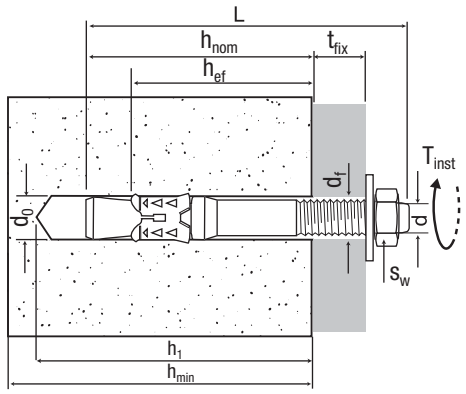
Anchorage of threaded rod and rebar without losses

Rebar size	Resin consumption (examples of embedment depths in the range specified in the ETA) [ml]																		
ø8	4.5	4.9	5.6	6.3	7	7.7	8.4	11.2											
ø10	5	5.9	6.7	7.5	8.4	9.2	10	13.4	16.7										
ø12		6.8	7.8	8.8	9.7	10.7	11.7	15.5	19.4	23.3									
ø14		7.8	8.9	10	11.1	12.2	13.3	17.7	22.2	26.6	31								
ø16			10.1	11.4	12.6	13.9	15.1	20.2	25.2	30.2	35.3	40.3							
ø20				13.9	15.4	16.9	18.5	24.6	30.7	36.9	43	49.1	55.3	61.4					
ø25					33.9	37.3	40.7	54.2	67.8	81.3	94.9	108.4	122	135.5	149.1	162.6			
ø28					37.5	41.2	44.9	59.9	74.9	89.8	104.8	119.7	134.7	149.7	164.6	179.6	202	224.5	
ø32							58.9	78.5	98.1	117.7	137.4	157	176.6	196.2	215.8	235.4	264.9	294.3	313.9
Effective embedment depth h_{ef} [mm]	60	70	80	90	100	110	120	160	200	240	280	320	360	400	440	480	540	600	640

Threaded rod size	Resin consumption (examples of embedment depths in the range specified in the ETA) [ml]																	
M8	2.8	3.2	3.7	4.1	4.6	5	5.5											
M10	3.5	4.1	4.7	5.3	5.9	6.4	7	9.3	11.7									
M12		5.1	5.8	6.5	7.3	8	8.7	11.6	14.5	17.4								
M16			8	9	10	11	12	15.9	19.9	23.9	27.8	31.8						
M20				18.8	20.9	23	25.1	33.4	41.7	50.1	58.4	66.8	75.1	83.4				
M24				23.5	26.1	28.7	31.3	41.7	52.1	62.5	72.9	83.3	93.7	104.1	114.5	124.9		
M27					34.7	38.2	41.6	55.5	69.3	83.2	97	110.9	124.8	138.6	152.5	166.3	187.1	
M30							47.7	63.6	79.5	95.4	111.3	127.2	143.1	159	174.9	190.8	214.7	238.5
Effective embedment depth h_{ef} [mm]	60	70	80	90	100	110	120	160	200	240	280	320	360	400	440	480	540	600

FM-753

GALVANIZED WEDGE ANCHOR FOR NON-CRACKED CONCRETE

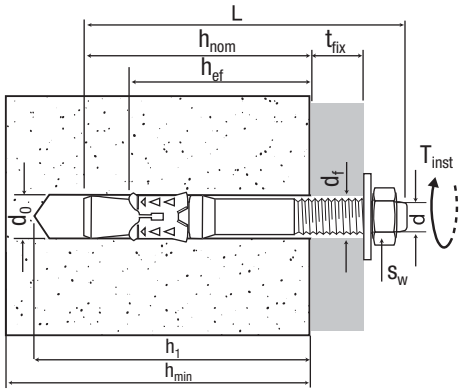


t_{fix} – fixing element thickness
d_o – drill hole diameter
h_1 – minimum drill hole depth
h_{nom} – minimum anchoring depth
h_{ef} – minimum effective anchoring depth
d_f – hole diameter in the fixing element
h_{min} – minimum base material thickness
t_{inst} – torque moment
d – anchor diameter
L – anchor length
s_w – wrench/nut

Characteristic capacities of a single anchor without taking into account anchor spacing and edge distances in concrete C20/25. accc.: ETA-01/2014.

Anchor FM 753			M6	M8	M10	M12	M16
Minimum base material thickness	h_{min}	mm	100	100	100	120	170
Minimum drill hole depth	h_1	mm	50	60	70	85	115
Minimum embedment depth	h_{nom}	mm	41	48	59	71	96
Effective anchoring depth	h_{ef}	mm	35	40	50	60	85
Drill hole diameter	d_0	mm	6	8	10	12	16
Torque moment	t_{inst}	Nm	6	15	25	50	100
Minimum anchor spacing	c_{min}	mm	50	60	75	90	130
Minimum edge distance	s_{min}	mm	50	60	75	90	130
Characteristic tension load resistance							
Characteristic steel failure	$N_{rk,s}$	kN	10.9	17.2	28	31.6	72.3
Characteristic pull-out failure in non-cracked concrete C20/25	$N_{rk,p}$	kN	6	9	12	20	35
Concrete cone failure and splitting	$N_{rk,c}$	kN	10.5	12.8	17.9	23.5	39.6
Characteristic shear load resistance							
Characteristic shear steel failure, without lever arm	$V_{rk,s}$	kN	6	9.1	14.8	18.4	45.3
Characteristic shear steel failure, with lever arm	$M_{rk,s}$	Nm	12	24	49	68	193
Concrete pry-out failure	$V_{rk,cp}$	kN	10.5	12.8	17.9	46.9	79.1
Concrete edge failure	$V_{rk,c}$	kN	6	8.2	11.9	16.2	28.9

Characteristic loading resistances do not taking into account safety factors. The design loading resistances should be calculated according to the guidelines ETAG 001 annex C.



t_{fix} – fixing element thickness
d_o – drill hole diameter
h_1 – minimum drill hole depth
h_{nom} – minimum anchoring depth
h_{ef} – minimum effective anchoring depth
d_f – hole diameter in the fixing element
h_{min} – minimum base material thickness
t_{inst} – torque moment
d – anchor diameter
L – anchor length
s_w – wrench/nut

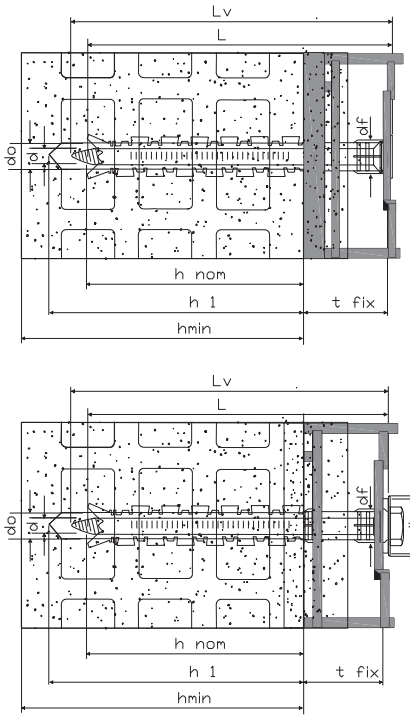
Characteristic capacities of a single anchor without taking into account anchor spacing and edge distances in concrete C20/25. aac.: ETA-10/0293.

Anchor FM 753 Crack A4				M8	M10	M12	M16
Minimum base material thickness		h_{min}	mm	100	120	150	170
Minimum drill hole depth		h_1	mm	70	80	100	115
Minimum embedment depth		h_{nom}	mm	54	67	81	97
Effective anchoring depth		h_{ef}	mm	48	60	72	86
Drill hole diameter		d_0	mm	8	10	12	16
Torque moment		t_{inst}	Nm	20	40	60	120
Minimum anchor spacing		c_{min}	mm	50	50	60	70
Minimum edge distance		s_{min}	mm	50	55	60	70
Characteristic tension load resistance							
Characteristic steel failure		$N_{rk,s}$	kN	21	34	49	88
Characteristic pull-out strength in concrete	Non-cracked	$N_{rk,p}$	kN	9	16	20	35
	Crakced			5	9	12	25
Concrete cone failure and splitting	Non-cracked	$N_{rk,c}$	kN	16.8	23.5	30.9	40.3
	Crakced			12	16.7	22	28.7
Characteristic shear load resistance							
Characteristic shear steel failure without lever arm		$V_{rk,s}$	kN	11.9	18.8	27.4	51
Characteristic shear steel failure, with lever arm		$M_{rk,s}$	Nm	24	49	85	216
Concrete pry-out failure	Non-cracked	$V_{rk,cp}$	kN	16.8	46.9	61.7	80.6
	Crakced			12	33.5	44	57.4
Concrete edge failure	Non-cracked	$V_{rk,c}$	kN	6.8	7.3	10.2	14.1
	Crakced			4.8	5.2	7.3	10
Tension and shear resistances in seismic conditions C1 and C2							
Characteristic steel failure	C1	$N_{rk,s}$	kN	21	34	49	88
	C2			-	34	49	88
Characteristic pull-out failure in non-cracked concrete C20/25	C1	$N_{rk,p}$	kN	4.1	9	12	25
	C2			-	2.4	8.8	21.9
Characteristic shear steel failure without lever arm	C1	$V_{rk,s}$	kN	8	12.3	15.8	36.6
	C2			-	12.3	15.8	36.6

Characteristic loading resistances do not taking into account safety factors. The design loading resistances should be calculated according to the guidelines ETAG 001 annex C.

Characteristic loading resistances for single anchor acc. ETA 10/425.

Anchor size			Ø8	Ø10
Anchoring depth		[mm]	70	70
Concrete C12/C15				
Characteristic tension resistance	$N_{Rk,p}$	kN	1.5	2.5
Characteristic edge distance	$C_{cr,N}$	mm	140	140
Minimum anchor spacing	S_{min}	mm	80	80
Minimum edge distance	C_{min}	mm	80	80
Minimum base material thickness	h_{min}	mm	100	100
Concrete C16/C20				
Characteristic tension resistance	$N_{Rk,p}$	kN	2.5	3.5
Characteristic edge distance	$C_{cr,N}$	mm	100	100
Minimum anchor spacing	S_{min}	mm	60	60
Minimum edge distance	C_{min}	mm	60	60
Minimum base material thickness	h_{min}	mm	100	100
Aerated Autoclaved Concrete AAC *Density ≥ 0,5Kg/m3; EN771-4 fb ≥ 2,5MPa*				
Characteristic tension resistance	F_{Rk}	kN	0.6	0.6
Minimum anchor spacing	S_{min}	mm	250	250
Minimum edge distance	C_{min}	mm	100	100
Minimum base material thickness	h_{min}	mm	200	200
SOLID BRICK *EN771-1 fb ≥ 43 MPa*				
Characteristic tension resistance	F_{Rk}	kN	3.5	3.5
Hollow blocks BIMATTONE *EN771-1 fb ≥27,3 MPa*				
Characteristic tension resistance	F_{Rk}	kN	1.5	1.5
Hollow blocks ALVEOLATER *SWISS HEAVY* *EN771-1 fb ≥13 MPa*				
Characteristic tension resistance	F_{Rk}	kN	1.5	1.5
Hollow blocks ALVEOLATER INCASTRO 35 *EN771-1 fb ≥ 10 MPa*				
Characteristic tension resistance	F_{Rk}	kN	1.5	1.5
Hollow blocks LEGGERO *EN771-1 fb ≥ 7 MPa*				
Characteristic tension resistance	F_{Rk}	kN	0.9	0.9
Hollow blocks *POROTON 25X30X19* *EN771-1 fb ≥ 22 MPa*				
Characteristic tension resistance	F_{Rk}	kN	1.5	2
Hollow blocks *LEOPARD BP CAT.1-HD* *EN771-1 fb ≥ 30 MPa*				
Characteristic tension resistance	F_{Rk}	kN	2	1.5
Hollow blocks *CALCESTRUZZO LEGGERO BC 203* *EN771-1 fb ≥ 4 MPa*				
Characteristic tension resistance	F_{Rk}	kN	0.75	0.6
Minimum spacing in masonry				
Minimum anchor spacing	S_{min}	mm	250	250
Minimum edge distance	C_{min}	mm	100	100
Minimum base material thickness	h_{min}	mm	110	110

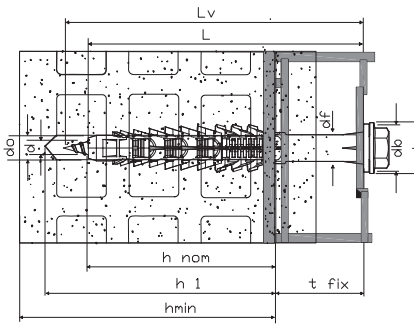


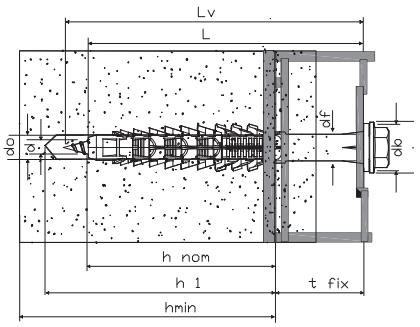
t_{fix} – fixing element thickness
d_o – drill hole diameter
h_1 – minimum drill hole depth
h_{nom} – minimum anchoring depth
h_{min} – minimum base material thickness
d – screw diameter
db – head diameter
df – hole diameter in fixing element
dr – flange diameter
L – plug length
Lv – screw length

(1) Characteristic loading resistances NRK, FRk acc. ETA 19/0245, do not included partial safety factors. The torque moment should be adjusted according to the type of installation and base material.
The loads are only valid if the installation was carried out correctly. The structural engineer is responsible for the calculations. Specification and calculation of anchors should be made in accordance with the appendix C of ETAG020

Characteristic loading resistances for single anchor acc. ETA 19/0245.

