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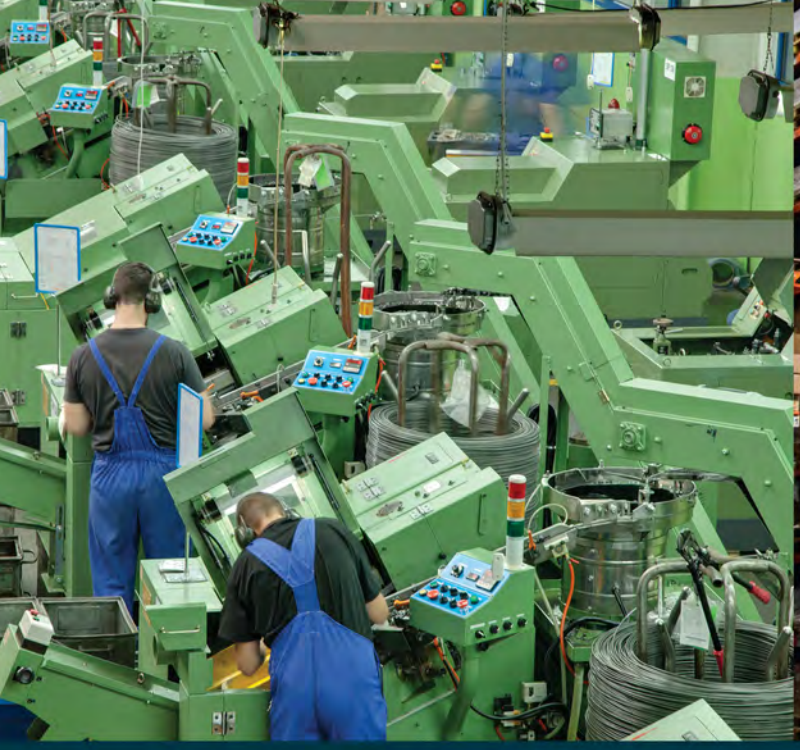
PRODUCT CATALOGUE

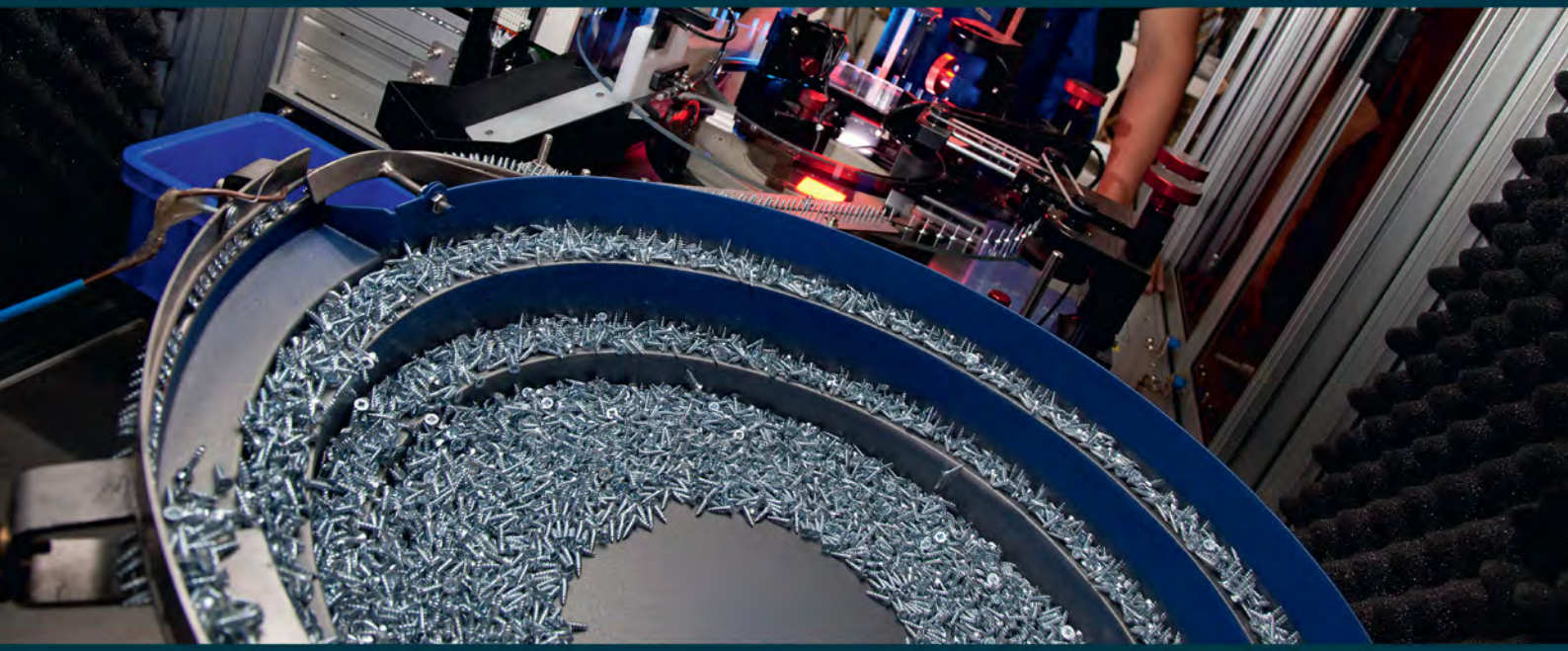
FOR THE INVESTMENT SECTOR

2021



Two production facilities

30,000 products



Advanced Quality Control

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Strict safety standards

Dear Readers,

Marcopol is one of the biggest producers and distributors of fasteners, fixings and construction chemicals operating in the B2B market in Europe. Our products have been highly valued and widely used in construction projects in different sectors for many years.

The Construction Company of the Year The 2019 title awarded by the Builder magazine and the Construction Brand of the Year 2020 award confirm our great success in the construction materials market and are a sign of recognition by our customers.

Together, we are creating a bright future.

LAUR KONSUMENTA TOP MARKA 2018

BUDOWLANA FIRMA ROKU 2019

WYRÓŻNIENIE BUDOWLANA MARKA ROKU 20 20

POLSKA IZBA KONSTRUKCJI STALOWYCH

Why is it worth

carrying out investment projects with Marcopol's products?

EXPERIENCE

We have been providing fasteners and fixings for the construction industry for 34 years.

SAFETY

Proven quality guaranteed by technical evaluations, certifications and approvals.

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PRODUCT AVAILABILITY

100% availability and a wide range of high quality products.

QUICK DELIVERIES

In major investment projects

Stadion Energa Gdańsk

One of the most prestigious and most recognisable sports facilities in Poland. This football stadium was built for the finals of the Euro 2012 championships.

Tunnel under the Martwa Wisła river

It's the first structure of its kind in Poland. It was put into service in 2016. It is 1.3 km long and reaches as deep as 35 m below the water's surface. This project was a major construction and structural challenge.

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Warsaw Metro

The Warsaw Metro is the only underground rail system in Poland. Due to the specificity of underground construction works, the project required certified high quality fasteners and fixings.

Rębiechowo Terminal

A passenger terminal at the Gdańsk-Rębiechowo Lech Wałęsa Airport. During this project special priority was given to the safety of millions of passengers. It was a great infrastructure project that required technologically advanced methods and components.

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SYMBOLS USED IN THE CATALOGUE

A2 stainless steel – AISI 304

A4 acid-resistant steel – AISI 316

A2 and A4 stainless steel – a group of steel alloys with a lower carbon content. They are characterised by a high resistance to corrosion when exposed to weather conditions, low-concentration acids, salts and oxides. Corrosion resistance is obtained by introducing suitable alloy additions to the steel: mainly chromium (minimum content: 11%), molybdenum, nickel or copper. Chromium contained in the steel reacts with oxygen and, as a result, a very thin yet durable and corrosion-resistant layer of chromium oxide is formed. The resulting layer can self-repair when damaged by external factors. Additionally, the layer of chromium oxide is passive, i.e. it does not react with other substances. Stainless steel is also characterised by grades, e.g. A2–50, A2–70, depending on its tensile strength.

Mechanical specifications

Steel	Yield limit Re_{min} [MPa]	Tensile strength Rm [MPa]	Elongation at break A [%]	Hardness HB_{max} [HB]
A2	230	500–750	45	215
A4	240	550–700	40	215

Bi-metal

Bi-metal products are formed by joining corrosion-resistant steel with carbon steel that can be thermally hardened. The resulting composition of the two separate materials with different properties facilitates drilling in construction steel while providing high and durable corrosion protection. Bi-metal products are mainly used in environments that require higher corrosion protection (C4, C5) in accordance with the Eurocodes.

Iso-Fit

Products that are hot-dip galvanized require special quality due to their coating thickness. As a result, two solutions are used, mainly oversizing and undersizing. For the purposes of ISO-FIT, screws and nuts are undersized. Thanks to this, the final dimensions comply with the standard tolerances after application of the protective coating.

Coatings

Electrolytic zinc coating

This is a commonly used protective coating. Its anti-corrosive properties largely depend upon the thickness. An electrolytic coating is applied to an element using differences in potential during electrolysis. Electrolytic zinc coatings provide a cost-effective solution and produce aesthetically pleasing results. It is the most commonly used fixing surface treatment method.

Hot-dip galvanization

Hot-dip galvanization provides a high degree of corrosion protection. The protective coating obtained, as a result of hot-dip galvanization, allows for effective and long exposure to highly corrosive environments (C4 and C5). Hot-dip coatings are produced through immersion or pre-galvanization. The thickness of hot-dip galvanizations varies from 18 to 50 µm.

Silver Ruspert coating

Silver Ruspert is a high-quality coating with excellent anti-corrosive properties due to the use of three layers: a metallic zinc layer, a special chemical layer and a surface coating. They are combined with each other by means of chemical reactions that form a rigid connection. Products coated through the use of this technique are widely used in environments were priority is given to high resistance and corrosion protection.

Sherardized coating

A sherardized coating (i.e. thermal diffusion coating) is obtained as a result of thermal-diffusion galvanizing. The process is based on the reactions occurring between a special zinc powder and iron. Zinc particles diffuse into the surface layer of steel, thereby creating a protective anti-corrosive layer. The zinc penetrates to approx. 1/3 of the entire depth providing an excellent level of protection against corrosion. It is a couple of times higher compared to galvanization and hot-dip galvanization.

Coating / steel durability comparison

Coating / steel type	Parameter defining protective coating / Corrosivity category according to EN ISO 12944-2			
Galvanized coating	≥5 µm C1	≥8 µm C1	≥12 µm C1, C2	≥20 µm C1, C2, C3
Hot-dip galvanization	≥15 µm C2, C3	≥20 µm C3, C4	≥40 µm C4	≥50 µm C4, C5
Thermal diffusion coating		≥10 µm C3, C4	≥20 µm C4	≥35 µm C4, C5
Silver Ruspert coating		≥500 h C3, C4	≥750 h C4, C5	≥1,500 h C5
AISI 304 stainless steel		C3	C4	
AISI 314 stainless steel		C3	C4	C5

Mechanical property class

Properties of screws made of carbon steel fall into one of several mechanical property classes. Mechanical property classes define the nominal tensile strength (Rm) and nominal yield limit (Re) of fixings made of carbon steel that undergo heat treatment. The class designation consists of two digits separated with a dot. The first digit refers to the nominal tensile strength while the second corresponds to the yield limit, as shown below:

Example – class 4.8

The first number corresponds to the 1/100 of the nominal tensile strength, i.e.:

Rm = 4 * 100 = 400 [N/mm^2] or [MPa]

The second number defines the yield limit factor. In order to calculate the nominal yield limit, multiply the nominal tensile strength by the second number (i.e. 0.8):

Re = 400 N/mm2 * 0.8 = 320 [N/mm^2] or [MPa]

Corrosion / corrosivity categories according to EN ISO 12944-2

Corrosion is a set of processes that gradually damage the material structure, leading to its destruction. The processes occur when there is moisture on the metal surface. A layer of moisture may be so thin that it is invisible to the naked eye.

Corrosion occurs quicker under the following conditions:

– Increased relative humidity

– Condensation (i.e. when the temperature is equal to or lower than the dew point)

– Increased amount of contaminants in the environment (corrosive contaminants may react with the steel and create deposits on its surface).

Corrosion occurs most often when relative humidity is above 80% and in temperatures above 0°C. However, if there are other contaminants and/or hygroscopic salts in the environment, corrosion occurs at a much lower level of humidity.

There are five categories of corrosivity defined in PN EN ISO 12944-2. They differ in terms of location and conditions of use.

Coating / steel durability comparison

Corrosivity category	Examples of typical environments in a moderate climate according to EN ISO 12944-2	
	Exterior	Interior
C1 – very low	N/A	Heated buildings with clean atmospheres, e.g. offices, shops, schools or hotels
C2 – low	Atmospheres with a low level of pollution: mostly rural areas	Unheated buildings where condensation can occur, e.g. warehouses, sports halls
C3 – medium	Urban and industrial atmospheres, moderate sulphur dioxide pollution; coastal areas with low salinity	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies
C4 – high	Industrial areas and coastal areas with moderate salinity	Chemical plants, swimming pools, ship and boat repair yards
C5 – very high	Industrial areas with high humidity and an aggressive atmosphere	Buildings or areas with almost continuous condensation and a high level pollution

Notes:

1. The table does not include the CX category that defines extreme industrial corrosive environments.
2. Special attention should be paid to product storage and warehousing conditions. The conditions in which products are stored or warehoused should correspond to a lower corrosivity class than the one in which the product will be used.

Seismic performance

Seismic performance categories:

- C1 – resistance to cyclic loads with a crack width up to 0.5 mm
- C2 – resistance to cyclic loads with changeable crack widths up to 0.8 mm, with a maximum crack movement defined.

Installation specifications

Torque

Recommended screw gun speed when installing screws

Lap and butt screw joints

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Structural bolts and fixings

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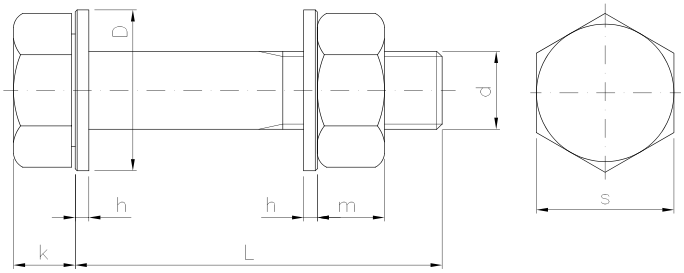
HV preloaded structural bolt assembly

CE PN-EN 14399-1 GIG

HV **1133**



HDG HOT-DIP GALVANIZATION CLASS 10.9

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	m [mm]	h [mm]	D [mm]	Thread pitch P [mm]	Index	Packaging [set]
HV M12 x 30	M12	30	8	22	10	3	24	1.75	75616	25
HV M12 x 35	M12	35	8	22	10	3	24	1.75	75618	25
HV M12 x 40	M12	40	8	22	10	3	24	1.75	75623	25
HV M12 x 45	M12	45	8	22	10	3	24	1.75	75625	25
HV M12 x 50	M12	50	8	22	10	3	24	1.75	75628	25
HV M12 x 55	M12	55	8	22	10	3	24	1.75	75649	25
HV M12 x 60	M12	60	8	22	10	3	24	1.75	75654	25
HV M12 x 70	M12	70	8	22	10	3	24	1.75	75655	25
HV M16 x 40	M16	40	10	27	13	4	30	2.0	51700	25
HV M16 x 45	M16	45	10	27	13	4	30	2.0	51704	25
HV M16 x 50	M16	50	10	27	13	4	30	2.0	51705	25
HV M16 x 60	M16	60	10	27	13	4	30	2.0	51709	25
HV M16 x 65	M16	65	10	27	13	4	30	2.0	51710	25
HV M16 x 70	M16	70	10	27	13	4	30	2.0	51713	25
HV M16 x 75	M16	75	10	27	13	4	30	2.0	51714	25
HV M16 x 80	M16	80	10	27	13	4	30	2.0	51715	25
HV M16 x 90	M16	90	10	27	13	4	30	2.0	75656	25
HV M16 x 100	M16	100	10	27	13	5	30	2.0	75662	25
HV M20 x 50	M20	50	13	32	16	4	37	2.5	75663	10
HV M20 x 55	M20	55	13	32	16	4	37	2.5	75669	10
HV M20 x 60	M20	60	13	32	16	4	37	2.5	75671	10
HV M20 x 65	M20	65	13	32	16	4	37	2.5	75672	10
HV M20 x 70	M20	70	13	32	16	4	37	2.5	51716	10
HV M20 x 75	M20	75	13	32	16	4	37	2.5	75673	10
HV M20 x 80	M20	80	13	32	16	4	37	2.5	51717	10
HV M20 x 85	M20	85	13	32	16	4	37	2.5	51718	10
HV M20 x 90	M20	90	13	32	16	4	37	2.5	75674	10
HV M20 x 95	M20	95	13	32	16	4	37	2.5	75675	10
HV M20 x 100	M20	100	13	32	16	4	37	2.5	75677	10
HV M20 x 110	M20	110	13	32	16	4	37	2.5	75679	10
HV M24 x 60	M24	60	15	41	20	4	44	3.0	75680	5
HV M24 x 70	M24	70	15	41	20	4	44	3.0	75705	5
HV M24 x 75	M24	75	15	41	20	4	44	3.0	75721	5
HV M24 x 80	M24	80	15	41	20	4	44	3.0	75723	5
HV M24 x 85	M24	85	15	41	20	4	44	3.0	75724	5
HV M24 x 90	M24	90	15	41	20	4	44	3.0	75725	5
HV M24 x 95	M24	95	15	41	20	4	44	3.0	75732	5
HV M24 x 100	M24	100	15	41	20	4	44	3.0	75753	5
HV M24 x 110	M24	110	15	41	20	4	44	3.0	75755	5
HV M24 x 120	M24	120	15	41	20	4	44	3.0	75756	5

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

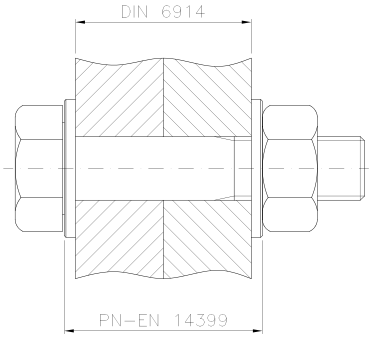
HV assembly specification

An preloaded structural bolt assembly consists of a bolt, nut and two washers – hot-dip galvanization (HDG).

Washers with hardness of at least 300 HV should be used for preloading. HV assemblies in accordance with EN 14399-4 – a bolt and a nut and in accordance with EN 14399-6 – 2 x washers.

There are significant differences between PN-EN, PN and DIN:

In PN-EN 14399, the clamp length is measured from the bolt's head to the nut while in DIN 6914/5/6, the clamp length is measured between the two washers.



HV assembly characteristic properties

Larger bolt head

- Exerts less unit pressure on the material being clamped. The preloading force is maintained throughout its service life.

Hot-dip galvanization

- Anti-corrosion protection that maintains its reliability even in aggressive environments over long periods of time.
- The thickness of zinc layer varies from 50 to 70 µm.

Nuts are pre-greased with molybdenum disulphide grease (MoS2) in order to ensure the required preloading force and avoid seizing when tensioning.

Assembly class – K1 (the K assembly class is defined based on how the k tightening factor and tightening method are determined).

The assemblies may be delivered in accordance with one of the categories specified in the table below. The k_i, k_m and V_k factors should be specified in the relevant product standards or documents supplied with the appropriate batches.

K category	Information accompanying the CE mark
K0	No tests for the K factor
K1	Range of individual tests for k_i
K2	Average value tests for k_m Variation factor V_k

Supply requirements

HV bolt assemblies are delivered in sets that are ready for installation. Applying additional grease coatings is prohibited as it alters the preloading force and may result in faults in the assembly. HV preloaded structural bolt assemblies are very sensitive to differences resulting from production and lubrication. It is therefore extremely important to only use components delivered by one manufacturer in their original packaging.

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Common applications

- Preloaded butt joints in steel structures
- Standard and friction lap joints in industrial buildings

HV BOLT ASSEMBLY TIGHTENING

The HV bolts are tightened by turning the nut until the desired preloading force is reached. This can be done with the use of the torque-, impulse control- or the angle method. The installation is performed with the use of standard tightening tools, i.e. torque wrenches, that should be calibrated once a year.

Unless otherwise provided in the specification, the minimum preloading force $F_{p,C}$ should be calculated in accordance with EN 1993-1-8 with the following formula:

$$F_{p,C} = 0.7\, f_{ub} A_s$$

where: f_{ub} is the nominal tensile strength of the bolt material,

A_s is the stress area of the bolt

Principles

Preloading of joints is carried out due to slip capacity, fatigue, seismic actions, quality improvement (e.g. durability) or for installation purposes. See Table 1.

TABLE 1. PRELOADING FORCE VALUES $F_{P,C}$ [kN]

Bolt class	Thread type							
	M12	M16	M20	M22	M24	M27	M30	M36
10.9	59 kN	110 kN	172 kN	212 kN	247 kN	321 kN	393 kN	572 kN

All tightening methods described below may be used unless specification introduces limits on their use. Depending on the tightening method adopted, the following K classes of bolt assemblies (calibration as-delivered) must be followed (see Table 2).

TABLE 2. K CLASSES REQUIRED FOR DIFFERENT TIGHTENING METHODS

Tightening method	K classes
Torque method	K2
Combined method	K2 or K1
HRC method	K0 with HRD nut only or K2
Direct tension indicator (DTI) method	K2, K1 or K0

Before commencement of preloading, the components need to be brought together so that they are a snug-tight fit. Bolt groups should always be tightened as required so that residual gaps at the edges do not exceed 2 mm.

Torque method in accordance with EN ISO 6789

At all stages of the torque method, the torque wrenches used are required to have an accuracy of ± 4% according to EN ISO 6789. Each wrench must be checked in accordance with EN ISO 6789 and in the case of pneumatic wrenches, every time the hose length changes. Torque wrenches used in the first step of the combined method require an accuracy of ± 10% and need to be checked annually.

When using the torque method tightening can be carried out after several days.

High strength preloading bolts are used with grease applied by the manufacturer unless the DTI method or other procedures are used.

A bolt assembly that was tightened to a minimum preload level and then loosened is not suitable for reuse and should be discarded.

RECOMMENDED TORQUE VALUES

The recommended torque value $M_{r,i}$ required to obtain the minimum nominal preloading force $F_{p,C}$ is determined for every bolt assembly as follows:

Values determined based on the K class provided by the manufacturer in accordance with the appropriate section of EN 14399:

1. $M_{r,1} = k_m\, dF_{p,C}$ where k_m is for the K class K1
2. $M_{r,2} = k_m\, dF_{p,C}$ where k_m is for the K class K2

d is the bolt diameter

k_m is the value provided on the packaging by the manufacturer

$M_{r,1}$ – torque for the 1st step

$M_{r,2}$ – torque for the 2nd step

The assemblies should be tightened using a torque wrench offering a suitable range of operation. Both hand and power-operated wrenches may be used. Impact wrenches may be used in the first tightening step.

Tightening should be performed in a smooth and continuous manner.

The torque method comprises the following steps:

1. In the first step, the wrench has to be set to a torque value of 0.75 $M_{r,i}$ where $M_{r,i} = M_{r,2}$ or $M_{r,test}$. This first step has to be completed for all bolts in the connection prior to commencement of the second step.
2. In the second step, the wrench has to be set to a torque value of 1.10 $M_{r,i}$ where $M_{r,i} = M_{r,2}$ or $M_{r,test}$. The 1.10 $M_{r,2}$ factor corresponds to a value of (1+ 1.65 V_k), where V_k=0.06 for the K2 class.

Combined method

Tightening using the combined method comprises the following two steps:

1. In the first tightening step, a torque wrench offering a suitable range of operation is used. The wrench has to be set to a torque value of approx. 0.75 $M_{r,i}$, where $M_{r,i} = M_{r,2}$ or $M_{r,1}$ or $M_{r,test}$. In the first step, tightening should be completed for all bolts of the connection prior to commencement of the second tightening step The $M_{r,1}$ value can be roughly determined with the following formula: $M_r1 = 0.13\, d\, F_{p,C}$, unless agreed otherwise.
2. The second tightening step involves further rotation of the rotating part of the bolt assembly. The position of the nut relative to the shank thread has to be marked after the first step, using a crayon/scriber, so that the final rotation of the nut can be easily determined. The second tightening step involves an additional rotation of the nut according to Table 3, unless instructed otherwise.

TABLE 3. ROTATION ANGLES FOR THE K1 FACTOR FOR THE COMBINED METHOD

Total nominal thickness "t" of parts to be connected (including all spacers and washers) d = bolt diameter	Further rotation to be applied during the second step of tightening (10.9 class bolts)	
	Degrees	Part of full rotation
t <2 d	60	1/6
2 d ≤ t < 6 d	90	1/4
6 d ≤t ≤ 10 d	120	1/3
If the surface under the bolt head or nut is not perpendicular to the bolt axis, the required rotation angle should be determined through tests		

All data required in order to perform proper installation can be found in the table included with the label (see example to the right).

Metoda dokręcania – kombinowana / Calibration Combination Method		
Moment dokręcający / Torque	Kąt dokręcania / Tightening angle	
578.8 Nm	90°	
Współczynnik k / k factor	0.13	
Numer / Notified body	1453	CE 19
Certyfikat ZKP / Certificate CE	1453-CPR-2	
Dokumentacja odniesienia / Harmonised technical specification	EN 14399-1:2015	
Numer DWU / DoP	01.HV.EN14399.2019	
Zamierzone zastosowanie / Intended use	Zestawy śrubowe wysokiej wytrzymałości do połączeń sprężanych / Intencied to be used structural metalic works	
Zestaw / Set	Śruba / Bolt – EN 14399-4 Nakrętka / Nut EN 14399-4 MoS2 Podkładka x2 / Washer EN 14399-6	
K / Class	K1	

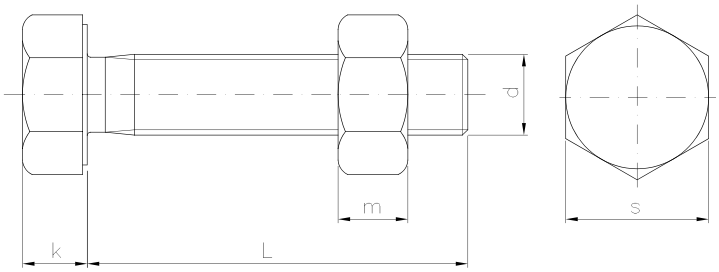
MARCOPOL

SB non-preloaded structural bolt assembly (full thread)

ISO 4017
ISO 4032
PN-EN 15048

GIG

SB 1134



HDG HOT DIP GALVANIZATION

CLASS 8.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	m [mm]	Thread pitch P [mm]	Index	Packaging [set]
SB M12 x 30	M12	30	8	19	10	1.75	2393	100
SB M12 x 35	M12	35	8	19	10	1.75	37994	100
SB M12 x 40	M12	40	8	19	10	1.75	43322	100
SB M12 x 45	M12	45	8	19	10	1.75	26052	100
SB M12 x 50	M12	50	8	19	10	1.75	88415	100
SB M12 x 55	M12	55	8	19	10	1.75	53861	100
SB M12 x 60	M12	60	8	19	10	1.75	85477	100
SB M12 x 65	M12	65	8	19	10	1.75	57964	50
SB M16 x 40	M16	40	10	24	13	2.0	77339	50
SB M16 x 45	M16	45	10	24	13	2.0	75364	50
SB M16 x 50	M16	50	10	24	13	2.0	75369	50
SB M16 x 55	M16	55	10	24	13	2.0	73764	50
SB M16 x 60	M16	60	10	24	13	2.0	71866	50
SB M16 x 65	M16	65	10	24	13	2.0	43744	25
SB M16 x 70	M16	70	10	24	13	2.0	39155	25
SB M20 x 50	M20	50	13	30	16	2.5	48931	25
SB M20 x 55	M20	55	13	30	16	2.5	43115	25
SB M20 x 60	M20	60	13	30	16	2.5	49342	25
SB M20 x 65	M20	65	13	30	16	2.5	95514	25
SB M20 x 70	M20	70	13	30	16	2.5	43692	25

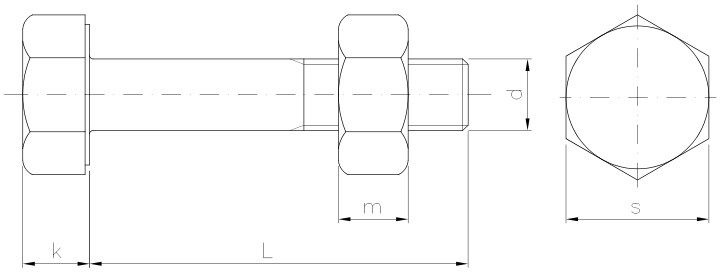
* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.
** SB assemblies are also available with washers.

SB non-preloaded structural bolt assembly (incomplete thread)

ISO 4014
ISO 4032
PN-EN 15048

GIG

SB 1135



HDG HOT-DIP GALVANIZATION

CLASS 8.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Designation type d	L [mm]	k [mm]	s [mm]	m [mm]	Thread pitch P [mm]	Index	Packaging [set]
SB M12 x 40	M12	40	8	19	10	1.75	26050	100
SB M12 x 45	M12	45	8	19	10	1.75	54241	100
SB M12 x 50	M12	50	8	19	10	1.75	27227	100
SB M12 x 55	M12	55	8	19	10	1.75	54242	100
SB M12 x 60	M12	60	8	19	10	1.75	54486	100
SB M12 x 65	M12	65	8	19	10	1.75	78502	50
SB M12 x 70	M12	70	8	19	10	1.75	54670	50
SB M12 x 80	M12	80	8	19	10	1.75	43120	50
SB M12 x 90	M12	90	8	19	10	1.75	95515	50
SB M12 x 100	M12	100	8	19	10	1.75	95551	50
SB M16 x 45	M16	45	10	24	13	2.0	99325	50
SB M16 x 50	M16	50	10	24	13	2.0	25928	50
SB M16 x 55	M16	55	10	24	13	2.0	58910	50
SB M16 x 60	M16	60	10	24	13	2.0	51790	50
SB M16 x 65	M16	65	10	24	13	2.0	55252	25
SB M16 x 70	M16	70	10	24	13	2.0	74379	25
SB M16 x 80	M16	80	10	24	13	2.0	92660	25
SB M16 x 90	M16	90	10	24	13	2.0	71465	25
SB M16 x 100	M16	100	10	24	13	2.0	93387	25
SB M20 x 60	M20	60	13	30	16	2.5	10613	25
SB M20 x 65	M20	65	13	30	16	2.5	20592	25
SB M20 x 70	M20	70	13	30	16	2.5	51054	25
SB M20 x 80	M20	80	13	30	16	2.5	23228	25
SB M20 x 90	M20	90	13	30	16	2.5	22125	25
SB M20 x 100	M20	100	13	30	16	2.5	41531	25
SB M24 x 70	M24	70	15	36	19	3.0	96224	10
SB M24 x 80	M24	80	15	36	19	3.0	43323	10
SB M24 x 90	M24	90	15	36	19	3.0	10266	10
SB M24 x 100	M24	100	15	36	19	3.0	43395	10

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.
** SB assemblies are also available with washers.

MARCOPOL

SB assembly specification

Non-preloaded structural bolt assemblies include bolts and nuts.

Bolt – mechanical property class marking in accordance with EN ISO 898-1 or EN ISO 3506-1, identification mark of the assembly manufacturer and an additional "SB" marking (for use in structural bolts)

Nuts – mechanical property class marking in accordance with EN 20898-2 or EN ISO 3506-2, identification mark of the assembly manufacturer and an additional "SB" marking (for use in structural bolts)

Washers (optional) – the use of washers without any marking is allowed since their impact on shearing and tension is negligible. The washers should comply with the HV100 and HV200 hardness classes, if applicable.

SB assembly characteristic properties

- Coating of assembly components will have the equivalent corrosion resistance. The most commonly used coatings are HDG and galvanized zinc.
- Suppliers of SB assemblies are CE certified (certification obtained by the manufacturer).
- The manufacturer (supplier) will also hold the Factory Production Control certificate.
- Since the tensile resistance of bolt/nut assemblies is very sensitive to differences in manufacturing, it is important that the assemblies are delivered by one manufacturer who is always responsible for the function of the assembly.

Tensile strength of the bolt/nut assemblies made of carbon and alloy steel

Thread type	Nominal stress area A_{snom} [mm²]	Mechanical property class						
		4.6	4.8	5.6	5.8	6.8	8.8	10.9
		Minimum tensile strength $(A_{s\,nom} \times R_{m\,min})_1$ [kN]						
M12	84.3	33.7	35.4	42.2	43.8	50.6	70	87.7
M14	115	46	48.3	57.5	59.8	69	95.5	120
M16	157	62.8	65.9	78.5	81.6	94	130	163
M18	192	76.8	80.6	96	99.8	115	159	200
M20	245	98	103	122	127	147	203	255
M22	303	121	127	152	158	182	252	315
M24	353	141	148	176	184	212	293	367
M27	459	184	193	230	239	275	381	477
M30	561	224	236	280	292	337	466	583
M33	694	278	292	347	361	416	576	722
M36	817	327	343	408	425	490	678	850

Fasteners that are zinc-coated by immersion may require specific measurements in accordance with EN ISO 10684:2004 to achieve maximum tensile resistance

Tightening bolts in non-preloaded connections

Connected parts should be tightened in such a manner that they adhere to each other tightly. Spacers can be used to ensure a better fit. If sheet plate and sheathing fixings with a thickness of t ≥ 4 mm or profiles with a wall thickness of ≥ 8 mm do not require full tightening, gaps of 4 mm can be left on the edges, provided that tightening is achieved in the central area of the fixing.

Each tightened bolt assembly should at least correspond to the tightness of the parts, exercising caution not to damage the bolts, especially relatively short bolts and M12 bolts. The tightening process for a group begins with the bolt located in the zone with the greatest stiffness and then gradually moves to zones which are less stiff. More than one tightening cycle may be required to achieve tight adherence of the connected parts.

The zone with the greatest stiffness in I-section lap joints is typically the centre of a bolt group, while in I-section butt joints, it is the surrounding area of the flanges.

The term tight adherence denotes a state of tightness achieved by hand and a regular wrench without an extension or a state in which an impact wrench starts to deliver rotational blows.

Supply requirements

All fasteners will be supplied to the purchaser in the original unopened, single-sealed container or alternatively in separate sealed containers by the manufacturer of the assemblies. The suitability for tensile loading of the assembly supplied to the purchaser should be demonstrated by the tensile test in accordance with EN 15048-2.

Bolt/nut assembly containers or their components complying with this European Standard will be labelled with the complete designation of the fasteners, including:

- Additional letters "SB" (for use in structural bolts)
- Relevant batch number(s)
- Identification of the assembly manufacturer

Washers are usually supplied in separate containers. Assemblies will be supplied in one of the following ways:

1. Bolts and nuts supplied by one manufacturer. The parts of the assembly will be packed together into one package that is labelled with an assembly lot number and the manufacturer's identification.
2. Bolts and nuts supplied by one manufacturer. Each part will be packed into separate packages that will be labelled with the manufacturing lot number of the components and the manufacturer's identification. The parts in an assembly are freely interchangeable within one nominal thread diameter.

Common applications

Connection of non-preloaded structures. Butt joints in accordance with EN standards can be used under shearing and/or tensile loads. Bolts, nuts and washers that comply with the EN standards are not usually intended for welding.

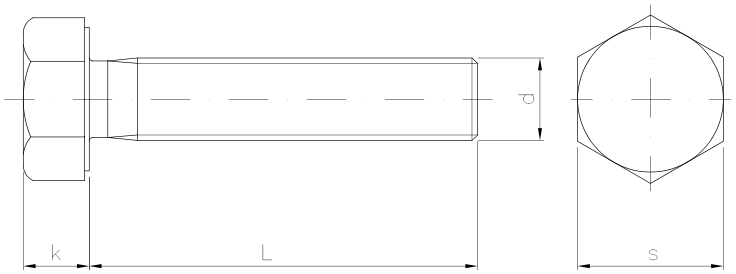
MARCOPOL

Hexagonal head bolt (full thread), class 8.8

Related standards:

DIN 933
PN-EN ISO 4017

S6K 1101



Zn ZINC COATING 5 µm

CLASS 8.8

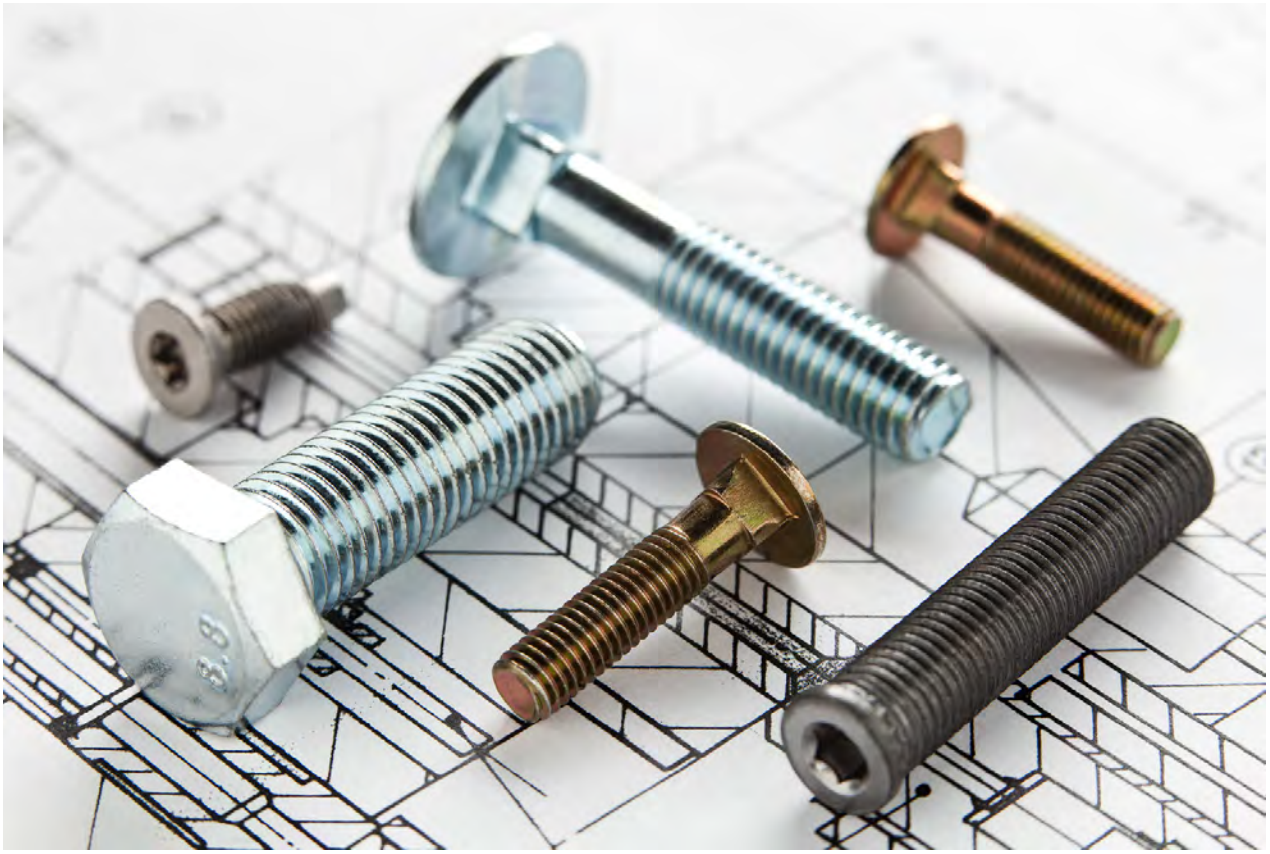
A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M8 x 10	M8	10	5.3	13.0	1.25	630677	200
S6K M8 x 12	M8	12	5.3	13.0	1.25	630678	200
S6K M8 x 16	M8	16	5.3	13.0	1.25	630679	200
S6K M8 x 20	M8	20	5.3	13.0	1.25	642584	200
S6K M8 x 25	M8	25	5.3	13.0	1.25	15201	200
S6K M8 x 30	M8	30	5.3	13.0	1.25	630686	200
S6K M8 x 35	M8	35	5.3	13.0	1.25	630688	200
S6K M8 x 40	M8	40	5.3	13.0	1.25	642585	200
S6K M8 x 45	M8	45	5.3	13.0	1.25	630693	200
S6K M8 x 50	M8	50	5.3	13.0	1.25	630696	200
S6K M8 x 60	M8	60	5.3	13.0	1.25	630699	200
S6K M8 x 70	M8	70	5.3	13.0	1.25	630701	200
S6K M8 x 80	M8	80	5.3	13.0	1.25	630703	200
S6K M8 x 90	M8	90	5.3	13.0	1.25	642588	200
S6K M8 x 100	M8	100	5.3	13.0	1.25	642590	200
S6K M8 x 120	M8	120	5.3	13.0	1.25	642592	200
S6K M10 x 20	M10	20	6.4	17.0	1.5	630710	200
S6K M10 x 25	M10	25	6.4	17.0	1.5	630712	200
S6K M10 x 30	M10	30	6.4	17.0	1.5	630714	200
S6K M10 x 35	M10	35	6.4	17.0	1.5	630716	100
S6K M10 x 40	M10	40	6.4	17.0	1.5	630718	100
S6K M10 x 45	M10	45	6.4	17.0	1.5	630720	100
S6K M10 x 50	M10	50	6.4	17.0	1.5	630722	100
S6K M10 x 60	M10	60	6.4	17.0	1.5	630724	100
S6K M10 x 70	M10	70	6.4	17.0	1.5	630726	100
S6K M10 x 80	M10	80	6.4	17.0	1.5	630728	100
S6K M10 x 100	M10	100	6.4	17.0	1.5	630731	100
S6K M12 x 25	M12	25	7.5	19.0	1.75	630735	100
S6K M12 x 30	M12	30	7.5	19.0	1.75	630737	100

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M12 x 35	M12	35	7.5	19.0	1.75	630739	100
S6K M12 x 40	M12	40	7.5	19.0	1.75	630741	100
S6K M12 x 45	M12	45	7.5	19.0	1.75	630743	100
S6K M12 x 50	M12	50	7.5	19.0	1.75	630745	100
S6K M12 x 55	M12	55	7.5	19.0	1.75	630747	100
S6K M12 x 60	M12	60	7.5	19.0	1.75	630748	100
S6K M12 x 70	M12	70	7.5	19.0	1.75	630750	50
S6K M12 x 80	M12	80	7.5	19.0	1.75	630752	50
S6K M12 x 100	M12	100	7.5	19.0	1.75	640884	50
S6K M12 x 120	M12	120	7.5	19.0	1.75	630757	50
S6K M14 x 50	M14	50	8.8	22.0	2.0	630760	50
S6K M16 x 30	M16	30	10.0	24.0	2.0	630767	50
S6K M16 x 35	M16	35	10.0	24.0	2.0	630769	50
S6K M16 x 40	M16	40	10.0	24.0	2.0	630771	50
S6K M16 x 45	M16	45	10.0	24.0	2.0	630773	50
S6K M16 x 50	M16	50	10.0	24.0	2.0	630775	50
S6K M16 x 55	M16	55	10.0	24.0	2.0	630777	50
S6K M16 x 60	M16	60	10.0	24.0	2.0	630778	50
S6K M16 x 65	M16	65	10.0	24.0	2.0	630780	25
S6K M16 x 70	M16	70	10.0	24.0	2.0	630781	25
S6K M16 x 80	M16	80	10.0	24.0	2.0	630783	25
S6K M16 x 100	M16	100	10.0	24.0	2.0	630786	25

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.



MARCOPOL

Hexagonal head bolt (full thread), class 8.8

S6K **1101**

Code and size – packaging by weight

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [kg]
S6K M8 x 12	M8	12	5.3	13.0	1.25	630059	2.5
S6K M8 x 16	M8	16	5.3	13.0	1.25	630073	2.5
S6K M8 x 20	M8	20	5.3	13.0	1.25	630077	2.5
S6K M8 x 25	M8	25	5.3	13.0	1.25	630081	2.5
S6K M8 x 30	M8	30	5.3	13.0	1.25	630085	2.5
S6K M8 x 35	M8	35	5.3	13.0	1.25	630089	2.5
S6K M8 x 40	M8	40	5.3	13.0	1.25	630093	2.5
S6K M8 x 45	M8	45	5.3	13.0	1.25	630096	2.5
S6K M8 x 50	M8	50	5.3	13.0	1.25	630100	2.5
S6K M8 x 60	M8	60	5.3	13.0	1.25	630106	2.5
S6K M8 x 70	M8	70	5.3	13.0	1.25	630110	2.5
S6K M8 x 80	M8	80	5.3	13.0	1.25	630114	2.5
S6K M8 x 90	M8	90	5.3	13.0	1.25	630117	2.5
S6K M8 x 100	M8	100	5.3	13.0	1.25	630121	2.5
S6K M10 x 16	M10	16	6.4	17.0	1.5	630123	5
S6K M10 x 20	M10	20	6.4	17.0	1.5	630126	5
S6K M10 x 25	M10	25	6.4	17.0	1.5	630130	5
S6K M10 x 30	M10	30	6.4	17.0	1.5	630134	5
S6K M10 x 35	M10	35	6.4	17.0	1.5	630138	5
S6K M10 x 40	M10	40	6.4	17.0	1.5	630142	5
S6K M10 x 50	M10	50	6.4	17.0	1.5	630148	5
S6K M10 x 60	M10	60	6.4	17.0	1.5	630152	5
S6K M10 x 65	M10	65	6.4	17.0	1.5	630154	5
S6K M10 x 70	M10	70	6.4	17.0	1.5	630158	5
S6K M10 x 80	M10	80	6.4	17.0	1.5	640877	5
S6K M10 x 90	M10	90	6.4	17.0	1.5	640879	5
S6K M10 x 100	M10	100	6.4	17.0	1.5	640880	5
S6K M12 x 20	M12	20	7.5	19.0	1.75	630174	5
S6K M12 x 25	M12	25	7.5	19.0	1.75	630178	5
S6K M12 x 30	M12	30	7.5	19.0	1.75	630182	5
S6K M12 x 35	M12	35	7.5	19.0	1.75	630186	5
S6K M12 x 40	M12	40	7.5	19.0	1.75	630190	5
S6K M12 x 45	M12	45	7.5	19.0	1.75	630193	5
S6K M12 x 50	M12	50	7.5	19.0	1.75	630197	5
S6K M12 x 60	M12	60	7.5	19.0	1.75	630202	5
S6K M12 x 70	M12	70	7.5	19.0	1.75	630206	5
S6K M12 x 80	M12	80	7.5	19.0	1.75	630210	5
S6K M12 x 90	M12	90	7.5	19.0	1.75	630213	5
S6K M12 x 100	M12	100	7.5	19.0	1.75	630216	5
S6K M12 x 120	M12	120	7.5	19.0	1.75	640885	5
S6K M14 x 30	M14	30	8.8	22.0	2.0	642472	5
S6K M14 x 35	M14	35	8.8	22.0	2.0	642471	5
S6K M14 x 40	M14	40	8.8	22.0	2.0	642469	5
S6K M14 x 45	M14	45	8.8	22.0	2.0	642468	5
S6K M14 x 50	M14	50	8.8	22.0	2.0	642466	5

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [kg]
S6K M14 x 60	M14	60	8.8	22.0	2.0	642465	5
S6K M14 x 70	M14	70	8.8	22.0	2.0	642464	5
S6K M14 x 80	M14	80	8.8	22.0	2.0	642463	5
S6K M16 x 25	M16	25	10.0	24.0	2.0	642461	5
S6K M16 x 30	M16	30	10.0	24.0	2.0	642459	5
S6K M16 x 35	M16	35	10.0	24.0	2.0	642457	5
S6K M16 x 40	M16	40	10.0	24.0	2.0	642455	5
S6K M16 x 45	M16	45	10.0	24.0	2.0	642453	5
S6K M16 x 50	M16	50	10.0	24.0	2.0	642451	5
S6K M16 x 55	M16	55	10.0	24.0	2.0	642450	5
S6K M16 x 60	M16	60	10.0	24.0	2.0	642448	5
S6K M16 x 70	M16	70	10.0	24.0	2.0	642445	5
S6K M16 x 80	M16	80	10.0	24.0	2.0	642443	5
S6K M16 x 90	M16	90	10.0	24.0	2.0	642441	5
S6K M16 x 100	M16	100	10.0	24.0	2.0	642439	5
S6K M16 x 120	M16	120	10.0	24.0	2.0	642437	5
S6K M20 x 40	M20	40	12.5	30.0	2.5	630258	10
S6K M20 x 45	M20	45	12.5	30.0	2.5	630259	10
S6K M20 x 50	M20	50	12.5	30.0	2.5	630261	10
S6K M20 x 55	M20	55	12.5	30.0	2.5	630262	10
S6K M20 x 60	M20	60	12.5	30.0	2.5	630264	10
S6K M20 x 70	M20	70	12.5	30.0	2.5	630266	10
S6K M20 x 80	M20	80	12.5	30.0	2.5	640891	10
S6K M20 x 90	M20	90	12.5	30.0	2.5	640892	10
S6K M20 x 100	M20	100	12.5	30.0	2.5	640893	10
S6K M20 x 120	M20	120	12.5	30.0	2.5	630274	10
S6K M24 x 80	M24	80	15.0	36.0	3.0	630276	10
S6K M24 x 90	M24	90	15.0	36.0	3.0	630277	10
S6K M24 x 100	M24	100	15.0	36.0	3.0	640895	10

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

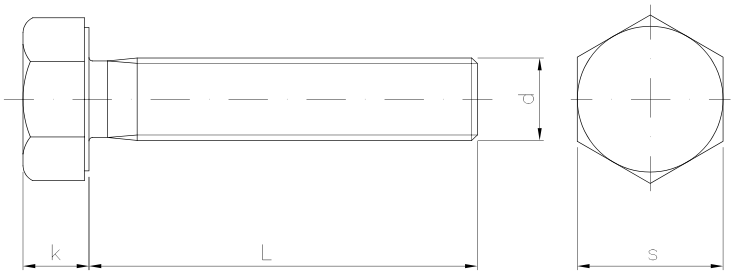
MARCOPOL

Hexagonal head bolt (full thread), class 10.9

Related standards:

DIN 933
PN-EN ISO 4017

S6K 1101



CLASS 10.9

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M8 x 20	M8	20	5.3	13.0	1.25	630682	200
S6K M8 x 25	M8	25	5.3	13.0	1.25	630685	200
S6K M8 x 30	M8	30	5.3	13.0	1.25	630687	200
S6K M8 x 35	M8	35	5.3	13.0	1.25	630689	200
S6K M8 x 40	M8	40	5.3	13.0	1.25	630692	200
S6K M8 x 45	M8	45	5.3	13.0	1.25	630694	200
S6K M8 x 50	M8	50	5.3	13.0	1.25	630697	200
S6K M8 x 60	M8	60	5.3	13.0	1.25	630700	200
S6K M8 x 70	M8	70	5.3	13.0	1.25	630702	200
S6K M8 x 80	M8	80	5.3	13.0	1.25	630704	200
S6K M8 x 90	M8	90	5.3	13.0	1.25	642589	200
S6K M8 x 100	M8	100	5.3	13.0	1.25	642591	200
S6K M10 x 20	M10	20	6.4	17.0	1.5	630711	200
S6K M10 x 25	M10	25	6.4	17.0	1.5	630713	200
S6K M10 x 30	M10	30	6.4	17.0	1.5	630715	200
S6K M10 x 35	M10	35	6.4	17.0	1.5	630717	100
S6K M10 x 40	M10	40	6.4	17.0	1.5	630719	100
S6K M10 x 45	M10	45	6.4	17.0	1.5	630721	100
S6K M10 x 50	M10	50	6.4	17.0	1.5	630723	100
S6K M10 x 60	M10	60	6.4	17.0	1.5	630725	100
S6K M10 x 70	M10	70	6.4	17.0	1.5	630727	100
S6K M10 x 80	M10	80	6.4	17.0	1.5	630729	100
S6K M10 x 90	M10	90	6.4	17.0	1.5	630730	100
S6K M10 x 100	M10	100	6.4	17.0	1.5	630732	100
S6K M12 x 20	M12	20	7.5	19.0	1.75	630734	100
S6K M12 x 25	M12	25	7.5	19.0	1.75	630736	100
S6K M12 x 30	M12	30	7.5	19.0	1.75	630738	100
S6K M12 x 35	M12	35	7.5	19.0	1.75	630740	100
S6K M12 x 40	M12	40	7.5	19.0	1.75	630742	100
S6K M12 x 45	M12	45	7.5	19.0	1.75	630744	100

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M12 x 50	M12	50	7.5	19.0	1.75	630746	100
S6K M12 x 60	M12	60	7.5	19.0	1.75	630749	100
S6K M12 x 70	M12	70	7.5	19.0	1.75	630751	50
S6K M12 x 80	M12	80	7.5	19.0	1.75	630753	50
S6K M12 x 90	M12	90	7.5	19.0	1.75	630754	50
S6K M12 x 100	M12	100	7.5	19.0	1.75	630756	50
S6K M14 x 30	M14	30	8.8	22.0	2.0	642593	50
S6K M14 x 40	M14	40	8.8	22.0	2.0	642594	50
S6K M14 x 50	M14	50	8.8	22.0	2.0	630761	50
S6K M14 x 60	M14	60	8.8	22.0	2.0	630763	50
S6K M14 x 70	M14	70	8.8	22.0	2.0	630765	50
S6K M14 x 80	M14	80	8.8	22.0	2.0	630766	50
S6K M16 x 30	M16	30	10.0	24.0	2.0	630768	50
S6K M16 x 35	M16	35	10.0	24.0	2.0	630770	50
S6K M16 x 40	M16	40	10.0	24.0	2.0	630772	50
S6K M16 x 45	M16	45	10.0	24.0	2.0	630774	50
S6K M16 x 50	M16	50	10.0	24.0	2.0	630776	50
S6K M16 x 60	M16	60	10.0	24.0	2.0	630779	50
S6K M16 x 70	M16	70	10.0	24.0	2.0	630782	25
S6K M16 x 80	M16	80	10.0	24.0	2.0	630784	25
S6K M16 x 90	M16	90	10.0	24.0	2.0	630785	25
S6K M16 x 100	M16	100	10.0	24.0	2.0	630787	25
S6K M18 x 50	M18	50	11.5	27.0	2.5	630789	25
S6K M18 x 60	M18	60	11.5	27.0	2.5	630791	25
S6K M18 x 70	M18	70	11.5	27.0	2.5	630792	25
S6K M18 x 80	M18	80	11.5	27.0	2.5	630794	25
S6K M20 x 40	M20	40	12.5	30.0	2.5	630795	25
S6K M20 x 50	M20	50	12.5	30.0	2.5	630797	25
S6K M20 x 60	M20	60	12.5	30.0	2.5	630799	25
S6K M20 x 70	M20	70	12.5	30.0	2.5	630802	25
S6K M20 x 80	M20	80	12.5	30.0	2.5	630804	25
S6K M20 x 90	M20	90	12.5	30.0	2.5	630805	25
S6K M20 x 100	M20	100	12.5	30.0	2.5	630807	25

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

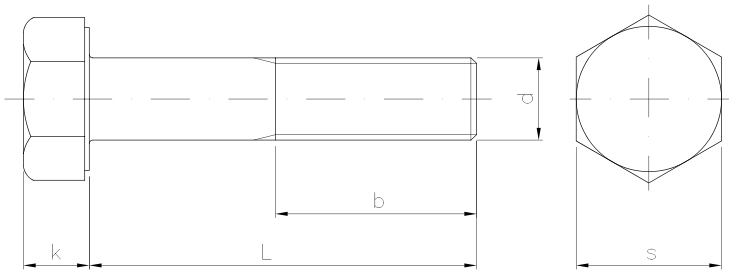
MARCOPOL

Hexagonal head bolt (incomplete thread), class 8.8

Related standards:

DIN 931
PN-EN ISO 4014

S6K 1102



Zn ZINC COATING 5 µm

CLASS 8.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M8 x 110	M8	10	5.3	13.0	22	1.25	630823	100
S6K M10 x 100	M10	100	6.4	17.0	26	1.5	630832	100
S6K M10 x 120	M10	120	6.4	17.0	26	1.5	630834	50
S6K M10 x 130	M10	130	6.4	17.0	32	1.5	630836	50
S6K M10 x 140	M10	140	6.4	17.0	32	1.5	630837	50
S6K M10 x 150	M10	150	6.4	17.0	32	1.5	630839	50
S6K M10 x 180	M10	180	6.4	17.0	32	1.5	630841	50
S6K M10 x 200	M10	200	6.4	17.0	32	1.5	630843	50
S6K M12 x 55	M12	55	7.5	19.0	30	1.75	630846	100
S6K M12 x 80	M12	80	7.5	19.0	30	1.75	630849	50
S6K M12 x 100	M12	100	7.5	19.0	30	1.75	630852	50
S6K M12 x 120	M12	120	7.5	19.0	30	1.75	630854	50
S6K M12 x 140	M12	140	7.5	19.0	36	1.75	630856	50
S6K M12 x 160	M12	160	7.5	19.0	36	1.75	630858	25
S6K M12 x 180	M12	180	7.5	19.0	36	1.75	630860	25
S6K M12 x 200	M12	200	7.5	19.0	36	1.75	27223	25
S6K M14 x 120	M14	120	8.8	22.0	34	2.0	630869	50
S6K M16 x 50	M16	50	10.0	24.0	38	2.0	630874	50
S6K M16 x 60	M16	60	10.0	24.0	38	2.0	630876	50
S6K M16 x 70	M16	70	10.0	24.0	38	2.0	630878	25
S6K M16 x 80	M16	80	10.0	24.0	38	2.0	630880	25
S6K M16 x 100	M16	100	10.0	24.0	38	2.0	630883	25
S6K M16 x 120	M16	120	10.0	24.0	38	2.0	630885	25
S6K M16 x 130	M16	130	10.0	24.0	44	2.0	630887	25
S6K M16 x 140	M16	140	10.0	24.0	44	2.0	630888	25
S6K M16 x 150	M16	150	10.0	24.0	44	2.0	630890	25
S6K M16 x 160	M16	160	10.0	24.0	44	2.0	630891	25
S6K M16 x 200	M16	200	10.0	24.0	44	2.0	630894	25
S6K M16 x 220	M16	200	10.0	24.0	57	2.0	630896	25
S6K M16 x 240	M16	240	10.0	24.0	57	2.0	630899	25

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M18 x 70	M18	70	11.5	27.0	42	2.5	630899	25
S6K M18 x 80	M18	80	11.5	27.0	42	2.5	630900	25
S6K M18 x 90	M18	90	11.5	27.0	42	2.5	630902	25
S6K M18 x 100	M18	100	11.5	27.0	42	2.5	630903	25
S6K M18 x 140	M18	140	11.5	27.0	48	2.5	630906	25
S6K M18 x 160	M18	140	11.5	27.0	48	2.5	630908	25
S6K M20 x 70	M20	70	12.5	30.0	46	2.5	630911	25
S6K M20 x 80	M20	80	12.5	30.0	46	2.5	630913	25
S6K M20 x 130	M20	130	12.5	30.0	52	2.5	630918	25
S6K M20 x 140	M20	140	12.5	30.0	52	2.5	630919	25
S6K M20 x 150	M20	150	12.5	30.0	52	2.5	630921	25
S6K M20 x 160	M20	160	12.5	30.0	52	2.5	630922	10
S6K M20 x 180	M20	180	12.5	30.0	52	2.5	630924	10
S6K M20 x 200	M20	200	12.5	30.0	52	2.5	630926	10
S6K M24 x 80	M24	80	15.0	36.0	54	3.0	630928	25
S6K M24 x 100	M24	100	15.0	36.0	54	3.0	630929	10
S6K M24 x 110	M24	110	15.0	36.0	54	3.0	630931	10
S6K M24 x 120	M24	120	15.0	36.0	54	3.0	630932	10
S6K M24 x 140	M24	140	15.0	36.0	60	3.0	630934	10
S6K M24 x 180	M24	180	15.0	36.0	60	3.0	630936	10
S6K M24 x 200	M24	200	15.0	36.0	60	3.0	630937	10
S6K M30 x 120	M30	120	18.7	46.0	66	3.5	630939	10
S6K M30 x 140	M30	140	18.7	46.0	72	3.5	630940	10
S6K M30 x 200	M30	200	18.7	46.0	72	3.5	630941	10

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

MARCOPOL

Hexagonal head bolt (incomplete thread), class 8.8

S6K **1102**

Code and size – packaging by weight

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [kg]
S6K M8 x 40	M8	40	5.3	13.0	22	1.25	630289	2.5
S6K M8 x 50	M8	50	5.3	13.0	22	1.25	630294	2.5
S6K M8 x 60	M8	60	5.3	13.0	22	1.25	630296	2.5
S6K M8 x 70	M8	70	5.3	13.0	22	1.25	630299	2.5
S6K M8 x 80	M8	80	5.3	13.0	22	1.25	630302	2.5
S6K M8 x 90	M8	90	5.3	13.0	22	1.25	630304	2.5
S6K M8 x 100	M8	100	5.3	13.0	22	1.25	642477	5
S6K M8 x 120	M8	120	5.3	13.0	22	1.25	642479	5
S6K M10 x 40	M10	40	6.4	17.0	26	1.5	630312	5
S6K M10 x 50	M10	50	6.4	17.0	26	1.5	630314	5
S6K M10 x 60	M10	60	6.4	17.0	26	1.5	630316	5
S6K M10 x 70	M10	70	6.4	17.0	26	1.5	630319	5
S6K M10 x 80	M10	80	6.4	17.0	26	1.5	640900	5
S6K M10 x 90	M10	90	6.4	17.0	26	1.5	640901	5
S6K M10 x 100	M10	100	6.4	17.0	26	1.5	640902	5
S6K M10 x 110	M10	110	6.4	17.0	26	1.5	640903	5
S6K M10 x 120	M10	120	6.4	17.0	26	1.5	640904	5
S6K M10 x 130	M10	130	6.4	17.0	32	1.5	640905	5
S6K M10 x 140	M10	140	6.4	17.0	32	1.5	640906	5
S6K M10 x 160	M10	160	6.4	17.0	32	1.5	640907	5
S6K M10 x 170	M10	170	6.4	17.0	32	1.5	640908	5
S6K M12 x 45	M12	45	7.5	19.0	30	1.75	630347	5
S6K M12 x 50	M12	50	7.5	19.0	30	1.75	630349	5
S6K M12 x 60	M12	60	7.5	19.0	30	1.75	630352	5
S6K M12 x 65	M12	65	7.5	19.0	30	1.75	630354	5
S6K M12 x 70	M12	70	7.5	19.0	30	1.75	640909	5
S6K M12 x 80	M12	80	7.5	19.0	30	1.75	640910	5
S6K M12 x 90	M12	90	7.5	19.0	30	1.75	640911	5
S6K M12 x 100	M12	100	7.5	19.0	30	1.75	640912	5
S6K M12 x 110	M12	110	7.5	19.0	30	1.75	640914	5
S6K M12 x 120	M12	120	7.5	19.0	30	1.75	640915	5
S6K M12 x 130	M12	130	7.5	19.0	36	1.75	640916	5
S6K M12 x 140	M12	140	7.5	19.0	36	1.75	630379	5
S6K M12 x 150	M12	150	7.5	19.0	36	1.75	630382	5
S6K M12 x 160	M12	160	7.5	19.0	36	1.75	630384	5
S6K M12 x 180	M12	180	7.5	19.0	36	1.75	642485	5
S6K M14 x 50	M14	50	8.8	22.0	34	2.0	642486	5
S6K M14 x 60	M14	60	8.8	22.0	34	2.0	642487	5
S6K M14 x 80	M14	80	8.8	22.0	34	2.0	642489	5
S6K M14 x 90	M14	90	8.8	22.0	34	2.0	642490	5
S6K M14 x 100	M14	100	8.8	22.0	34	2.0	642492	5
S6K M14 x 140	M14	140	8.8	22.0	40	2.0	642493	5

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [kg]
S6K M16 x 50	M16	50	10.0	24.0	38	2.0	642495	5
S6K M16 x 55	M16	55	10.0	24.0	38	2.0	642497	5
S6K M16 x 60	M16	60	10.0	24.0	38	2.0	642499	5
S6K M16 x 65	M16	65	10.0	24.0	38	2.0	642500	5
S6K M16 x 70	M16	70	10.0	24.0	38	2.0	642502	5
S6K M16 x 80	M16	80	10.0	24.0	38	2.0	642504	5
S6K M16 x 90	M16	90	10.0	24.0	38	2.0	642506	5
S6K M16 x 100	M16	100	10.0	24.0	38	2.0	642508	5
S6K M16 x 110	M16	110	10.0	24.0	38	2.0	642510	5
S6K M16 x 120	M16	120	10.0	24.0	38	2.0	642512	5
S6K M16 x 130	M16	130	10.0	24.0	44	2.0	630417	10
S6K M16 x 140	M16	140	10.0	24.0	44	2.0	630419	10
S6K M16 x 150	M16	150	10.0	24.0	44	2.0	630421	10
S6K M16 x 160	M16	160	10.0	24.0	44	2.0	630423	10
S6K M16 x 180	M16	180	10.0	24.0	44	2.0	630425	10
S6K M20 x 60	M20	60	12.5	30.0	42	2.5	630428	10
S6K M20 x 70	M20	70	12.5	30.0	42	2.5	630430	10
S6K M20 x 75	M20	75	12.5	30.0	42	2.5	630431	10
S6K M20 x 80	M20	80	12.5	30.0	42	2.5	640928	10
S6K M20 x 90	M20	90	12.5	30.0	42	2.5	640929	10
S6K M20 x 100	M20	100	12.5	30.0	42	2.5	640930	10
S6K M20 x 110	M20	110	12.5	30.0	42	2.5	640931	10
S6K M20 x 120	M20	120	12.5	30.0	42	2.5	630441	10
S6K M20 x 140	M20	140	12.5	30.0	48	2.5	630444	10
S6K M20 x 180	M20	180	12.5	30.0	48	2.5	630449	10
S6K M24 x 90	M24	90	15.0	36.0	54	3.0	640932	10
S6K M24 x 100	M24	100	15.0	36.0	54	3.0	640933	10
S6K M24 x 120	M24	120	15.0	36.0	54	3.0	630458	10
S6K M24 x 160	M24	160	15.0	36.0	60	3.0	630459	10

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

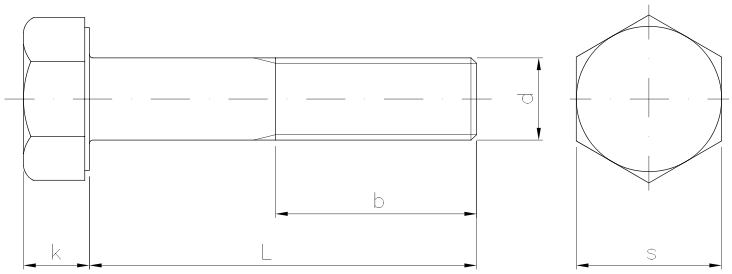
MARCOPOL

Hexagonal head bolt (incomplete thread), class 10.9

Related standards:

DIN 931
PN-EN ISO 4014

S6K 1102



CLASS 10.9

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M8 x 50	M8	50	5.3	13.0	22	1.25	630818	200
S6K M8 x 60	M8	60	5.3	13.0	22	1.25	630819	200
S6K M8 x 70	M8	70	5.3	13.0	22	1.25	630820	200
S6K M8 x 80	M8	80	5.3	13.0	22	1.25	630821	200
S6K M8 x 100	M8	100	5.3	13.0	22	1.25	630822	100
S6K M8 x 120	M8	120	5.3	13.0	22	1.25	640955	100
S6K M8 x 140	M8	140	5.3	13.0	28	1.25	630825	100
S6K M10 x 40	M10	40	6.4	16.0	26	1.5	630826	100
S6K M10 x 50	M10	50	6.4	16.0	26	1.5	630827	100
S6K M10 x 60	M10	60	6.4	16.0	26	1.5	630828	100
S6K M10 x 70	M10	70	6.4	16.0	26	1.5	630829	100
S6K M10 x 80	M10	80	6.4	16.0	26	1.5	640956	100
S6K M10 x 90	M10	90	6.4	16.0	26	1.5	630831	100
S6K M10 x 100	M10	100	6.4	16.0	26	1.5	630833	100
S6K M10 x 120	M10	120	6.4	16.0	26	1.5	642568	100
S6K M10 x 140	M10	140	6.4	16.0	32	1.5	630838	50
S6K M10 x 160	M10	160	6.4	16.0	32	1.5	630840	50
S6K M10 x 180	M10	180	6.4	16.0	32	1.5	630842	50
S6K M12 x 40	M12	40	7.5	18.0	30	1.75	630844	100
S6K M12 x 50	M12	50	7.5	18.0	30	1.75	630845	100
S6K M12 x 60	M12	60	7.5	18.0	30	1.75	630847	100
S6K M12 x 70	M12	70	7.5	18.0	30	1.75	630848	50
S6K M12 x 80	M12	80	7.5	18.0	30	1.75	630850	50
S6K M12 x 90	M12	90	7.5	18.0	30	1.75	630851	50
S6K M12 x 100	M12	100	7.5	18.0	30	1.75	630853	50
S6K M12 x 120	M12	120	7.5	18.0	30	1.75	630855	50
S6K M12 x 140	M12	140	7.5	18.0	36	1.75	630857	50
S6K M12 x 160	M12	160	7.5	18.0	36	1.75	630859	25
S6K M12 x 180	M12	180	7.5	18.0	36	1.75	630861	25
S6K M12 x 200	M12	200	7.5	18.0	36	1.75	630863	25

Code and size	Thread type d	L [mm]	k [mm]	s [mm]	b [mm]	Thread pitch P [mm]	Index	Packaging [pcs]
S6K M14 x 50	M14	50	8.8	19.0	34	2.0	630864	50
S6K M14 x 60	M14	60	8.8	19.0	34	2.0	630865	50
S6K M14 x 70	M14	70	8.8	19.0	34	2.0	630866	50
S6K M14 x 80	M14	80	8.8	19.0	34	2.0	630867	50
S6K M14 x 100	M14	100	8.8	19.0	34	2.0	630868	50
S6K M14 x 120	M14	120	8.8	19.0	34	2.0	630870	50
S6K M14 x 140	M14	140	8.8	19.0	40	2.0	630871	25
S6K M14 x 160	M14	160	8.8	19.0	40	2.0	630872	25
S6K M14 x 180	M14	180	8.8	19.0	40	2.0	630873	25
S6K M16 x 50	M16	50	10.0	24.0	38	2.0	630875	50
S6K M16 x 60	M16	60	10.0	24.0	38	2.0	630877	50
S6K M16 x 70	M16	70	10.0	24.0	38	2.0	630879	25
S6K M16 x 80	M16	80	10.0	24.0	38	2.0	630881	25
S6K M16 x 90	M16	90	10.0	24.0	38	2.0	630882	25
S6K M16 x 100	M16	100	10.0	24.0	38	2.0	630884	25
S6K M16 x 120	M16	120	10.0	24.0	38	2.0	630886	25
S6K M16 x 140	M16	140	10.0	24.0	44	2.0	630889	25
S6K M16 x 160	M16	160	10.0	24.0	44	2.0	630892	25
S6K M16 x 180	M16	180	10.0	24.0	44	2.0	630893	25
S6K M16 x 200	M16	200	10.0	24.0	44	2.0	630895	25
S6K M18 x 60	M18	60	11.5	27.0	42	2.5	630898	25
S6K M18 x 80	M18	80	11.5	27.0	42	2.5	630901	25
S6K M18 x 100	M18	100	11.5	27.0	42	2.5	630904	25
S6K M18 x 120	M18	120	11.5	27.0	42	2.5	630905	25
S6K M18 x 140	M18	140	11.5	27.0	48	2.5	630907	25
S6K M18 x 160	M18	160	11.5	27.0	48	2.5	630909	25
S6K M20 x 60	M20	60	12.5	30.0	46	2.5	630910	25
S6K M20 x 70	M20	70	12.5	30.0	46	2.5	630912	25
S6K M20 x 80	M20	80	12.5	30.0	46	2.5	630914	25
S6K M20 x 90	M20	90	12.5	30.0	46	2.5	630915	25
S6K M20 x 100	M20	100	12.5	30.0	46	2.5	630916	25
S6K M20 x 120	M20	120	12.5	30.0	46	2.5	630917	25
S6K M20 x 140	M20	140	12.5	30.0	52	2.5	630920	25
S6K M20 x 160	M20	160	12.5	30.0	52	2.5	630923	10
S6K M20 x 180	M20	180	12.5	30.0	52	2.5	630925	10
S6K M20 x 200	M20	200	12.5	30.0	52	2.5	630927	10
S6K M24 x 100	M24	100	15.0	36.0	54	3.0	630930	10
S6K M24 x 120	M24	120	15.0	36.0	54	3.0	630933	10
S6K M24 x 140	M24	140	15.0	36.0	60	3.0	630935	10
S6K M24 x 200	M24	200	15.0	36.0	60	3.0	630938	10

* Assemblies are available in sizes not included in what is offered – please ask your consultant for details.

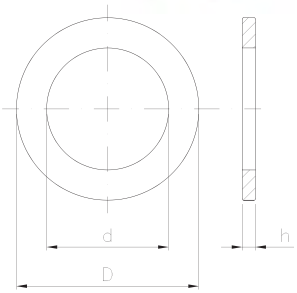
MARCOPOL

200HV round washer

Related standards:

DIN 125
ISO 7089
ISO 7091

PZ 1401



Zn ZINC COATING 3 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

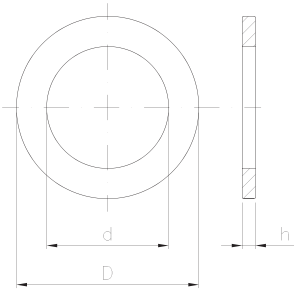
Code and size	d [mm]	D [mm]	h [mm]	Index	Packaging [pcs]
PZ M8	8.4	16	1.6	632330	100
PZ M10	10.5	20	2.0	632333	100
PZ M20	21.0	37	3.0	632343	100
PZ M24	25.0	44	4.0	632347	100

200HV round washer – HDG

Related standards:

DIN 125
ISO 7089
ISO 7091

PZ 1401



HDG HOT-DIP GALVANIZATION

CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

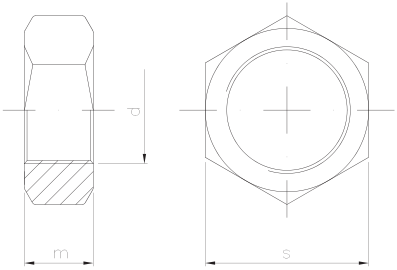
Code and size	d [mm]	D [mm]	h [mm]	Index	Packaging [pcs]
PZ M10	10.5	20	2.0	632336	100
PZ M12	13.0	24	2.5	632338	100
PZ M16	17.0	30	3.0	636775	100
PZ M20	21.0	37	3.0	632345	100
PZ M24	25.0	44	4.0	632349	50

Hexagonal coupling, class 8

Related standards:

DIN 934
ISO 4032

N6K 1501



Zn ZINC COATING 3 µm

CLASS 8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [pcs]
N6K M8	M8	13	6.5	80645	1,000
N6K M10	M10	17	8	80646	1,000
N6K M12	M12	19	10	74731	500
N6K M14	M14	22	11	5981	250
N6K M16	M16	24	13	13569	200
N6K M18	M18	27	15	49621	100
N6K M20	M20	30	16	15535	100
N6K M22	M22	32	18	16482	100
N6K M24	M24	36	19	18663	100
N6K M27	M27	41	22	79720	100
N6K M30	M30	46	24	6328	10
N6K M33	M33	50	26	92610	10
N6K M36	M36	55	29	80600	10

Code and size – packaging by weight

Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [kg]
N6K M8	M8	13	6.5	631780	2.5
N6K M10	M10	17	8	631785	5
N6K M12	M12	19	10	631793	5
N6K M14	M14	22	11	642353	5
N6K M16	M16	24	13	642355	5
N6K M18	M18	27	15	642359	5
N6K M20	M20	30	16	642361	5
N6K M22	M22	32	18	642365	5
N6K M24	M24	36	19	642367	5
N6K M27	M27	41	22	631822	10
N6K M30	M30	46	24	631824	10

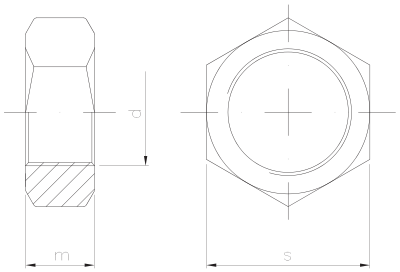
MARCOPOL

Hexagonal coupling, class 10

Related standards:

DIN 934
PN-EN ISO 4032

N6K 1501



CLASS 10

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [pcs]
N6K M8	M8	13	6.5	632448	200
N6K M10	M10	17	8	632454	100
N6K M12	M12	19	10	642831	100
N6K M14	M14	22	11	642832	100
N6K M16	M16	24	13	642833	100
N6K M18	M18	27	15	632475	100
N6K M20	M20	30	16	632482	25

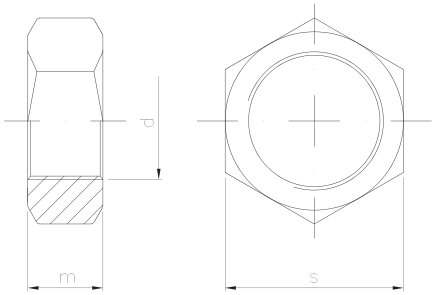
Code and size – packaging by weight

Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [kg]
N6K M10	M10	17	8	631787	5
N6K M16	M16	24	13	631804	5
N6K M20	M20	30	16	642362	5
N6K M36	M36	55	26	642375	5

HDG Hexagonal coupling – ISOFIT, class 8

Related standards:
DIN 934
PN-EN ISO 4032

N6K 1501



HDG HOT-DIP GALVANIZATION · CLASS 8 · ISO-FIT · CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size – individual packaging

Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [pcs]
N6K M10	M10	17	8	632456	100
N6K M12	M12	19	10	632462	100
N6K M16	M16	24	13	642834	100
N6K M20	M20	30	16	632481	50
N6K M22	M22	32	18	632484	50
N6K M24	M24	36	19	632488	50
N6K M27	M27	41	22	632491	25
N6K M30	M30	46	24	632495	25

Code and size – packaging by weight

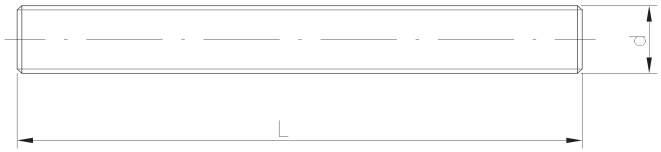
Code and size	Thread type d	s [mm]	m [mm]	Index	Packaging [kg]
N6K M10	M10	17	8	631790	5
N6K M12	M12	19	10	642352	5
N6K M16	M16	24	13	642357	5
N6K M24	M24	36	19	642369	5

MARCOPOL

Threaded rod, class 4.8

AT-15-8605/2016
Related standards:
DIN 975, DIN 976-1

PG 5352



Zn ZINC COATING 5µm

CLASS 4.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d	L [mm]	Index	Packaging [pcs]
PG M4 x 1,000	M4	1,000	55042	100
PG M5 x 1,000	M5	1,000	54052	100
PG M6 x 1,000	M6	1,000	13376	100
PG M6 x 2,000	M6	2,000	13770	50
PG M8 x 1,000	M8	1,000	13377	50
PG M8 x 2,000	M8	2,000	18147	25
PG M10 x 1,000	M10	1,000	13378	25
PG M10 x 2,000	M10	2,000	98882	25
PG M12 x 1,000	M12	1,000	13771	25
PG M12 x 2,000	M12	2,000	37355	20
PG M14 x 1,000	M14	1,000	98883	10
PG M14 x 2,000	M14	2,000	99723	5
PG M16 x 1,000	M16	1,000	98884	10
PG M16 x 2,000	M16	2,000	38614	10
PG M18 x 1,000	M18	1,000	98886	5
PG M20 x 1,000	M20	1,000	98887	5
PG M20 x 2,000	M20	2,000	98888	5
PG M22 x 1,000	M22	1,000	98889	5
PG M24 x 1,000	M24	1,000	98890	5
PG M27 x 1,000	M27	1,000	7060	5
PG M30 x 1,000	M30	1,000	51492	5
PG M36 x 1,000	M36	1,000	99724	2

Strength characteristics

Thread type d	Nominal cross-sectional area A_s [mm²] (*)	Nominal tensile strength $R_{m\,nom}$ [N/mm²]	Minimum tensile strength $R_{m\,min}$ [N/mm²]	Breakout force $P = A_s \times R_{M\,MIN}$ [kN]
M4	8.78	400	420	3.69
M5	14.2			5.96
M6	20.1			8.44
M8	36.6			15.40
M10	58.0			24.40
M12	84.3			35.40
M14	115.0			48.30
M16	157.0			65.90
M18	192.0			80.60
M20	245.0			103.00
M22	303.0			127.00
M24	353.0			148.00
M27	459.0			193.00
M30	561.0			236.00
M36	817.0			343.00

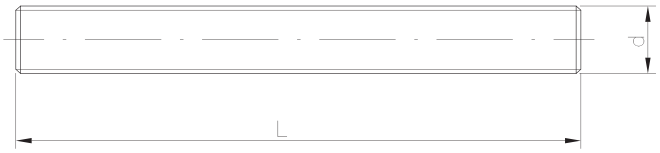
(*) In accordance with PN-EN ISO 898-1:2013

* Rods with a length of L = 3,000 mm are available – please ask your consultant for details.

Threaded rod, class 8.8

AT-15-8605/2016
Related standards:
DIN 975, DIN 976-1

PG 5352



Zn ZINC COATING 5 µm

CLASS 8.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d	L [mm]	Index	Packaging [pcs]
PG M6 x 1,000	M6	1,000	48942	100
PG M8 x 1,000	M8	1,000	98436	50
PG M10 x 1,000	M10	1,000	19519	25
PG M12 x 1,000	M12	1,000	98438	25
PG M14 x 1,000	M14	1,000	41636	10
PG M16 x 1,000	M16	1,000	98439	10
PG M18 x 1,000	M18	1,000	95333	10
PG M20 x 1,000	M20	1,000	11092	5
PG M20 x 2,000	M20	2,000	16452	5
PG M24 x 1,000	M24	1,000	18270	5
PG M27 x 1,000	M27	1,000	95334	5
PG M30 x 1,000	M30	1,000	2417	5
PG M36 x 1,000	M36	1,000	48963	2

Strength characteristics

Thread type d	Nominal cross-sectional area A_s [mm²] (*)	Nominal tensile strength $R_{m\,nom}$ [N/mm²]	Minimum tensile strength $R_{m\,min}$ [N/mm²]	Breakout force $P = A_s \times R_{M\,MIN}$ [kN]
M6	20.1	800	800	16.10
M8	36.6		800	29.20
M10	58.0		800	46.40
M12	84.3		800	67.40
M14	115.0		800	92.00
M16	157.0		800	125.00
M18	192.0		830	159.00
M20	245.0		830	203.00
M22	303.0		830	252.00
M24	353.0		830	293.00
M27	459.0		830	381.00
M30	561.0		830	466.00
M36	817.0		830	678.00

(*) In accordance with PN-EN ISO 898-1:2013

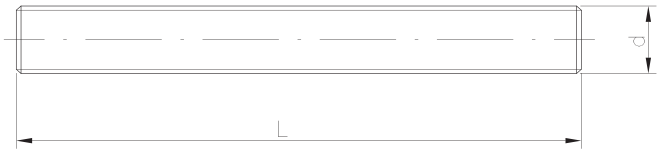
* Rods with a length of L = 3,000 mm are available – please ask your consultant for details.

MARCOPOL

Threaded rod
HDG ISO-FIT, class 8.8

AT-15-8605/2016
Related standards:
DIN 975, DIN 976-1

PG **5352**



HDG HOT-DIP GALVANIZATION · CLASS 8.8 · ISO-FIT · CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d	L [mm]	Index	Packaging [pcs]
PG M10 x 1,000	M10	1,000	55826	25
PG M12 x 1,000	M12	1,000	55830	20
PG M16 x 1,000	M16	1,000	55832	10
PG M20 x 1,000	M20	1,000	55835	5
PG M22 x 1,000	M22	1,000	55837	5
PG M24 x 1,000	M24	1,000	55843	5
PG M27 x 1,000	M27	1,000	55848	5
PG M30 x 1,000	M30	1,000	55850	5
PG M33 x 1,000	M33	1,000	55852	3
PG M36 x 1,000	M36	1,000	55853	3

Strength characteristics

Thread type d	Nominal cross-sectional area A_s [mm²] (*)	Nominal tensile strength $R_{m\,nom}$ [N/mm²]	Minimum tensile strength $R_{m\,min}$ [N/mm²]	Breakout force $P = A_s \times R_{M\,MIN}$ [kN]
M10	58.0	800	800	46.40
M12	84.3		800	67.40
M16	157.0		800	125.00
M20	245.0		830	203.00
M22	303.0		830	252.00
M24	353.0		830	293.00
M27	459.0		830	381.00
M30	561.0		830	466.00
M33	694.0		830	576.00
M36	817.0		830	678.00

(*) In accordance with PN-EN ISO 898-1:2013

* Rods with a length of L = 3,000 mm are available – please ask your consultant for details.