Anchor size			**Ø10**		
Embedment depth	h_{nom}	[mm]	**50**	**70**	**90**
Concrete C12/15					
Characteristic tension resistance	$N_{Rk,p}$	[kN]	3	4.5	-
Minimum anchor spacing	S_{min}	[mm]	180	180	-
Minimum edge distance	C_{min}	[mm]	70	70	-
Minimum base material thickness	h_{min}	[mm]	100	120	-
Concrete C16/20					
Characteristic tension resistance	$N_{Rk,p}$	[kN]	4	6.5	-
Minimum anchor spacing	S_{min}	[mm]	150	150	-
Minimum edge distance	C_{min}	[mm]	50	50	-
Minimum base material thickness	h_{min}	[mm]	100	120	-
Solid Brick *EN771-1 fb ≥ 20 MPa*					
Characteristic tension resistance	F_{Rk}	[kN]	3.5	4	-
Minimum base material thickness	h_{min}	[mm]	175	175	-
Hollow blocks POROTON P800 *EN771-1 fb ≥ 10,5 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	2	1.5	-
Minimum base material thickness	h_{min}	[mm]	250	250	-
Hollow blocks BIO PLAN 45-25/19,9 *EN771-1 fb ≥ 12 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	2	2	-
Minimum base material thickness	h_{min}	[mm]	450	450	-
Hollow blocks DOPIO UNI *EN771-1 fb ≥ 22 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	2	2	-
Minimum base material thickness	h_{min}	[mm]	120	120	-
Hollow blocks BIO PLAN 45-25/19,9T *EN771-1 fb ≥ 7 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	1.5	1.5	-
Minimum base material thickness	h_{min}	[mm]	120	120	-
Hollow blocks SM B 15/19 *EN771-1 fb ≥ 28 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	2	2	-
Minimum base material thickness	h_{min}	[mm]	150	150	-
Hollow blocks LEGGERO *EN771-1 fb ≥ 8 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	0.9	0.9	-
Minimum base material thickness	h_{min}	[mm]	120	120	-
Hollow blocks POROTON P700 TS *EN771-1 fb ≥ 11 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	0.9	0.9	-
Minimum base material thickness	h_{min}	[mm]	350	350	-
Hollow blocks LECA UNIVERSALBLOCK 20 *EN771-1 fb ≥ 4 Mpa*					
Characteristic tension resistance	F_{Rk}	[kN]	1.5	1.5	-
Minimum base material thickness	h_{min}	[mm]	200	200	-
Minimum spacing in masonry					
Minimum anchor spacing	S_{min}	[mm]	250	250	-
Minimum edge distance	C_{min}	[mm]	100	100	-
Aerated Autoclaved Concrete AAC *Density ≥ 0,5Kg/dm3; EN771-4 fb ≥ 2,5MPa*					
Characteristic tension resistance	F_{Rk}	[kN]	-	2	2.5
Minimum anchor spacing	S_{min}	[mm]	-	250	250
Minimum edge distance	C_{min}	[mm]	-	100	100
Minimum base material thickness	h_{min}	[mm]	-	240	240
Torque moment					
Galvanized steel anchor	T_{max}	[Nm]		15	
A4 stainless steel anchor				20	





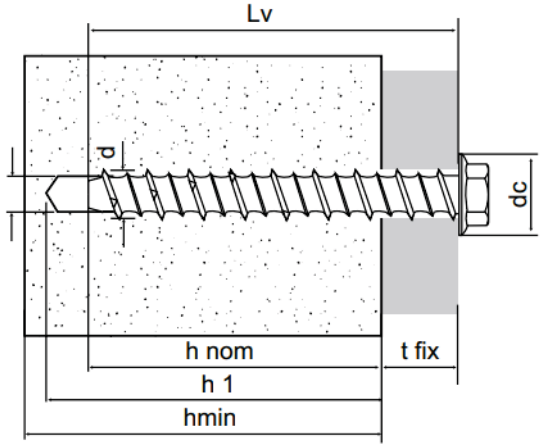
t_{fix} – fixing element thickness
d_o – drill hole diameter
h_1 – minimum drill hole depth
h_{nom} – minimum anchoring depth
h_{min} – minimum base material thickness
d – screw diameter
db – head diameter
df – hole diameter in fixing element
dr – flange diameter
L – plug length
Lv – screw length

(1) Characteristic loading resistances NRK, FRk acc. ETA 19/0245, do not included partial safety factors. The torque moment should be adjusted according to the type of installation and base material. The loads are only valid if the installation was carried out correctly. The structural engineer is responsible for the calculations. Specification and calculation of anchors should be made in accordance with the appendix C of ETAG020

Characteristic loads resistances of a single anchor without taking into account the distance between adjacent anchors and the edge distance in concrete C20/25 according to ETA 16/0177

Anchor size			**Ø10**			**Ø12**		
Nominal hole diameter	d_0	mm		8			10	
Minimum anchorage depth	h_{nom}	mm	45	50	65	50	60	75
Effective anchorage depth	h_{ef}	mm	30	34	47	33	42	54
Minimum base thickness	h_{min}	mm		110			110	
Minimum spacing	S_{min}	mm		60			70	
Minimum edge spacing	C_{min}	mm		60			70	
Tensile, steel failure								
Characteristic load	$N_{Rk,s}$	kN		42,4			67,2	
Destruction by pull-out from substrate								
Characteristic pull-out load for cracked concrete C20/25	$N_{Rk,p,cr}$	kN	3	4	7,5	4	6	9
Characteristic pull-out load for non cracked concrete C20/25	$N_{Rk,p,ucr}$	kN	6	6	12	6	9	16
Concrete cone tearing out and destruction by splitting								
Effective anchorage depth	h_{ef}	mm	30	34	47	33	42	54
Critical spacing	$S_{cr,N}$	mm	90	102	141	100	124	162
Critical edge spacing	$C_{cr,N}$	mm	45	51	71	50	62	81
Critical spacing splitting	$S_{cr,sp}$	mm	90	102	141	100	124	162
Critical edge spacing splitting	$S_{cr,sp}$	mm	45	51	71	50	62	81
Shear, steel failure								
Characteristic load	$V_{Rk,s}$	kN		17			26,9	
Characteristic bending moment	$M^0_{Rk,s}$	Nm		46,8			93,2	
Destruction by splitting concrete								
Factor acc EN 1992 4 § 7.2.2.4	k_8	-		1,0			1,0	
Destruction of the edge of concrete								
Effective screw length	l_{ef}	mm	30	34	47	33	42	54
Effective screw diameter	d_{nom}	mm		8			10	

The characteristic loads do not take into account the safety factors. The design resistances have to be determined in accordance with the guidelines of ETAG 001 Annex C and ETA 16/0177.

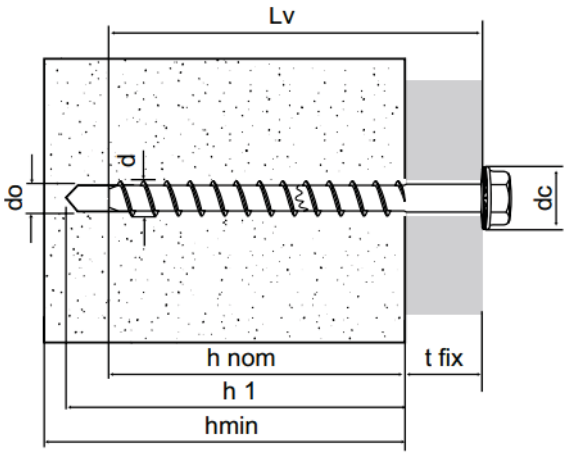


d – screw diameter
dc – washer diameter
d_o – hole diameter
h_1 – minimum hole depth
h_{min} – minimum thickness of the substrate
h_{nom} – nominal anchorage depth
Lv – total length of the screw
t_{fix} – thickness of the fixture

Characteristic loads resistances of a single anchor without taking into account the distance between adjacent anchors and the edge distance in concrete C20 / 25 according to ETA 19/0332

Anchor size			**Ø10**	**Ø12**
Nominal hole diameter	d_0	mm	8	10
Minimum anchorage depth	h_{nom}	mm	85	100
Effective anchorage depth	h_{ef}	mm	51,9	58,7
Minimum base thickness	h_{min}	mm	125	140
Minimum spacing	S_{min}	mm	50	60
Minimum edge spacing	C_{min}	mm	50	60
Tensile, steel failure				
Characteristic load	$N_{Rk,s}$	kN	33	53,7
Destruction by pull-out from substrate				
Characteristic pull-out load for cracked concrete C20/25	$N_{Rk,p,cr}$	kN	4,5	7,0
Characteristic pull- out load for non cracked concrete C20/25	$N_{Rk,p,ucr}$	kN	9	16
Concrete cone tearing out and destruction by splitting				
Effective anchorage depth	h_{ef}	mm	51,9	58,7
Critical spacing	$S_{cr,N}$	mm	3 h_{ef}	
Critical edge spacing	$C_{cr,N}$	mm	1,5 h_{ef}	
Critical spacing splitting	$S_{cr,sp}$	mm	3 h_{ef}	
Critical edge spacing splitting	$S_{cr,sp}$	mm	1,5 h_{ef}	
Shear, steel failure				
Characteristic load	$V_{Rk,s}$	kN	16,5	26,8
Characteristic bending moment	$M^0_{Rk,s}$	Nm	35,9	74,4
Destruction by splitting concrete				
Factor acc EN 1992 4 § 7.2.2.4 k	k_8	-	1,0	
Destruction of the edge of concrete				
Effective screw length	l_{ef}	mm	51,9	58,7
Effective screw diameter	d_{nom}	mm	8	10

The characteristic loads do not take into account the safety factors. The design resistances have to be determined in accordance with the guidelines of ETAG 001 Annex C and ETA 19/0332.

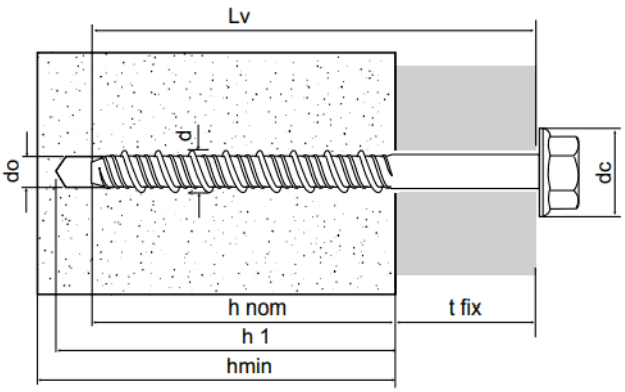


d	– screw diameter
dc	– washer diameter
d_o	– hole diameter
h_1	– minimum hole depth
h_{min}	– minimum thickness of the substrate
h_{nom}	– nominal anchorage depth
Lv	– total length of the screw
t_{fix}	– thickness of the fixture

Characteristic loads resistance of a single anchor without taking into account the distance between adjacent anchors and the edge distance in concrete C20 / 25 according to ETA 19/0343.

Anchor size			**Ø7,5**
Nominal hole diameter	d_0	mm	6
Minimum anchorage depth	h_{nom}	mm	55
Effective anchorage depth	h_{ef}	mm	42
Minimum base thickness	h_{min}	mm	100
Minimum spacing	S_{min}	mm	45
Minimum edge spacing	C_{min}	mm	45
Minimum edge spacing			
Characteristic load	$N_{Rk,s}$	kN	18,7
Destruction by pull-out from substrate			
Characteristic pull-out load for cracked concrete C20/25	$N_{Rk,p,cr}$	kN	6
Characteristic pull-out load for non cracked concrete C20/25	$N_{Rk,p,ucr}$	kN	9
Concrete cone tearing out and destruction by splitting			
Effective anchorage depth	h_{ef}	mm	42
Critical spacing	$S_{cr,N}$	mm	126
Critical edge spacing	$C_{cr,N}$	mm	63
Critical spacing splitting	$S_{cr,sp}$	mm	126
Critical edge spacing splitting	$S_{cr,sp}$	mm	63
Shear, steel failure			
Characteristic load	$V_{Rk,s}$	kN	7,5
Characteristic bending moment	$M^0_{Rk,s}$	Nm	15,2
Destruction by splitting concrete			
Factor acc EN 1992 4 § 7.2.2.4	k_8	-	1,0
Destruction of the edge of concrete			
Effective screw length	l_{ef}	mm	42
Effective screw diameter	d_{nom}	mm	7,5

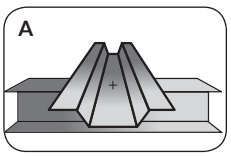
The characteristic loads do not take into account the safety factors. The design resistances have to be determined in accordance with the guidelines of ETAG 001 Annex C and ETA 19/0343.



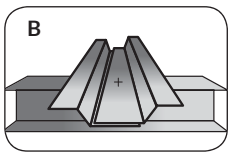
d – screw diameter
dc – washer diameter
d_o – hole diameter
h_1 – minimum hole depth
h_{min} – minimum thickness of the substrate
h_{nom} – nominal anchorage depth
Lv – total length of the screw
t_{fix} – thickness of the fixture

SELECTION OF HSBR-14 NAILS FOR FIXING METAL SHEET TO STEEL SUBSTRATE*

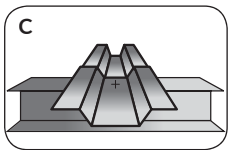
1. Check whether the method of fixing meets the assumptions given in the table below**



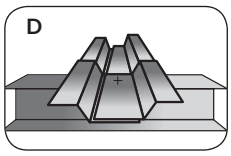
fixing 1 sheet



fixing 2 sheets



fixing 2 sheets

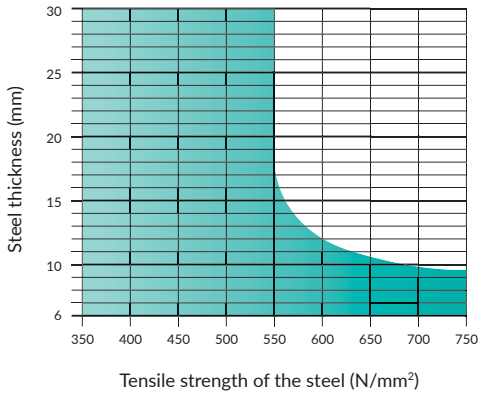


fixing 4 sheets

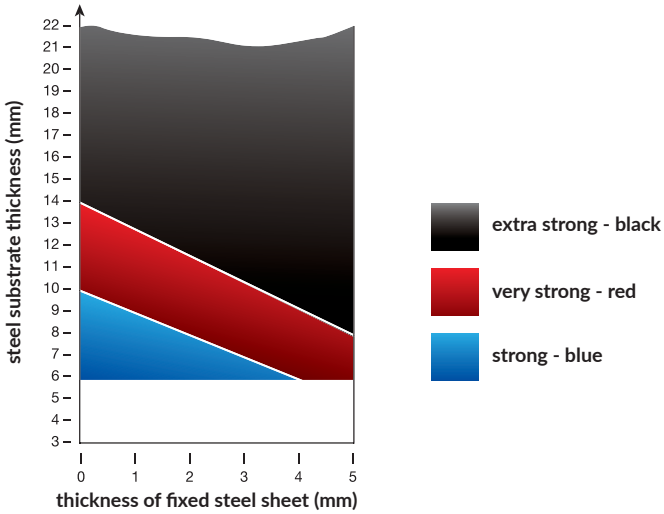
fastened metal sheet thickness (mm)	allowed type of connection
0.63	A B C D
0.75	A B C D
0.88	A B C D
1.00	A B C D
1.13	A C
1.25	A C
1.50	A
1.75	A
2.00	A
2.50	A

2. It is necessary to check which nail is suitable for the steel substrate (steel class/thickness)

HSBR14



(1)	E24	E28	E360	A60
(2)	ST37	ST44	ST52	ST60
(3)	S235	S275	S355	E335



* The number of SBR-14/HSBR-14 nails must be selected according to structural calculation requirements and information provided in product technical approvals. Setting of nails should be checked using a special test card. The nail head must be within a certain distance from the substrate. A correctly set nail provides full load bearing resistance.

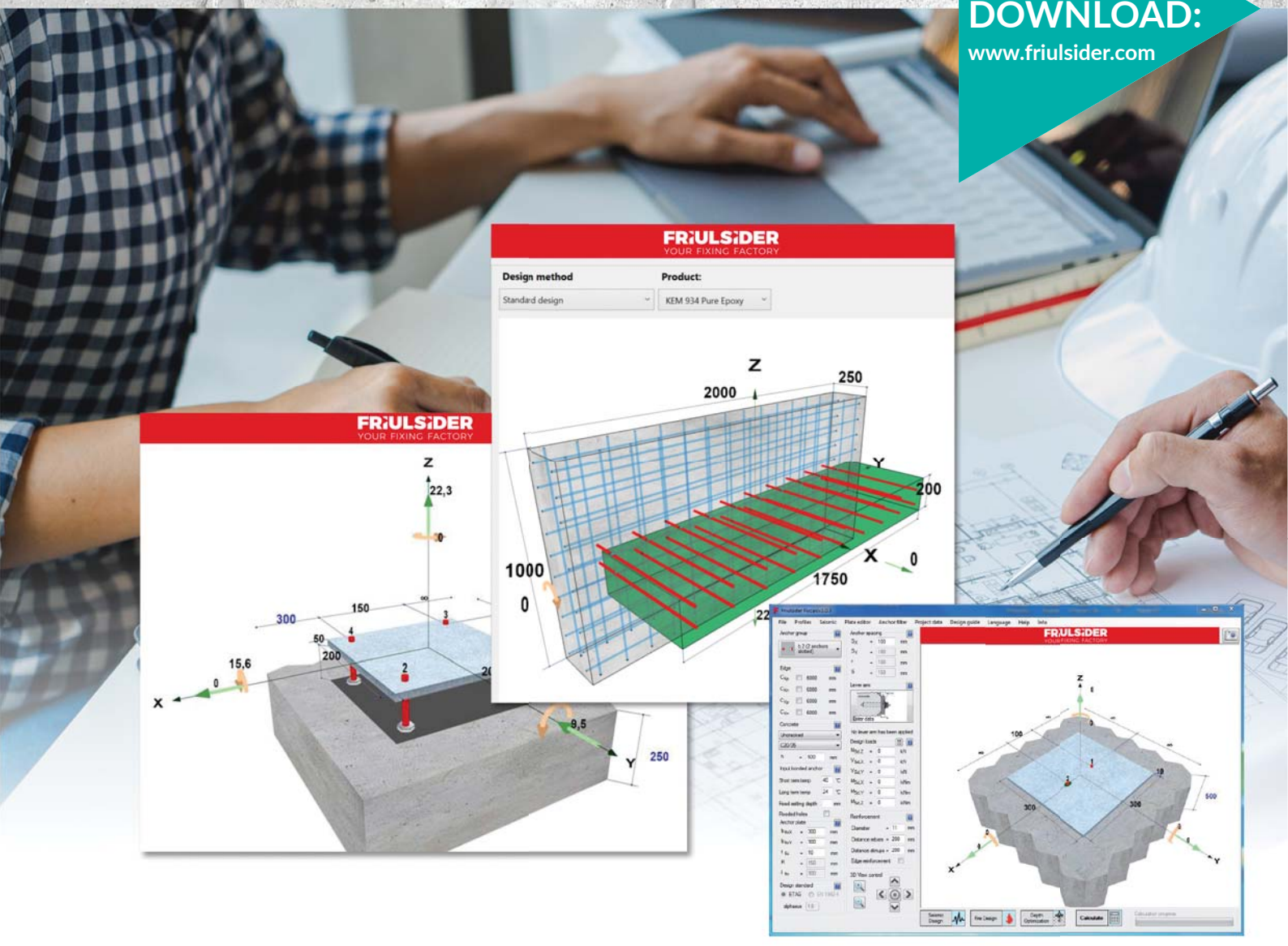
** If the fastening does not meet the criteria specified in Table 1, the installation can be performed using appropriately selected (according to the structural calculations) drilling, self-drilling or self-tapping screws.

FIXCALC
ENGINEERING SOFTWARE
A VALUABLE TOOL FOR DESIGNERS

ANCHOR CALCULATION SOFTWARE:

- The FIX-CALC engineering software can be downloaded directly from the Friulsider website
- The suite consists of two modules, one for anchor calculations + one for post-installed rebar connections.
- All Friulsider certified fixings can be calculated using the anchor module
- Calculation according to ETAG 001 annex C or EN1992-4: 2018

FIX CALC
DOWNLOAD:
www.friulsider.com



ETANCO®

X3 HIGH PERFORMANCE FRAME ANCHOR

MAXIMUM PULL-OUT VALUES
EXTRAORDINARY PERFORMANCE
ON ALL BASE MATERIALS

UP TO 3 EMBEDMENT DEPTHS
EXTREME VERSATILITY AND
SIGNIFICANT REDUCTION
IN INSTALLATION TIME

INCREASE EXPANSION
DESIGNED FOR FACEDES AND
HEAVY CARPENTRY

MAXIMUM PULL-OUT VALUES
UP TO 2.000 Kg*

FM X5 MULTI-EXPANSION FRAME ANCHOR

MULTI-EXPANSION GEOMETRY
STRONG AND DURABLE ANCHORAGE ALREADY
BEHIND THE FIRST RIB OF THE HOLLOW BRICK
OR BLOCK. CORRECT DRIVING OF THE SCREW,
EVEN IN INACCURRICALLY DRILLED HOLES.

ULTRA FLEXIBLE NYLON – FleX5®
NO EXPANSION TENSION IN HOLLOW
BRICK RIBS AND POSSIBILITY OF MANUAL
PRE-LOCKING OF THE PLUG.

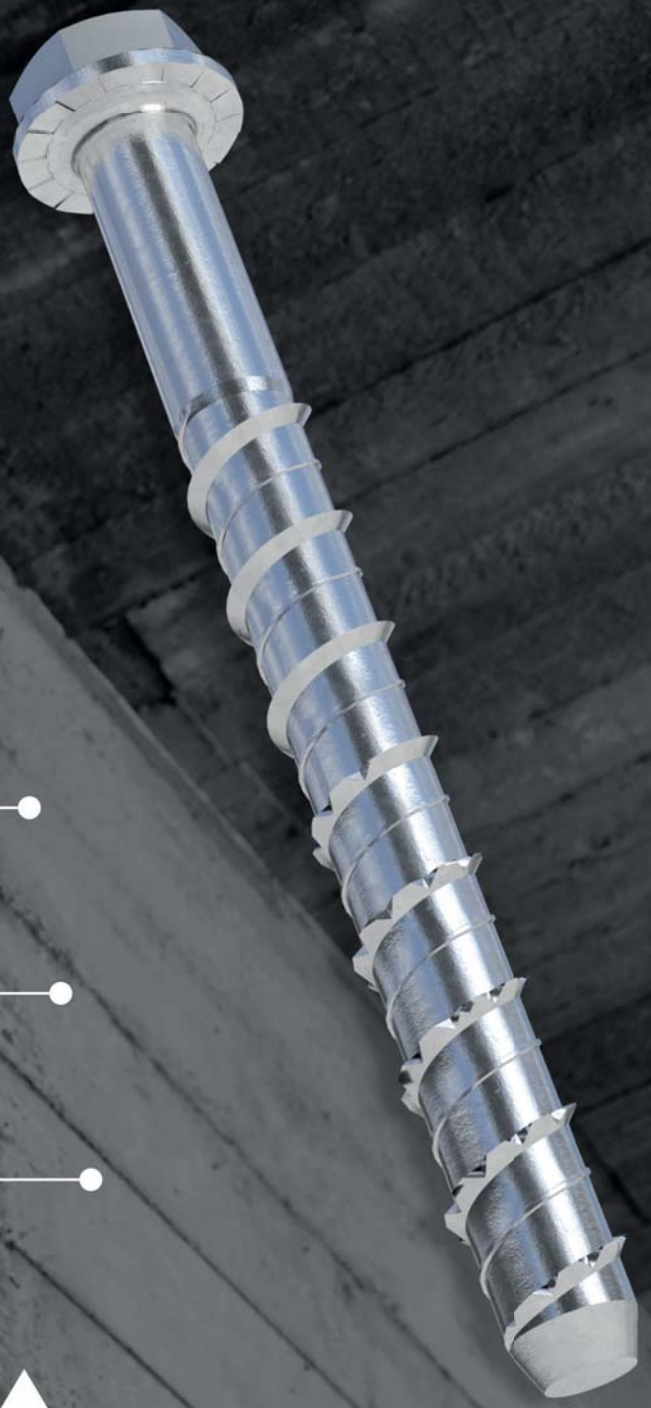
SCREW ALWAYS PREASSEMBLED
HIGH CONVENIENCE OF WORK.
ELIMINATION OF THE POSSIBILITY
OF USING AN INCORRECT SCREW.

TECHNOLOGY
FleX5®

*) Average pull-out values obtained from tests carried out on non-cracked concrete C20/25 with Ø10 plug installed at 70 mm. This information should be considered indicative and not a substitute for the official performance declaration, which is reported in the technical data sheet and ETA.

CLR

SCREW ANCHOR FOR STRUCTURAL FIXINGS



- QUICK INSTALLATION
- REDUCED EDGE DISTANCE AND SPACING DISTANCES
- 3 CERTIFIED EMBEDMENT DEPTHS

CE op. 1 | R 120 | FIX CALC

ETANCO
ul. Olsztyńska 30, 11-130 Orneta
info@etanco.pl | www.etanco.pl

KEM P

POYESTER CHEMICAL ANCHOR FOR CONCRETE AND MASONRY

Versatile polyester resin for non-cracked concrete and masonry.

Intended for fastening light and medium loaded elements such as sanitary equipment, electrical installations, awnings, shutters and roller blinds, gazebos, porches, fences, air conditioners, etc. Perfect for non-cracked concrete. For hollow masonry it should be used additionally a mesh sleeve. It is also possible to use in flooded holes.

Index	Resin Capacity D [ml]	Packaging Single/ Qty/Collective [pcs]
P344610	280	1/12/12
P344611	380	1/10/10

KEM V

VINYLESTER CHEMICAL ANCHOR FOR CRACKED CONCRETE AND MASONRY

Professional versatile vinylester resin for cracked and non-cracked concrete, masonry and post-installed rebar connections.

Intended for fixing medium-loaded elements such as steel structures, poles, pillars, brackets, consoles, balustrades and handrails, gazebos, porches, fences, machines and devices, etc. For non-cracked and cracked concrete.
For hollow masonry it should be used additionally a mesh sleeve. It is also possible to use in flooded holes. Lots of uses. The resin does not thicken at low temperatures (down to -10°C)

Index	Resin Capacity D [ml]	Packaging Single/ Qty/Collective [pcs]
P344614	280	1/12/12
P344615	380	1/10/10

High-performance professional hybrid resin for cracked and non-cracked concrete and post-installed rebar connections

KEM H

HYBRID CHEMICAL ANCHOR FOR CRACKED CONCRETE

Professional resin with very high load capacity for anchoring threaded rods and rebars to non-cracked and cracked concrete.
Fastening heavy steel structures, balustrades, handrails and stairs, sound-absorbing screens and barriers, energy-absorbing barriers, fixing machines and devices, anchoring poles, pillars, etc. The resin can be used for reinforced concrete structures by deep embedding of reinforcing bars.
Seismic loads C1 and C2. High temperature resistant.

Index	Resin Capacity D [ml]	Packaging Single/ Qty/Collective [pcs]
P344616*	280	1/12/12
P344617	380	1/9/9

(*) For order

ETE 16/0957 - Op. 7
ETE 16/0957 - Op. 1
ETE 16/0957 - TR 029
ETE 16/0961 - TR 023

FIX CALC

LEED tested
ÉMISSIONS DANS L'AIR INTÉRIEUR A+
SEISMIC C1 C2
ETA

Slow-curing high-performance professional pure epoxy resin for cracked and non-cracked concrete and post-installed rebar connections.

KEM E

EPOXYDE SLOW CURING CHEMICAL ANCHOR FOR CRACKED CONCRETE

Professional epoxy resin with very high load capacity for anchoring threaded rods and rebars to non-cracked and cracked concrete.
The resin can be used for reinforced concrete structures by deep embedding of reinforcing bars. Reinforcement of reinforced concrete structures (joining walls, ceilings, foundations), fastening heavy steel structures, renovation, etc.
Seismic loads C1 and C2. Diamont coring. Installation in flooded holes. High resistance to chemicals.

Index	Resin Capacity D [ml]	Packaging Single/ Qty/Collective [pcs]
P344846*	585	1/12/12

(*) For order

ETE 09/0061 - Op. 7
ETE 09/0061 - Op. 1
ETE 12/0542 - TR 023
ETE 12/0602 - Op. 7

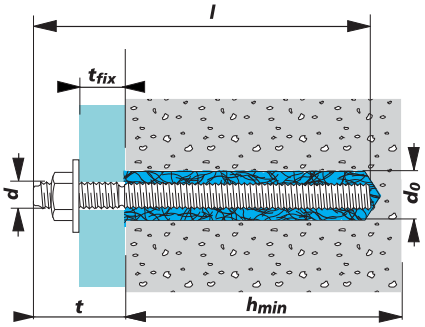
FIX CALC

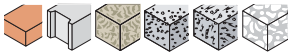
LEED tested
ÉMISSIONS DANS L'AIR INTÉRIEUR A+
SEISMIC C1 C2
ETA

Intended for using with chemical resins. Carbon steel class 5.8 threaded rods. Corrosion protection with a galvanized coating.

Index	Threaded rods		Packaging
	Diameter	Length	Single/ Qty/Collective [pcs]
	D	L	
	[mm]	[mm]	
P21911b08110	M 8	110	10
P21911b10115	M 10	115	10
P21911b10130	M 10	130	10
P21911b10120	M 12	120	10
P21911b12160	M 12	160	10
P21911b12220	M 12	220	5
P21911b16190	M 16	190	5
P21911b16210	M 16	210	5
P21911b20260*	M 20	260	5
P21911b20300*	M 20	300	5
P21911b24300*	M 24	300	5
P21911b30380*	M 30	380	2

(*) For order





Steel meter mesh sleeve

METAL MESH SLEEVE

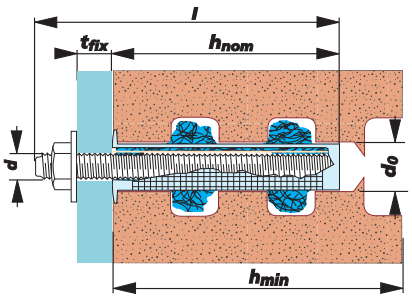
Intended for making chemical anchors in hollow materials, eg. hollow blocks, hollow bricks with threaded rods and resins. The steel mesh sleeve should be cut to the desired length. Corrosion protection with a galvanized coating.

Index	Mesh sleeve			Packaging
	Diameter	Length	Material	Single/ Qty/Collective [pcs]
	D	L		
	[mm]	[mm]		
P63310B12000	12	1000	Fe	10
P63310B16000	16	1000	Fe	10
P63310B22000	22	1000	Fe	6

Nylon mesh sleeve

PLASTIC MESH SLEEVE

Intended for making chemical anchors in hollow materials, eg. hollow blocks, hollow bricks with threaded rods and resins.
The plastic mesh sleeve is used to make fixings to the standard depth.