Threaded rod
A2-70

AT-15-8605/2016
Related standards:
DIN 975, DIN 976-1

PG I5352

A2 AGID-RESISTANT
CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d	L [mm]	Index	Packaging [pcs]
PG M5 x 1,000	M5	1,000	4824	1
PG M6 x 1,000	M6	1,000	31875	1
PG M8 x 1,000	M8	1,000	31876	1
			31876	50
PG M8 x 2,000	M8	2,000	31877	1
			7327	50
PG M10 x 1,000	M10	1,000	53769	1
			13233	25
PG M10 x 2,000	M10	2,000	53248	1
PG M12 x 1,000	M12	1,000	4832	1
			13213	20
PG M12 x 2,000	M12	2,000	53249	1
			46417	20
PG M14 x 1,000	M14	1,000	4833	1
			14929	10
PG M16 x 1,000	M16	1,000	4835	1
			14978	10
PG M20 x 1,000	M20	1,000	45005	1
			15635	5

Strength characteristics

Thread type d	Nominal cross-sectional area A_s [mm²] (*)	Minimum tensile strength $R_{m\,min}$ [N/mm²]	Breakout force $P = A_s \times R_{M\,MIN}$ [kN]
M5	14.2	700	9.94
M6	20.1		14.07
M8	36.6		25.62
M10	58.0		40.60
M12	84.3		59.01
M14	115.0		80.50
M16	157.0		109.90
M20	245.0		171.50

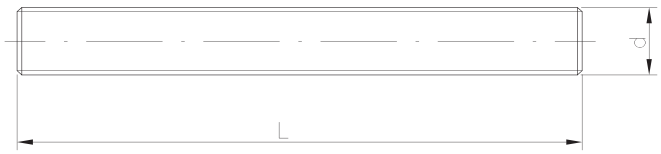
(*) In accordance with PN-EN ISO 898-1:2013

MARCOPOL

Threaded rod
A4-70

AT-15-8605/2016
Related standards:
DIN 975, DIN 976-1

PG I5352



A4 ACID-RESISTANT

CORROSION CLASS C5

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d	L [mm]	Index	Packaging [pcs]
PG M6 x 1,000	M6	1,000	643323	10
PG M8 x 1,000	M8	1,000	643325	10
PG M10 x 1,000	M10	1,000	643327	10
PG M12 x 1,000	M12	1,000	643329	10
PG M16 x 1,000	M16	1,000	643332	5

Strength characteristics

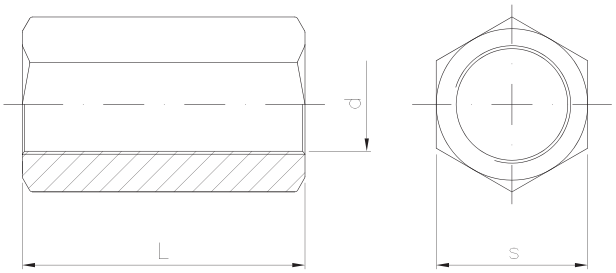
Thread type d	Nominal cross-sectional area A_s [mm²] (*)	Minimum tensile strength $R_{m\,min}$ [N/mm²]	Breakout force $P = A_s \times R_{M\,MIN}$ [kN]
M6	20.1	700	14.07
M8	36.6		25.62
M10	58.0		40.60
M12	84.3		59.01
M16	157.0		109.90

(*) In accordance with PN-EN ISO 898-1:2013

Hexagonal coupling nut

AT-15-8605/2016
Related standards:
DIN 6334~

NLACZ 1502



Zn ZINC COATING 5µm

CORROSION CLASS C1

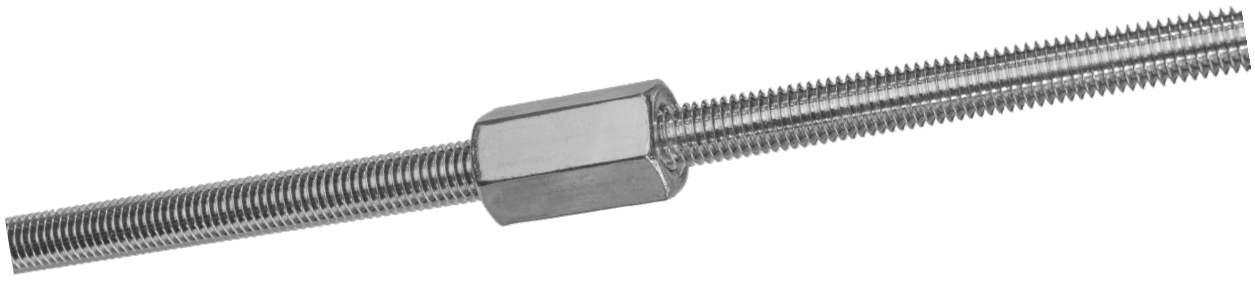
A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	s [mm]	Index	Packaging [pcs]
NLACZ M5 x 15	M5	15	8	50748	1,000
NLACZ M5 x 25	M5	25	8	56478	1,000
NLACZ M6 x 18	M6	18	10	6320	1,000
NLACZ M6 x 40	M6	40	10	80846	1,000
NLACZ M8 x 24	M8	24	13	90963	500
NLACZ M10 x 30	M10	30	17	10028	100
NLACZ M12 x 36	M12	36	19	20351	100
NLACZ M14 x 42	M14	42	22	74187	25
NLACZ M16 x 48	M16	48	24	39266	25
NLACZ M20 x 60	M20	60	30	39897	25
NLACZ M24 x 72	M24	72	36	97851	10

Application

Connecting and extending clamping elements in suspension systems. Facilitates the joining of threaded rods, used when installing suspension systems to load-bearing structures.



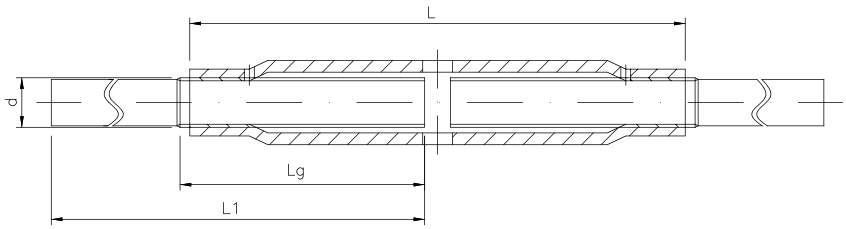
MARCOPOL

Tubular tension nut with rods

NEW

ITB-KOT-2017/0215

NN235-PP 6370



Zn ZINC COATING 8µm

CORROSION CLASS C2

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	Lg min [mm]	L1 [mm]	Index	Packaging [pcs]
NN235-PP M6 x 105	M6	105	53	120	640822	50
NN235-PP M8 x 112	M8	112	55	120	640823	50
NN235-PP M10 x 123	M10	123	60	149	640824	25
NN235-PP M12 x 125	M12	125	75	150	640825	25
NN235-PP M16 x 168	M16	168	98	200	640826	10
NN235-PP M20 x 200	M20	200	120	230	640827	5
NN235-PP M22 x 216	M22	216	125	218	640828	5
NN235-PP M24 x 255	M24	255	146	260	640829	5
NN235-PP M27 x 255	M27	255	155	260	640830	5
NN235-PP M30 x 255	M30	255	155	260	640831	5
NN235-PP M36 x 310	M36	310	175	300	640832	3

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
NN235-PP M6 x 105	10.0
NN235-PP M8 x 112	19.0
NN235-PP M10 x 123	35.0
NN235-PP M12 x 125	51.0
NN235-PP M16 x 168	93.0
NN235-PP M20 x 200	140.0
NN235-PP M22 x 216	166.0
NN235-PP M24 x 255	186.0
NN235-PP M27 x 255	260.0
NN235-PP M30 x 255	300.0
NN235-PP M36 x 310	380.0

Application

Tubular tension nuts are used for bracing metal and wooden structures in industrial buildings, warehouses and public buildings. They serve as tensioning elements when bracing load-bearing wall and roof structures.

Material

- Body – Q235 steel – equivalent to S235JR steel – galvanized coating with a thickness of ≥ 8 µm
- Threaded rod – untreated material

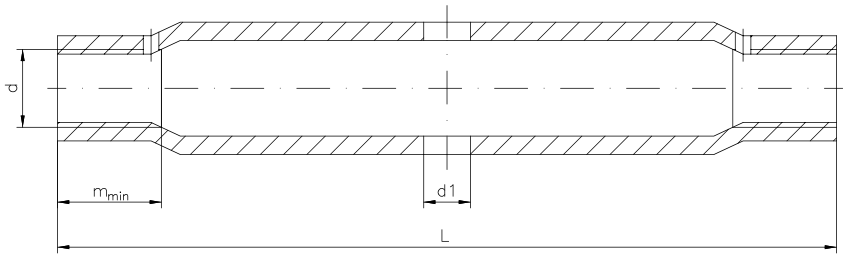
MARCOPOL

Tubular tension nut

NEW

ITB-KOT-2017/0215

NN235 6371



Zn ZINC COATING 8µm

CORROSION CLASS C2

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	d1 [mm]	m_{min} [mm]	Index	Packaging [pcs]
NN235 M6 x 105	M6	105	5.8 ± 0.3	7.5	641460	50
NN235 M8 x 112	M8	112	7.7 ± 0.3	10	641461	50
NN235 M10 x 123	M10	123	7.8 ± 0.3	12	641462	50
NN235 M12 x 125	M12	125	9.6 ± 0.6	15	641463	50
NN235 M16 x 168	M16	168	9.9 ± 0.6	20	641464	25
NN235 M20 x 200	M20	200	12.0 ± 0.6	24	641465	25
NN235 M22 x 216	M22	216	12.0 ± 0.6	25	641466	10
NN235 M24 x 255	M24	255	12.0 ± 0.6	29	641467	10
NN235 M27 x 255	M27	255	14.5 ± 0.6	32	641468	10
NN235 M30 x 255	M30	255	16.0 ± 0.6	36	641469	10
NN235 M36 x 310	M36	310	16.5 ± 0.6	43	641470	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
NN235 M6 x 105	10.0
NN235 M8 x 112	19.0
NN235 M10 x 123	35.0
NN235 M12 x 125	51.0
NN235 M16 x 168	93.0
NN235 M20 x 200	140.0
NN235 M22 x 216	166.0
NN235 M24 x 255	186.0
NN235 M27 x 255	260.0
NN235 M30 x 255	300.0
NN235 M36 x 310	380.0

Application

Tubular tension nuts are used for bracing metal and wooden structures in industrial buildings, warehouses and public buildings. They serve as tensioning elements when bracing load-bearing wall and roof structures.

Material

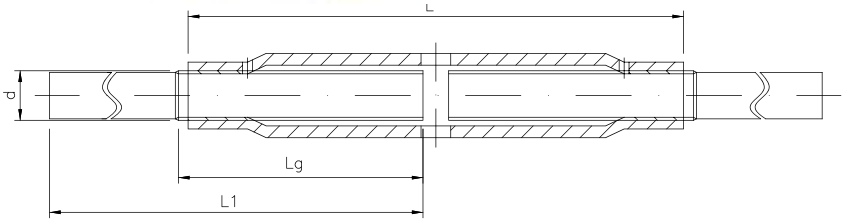
- Q235 steel – equivalent to S235JR steel – galvanized coating with a thickness of ≥ 8 µm

MARCOPOL

Tubular tension nut with rods

NEW

NN355-PP 6372



UPON REQUEST

HDG HOT-DIP GALVANIZATION

CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	Lg min [mm]	L1 [mm]	Index	Packaging [pcs]
NN355-PP M12 x 125	M12	125	75	150	640834	25
NN355-PP M16 x 168	M16	168	98	200	640835	10
NN355-PP M20 x 200	M20	220	115	220	640836	5
NN355-PP M24 x 255	M24	255	146	260	640837	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
NN355-PP M12 x 125	76.0
NN355-PP M16 x 168	141.0
NN355-PP M20 x 200	220.0
NN355-PP M24 x 255	318.0

Application

Tubular tension nuts are used for bracing metal and wooden structures in industrial buildings, warehouses and public buildings. They serve as tensioning elements when bracing load-bearing wall and roof structures.

Material

- Body – Q345B steel – equivalent to S355JR steel – hot-dip galvanization with a thickness of ≥ 40 µm
- Threaded rod – untreated material, class: at least 10.9

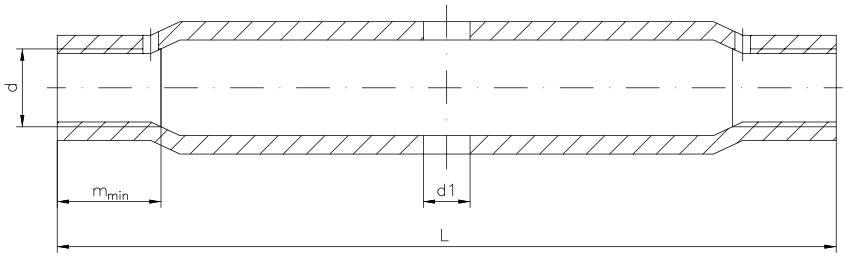
*** Available upon request – delivery within approx. 14 days.**

Tubular tension nut

NEW

ITB-KOT-2017/0215

NN355 6373



HDG HOT-DIP GALVANIZATION
CORROSION CLASS C4

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	L [mm]	d1 [mm]	m_{min} [mm]	Index	Packaging [pcs]
NN355 M12 x 125	M12	125	9.6 ± 0.6	15	640838	50
NN355 M16 x 168	M16	168	9.9 ± 0.6	20	640839	25
NN355 M20 x 200	M20	200	12.0 ± 0.6	24	640840	25
NN355 M24 x 255	M24	255	12.0 ± 0.6	29	640841	10

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
NN355 M12 x 125	76.0
NN355 M16 x 168	141.0
NN355 M20 x 200	220.0
NN355 M24 x 255	318.0

Application

Tubular tension nuts are used for bracing metal and wooden structures in industrial buildings, warehouses and public buildings. They serve as tensioning elements when bracing load-bearing wall and roof structures.

Material

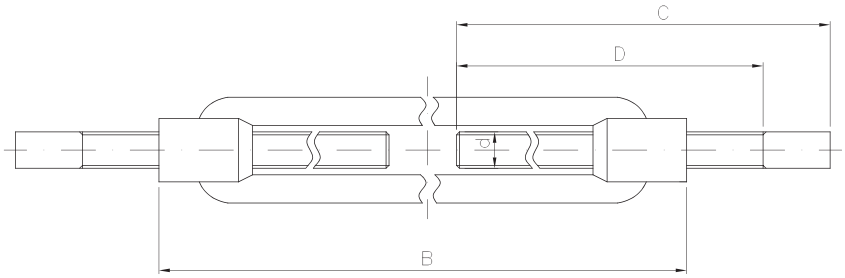
- Body – Q345B steel – equivalent to S355JR steel – hot-dip galvanization with a thickness of ≥ 40 µm

MARCOPOL

Straight turnbuckle

ITB-KOT-2017/0215

SRM-PP 6312



Zn ZINC COATING 8 µm

CORROSION CLASS C2

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	C [mm]	D [mm]	Index	Packaging [pcs]
SRM-PP M5 x 70	M5	70	85 ± 3	40	74683	50
SRM-PP M6 x 110	M6	110	120 ± 3	65	74684	50
SRM-PP M8 x 110	M8	110	120 ± 3	65	74685	50
SRM-PP M10 x 125	M10	125	150 ± 3	75	74686	25
SRM-PP M12 x 125	M12	125	150 ± 3	75	74687	25
SRM-PP M14 x 140	M14	140	162 ± 4	85	74689	10
SRM-PP M16 x 170	M16	170	196 ± 4	100	74690	10
SRM-PP M20 x 200	M20	200	216 ± 5	120	74691	5
SRM-PP M22 x 220	M22	220	216 ± 5	130	74699	5
SRM-PP M24 x 255	M24	255	256 ± 5	150	74701	5
SRM-PP M27 x 255	M27	255	256 ± 5	150	74709	5
SRM-PP M30 x 255	M30	255	256 ± 5	160	74710	5
SRM-PP M36 x 295	M36	295	300 ± 5	180	74711	1

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRM-PP M5 x 70	6.01
SRM-PP M6 x 110	13.52
SRM-PP M8 x 110	20.62
SRM-PP M10 x 125	31.84
SRM-PP M12 x 125	44.96
SRM-PP M14 x 140	63.96
SRM-PP M16 x 170	85.37
SRM-PP M20 x 200	132.33
SRM-PP M22 x 220	164.60
SRM-PP M24 x 255	165.42
SRM-PP M27 x 255	182.18
SRM-PP M30 x 255	273.35
SRM-PP M36 x 295	300.74

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities.

Material

- S235JR steel in accordance with PN-EN 10025-2:2007
- Electrolytic zinc coating with a thickness of at least 8 µm

Scope of application

Due to the corrosive aggressiveness of the environment, the fasteners should be used in environments categorised as C1 or C2 in accordance with PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

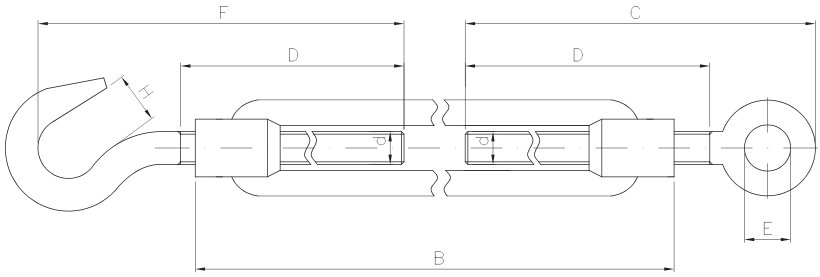
Installation instructions:

MARCOPOL

Turnbuckle
EYE + HOOK

ITB-KOT-2017/0215

SRM-HO 6308



Zn ZINC COATING 8 µm

CORROSION CLASS C2

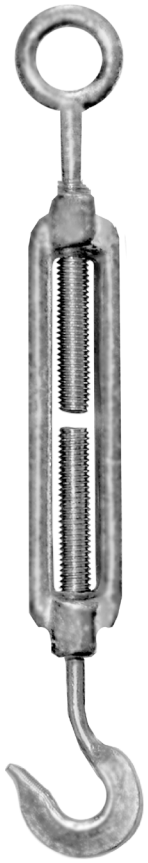
A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	C [mm]	F [mm]	D [mm]	H [mm]	E_{min} [mm]	Index	Packaging [pcs]
SRM-HO M5 x 70	M5	70	57 ± 3	56 ± 3	35	7	8	74668	50
SRM-HO M6 x 110	M6	110	80 ± 3	77 ± 3	55	8	9	74669	50
SRM-HO M8 x 110	M8	110	85 ± 3	89 ± 3	57	10.5	10	14291	50
SRM-HO M10 x 125	M10	125	105 ± 3	106 ± 3	68	13	14	74671	25
SRM-HO M12 x 125	M12	125	111 ± 3	117 ± 3	70	16	16	74672	25
SRM-HO M14 x 140	M14	140	124 ± 4	124 ± 4	75	18	18	74673	10
SRM-HO M16 x 170	M16	170	150 ± 4	144 ± 4	88	20	22	74674	10
SRM-HO M18 x 200	M18	200	160 ± 4	163 ± 4	98	21	25	74675	10
SRM-HO M20 x 200	M20	200	168 ± 5	170 ± 5	105	21	25	74676	5
SRM-HO M22 x 220	M22	220	190 ± 5	200 ± 5	118	24	28	74677	5
SRM-HO M24 x 255	M24	255	215 ± 5	220 ± 5	135	26	28	74678	5
SRM-HO M27 x 255	M27	255	224 ± 5	240 ± 5	135	34	31	74680	5
SRM-HO M30 x 255	M30	255	224 ± 5	240 ± 5	135	34	31	74682	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRM-HO M5 x 70	1.31
SRM-HO M6 x 110	2.54
SRM-HO M8 x 110	4.94
SRM-HO M10 x 125	5.29
SRM-HO M12 x 125	8.29
SRM-HO M14 x 140	9.62
SRM-HO M16 x 170	17.22
SRM-HO M18 x 200	17.24
SRM-HO M20 x 200	26.29
SRM-HO M22 x 220	28.62
SRM-HO M24 x 255	29.51
SRM-HO M27 x 255	29.86
SRM-HO M30 x 255	43.60



Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- S235JR steel in accordance with PN-EN 10025-2:2007
- Electrolytic zinc coating with a thickness of at least 8 µm

Scope of application

Due to the corrosive aggressiveness of the environment, the fasteners should be used in environments categorised as C1 or C2 in accordance with PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

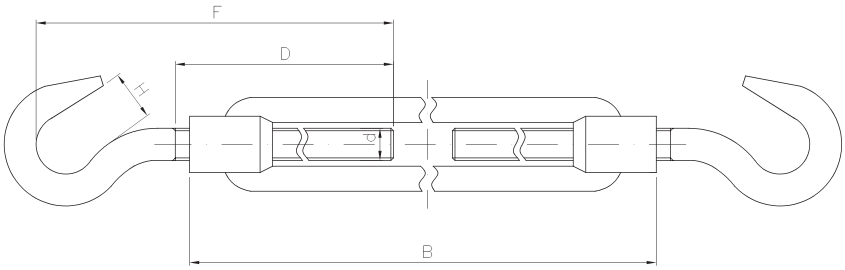
Installation instructions:

MARCOPOL

Turnbuckle
HOOK + HOOK

ITB-KOT-2017/0215

SRM-HH 6328



Zn ZINC COATING 8 µm

CORROSION CLASS C2

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	F [mm]	D [mm]	H [mm]	Index	Packaging [pcs]
SRM-HH M5 x 70	M5	70	56 ± 3	35	7	74628	50
SRM-HH M6 x 110	M6	110	77 ± 3	55	8	74631	50
SRM-HH M8 x 110	M8	110	89 ± 3	57	10.5	74642	50
SRM-HH M10 x 125	M10	125	106 ± 3	68	13	74643	25
SRM-HH M12 x 125	M12	125	117 ± 3	70	16	74644	25
SRM-HH M14 x 140	M14	140	124 ± 4	75	18	74648	10
SRM-HH M16 x 170	M16	170	144 ± 4	88	20	74652	10
SRM-HH M18 x 200	M18	200	163 ± 4	98	21	74655	5
SRM-HH M20 x 200	M20	200	170 ± 5	105	21	74656	5
SRM-HH M22 x 220	M22	220	200 ± 5	118	24	74657	5
SRM-HH M24 x 255	M24	255	220 ± 5	135	26	74665	5
SRM-HH M27 x 255	M27	255	240 ± 5	135	34	74666	5
SRM-HH M30 x 255	M30	255	240 ± 5	135	34	74667	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRM-HH M5 x 70	1.31
SRM-HH M6 x 110	2.54
SRM-HH M8 x 110	4.94
SRM-HH M10 x 125	5.29
SRM-HH M12 x 125	8.29
SRM-HH M14 x 140	9.62
SRM-HH M16 x 170	17.22
SRM-HH M18 x 200	17.24
SRM-HH M20 x 200	26.29
SRM-HH M22 x 220	28.62
SRM-HH M24 x 255	29.51
SRM-HH M27 x 255	29.86
SRM-HH M30 x 255	43.60

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- S235JR steel in accordance with PN-EN 10025-2:2007
- Electrolytic zinc coating with a thickness of at least 8 µm

Scope of application

Due to the corrosive aggressiveness of the environment, the fasteners should be used in environments categorised as C1 or C2 in accordance with PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

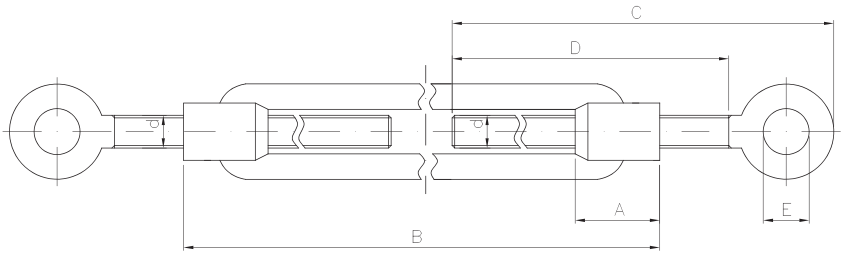
Installation instructions:

MARCOPOL

Turnbuckle
EYE + EYE

ITB-KOT-2017/0215

SRM-OO 6309



Zn ZINC COATING 8 µm

CORROSION CLASS C2

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	C [mm]	D [mm]	E_{min} [mm]	N [mm]	Index	Packaging [pcs]
SRM-OO M6 x 110	M6	110	80 ± 3	55	9	12	74616	50
SRM-OO M8 x 110	M8	110	85 ± 3	57	10	15	74617	50
SRM-OO M10 x 125	M10	125	105 ± 3	68	14	18	74618	25
SRM-OO M12 x 125	M12	125	111 ± 3	70	16	21	74619	25
SRM-OO M14 x 140	M14	140	124 ± 4	75	18	25	74620	10
SRM-OO M16 x 170	M16	170	150 ± 4	88	22	27	74621	10
SRM-OO M18 x 200	M18	200	160 ± 4	98	25	32	74622	10
SRM-OO M20 x 200	M20	200	168 ± 5	105	25	34	74623	5
SRM-OO M22 x 220	M22	220	190 ± 5	118	28	34.5	74624	5
SRM-OO M24 x 255	M24	255	215 ± 5	135	28	39	74625	5
SRM-OO M27 x 255	M27	255	224 ± 5	135	31	42.5	74626	5
SRM-OO M30 x 255	M30	255	224 ± 5	135	31	42.5	74627	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRM-OO M6 x 110	1.73
SRM-OO M8 x 110	7.01
SRM-OO M10 x 125	21.18
SRM-OO M12 x 125	24.81
SRM-OO M14 x 140	25.02
SRM-OO M16 x 170	64.09
SRM-OO M18 x 200	72.55
SRM-OO M20 x 200	86.06
SRM-OO M22 x 220	96.60
SRM-OO M24 x 255	146.49
SRM-OO M27 x 255	168.67
SRM-OO M30 x 255	190.07

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- S235JR steel in accordance with PN-EN 10025-2:2007
- Electrolytic zinc coating with a thickness of at least 8 µm

Scope of application

Due to the corrosive aggressiveness of the environment, the fasteners should be used in environments categorised as C1 or C2 in accordance with PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

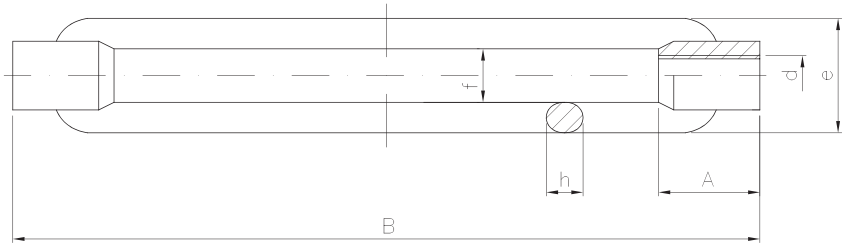
Installation instructions:

MARCOPOL

Turnbuckle body

ITB-KOT-2017/0215

SRM 6336



Zn ZINC COATING 8 µm

CORROSION CLASS C2

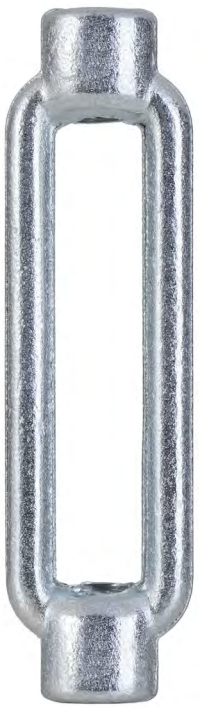
A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	e [mm]	f [mm]	h [mm]	A_{min} [mm]	Index	Packaging [pcs]
SRM M6 x 110	M6	110	19	9	6	12	74712	50
SRM M8 x 110	M8	110	23	11	8	15	74725	50
SRM M10 x 125	M10	125	29	14	9	18	74726	50
SRM M12 x 125	M12	125	34	16	11	21	74727	50
SRM M14 x 140	M14	140	37	17	12	25	74729	50
SRM M16 x 170	M16	170	42	20	14	27	74734	50
SRM M18 x 200	M18	200	46	22	16	32	74736	10
SRM M20 x 200	M20	200	52	24	17	34	74739	10
SRM M22 x 220	M22	220	56	26	18	34.5	74742	10
SRM M24 x 255	M24	255	60	28	20	39	74743	10
SRM M27 x 255	M27	255	74	34	23	42.5	74747	5
SRM M30 x 255	M30	255	74	34	23	42.5	74748	5
SRM M36 x 295	M36	290	86	40	28	53.5	74752	5

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRM M6 x 110	13.52
SRM M8 x 110	20.62
SRM M10 x 125	31.84
SRM M12 x 125	44.96
SRM M14 x 140	63.96
SRM M16 x 170	85.37
SRM M18 x 200	72.55
SRM M20 x 200	132.33
SRM M22 x 220	164.60
SRM M24 x 255	165.43
SRM M27 x 255	182.18
SRM M30 x 255	273.35
SRM M36 x 295	300.74



Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- S235JR steel in accordance with PN-EN 10025-2:2007
- Electrolytic zinc coating with a thickness of at least 8 µm

Scope of application

Due to the corrosive aggressiveness of the environment, the fasteners should be used in environments categorised as C1 or C2 in accordance with PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

Installation instructions:

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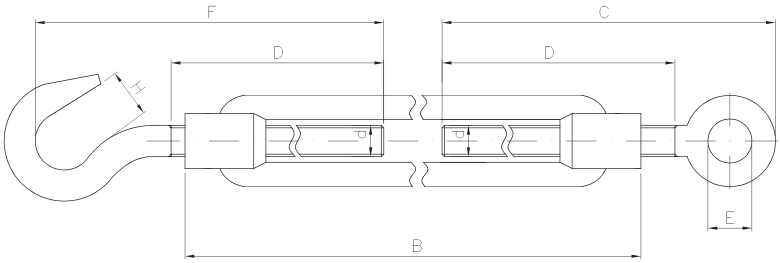
SRMI-HO I6308



A4 ACID-RESISTANT

CORROSION CLASS C5

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	H [mm]	Index	Packaging [pcs]
SRMI-HO M5 x 70	M5	70	56 ± 3	32	8	56 ± 3	9	5275	10
SRMI-HO M6 x 90	M6	90	70 ± 3	42	10	70 ± 3	10	14647	10
SRMI-HO M8 x 120	M8	120	98 ± 3	56	15	90 ± 3	12.5	86541	10
SRMI-HO M10 x 150	M10	150	117 ± 3	71	16	105 ± 3	14	86542	5
SRMI-HO M12 x 200	M12	200	152 ± 3	94	20	143 ± 3	16	8491	5
SRMI-HO M16 x 250	M16	250	190 ± 3	115	26	180 ± 3	18	35631	1
SRMI-HO M20 x 300	M20	300	220 ± 3	140	30	205 ± 3	20	35632	1

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRMI-HO M5 x 70	2.15
SRMI-HO M6 x 90	2.71
SRMI-HO M8 x 120	4.46
SRMI-HO M10 x 150	10.55
SRMI-HO M12 x 200	14.15
SRMI-HO M16 x 250	22.29
SRMI-HO M20 x 300	29.67

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- Corrosion resistant (stainless) steel type 1.4401 in accordance with PN-EN 10088-1:2014 (class A4-70 in accordance with PN-EN ISO 3506:2009)

Scope of application

The fasteners are very resistant to adverse weather conditions, such as humidity, variable temperatures and chemical substances. They can be used in C1, C2, C3, C4 and C5 corrosive environments according to PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

MARCOPOL

Turnbuckle
HOOK + HOOK

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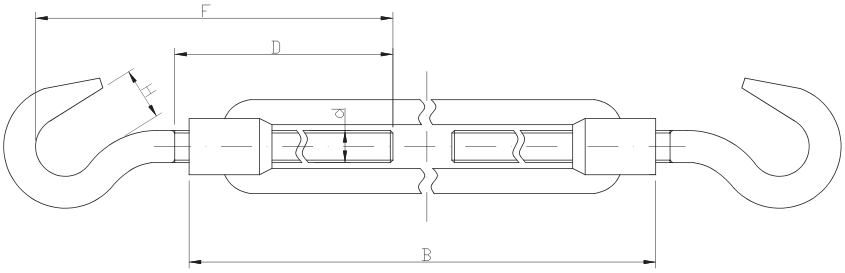
SRMI-HH I6328



A4 ACID-RESISTANT

CORROSION CLASS C5

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	F [mm]	D [mm]	H [mm]	Index	Packaging [pcs]
SRMI-HH M4 x 58	M4	58	52 ± 3	30	6	39561	10
SRMI-HH M5 x 70	M5	70	56 ± 3	32	9	51819	10
SRMI-HH M6 x 90	M6	90	70 ± 3	42	10	8492	10
SRMI-HH M8 x 120	M8	120	90 ± 3	55	12.5	86545	10
SRMI-HH M10 x 150	M10	150	105 ± 3	70	14	8495	5
SRMI-HH M12 x 200	M12	200	143 ± 3	94	16	8497	5
SRMI-HH M16 x 250	M16	250	180 ± 3	115	18	70564	1
SRMI-HH M20 x 300	M20	300	205 ± 3	140	20	73296	1

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRMI-HH M4 x 58	0.51
SRMI-HH M5 x 70	2.15
SRMI-HH M6 x 90	2.71
SRMI-HH M8 x 120	4.46
SRMI-HH M10 x 150	10.55
SRMI-HH M12 x 200	14.15
SRMI-HH M16 x 250	22.29
SRMI-HH M20 x 300	29.67

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- Corrosion resistant (stainless) steel type 1.4401 in accordance with PN-EN 10088-1:2014 (class A4-70 in accordance with PN-EN ISO 3506:2009)

Scope of application

The fasteners are very resistant to adverse weather conditions, such as humidity, variable temperatures and chemical substances. They can be used in C1, C2, C3, C4 and C5 corrosive environments according to PN-EN ISO 9223:2012.

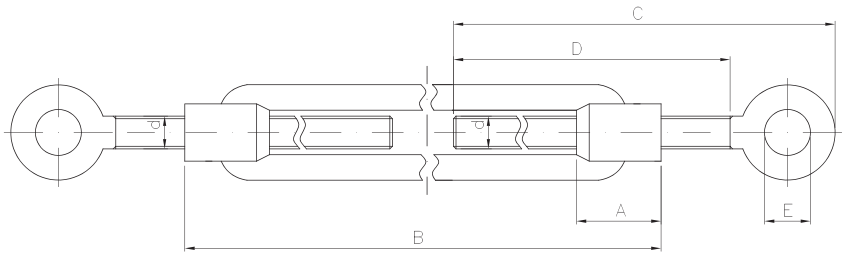
The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

MARCOPOL

Turnbuckle
EYE + EYE

ITB-KOT-2017/0215

SRMI-OO 6309



A4 ACID-RESISTANT STEEL

CORROSION CLASS C5

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	C [mm]	D [mm]	E [mm]	Index	Packaging [pcs]
SRMI-OO M4 x 58	M4	58	52 ± 3	30	6	58588	10
SRMI-OO M5 x 70	M5	70	56 ± 3	32	8	58589	10
SRMI-OO M6 x 90	M6	90	70 ± 3	42	10	8484	10
SRMI-OO M8 x 120	M8	120	98 ± 3	58	15	8485	10
SRMI-OO M10 x 150	M10	150	117 ± 3	71	16	8486	5
SRMI-OO M12 x 200	M12	200	152 ± 3	94	20	8487	5
SRMI-OO M16 x 250	M16	250	190 ± 3	115	26	36205	1
SRMI-OO M20 x 300	M20	300	220 ± 3	140	30	38749	1

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRMI-OO M4 x 58	1.72
SRMI-OO M5 x 70	7.95
SRMI-OO M6 x 90	14.59
SRMI-OO M8 x 120	23.75
SRMI-OO M10 x 150	34.08
SRMI-OO M12 x 200	34.94
SRMI-OO M16 x 250	66.64
SRMI-OO M20 x 300	79.63

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- Corrosion resistant (stainless) steel type 1.4401 in accordance with PN-EN 10088-1:2014 (class A4-70 in accordance with PN-EN ISO 3506:2009)

Scope of application

The fasteners are very resistant to adverse weather conditions, such as humidity, variable temperatures and chemical substances. They can be used in C1, C2, C3, C4 and C5 corrosive environments according to PN-EN ISO 9223:2012.

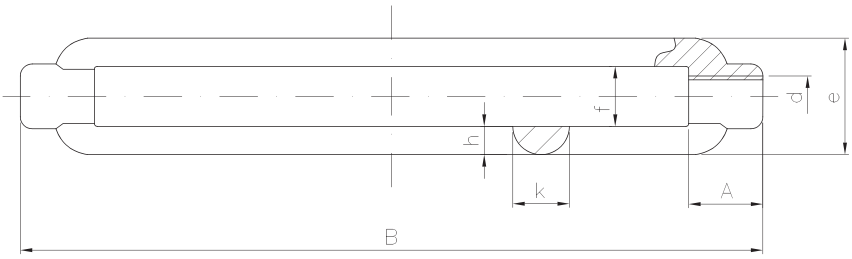
The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

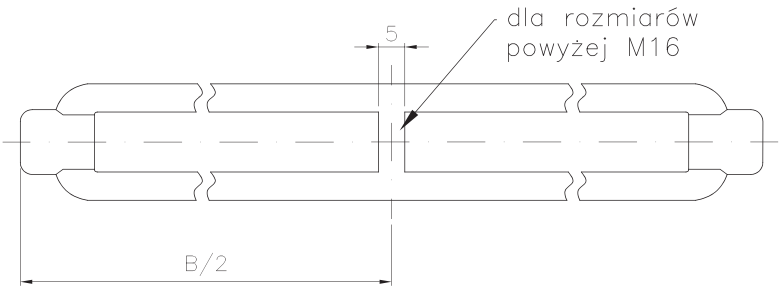
MARCOPOL

Turnbuckle body

ITB-KOT-2017/0215

SRMI I6336





A4 ACID-RESISTANT STEEL

CORROSION CLASS C5

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	Thread type d	B [mm]	e [mm]	f [mm]	h [mm]	k [mm]	A_{min} [mm]	Index	Packaging [pcs]
SRMI M5 x 70	M5	70	15	8	3.5	5.5	8	73306	10
SRMI M6 x 90	M6	90	18.5	11	3.75	6.5	10.5	86544	10
SRMI M8 x 120	M8	120	20	12	4	8	12.5	47360	10
SRMI M10 x 150	M10	150	24	14	5	10	15.5	3904	5
SRMI M12 x 200	M12	200	29.5	17.5	6	12	18	41637	5
SRMI M16 x 250	M16	250	39	24	7.5	15	20	99363	1
SRMI M20 x 300	M20	300	46	27	9.85	20	22	15474	1

Strength characteristics

Code and size	Characteristic tensile strength N_{Rk} [kN]
SRMI M5 x 70	7.95
SRMI M6 x 90	14.59
SRMI M8 x 120	23.75
SRMI M10 x 150	34.08
SRMI M12 x 200	34.95
SRMI M16 x 250	66.64
SRMI M20 x 300	79.63

Application

Double-sided bolt fasteners are used for bracing metal and wooden structures in apartment buildings, community residences, public utility-, industrial- and warehouse facilities. In addition, they are used for adjusting rope tension.

Material

- Corrosion resistant (stainless) steel type 1.4401 in accordance with PN-EN 10088-1:2014 (class A4-70 in accordance with PN-EN ISO 3506:2009)

Scope of application

The fasteners are very resistant to adverse weather conditions, such as humidity, variable temperatures and chemical substances. They can be used in C1, C2, C3, C4 and C5 corrosive environments according to PN-EN ISO 9223:2012.

The use of such fasteners should be consistent with the technical designs of particular structures, including binding technical and construction regulations.

Chemical anchors for heavy-duty anchoring to structural concrete

Section 2

Chemical anchors

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2.	Vinyl ester resin anchor MKW CH+	84
3.	MKA arctic resin anchor	87
4.	MKP polyester resin anchor	88
5.	Vinyl ester resin anchor MKW CH200	90
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Bonded anchor design in accordance with TR029

Introduction

Anchor design processes are consistent with current level of technical knowledge, general building structure design and dimensioning with the use of the following methods:

- Ultimate limit state – dimensioning relies upon checking whether forces affecting a particular component are not greater than its load-carrying capacity or the strength of its section;
- Serviceability limit state – dimensioning relies upon checking whether movements (deflections) of the component under consideration do not exceed acceptable values.

Current bonded anchor design methods are based on the following standards:

- Harmonized construction design standards: EN 1990 Eurocodes;
- ETAG 001 – European Technical Approval of Metal Anchors for Use in Concrete;
- TR 029 – Technical report: Design of Bonded Anchors;
- ETA – European Technical Assessment.

We determine calculated load-carrying capacity when designing bonded anchors following the limit state methods. It must be shown that the calculated load does not exceed the calculated load-bearing capacity of a particular joint:

$$\mathbf{S_D \leq R_D}$$

S_D is the calculated value of applied load [kN]

R_D is the calculated load-carrying capacity of a single anchor (or a group of anchors) [kN]

$$\mathbf{R_D = N_{R,k} / \gamma_M}$$

$N_{R,k}$ is the characteristic pull-out resistance of a single anchor (or their group) [kN]

γ_M is the partial safety factor

Safety factor values

1. **Concrete substrate failure:**

   For tensile loading:

   $$\mathbf{\gamma_{MC} = \gamma_C * \gamma_2}$$

   $\gamma_C = 1.5$ – partial safety factor for concrete

   γ_2 is the additional factor accounting for installation safety:

   $\gamma_2 = 1.0$ – for systems with a high installation safety level

   $\gamma_2 = 1.2$ – for systems with a medium installation safety level

   $\gamma_2 = 1.4$ – for systems with a low installation safety level

   For shear loading:

   $\gamma_C = 1.5$ – partial safety factor for concrete

   $\gamma_2 = 1.0$ – for shear loading

2. Steel anchor failure:

For tensile loading:

$$\gamma_{Ms} = \frac{1.2}{f_{yk} / f_{uk}} \geq 1.4$$

f_{yk} is the characteristic yield limit of used steel [N/mm^2]

f_{uk} is the characteristic tensile strength of used steel [N/mm^2]

For shear loading:

If $f_{uk} \leq 800$ N/mm^2 and $f_{yk}/f_{uk} \leq 0.8$ $\longrightarrow$ $\gamma_{Ms} = \frac{1.0}{f_{yk} / f_{uk}} \geq 1.25$

If $f_{uk} > 800$ N/mm^2 or $f_{yk}/f_{uk} > 0.8$ $\longrightarrow$ $\gamma_{Ms} = 1.5$

Pull-out resistance

1. Loss of anchor resistance due to steel failure:

$$N_{Rk,s} = A_S * f_{uk} \text{ [N]}$$

A_S is the steel rod cross section [mm^2]

f_{uk} is the characteristic tensile resistance of steel [N/mm^2]

2. Loss of anchor resistance due to pull out and concrete pry-out:

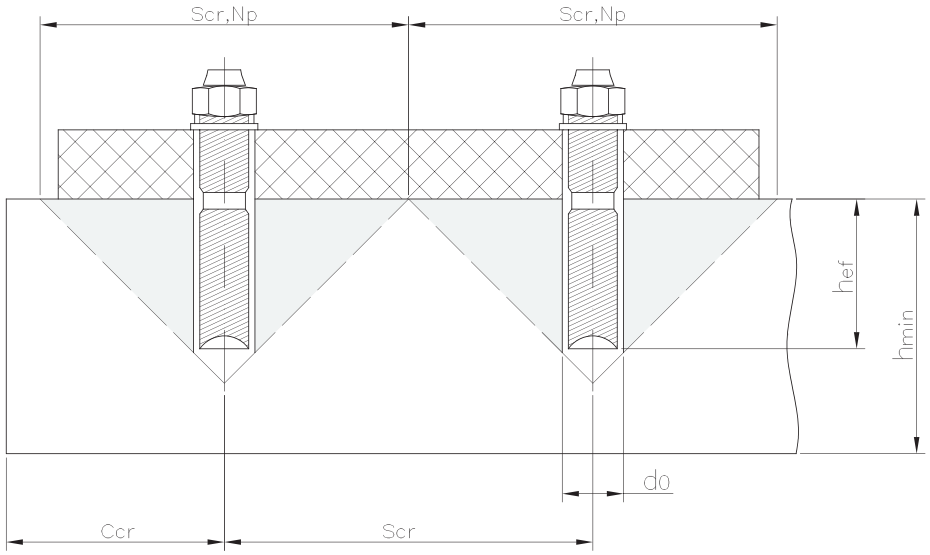
$$N_{Rk,p} = N^0_{Rk,p} * \frac{A_{p,N}}{A^0_{p,N}} * \psi_{s,Np} * \psi_{g,Np} * \psi_{eC,Np} * \psi_{re,Np}$$

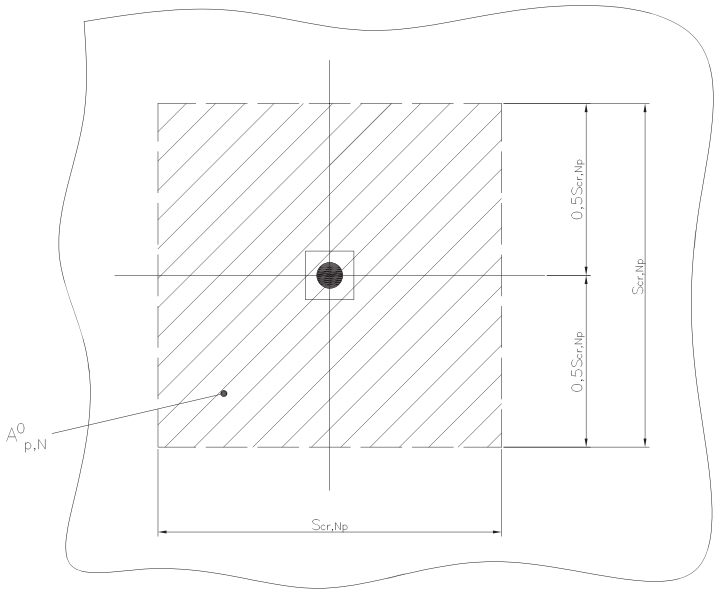
$A_{p,N}$ is the actual pull-out cone surface (minus the impact of a lower edge distance)

($C \leq C_{cr,Np}$) and overlapping of cones of neighbouring anchors ($S \leq S_{cr,Np}$)

$A^0_{p,N}$ is pull-out cone surface for a single anchor, provided there is a large distance from concrete edge

($C > C_{cr,Np}$) and neighbouring anchors ($S > S_{cr,Np}$)





$$S_{cr,Np} = 20 * d * (\frac{\tau_{Rk,ucr}}{7.5})^{0.5} \leq 3 * h_{ef}$$

$$C_{cr,Np} = \frac{S_{cr,Np}}{2}$$

$\tau_{Rk,ucr}$ is the load carrying capacity of the resin in non-cracked concrete in accordance with ETA [N/mm^2]

d is the nominal diameter of a bonded rod [mm]

$$\psi s,Np = 0.7 + 3.0 * \frac{C}{C_{cr,Np}} \leq 1.0$$

$\psi_{s,Np}$ is the factor accounting for the impact of a lower edge distance on the load distribution in a concrete substrate (the lowest C value should be used in calculations).

$$\psi_{g,Np} = \psi^0_{g,Np} - (\frac{S}{S_{cr,Np}})^{0.5} * (\psi^0_{g,Np} - 1) \geq 1.0$$

$\psi_{g,Np}$ is the factor accounting for the interaction between an anchor group and a concrete pull-out cone surface, whereas:

$$\psi^0_{g,Np} = \sqrt{n} - (\sqrt{n} - 1) * (\frac{d * \tau_{R,k}}{k * \sqrt{h_{ef}} * f_{ck,cube}})^{1.5} \geq 1.0$$

n is the number of anchors in a group

$\tau_{R,k}$ is the characteristic shear strength of the resin depending on the concrete strength class in accordance with ETA [N/mm^2]:

- for cracked concrete applications a value of k = 2.3 should be used
- for non-cracked concrete applications a value of k = 3.2 should be used

$$\psi_{eC,Np} = \frac{1}{1 + 2e_N / S_{cr,Np}} \leq 1.0$$

$\psi_{eC,Np}$ is the factor accounting for the impact of the eccentric load

e_N is the tension load eccentricity

In the case of an eccentric load distributed in two different directions, each eccentricity should be calculated individually and the product of both eccentricities should be used in the equation.

$$\psi_{re,Np} = 0.5 + \frac{h_{ef}}{200} \leq 1.0$$

ψre,Np is the factor accounting for the impact of the congested reinforcement

If the embedment zone contains reinforcement spaced at ≥ 150 mm or if the reinforcement with a diameter ≤ 10 mm spaced at ≥ 100 mm is used, the following can be used:

$$\psi_{re,Np} = 1.0$$

$N^0_{Rk,p}$ is the initial characteristic load-carrying capacity of the resin

$$N^0_{Rk,p} = \pi * d * h_{ef} * \tau_{R,k} \text{ [N]}$$

$\tau_{R,k}$ is the shear force for resin [N/mm^2]

h_{ef} is the effective embedment depth [mm]

d is the nominal diameter of a bonded rod [mm]

3. Loss of embedment due to concrete cone pry-out:

The characteristic value for a single anchor or a group of anchors in the case of a concrete cone failure:

$$N_{Rk,c} = N^0_{Rk,c} * \frac{A_{c,N}}{A^0_{c,N}} * \psi_{s,N} * \psi_{re,N} * \psi_{ec,N}$$

where:

$$N^0_{Rk,c} = k_1 * \sqrt{f_{ck,cube}} * h_{ef}^{1.5} \text{ [N]}$$

$N^0_{Rk,c}$ is the characteristic load-carrying capacity of an anchor in non-cracked or cracked concrete [N];

k_1 = 10.1 is the factor for non-cracked concrete in accordance with TR029;

k_1 = 7.2 is the factor for cracked concrete in accordance with TR029;

$f_{ck,cube}$ is the characteristic concrete compression capacity measured in cubes sized 150 x 150 mm (concrete strength class in accordance with EN 206) [N/mm^2];

h_{ef} is the effective embedment depth [mm];

A_{cN} is the surface of an individual anchor with a large concrete surface and anchor spacing

$A^0_{c,N}$ is the actual concrete pull-out cone surface

$$\psi s,N = 0.7 + 0.3 * \frac{C}{C_{cr,N}} \leq 1$$

$\psi_{s,N}$ is the factor accounting for a non-uniform stress distribution caused by the concrete element edges (e.g. embedment at a concrete element corner or in a narrow element). The lowest edge distance C should be used in calculations.

$$\psi_{re,N} = 0{,}5 + \frac{h_{ef}}{200} \leq 1$$

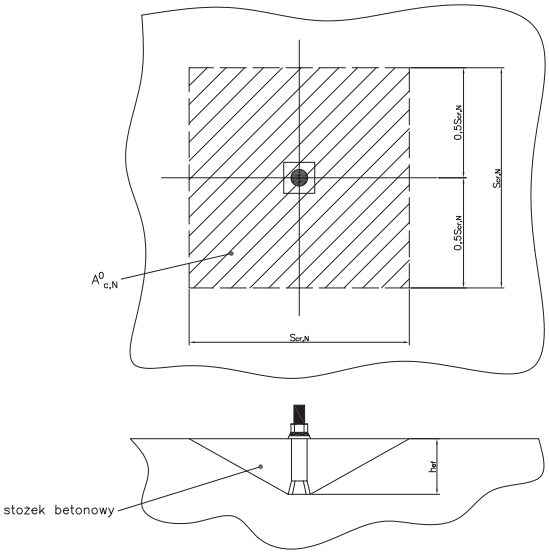
$\psi_{re,N}$ is the factor accounting for the reinforcement. If the embedment zone contains reinforcement spaced at ≥ 150 mm (regardless of the anchor diameter or if the anchor diameter is ≤ 100 mm and at the same time reinforcement spacing is ≥ 100 mm), then a value of $\psi_{re,N}$ = 1.0 can be used in calculations (regardless of the embedment depth).

$$\psi_{ec,N} = \frac{1}{1+2e_N / S_{cr,N}} \leq 1$$

$\psi_{ec,N}$ is the factor accounting for the interaction between a group of anchors subject to non-uniform tensile loads;

e_N is the resultant tension load eccentricity with respect to the anchors in a group.

In the case of an eccentric load distributed in two directions, the e_N value should be calculated individually for each direction and the product of both values should be used in the equation.



Shear load resistance

1. Steel failure:

The characteristic shear resistance of an anchor should be calculated using the following formula:

$$V_{Rk,s} = 0.5 * A_s * f_{uk} \text{ [N]}$$

A_s is the cross section of a bonded rod [mm^2]

f_{uk} is the characteristic tensile strength of the steel [N/mm^2]

The $V_{Rk,s}$ value is specified in ETA.

2. Concrete fragment pry-out failure:

The following two conditions should be checked:

$$V_{Rk,cp} = k * N_{Rk,p}$$

$$V_{Rk,cp} = k * N_{Rk,c}$$

k is the factor specified in ETA:

k = 1 – if the embedment depth is $h_{ef} \leq 60$ mm

k = 2 – if the embedment depth is $h_{ef} \geq 60$ mm

$N_{Rk,p}$ is the single anchor load-carrying capacity in the case of failure [N]

$N_{Rk,c}$ is the anchor group load-carrying capacity in the case of failure [N]

The lower value {$N_{Rk,p}$, $N_{Rk,c}$} should be used.

3. Concrete edge pry-out failure:

$$V_{Rk,c} = V^0_{Rk,c} * \frac{A_{c,V}}{A^0_{c,V}} * \psi_{s,V} * \psi_{h,V} * \psi_{\alpha,V} * \psi_{ec,V} * \psi_{re,V} \text{ [N]}$$

where:

$$V^0_{Rk,c} = k_1 * d^{\alpha} * h^{\beta}_{ef} * \sqrt{f_{ck,cube}} * c^{1.5}_1 \quad \text{[N]}$$

α – should be calculated from the following formula: $\alpha = 0.1 * (\frac{h_{ef}}{C_1})^{0.5}$

β – should be calculated from the following formula: $\beta = 0.1 * (\frac{d}{C_1})\ 0.2$

d is the diameter of an installed rod [mm]

h_{ef} is the embedment depth [mm]

c_1 is the edge distance for the anchors loaded with shear force [mm]

$f_{ck,cube}$ is the characteristic concrete compression capacity measured in cubes sized 150 x 150 mm (concrete strength class in accordance with EN 206) [N/mm^2]

$A_{c,V}$ is the actual concrete cone impact surface accounting for edges parallel to the load direction and overlapping of tension cones of neighbouring anchors [mm^2]

$A^0_{c,V}$ is the concrete cone impact surface for a single anchor, not accounting for edges parallel to the load direction, component thickness and impact of neighbouring cones [mm^2]

$\psi_{s,V}$ is the factor accounting for the edge distance

$$\psi_{s,V} = 0.7 + 0.3 * \frac{C_2}{1.5\, C_1} \leq 1$$

$\psi_{h,V}$ is the factor accounting for the thickness of the concrete substrate

$$\psi_{h,V} = (\frac{1.5\, C_1}{h})^{1/2} \geq 1$$

$\psi_{\alpha,V}$ is the factor accounting for shear load direction

$$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_v)^2 + (\frac{\sin \alpha_v}{2.5})^2}} \geq 1$$

α_v is the angle between the shear load direction and the free edge of the concrete

$\psi_{ec,V}$ is the factor accounting for the interaction between a group of anchors subject to the eccentric shear load

$$\psi_{ec,V} = \frac{1}{1 + 2e_v / (3c_1)} \leq 1$$

e_v is the shear load eccentricity [mm]

c_1 is the edge distance for the anchors loaded with shear force [mm]

$\psi_{re,V}$ is the factor accounting for the impact of reinforcement in cracked concrete, equal to:

$\psi_{re,V}$ = 1.0 – for non.cracked concrete and embedments without shear load eccentricity;

$\psi_{ec,V}$ = 1.2 – for cracked concrete with an edge reinforcement with a diameter of ≥ 12 mm;

$\psi_{ec,V}$ = 1.4 – for cracked concrete with an edge reinforcement spaced at ≤ 10 mm.

Epoxy resin anchor

ETA-13/0470
ETA-14/0395
ETA-15/0130

MKE CHEMFIX 500 5812

STYRENE FREE · CLASS 5.8 · CLASS 8.8 · A4 ACID-RESISTANT

A detailed description of symbols used in the catalogue can be found on pages 12–15

A two-component chemical anchor used to fix steel threaded rods and reinforcement rods. It facilitates anchoring in cracked and non-cracked concrete areas in dry, humid and underwater environments.

Designation

Capacity	Index	Packaging [pcs]
585 ml	85843	12

Substrates


Cracked concrete


Non-cracked concrete

Minimum curing time

Substrate temperature	Gel time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
≥ 5°C	120 min	50 h	100 h
≥ 10°C	90 min	30 h	60 h
≥ 20°C	30 min	10 h	20 h
≥ 30°C	20 min	6 h	12 h
≥ 40°C	12 min	4 h	8 h

Threaded rod installation specifications

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Nominal diameter of drilled hole	d_0	[mm]	10	12	14	18	24	28	32	35
Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	80	90	96	108	120
	$h_{ef,max}$	[mm]	96	120	144	192	240	288	324	360
Diameter of fastener through-hole	d_f	[mm] ≤	9	12	14	18	22	26	30	33
Steel brush diameter	d_b	[mm] ≥	12	14	16	20	26	30	34	37
Torque	T_{inst}	[Nm]	10	20	40	80	120	160	180	200
Fixture thickness	$t_{fix,min}$	[mm] >	0							
	$t_{fix,max}$	[mm] <	1,500							
Minimum substrate thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2d_0$				
Minimum distance	s_{cr}	[mm]	40	50	60	80	100	120	135	150
Minimum edge distance	c_{cr}	[mm]	40	50	60	80	100	120	135	150

Reinforcement rod installation specifications

Reinforcement rod size			ø 8	ø 10	ø 12	ø 14	ø 16	ø 20	ø 25	ø 28	ø 32
Nominal diameter of drilled hole	d_0	[mm]	12	14	16	18	20	24	32	35	40
Effective embedment depth	$h_{ef,min}$	[mm]	60	60	70	75	80	90	100	112	128
	$h_{ef,max}$	[mm]	96	120	144	168	192	240	300	336	384
Steel brush diameter	d_b	[mm] ≥	14	16	18	20	22	26	34	37	41.5
Minimum substrate thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm		h_{ef} + 2d0						
Minimum distance	s_{cr}	[mm]	40	50	60	70	80	100	125	140	160
Minimum edge distance	c_{cr}	[mm]	40	50	60	70	80	100	125	140	160

Characteristic pull-out resistance of threaded rods in non-cracked concrete

Sizes of anchors with threaded rods				M8	M10	M12	M16	M20	M24	M27	M30
Steel strength											
Tensile strength, steel, strength class 5.8		$N_{Rk,s}$	[kN]	18	29	42	78	122	176	230	280
Tensile strength, steel, strength class 8.8		$N_{Rk,s}$	[kN]	29	46	67	125	196	282	368	449
Tensile strength, A4 stainless steel, strength classes 50 (>M24) and 70 (≤M24)		$N_{Rk,s}$	[kN]	26	41	59	110	171	247	230	281
Total pull-out resistance and concrete cone resistance											
Characteristic resistance of anchoring in non-cracked concrete, class C20/25											
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	15	15	15	14	13	12	12	12
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	15	14	13	10	9.5	8.5	7.5	7.0
Temperature range II: 60°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	9.5	9.5	9.0	8.5	8.0	7.5	7.5	7.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	9.5	9.5	9.0	8.5	7.5	7.0	6.5	6.0
Temperature range III: 72°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	8.5	8.5	8.0	7.5	7.0	7.0	6.5	6.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	8.5	8.5	8.0	7.5	7.0	6.0	5.5	5.5
Increasing factor for concrete ψ_c		C30/37		1.04							
		C40/50		1.08							
		C50/60		1.10							
Splitting resistance											
Edge distance		$h/h_{ef} \geq 2.0$		$1.0\ h_{ef}$							
		$2.0 > h/h_{ef} > 1.3$		$4.6\ h_{ef} - 1.8\ h$							
		$h/h_{ef} \leq 1.3$		$2.26\ h_{ef}$							
Axial distance		$s_{cr,sp}$	[mm]	$2c_{cr,sp}$							
Installation safety factor (dry or wet concrete)		γ_2		1.2				1.4			
Installation safety factor (filled hole)		γ_2		1.4							

Characteristic pull-out resistance of threaded rods in cracked concrete

Sizes of anchors with threaded rods				M12	M16	M20	M24	M27	M30
Steel strength									
Tensile strength, steel, strength class 5.8		$N_{Rk,s}$	[kN]	42	78	122	176	230	280
Tensile strength, steel, strength class 8.8		$N_{Rk,s}$	[kN]	67	125	196	282	368	449
Tensile strength, A4 stainless steel, strength classes 50 (>M24) and 70 (≤M24)		$N_{Rk,s}$	[kN]	59	110	171	247	230	281
Total pull-out resistance and concrete cone resistance									
Characteristic resistance of anchoring in cracked concrete, class C20/25									
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	7.5	6.5	6.0	5.5	5.5	5.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	7.5	6.0	5.0	4.5	4.0	4.0
Temperature range II: 60°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	4.5	4.0	3.5	3.5	3.5	3.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	4.5	4.0	3.5	3.5	3.5	3.5
Temperature range III: 72°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	4.0	3.5	3.0	3.0	3.0	3.0
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	4.0	3.5	3.0	3.0	3.0	3.0
Increasing factor for concrete ψc		C30/37		1.04					
		C40/50		1.08					
		C50/60		1.10					
Installation safety factor (dry or wet concrete)		γ_2		1.2		1.4			
Installation safety factor (filled hole)		γ_2		1.4					

Characteristic shear resistance of threaded rods in cracked and non-cracked concrete

Sizes of anchors with threaded rods			M8	M10	M12	M16	M20	M24	M27	M30
Strength of steel without a lever arm										
Shear strength, steel, strength class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
Shear strength, steel, strength class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Shear strength, A4 stainless steel, strength classes 50 (>M24) and 70 (≤M24)	$V_{Rk,s}$	[kN]	13	20	30	55	86	124	115	140
Strength of steel with a lever arm										
Bending moment, steel, strength class 5.8	$V^0_{Rk,s}$	[Nm]	19	37	65	166	324	560	833	1123
Bending moment, steel, strength class 8.8	$V^0_{Rk,s}$	[Nm]	30	60	105	266	519	896	1333	1797
Bending moment, A4 stainless steel, strength classes 50 (>M24) and 70 (≤M24)	$V^0_{Rk,s}$	[Nm]	26	52	92	232	454	784	832	1125
Concrete edge resistance factor										
Installation safety factor	γ_2		1.0							

Characteristic pull-out resistance of reinforcement rods in non-cracked concrete

Sizes of anchors with reinforcement rods				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Steel strength												
Tensile strength		$N_{Rk,s}$	[kN]	$A_s \times f_{uk}$								
Total pull-out resistance and concrete cone resistance												
Characteristic resistance of anchoring in non-cracked concrete, class C20/25												
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	14	14	13	13	12	12	11	11	11
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	14	13	11	10	9.5	8.5	7.5	7.0	6.0
Temperature range II: 60°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	8.5	8.5	8.0	8.0	7.5	7.0	7.0	6.5	6.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	8.5	8.5	8.0	8.0	7.5	7.0	6.0	5.5	5.0
Temperature range III: 72°C/43°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	7.5	7.5	7.5	7.0	7.0	6.5	6.0	6.0	6.0
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	7.5	7.5	7.5	7.0	7.0	6.0	5.5	5.0	4.5
Increasing factor for concrete ψ_c		C30/37		1.04								
		C40/50		1.08								
		C50/60		1.10								
Splitting resistance												
Edge distance		$h/h_{ef} \geq 2.0$		$1.0\ h_{ef}$								
		$2.0 > h/h_{ef} > 1.3$		$4.6\ h_{ef} - 1.8\ h$								
		$h/h_{ef} \leq 1.3$		$2.26\ h_{ef}$								
Axial distance		$s_{cr,sp}$	[mm]	$2c_{cr,sp}$								
Installation safety factor (dry or wet concrete)		γ_2		1.2					1.4			
Installation safety factor (filled hole)		γ_2		1.4								

Characteristic pull-out resistance of reinforcement rods in cracked concrete

Sizes of anchors with reinforcement rods				Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Steel strength										
Tensile strength		$N_{Rk,s}$	[kN]	$A_s \times f_{uk}$						
Total pull-out resistance and concrete cone resistance										
Characteristic resistance of anchoring in non-cracked concrete, class C20/25										
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	7.5	7.0	6.5	6.0	5.5	5.5	5.5
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	7.5	6.5	6.0	5.0	4.5	4.0	4.0
Temperature range II: 60°C/43°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	4.5	4.0	4.0	3.5	3.5	3.5	3.5
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	4.5	4.0	4.0	3.5	3.5	3.5	3.0
Temperature range III: 72°C/43°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	4.0	3.5	3.5	3.0	3.0	3.0	3.0
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	4.0	3.5	3.5	3.0	3.0	3.0	3.0
Increasing factor for concrete ψ_c		C30/37		1.04						
		C40/50		1.08						
		C50/60		1.10						
Installation safety factor (dry or wet concrete)		τ_2		1.2			1.4			
Installation safety factor (filled hole)		τ_2		1.4						

Characteristic shear resistance of reinforcement rods in cracked and non-cracked concrete

Sizes of anchors with reinforcement rods			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Strength of steel without a lever arm											
Tensile strength	$V_{Rk,s}$	[kN]	$0.50 \times A_s \times f_{uk}$								
Strength of steel with a lever arm											
Bending moment	$M^0_{Rk,s}$	[Nm]	$1.2 * W_{el} * f_{uk}$								
Concrete edge resistance factor											
Installation safety factor	γ_2		1.0								

Vinyl ester resin anchor

CE **ETA-12/0024**
ETA-14/0057

MKW CH+ 5811

STYRENE FREE · CLASS 5.8 · CLASS 8.8 · CLASS 10.9 · A4 ACID-RESISTANT

A detailed description of symbols used in the catalogue can be found on pages 12–15

A two-component, vinyl ester resin-based chemical anchor. The lack of styrene reduces unpleasant odours and vapours that are harmful to human health and the environment. It is highly resistant to mechanical and chemical factors as well as high temperatures.

Designation

Capacity	Index	Packaging [pcs]
300 ml	85826	12
410 ml	85838	12

Substrates


Cracked concrete


Non-cracked concrete

Minimum curing time

Minimum substrate temperature	Gel time in dry/wet concrete	Curing time
$-10° \le T_{substrate} < -5°C$	125 min	8 hours
$-5° \le T_{substrate} < 0°C$	80 min	160 min
$0° \le T_{substrate} < 5°C$	25 min	90 min
$5° \le T_{substrate} < 10°C$	17 min	70 min
$10° \le T_{substrate} < 20°C$	12 min	65 min
$20° \le T_{substrate} < 30°C$	6 min	60 min
$30° \le T_{substrate} \le 40°C$	3 min	45 min

Threaded rod installation specifications

Anchor size			M8	M10	M12	M16	M20	M24
Anchoring rod diameter	d	[mm]	8	10	12	16	20	24
Embedment depth range h_{ef}	min	[mm]	60	60	70	80	90	100
Drilled hole depth h_0	max	[mm]	160	200	240	320	400	480
Nominal embedment depth	h_{ef}	[mm]	80	90	110	125	170	210
Nominal diameter of drill	d_0	[mm]	10	12	14	18	24	28
Diameter of final component through-hole	d_f	[mm]	9	12	14	18	22	26
Maximum torque	T_{max}	[Nm]	10	20	30	60	90	140
Minimum substrate thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + $2d_0$		
Minimum distance	s_{cr}	[mm]	40	50	60	80	100	120
Minimum edge distance	c_{cr}	[mm]	40	50	60	80	100	120

Reinforcement rod installation specifications

Reinforcement rod diameter			ø 8	ø 10	ø 12	ø 14	ø 16	ø 20	ø 25
Component diameter	D	[mm]	8	10	12	14	16	20	25
Embedment depth range h_{ef}	min	[mm]	60	60	70	75	80	90	100
Drilled hole depth h_0	max	[mm]	160	200	240	280	320	400	500
Nominal diameter of drill	d_0	[mm]	12	14	16	18	20	25	32
Minimum substrate thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + $2d_0$			
Minimum distance	s_{cr}	[mm]	40	50	60	70	80	100	125
Minimum edge distance	c_{cr}	[mm]	40	50	60	70	80	100	125

Resistance of threaded rods to tension forces

Sizes of anchors with threaded rods			M8	M10	M12	M16	M20	M24
Steel strength								
Characteristic strength, class 5.8	$N_{Rk,s}$	[kN]	18	29	42	79	123	177
Characteristic strength, class 8.8	$N_{Rk,s}$	[kN]	29	46	67	126	196	282
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.5					
Characteristic strength, class 10.9	$N_{Rk,s}$	[kN]	36	58	84	157	245	353
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.4					
Characteristic strength, A4-70	$N_{Rk,s}$	[kN]	26	41	59	110	172	247
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.87					
Total pull-out resistance and concrete cone resistance								
Threaded rod diameter	d	[mm]	8	10	12	16	20	24
Characteristic resistance of anchoring in non-cracked concrete, class C20/25								
Temperature range I: 40°C/24°C	τ_{Rk}	[N/mm²]	10.0	9.5	9.0	8.0	7.5	7.0
Temperature range II: 80°C/50°C	τ_{Rk}	[N/mm²]	9.0	8.0	7.5	7.0	6.5	6.0
Increasing factor for $\tau_{Rk,p}$ in non-cracked concrete	ψ_c	C30/37	1.12					
		C40/50	1.23					
		C50/60	1.30					
Characteristic resistance of anchoring in cracked concrete, class C20/25								
Temperature range I: 40°C/24°C	τ_{Rk}	[N/mm²]	-	-	3.5	3.5	-	-
Temperature range II: 80°C/50°C	τ_{Rk}	[N/mm²]	-	-	3.0	3.0	-	-
Increasing factor for $\tau_{Rk,p}$ in non-cracked concrete	ψ_c	C30/37	1.04					
		C40/50	1.07					
		C50/60	1.09					
Splitting resistance								
Edge distance $c_{cr,sp}$ [mm] for	$h/h_{ef} \geq 2.0$		1.0 h_{ef}					
	$2.0 > h/h_{ef} > 1.3$		4.6 h_{ef} – 1.8 h					
	$h/h_{ef} \leq 1.3$		2.26 h_{ef}					
Spacing	$S_{cr,sp}$	[mm]	$2c_{cr,sp}$					
Partial safety factor	$\gamma_{Mp}=\gamma_{Mc}=\gamma_{Msp}$	[-]	1.5	1.5	1.5	1.5	1.5	1.5

Resistance of threaded rods to shear forces

Sizes of anchors with threaded rods			M8	M10	M12	M16	M20	M24
Strength of steel without a lever arm								
Characteristic strength, class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39	61	88
Characteristic strength, class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63	98	141
Characteristic strength, class 10.9	$V_{Rk,s}$	[kN]	18	29	42	79	123	156
Characteristic strength, A4-70	$V_{Rk,s}$	[kN]	13	20	30	55	86	124
Strength of steel with a lever arm								
Characteristic strength, class 5.8	$M^0_{Rk,s}$	[Nm]	19	37	66	167	326	561
Characteristic strength, class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898
Characteristic strength, class 10.9	$M^0_{Rk,s}$	[Nm]	38	75	131	333	649	893
Characteristic strength, A4-70	$M^0_{Rk,s}$	[Nm]	26	53	92	233	454	625
Partial safety factor for steel strength								
class 5.8 or 8.8	$\gamma_{Ms,V}$	[-]	1.25					
class 10.9	$\gamma_{Ms,V}$	[-]	1.50					
A4-70	$\gamma_{Ms,V}$	[-]	1.56					
Partial safety factor for steel strength								
Partial safety factor	γ_{MC}		1.5					

Resistance of reinforcement rods to tension forces

Sizes of anchors with reinforcement rods			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
Reinforcing steel strength									
BSt 500 S reinforcement rod strength in accordance with DIN 488	$N_{Rk,s}$	[kN]	28	43	62	85	111	173	270
BSt 500 S reinforcement rod partial safety factor in accordance with DIN 488	$\gamma_{Ms,N}$	[-]	1.4						
Total splitting resistance and concrete cone resistance									
Reinforcement rod diameter	d	[mm]	8	10	12	14	16	20	25
Characteristic resistance of anchoring in non-cracked concrete, class C20/25									
Temperature range I: 40°C/24°C	τ_{Rk}	[N/mm²]	7.0	7.5	7.0	7.0	6.5	6.5	6.0
Temperature range II: 80°C/50°C	τ_{Rk}	[N/mm²]	6.5	6.5	6.0	6.0	6.0	5.5	5.5
Increasing factor for $\tau_{Rk,p}$ in non-cracked concrete Partial safety factor	ψ_c	C30/37	1.12						
		C40/50	1.23						
		C50/60	1.30						
Splitting resistance									
Edge distance $c_{cr,sp}$ [mm] for	$h/h_{ef} \geq 2.0$		$1.0\ h_{ef}$						
	$2.0 > h/h_{ef} > 1.3$		$4.6\ h_{ef} - 1.8\ h$						
	$h/h_{ef} \leq 1.3$		2.26 hef						
Spacing	$S_{cr,sp}$	[mm]	$2c_{cr,sp}$						
Partial safety factor	$\gamma_{Mp}=\gamma_{Mc}=\gamma_{Msp}$	[-]	1.8	1.8	1.8	1.8	1.8	1.8	1.8

Resistance of reinforcement rods to shear forces

Sizes of anchors with reinforcement rods			Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
Strength of steel without a lever arm									
BSt 500 S reinforcement rod shear strength in accordance with DIN 488	$V_{Rk,s}$	[kN]	14	22	31	42	55	86	135
BSt 500 S reinforcement rod partial safety factor in accordance with DIN 488	$\gamma_{Ms,V}$	[-]	1.5						
Strength of steel with a lever arm									
BSt 500 S reinforcement rod shear strength in accordance with DIN 488	$M^0_{Rk,s}$	[Nm]	33	65	112	178	265	518	1012
BSt 500 S reinforcement rod partial safety factor according to DIN 488	$\gamma_{Ms,V}$	[-]	1.5						
Concrete edge resistance factor									
Partial safety factor	γ_{Mc}	[-]	1.5						

Arctic resin anchor

AT-15-6835/2016

MKA CHEMFIX EASF ARCTIC 5813

CLASS 5.8

A detailed description of symbols used in the catalogue can be found on pages 12–15

The Arctic anchor is used in heavy and medium-load applications. A special winter formula makes it possible to use the products in low temperatures down to -18°C.

Designation

Capacity	Index	Packaging [pcs]
300 ml	32143	12
410 ml	37242	12

Substrates

Non-cracked concrete

Minimum curing time

Ambient temperature	Maximum embedment time	Minimum bonding time
-18°C	100 min	360 min
-10°C	75 min	180 min
-5°C	50 min	90 min
5°C	12 min	50 min
15°C	6 min	35 min
25°C	3 min	30 min

Substrate distribution specifications

Fastener thread type			M8	M10	M12	M16	M20
Minimum distance between the centres of the fasteners	$s_{cr,N}$	[mm]	100	130	150	170	210
Minimum distance from the substrate edge in the case of tension	$c_{cr,N}$	[mm]	80	90	110	130	150
Minimum distance from the substrate edge in the case of shearing	$c_{cr,V}$	[mm]	100	130	150	170	190
Hole diameter equal to drill point diameter	d_0	[mm]	10	12	14	18	24
Minimum fastener effective depth	h_{ef}	[mm]	80	90	110	125	170
Minimum hole depth at its deepest point	h_1	[mm]	85	95	115	130	175
Maximum nut tightening torque	T_{inst}	[Nm]	11	22	38	95	170

Polyester resin anchor

CE **ETA-11/0032**
ETA-15/0008

MKP PESF TOP 5810

CLASS 5.8 CLASS 8.8 CLASS 10.9 A4

A detailed description of symbols used in the catalogue can be found on pages 12–15

A two-component chemical anchor made of styrene free polyester resin. The lack of styrene reduces unpleasant odours and vapours that are harmful to human health and the environment. It is highly resistant to mechanical and chemical factors as well as high temperatures.

Designation

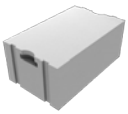
Capacity	Index	Packaging [pcs]
300 ml	85817	12
410 ml	85825	12

Substrates


Non-cracked concrete


Solid clay brick


Structural clay tile


Autoclaved aerated concrete

Minimum curing time

Minimum substrate temperature	Gel time in dry/wet concrete	Curing time
-5°C ≤ Tsubstrate < 0°C	40 min	180 min
0°C ≤ Tsubstrate < 10°C	20 min	90 min
10°C ≤ Tsubstrate < 20°C	9 min	60 min
20°C ≤ Tsubstrate < 30°C	5 min	30 min
30°C ≤ Tsubstrate < 40°C	3 min	20 min

Threaded rod installation specifications

Anchor size			M8	M10	M12	M16
Anchoring rod diameter	d	[mm]	8	10	12	16
Anchor depth range h_{ef}	min	[mm]	60	60	70	80
Drilled hole depth h_0	max	[mm]	160	200	240	320
Nominal embedment depth	h_{ef}	[mm]	80	90	110	125
Nominal diameter of drill	d_0	[mm]	10	12	14	18
Diameter of fastener through-hole	d_f	[mm] ≤	9	12	14	18
Steel brush diameter	d_b	[mm] ≤	18	13.3	14.9	19.35
Installation torque	T_{inst}	[Nm]	8	10	15	25
Minimum substrate thickness	h_{min}	[mm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + $2d_0$
Minimum distance	s_{cr}	[mm]	0.5 h_{ef}			
Minimum edge distance	c_{cr}	[mm]	0.5h_{ef}			

Resistance of threaded rods to tension forces

Sizes of anchors with threaded rods			M8	M10	M12	M16
Steel strength						
Characteristic strength, class 5.8	$N_{Rk,s}$	[kN]	18	29	42	79
Characteristic strength, class 8.8	$N_{Rk,s}$	[kN]	29	46	67	126
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.5			
Characteristic strength, class 10.9	$N_{Rk,s}$	[kN]	36	58	84	157
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.4			
Characteristic strength, A4-70	$N_{Rk,s}$	[kN]	26	41	59	110
Partial safety factor	$\gamma_{Ms,N}$	[-]	1.87			
Pull-out resistance and concrete cone resistance						
Threaded rod diameter	d	[mm]	8	10	12	16
Characteristic resistance of anchoring in non-cracked concrete, class C20/25 – dry or wet concrete						
Temperature range I: 40°C/24°C	$\tau_{Rk,ucr}$	[N/mm²]	6.0	5.5	5.0	4.0
Temperature range II: 80°C/50°C	$\tau_{Rk,ucr}$	[N/mm²]	4.5	4.0	3.5	3.0
Partial safety factor for filled holes	$\gamma_{Mp} = \gamma_{Mc}$	[-]	2.1			
Increasing factor for $\tau_{Rk,ucr}$ in non-cracked concrete	ψ_c	C30/37	1.08			
		C40/50	1.15			
		C50/60	1.19			
Splitting resistance						
Edge distance $c_{cr,sp}$ [mm] for		$h/h_{ef} \geq 2.0$	1.0 h_{ef}			
		$2.0 > h/h_{ef} > 1.3$	5.28 h_{ef} – 2.14 h			
		$h/h_{ef} \leq 1.3$	2.5 hef			
Spacing	$S_{cr,sp}$	[mm]	$2c_{cr,sp}$			
Partial safety factor – wet or dry concrete	$\gamma_{Msp} = \gamma_{Mc}$	[-]	2.1	1.8		
Partial safety factor for filled holes	$\gamma_{Msp} = \gamma_{Mc}$	[-]	2.1			

Resistance of threaded rods to shear forces

Sizes of anchors with threaded rods			M8	M10	M12	M16
Strength of steel without a lever arm						
Characteristic strength, class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39
Characteristic strength, class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63
Characteristic strength, class 10.9	$V_{Rk,s}$	[kN]	18	29	42	79
Characteristic strength, A4-70	$V_{Rk,s}$	[kN]	13	20	30	55
Strength of steel with a lever arm						
Characteristic strength, class 5.8	$M^0_{Rk,s}$	[Nm]	19	37	66	167
Characteristic strength, class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266
Characteristic strength, class 10.9	$M^0_{Rk,s}$	[Nm]	38	75	131	333
Characteristic strength, A4-70	$M^0_{Rk,s}$	[Nm]	26	53	92	233
Partial safety factor for steel strength						
class 5.8 or 8.8	$\gamma_{Ms,V}$	[-]	1.25			
class 10.9	$\gamma_{Ms,V}$	[-]	1.50			
A4-70	$\gamma_{Ms,V}$	[-]	1.56			
Concrete edge resistance factor						
Partial safety factor	γ_{MC}	[-]	2.1	1.8		

Vinyl ester resin anchor

NEW

ETA-18/0797
ETA-18/0798
ETA-18/0814

MKW CH 200 5829

STYRENE FREE · CLASS 5.8 · CLASS 8.8 · CLASS 10.9 · A2 ACID-RESISTANT · A4 ACID-RESISTANT

A detailed description of symbols used in the catalogue can be found on pages 12–15

A two-component chemical anchor made of styrene free polyester resin with very high bond strength. Used to fix steel threaded rods and reinforcement rods in the heaviest load applications. The lack of styrene reduces unpleasant odours and vapours that are harmful to human health and the environment. It is highly resistant to mechanical and chemical factors as well as high temperatures.