Index	Mesh sleeve			Packaging
	Diameter	Length	Material	Single/ Qty/Collective [pcs]
	D	L		
	[mm]	[mm]		
P63300012050	12	50	Nylon	10
P63300012080	12	80	Nylon	10
P63300015085	15	85	Nylon	10
P63300015130	15	130	Nylon	10
P63300020085	20	85	Nylon	10

CLEANING PUMP

Blow-out pump

Intended for blowing out drill holes from drill dust generated during drilling.
The cleaning process should be carried out in accordance with the instructions appropriate for the product.

Index	Packaging		
	Single	Qty	Collective
	[pcs]	[pcs]	[pcs]
PCMA002	1	1	1

CLEANING BRUSH

Brush for mechanical cleaning of anchor holes.

Intended for cleaning the walls of holes from drill dust and particles generated during drilling.
The cleaning process should be carried out in accordance with the instructions appropriate for the product.

Index	Brush diameter	Drill hole diameter	Packaging
	D	d_0	Single/ Qty/Collective [pcs]
	[mm]	[mm]	
P49999014300	14	10 - 12	1/1/1
P49999020300	20	14 - 18	1/1/1
P49999030300	30	20 - 28	1/1/1

DISPENSERS

Intended for the application of chemical anchors.

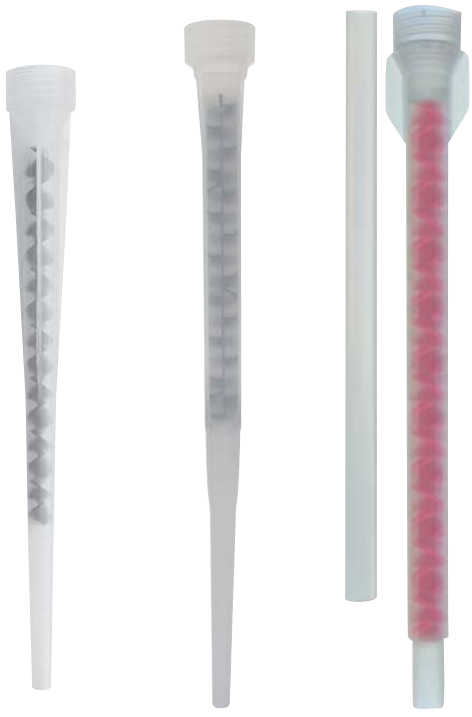
Index	Intended for cartridges with capacity	Packaging Single/ Qty/Collective [pcs]
PCMA280	280 ml	1
PCMA380	380 ml	1
PCMA585	585 ml	1

MIXERS

Mixers for the application of chemical anchors.

Mixers for the application of chemical anchors.
Additional mixers enable smooth operation when the resin has cured.
They enable optimal use of the cartridge content after work breaks.

Index	Intended for	Packaging Single/ Qty/Collective [pcs]
P40140	KEM-P / KEM-V resin	1
P40150	KEM-H resin	1
P16001	KEM-E resin + extension	1+1
P16009	Extension 20 cm	1



KEM-P / KEM-V KEM-H KEM-E

FM-753

GALVANIZED WEDGE ANCHOR FOR NON-CRACKED CONCRETE

The anchor made of galvanized carbon steel.

ETA 01/0014 - op. 7

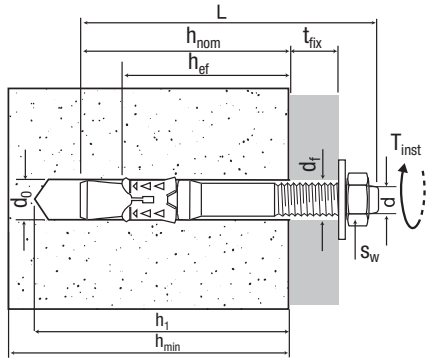
FIX CALC

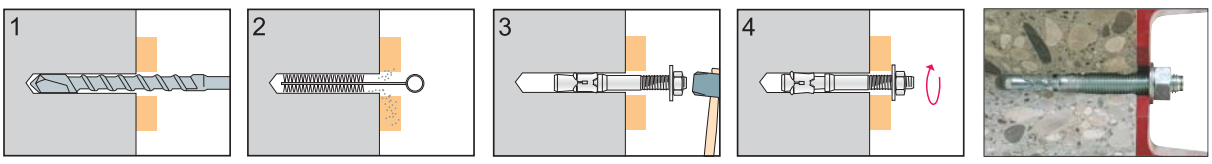
Wedge anchor for non-cracked concrete (Option 7). Cold formed bolt makes the anchor flexible while maintaining high performance.

Through-set.

Installation of steel structures, balustrades, handrails, machines and devices in the non-cracked concrete zone.

Index	d x L [mm]	Thread length [mm]	d_0 [mm]	t_{fix} [mm]	d_f [mm]	s_w [mm]	Packaging Single/ Qty/Collective [pcs]
P75320b060650PL	M6x65	40	6	15	7	11	100/1000
P75320b060850PL	M6x85	60	6	35	7	11	100/1000
P75320b061000PL	M6x100	60	6	50	7	11	50/500
P75320b080750PL	M8x75	48	8	15	9	13	100/400
P75320b080900PL	M8x90	63	8	30	9	13	100/400
P75320b100750PL	M10x75	43	10	5	12	17	50/500
P75320b100900PL	M10x90	55	10	20	12	17	50/200
P75320b101000PL	M10x100	60	10	30	12	17	50/200
P75320b101200PL	M10x120	85	10	50	12	17	50/200
P75320b121000PL	M12x100	58	12	10	14	19	50/200
P75320b121100PL	M12x110	68	12	20	14	19	50/200
P75320b121200PL	M12x120	68	12	30	14	19	25/100
P75320b121350PL	M12x135	93	12	45	14	19	25/100
P75320b161250PL	M16x125	68	16	10	18	24	20/80
P75320b161450PL	M16x145	88	16	30	18	24	20/80
P75320b161750PL	M16x175	88	16	60	18	24	20/80
P75320b162150PL	M16x215	88	16	100	18	24	15/60





FM-753 CRACK INOX A4

STAINLESS STEEL WEDGE ANCHOR FOR CRACKED CONCRETE

Wedge anchor for cracked and non-cracked concrete (Option 1) with high load capacity, stainless steel. The special design of the clip in combination with A4 steel ensures not only high load capacity but also high corrosion resistance.

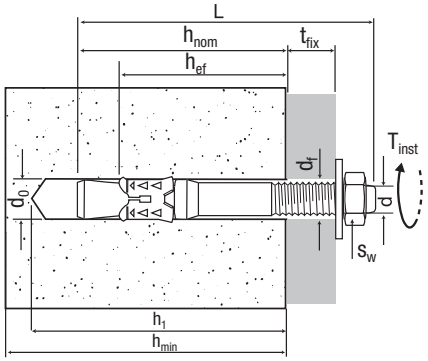
Through-set.

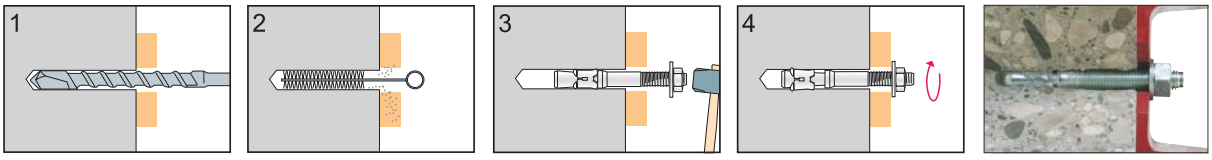
Installation of steel structures, balustrades, handrails, machines and devices in the cracked concrete zone inside and outside.

Seismic loads C1 and C2.

Index	d x L	Thread length [mm]	d_0 [mm]	t_{fix} [mm]	d_f [mm]	s_w [mm]	Packaging Single/ Qty/Collective [pcs]
P753500080750PL(1)	M8x75	30	8	10	9	13	100/400
P753500080900PL(1)	M8x90	40	8	25	9	13	100/400
P753500081150PL(1)	M8x115	60	8	50	9	13	100/400
P753500100900PL	M10x90	40	10	10	12	17	50/200
P753500101050PL	M10x105	55	10	25	12	17	50/200
P753500101150PL	M10x115	55	10	35	12	17	50/200
P753500121100PL	M12x110	65	12	10	14	19	50/200
P753500121200PL	M12x120	65	12	20	14	19	50/200
P753500121450PL	M12x145	85	12	45	14	19	25/100
P753500161300PL	M16x130	65	16	10	18	24	20/80
P753500161500PL	M16x150	85	16	30	18	24	20/80
P753500161850PL	M16x185	85	16	60	18	24	20/80
P753500162200PL	M16x220	85	16	100	18	24	15/60

(1) Seismic load only C1





FM-X5 C

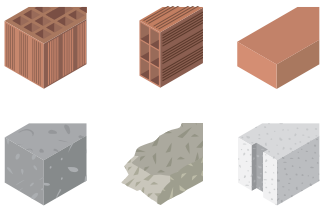
MULTI EXPANSION FRAME ANCHOR

Multi expansion anchor FM-X5 C without rim with countersunk head screw, made of galvanized carbon steel class 5.8 (Ø8), 6.8 (Ø10).

ETA 10/0425

R 90

*) R90 NRd ≤ 0,8 kN

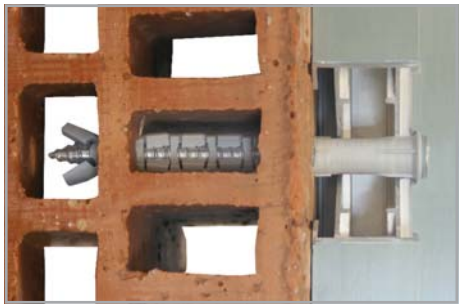


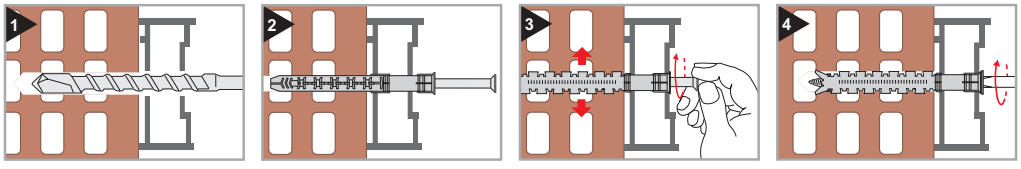
Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: without rim.
Screw material: carbon steel 5.8 (Ø8), carbon steel 6.8 (Ø10).
Head type: countersunk with TX type socket.
Corrosion protection: galvanized 5 µm.
Plug and screw supplied pre-assembled.

Keying multi-expansion geometry. Strong and durable anchoring from the very first rib of hollow brick. Screw containment system. Reliable guidance of the screw even in incorrectly made drill holes.

Special flexible plug. The two initial turns and pre-locking can be done manually.

Index	Diameter		Thickness of fixed element t_{fix}	Socket	Packaging Single/ Qty/Collective [pcs]
	Ø [mm]	L [mm]	[mm]		
P64301b080800PL	8	80	10	TX 30	100/1000
P64301b081000PL	8	100	30	TX 30	50/500
P64301b081200PL	8	120	50	TX 30	50/500
P64301b081500PL	8	150	80	TX 30	50/500
P64301b100850PL	10	85	15	TX 40	50/500
P64301b101000PL	10	100	30	TX 40	50/500
P64301b101150PL	10	115	45	TX 40	50/500
P64301b101350PL	10	135	65	TX 40	50/200
P64301b101600PL	10	160	90	TX 40	50/200





FM-X5 K

MULTI EXPANSION FRAME ANCHOR

Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: without rim.
Screw material: Carbon steel 6.8.
Head type: flange head with HEX socket.
Corrosion protection: galvanized 5 µm.
Plug and screw supplied pre-assembled.

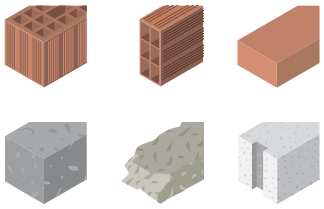
Keying multi-expansion geometry. Strong and durable anchoring from the very first rib of hollow brick. Screw containment system. Reliable guidance of the screw even in incorrectly made drill holes.

Special flexible plug. The two initial turns and pre-locking can be done manually.

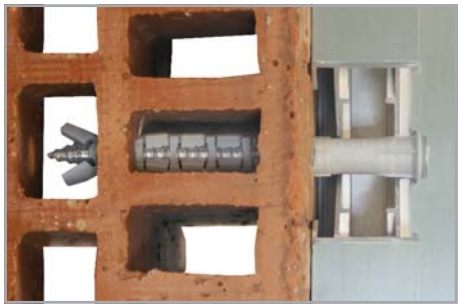
ETA 10/0425

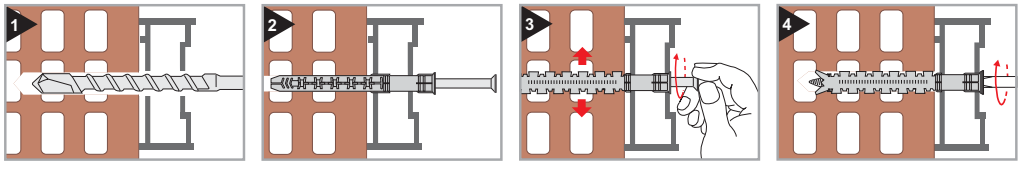
R 90

*) R90 NRd ≤ 0,8 kN



Index	Diameter		Thickness of fixed element t_{fix}	Wrench/socket	Packaging Single/ Qty/Collective [pcs]
	Ø	L			
	[mm]	[mm]	[mm]		
P64302b100850PL	10	85	15	SW 13 / TX 40	50/500
P64302b101000PL	10	100	30	SW 13 / TX 40	50 / 500
P64302b101150PL	10	115	45	SW 13 / TX 40	50 / 500
P64302b101350PL	10	135	65	SW 13 / TX 40	50 / 200
P64302b101600PL	10	160	90	SW 13 / TX 40	50 / 200





FM-X5 H

MULTI EXPANSION FRAME ANCHOR

Multi expansion anchor FM-X5 H with rim with hexagonal washer head screw, made of galvanized carbon steel class 6.8

ETA 10/0425

R 90

*) R90 NRd ≤ 0,8 kN

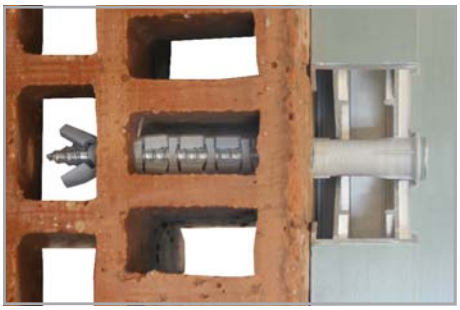
Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: Wide flange Ø18
Screw material: Carbon steel 6.8.
Head type: flange head with HEX socket.
Corrosion protection: galvanized 5 µm.
Plug and screw supplied pre-assembled.

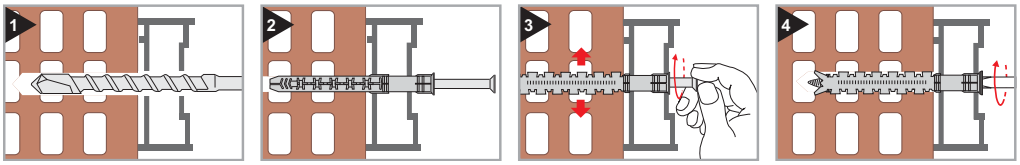
Keying multi-expansion geometry. Strong and durable anchoring from the very first rib of hollow brick. Screw containment system. Reliable guidance of the screw even in incorrectly made drill holes.

Special flexible plug. The two initial turns and pre-locking can be done manually.

A wide flange isolates the screw from the base material.

Index	Diameter		Thickness of fixed element t_{fix}	Wrench/socket	Packaging Single/ Qty/Collective [pcs]
	Ø [mm]	L [mm]	[mm]		
P64402b100850PL	10	85	15	SW 13 / TX 40	50/500
P64402b101000PL	10	100	30	SW 13 / TX 40	50/500
P64402b101150PL	10	115	45	SW 13 / TX 40	50/500
P64402b101350PL	10	135	65	SW 13 / TX 40	50/200
P64402b101600PL	10	160	90	SW 13 / TX 40	50/200





Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: without rim.
Screw material: Carbon steel 6.8.
Head type: countersunk with TX type socket.
Corrosion protection: galvanized 5 µm.
Plug and screw supplied separately.

ETA 10/0425

R 90

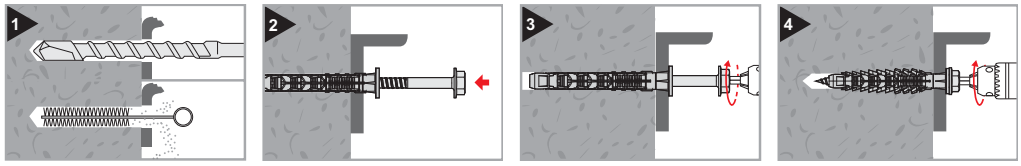
*) R90 NRd ≤ 0,8 kN

Extremely high performance in all types of substrates.

The three embedment depths ensure extreme versatility and a significant reduction in installation time.

Specially designed increased expansion zone.

Index	Diameter		Thickness of fixed element t_{fix} [mm]			Socket	Packaging
	Ø	L					Single/ Qty/Collective [pcs]
	[mm]	[mm]	h_{ef} red.	h_{ef} std.	h_{ef} inc.		
P64602b100600PL	10	60	10			TX 40	50/500
P64602b100800PL	10	80	30	10		TX 40	50/500
P64602b101000PL	10	100	50	30	10	TX 40	50/500
P64602b101200PL	10	120	70	50	30	TX 40	50/300
P64602b101400PL	10	140	90	70	50	TX 40	50/300
P64602b101600PL	10	160	110	90	70	TX 40	50/250



X3 H

HIGH PERFORMANCE FRAME ANCHOR

High performance frame anchor X3 C with rim, with hexagonal washer head screw, made of galvanized carbon steel class 6.8

ETA 10/0425

R 90

*) R90 NRd ≤ 0,8 kN

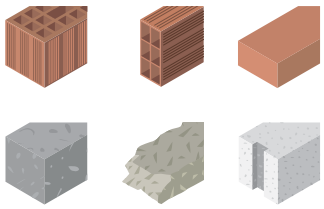
Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: Wide flange Ø18
Screw material: Carbon steel 6.8.
Head type: flange head with HEX socket.
Corrosion protection: galvanized 5 µm.
Plug and screw supplied separately.

Extremely high performance in all types of substrates.

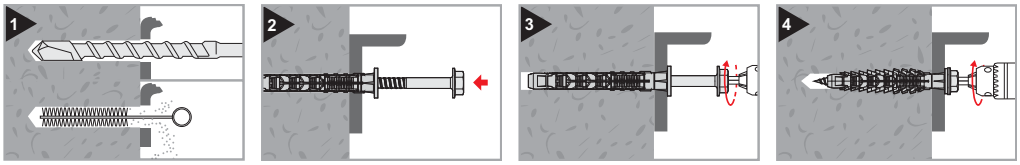
The three embedment depths ensure extreme versatility and a significant reduction in installation time.

Specially designed increased expansion zone.

A wide flange isolates the screw from the base material.



Index	Diameter		Thickness of fixed element t_{fix} [mm]			Wrench/socket	Packaging Single/ Qty/Collective [pcs]
	Ø	L					
	[mm]	[mm]	h_{ef} red.	h_{ef} std.	h_{ef} inc.		
P64703b100600PL	10	60	10			SW 13 / TX 40	50/500
P64703b100800PL	10	80	30	10		SW 13 / TX 40	50/500
P64703b101000PL	10	100	50	30	10	SW 13 / TX 40	50/500
P64703b101200PL	10	120	70	50	30	SW 13 / TX 40	50/300
P64703b101400PL	10	140	90	70	50	SW 13 / TX 40	50/300
P64703b101600PL	10	160	110	90	70	SW 13 / TX 40	50/250



Substrate category according to ETAG 020: A B C D.
Plug material: polyamide PA6.
Plug: Wide flange Ø18
Screw material: Stainless steel A4
Head type: flange head with HEX socket.
Corrosion protection: stainless steel A4.
Plug and screw supplied separately.

Extremely high performance in all types of substrates.

The three embedment depths ensure extreme versatility and a significant reduction in installation time.

Specially designed increased expansion zone.

A wide flange isolates the screw from the base material.

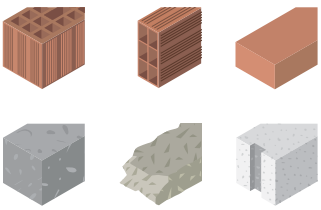
ETA 10/0425

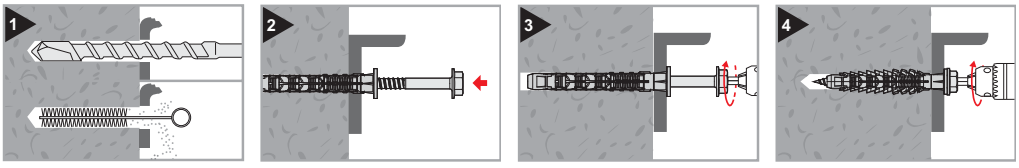
INOX A4 70

R 90

*) R90 NRd ≤ 0,8 kN

Index	Diameter		Thickness of fixed element t_{fix} [mm]			Wrench/socket	Packaging Single/ Qty/Collective [pcs]
	Ø	L					
	[mm]	[mm]	h_{ef} red.	h_{ef} std.	h_{ef} inc.		
P647030100600PL	10	60	10			SW 13 / TX 40	50/500
P647030100800PL	10	80	30	10		SW 13 / TX 40	50/500
P647030101000PL	10	100	50	30	10	SW 13 / TX 40	50/500
P647030101200PL	10	120	70	50	30	SW 13 / TX 40	50/300
P647030101400PL	10	140	90	70	50	SW 13 / TX 40	50/300
P647030101600PL	10	160	110	90	70	SW 13 / TX 40	50/250





Galvanized screw anchor for structural fixings

Base material: cracked and non-cracked concrete (Option 1)
Screw material: carbon steel
Head type: hex head with built in washer and knurling
Anti-corrosion protection: galvanized >5µm

Hex head with built-in washer and knurling for better fixation and stability of the connection cuts on the thread facilitate screwing into the substrate

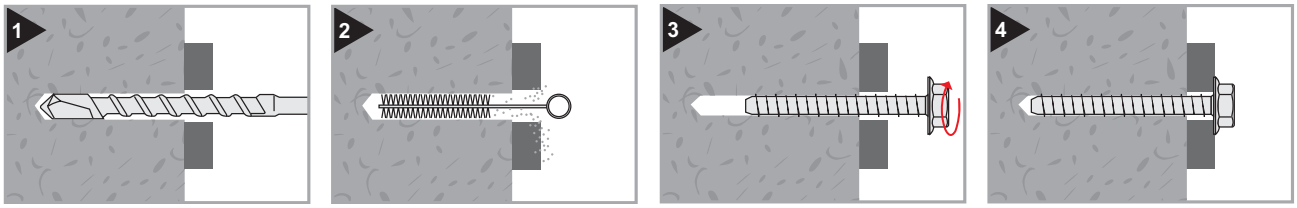
High flexibility thanks to 3 anchorage depths

High loading capacity in relation to diameter even near edges and with reduced spacing distances

Permanent or temporary fixing. It is possible to unscrew the anchor.

Fireresistance R120.

Product designation	Hole [mm]	Dimensions		Fixing thickness t_{fix} [mm]			Socket SW	Package Separate / Collective [pcs]
		d	Lv					
		[mm]	[mm]	h_{ef} ex. red.	h_{ef} red.	h_{ef} std.		
P72005b100600PL	8	10	60	15	10		13	100/600
P72005b100750PL	8	10	75	30	25	10	13	100/500
P72005b101000PL	8	10	100	55	50	35	13	100/400
P72005b101300PL	8	10	130	85	80	65	13	50/300
P72005b101500PL	8	10	150	105	100	85	13	50/300
P72005b120600PL	10	12	60	10			15	50/300
P72005b120750PL	10	12	75	25	15		15	50/300
P72005b121000PL	10	12	100	50	40	25	15	50/200
P72005b121300PL	10	12	130	80	70	55	15	25/150
P72005b121500PL	10	12	150	100	90	15	15	25/150



Base material: cracked and non-cracked concrete (Option 1)
Screw material: Stainless steel A4
Head type: hex head with built in washer and knurling

The bimetallic construction ensures high functionality and safety the screw body is made of A4 stainless steel, and the tapping part is made of high hardness carbon steel.

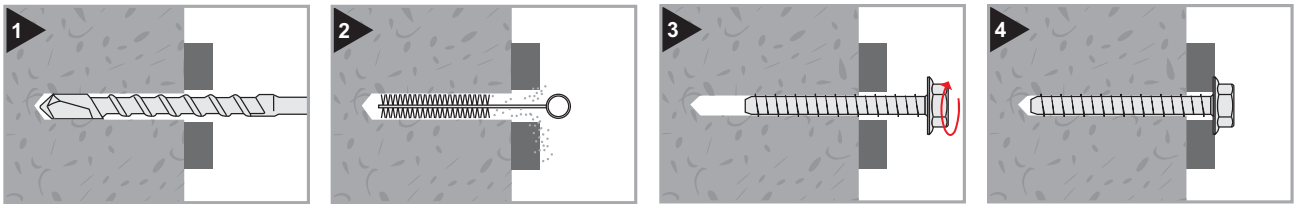
Hex head with built in washer and knurling for better fixation and stability of the connection cuts on the thread facilitate screwing into the substrate

High loading capacity in relation to diameter even near edges and with reduced spacing distances

Permanent or temporary fixing. It is possible to unscrew the anchor.

Fire resistance R120.

Product designation	Hole [mm]	Dimension		Fixing thickness t_{fix} [mm]	Socket SW	Package Separate / Collective [pcs]
		d	Lv			
		[mm]	[mm]			
P720100101000PL	8	10	100	15	13	25/150
P720100101100PL	8	10	110	25	13	25/150
P720100101200PL	8	10	120	35	13	25/150
P720100121150PL	10	12	115	15	17	25/150
P720100121250PL	10	12	125	25	17	25/150
P720100121350PL	10	12	135	35	17	25/150



CLR6 H/P/I
SCREW ANCHORS
GALVANIZED

Galvanized screw anchor for medium light fixings

Base material: cracked and non-cracked concrete (Option 1)
Screw material: carbon steel
Anticorrosion protection: galvanized >5µm

Low edges and spacing distances
No plug required
Permanent or temporary fixing. It is possible to unscrew the anchor.
Fire resistance R120.

Product designation	Hole [mm]	Dimension d [mm]	Dimension Lv [mm]	Fixing thickness t_{fix} [mm]	Socket SW	Package Separate / Collective [pcs]
P72009b080600PL	6	7,5	60	15	10	100/1200
P72009b080800PL	6	7,5	80	30	10	100/1200
P72009b081000PL	6	7,5	100	55	10	50/600
P72009b081200PL	6	7,5	120	85	10	50/600

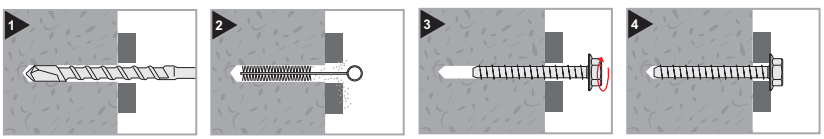
Head type: hex head with built in washer

Product designation	Hole [mm]	Dimension d [mm]	Dimension Lv [mm]	Fixing thickness t_{fix} [mm]	Socket SW	Package Separate / Collective [pcs]
P72006b080600PL	6	7,5	60	5	TX 30	100/1200
P72006b080750PL	6	7,5	75	20	TX 30	100/1200

Head type: flat with torx socket

Product designation	Hole [mm]	Dimension d [mm]	Dimension Lv [mm]	Fixing thickness t_{fix} [mm]	Socket SW	Package Separate / Collective [pcs]
P72008b080550PL	6	7,5	55	0	13	50/600

Head type: with metric thread M8 with mounted socket with double internal thread M8 / M10



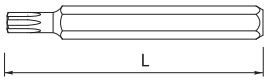
SCREWDRIVER BITS

Screwdrivers bits are made of high quality chrome vanadium steel, surface hardened, protected from corrosion.

Intended for use in screwdrivers. Used for correct screwing fasteners into the base material.

Index	Bit		Packaging Single/ Qty/Collective [pcs]
	L [mm]	Type	
B006224	25	TX20	1/1/1
B006227	25	TX25	1/1/1
B006221	25	TX30	1/1/1
B006222	25	TX40	1/1/1

TORX



THREE-CUTTERS CONCRETE DRILL BITS

Drill bits for drilling in concrete.

Index	SDS+ Drill bit				Packaging Single/ Qty/Collective [pcs]
	L [mm]	Lr [mm]	D [mm]	Connection end Type	
PSDS6100170	170	100	6	SDS+	1/1/1
PSDS8150220	220	150	8	SDS+	1/1/1
PSDS10150220	220	150	10	SDS+	1/1/1
PSDS12150220	220	150	12	SDS+	1/1/1
PSDS14150220	220	150	14	SDS+	1/1/1
PSDS14250320	320	250	14	SDS+	1/1/1
PSDS16150220	220	150	16	SDS+	1/1/1
PSDS16250320	320	250	16	SDS+	1/1/1
PSDS16400470	470	400	16	SDS+	1/1/1
PSDS20250320	320	250	20	SDS+	1/1/1
PSDS20400470	470	400	20	SDS+	1/1/1

Three-cutter drill bits

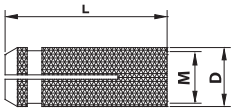
GD-B

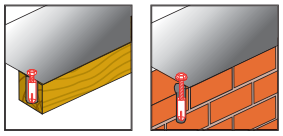
BRASS EXPANSION SLEEVE

Drop-in brass grooved expansion sleeve with internal metric thread

Intended for fixing statically loaded elements in construction timber and in solid ceramic brick.