Designation

Capacity	Index	Packaging [pcs]
420 ml	40593	12

Substrates

Cracked concrete · Non-cracked concrete · Solid calcium-silicate brick · Solid clay brick · Cored calcium-silicate brick · Structural clay tile · Autoclaved aerated concrete

Minimum curing time

Substrate temperature	Gel time	Minimum curing time in dry concrete	Minimum curing time in wet concrete
-10°C	50 min	240 min	480 min
-5°C	40 min	180 min	360 min
5°C	20 min	90 min	180 min
15°C	9 min	60 min	120 min
25°C	5 min	30 min	60 min
35°C	3 min	20 min	40 min

Threaded rod installation specifications

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
Anchor outer diameter	d_{nom}	[mm]	8	10	12	16	20	24	27	30
Nominal diameter of drilled hole	d_0	[mm]	10	12	14	18	24	28	32	35
Effective anchoring depth h_{ef}	min	[mm]	60	60	70	80	90	96	108	120
	max	[mm]	160	200	240	320	400	480	540	600
Clearance hole diameter	d_f	[mm] ≤	9	12	14	18	22	26	30	33
Steel brush diameter	d_b	[mm] ≥	12	14	16	20	26	30	34	37
Maximum torque	T_{inst}	[mm] ≤	10	20	40	80	120	160	180	200
Minimum substrate thickness	h_{min}	[Nm]	h_{ef} + 30 mm ≥ 100 mm			h_{ef} + $2d_0$				
Minimum distance	s_{cr}	[mm]	40	50	60	80	100	120	135	150
Minimum edge distance	c_{cr}	[mm]	40	50	60	80	100	120	135	150

Reinforcement rod installation specifications

Reinforcement rod size			ø 8	ø 10	ø 12	ø 14	ø 16	ø 20	ø 25	ø 28	ø 32
Anchor outer diameter	d_{nom}	[mm]	8	10	12	14	16	20	25	28	32
Nominal diameter of drilled hole	d_0	[mm]	12	14	16	18	20	24	32	35	40
Effective anchoring depth h_{ef}	min	[mm]	60	60	70	75	80	90	100	112	128
	max	[mm]	160	200	240	280	320	400	500	580	640
Steel brush diameter	d_b	[mm] ≥	14	16	18	20	22	26	34	37	41.5
Minimum substrate thickness	h_{min}	[Nm]	h_{ef} + 30 mm		h_{ef} + $2d_0$						
Minimum distance	s_{cr}	[mm]	40	50	60	70	80	100	125	140	160
Minimum edge distance	c_{cr}	[mm]	40	50	60	70	80	100	125	140	160

Characteristic pull-out resistance of threaded rods in non-cracked concrete

Sizes of anchors with threaded rods				M8	M10	M12	M16	M20	M24	M27	M30
Steel strength											
Tensile strength, steel, strength class 5.8		$N_{Rk,s}$	[kN]	18	29	42	78	122	176	230	280
Tensile strength, steel, strength class 8.8		$N_{Rk,s}$	[kN]	29	46	67	125	196	282	368	449
Tensile strength, steel, strength class 10.9		$N_{Rk,s}$	[kN]	38	60	87	163	355	367	477	583
Tensile strength, A2, A4 and HCR stainless steel, strength class 50		$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Tensile strength, A2, A4 and HCR stainless steel, strength class 70		$N_{Rk,s}$	[kN]	26	41	59	110	171	247	-	-
Tensile strength, A2, A4 and HCR stainless steel, strength class 80		$N_{Rk,s}$	[kN]	29	46	67	126	196	282	-	-
Total pull-out resistance and concrete cone resistance											
Characteristic resistance of anchoring in non-cracked concrete, class C20/25											
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	10	12	12	12	12	11	10	9
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	7.5	8.5	8.5	8.5	Performance not evaluated			
Temperature range II: 80°C/50°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	7.5	9	9	9	9	8.5	7.5	6.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	5.5	6.5	6.5	6.5	Performance not evaluated			
Temperature range III: 120°C/72°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	5.5	6.5	6.5	6.5	6.5	6.5	5.5	5.0
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	4.0	5.0	5.0	5.0	Performance not evaluated			
Increasing factor for concrete ψ_c		C25/30		1.02							
		C30/37		1.04							
		C35/45		1.07							
		C40/50		1.08							
		C45/55		1.09							
		C50/60		1.10							
Splitting resistance											
Edge distance		$h/h_{ef} \geq 2.0$		1.0 h_{ef}							
		$2.0 > h/h_{ef} > 1.3$		2* h_{ef} (2.5 - h/h_{ef})							
		$h/h_{ef} \leq 1.3$		2.4 h_{ef}							
Axial distance		$s_{cr,sp}$	[mm]	$2c_{cr,sp}$							
Installation safety factor (dry or wet concrete)		γ_2		1.0		1.2					
Installation safety factor (filled hole)		γ_2		1.4				Not evaluated			

Characteristic pull-out resistance of threaded rods in cracked concrete

Sizes of anchors with threaded rods				M8	M10	M12	M16	M20	M24	M27	M30
Steel strength											
Tensile strength, steel, strength class 5.8		$N_{Rk,s}$	[kN]	18	29	42	78	122	176	230	280
Tensile strength, steel, strength class 8.8		$N_{Rk,s}$	[kN]	29	46	67	125	196	282	368	449
Tensile strength, steel, strength class 10.9		$N_{Rk,s}$	[kN]	38	60	87	163	355	367	477	583
Tensile strength, A2, A4 and HCR stainless steel, strength class 50		$N_{Rk,s}$	[kN]	18	29	42	79	123	177	230	281
Tensile strength, A2, A4 and HCR stainless steel, strength class 70		$N_{Rk,s}$	[kN]	26	41	59	110	171	247	-	-
Tensile strength, A2, A4 and HCR stainless steel, strength class 80		$N_{Rk,s}$	[kN]	29	46	67	126	196	282	-	-
Total pull-out resistance and concrete cone resistance											
Characteristic resistance of anchoring in cracked concrete, class C20/25											
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	4.0	5.0	5.5	5.5	5.5	5.5	6.5	6.5
		$\tau_{Rk,c1}$	[N/mm²]	2.5	3.1	3.7	3.7	3.7	3.8	4.5	4.5
		$\tau_{Rk,c2}$	[N/mm²]	-	-	2	2	2	-	-	-
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	4.0	4.0	5.5	5.5	Not evaluated			
		$\tau_{Rk,c1}$	[N/mm²]	2.5	2.5	3.7	3.7	Performance not evaluated			
Temperature range II: 80°C/50°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	2.5	3.5	4.0	4.0	4.0	4.0	4.5	4.5
		$\tau_{Rk,c1}$	[N/mm²]	1.6	2.2	2.7	2.7	2.7	2.8	3.1	3.1
		$\tau_{Rk,c2}$	[N/mm²]	-	-	1.1	1.1	1.1	-	-	-
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	2.5	3.0	4.0	4.0	Not evaluated			
		$\tau_{Rk,c1}$	[N/mm²]	1.6	1.9	2.7	2.7	Performance not evaluated			
Temperature range III: 120°C/72°C	in dry or wet concrete	$\tau_{Rk,cr}$	[N/mm²]	2.0	2.5	3.0	3.0	3.0	3.0	3.5	3.5
		$\tau_{Rk,c1}$	[N/mm²]	1.3	1.6	2.0	2.0	2.0	2.1	2.4	2.4
		$\tau_{Rk,c2}$	[N/mm²]	-	-	1.1	1.1	1.1	-	-	-
	in a filled hole	$\tau_{Rk,cr}$	[N/mm²]	2.0	3.5	3.0	3.0	Not evaluated			
		$\tau_{Rk,c1}$	[N/mm²]	1.3	1.6	2.0	2.0	Not evaluated			
Increasing factor for concrete ψ_c		C25/30		1.02							
		C30/37		1.04							
		C35/45		1.07							
		C40/50		1.08							
		C45/55		1.09							
		C50/60		1.10							
Installation safety factor (dry or wet concrete)		γ_2		1.0		1.2					
Installation safety factor (filled hole)		γ_2		1.4				Not evaluated			

Characteristic shear resistance of threaded rods in cracked and non-cracked concrete

Sizes of anchors with threaded rods			M8	M10	M12	M16	M20	M24	M27	M30
Strength of steel without a lever arm										
Shear strength, steel, strength class 5.8	$N_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
Shear strength, steel, strength class 8.8	$N_{Rk,s}$	[kN]	15	23	34	63	98	141	184	224
Shear strength, steel, strength class 10.9	$N_{Rk,s}$	[kN]	19	30	43	81	127	183	238	224
Shear strength, A2, A4 and HCR stainless steel, strength class 50	$N_{Rk,s}$	[kN]	9	15	21	39	61	88	115	140
Shear strength, A2, A4 and HCR stainless steel, strength class 70	$N_{Rk,s}$	[kN]	13	20	30	55	86	124	-	-
Shear strength, A2, A4 and HCR stainless steel, strength class 80	$N_{Rk,s}$	[kN]	15	23	34	63	98	141	-	-
Strength of steel with a lever arm										
Bending moment, steel, strength class 5.8	$M^0_{Rk,s}$	[kN]	19	37	65	166	324	560	833	1123
Bending moment, steel, strength class 8.8	$M^0_{Rk,s}$	[kN]	30	60	105	266	519	896	1333	1797
Bending moment, steel, strength class 10.9	$M^0_{Rk,s}$	[kN]	37	75	131	333	649	1123	1664	2249
Bending moment, A2, A4 and HCR stainless steel, strength class 50	$M^0_{Rk,s}$	[kN]	19	37	66	167	325	561	832	1125
Bending moment, A2, A4 and HCR stainless steel, strength class 70	$M^0_{Rk,s}$	[kN]	26	52	92	232	454	784	-	-
Bending moment, A2, A4 and HCR stainless steel, strength class 80	$M^0_{Rk,s}$	[kN]	30	59	105	266	519	896	-	-

Characteristic shear resistance of reinforcement rods in cracked and non-cracked concrete

Sizes of anchors with reinforcement rods			ø 8	ø 10	ø 12	ø 14	ø 16	ø 20	ø 25	ø 28	ø 32
Steel failure without a lever											
Characteristic shear resistance	$V^0_{Rk,s}$	[kN]	0.50 * A_s * f_{uk} [1]								
	$V_{Rk,s,eq}$	[kN]	0.35 * A_s * f_{uk} [2]								
Cross-sectional area	A_s	[mm²]	50	79	113	154	201	314	491	616	804
Partial factor	$\gamma_{Ms,V}$	[-]	1.5 [2]								
Steel failure with a lever											
Characteristic bending moment	$M^0_{Rk,s}$	[kN]	1.2 * W_{el} * f_{uk} [1]								
	$M_{Rk,s,eq}$	[kN]	Not evaluated								
Effective cross-section modulus of steel	W_{el}	[mm³]	50	98	170	269	402	785	1534	2155	3217
Partial factor	$\gamma_{Ms,V}$	[-]	1.5 [2]								

1) f_{uk} value in accordance with reinforcement rods' specifications.
2) If national regulations do not apply.

Characteristic pull-out resistance of reinforcement rods in cracked and non-cracked concrete

Diameter				Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 28	Ø 32
Strength of steel without a lever arm												
Characteristic tensile strength		$N_{Rk,s}$	[kN]	As * f_{uk} [1]								
		$N_{Rk,s,ek}$	[kN]	1.0 * A_s * f_{uk} [1]								
Cross-sectional area		A_s	[mm²]	50	79	113	154	201	314	491	616	804
Partial factor		$\gamma_{Ms,N}$	[-]	1.4 [2]								
Concurrent pulling out and concrete cracking												
Characteristic resistance of anchoring in non-cracked concrete, class C20/25												
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	10	12	12	12	12	12	11	10	8.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	7.5	8.5	8.5	8.5	8.5	Performance not evaluated			
Temperature range II: 80°C/50°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	7.5	9	9	9	9	9	8	7	6
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	5.5	6.5	6.5	6.5	6.5	Performance not evaluated			
Temperature range III: 120°C/72°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	5.5	6.5	6.5	6.5	6.5	6.5	6.0	5.0	4.5
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	4.0	5.0	5.0	5.0	5.0	Performance not evaluated			
Characteristic resistance of bond in cracked concrete, class C20/25												
Temperature range I: 40°C/24°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	4.0	5.0	5.5	5.5	5.5	5.5	5.5	6.5	6.5
				2.5	3.1	3.7	3.7	3.7	3.7	3.8	4.5	4.5
	in a filled hole	$\tau_{Rk,eq}$	[N/mm²]	4.0	4.0	5.5	5.5	5.5	Performance not evaluated			
				2.5	5.5	3.7	3.7	3.7				
Temperature range II: 80°C/50°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	2.5	3.5	4.0	4.0	4.0	4.0	4.0	4.5	4.5
				1.6	2.2	2.7	2.7	2.7	2.7	2.8	3.1	3.1
	in a filled hole	$\tau_{Rk,eq}$	[N/mm²]	2.5	3.0	4.0	4.0	4.0	Performance not evaluated			
				1.6	1.9	2.7	2.7	2.7				
Temperature range III: 120°C/72°C	in dry or wet concrete	$\tau_{Rk,ucr}$	[N/mm²]	2.0	2.5	3.0	3.0	3.0	3.0	3.0	3.5	3.5
				1.3	1.6	2.0	2.0	2.0	2.0	2.1	2.4	2.4
	in a filled hole	$\tau_{Rk,ucr}$	[N/mm²]	2.0	3.5	3.0	3.0	3.0	Performance not evaluated			
				1.3	1.3	2.0	2.0	2.0				
Increasing factor for concrete ψ_c			C25/30	1.02								
			C30/37	1.04								
			C35/45	1.08								
			C40/50	1.09								
			C45/55	1.10								
			C50/60	1.10								
Concrete cone failure												
Non-cracked concrete		$k_{ucr,N}$	[-]	11.0								
Cracked concrete		$k_{ucr,N}$	[-]	7.7								
Edge spacing		$c_{cr,N}$	[mm]	1.5 h_{ef}								
Longitudinal distance		$s_{cr,N}$	[mm]	2 $c_{cr,N}$								
Splitting												
Edge distance	$h/h_{ef} \geq 2.0$	$c_{cr,sp}$	[mm]	1.0 h_{ef}								
	$2.0 > h/h_{ef} > 2.0$			2*h_{ef} (2.5 - h/h_{ef})								
	$h/h_{ef} \leq 3.0$			2.4 h_{ef}								
Longitudinal distance		$s_{cr,sp}$	[mm]	2 $c_{cr,sp}$								
Installation factor (dry and wet concrete)		γ_{inst}	[-]	1.0	1.2							
Installation factor (filled hole)		γ_{inst}	[-]	1.4	Not evaluated							

1) f_{uk} value in accordance with reinforcement rods' specifications.
2) If national regulations do not apply.

Installation and strength characteristics for other substrates (autoclaved aerated concrete – AAC6, solid calcium-silicate brick – KS-NF, hollow calcium-silicate brick – KSL-3DF, hollow calcium-silicate brick – KSL-12DF, solid clay brick – Mz-DF, hollow clay brick – HLz-16DF, hollow clay brick – Porotherm Homebrick, hollow clay brick – BGV Thermo, hollow clay brick – Calibric R+, hollow clay brick – Urbanbrick, hollow clay brick – Brique creuse C40, hollow clay brick – Blocchi Leggeri, hollow clay brick – Doppio Uni, lightweight concrete hollow brick – Bloc creux B40, solid lightweight concrete brick – LAC) are available with **ETA-18/0814**.

Electric caulking gun

NEW

9912

UPON REQUEST

A professional electric caulking gun for chemical anchors.

Designation

Designation	Maximum speed	Maximum force	Index	Packaging [pcs]
Caulking gun, 380–410 ml	4 mm/s	6,000 N	75438	1

Chemical anchor caulking guns

9911

Ensure effective application of chemical anchors, e.g. glues, sealants and resins used for anchoring components in building structures.

Designation

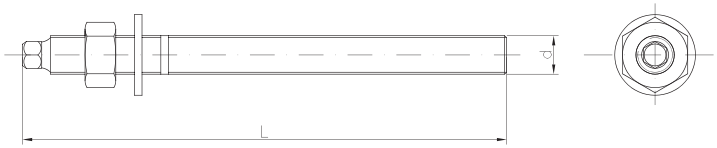
Designation	Index	Packaging [pcs]
Caulking gun, 280–300 ml	36716	1
Caulking gun, 380–410 ml	36717	1
Caulking gun, 585 ml	93308	1

Steel anchor for chemical anchoring

KGFIX 5870

CLASS 5.8

A detailed description of symbols used in the catalogue can be found on pages 12–15



Anchors statically loaded construction elements in substrates made of ordinary concrete with a class of at least C20/25.

Threaded anchors for chemical anchoring are delivered with a coarse round washer and a hexagonal nut in standard sizes.

Designation

Code and size	Thread type d	Length L [mm]	Index	Packaging [pcs]
KGFIX M8 x 110	M8	110	36926	10
KGFIX M10 x 130	M10	130	36927	10
KGFIX M12 x 160	M12	160	36928	10
KGFIX M16 x 190	M16	190	36929	10

Mixing nozzle for mechanical anchor

5891

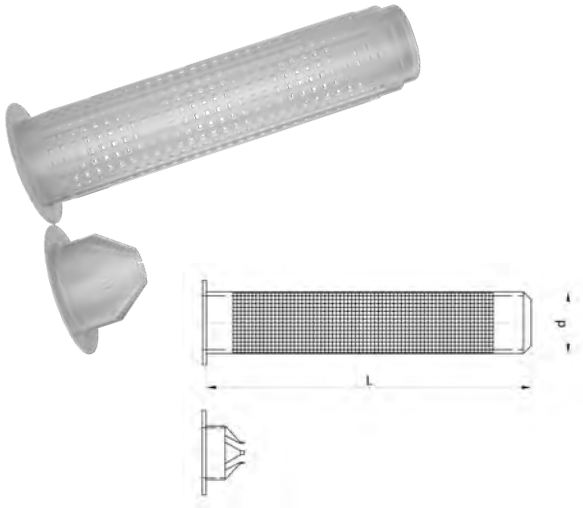
Facilitates mixing of chemical mortar ingredients, i.e. resin and a hardening agent. Proper mixing is required in order to obtain suitable anchoring strength. Made of polypropylene.

Designation

Capacity	Application	Index	Packaging [pcs]
300–410 ml	MKP, MKW, MKA anchors	36708	10
585 ml	MKE anchor	79755	10

Plastic mesh sleeve

5892



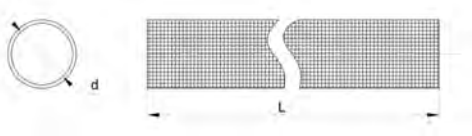
Installed in substrates with hollow spaces. Protects against penetration of resin into substrate holes during installation.

Designation

Diameter d [mm]	Length L [mm]	Type of	Index	Packaging [pcs]
12	80	M8/M6	7126	10
16	85	M10/M12	36709	10
16	130	M10/M12	36710	10
20	85	M16	36711	10

Wire mesh sleeve

5895



Installed in substrates with hollow spaces. Facilitates deep anchoring, thereby increasing the anchoring strength. Protects against penetration of resin into substrate holes during installation.

Designation

Diameter d [mm]	Length L [mm]	Type of threaded rod	Index	Packaging [pcs]
12	1,000	M8	36841	1
16	1,000	M10/M12	36850	1
22	1,000	M16	36851	1
26	1,000	M20	36854	1

Hole cleaning brush

5893

Designed for the removal of bore dust from drilled holes.

Designation

Diameter	Application	Index	Packaging [pcs]
13 mm	Small holes with diameters from 10 to 12 mm	36712	1
19 mm	Large holes with diameters from 18 to 20 mm	36714	1

Hole cleaning pump

5894

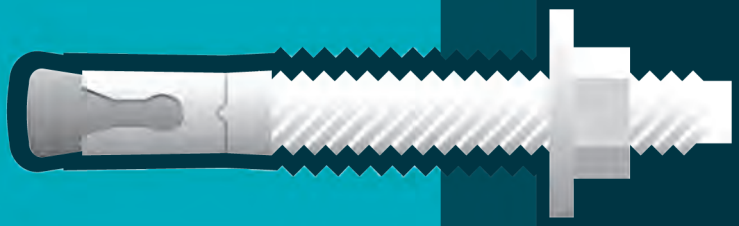
Designed for blowing out bore dust from holes to be injected with resin.

Designation

Index	Packaging [pcs]
36715	1

Steel anchors for anchoring to structural concrete

Section 3
Medium and high load fixings



		Page
1.	CA-Z/H concrete anchor bolt	100
2.	CA-H/X concrete anchor bolt	102
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Concrete anchor bolt (zinc coating + ring, sherardized coating)

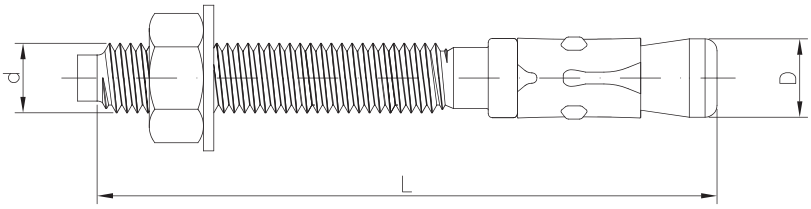
NEW

CE ETA 19/0284

CA-Z/H 5633

SHERARDIZED COATING · SEISMIC C1/C2 · Zn ZINC COATING 5 µm · FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15



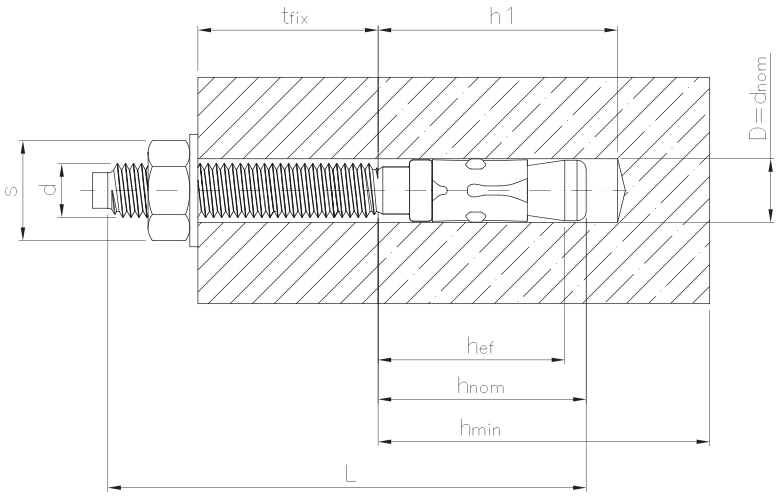
Concrete cracked zone – OPTION 1

Code and size

Code and size	Thread type d	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CA-Z/H M8 x 75	M8	8	75	9	26000	100
CA-Z/H M8 x 95	M8	8	95	29	26016	100
CA-Z/H M8 x 115 *	M8	8	115	49	26017	100
CA-Z/H M10 x 90	M10	10	90	10	26018	100
CA-Z/H M10 x 105	M10	10	105	25	26019	50
CA-Z/H M10 x 115	M10	10	115	35	26048	50
CA-Z/H M10 x 135 *	M10	10	135	55	26049	50
CA-Z/H M10 x 165 *	M10	10	165	85	26244	50
CA-Z/H M10 x 185 *	M10	10	185	105	26245	50
CA-Z/H M12 x 100	M12	12	100	4	26246	50
CA-Z/H M12 x 110	M12	12	110	14	26247	50
CA-Z/H M12 x 120 *	M12	12	120	24	26250	50
CA-Z/H M12 x 130	M12	12	130	34	26251	50
CA-Z/H M12 x 150 *	M12	12	150	54	26254	50
CA-Z/H M12 x 180	M12	12	180	84	26281	50
CA-Z/H M12 x 200 *	M12	12	200	104	26282	50
CA-Z/H M16 x 145	M16	16	145	28	26283	25
CA-Z/H M16 x 175	M16	16	175	58	26284	25
CA-Z/H M16 x 220 *	M16	16	220	103	26297	25
CA-Z/H M16 x 250 *	M16	16	250	133	26300	25
CA-Z/H M20 x 170 *	M20	20	170	32	26313	20
CA-Z/H M20 x 200 *	M20	20	200	62	26314	20

t_{fix} – Useful length of anchor

* Product available upon request



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	s [mm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CA-Z/H M8 x L	8	60	48	15	13	100	55	50	50
CA-Z/H M10 x L	10	75	60	40	17	120	68	60	60
CA-Z/H M12 x L	12	85	70	60	19	140	80	70	70
CA-Z/H M16 x L	16	105	85	100	24	170	97	128	128
CA-Z/H M20 x L	20	125	100	200	30	200	114	150	150

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	D [mm]	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked concrete, class C20/C25 (1)	8	6.0	11.0
	10	9.0	17.4
	12	16.0	25.3
	16	25.0	47.1
	20	30.0	73.1
Non-cracked concrete, class C20/25 (1)	8	9.0	11.0
	10	16.0	17.4
	12	25.0	25.3
	16	35.0	47.1
	20	50.0	73.1

(1) In accordance with PN EN 206+A1:2016

Application

Anchoring statically loaded construction elements to cracked or non-cracked concrete in classes C20/25 to C50/60.

Material

- The shank is made of zinc-plated carbon steel with a thickness of ≥ 5 µm.
- The expansion ring is made of hot-dip plated carbon steel with a thickness of ≥ 15 µm.
- The nut and washer are made of zinc-plated carbon steel with a thickness of ≥ 5 µm.

Concrete anchor bolt (sherardized coating + ring, A4)

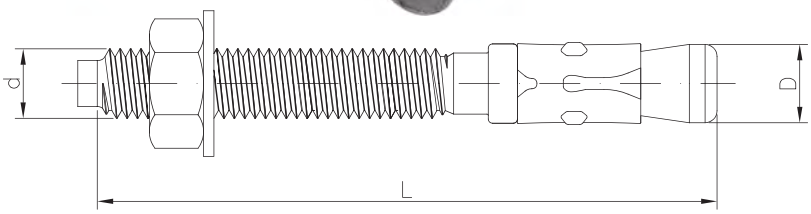
NEW

CE ETA 19/0284

CA-H/X 5634

SHERARDIZED COATING · A4 ACID-RESISTANT · SEISMIC C1/C2 · FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15



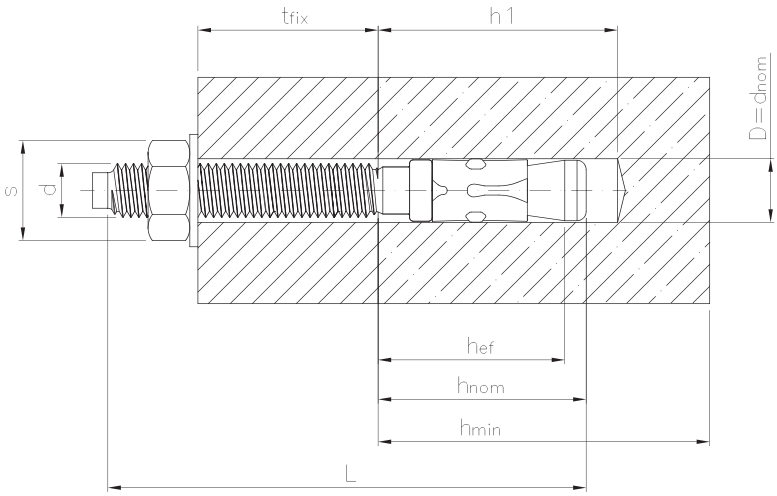
Concrete cracked zone – OPTION 1

Code and size

Code and size	Thread type d	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CA-H/X M8 x 75 *	M8	8	75	9	26325	100
CA-H/X M8 x 95	M8	8	95	29	26367	100
CA-H/X M8 x 115 *	M8	8	115	49	26375	100
CA-H/X M10 x 90	M10	10	90	10	26427	100
CA-H/X M10 x 105 *	M10	10	105	25	26555	50
CA-H/X M10 x 115	M10	10	115	35	26556	50
CA-H/X M10 x 135 *	M10	10	135	55	26595	50
CA-H/X M10 x 165 *	M10	10	165	85	26596	50
CA-H/X M10 x 185 *	M10	10	185	105	26597	50
CA-H/X M12 x 110 *	M12	12	110	14	26771	50
CA-H/X M12 x 130	M12	12	130	34	26772	50
CA-H/X M12 x 150 *	M12	12	150	54	26773	50
CA-H/X M12 x 180 *	M12	12	180	84	26774	50
CA-H/X M12 x 200 *	M12	12	200	104	26835	50
CA-H/X M16 x 125	M16	16	125	8	26910	25
CA-H/X M16 x 145 *	M16	16	145	28	26921	25
CA-H/X M16 x 175 *	M16	16	175	58	26922	25
CA-H/X M16 x 220 *	M16	16	220	103	26923	25
CA-H/X M20 x 170	M20	20	170	32	26924	20
CA-H/X M20 x 200 *	M20	20	200	62	26940	20

t_{fix} – Useful length of anchor

* Product available upon request



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	s [mm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CA-H/X M8 x L	8	60	48	15	13	100	55	50	50
CA-H/X M10 x L	10	75	60	40	17	120	68	60	60
CA-H/X M12 x L	12	85	70	60	19	140	80	70	70
CA-H/X M16 x L	16	105	85	100	24	170	97	128	128
CA-H/X M20 x L	20	125	100	200	30	200	114	150	150

Substrates

Cracked concrete

Non-cracked concrete

Strength characteristics

Substrate	D [mm]	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked concrete, class C20/C25 (1)	8	6.0	11.0
	10	9.0	17.4
	12	16.0	25.3
	16	25.0	47.1
	20	30.0	73.1
Non-cracked concrete, class C20/25 (1)	8	9.0	11.0
	10	16.0	17.4
	12	30.0	25.3
	16	35.0	47.1
	20	50.0	73.1

(1) In accordance with PN EN 206+A1:2016

Application

Anchoring statically loaded construction elements to cracked or non-cracked concrete in classes C20/25 to C50/60.

Material

- The shank is made of hot-dip plated carbon steel with a thickness of ≥ 40 µm.
- The expansion ring is made of A4 acid-resistant steel.
- The nut and washer are made of hot-dip plated carbon steel with a thickness of ≥ 40 µm.

Concrete anchor bolt (zinc coating + ring, A4)

NEW

CE ETA 19/0284

CA-Z/X 5632

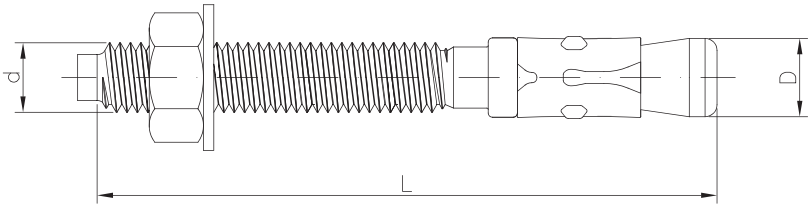
A4 ACID-RESISTANT

SEISMIC C1/C2

Zn ZINC COATING 5 µm

FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15

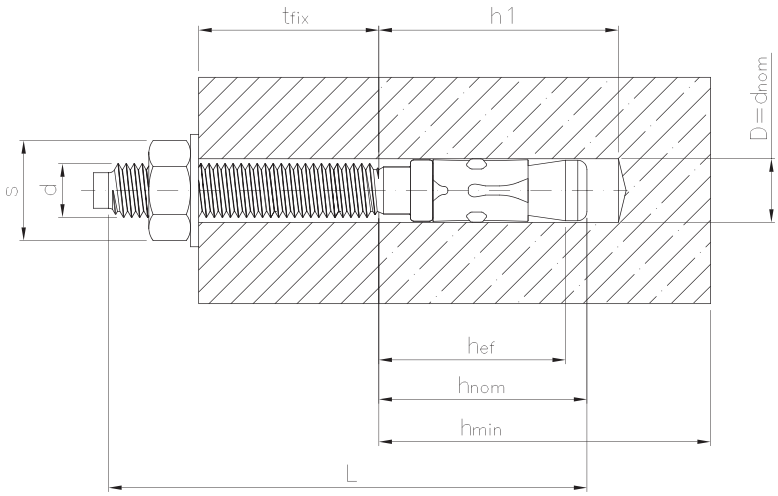


Concrete cracked zone – OPTION 1

Code and size

Code and size	Thread type d	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CA-Z/X M8 x 75	M8	8	75	9	25386	100
CA-Z/X M8 x 95	M8	8	95	29	25387	100
CA-Z/X M8 x 115	M8	8	115	49	25509	100
CA-Z/X M10 x 90	M10	10	90	10	25524	100
CA-Z/X M10 x 105	M10	10	105	25	25525	50
CA-Z/X M10 x 115	M10	10	115	35	25526	50
CA-Z/X M10 x 135	M10	10	135	55	25527	50
CA-Z/X M10 x 165	M10	10	165	85	25528	50
CA-Z/X M10 x 185	M10	10	185	105	25546	50
CA-Z/X M12 x 100	M12	12	100	4	25623	50
CA-Z/X M12 x 110	M12	12	110	14	25642	50
CA-Z/X M12 x 120	M12	12	120	24	25643	50
CA-Z/X M12 x 130	M12	12	130	34	25646	50
CA-Z/X M12 x 150	M12	12	150	54	25647	50
CA-Z/X M12 x 180	M12	12	180	84	25802	50
CA-Z/X M12 x 200	M12	12	200	104	25803	50
CA-Z/X M16 x 145	M16	16	145	28	25804	25
CA-Z/X M16 x 175	M16	16	175	58	25810	25
CA-Z/X M16 x 220	M16	16	220	103	25812	25
CA-Z/X M16 x 250	M16	16	250	133	25814	25
CA-Z/X M20 x 170	M20	20	170	32	25818	20
CA-Z/X M20 x 200	M20	20	200	62	25820	20
CA-Z/X M24 x 205	M24	24	205	35	25821	10
CA-Z/X M24 x 235	M24	24	235	65	25877	10

t_{fix} – Useful length of anchor



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	s [mm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CA-Z/X M8 x L	8	60	48	20	13	100	55	50	50
CA-Z/X M10 x L	10	75	60	40	17	120	68	60	60
CA-Z/X M12 x L	12	85	70	60	19	140	80	70	70
CA-Z/X M16 x L	16	105	85	100	24	170	97	85	85
CA-Z/X M20 x L	20	125	100	200	30	200	114	100	100
CA-Z/X M24 x L	24	155	125	250	36	250	143	125	125

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	D [mm]	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked concrete, class C20/C25 (1)	8	5.0	11.0
	10	9.0	17.4
	12	12.0	25.3
	16	25.0	47.1
	20	30.0	73.1
	24	30.0	84.7
Non-cracked concrete, class C20/25 (1)	8	9.0	11.0
	10	16.0	17.4
	12	20.0	25.3
	16	35.0	47.1
	20	50.0	73.1
	24	50.0	84.7

(1) In accordance with PN EN 206+A1:2016

Application

Anchoring statically loaded construction elements to cracked or non-cracked concrete in classes C20/25 to C50/60.

Material

- The shank is made of zinc-plated carbon steel with a thickness of ≥ 5 µm.
- The expansion ring is made of A4 acid-resistant steel.
- The nut and washer are made of zinc-plated carbon steel with a thickness of ≥ 5 µm.

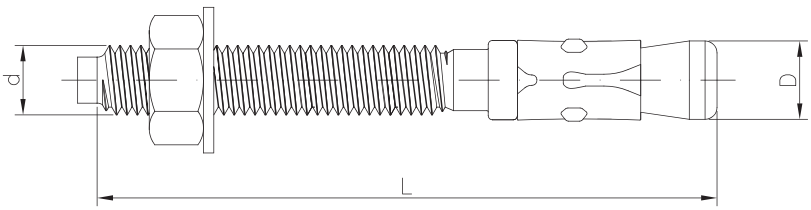
Concrete anchor bolt (A4 + ring, A4)

NEW

CE ETA 15/0145

CA-X/X I5635

A4 ACID-RESISTANT STEEL | SEISMIC C1/C2 | FIRE RESISTANCE



A detailed description of symbols used in the catalogue can be found on pages 12–15

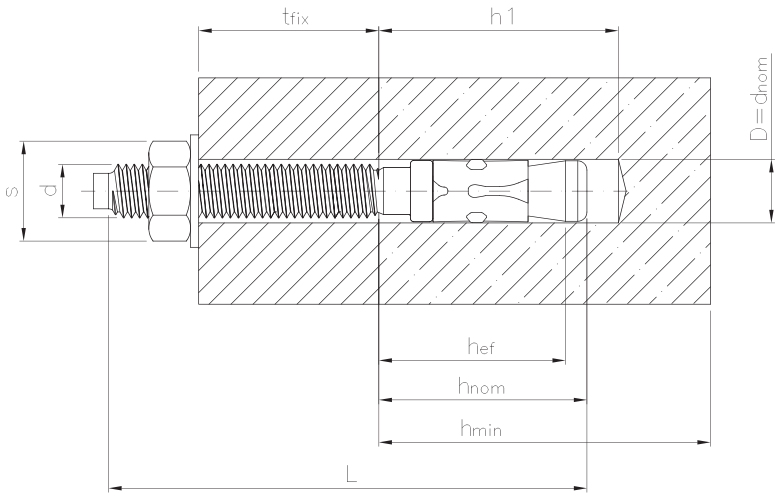
Concrete cracked zone – OPTION 1

Code and size

Code and size	Thread type d	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CA-X/X M8 x 68 *	M8	8	68	4	25096	100
CA-X/X M8 x 75	M8	8	75	10	25099	100
CA-X/X M8 x 90	M8	8	90	25	25102	100
CA-X/X M8 x 115 *	M8	8	115	50	25104	100
CA-X/X M8 x 135 *	M8	8	135	70	25105	50
CA-X/X M8 x 165 *	M8	8	165	100	25114	50
CA-X/X M10 x 90 *	M10	10	90	10	25115	100
CA-X/X M10 x 105 *	M10	10	105	25	25116	50
CA-X/X M10 x 115	M10	10	115	35	25154	50
CA-X/X M10 x 135 *	M10	10	135	55	25155	50
CA-X/X M10 x 155 *	M10	10	155	75	25156	50
CA-X/X M10 x 185 *	M10	10	185	105	25157	50
CA-X/X M12 x 110 *	M12	12	110	10	25181	50
CA-X/X M12 x 120	M12	12	120	20	25183	50
CA-X/X M12 x 145 *	M12	12	145	45	25218	50
CA-X/X M12 x 170 *	M12	12	170	70	25219	50
CA-X/X M12 x 200 *	M12	12	200	100	25221	50
CA-X/X M16 x 130	M16	16	130	10	638124	25
CA-X/X M16 x 150 *	M16	16	150	30	25224	25
CA-X/X M16 x 185 *	M16	16	185	60	25226	25
CA-X/X M16 x 220 *	M16	16	220	100	25227	25

t_{fix} – Useful length of anchor

* Product available upon request



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	s [mm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CA-X/X M8 x L	8	70	48	20	13	100	54	50	50
CA-X/X M10 x L	10	80	60	40	17	120	67	55	50
CA-X/X M12 x L	12	100	72	60	19	150	81	60	60
CA-X/X M16 x L	16	115	86	120	24	170	97	70	70

Substrates

Cracked concrete

Non-cracked concrete

Strength characteristics

Substrate	D [mm]	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked concrete, class C20/C25 (1)	8	5.0	11.9
	10	9.0	18.8
	12	12.0	27.4
	16	25.0	51.0
Non-cracked concrete, class C20/25 (1)	8	9.0	11.9
	10	16.0	18.8
	12	20.0	27.4
	16	35.0	51.0

(1) In accordance with PN EN 206+A1:2016

Application

Anchoring statically loaded construction elements to ordinary, reinforced, plain, cracked or non-cracked concrete substrates.

Material

- The shank is made of A4 acid-resistant steel.
- The expansion ring is made of A4 acid-resistant steel.
- The nut and washer are made of A4 acid-resistant steel.

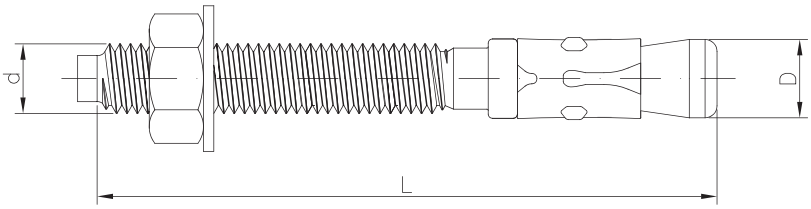
Wedge anchor (zinc coating + zinc-plated ring)

AT-15-8846/2016

PSR 5631

Zn ZINC COATING 5µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

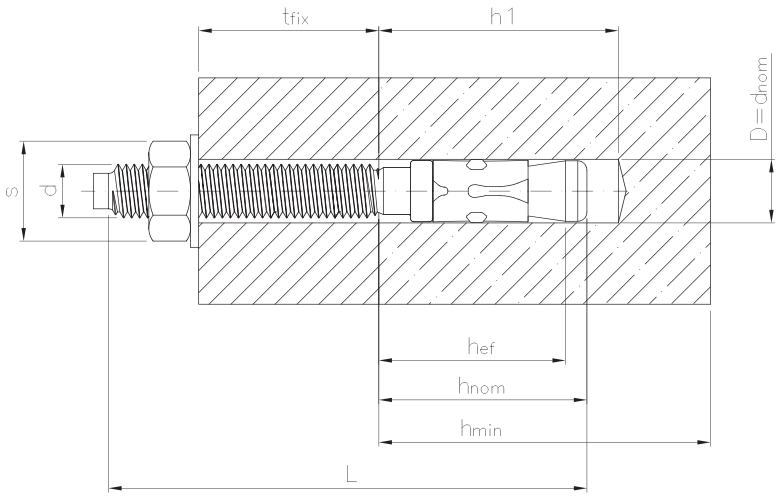


Concrete non-cracked zone – OPTION 7

Code and size

Code and size	Thread type d	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
PSR M6 x 85	M6	6	85	45	51643	100
PSR M8 x 65	M8	8	65	13	38007	100
PSR M8 x 75	M8	8	75	23	45529	100
PSR M8 x 80	M8	8	80	28	38024	100
PSR M8 x 90	M8	8	90	38	26195	100
PSR M8 x 115	M8	8	115	63	38051	100
PSR M10 x 65	M10	10	65	1	38052	100
PSR M10 x 75	M10	10	75	10	73545	100
PSR M10 x 80	M10	10	80	15	53101	100
PSR M10 x 90	M10	10	90	25	32173	50
PSR M10 x 105	M10	10	105	45	44409	50
PSR M10 x 120	M10	10	120	55	38058	50
PSR M12 x 100	M12	12	100	22	38059	25
PSR M12 x 120	M12	12	120	42	38067	25
PSR M12 x 140	M12	12	140	62	50193	25
PSR M12 x 150	M12	12	150	72	38069	25
PSR M12 x 160	M12	12	160	82	83173	25
PSR M12 x 180	M12	12	180	102	56840	25
PSR M12 x 200	M12	12	200	122	50194	25
PSR M12 x 220	M12	12	220	142	50197	25
PSR M16 x 105	M16	16	105	3	77622	25
PSR M16 x 125	M16	16	125	23	38072	25
PSR M16 x 140	M16	16	140	38	38073	25
PSR M16 x 150	M16	16	150	48	7409	25
PSR M16 x 175	M16	16	175	73	38074	25
PSR M16 x 180	M16	16	180	78	83175	25
PSR M20 x 160	M20	20	160	13	56842	10
PSR M20 x 220	M20	20	220	73	56843	10
PSR M20 x 250	M20	20	250	103	57016	10

t_{fix} – Useful length of anchor



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	s [mm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
PSR M6 x L	6	40	30	5	10	100	34	90	60
PSR M8 x L	8	45	40	15	13	100	44	120	80
PSR M10 x L	10	55	50	30	17	100	54	150	100
PSR M12 x L	12	65	60	50	19	120	65	180	120
PSR M16 x L	16	90	80	100	24	160	85	240	160
PSR M20 x L	20	140	120	200	30	240	110	360	240

Substrates

Non-cracked concrete

Strength characteristics

Substrate	D [mm]	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Ordinary non-cracked concrete, class C20/C25 (1)	6	4.0	4.0
	8	5.0	5.0
	10	7.5	7.5
	12	12.0	21.0
	16	16.0	39.0
	20	16.0	61.0

(1) In accordance with PN EN 206+A1:2016

Application

Anchoring statically loaded construction elements to ordinary non-cracked, reinforced or plain concrete substrates.

Material

- The shank is made of low-carbon steel with a mechanical property class of at least 5.8.
- The expansion ring is made of S235JR steel sheet.
- The nut and washer are made of low-carbon steel with a mechanical property class of at least 5.

Steel sleeve anchor

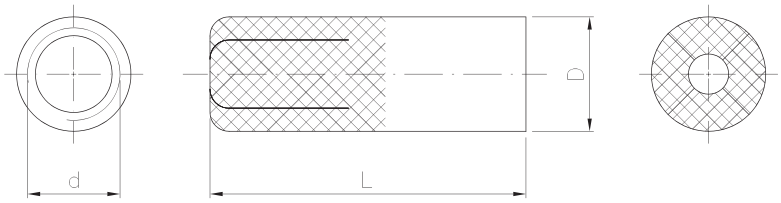
ITB-KOT-2017/0038

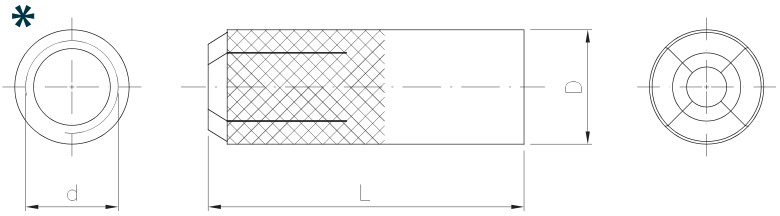
TRS 5641

Zn ZINC COATING 5 µm

FIRE RESISTANCE

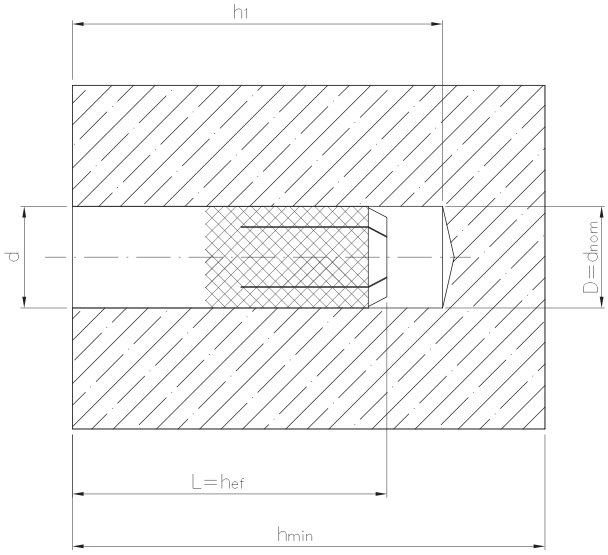
A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	Internal thread type d	D [mm]	L [mm]	Index	Packaging [pcs]
TRS M6	M6	8	25	38080	100
TRS M8	M8	10	30	42653	100
TRS M10*	M10	12	40	73959	50
TRS M12*	M12	15	50	42655	50
TRS M16*	M16	20	65	42656	25



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	h_{min} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
TRS M6	8	27	25	80	200	150
TRS M8	10	32	30	80	200	150
TRS M10	12	42	40	80	200	150
TRS M12	15	52	50	100	200	150
TRS M16	20	67	65	130	220	165

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	Internal thread type d	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked and non-cracked concrete, classes C20/C25 to C50/60 [1]	M6	0.75	0.75
	M8	1.20	1.20
	M10	2.00	2.00
	M12	3.00	3.00
	M16	5.00	5.00

[1] In accordance with PN EN 206+A1:2016

Application

Non-structural anchoring (suspensions, installation fixings, process device fixings, temporary process and working fixings) in cracked or non-cracked concrete classes C20/25 to C50/60.

Smooth steel sleeve anchor

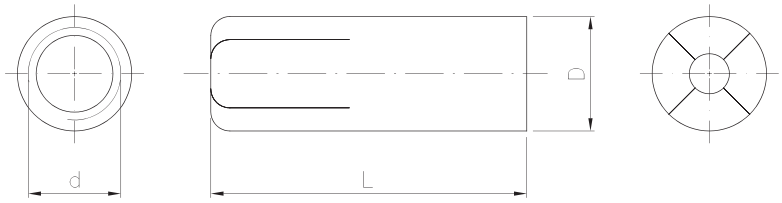
ITB-KOT-2017/0038

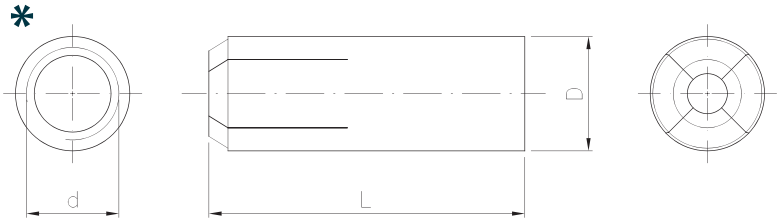
TRSG 5642

Zn ZINC COATING 5 µm

FIRE RESISTANCE

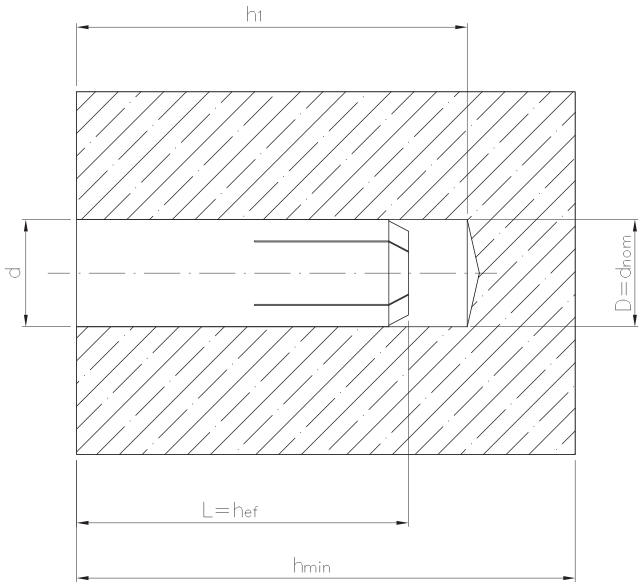
A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	Internal thread type d	D [mm]	L [mm]	Index	Packaging [pcs]
TRSG M6	M6	8	25	31029	100
TRSG M8	M8	10	30	31030	100
TRSG M10*	M10	12	40	31031	50
TRSG M12*	M12	15	50	50113	50
TRSG M16*	M16	20	65	31032	25



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	h_{min} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
TRSG M6	8	27	25	80	200	150
TRSG M8	10	32	30	80	200	150
TRSG M10	12	42	40	80	200	150
TRSG M12	15	52	50	100	200	150
TRSG M16	20	67	65	130	220	165

Substrates

Cracked concrete

Non-cracked concrete

Strength characteristics

Substrate	Internal thread type d	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked and non-cracked concrete, classes C20/C25 to C50/60 [1]	M6	0.75	0.75
	M8	1.30	1.30
	M10	2.00	2.00
	M12	3.00	3.00
	M16	5.00	5.00

[1] In accordance with PN EN 206+A1:2016

Application

Non-structural anchoring (suspensions, installation fixings, process device fixings, temporary process and working fixings) in cracked or non-cracked concrete classes C20/25 to C50/60.

Stainless-steel sleeve anchor

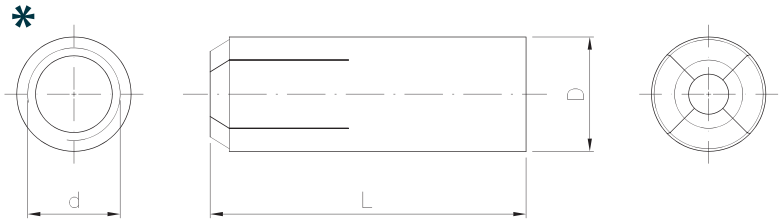
NEW

ITB-KOT-2017/0038

TRX I5642

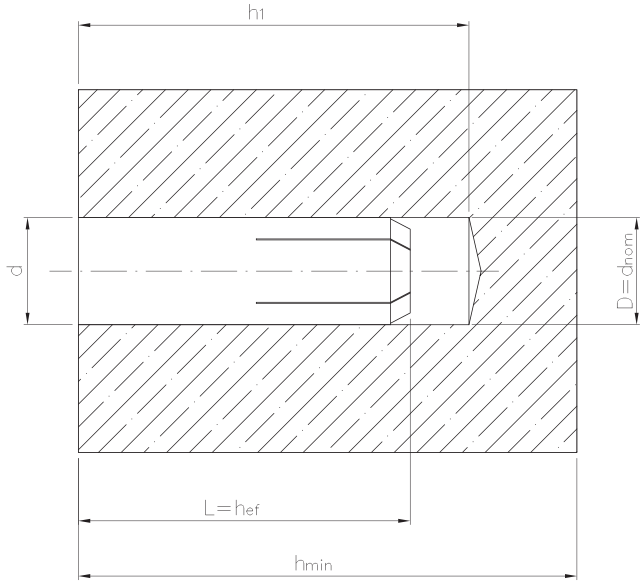
A4 ACID-RESISTANT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	Internal thread type d	D [mm]	L [mm]	Index	Packaging [pcs]
TRX M6	M6	8	25	25229	100
TRX M8	M8	10	30	25230	100
TRX M10*	M10	12	40	25238	50
TRX M12*	M12	15	50	25243	50
TRX M16*	M16	20	65	25245	25
TRX M20*	M20	25	80	25251	25



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	h_{min} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
TRX M6	8	27	25	80	200	150
TRX M8	10	32	30	80	200	150
TRX M10	12	42	40	80	200	150
TRX M12	15	52	50	100	200	150
TRX M16	20	67	65	130	260	195
TRX M20	25	82	80	160	320	240

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	Internal thread type d	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Cracked and non-cracked concrete, classes C20/C25 to C50/60 [1]	M6	0.65	0.65
	M8	2.00	2.00
	M10	4.50	4.50
	M12	5.00	5.00
	M16	9.00	9.00
	M20	13.00	13.00

[1] In accordance with PN EN 206+A1:2016

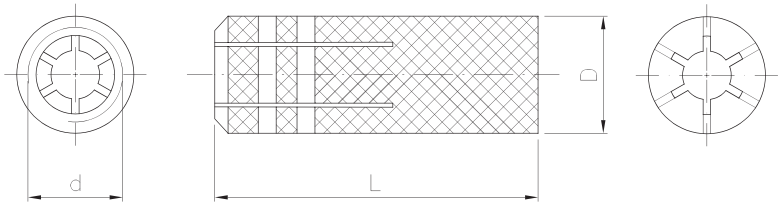
Application

Non-structural anchoring (suspensions, installation fixings, process device fixings, temporary process and working fixings) in cracked or non-cracked concrete classes C20/25 to C50/60.

Brass sleeve anchor

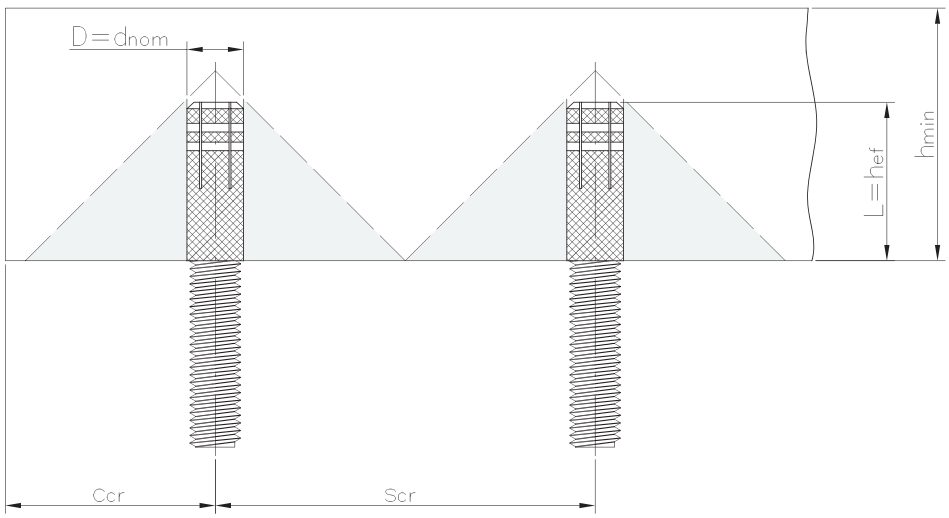
AT-15-8843/2016

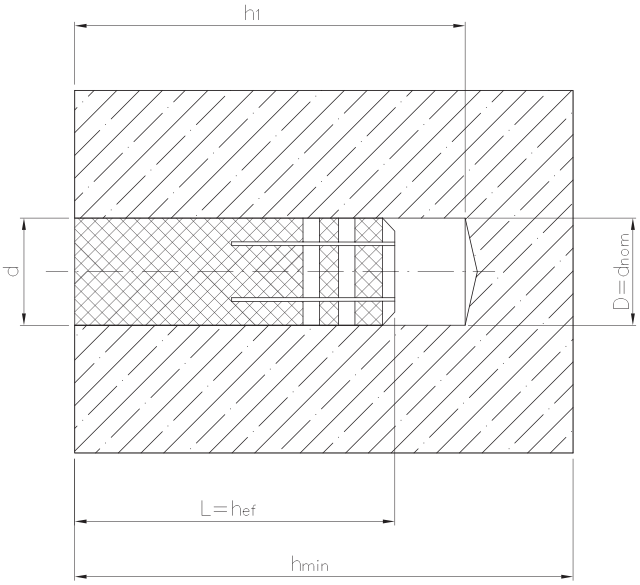
TRM 5646



Code and size

Code and size	Internal thread type d	D [mm]	L [mm]	Index	Packaging [pcs]
TRM M6	M6	8	25	38082	100
TRM M8	M8	10	28	38085	100
TRM M10	M10	12	33	31428	50
TRM M12	M12	16	38	38088	50
TRM M16	M16	20	45	79145	25





Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	h_{min} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
TRM M6	8	28	25	80	200	150
TRM M8	10	33	28	80	200	150
TRM M10	12	38	33	80	200	150
TRM M12	16	43	38	86	200	150
TRM M16	20	50	45	90	200	150

Substrates


Non-cracked concrete


Solid clay brick

Strength characteristics

Substrate	Internal thread type d	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Non-cracked concrete, class C20/C25 (1)	M6	1.50	1.50
	M8	2.00	2.00
	M10	3.00	3.00
	M12	5.00	5.00
	M16	5.00	5.00
Solid clay brick, class C20 (1)	M6	0.90	0.90
	M8	2.50	2.50
	M10	2.50	2.50
	M12	2.50	2.50
	M16	2.50	2.50

(1) In accordance with PN EN 206+A1:2016

(2) In accordance with PN-EN 771-1:2015

Application

Anchoring non-structural, statically loaded construction elements:

- To ordinary cracked or non-cracked, reinforced or plain concrete substrates of classes C20/25–C50/60.
- To solid clay brick substrates with nominal compression strength of at least 20 N/mm^2 (classes not lower than 20).

Material

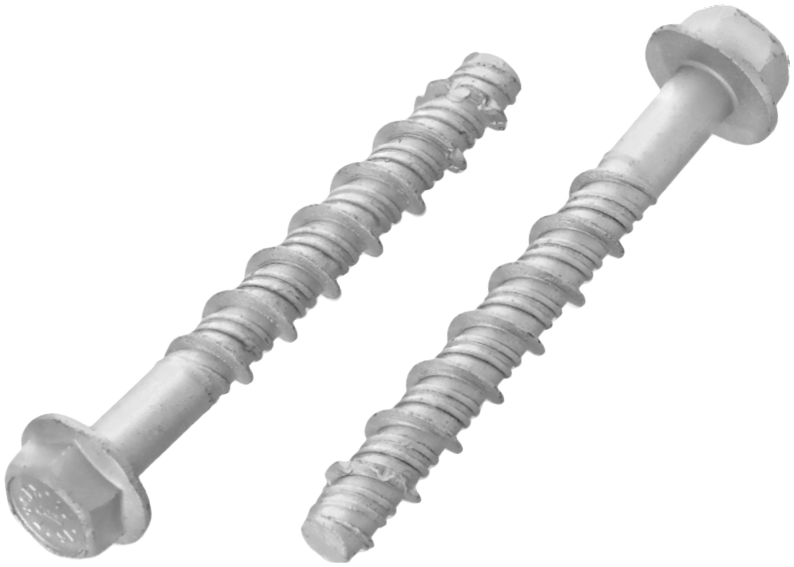
CH2 brass

Hexagonal head concrete screw – zinc coating

NEW

ETA 14/0374

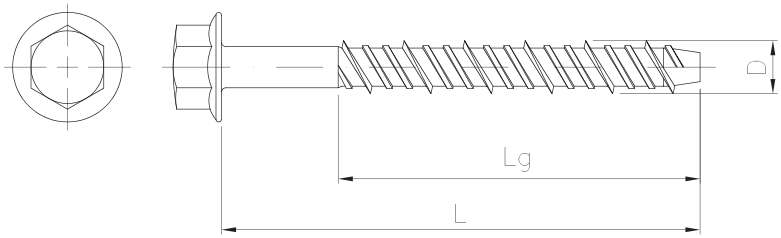
CBH-Z 5651



Zn ZINC COATING 5 µm

FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15

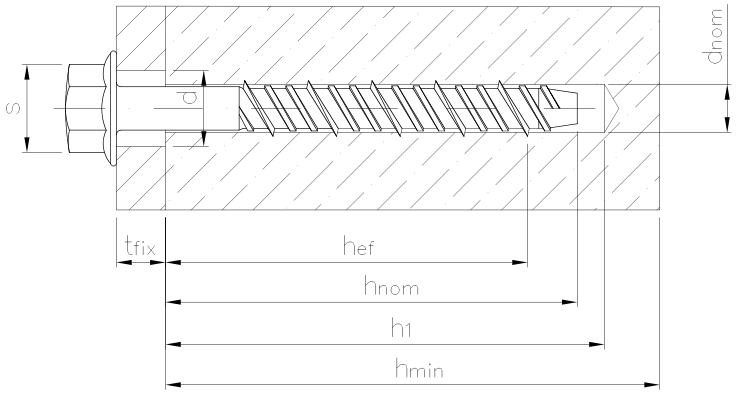


Concrete cracked zone – OPTION 1

Code and size

Code and size	D [mm]	L [mm]	Lg [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CBH-Z 7.5 x 60	7.5	60	50	5	40132	100
CBH-Z 7.5 x 80	7.5	80	50	25	40341	100
CBH-Z 10.5 x 90	10.5	90	60	30	40361	50
CBH-Z 10.5 x 100	10.5	100	60	40	40375	50
CBH-Z 12.5 x 85	12.5	85	70	15	40376	30
CBH-Z 12.5 x 100	12.5	100	70	30	40639	20
CBH-Z 16.5 x 115	16.5	115	80	5	40710	12

t_{fix} – Useful length



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	h_{min} [mm]	h_{nom} [mm]	s [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CBH-Z 7.5 x L	6	65	42	20	100	55	10	45	45
CBH-Z 10.5 x L	8	70	45	50	100	60	13	50	50
CBH-Z 12.5 x L	10	85	52	80	105	70	17	60	60
CBH-Z 16.5 x L	14	130	86	120	175	110	19	100	100

Substrates

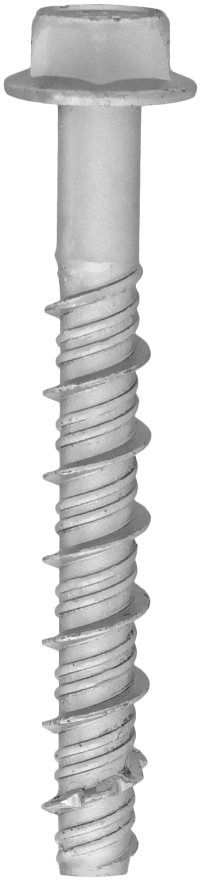

Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	Nominal thread diameter D [mm]	Characteristic resistance	
		Pull-out resistance $N_{Rk,p}$ [kN]	Shear resistance $V_{Rk,s}$ [kN]
Cracked concrete, class C20/25 (1)	7.5	6.0	7.5
	10.5	9.0	16.3
	12.5	12.0	35.6
	16.5	30.0	57.9
Non-cracked concrete, class C20/25 (1)	7.5	9.0	7.5
	10.5	12.0	16.3
	12.5	20.0	35.6
	16.5	40.0	57.9

(1) In accordance with PN EN 206+A1:2016



Application

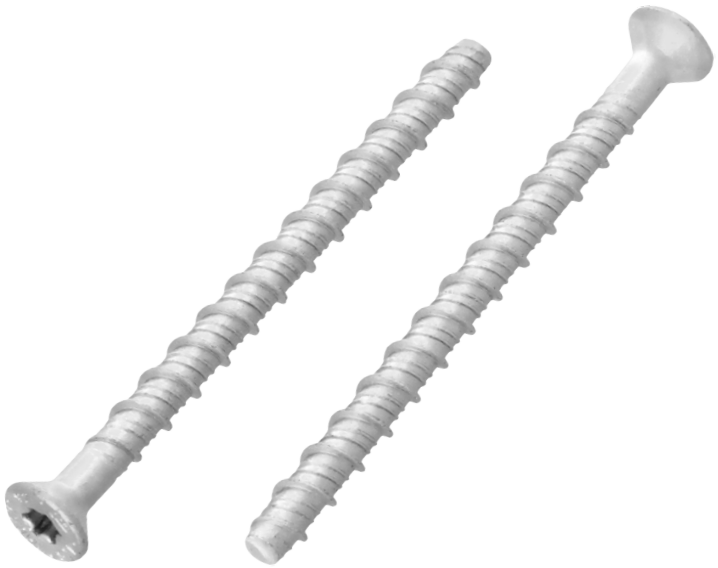
Fixing railings, brackets, supports, cable routes, machines, gates, façades, frames, mouldings, metal profiles, wire joists, chains, ropes, perforated tapes, ventilation ducts, wooden or metal substructures and ceiling lining.

Benefits

- Concurrent mounting and fixing saves time and facilitates easier installation.
- The anchor can be removed leaving a flat concrete surface.
- A preferred solution for temporary fixings (e.g. formwork supports or scaffolding)
- Installation performed practically without any expansion stress and facilitates fixing with small axial and edge distances.

Steeple head concrete screw – zinc coating

NEW



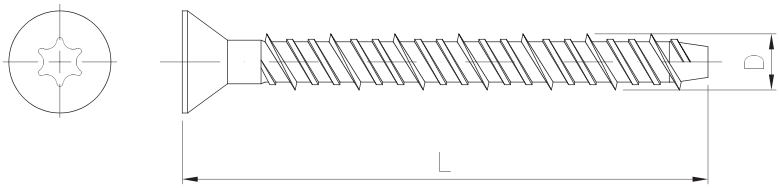
CE ETA 14/0374

CBC-Z 5653

Zn ZINC COATING 5 µm

FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15

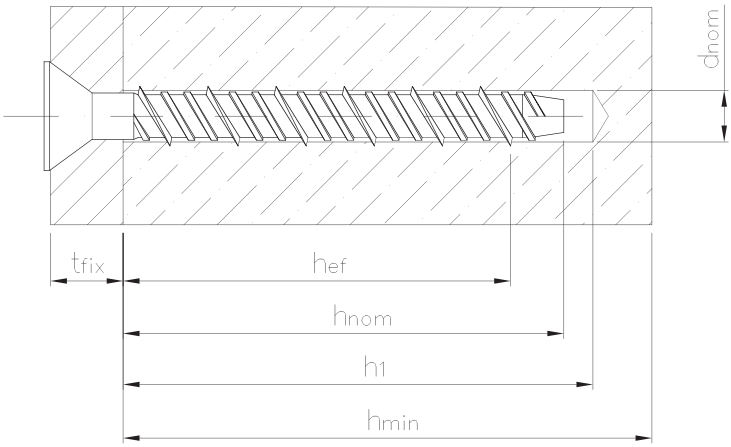


Concrete cracked zone – OPTION 1

Code and size

Code and size	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CBC-Z 7.5 x 72	7.5	72	17	40712	100
CBC-Z 7.5 x 92	7.5	92	37	40821	50
CBC-Z 7.5 x 112	7.5	112	57	41317	50
CBC-Z 7.5 x 132	7.5	132	77	41332	50
CBC-Z 7.5 x 152	7.5	152	97	41334	50

t_{fix} – Useful length



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	h_{min} [mm]	h_{nom} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CBC-Z 7.5 x L	6	65	42	20	100	55	45	45

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	Nominal thread diameter D [mm]	Characteristic resistance	
		Pull-out resistance $N_{Rk,p}$ [kN]	Shear resistance $V_{Rk,s}$ [kN]
Cracked concrete, class C20/25 (1)	7.5	6.0	7.5
Non-cracked concrete, class C20/25 (1)	7.5	9.0	7.5

(1) In accordance with PN EN 206+A1:2016

Application

Fixing railings, brackets, supports, cable routes, machines, gates, façades, frames, mouldings, metal profiles, wire joists, chains, ropes, perforated tapes, ventilation ducts, wooden or metal substructures and ceiling lining.

Benefits

- Concurrent mounting and fixing saves time and facilitates easier installation.
- The anchor can be removed leaving a flat concrete surface.
- A preferred solution for temporary fixings (e.g. formwork supports or scaffolding)
- Installation performed practically without any expansion stress and facilitates fixing with small axial and edge distances.

Hexagonal head concrete screw – 500h ceramic coating

NEW

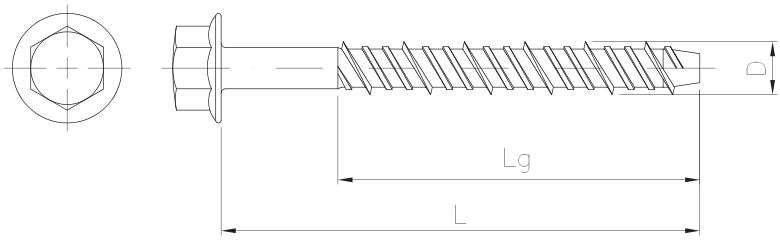
ETA 14/0374

CBH-R 5652

SILVER RUSPERT

FIRE RESISTANCE

A detailed description of symbols used in the catalogue can be found on pages 12–15

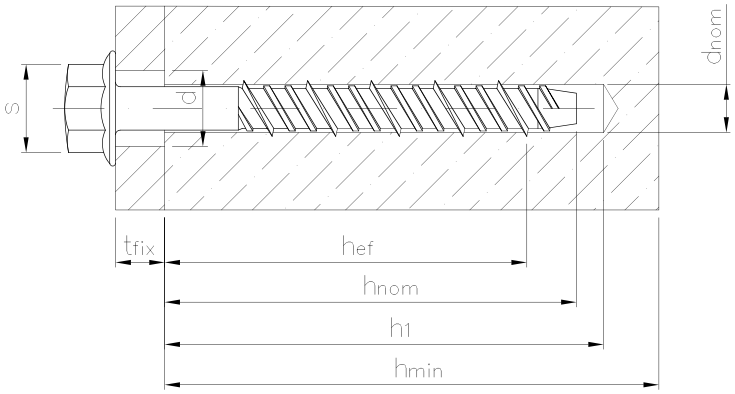


Concrete cracked zone – OPTION 1

Code and size

Code and size	D [mm]	L [mm]	Lg [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CBH-R 7.5 x 60	7.5	60	50	5	41341	100
CBH-R 7.5 x 80	7.5	80	50	25	41451	100
CBH-R 10.5 x 90	10.5	90	60	30	41543	50
CBH-R 10.5 x 110	10.5	110	60	50	41782	50
CBH-R 12.5 x 85	12.5	85	70	15	41787	30
CBH-R 12.5 x 100	12.5	100	70	30	41806	20
CBH-R 16.5 x 115	16.5	115	80	5	41807	12

t_{fix} – Useful length



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	h_{min} [mm]	h_{nom} [mm]	s [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CBH-R 7.5 x L	6	65	42	20	100	55	10	45	45
CBH-R 10.5 x L	8	70	45	50	100	60	13	50	50
CBH-R 12.5 x L	10	85	52	80	105	70	17	60	60
CBH-R 16.5 x L	14	130	86	120	175	110	19	100	100

Substrates


Cracked concrete


Non-cracked concrete

Strength characteristics

Substrate	Nominal thread diameter D [mm]	Characteristic resistance	
		Pull-out resistance $N_{Rk,p}$ [kN]	Shear resistance $V_{Rk,s}$ [kN]
Cracked concrete, class C20/25 (1)	7.5	6.0	7.5
	10.5	9.0	16.3
	12.5	12.0	35.6
	16.5	30.0	57.9
Non-cracked concrete, class C20/25 (1)	7.5	9.0	7.5
	10.5	12.0	16.3
	12.5	20.0	35.6
	16.5	40.0	57.9

(1) In accordance with PN EN 206+A1:2016

Application

Fixing railings, brackets, supports, cable routes, machines, gates, façades, frames, mouldings, metal profiles, wire joists, chains, ropes, perforated tapes, ventilation ducts, wooden or metal substructures and ceiling lining.

Benefits

- Concurrent mounting and fixing saves time and facilitates easier installation.
- The anchor can be removed leaving a flat concrete surface.
- A preferred solution for temporary fixings (e.g. formwork supports or scaffolding)
- Installation performed practically without any expansion stress and facilitates fixing with small axial and edge distances.

Concrete screw – Bi-metal

NEW

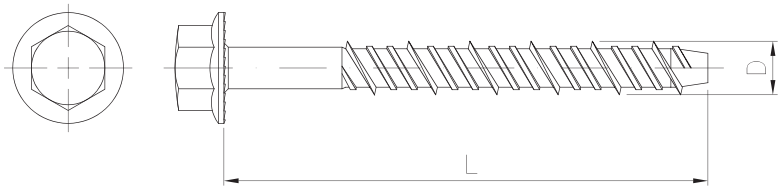
ETA-15/0815
ETA-16/0067

CBH-B 5654

FIRE RESISTANCE

BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15

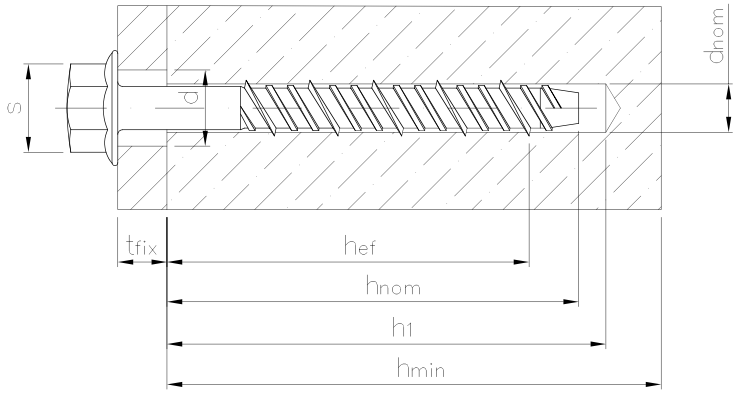


Concrete cracked zone – OPTION 1

Code and size

Code and size	D [mm]	L [mm]	t_{fix} [mm]	Index	Packaging [pcs]
CBH-B 7.5 x 75	7.5	75	5	41818	100
CBH-B 7.5 x 85	7.5	85	15	41878	50
CBH-B 10.0 x 90	10.0	90	5	42044	50
CBH-B 10.0 x 100	10.0	100	15	42045	50
CBH-B 12.5 x 105	12.5	105	5	42046	50
CBH-B 12.5 x 125	12.5	125	25	42116	15
CBH-B 14.5 x 125	14.5	125	5	42117	15
CBH-B 14.5 x 135	14.5	135	15	42233	15

t_{fix} – Useful length



Installation characteristics

Designation	d_{nom} [mm]	h_1 [mm]	h_{ef} [mm]	[Nm]	h_{min} [mm]	h_{nom} [mm]	s [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum substrate edge distance c_{cr} [mm]
CBH-B 7.5 x L	6	64	42.6	20	100	55	10	40	40
CBH-B 10.0 x L	8	75	50.6	40	110	65	13	50	50
CBH-B 12.5 x L	10	85	58.1	60	130	75	17	60	60
CBH-B 14.2 x L	12	105	75.4	80	150	95	19	70	70

Substrates

Cracked concrete

Non-cracked concrete

Strength characteristics

Substrate	Nominal thread diameter D [mm]	Characteristic resistance	
		Pull-out resistance $N_{Rk,p}$ [kN]	Shear resistance $V_{Rk,s}$ [kN]
Cracked concrete, class C20/25 (1)	7.5	5.0	7.3
	10.0	4.0	13.4
	12.5	7.5	21.3
	14.2	12.0	37.8
Non-cracked concrete, class C20/25 (1)	7.5	5.0	7.3
	10.0	9.0	13.4
	12.5	16.0	21.3
	14.2	25.0	37.8

(1) In accordance with PN EN 206+A1:2016

Application

Fixing railings, brackets, supports, cable routes, machines, gates, façades, frames, mouldings, metal profiles, wire joists, chains, ropes, perforated tapes, ventilation ducts, wooden or metal substructures and ceiling lining.

Benefits

- Concurrent mounting and fixing saves time and facilitates easier installation.
- The anchor can be removed leaving a flat concrete surface.
- A preferred solution for temporary fixings (e.g. formwork supports or scaffolding)
- Installation performed practically without any expansion stress and facilitates fixing with small axial and edge distances.
- The CBH-B bi-metal anchors are designed to be used outdoors and in humid rooms.

PowerFix frame fixing with hexagonal head bolt

NEW

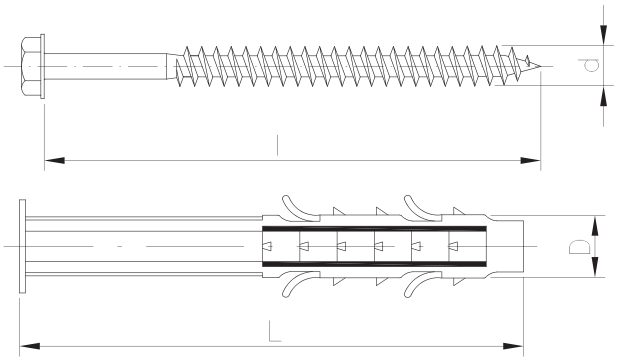
AT-15-9538/2015 +A1 +A2

PF 5519

Zn ZINC COATING 5 µm

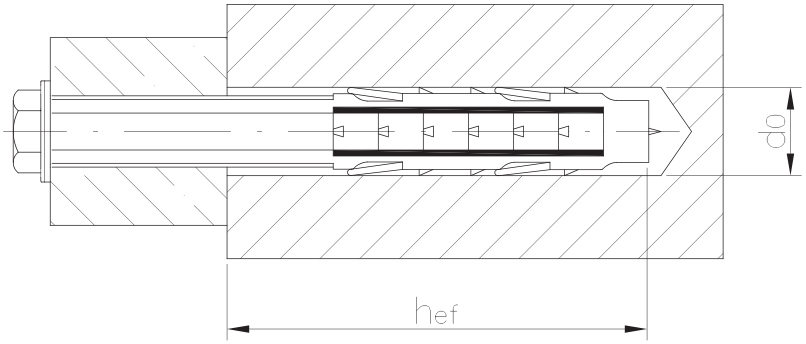
NYLON Construction Performance

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	Diameter D [mm]	Length L [mm]	Bolt diameter d [mm]	Bolt length l [mm]	Index	Packaging [pcs]
PF 10 x 70	10	70	7	85	14486	50
PF 10 x 90	10	90	7	105	17877	50
PF 10 x 110	10	110	7	125	18122	50
PF 10 x130	10	130	7	145	18135	50
PF 10 x 150	10	150	7	165	18136	50
PF 10 x 170	10	170	7	185	26561	50
PF 10 x 190	10	190	7	205	27099	50
PF 10 x 210	10	210	7	225	27309	25
PF 10 x 250	10	250	7	265	27310	25
PF 10 x 290	10	290	7	305	27311	25
PF 12 x 90	12	90	8	105	27312	25
PF 12 x 110	12	110	8	125	27440	25
PF 12 x 130	12	130	8	145	33745	25
PF 12 x 150	12	150	8	165	34351	25
PF 12 x 170	12	170	8	185	34699	25
PF 12 x 190	12	190	8	205	34866	25
PF 12 x 210	12	210	8	225	34877	25
PF 12 x 250	12	250	8	265	35433	25
PF 12 x 290	12	290	8	305	38525	25



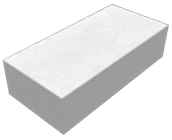
Installation characteristics

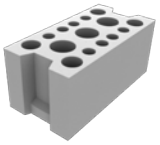
Designation	Drilling diameter d_0 [mm]	Anchoring depth h_{ef} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
PF 10 x L	10.3	58	40	40
PF 12 x L	12.3	58	50	50

Substrates

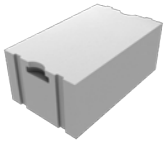

Ordinary concrete


Solid clay brick


Solid calcium-silicate brick


Cored calcium-silicate brick


Structural clay tile


Autoclaved aerated concrete

Strength characteristics

Name	Diameter D [mm]	Substrate					
		Ordinary concrete, C20/25–C50/60	Solid clay brick, class 20	Solid calcium-silicate brick, class 20	Cored calcium-silicate brick, class 15	Perforated structural clay tile, class 15	Autoclaved aerated concrete, class 4
Characteristic pull-out resistance $N_{Rk,p}$ [kN]							
PF 10 x L	10.0	6.0	4.0	4.0	2.0	1.2	2.0
PF 12 x L	12.0	7.5	4.0	4.0	2.0	1.2	3.0
Characteristic shear resistance $V_{Rk,p}$ [kN]							
PF 10 x L	10.0	12.0	4.0	4.0	2.0	1.2	2.0
PF 12 x L	12.0	16.0	4.0	4.0	2.0	1.2	3.0

Application

Multiple-point, non-structural and push-through anchoring. The frame fixings are made of the highest quality polyamide (nylon). We recommend using them in outdoor installations and installations subject to UV radiation or large daily temperature fluctuations.

PowerSpace frame fixing with hexagonal head bolt

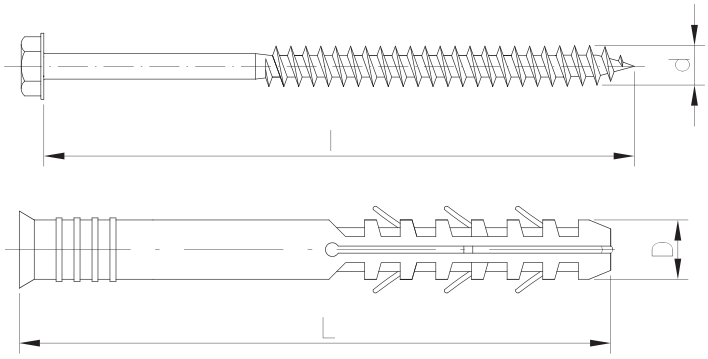
NEW

ITB-KOT-2018/0654

PS 5517

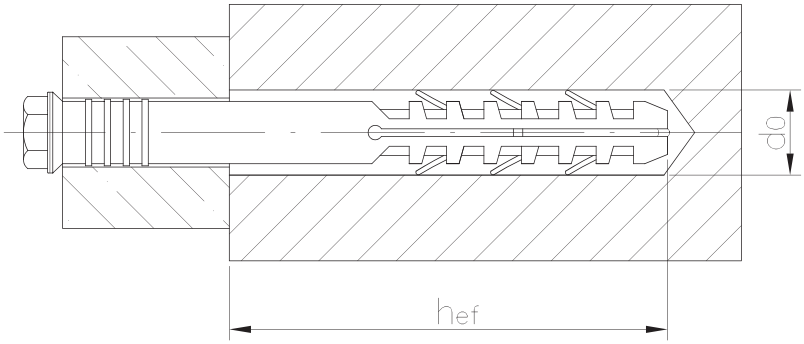
Zn ZINC COATING 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	Diameter D [mm]	Length L [mm]	Bolt diameter d [mm]	Bolt length l [mm]	Index	Packaging [pcs]
PS 10 x 100	10	100	7	105	30945	50
PS 10 x 120	10	120	7	125	30946	50
PS 10 x 140	10	140	7	145	30947	50
PS 10 x 160	10	160	7	165	30948	50
PS 10 x 180	10	180	7	185	30949	50
PS 10 x 200	10	200	7	205	30950	50
PS 10 x 220	10	220	7	225	30951	25
PS 10 x 260	10	260	7	265	30952	25
PS 10 x 300	10	300	7	305	30953	25
PS 10 x 340	10	340	7	345	30954	25
PS 12 x 100	12	100	8	105	30955	50
PS 12 x 120	12	120	8	125	30956	50
PS 12 x 140	12	140	8	145	30957	50
PS 12 x 160	12	160	8	165	30958	50
PS 12 x 180	12	180	8	185	30959	50
PS 12 x 200	12	200	8	205	30960	50
PS 12 x 220	12	220	8	225	30961	25
PS 12 x 260	12	260	8	265	30962	25
PS 12 x 300	12	300	8	305	30963	25



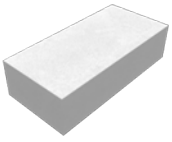
Installation characteristics

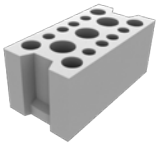
Designation	Drilling diameter d_0 [mm]	Anchoring depth h_{ef} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
PS 10 x L	10	70	180	180
PS 12 x L	12	70	180	180

Substrates

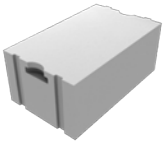

Ordinary concrete


Solid clay brick


Solid calcium-silicate brick


Cored calcium-silicate brick


Structural clay tile


Autoclaved aerated concrete

Strength characteristics

Name	Diameter D [mm]	Substrate					
		Ordinary concrete, C20/25–C50/60	Solid clay brick, class 20	Solid calcium-silicate brick, class 20	Cored calcium-silicate brick, class 15	Perforated structural clay tile, class 15	Autoclaved aerated concrete, class 4
Characteristic pull-out resistance $N_{Rk,p}$ [kN]							
PS 10 x L	10.0	1.20	1.50	1.50	1.20	1.20	1.50
PS 12 x L	12.0	1.20	2.00	2.00	1.20	1.20	2.00
Characteristic shear resistance $V_{Rk,p}$ [kN]							
PS 10 x L	10.0	1.20	1.50	1.50	1.20	1.20	1.50
PS 12 x L	12.0	1.20	2.00	2.00	1.20	1.20	2.00

Application

Multiple-point, non-structural and push-through anchoring. The frame fixings are made of polypropylene. We recommend using them indoors where they will not be subject to adverse weather conditions and large daily temperature fluctuations.

SuperFix frame fixing with steeple bolt

NEW

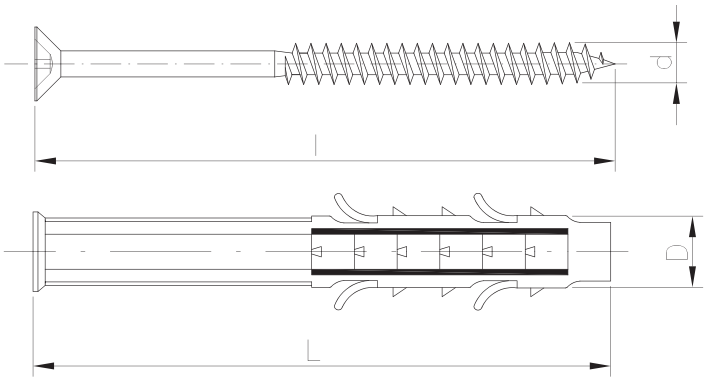
AT-15-9538/2015 +A1 +A2

SF 5518

Zn ZINC COATING 5µm

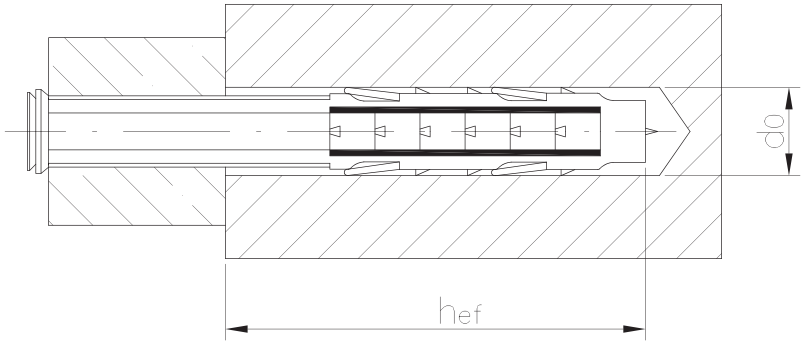
NYLON Construction Performance

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	Diameter D [mm]	Length L [mm]	Bolt diameter d [mm]	Bolt length l [mm]	Index	Packaging [pcs]
SF 10 x 90	10	90	7	105	17429	50
SF 10 x 110	10	110	7	125	17435	50
SF 10 x 130	10	130	7	145	17437	50
SF 10 x 150	10	150	7	165	17439	50
SF 10 x 170	10	170	7	185	17441	50
SF 10 x 190	10	190	7	205	17443	50
SF 10 x 210	10	210	7	225	17445	50



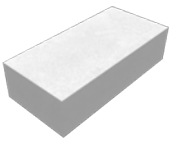
Installation characteristics

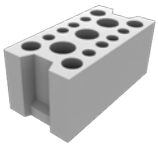
Designation	Drilling diameter d_0 [mm]	Anchoring depth h_{ef} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
SF 10 x L	10.3	58	40	40

Substrates

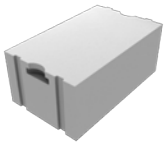

Ordinary concrete


Solid clay brick


Solid calcium-silicate brick


Cored calcium-silicate brick


Structural clay tile


Autoclaved aerated concrete

Strength characteristics

Name	Diameter D [mm]	Substrate					
		Ordinary concrete, C20/25–C50/60	Solid clay brick, class 20	Solid calcium-silicate brick, class 20	Cored calcium-silicate brick, class 15	Perforated structural clay tile, class 15	Autoclaved aerated concrete, class 4
Characteristic pull-out resistance $N_{Rk,p}$ [kN]							
SF 10 x L	10.0	6.0	4.0	4.0	2.0	1.2	2.0
Characteristic shear resistance $V_{Rk,p}$ [kN]							
SF 10 x L	10.0	12.8	4.0	4.0	2.0	1.2	2.0

Application

Multiple-point, non-structural and push-through anchoring. The frame fixings are made of the highest quality polyamide (nylon). We recommend using them in outdoor installations and installations subject to UV radiation or large daily temperature fluctuations.