Index	Sleeve			Packaging
	D	L	M	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	
P161006	8	23	6	100/8/800
P161008	10	28	8	100/8/800
P161010	12	33	10	100/4/400
P161012	15	38	12	100/4/400





POWDER AMMUNITION IN DISKS

Powder ammunition installed on a steel disk.
Different colors mean different power.

Intended for use in tools SPIT P230, P560, P525L, P230L, P560L

Index	Ammunition			Packaging
	Diameter	Power	Colour	Single/ Qty/Collective [pcs]
	[mm]	[in a scale]		
PSPAM165	6,3		blue	10/10/100
PSPAM166	6,3		red	10/10/100
PSPAM167	6,3		black	10/10/100

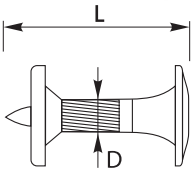
Powder actuated nails made of galvanized hardened carbon steel with rolled shank, flat head and wide steel washer.

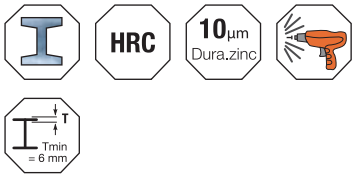
HSBR 14

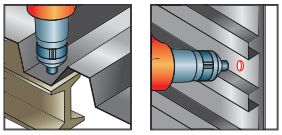
NAILS WITH WASHER
FOR POWDER ACTUATED TOOLS
FOR STEEL IN STRIPS

Intended for fixing steel sheets to steel structures with powder actuated tools SPIT P230, P560, P525L, P230L, P560L, P370.

Index	Nail				Packaging
	Diameter	Length	Type	Min. substrate thickness	Single/ Qty/Collective [pcs]
	D	L		Tmin	
	[mm]	[mm]		[mm]	
PSP011390	4,5	25	in bulk	6	1000/1/1000
PSP53953	4,5	25	in stripes	6	1000/1/1000







Powder actuated tool with simple and proven design.

P560

POWDER ACTUATED TOOL
FOR STEEL

Intended for fastening nails type HSBR 14 into steel. Model P560 allows fastening nails HSBR 14 in strips.

Index	Tool		
	Model	Energy	Weight
		[J]	[kg]
PSP013891	P560	560	3,7

available ammunition colors:

FIXING USED IN CARPENTER WORKS

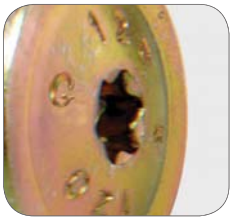
FIXINGS FOR WOOD STRUCTURES

- TERRACE SCREW
- CARPENTRY JOINTS SCREW
- CONSTRUCTION SCREW
- ACCESSORIES

TOP GT - WOOD CONSTRUCTION SCREW

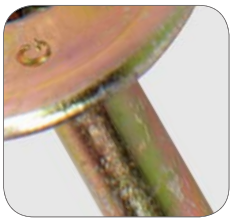
ETANCO

- european manufacturer of fasteners & systems for the envelope of the buildings
- the ETANCO products can be easily identified through their characteristic marking
- strict production control carried out by the in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification
- products comply with European standard EN 14592: 2008, and confirmation of their quality parameters is labelling our products with the CE mark



TORX SOCKET

- increased depth of the socket improves installation properties
- assures faster and more reliable screw installation on timber substrate



INTEGRATED WASHER HEAD

- increases the screw strength by about 20% for pulling head through timber, in accordance with the standard 14592:2008 (as compared to countersunk screw)

MILLING CUT

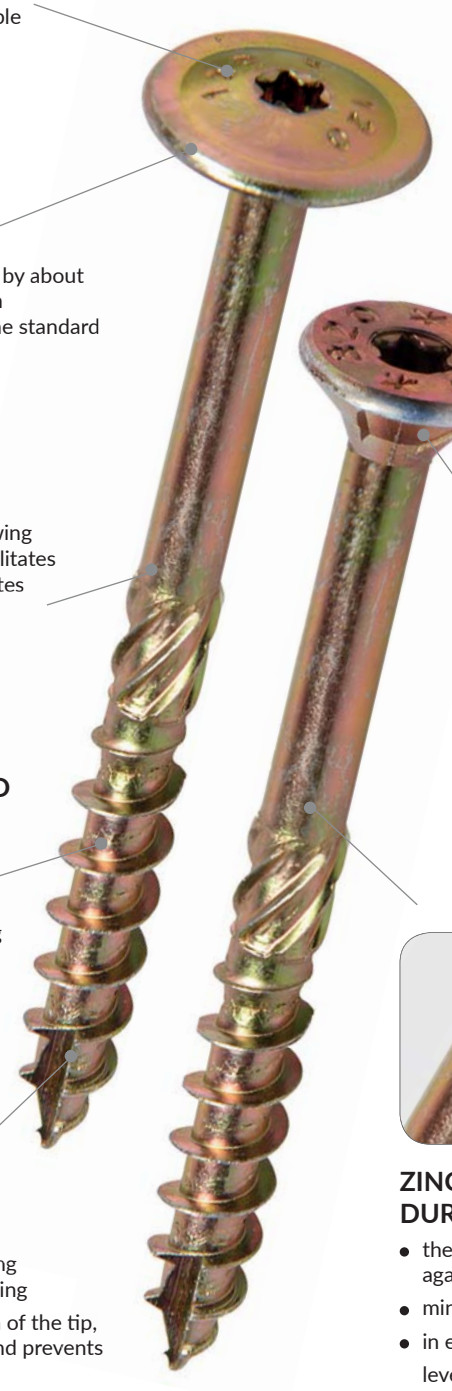
- drills the hole reducing screwing force, which significantly facilitates installation in timber substrates
- available in all sizes (from 80 to 400 [mm])

SELF-CUTTING THREAD

- optimally matched to installation in timber substrates
- breaks the timber chips formed in the screwing
- prevents timber splitting
- coated with a special wax for easy installation in timber

DRILLING TIP

- protective layer of zinc coating does not wear off during drilling
- thread, which is an extension of the tip, facilitates drilling initiation and prevents slipping of the drill
- special milling cut prevents timber from splitting



MILLING RIBS

- facilitate penetration of the screw head in timber surface

ZINC COATING DURA.ZINC

- the most important basic protection against corrosion
- minimum 3 µm of zinc layer
- in environment of very low corrosivity level (e.g. indoors) the zinc layer loss is below 0,1µm per year
- additionally, chromium passivation (yellow) increases anti-corrosion protection of products

Permanent and stable connection of timber elements does not always require the use of labor consuming carpentry fastenings.
It is perfectly enough to apply proper fasteners for timber for many wooden structures.

Fasteners for timber replace complicated carpentry connections, performed by qualified specialists exclusively. Fasteners enable performing reliable timber constructions even to a beginner DIY-enthusiast. What is more, they also enable reduction of wood consumption using timber elements of smaller thickness maintaining the same loading capacity.

The entire range of components for timber fastening can be classified based on the application type, intended load, or more specific criteria as follows:

- **material of the screw:**
  - carbon steel
  - stainless steel
- **type and thickness of anti-corrosion coating:**
  - galvanized Dura.zinc
  - hot-dip galvanized Dura.HDG
  - additional protection coatings, for example gRey.coat
- **bolt type:**
  - full
  - self-cutting
- **thread type:**
  - smooth
  - knurled
  - milling
- **tip type:**
  - full
  - with drilling cut
- **head type:**
  - washer head
  - countersunk
- **type of head socket:**
  - PZ Pozidriv
  - PH Phillips
  - TX Torx
- **application types:**
  - indoors
  - outdoors

Classification in terms of use

Inside the building:

Elements of roof structure

Ceilings

Walls and particle boards

Structural beams

Floors

Outside the building:

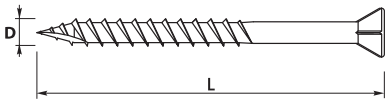
Façade

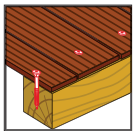
Terraces

TERRACE SCREW

STAINLESS SCREW COUNTERSUNK HEAD FOR TERRACE BOARDS

Stainless steel drilling screw with cutting thread for timber and with countersunk head with TX socket.





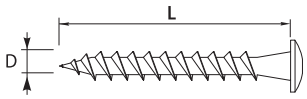
Intended for fastening terrace boards and outdoor coverings to timber, in marine environment and contaminated industrial atmosphere. Terrace screw with cutpoint which drives the screw effectively into woodwork and prevents splitting. Milling ribs facilitate penetration of the screw head into timber structure. Stainless steel terrace screw does not change the colour around the head, even in precious types of timber such as oak, cedar or larch.

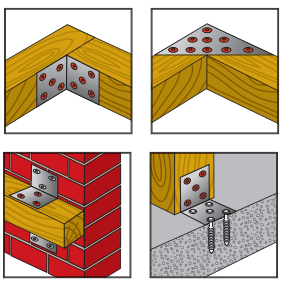
Index	Screw				Packaging
	D	L	hef	Head type	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]		
28670PL	4,2	45	20	TX20	250/8/2000
28680PL	4,2	55	20	TX20	250/8/2000
28690PL	4,8	75	20	TX20	100/8/800

ANCHOR

CARPENTRY JOINTS SCREW

Hardened galvanized screw of carbon steel with flat head, spherical socket torx 20 and special conical thread part under the head.





Dedicated for carpentry joints fitting. The design of the head and thread provides the most reliable and secure fixing.

Index	Screw				Packaging
	D	L	hef	Head type	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]		
7254	5,0	35	20	TX20	250/8/2000
7255	5,0	40	20	TX20	250/8/2000
7257	5,0	45	20	TX20	250/8/2000

Resistance to pull-out and shear force of steel plate 2-5 [mm] thick on a timber substrate, fixed by anchor-type screws (timber with a density of 370 kg/m^3, humidity 15 +/- 3%

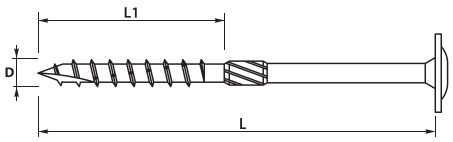
Anchor screw	Shear resistance		Pull-out resistance	
D x L [mm]	characteristic	design	characteristic	design
	[kN]	[kN]	[kN]	[kN]
5,0 x 35	1,80	1,05	1,96	1,14
5,0 x 40	2,00	1,27	2,35	1,37
5,0 x 45	2,20	1,31	2,73	1,59

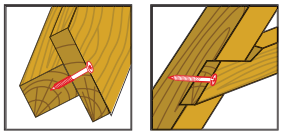
Hardened carbon steel screw with cutpoint, with thread for timber, washer head and TX socket. Yellow galvanized screws.

TOP GT W

WOOD SCREW WITH WASHER HEAD

Intended for installing light and heavy timber constructions to timber substrate inside the building. TOP GT screws with cutpoint which prevents timber splitting and drives the screw effectively into woodwork. Milling cuts drill the hole reducing torque, which significantly facilitates installation in timber substrates. Washer head increases downforce of the screw into the timber, and increases load capacity to pull the screw head through timber.



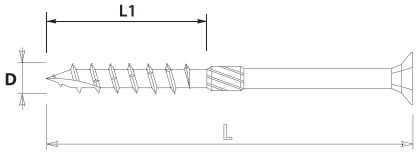


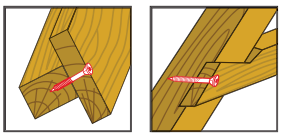
Index	Screw					Packaging
	D	L	L1	hef	Head type	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]		
P1310800PL	8	80	50	35	TX40	50/4/200
P1311000PL	8	100	50	35	TX40	50/4/200
P1311200PL	8	120	80	35	TX40	50/4/200
P1311400PL	8	140	80	35	TX40	50/1/50
P1311500PL	8	150	80	35	TX40	50/1/50
P1311600PL	8	160	80	35	TX40	50/1/50
P1311800PL	8	180	80	35	TX40	50/1/50
P1312000PL	8	200	80	35	TX40	50/1/50
P1312200PL	8	220	80	35	TX40	50/1/50
P1312400PL	8	240	80	35	TX40	50/1/50
P1312600PL	8	260	80	35	TX40	50/1/50
P1312800PL	8	280	80	35	TX40	50/1/50
P1313000PL	8	300	80	35	TX40	50/1/50
P1313200PL	8	320	80	35	TX40	50/1/50
P1313400PL	8	340	80	35	TX40	50/1/50
P1313600PL	8	360	80	35	TX40	50/1/50
P1313800PL	8	380	80	35	TX40	50/1/50
P1314000PL	8	400	80	35	TX40	50/1/50
P1341600PL	10	160	80	40	TX40	50/1/50
P1341800PL	10	180	80	40	TX40	50/1/50
P1342000PL	10	200	80	40	TX40	50/1/50
P1342200PL	10	220	80	40	TX40	50/1/50
P1342400PL	10	240	80	40	TX40	50/1/50
P1342600PL	10	260	80	40	TX40	50/1/50
P1342800PL	10	280	80	40	TX40	50/1/50
P1343000PL	10	300	80	40	TX40	50/1/50
P1343400PL	10	340	80	40	TX40	50/1/50
P1343600PL	10	360	80	40	TX40	50/1/50
P1343800PL	10	380	80	40	TX40	50/1/50
P1344000PL	10	400	80	40	TX40	50/1/50

TOP GT C

WOOD SCREW COUNTERSUNK

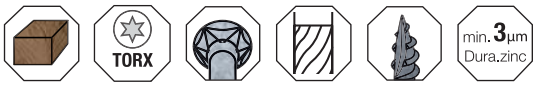
Hardened carbon steel screw with cutpoint, with thread for timber and ribbed countersunk head with TX socket. Yellow galvanized screws.





Intended for installing light and heavy timber constructions to timber substrate inside the building. TOP GT screws with cutpoint which prevents timber splitting and drives the screw effectively into woodwork. Milling cuts drill the hole reducing torque, which significantly facilitates installation in timber substrates. Milling ribs enable easy penetration of the screw head into timber structure.

Index	Screw					Packaging
	D	L	L1	hef	Head type	Single/ Qty/Collective [pcs]
	[mm]	[mm]	[mm]	[mm]		
P1331000PL	8	100	50	35	TX40	50/4/200
P1331200PL	8	120	80	35	TX40	50/4/200
P1331400PL	8	140	80	35	TX40	50/1/50
P1331500PL	8	150	80	35	TX40	50/1/50
P1331600PL	8	160	80	35	TX40	50/1/50
P1331800PL	8	180	80	35	TX40	50/1/50
P1332000PL	8	200	80	35	TX40	50/1/50
P1332200PL	8	220	80	35	TX40	50/1/50
P1332400PL	8	240	80	35	TX40	50/1/50
P1332600PL	8	260	80	35	TX40	50/1/50
P1332800PL	8	280	80	35	TX40	50/1/50
P1333000PL	8	300	80	35	TX40	50/1/50
P1333200PL	8	320	80	35	TX40	50/1/50
P1333400PL	8	340	80	35	TX40	50/1/50
P1333600PL	8	360	80	35	TX40	50/1/50
P1333800PL	8	380	80	35	TX40	50/1/50
P1334000PL	8	400	80	35	TX40	50/1/50

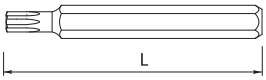


Screwdrivers bits are made of high quality chrome vanadium steel, surface hardened, protected from corrosion.