LongSpace frame fixing with steeple bolt

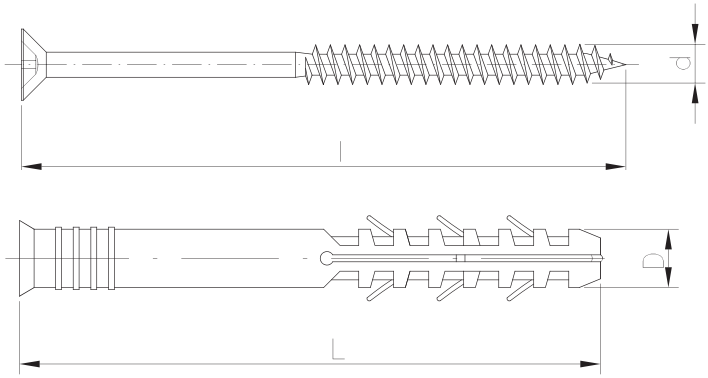
NEW

ITB-KOT-2018/0654

LS 5516

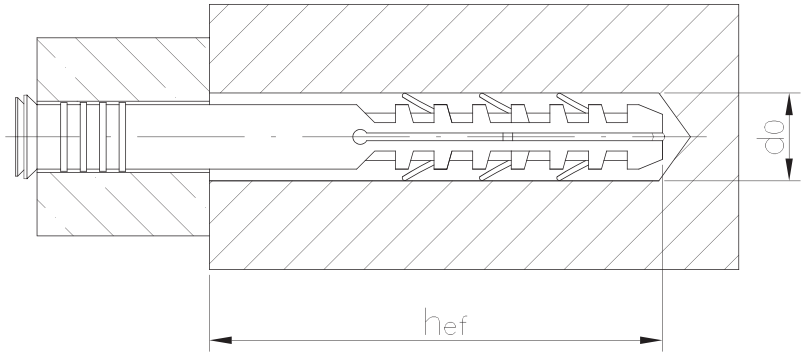
Zn ZINC COATING 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	Diameter D [mm]	Length L [mm]	Bolt diameter d [mm]	Bolt length l [mm]	Index	Packaging [pcs]
LS 8 x 80	8	80	5	85	30930	50
LS 8 x 100	8	100	5	105	30931	50
LS 8 x 120	8	120	5	125	30932	50
LS 8 x 140	8	140	5	145	30933	50
LS 8 x 160	8	160	5	165	30934	50
LS 10 x 100	10	100	7	105	30935	50
LS 10 x 120	10	120	7	125	30936	50
LS 10 x 140	10	140	7	145	30937	50
LS 10 x 160	10	160	7	165	30938	50
LS 10 x 180	10	180	7	185	30939	50
LS 10 x 200	10	200	7	205	30940	50
LS 10 x 220	10	220	7	225	30941	25



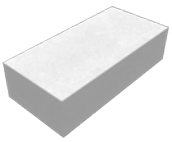
Installation characteristics

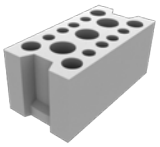
Designation	Drilling diameter d_0 [mm]	Anchoring depth h_{ef} [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
LS 8 x L	8	50	150	150
LS 10 x L	10	70	180	180

Substrates

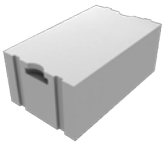

Ordinary concrete


Solid clay brick


Solid calcium-silicate brick


Cored calcium-silicate brick


Structural clay tile


Autoclaved aerated concrete

Strength characteristics

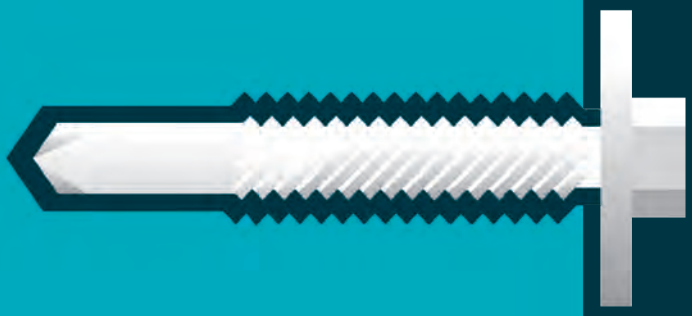
Name	Diameter D [mm]	Substrate					
		Ordinary concrete, C20/25–C50/60	Solid clay brick, class 20	Solid calcium-silicate brick, class 20	Cored calcium-silicate brick, class 15	Perforated structural clay tile, class 15	Autoclaved aerated concrete, class 4
Characteristic pull-out resistance $N_{Rk,p}$ [kN]							
LS 8 x L	8.0	0.90	0.90	0.90	0.75	0.90	0.75
LS 10 x L	10.0	1.20	1.50	1.50	1.20	1.20	1.50
Characteristic shear resistance $V_{Rk,p}$ [kN]							
LS 8 x L	8.0	0.90	0.90	0.90	0.75	0.90	0.75
LS 10 x L	10.0	1.20	1.50	1.50	1.20	1.20	1.50

Application

Multiple-point, non-structural and push-through anchoring. The frame fixings are made of polypropylene. We recommend using them indoors where they will not be subject to adverse weather conditions and large daily temperature fluctuations.

Fixing thin sheet metal to flat roofing and façades

Section 4
Sheet metal and façade self-drilling screws



		Page
1.	MPZ 02 self-drilling screws	136
2.	MPT 02 self-drilling screws	138
3.	MPX 02 self-drilling screws	140
4.	MPZ 03 IW self-drilling screws	142
5.	MPT 03 IW self-drilling screws	143
6.	MPZ 3 self-drilling screws	144
7.	MPT 3 self-drilling screws	146
8.	MPX 3 self-drilling screws	148
9.	MPZ 5 self-drilling screws	150
10.	MPT 5 self-drilling screws	152
11.	MPT 5 IW self-drilling screws	154
12.	MPX 5 self-drilling screws	155
13.	MPZ 8 self-drilling screws	157
14.	MPT 8 self-drilling screws	159
15.	MPX 8 self-drilling screws	161
16.	MPZ 12 self-drilling screws	163
17.	MPT 12 self-drilling screws	166
18.	MPT 12 IW self-drilling screws	169
19.	MPX 12 self-drilling screws	170
20.	MPT 16 self-drilling screws	173
21.	MPTC self-drilling screws	175
22.	MPTC IW self-drilling screws	177
23.	BPMNT installation screws	178
24.	BPSMNT installation screws	179
25.	BSX self-drilling screws	180

MPZ 02 self-drilling screw (zinc plating)

NEW

CE ETA 18/0371

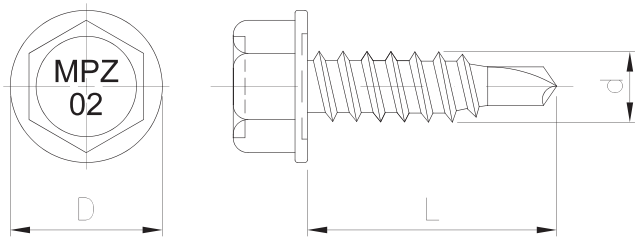
MPZ 02 5230

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 3 Nm | 1,800 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

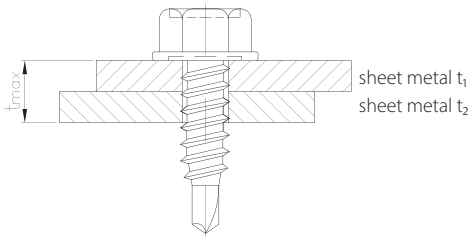


Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 02 4.8 x 20	4.8	10.5	20	78623	500

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.54	0.54	0.54	0.54	0.54
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 02 + S14 self-drilling screw with washer

NEW

CE ETA 18/0371

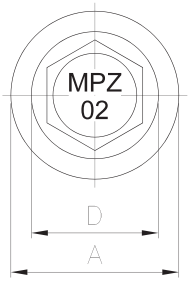
MPZ 02 5230

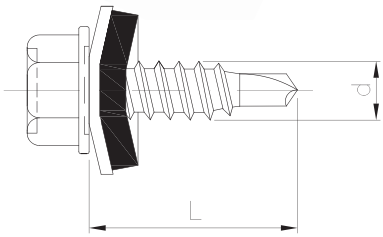
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C1 | 3 Nm | 1,800 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



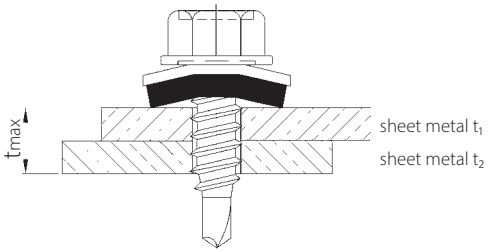


Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 02 4.8 x 20 / S14	4.8	10.5	20	14	78624	500

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 02 self-drilling screw

NEW

CE ETA 18/0371

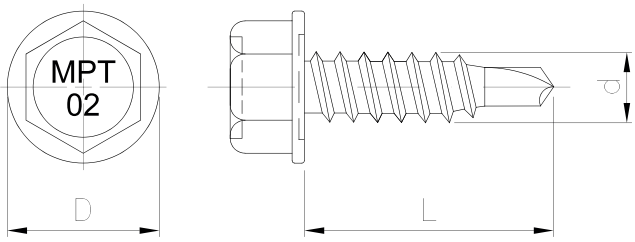
MPT 02 5231

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 3 Nm | 1,800 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15

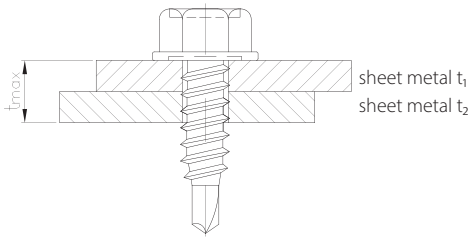


Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 02 4.8 x 20	4.8	10.5	20	637623	1,000

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.54	0.54	0.54	0.54	0.54
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 02 + S14 self-drilling screw with washer

NEW

CE ETA 18/0371

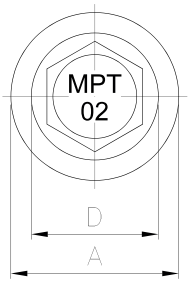
MPT 02 5231

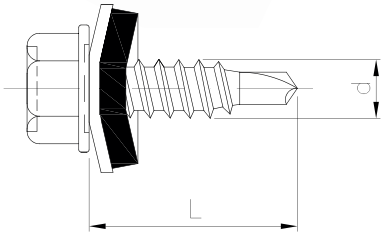
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 3 Nm | 1,800 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



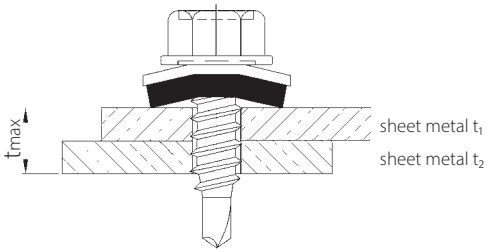


Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 02 4.8 x 20 / A14	4.8	10.5	20	14	637623	1,000

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 02 bi-metal self-drilling screw

NEW

CE ETA 18/0371

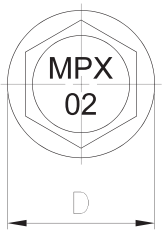
MPX 02 5260

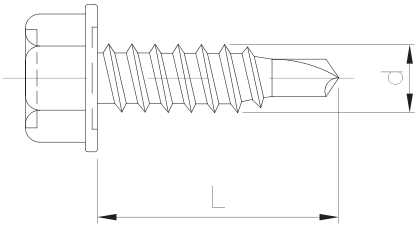
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 3 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



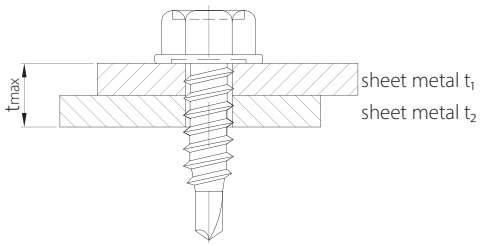


Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 02 4.8 x 20	4.8	10.5	20	78868	500

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.54	0.54	0.54	0.54	0.54
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 02 + I14 bi-metal self-drilling screw with washer

NEW

CE ETA 18/0371

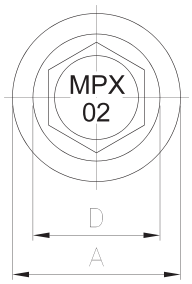
MPX 02 5260

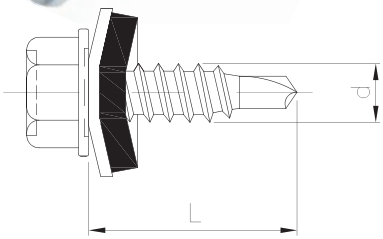
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 3 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



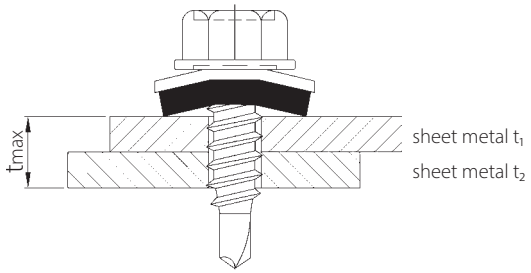


Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPX 02 4.8 x 20 / I14	4.8	10.5	20	14	640684	250

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 2 \times 1.25$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		0.50	0.55	0.63	0.75	0.88	1.00	1.13	1.25
Characteristic shear resistance V_{Rk} [kN]	0.40	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
	0.50	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.55	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	0.63	0.96	0.96	0.96	1.63	1.63	1.63	1.63	1.63
	0.75	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	0.88	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.00	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.13	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
	1.25	0.96	0.96	0.96	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.40	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.50	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.55	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.63	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.75	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	0.88	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.00	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.13	0.48	0.48	0.48	0.72	0.72	0.72	0.72	0.72
	1.25	0.48	0.48	0.48	—	—	—	—	—

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 03 IW self-drilling screw with integrated washer

NEW

CE ETA 18/0371

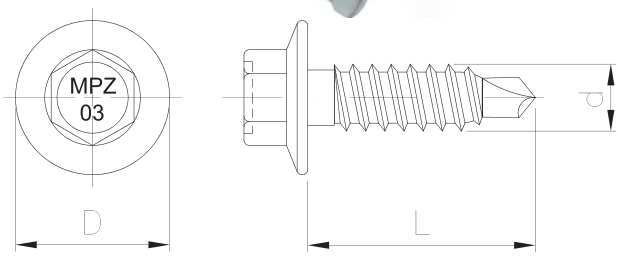
MPZ 03 IW 5232

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 4 Nm | 1,800 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

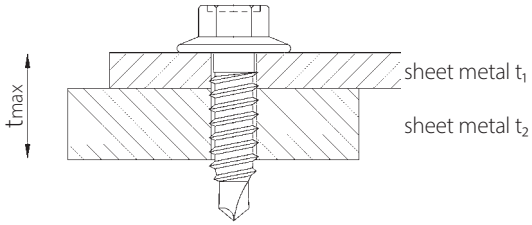


Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 03 IW 6.3 x 22	6.3	15.0	22	78625	500

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 3$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)					
		0.75	0.88	1.00	1.13	1.25	1.50
Characteristic shear resistance V_{Rk} [kN]	0.75	1.39	1.39	1.39	1.39	1.39	1.39
	0.88	2.30	2.30	2.30	2.30	2.30	2.30
	1.00	2.56	2.56	2.56	2.56	2.56	2.56
	1.13	2.56	2.56	2.56	2.56	2.56	2.56
	1.25	2.70	2.70	2.70	2.70	2.70	2.70
	1.50	2.77	2.77	2.77	2.77	2.77	2.77
Characteristic pull-out resistance N_{Rk} [kN]	0.75	0.47	0.47	0.47	0.47	0.47	0.47
	0.88	0.63	0.63	0.63	0.63	0.63	0.63
	1.00	0.90	0.90	0.90	0.90	0.90	0.90
	1.13	0.90	0.90	0.90	0.90	0.90	0.90
	1.25	1.20	1.20	1.20	1.20	1.20	1.20
	1.50	1.36	1.36	1.36	1.36	1.36	1.36

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 03 IW self-drilling screw with integrated washer

NEW

CE ETA 18/0371

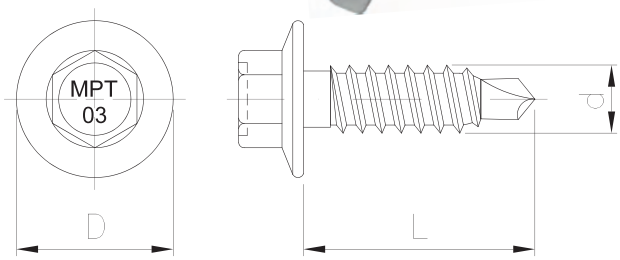
MPT 03 IW 5233

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 4 Nm | 1,800 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15

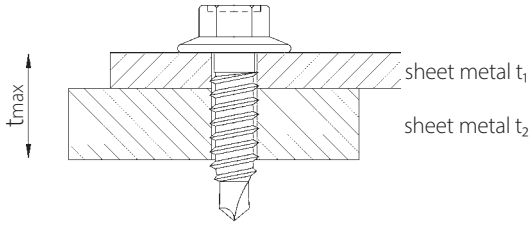


Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 03 IW 6.3 x 22	6.3	15.0	22	78626	500

Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.



Drilling capacity
$t_{max} \leq 3$ mm

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)					
		0.75	0.88	1.00	1.13	1.25	1.50
Characteristic shear resistance V_{Rk} [kN]	0.75	1.39	1.39	1.39	1.39	1.39	1.39
	0.88	2.30	2.30	2.30	2.30	2.30	2.30
	1.00	2.56	2.56	2.56	2.56	2.56	2.56
	1.13	2.56	2.56	2.56	2.56	2.56	2.56
	1.25	2.70	2.70	2.70	2.70	2.70	2.70
	1.50	2.77	2.77	2.77	2.77	2.77	2.77
Characteristic pull-out resistance N_{Rk} [kN]	0.75	0.47	0.47	0.47	0.47	0.47	0.47
	0.88	0.63	0.63	0.63	0.63	0.63	0.63
	1.00	0.90	0.90	0.90	0.90	0.90	0.90
	1.13	0.90	0.90	0.90	0.90	0.90	0.90
	1.25	1.20	1.20	1.20	1.20	1.20	1.20
	1.50	1.36	1.36	1.36	1.36	1.36	1.36

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPZ 3 self-drilling screw (zinc plating)

NEW

CE ETA 18/0371

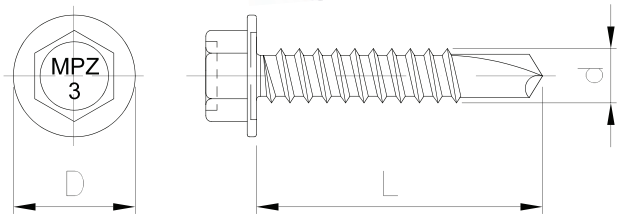
MPZ 3 5234

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 3 Nm | 1,800 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 3 4.8 x 16	4.8	10.5	16	78627	1,000
MPZ 3 4.8 x 19	4.8	10.5	19	78628	1,000
MPZ 3 4.8 x 22	4.8	10.5	22	78629	1,000
MPZ 3 4.8 x 25	4.8	10.5	25	78634	500
MPZ 3 4.8 x 32	4.8	10.5	32	78640	500
MPZ 3 4.8 x 35	4.8	10.5	35	78646	500
MPZ 3 4.8 x 45	4.8	10.5	45	78647	500
MPZ 3 4.8 x 55	4.8	10.5	55	78650	250

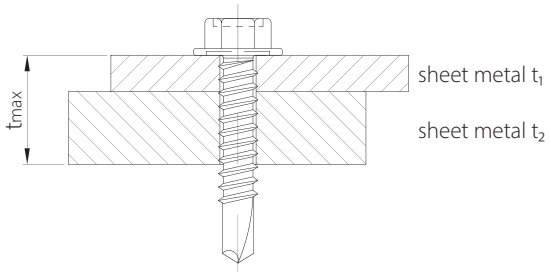
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.21	1.21	1.21
	0.88	1.43	1.43	1.43
	1.00	1.91	1.91	1.91
	1.13	1.91	1.91	1.91
	1.25	2.03	2.03	2.03
	1.50	2.03	2.03	2.03

(1) Steel grades S280GD, S320GD and S320GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 3 + S14 self-drilling screw with washer

NEW

CE ETA 18/0371

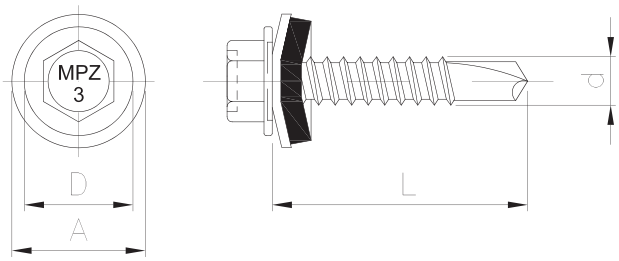
MPZ 3 5234

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C1 | 3 Nm | 1,800 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 3 4.8 x 16 / S14	4.8	10.5	16	14	640649	250
MPZ 3 4.8 x 19 / S14	4.8	10.5	19	14	640650	250
MPZ 3 4.8 x 22 / S14	4.8	10.5	22	14	640651	250
MPZ 3 4.8 x 25 / S14	4.8	10.5	25	14	640652	250
MPZ 3 4.8 x 32 / S14	4.8	10.5	32	14	640653	250
MPZ 3 4.8 x 35 / S14	4.8	10.5	35	14	640654	250
MPZ 3 4.8 x 45 / S14	4.8	10.5	45	14	640655	250
MPZ 3 4.8 x 55 / S14	4.8	10.5	55	14	640656	250

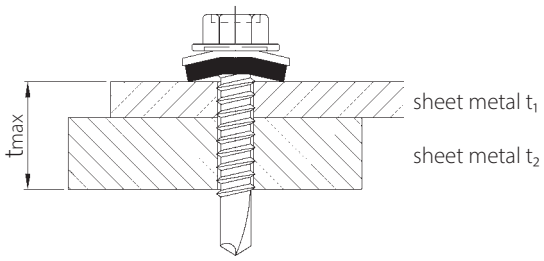
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.03	3.03	3.30
	0.88	3.03	3.03	4.00
	1.00	3.03	3.03	4.13
	1.13	3.03	3.03	4.13
	1.25	3.03	3.03	4.13
	1.50	3.03	3.03	4.13

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 3 self-drilling screw (ceramic coating)

NEW

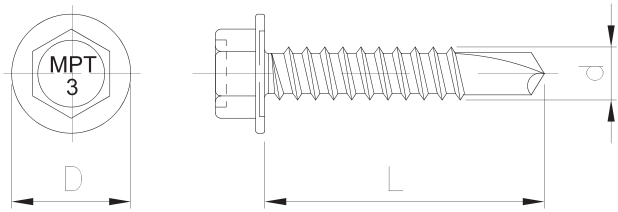
CE ETA 18/0371

MPT 3 5235

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 3 Nm | 1,800 rpm max | SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 3 4.8 x 16	4.8	10.5	16	78694	1,000
MPT 3 4.8 x 19	4.8	10.5	19	78696	1,000
MPT 3 4.8 x 22	4.8	10.5	22	78698	1,000
MPT 3 4.8 x 25 *	4.8	10.5	25	78704	500
MPT 3 4.8 x 32 *	4.8	10.5	32	78706	500
MPT 3 4.8 x 35 *	4.8	10.5	35	78708	500
MPT 3 4.8 x 45 *	4.8	10.5	45	78709	500
MPT 3 4.8 x 55 *	4.8	10.5	55	78712	250

* Product available upon request.

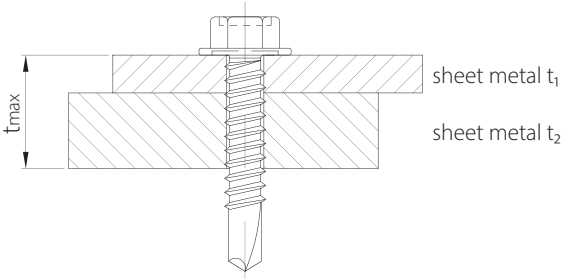
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.21	1.21	1.21
	0.88	1.43	1.43	1.43
	1.00	1.91	1.91	1.91
	1.13	1.91	1.91	1.91
	1.25	2.03	2.03	2.03
	1.50	2.03	2.03	2.03

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 3 + A14 self-drilling screw with washer

NEW

CE ETA 18/0371

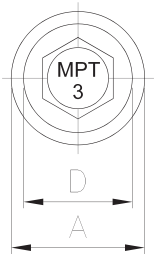
MPT 3 5235

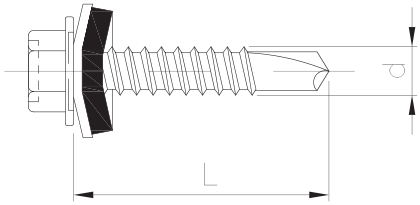
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 3 Nm | 1,800 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 3 4.8 x 16 / A14	4.8	10.5	16	14	640657	250
MPT 3 4.8 x 19 / A14	4.8	10.5	19	14	640658	250
MPT 3 4.8 x 22 / A14	4.8	10.5	22	14	640659	250
MPT 3 4.8 x 25 / A14 *	4.8	10.5	25	14	78726	250
MPT 3 4.8 x 32 / A14 *	4.8	10.5	32	14	78728	250
MPT 3 4.8 x 35 / A14 *	4.8	10.5	35	14	78730	250
MPT 3 4.8 x 45 / A14 *	4.8	10.5	45	14	78732	250
MPT 3 4.8 x 55 / A14 *	4.8	10.5	55	14	78734	250

* Product available upon request.

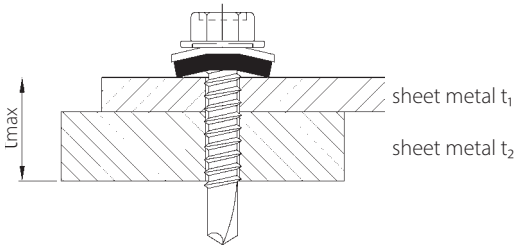
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.03	3.03	3.30
	0.88	3.03	3.03	4.00
	1.00	3.03	3.03	4.13
	1.13	3.03	3.03	4.13
	1.25	3.03	3.03	4.13
	1.50	3.03	3.03	4.13

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 3 bi-metal self-drilling screw

NEW

CE ETA 18/0371

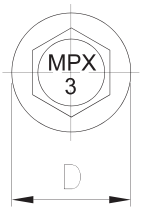
MPX 3 5261

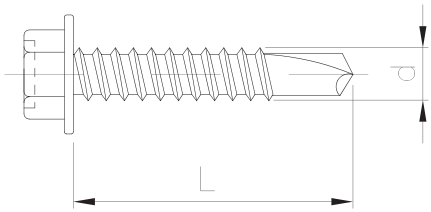
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 3 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 3 4.8 x 25	4.8	11.0	25	78882	500

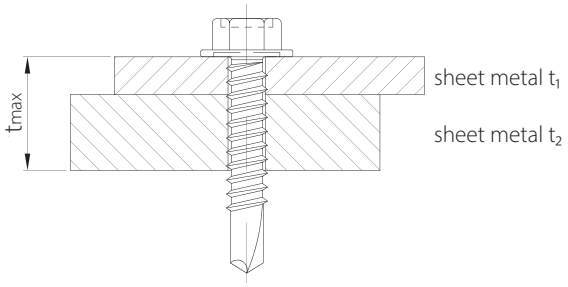
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.21	1.21	1.21
	0.88	1.43	1.43	1.43
	1.00	1.91	1.91	1.91
	1.13	1.91	1.91	1.91
	1.25	2.03	2.03	2.03

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 3 + I14 bi-metal self-drilling screw with washer

NEW

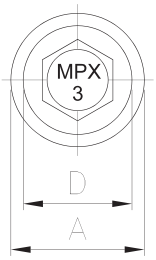
CE ETA 18/0371

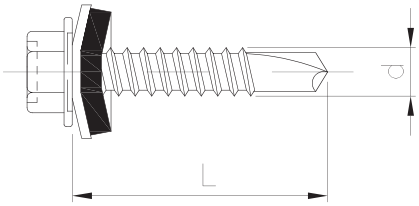
MPX 3 5261

RAL (*) READY TO BE PAINTED IN RAL COLOURS
* RAL colour availability, see page 181

CORROSION CLASS C5 | 3 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPX 3 4.8 x 25 / I14	4.8	11.0	25	14	640685	500

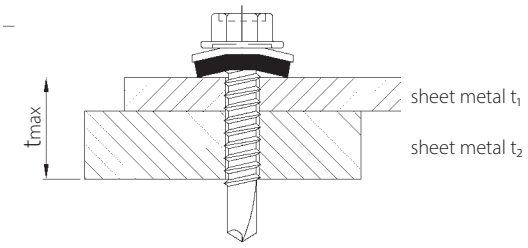
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		2.00	2.50	3.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.64	1.64	1.64
	0.88	1.80	1.80	1.80
	1.00	1.96	1.96	1.96
	1.13	1.96	1.96	1.96
	1.25	1.96	1.96	1.96
	1.50	1.96	1.96	1.96
Characteristic pull-out resistance N_{Rk} [kN]	0.75	2.52	2.52	3.17
	0.88	2.52	2.52	3.17
	1.00	2.52	2.52	3.17
	1.13	2.52	2.52	3.17
	1.25	2.52	2.52	3.17

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 4.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 5 self-drilling screw (zinc plating)

NEW

CE ETA 18/0371

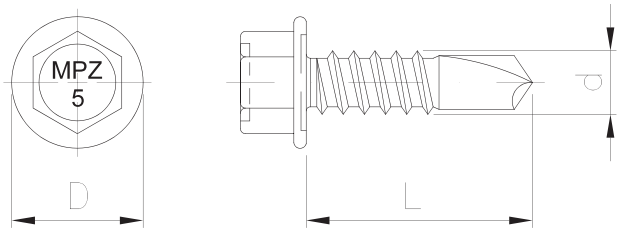
MPZ 5 5238

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 5 5.5 x 19	5.5	10.5	19	78738	500
MPZ 5 5.5 x 25	5.5	10.5	25	78740	500
MPZ 5 5.5 x 32	5.5	10.5	32	78742	500
MPZ 5 5.5 x 38	5.5	10.5	38	78744	500
MPZ 5 5.5 x 50	5.5	10.5	50	78748	250
MPZ 5 5.5 x 60	5.5	10.5	60	78750	250
MPZ 5 5.5 x 70	5.5	10.5	70	78758	250

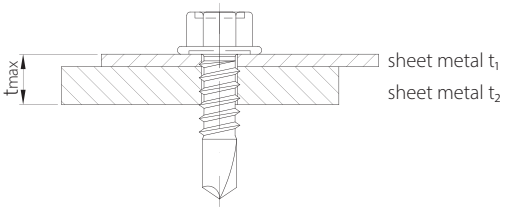
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23
	0.88	1.31	1.31	1.31
	1.00	1.64	1.64	1.64
	1.13	1.64	1.64	1.64
	1.25	1.72	1.72	1.72
	1.50	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38
	0.88	1.45	1.45	1.45
	1.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00
	1.25	2.06	2.06	2.06
	1.50	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 5 + S14/S16 self-drilling with washer

NEW

CE ETA 18/0371

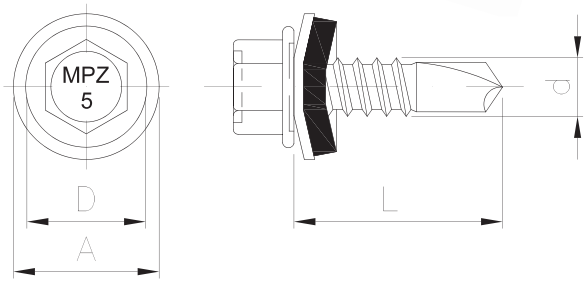
MPZ 5 5238

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 5 5.5 x 19 / S14	5.5	10.5	19	14	640660	250
MPZ 5 5.5 x 25 / S14	5.5	10.5	25	14	640662	250
MPZ 5 5.5 x 32 / S14	5.5	10.5	32	14	640664	250
MPZ 5 5.5 x 38 / S14	5.5	10.5	38	14	640666	250
MPZ 5 5.5 x 50 / S14	5.5	10.5	50	14	640668	250
MPZ 5 5.5 x 60 / S14	5.5	10.5	60	14	640670	100
MPZ 5 5.5 x 70 / S14	5.5	10.5	70	14	640672	100
MPZ 5 5.5 x 19 / S16	5.5	10.5	19	16	640661	250
MPZ 5 5.5 x 25 / S16	5.5	10.5	25	16	640663	250
MPZ 5 5.5 x 32 / S16	5.5	10.5	32	16	640665	250
MPZ 5 5.5 x 38 / S16	5.5	10.5	38	16	640667	250
MPZ 5 5.5 x 50 / S16	5.5	10.5	50	16	640669	250
MPZ 5 5.5 x 60 / S16	5.5	10.5	60	16	640671	100
MPZ 5 5.5 x 70 / S16	5.5	10.5	70	16	640673	100

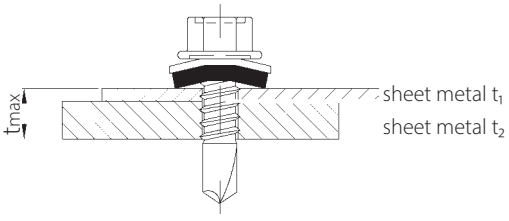
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	S14 washer			S16 washer		
		Sheet metal thickness t_2 [mm](1)			Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00	3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	3.68	4.04	4.04
	1.00	4.19	4.19	4.19	3.68	4.23	4.23
	1.13	4.19	4.19	4.19	3.68	4.23	4.23
	1.25	4.21	4.21	4.21	3.68	4.26	4.26
	1.50	4.21	4.21	4.21	3.68	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 5 self-drilling screw (ceramic coating)

NEW

CE ETA 18/0371

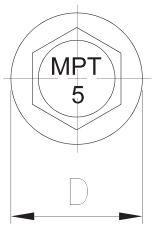
MPT 5 5240

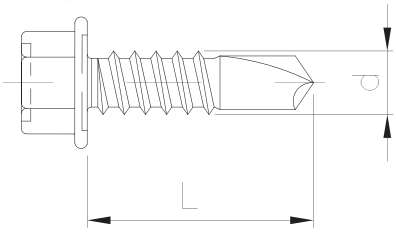
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 5 5.5 x 19 *	5.5	10.5	19	78786	500
MPT 5 5.5 x 25	5.5	10.5	25	78788	500
MPT 5 5.5 x 32	5.5	10.5	32	78790	500
MPT 5 5.5 x 38 *	5.5	10.5	38	78791	500
MPT 5 5.5 x 50 *	5.5	10.5	50	78793	250
MPT 5 5.5 x 60 *	5.5	10.5	60	78799	250
MPT 5 5.5 x 70 *	5.5	10.5	70	78801	250

* Product available upon request.

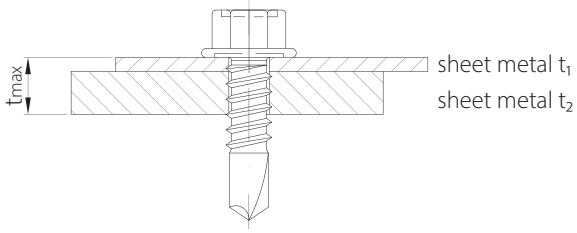
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23
	0.88	1.31	1.31	1.31
	1.00	1.64	1.64	1.64
	1.13	1.64	1.64	1.64
	1.25	1.72	1.72	1.72
	1.50	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38
	0.88	1.45	1.45	1.45
	1.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00
	1.25	2.06	2.06	2.06
	1.50	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 5 + A14/A16 self-drilling screw with washer

NEW

CE ETA 18/0371

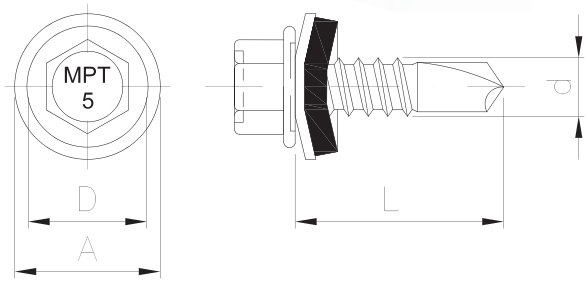
MPT 5 5240

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 5 5.5 x 19 / A14 *	5.5	10.5	19	14	78802	250
MPT 5 5.5 x 25 / A14	5.5	10.5	25	14	640674	250
MPT 5 5.5 x 32 / A14	5.5	10.5	32	14	640676	250
MPT 5 5.5 x 38 / A14 *	5.5	10.5	38	14	78809	250
MPT 5 5.5 x 50 / A14 *	5.5	10.5	50	14	78824	100
MPT 5 5.5 x 60 / A14 *	5.5	10.5	60	14	78825	100
MPT 5 5.5 x 70 / A14 *	5.5	10.5	70	14	78826	100
MPT 5 5.5 x 19 / A16 *	5.5	10.5	19	16	78827	250
MPT 5 5.5 x 25 / A16 *	5.5	10.5	25	16	78828	250
MPT 5 5.5 x 32 / A16 *	5.5	10.5	32	16	78829	250
MPT 5 5.5 x 38 / A16 *	5.5	10.5	38	16	78830	250
MPT 5 5.5 x 50 / A16 *	5.5	10.5	50	16	78831	100
MPT 5 5.5 x 60 / A16 *	5.5	10.5	60	16	78832	100
MPT 5 5.5 x 70 / A16 *	5.5	10.5	70	16	78833	100

* Product available upon request.

Application

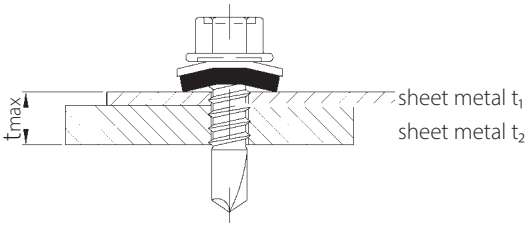
Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	A14 washer			A16 washer		
		Sheet metal thickness t_2 [mm](1)			Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00	3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	3.68	4.04	4.04
	1.00	4.19	4.19	4.19	3.68	4.23	4.23
	1.13	4.19	4.19	4.19	3.68	4.23	4.23
	1.25	4.21	4.21	4.21	3.68	4.26	4.26
	1.50	4.21	4.21	4.21	3.68	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.



Drilling capacity
$t_{max} \leq 6.50$ mm

MPT 5 IW self-drilling screw with integrated washer

NEW

CE ETA 18/0371

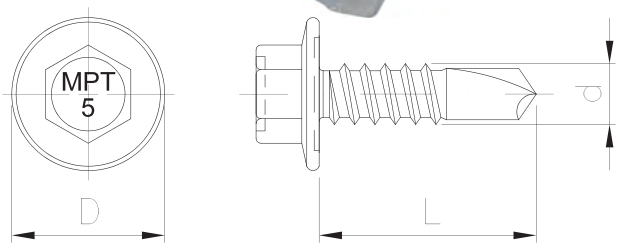
MPT 5 IW 5239

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 5 IW 5.5 x 19	5.5	10.5	19	78778	500
MPT 5 IW 5.5 x 25	5.5	10.5	25	78782	500
MPT 5 IW 5.5 x 32 *	5.5	10.5	32	78784	250

* Product available upon request.

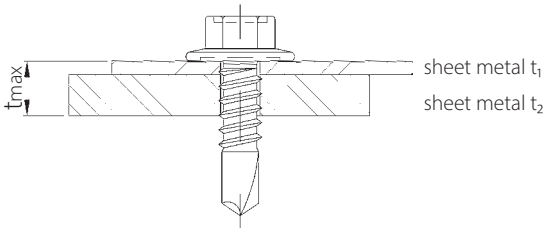
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23
	0.88	1.31	1.31	1.31
	1.00	1.64	1.64	1.64
	1.13	1.64	1.64	1.64
	1.25	1.72	1.72	1.72
	1.50	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	2.56	2.56	2.56
	0.88	3.28	3.28	3.28
	1.00	3.43	3.43	3.43
	1.13	3.43	3.43	3.43
	1.25	3.45	3.45	3.45
	1.50	3.45	3.45	3.45

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPX 5 bi-metal self-drilling screw

NEW

CE ETA 18/0371

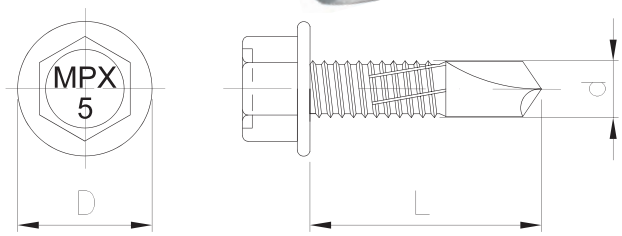
MPX 5 5263

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 5 5.5 x 25	5.5	11.0	25	78889	500
MPX 5 5.5 x 32	5.5	11.0	32	78890	500
MPX 5 5.5 x 38	5.5	11.0	38	78892	500
MPX 5 5.5 x 50 *	5.5	11.0	50	78894	250

* Product available upon request.

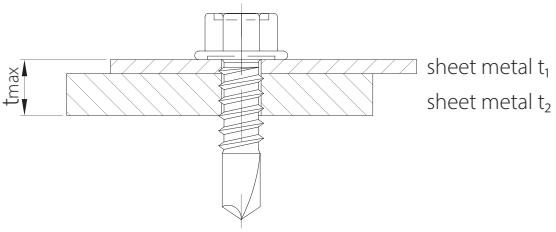
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23
	0.88	1.31	1.31	1.31
	1.00	1.64	1.64	1.64
	1.13	1.64	1.64	1.64
	1.25	1.72	1.72	1.72
	1.50	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38
	0.88	1.45	1.45	1.45
	1.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00
	1.25	2.06	2.06	2.06
	1.50	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPX 5 + I14/I16 bi-metal self-drilling screw with washer

NEW

CE ETA 18/0371

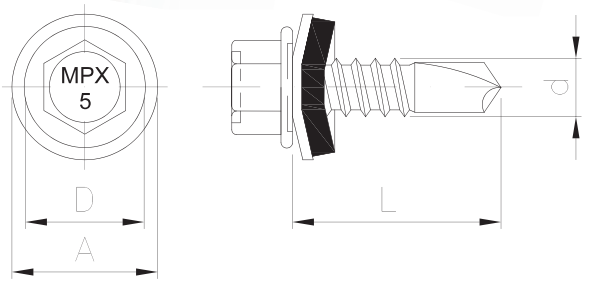
MPX 5 5263

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | BI-METAL | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPX 5 5.5 x 25 / I14	5.5	11.0	25	14	640686	250
MPX 5 5.5 x 32 / I14	5.5	11.0	32	14	640688	250
MPX 5 5.5 x 38 / I14	5.5	11.0	38	14	640690	250
MPX 5 5.5 x 50 / I14 *	5.5	11.0	50	14	78902	100
MPX 5 5.5 x 25 / I16	5.5	11.0	25	16	640687	250
MPX 5 5.5 x 32 / I16	5.5	11.0	32	16	640689	250
MPX 5 5.5 x 38 / I16	5.5	11.0	38	16	640691	250
MPX 5 5.5 x 50 / I16 *	5.5	11.0	50	16	78924	100

* Product available upon request.