Intended for use in screwdrivers. Used for correct screwing fasteners into the base material.

Index	Bit		Packaging
	L [mm]	Type	Single/ Qty/Collective [pcs]
B006224	25	TX20	1/1/1
B006227	25	TX25	1/1/1
B006221	25	TX30	1/1/1
B006222	25	TX40	1/1/1

TORX



FIXINGS FOR WOODEN MATERIALS

CONSTRUCTION FIXINGS - NAILS

- CONSTRUCTION NAILS
- CLOUT NAILS
- ROOFING NAILS
- CARPENTRY JOINTS NAILS
- HARDENED NAILS

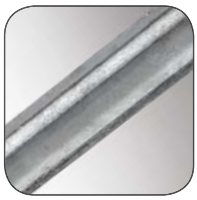
NAILS

ETANCO

- european manufacturer of fasteners & systems for the envelope of the buildings
- the ETANCO products can be easily identified through their characteristic marking
- strict production control carried out by the in-house laboratory guarantees high quality products
- each production batch is assigned a unique number, which allows its precise identification

THE HIGHEST QUALITY MATERIAL

- ETANCO mark stands both for the highest quality of the raw material and the extraordinary workmanship of fastener production
- stringent quality control procedures in accordance with ISO procedures
- guarantee of unchanged parameters of connection for at least 35 years

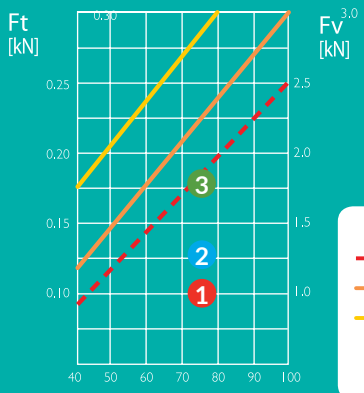


ZINC COAT DURA.HDG 50 µm

- superior corrosion protection
- cost-effective solution compared to the more expensive stainless steel nails
- modern technology and strict production control ensures stable quality of coating
- increased value of the pull force

SQUARE SHANK PROFILE

- unique shape based on experience of construction in the Nordic countries
- increases resistance of the nail to bending
- improves the basic technical parameters (shear and pull strength)
- ensures 25-30% more number of nails per one kilogram



INCREASED PULL FORCE (FT)

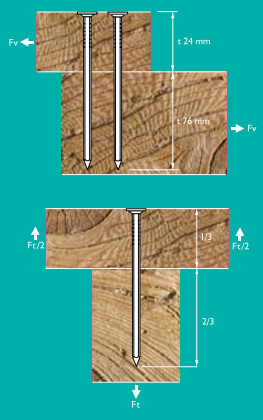
pull force is directly proportional to the anchorage depth (L) and to the square of the nail diameter (∅)

$Ft = ∅ (L-1,5 ∅) \varphi_{tk}$ [N]

Nail type	φ_{tk}
round	0.8
square (Swedish type)	1.0
ring shank CO	2.0
ring-shank CE	3.0
ETANCO ANCHOR	8.0

INCREASED SHEAR FORCE (FV)

1. traditional round nail 100-3,4 Fv=1,00 kN
2. profiled nail Swedish type 100-3,4 Fv=1,20 kN
3. ring-shank nail 100-3,4 Fv=1,75 kN



QUALITY CERTIFIED FOR YEARS...

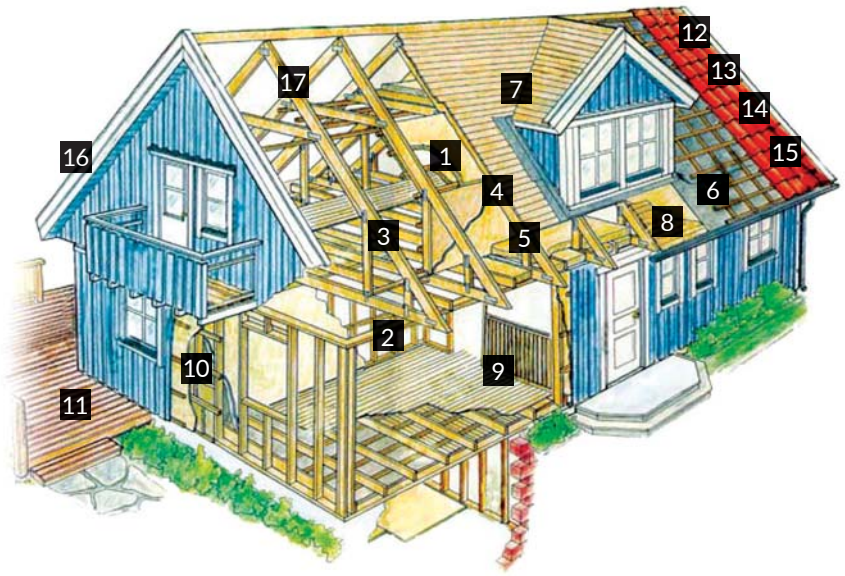
One of the most important tests to determine the corrosion resistance of construction fasteners is the so called Kesternich test which takes place in a humidity Kesternich chamber. The test is carried out in accordance with the DIN 50018-2,.OS standard. The fasteners are subjected to the action of high temperature and aggressive sulphur dioxide vapours in order to accelerate the corrosion processes. After each cycle of 24 hours, fasteners are assessed for the presence of red rust. If the corrosion is less than 15% of the fastener surface, the cycle is considered as successfully closed.

Nail samples after 24 hours (1 cycle) in the Kesternich chamber

Nail samples after 96 hours (4 cycles) in the Kesternich chamber

Nail samples after 168 hours (7 cycles) in the Kesternich chamber

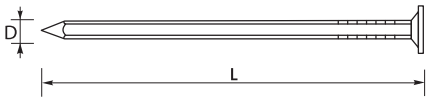
NAIL SELECTION

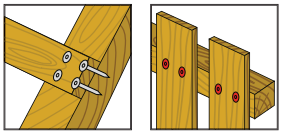


	FASTENED MATERIAL	FASTENER TYPE	SIZE EXAMPLE	RECOMMENDED QUANTITY
1	**RAFTERS**	Profiled nails, Construction screws	6,0x200	according to design
2	**STRUCTURAL BEAMS**	Profiled nails, Construction screws	3,1x90	15-20/m²
3	**CEILING BOARDS**	Profiled nails	2,8x75	15-20/m²
4	**CEILING CHIPBOARDS**	Profiled nails	2,9x65	18/m²
5	**CHIPBOARD SOFFIT**	Clout nails	3,1x35	20/m²
6	**BATTENS/COUNTERBATTENS**	Profiled nails	3,1x90	6-11/m²
7	**FULL FORMWORK, OSB**	Profiled nails	2,8x75	16-19/m²
8	**ROOFING MEMBRANE**	Clout nails	3,1x19	30/m²
9	**FLOOR BOARDS**	Profiled nails	2,3x60	20/m²
10	**FACADE BOARDS**	Profiled nails	2,9x65, 2,9x75	15-20/m²
11	**TARRACE BOARDS**	Profiled nails	4,8x55	30/m²
12	**ROOF PROFILED METAL SHEETS**	Farmer screws	4,8x35, 4,8x20	6-8/m²
13	**ROOF BITUMEN**	Twisted nails for roof-felt shingles, Clout nails	3,5x25	1kg/7-10m²
14	**ROOF BITUMEN PANELS**	Ondufix	3,1x70	13/m²
15	**ROOF PROFILED MTEAL SHEETS WITH CERAMIC FINISH**	Panel nails	2,8x50	11-15/m²
16	**ROOF FLASHINGS**	Flashing nails	3,5x30	according to design
17	**CARPENTRY JOINTS**	Anchor nails	4,0x50	according to design

CONSTRUCTION NAILS SWEDISH TYPE

Low-carbon steel nails with specially profiled square shank, hot-dip galvanized





Intended for fixing various wooden parts to timber structures outside buildings. Large size is designed for fixing the heavy duty components of wooden structures, for example battens.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
P220603PL	2,3	60	5/1/5
P220753PL	2,8	75	5/1/5
P221003PL	3,4	100	5/1/5

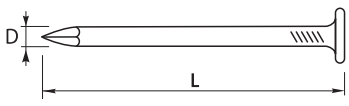
Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
Z400607	4,0	125	400/1/400
Z400608	5,1	150	200/1/200
Z341115	5,5	175	150/1/150
Z341157	6,0	200	100/1/100
Z341571	7,0	250	100/1/100
Z341678	8,0	300	100/1/100

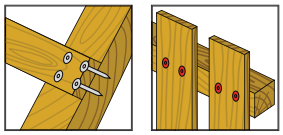
CONSTRUCTION NAILS ROUND NO COATED

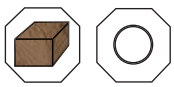
Round, low-carbon steel nails

Intended for fixing various wooden parts to timber structures and to each other.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
P405603PL	2,5	60	5/1/5
P402803PL	3,0	80	5/1/5
P4061003PL	4,0	100	5/1/5
P4071253PL	4,2	125	5/1/5







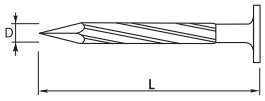
TWISTED NAILS

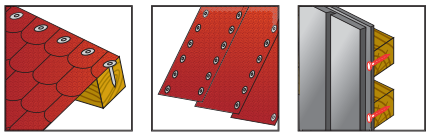
FOR SHINGLES
HOT-DIP GALVANIZED

Steel twisted nails with increased pull-out resistance and wide flat head.

Intended for permanent fixing of roof bitumen shingles and plastic façades to timber structure.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
P30250PL	3,5	25	1/8/8
P30300PL	3,5	30	1/8/8
P30253PL	3,5	25	5/1/5
P30303PL	3,5	30	5/1/5





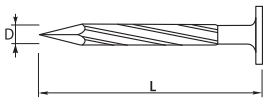
TWISTED NAILS

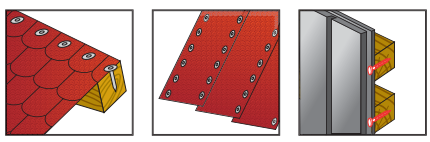
FOR SHINGLES GALVANIZED

Steel twisted nails with increased pull-out resistence and wide flat head.

Intended for cost-effective fixing of roof bitumen shingles and plastic façades to timber structure.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
P035250PL	3,5	25	1/8/8
P035300PL	3,5	30	1/8/8
P035253PL	3,5	25	5/1/5
P035303PL	3,5	30	5/1/5





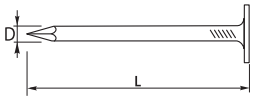
CLOUT NAILS

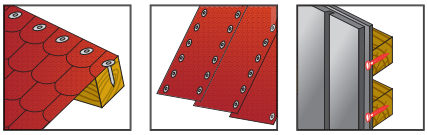
FOR SHINGLES
HOT-DIP GALVANIZED

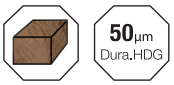
Round, plain, steel nails with a wide, flat head.

Intended for permanent fixing of roof bitumen shingles and plastic façades to timber structure.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter D [mm]	Length L [mm]	
P300250PL	2,5	25	1/8/8
P300350PL	2,5	35	1/8/8
P300400PL	2,5	40	1/8/8
P300310PL	3,0	30	1/8/8
P300253PL	2,5	25	5/1/5
P300353PL	2,5	35	5/1/5
P300313PL	3,0	30	5/1/5





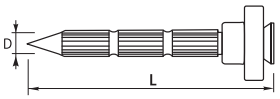


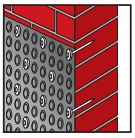
HARDENED ROLLED NAILS WITH PLASTIC WASHER

Nails of hardened carbon steel, with rolled pin and conical head, with pre-assembled plastic washer. Nails galvanized.

Intended for fixing a foil insulation to foundations of buildings. The cylindrical pin provides better and long-lasting fixing.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter	Length	
	D	L	
	[mm]	[mm]	
P82041FG10PL	3,5	40	100/8/800
P82041FG0PL	3,5	40	250/8/2000





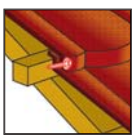
ROOF PANELS NAILS

Hot dip galvanized, ring-shank nails with a flat head, lacquered in the colour of roof cover.

Intended for effective fixing of roof steel panels with ceramic finish. Available in RAL and NCS colors.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter	Length	
	D	L	
	[mm]	[mm]	
P708500PL	2,8	50	500/6/3000

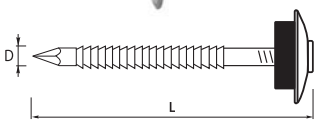
Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter	Length	
	D	L	
	[mm]	[mm]	
P708503PL	2,8	50	5/1/5

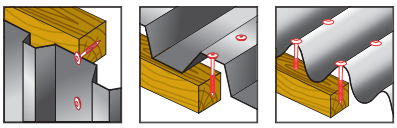


ROOFING NAILS

HOT-DIP GALVANIZED
WITH EPDM WASHER

Steel ring-shank nails with a wide head and EPDM washer, with an EPDM sealing washer.





Intended for tight installing of profiled roof steel sheets and profiled panels to timber structures on roofs. It is recommended to use a hardened rubber hammer for hammering.

Index	Fastener		Packaging Single/ Qty/Collective [pcs]
	Diameter	Length	
	D	L	
	[mm]	[mm]	
P710600PL	3,7	60	100/6/600
P710750PL	3,7	75	100/4/400
P710990PL	3,7	100	100/4/400

ANCHOR

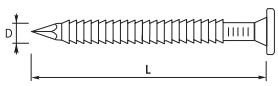
ANCHOR NAILS FOR CARPENTRY JOINTS

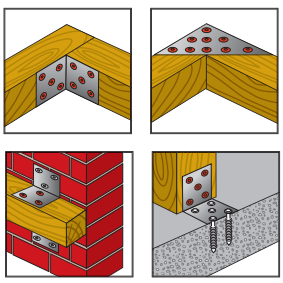
Low-carbon steel nails, with ring shank and specil conical wide head. Nails galvanized.

CE

Intended for carpentry joints and roof hooks for timber structures indoor and outdoor. The special shape of the head and ring shank provide increased strength parameters for pulling and tension.

Index	Fastener			Packaging Single/ Qty/Collective [pcs]
	Diameter	Length	Thickness of mounted element	
	D	L	Mtmax	
	[mm]	[mm]	[mm]	
P503350PL	4,0	35	10	1/8/8
P503400PL	4,0	40	10	1/8/8
P503500PL	4,0	50	10	1/8/8
P503600PL	4,0	60	10	1/8/8
P503750PL	4,0	75	10	1/6/6
P5031000PL	4,0	100	30	1/6/6
P5031250PL	4,0	125	55	1/6/6





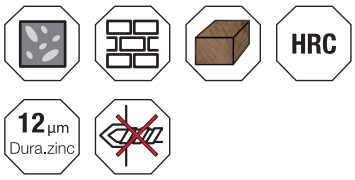
Index	Total length	Shank length	Shear force Fv [kN]		Pulling force Ft [kN] steel/wood
			Wood/wood	Steel/wood	
P503350PL	35	25	1,69	2,11	0,6
P503400PL	40	30	1,69	2,11	0,77
P503500PL	50	40	1,69	2,11	1,09
P503600PL	60	50	1,69	2,11	1,41
P503750PL	75	65	1,69	2,11	1,89
P5031000PL	100	70	1,69	2,11	2,05
P5031250PL	125	70	1,69	2,11	2,05

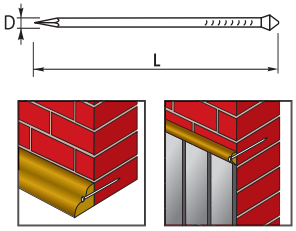
HARDENED NAILS GALVANIZED

Hardened carbon steel nails, with a round shank and reduced conical head.
Nails galvanized.

Intended to fix various light finishing elements (e.g. wooden slats)
to concrete, solid brick and hardwood.

Index	Fastener		Packaging
	Diameter	Length	Single/ Qty/Collective
	D	L	[pcs]
	[mm]	[mm]	
P438396	1,4	25	1000/8/8000
P438443	1,4	30	1000/8/8000
P438485	1,4	35	1000/8/8000
P438593	1,4	40	1000/8/8000
P438516	1,4	45	1000/8/8000
P438590	1,4	50	1000/8/8000



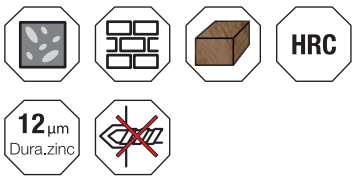


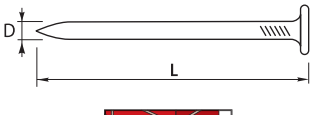
HARDENED NAILS CONSTRUCTION

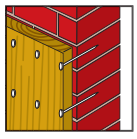
Hardened carbon steel nails, with flat head, galvanized.

Intended for fixing heavy duty construction elements (e.g. timber structures)
to concrete, solid brick and hardwood.

Index	Fastener		Packaging
	D	L	Single/ Qty/Collective
	[mm]	[mm]	[pcs]
P800300PL	3,0	30	100/8/800
P800350PL	3,0	35	100/8/800
P800400PL	3,0	40	100/8/800
P800500PL	3,0	50	100/8/800
P800600PL	3,0	60	100/8/800
P800700PL	3,0	70	100/8/800
P800800PL	3,0	80	100/8/800
P800850PL	3,5	85	100/6/600
P801000PL	3,5	100	100/6/600
P801250PL	4,0	125	100/6/600





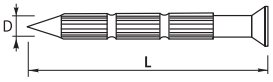


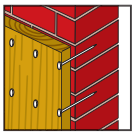
HARDENED NAILS ROLLED

Hardened carbon steel nails, with a ribbed shank and conical head. Nails galvanized.

Intended for fixing heavy duty construction elements (e.g. timber structures) to concrete, solid brick and hardwood. Ribbed shank provides better and more durable fixing.

Index	Fastener		Packaging
	D	L	Single/ Qty/Collective
	[mm]	[mm]	[pcs]
P820250PL	2,7	25	250/8/2000
P820300PL	2,7	30	250/8/2000
P820350PL	3,5	35	250/8/2000
P820400PL	2,7	40	250/8/2000
P820410PL	3,5	40	250/8/2000
P820500PL	3,5	50	250/8/2000
P820510PL	4,5	50	250/6/1500
P820600PL	3,5	60	250/8/2000
P820610PL	4,5	60	250/6/1500
P820700PL	4,5	70	250/4/1000



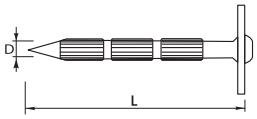


HARDENED ROLLED NAILS WITH WASHER HEAD

Hardened carbon steel nails, with a ribbed shank and very wide washer head. Nails galvanized

Intended for fixing soft materials (e.g. insulation), and building elements to concrete, solid brick and hardwood. Ribbed shank provides better and more durable fixing.

Index	Fastener		Packaging
	D	L	Single/ Qty/Collective
	[mm]	[mm]	[pcs]
P840200PL	3,5	20	250/8/2000
P840250PL	3,5	25	250/8/2000
P840300PL	3,5	30	250/8/2000
P840350PL	3,5	35	250/8/2000
P840400PL	3,5	40	250/6/1500
P840500PL	3,5	50	250/6/1500
P840650PL	3,5	65	250/4/1000
P840700PL	3,5	70	250/4/1000



INSTITUTES AND RESEARCH ORGANIZATIONS

EOTA	European Organization for Technical Assessment
ITB	Building Research Institute
STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV	Technical and Test Institute for Construction
FACH Hochschule Aachen	I.F.I. Institute of Industrial Aerodynamics
PCT	Federal Agency for Technical Regulation and Metrology
Würfel	German Institute of Building Technology
CERTYFIKACJA SYSTEMU ZARZĄDZANIA DNV·GL ISO 9001 ISO 14001	DNV GL Management System Certification
NARODOWY INSTYTUT PUBLICAE PZH HIGIENY	National Institute of Public Health - National Institute of Hygiene
ZÚS	Technical and Test Institute for Construction Prague
CONSTRUCTECH	Research and development for the construction industry

RAL COLOURS SAMPLER

RAL 1000
CMYK 10 10 50 10

RAL 1001
CMYK 0 20 50 20

RAL 1002
CMYK 0 20 60 10

RAL 1003
CMYK 5 20 90 0

RAL 1004
CMYK 5 30 100 0

RAL 1005
CMYK 10 30 100 0

RAL 1006
CMYK 5 30 90 0

RAL 1007
CMYK 0 40 100 0

RAL 1011
CMYK 30 40 70 0

RAL 1012
CMYK 10 10 90 0

RAL 1013
CMYK 0 5 20 10

RAL 1014
CMYK 0 10 40 10

RAL 1015
CMYK 0 5 30 10

RAL 1016
CMYK 10 0 90 0

RAL 1017
CMYK 0 30 70 0

RAL 1018
CMYK 0 0 80 0

RAL 1019
CMYK 5 20 40 40

RAL 1020
CMYK 1 5 30 40

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CMYK 0 10 100 0

RAL 1023
CMYK 0 10 90 0

RAL 1024
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RAL 1027
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CMYK 0 30 80 0

RAL 1037
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RAL 2001
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RAL 2002
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RAL 2003
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RAL 2004
CMYK 0 70 100 0

RAL 2005
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RAL 2007
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RAL 2008
CMYK 0 60 100 0

RAL 2009
CMYK 5 70 100 0

RAL 2010
CMYK 0 70 100 10

RAL 2011
CMYK 0 55 100 0

RAL 2012
CMYK 0 60 70 0

Minimum painted quantity: 6000 pieces (or to be agreed with the Customer Service). Fasteners can be painted in colors of the NCS and RR systems.

RAL 3000
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RAL 3001
CMYK 20 100 90 10

RAL 3002
CMYK 10 100 90 20

RAL 3003
CMYK 0 100 100 40

RAL 3004
CMYK 20 100 100 60

RAL 3005
CMYK 20 100 80 40

RAL 3007
CMYK 60 100 70 80

RAL 3009
CMYK 5 90 100 80

RAL 3011
CMYK 20 100 100 40

RAL 3012
CMYK 5 50 50 10

RAL 3013
CMYK 20 90 100 20

RAL 3014
CMYK 0 70 30 10

RAL 3015
CMYK 0 50 20 10

RAL 3016
CMYK 0 90 90 20

RAL 3017
CMYK 0 80 50 10

RAL 3018
CMYK 5 90 70 5

RAL 3020
CMYK 0 100 100 10

RAL 3022
CMYK 0 60 70 0

RAL 3024
CMYK 0 80 90 0

RAL 3026
CMYK 0 80 100 0

RAL 3027
CMYK 0 100 70 20

RAL 3031
CMYK 20 100 90 20

RAL 4001
CMYK 60 70 5 10

RAL 4002
CMYK 40 100 90 5

RAL 4003
CMYK 10 70 10 0

RAL 4004
CMYK 60 100 50 20

RAL 4005
CMYK 60 100 5 10

RAL 4006
CMYK 50 100 0 10

RAL 4007
CMYK 70 100 20 60

RAL 4008
CMYK 60 90 0 10

RAL 4009
CMYK 40 40 30 0

RAL 4010
CMYK 10 90 30 0

RAL 5000
CMYK 100 40 5 40

RAL 5001
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RAL 5002
CMYK 100 70 0 40

RAL 5003
CMYK 100 50 0 80

RAL 5004
CMYK 100 100 70 40

RAL 5005
CMYK 100 40 0 40

RAL 5007
CMYK 80 20 0 40

RAL 5008
CMYK 60 0 0 90

RAL COLOURS SAMPLER

RAL 5009
CMYK 90 30 10 40

RAL 5010
CMYK 100 40 5 40

RAL 5011
CMYK 100 60 10 80

RAL 5012
CMYK 90 30 10 10

RAL 5013
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RAL 5014
CMYK 50 20 0 40

RAL 5015
CMYK 100 30 0 10

RAL 5017
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RAL 5018
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RAL 5024
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RAL 6000
CMYK 80 20 60 20

RAL 6001
CMYK 90 30 90 10

RAL 6002
CMYK 90 40 90 10

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CMYK 80 50 80 20

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RAL 6008
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RAL 6009
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RAL 6010
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CMYK 60 10 40 0

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CMYK 30 10 20 60

RAL 7006
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CMYK 30 40 70 40

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CMYK 20 50 40 80

RAL 7010
CMYK 20 5 30 80

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CMYK 40 10 20 80

RAL 7012
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CMYK 10 10 40 80

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CMYK 40 10 10 80

RAL 7016
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CMYK 50 10 5 95

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CMYK 30 10 20 20

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RAL 7040
CMYK 20 5 10 40

RAL 7042
CMYK 30 10 20 40

RAL 7043
CMYK 30 10 20 80

RAL COLOURS SAMPLER


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RAL 7045
CMYK 20 10 10 40


RAL 7046
CMYK 30 10 10 40


RAL 7047
CMYK 0 0 5 20


RAL 8000
CMYK 50 50 80 10


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CMYK 40 60 90 10


RAL 8002
CMYK 60 80 80 10


RAL 8003
CMYK 50 70 80 10


RAL 8004
CMYK 40 80 80 10


RAL 8007
CMYK 60 70 80 20


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CMYK 50 60 70 20


RAL 8011
CMYK 10 60 100 80


RAL 8012
CMYK 5 100 100 80


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RAL 8016
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RAL 8017
CMYK 60 80 80 80


RAL 8019
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RAL 9002
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RAL 9003
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RAL 9004
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RAL 9005
CMYK 100 100 100 95


RAL 9006
CMYK 0 0 0 40


RAL 9007
CMYK 0 0 0 60


RAL 9010
CMYK 0 0 5 0


RAL 9011
CMYK 100 100 100 80


RAL 9016
CMYK 3 0 0 0


RAL 9017
CMYK 100 90 100 95


RAL 9018
CMYK 10 0 10 20

INDEX BY NAME

INDEX BY NAME

INDEX BY NAME

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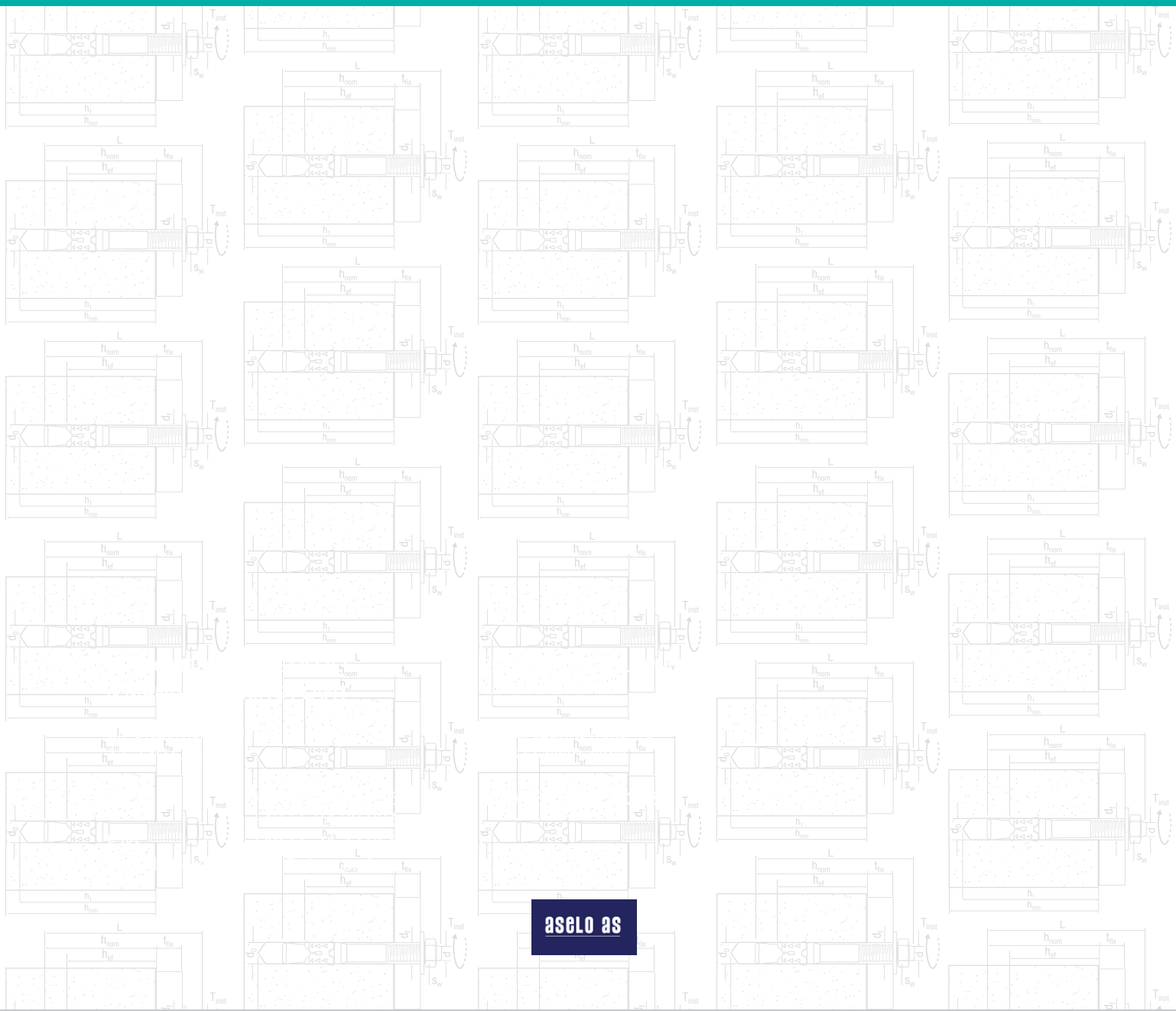

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