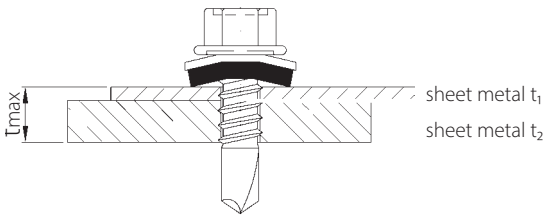
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	I14 washer			I16 washer		
		Sheet metal thickness t_2 [mm](1)			Sheet metal thickness t_2 [mm](1)		
		3.00	4.00	5.00	3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	4.04	4.04	4.04
	1.00	4.19	4.19	4.19	4.23	4.23	4.23
	1.13	4.19	4.19	4.19	4.23	4.23	4.23
	1.25	4.21	4.21	4.21	4.26	4.26	4.26
	1.50	4.21	4.21	4.21	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 6.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 8 self-drilling screw (zinc plating)

NEW

CE ETA 18/0371

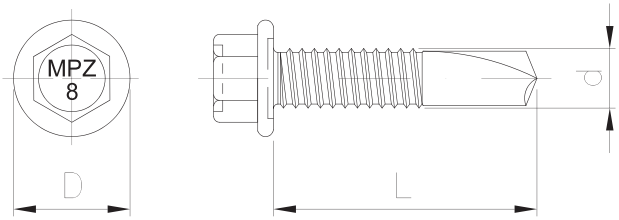
MPZ 8 5245

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 8 5.5 x 25	5.5	11.0	25	78834	500

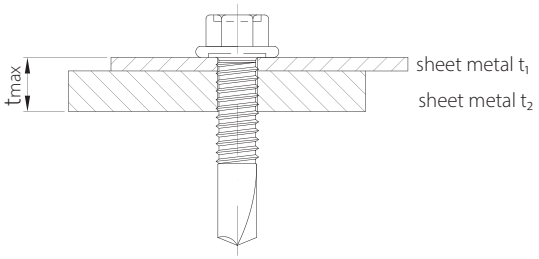
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 8 + S14/S16 self-drilling with washer

NEW

CE ETA 18/0371

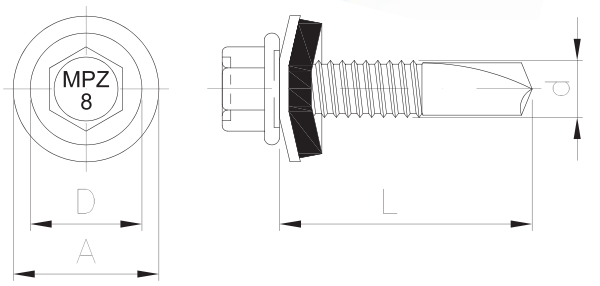
MPZ 8 5245

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C1 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 8 5.5 x 25 / S14	5.5	11	25	14	640678	250
MPZ 8 5.5 x 25 / S16	5.5	11	25	16	640679	250

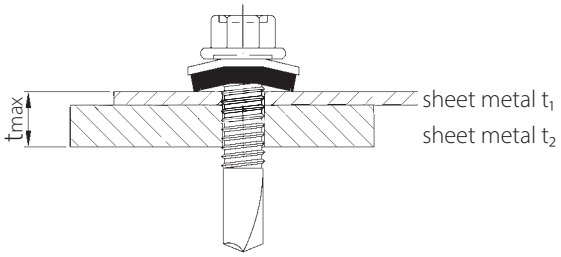
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	S14 washer				S16 washer			
		Sheet metal thickness t_2 [mm](1)				Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00	4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.33	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	4.00	4.04	4.04	4.04	4.04
	1.00	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.13	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.25	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26
	1.50	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 8 self-drilling screw (ceramic coating)

NEW

CE ETA 18/0371

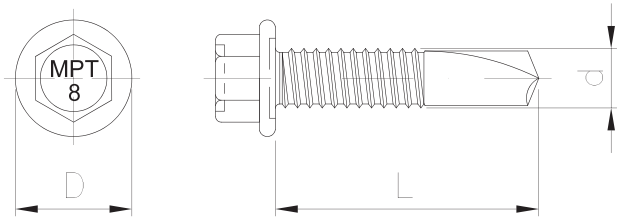
MPT 8 5246

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 8 5.5 x 25	5.5	11.0	25	78837	500

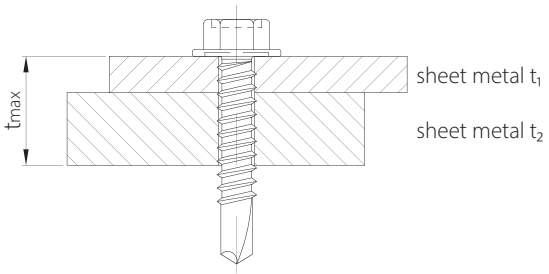
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 8 + A14/A16 self-drilling with washer

NEW

CE ETA 18/0371

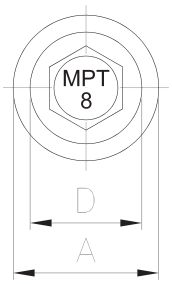
MPT 8 5246

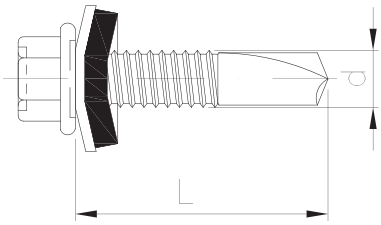
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 8 5.5 x 25 / A14	5.5	11.0	25	14	640680	250
MPT 8 5.5 x 25 / A16	5.5	11.0	25	16	640681	250

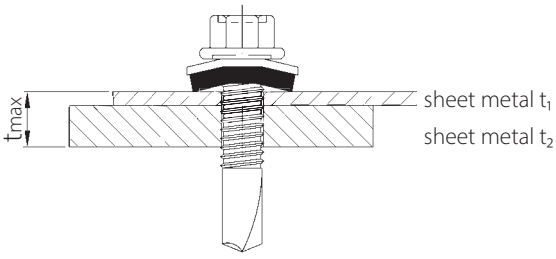
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	A14 washer Sheet metal thickness t_2 [mm](1)				A16 washer Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00	4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.33	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	4.00	4.04	4.04	4.04	4.04
	1.00	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.13	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.25	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26
	1.50	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 8 bi-metal self-drilling screw

NEW

CE ETA 18/0371

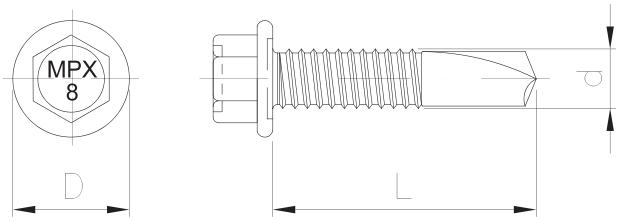
MPX 8 5265

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 8 5.5 x 35	5.5	11.0	35	637786	250

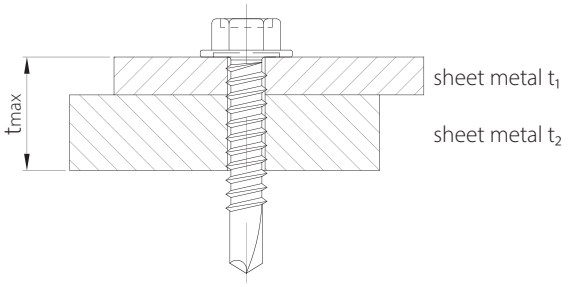
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 8 + I14/I16 bi-metal self-drilling screw with washer

NEW

CE ETA 18/0371

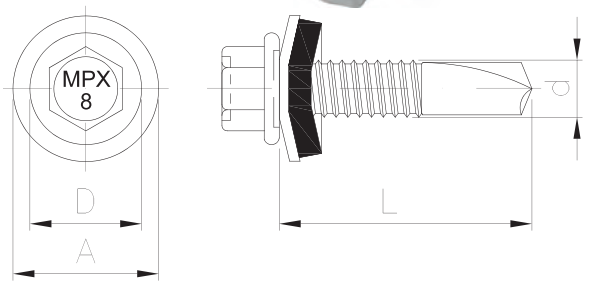
MPX 8 5265

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPX 8 5.5 x 35 / I14	5.5	11.0	35	14	637787	250
MPX 8 5.5 x 35 / I16	5.5	11.0	35	16	637788	250

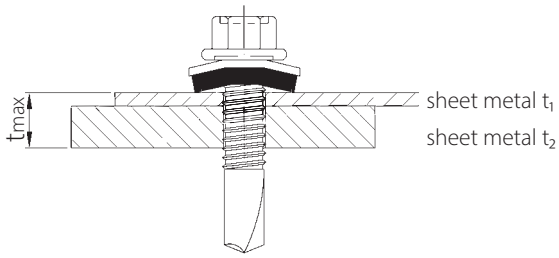
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	I14 washer				I16 washer			
		Sheet metal thickness t_2 [mm](1)				Sheet metal thickness t_2 [mm](1)			
		4.00	5.00	6.00	7.00	4.00	5.00	6.00	7.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
	0.88	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31
	1.00	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.13	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
	1.25	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	1.50	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.33	3.33	3.33	3.33
	0.88	4.00	4.00	4.00	4.00	4.04	4.04	4.04	4.04
	1.00	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.13	4.19	4.19	4.19	4.19	4.23	4.23	4.23	4.23
	1.25	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26
	1.50	4.21	4.21	4.21	4.21	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 8.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 12 self-drilling screw (zinc plating)

NEW

CE ETA 18/0371

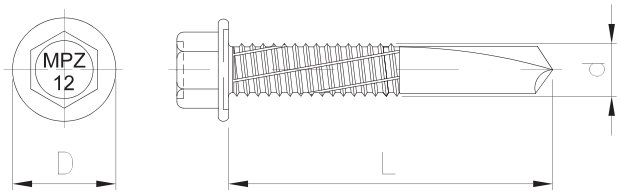
MPZ 12 5249

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C3 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPZ 12 5.5 x 35	5.5	11.0	35	78840	500

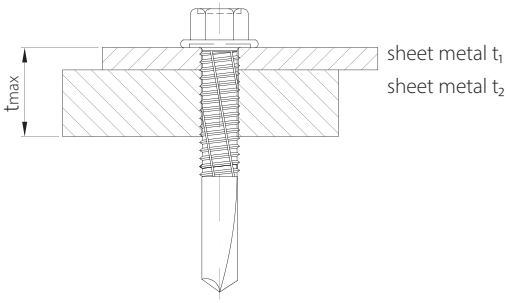
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 12 + S14 self-drilling screw with washer

NEW

CE ETA 18/0371

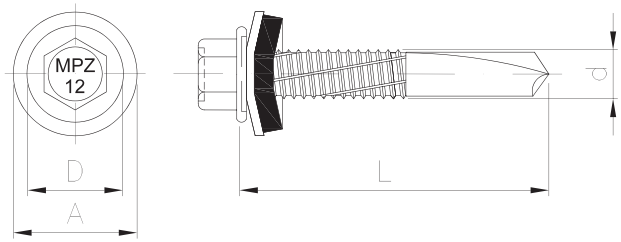
MPZ 12 5249

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C1 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 12 5.5 x 35 / S14	5.5	11.0	35	14	78841	250

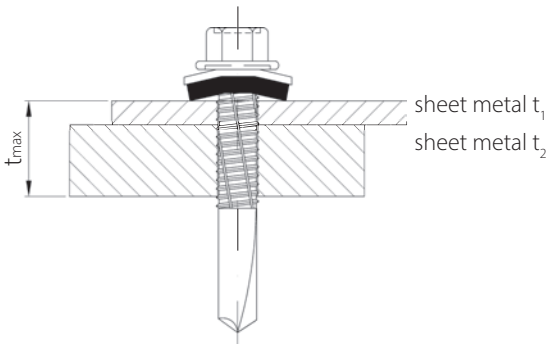
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
	0.88	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	1.00	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.13	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.25	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21
	1.50	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPZ 12 + S16 self-drilling screw with washer

NEW

CE ETA 18/0371

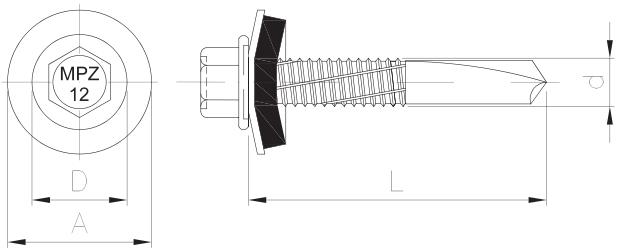
MPZ 12 5249

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C1 | 5 Nm | 1,500 rpm max | Zn POWŁOKA CYNKOWA 12 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPZ 12 5.5 x 35 / S16	5.5	11.0	35	16	78842	250

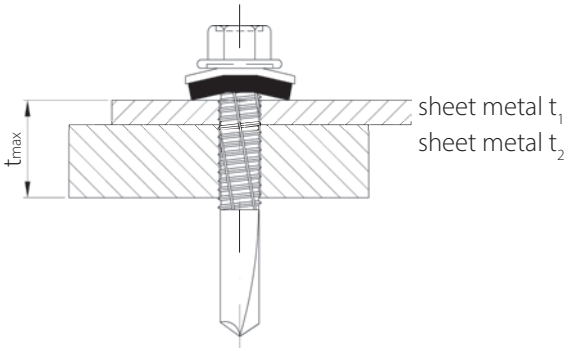
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
	0.88	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
	1.00	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.13	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.25	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26
	1.50	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 12 self-drilling screw (ceramic coating)

NEW

CE ETA 18/0371

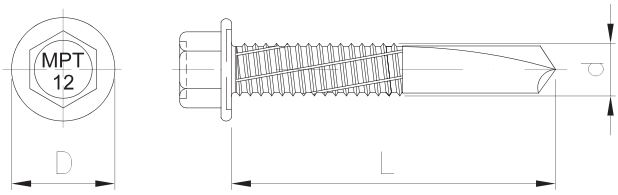
MPT 12 5252

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 12 5.5 x 35	5.5	11.0	35	78843	500
MPT 12 5.5 x 55 *	5.5	11.0	55	78844	250
MPT 12 5.5 x 65 *	5.5	11.0	65	78845	250

* Product available upon request.

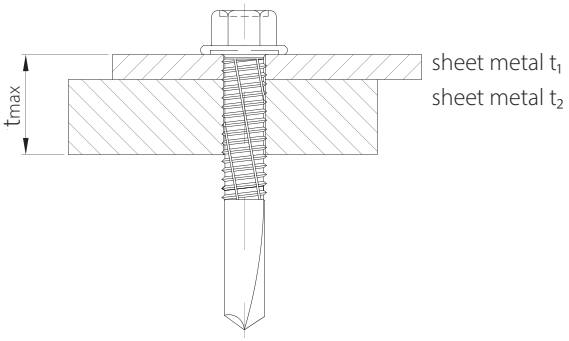
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 12 + A14 self-drilling screw with washer

NEW

CE ETA 18/0371

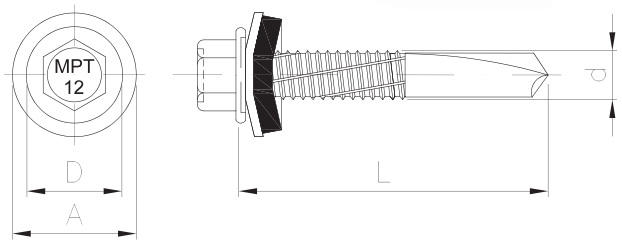
MPT 12 5252

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 12 5.5 x 35 / A14	5.5	11.0	35	14	640682	250
MPT 12 5.5 x 55 / A14 *	5.5	11.0	55	14	78847	100
MPT 12 5.5 x 65 / A14 *	5.5	11.0	65	14	78848	100

* Product available upon request.

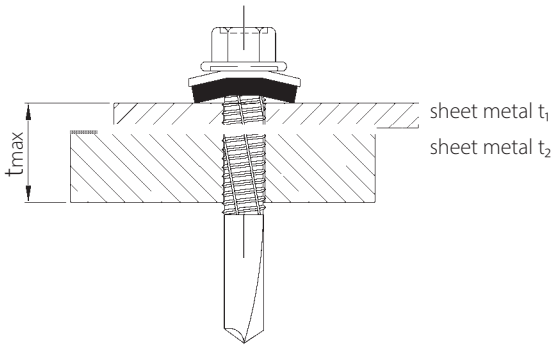
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
	0.88	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	1.00	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.13	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.25	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21
	1.50	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPT 12 + A16 self-drilling screw with washer

NEW

CE ETA 18/0371

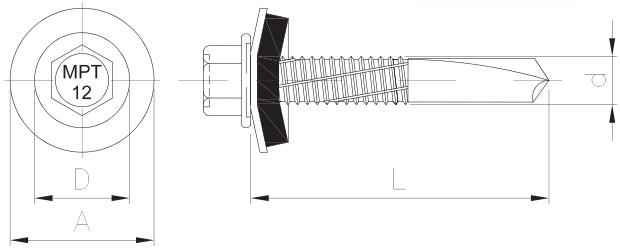
MPT 12 5252

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPT 12 5.5 x 35 / A16	5.5	11.0	35	16	640683	250
MPT 12 5.5 x 55 / A16 *	5.5	11.0	55	16	78850	100
MPT 12 5.5 x 65 / A16 *	5.5	11.0	65	16	78851	100

* Product available upon request.

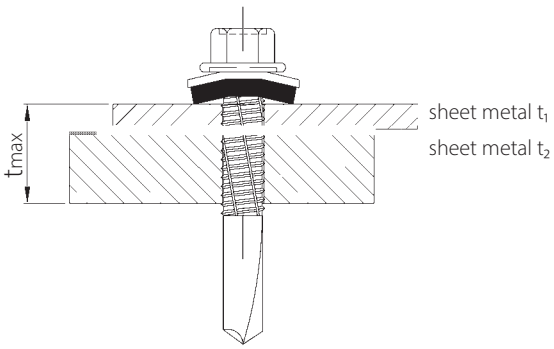
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
	0.88	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
	1.00	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.13	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.25	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26
	1.50	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPT 12 IW self-drilling screw with integrated washer

NEW

CE ETA 18/0371

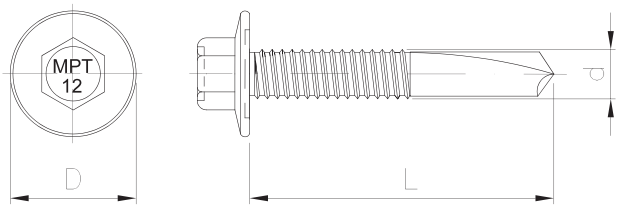
MPT 12 IW 5253

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,500 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 12 IW 5.5 x 35	5.5	15.0	35	633227	500

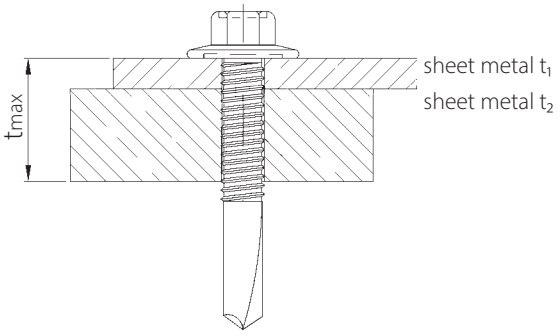
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
	0.88	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
	1.00	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43
	1.13	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43
	1.25	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45
	1.50	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 12 bi-metal self-drilling screw

NEW

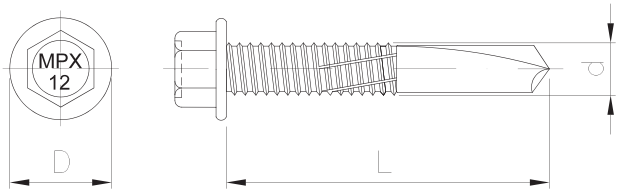
CE ETA 18/0371

MPX 12 5267

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 12 5.5 x 40	5.5	11.0	40	633252	250

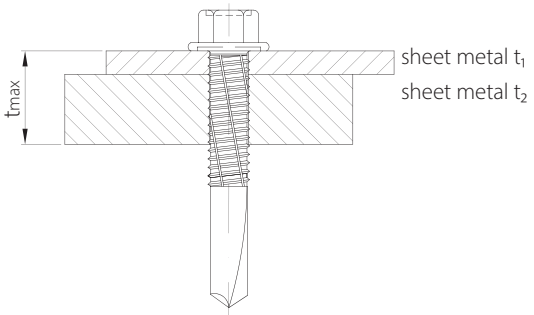
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
	0.88	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	1.25	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
	1.50	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 12 + I14 bi-metal self-drilling screw with washer

NEW

CE ETA 18/0371

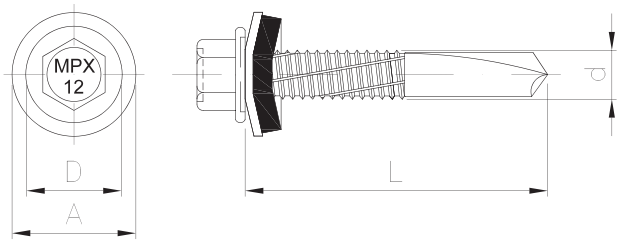
MPX 12 5267

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPX 12 5.5 x 40 / I14	5.5	11.0	40	640692	250

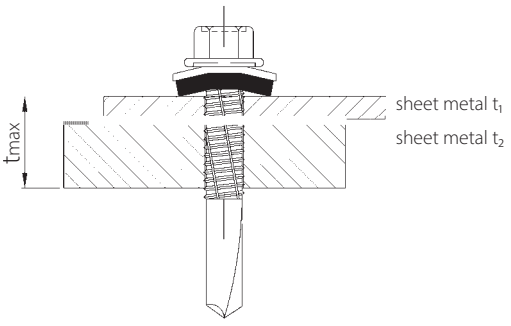
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
	0.88	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	1.00	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.13	4.19	4.19	4.19	4.19	4.19	4.19	4.19	4.19
	1.25	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21
	1.50	4.21	4.21	4.21	4.21	4.21	4.21	4.21	4.21

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPX 12 + I16 bi-metal self-drilling screw with washer

NEW

CE ETA 18/0371

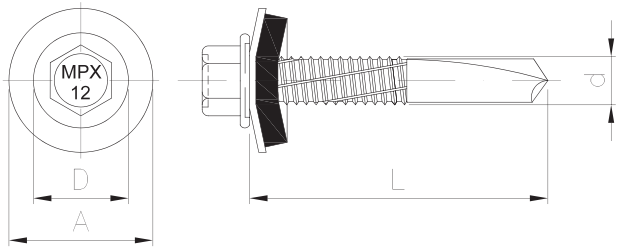
MPX 12 5267

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C5 | 5 Nm | 1,200 rpm max | SILVER RUSPERT | BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPX 12 5.5 x 40 / I16	5.5	11.0	40	16	640693	250

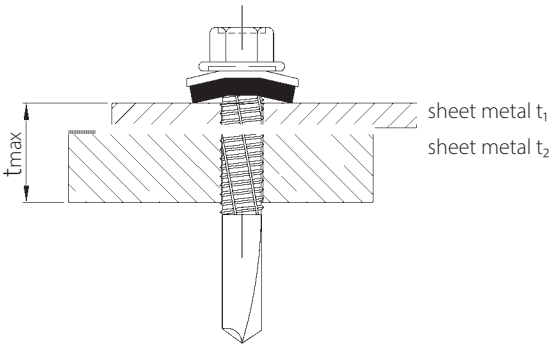
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	0.88	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
	1.00	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.13	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
	1.25	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
	1.50	1.98	1.98	1.98	1.98	1.98	1.98	1.98	1.98
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
	0.88	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
	1.00	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.13	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
	1.25	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26
	1.50	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPT 16 self-drilling screw (ceramic coating)

NEW

CE ETA 18/0371

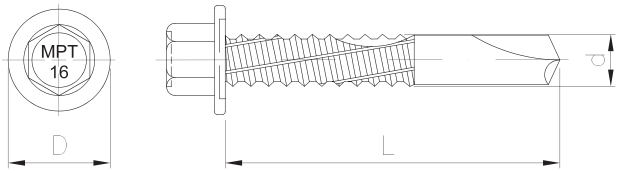
MPT 16 5254

RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 7 Nm | 1,200 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 16 6.3 x 45	6.3	12.0	45.0	633228	250

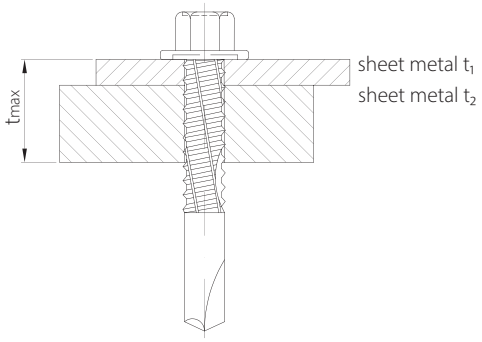
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	≥ 11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
	0.88	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
	1.00	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	1.13	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	1.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
	1.50	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
	0.88	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96
	1.00	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14
	1.13	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14
	1.25	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17
	1.50	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 12.50$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPT 16 + A16 self-drilling screw with washer

NEW

CE ETA 18/0371

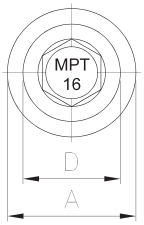
MPT 16 5254

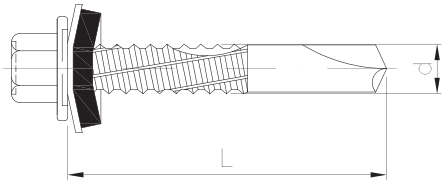
RAL (*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 7 Nm | 1,200 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15





Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPT 16 6.3 x 45 / A16	6.3	12.0	45.0	633229	250

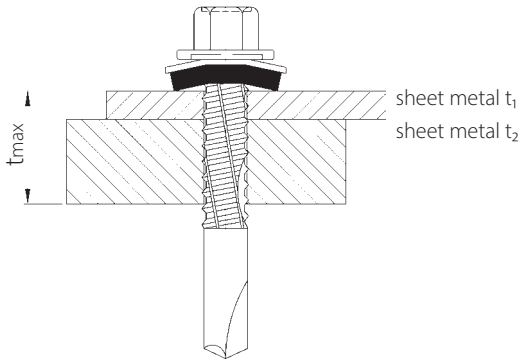
Application

Self-drilling screws are used for the overlapping joining of sheet metal and joining thin metal elements.

Strength characteristics

	Sheet metal thickness t_1 [mm](1)	Sheet metal thickness t_2 [mm](1)							
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	≥ 11.00
Characteristic shear resistance V_{Rk} [kN]	0.75	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
	0.88	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
	1.00	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	1.13	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
	1.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
	1.50	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Characteristic pull-out resistance N_{Rk} [kN]	0.75	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
	0.88	4.68	4.68	4.68	4.68	4.68	4.68	4.68	4.68
	1.00	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56
	1.13	5.56	5.56	5.56	5.56	5.56	5.56	5.56	5.56
	1.25	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96
	1.50	6.83	6.83	6.83	6.83	6.83	6.83	6.83	6.83

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Drilling capacity
$t_{max} \leq 16.50$ mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

MPTC self-drilling screw (ceramic coating)

NEW

ETA 18/0371
(substrate – wood)

ITB-KOT-2019/1014
(substrate – concrete)

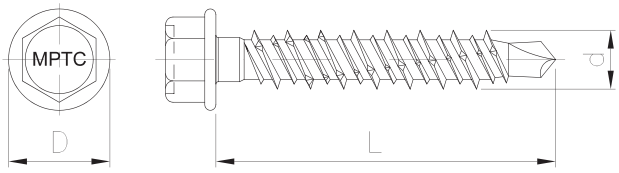
MPTC 5270

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,000 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPTC 6.4 x 40	6.4 – 5.3	11.0	40.0	633230	250
MPTC 6.4 x 50	6.4 – 5.3	11.0	50.0	633231	250
MPTC 6.4 x 65	6.4 – 5.3	11.0	65.0	637809	250

Application

Self-drilling screws are used for the fixing of sheet metal to wooden load-bearing structures and the fastening of sheet metal to concrete substrates.

Strength characteristics – ETA

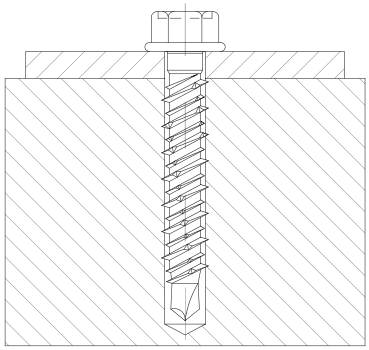
	Sheet metal thickness [mm](1)	Wood class ≥ C24	
		30 mm	40 mm
Characteristic shear resistance V_{Rk} [kN]	0.75	0.96	0.96
	0.88	1.18	1.18
	1.00	1.42	1.42
	1.13	1.42	1.42
	1.25	1.44	1.44
	1.50	1.44	1.44
Characteristic pull-out resistance N_{Rk} [kN]	0.75	1.60	1.60
	0.88	1.96	1.96
	1.00	2.14	2.14
	1.13	2.14	2.14
	1.25	2.17	2.17
	1.50	2.17	2.17

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

Strength characteristics – KOT

	Sheet metal thickness [mm](1)	Ordinary concrete, C20/25÷C50/60
Embedment depth [mm]		30 mm
Characteristic shear resistance $V_{R,k}$ [kN]	0.75	0.65
	0.88	0.65
	1.00	0.65
Characteristic pull-out resistance N_{Rk} [kN]	0.75	0.65
	0.88	0.65
	1.00	0.65

(1) Steel grade S280GD in accordance with PN-EN 10346:2015



Sheet metal t_1
Wood class ≥ C24
Concrete class ≥ C20/25

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPTC + A19 self-drilling screw with washer

NEW

ITB-KOT-2019/1014

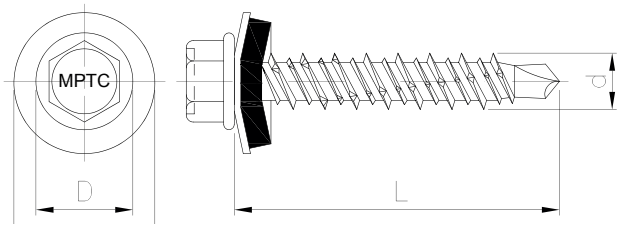
MPTC 5270

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,000 rpm max | SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

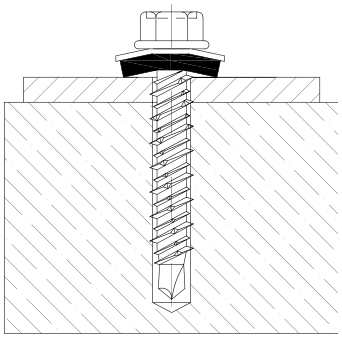
Code and size	d [mm]	D [mm]	L [mm]	N [mm]	Index	Packaging [pcs]
MPTC 6.4 x 40 / A19	6.4-5.3	11.0	40.0	19	637810	250
MPTC 6.4 x 50 / A19	6.4-5.3	11.0	50.0	19	687811	250
MPTC 6.4 x 65 / A19	6.4-5.3	11.0	65.0	19	687812	250

Application

Fixing sheet metal to concrete substrates.

	Sheet metal thickness [mm](1)	Ordinary concrete, C20/25÷C50/60
		30 mm
Characteristic shear resistance V_{Rk} [kN]	0.50	0.65
	0.55	0.65
	0.63	0.65
	0.75	0.65
	0.88	0.65
	1.00	0.65
Characteristic pull-out resistance N_{Rk} [kN]	0.50	0.65
	0.55	0.65
	0.63	0.65
	0.75	0.65
	0.88	0.65
	1.00	0.65

(1) Steel grade S280GD in accordance with PN-EN 10346:2015



Sheet metal t_1
Wood class ≥ C24
Concrete class ≥ C20/25

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MPTC IW self-drilling screw with integrated washer

NEW

ETA 18/0371 (substrate – wood)

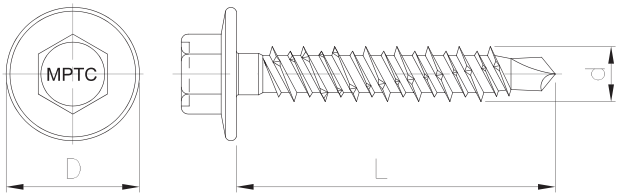
ITB-KOT-2019/1014 (substrate – concrete)

MPTC IW 5271

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 | 5 Nm | 1,000 rpm max | SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d [mm]	D [mm]	L [mm]	Index	Packaging [pcs]
MPTC IW 6.4 x 40	6.4 – 5.3	11.0	40.0	78862	250
MPTC IW 6.4 x 50	6.4 – 5.3	11.0	50.0	78866	250
MPTC IW 6.4 x 65	6.4 – 5.3	11.0	65.0	78867	250

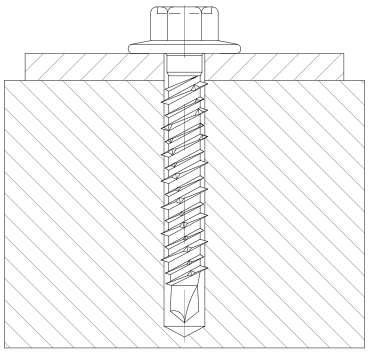
Application

Self-drilling screws are used for the fixing of sheet metal to wooden load-bearing structures and the fastening of sheet metal to concrete substrates.

Strength characteristics – ETA

	Sheet metal thickness [mm](1)	Wood class ≥ C24	
		30 mm	40 mm
Characteristic shear resistance V_{Rk} [kN]	0.75	0.96	0.96
	0.88	1.18	1.18
	1.00	1.42	1.42
	1.13	1.42	1.42
	1.25	1.44	1.44
	1.50	1.44	1.44
Characteristic pull-out resistance N_{Rk} [kN]	0.75	2.76	2.76
	0.88	3.03	3.60
	1.00	3.03	3.84
	1.13	3.03	3.84
	1.25	3.03	3.84
	1.50	3.03	3.84

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015



Sheet metal t_1
Wood class ≥ C24
Concrete class ≥ C20/25

Strength characteristics – KOT

	Sheet metal thickness [mm](1)	Ordinary concrete, C20/25÷C50/60
		30 mm
Characteristic shear resistance $V_{R,k}$ [kN]	0.50	0.65
	0.55	0.65
	0.63	0.65
	0.75	0.65
	0.88	0.65
	1.00	0.65
Characteristic pull-out resistance N_{Rk} [kN]	0.50	0.65
	0.55	0.65
	0.63	0.65
	0.75	0.65
	0.88	0.65
	1.00	0.65

(1) Steel grade S280GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Sheet metal installation screw with washer head

ITB-KOT-2018/0162

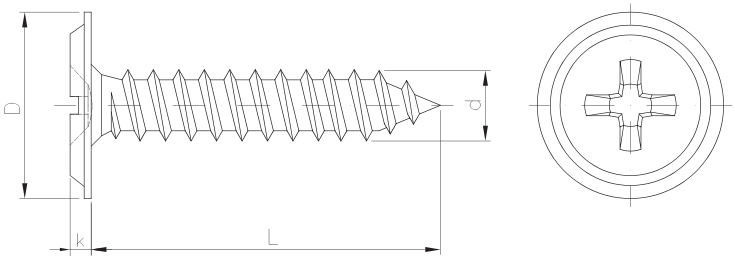
BPMNT 2315

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

Zn POWŁOKA CYNKOWA 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	K [mm]	Index	Packaging [pcs]
BPMNT 4.2 x 13	4.2	11.5	13.0	3.05	5885	1,000
BPMNT 4.2 x 16	4.2	11.5	16.0	3.05	5806	1,000
BPMNT 4.2 x 19	4.2	11.5	19.0	3.05	5887	1,000
BPMNT 4.2 x 25	4.2	11.5	25.0	3.05	5889	1,000
BPMNT 4.2 x 32	4.2	11.5	32.0	3.05	5895	500
BPMNT 4.2 x 40	4.2	11.5	40.0	3.05	5897	500

Application

Installation screws are used for fixing sheet metal to wooden substrates.

Installation characteristics

Designation	Minimum substrate embedment depth [mm]	Maximum drilling capacity [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
BPMNT 4.2 x L	16.8	2 x 1.00	30	10

Strength characteristics

Substrate	d [mm]	Sheet metal thickness [mm](1)	Characteristic resistance	
			Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Wood class ≥ C24	4.2	1.50	0.68	0.68
		2.00	0.68	0.68

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Self-drilling sheet metal installation screw with washer head

ITB-KOT-2018/0162

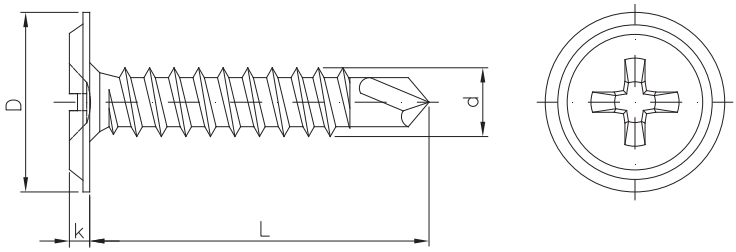
BPSMNT 2316

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

Zn POWŁOKA CYNKOWA 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	D [mm]	L [mm]	K [mm]	Index	Packaging [pcs]
BPSMNT 4.2 x 13	4.2	11.5	13.0	2.3	9860	1,000
BPSMNT 4.2 x 16	4.2	11.5	16.0	2.3	9862	1,000
BPSMNT 4.2 x 19	4.2	11.5	19.0	2.3	9866	1,000
BPSMNT 4.2 x 25	4.2	11.5	25.0	2.3	9868	1,000
BPSMNT 4.2 x 32	4.2	11.5	32.0	2.3	25396	500
BPSMNT 4.2 x 40	4.2	11.5	40.0	2.3	25395	500
BPSMNT 4.2 x 55	4.2	11.5	55.0	2.3	71124	250

Application

Self-drilling sheet metal installation screws are used for the overlapping joining of sheet metal and the fixing of sheet metal to steel substrates.

Installation characteristics

Designation	Minimum substrate embedment depth [mm]	Maximum drilling capacity [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
BPSMNT 4.2 x L	2.00	2 x 1.00	30	25

Strength characteristics

d [mm]	Sheet metal thickness [mm](1)	Characteristic resistance	
		Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
4.2	0.50	2.07	0.63
	0.63	2.07	0.63
	0.75	2.07	0.63
	1.00	2.07	0.63

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Bi-metal self-drilling screw for fastening wood to steel

ITB-KOT-2018/0162

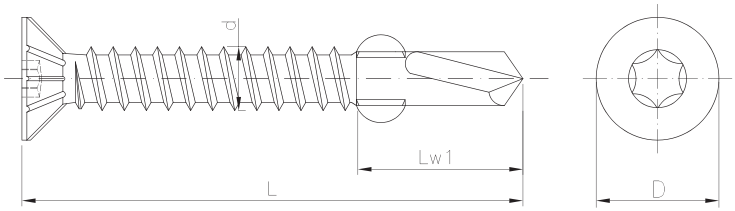
BSX I2319

(*) READY TO BE PAINTED IN RAL COLOURS

* RAL colour availability, see page 181

CORROSION CLASS C4 · SILVER RUSPERT · BI-METAL

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	L [mm]	D [mm]	Lw1 [mm]	Index	Packaging [pcs]
BSX 5.5 x 38	5.5	38	10.8	14	76107	100
BSX 5.5 x 45	5.5	45	10.8	14	76108	100
BSX 5.5 x 50	5.5	50	10.8	14	76109	100
BSX 5.5 x 60	5.5	60	10.8	14	76110	100

Lw1 – total length of drill and reaming elements

Application

Bi-metal self-drilling screws are used for fixing wooden elements to steel substrates.

Installation characteristics

Designation	Minimum substrate thickness [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
BSX 5.5 x L	3.0	30	25

Strength characteristics

Substrate	d [mm]	Substrate thickness [mm](1)	Characteristic resistance	
			Pull-out resistance N_{Rk} [kN]	Shear resistance V_{Rk} [kN]
Wood class ≥ C24	5.5	3.0	2.13	2.13

(1) Steel grades S280GD, S320GD and S350GD in accordance with PN-EN 10346:2015

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Painted self-drilling screws available on offer

RAL READY TO BE PAINTED IN RAL COLOURS

RAL colour palette

5003	7000	7016	7024	7035	9002	9005	9006	9007	9010

MPZ 02 5230

Code and size	RAL	Index	Packaging [pcs]
MPZ 02 4.8 x 20 / S14	5003	636141	250
MPZ 02 4.8 x 20 / S14	7000	636535	250
MPZ 02 4.8 x 20 / S14	7016	639106	250
MPZ 02 4.8 x 20 / S14	7024	639109	250
MPZ 02 4.8 x 20 / S14	7035	639110	250
MPZ 02 4.8 x 20 / S14	9005	639107	250
MPZ 02 4.8 x 20 / S14	9006	639111	250
MPZ 02 4.8 x 20 / S14	9007	639112	250
MPZ 02 4.8 x 20 / S14	9010	639108	250

MPZ 3 5234

Code and size	RAL	Index	Packaging [pcs]
MPZ 3 4.8 x 22 / S14	7016	636142	250
MPZ 3 4.8 x 22 / S14	7035	636145	250
MPZ 3 4.8 x 22 / S14	9006	636143	250
MPZ 3 4.8 x 22 / S14	9010	636144	250
MPZ 3 4.8 x 25 / S14	7016	636146	250
MPZ 3 4.8 x 25 / S14	7035	636149	250
MPZ 3 4.8 x 25 / S14	9006	636147	250
MPZ 3 4.8 x 25 / S14	9010	636148	250

MPZ 5 5238

Code and size	RAL	Index	Packaging [pcs]
MPZ 5 5.5 x 25 / S14	5003	636154	250
MPZ 5 5.5 x 25 / S14	7016	636150	250
MPZ 5 5.5 x 25 / S14	7035	636153	250
MPZ 5 5.5 x 25 / S14	9006	636151	250
MPZ 5 5.5 x 25 / S14	9010	636152	250

MPZ 12 5249

Code and size	RAL	Index	Packaging [pcs]
MPZ 12 5.5 x 35 / S14	5003	636159	250
MPZ 12 5.5 x 35 / S14	7016	636155	250
MPZ 12 5.5 x 35 / S14	7035	636158	250
MPZ 12 5.5 x 35 / S14	9006	636156	250
MPZ 12 5.5 x 35 / S14	9010	636157	250

MPX 02 5260

Code and size	RAL	Index	Packaging [pcs]
MPX 02 4.8 x 20 / I14	7016	639113	250
MPX 02 4.8 x 20 / I14	7024	639116	250
MPX 02 4.8 x 20 / I14	7035	639117	250
MPX 02 4.8 x 20 / I14	9005	639114	250
MPX 02 4.8 x 20 / I14	9006	639118	250
MPX 02 4.8 x 20 / I14	9007	639119	250
MPX 02 4.8 x 20 / I14	9010	639115	250

MPX 5 5263

Code and size	RAL	Index	Packaging [pcs]
MPX 5 5.5 x 25 / I14	7035	640643	250

BPSMNT 2316

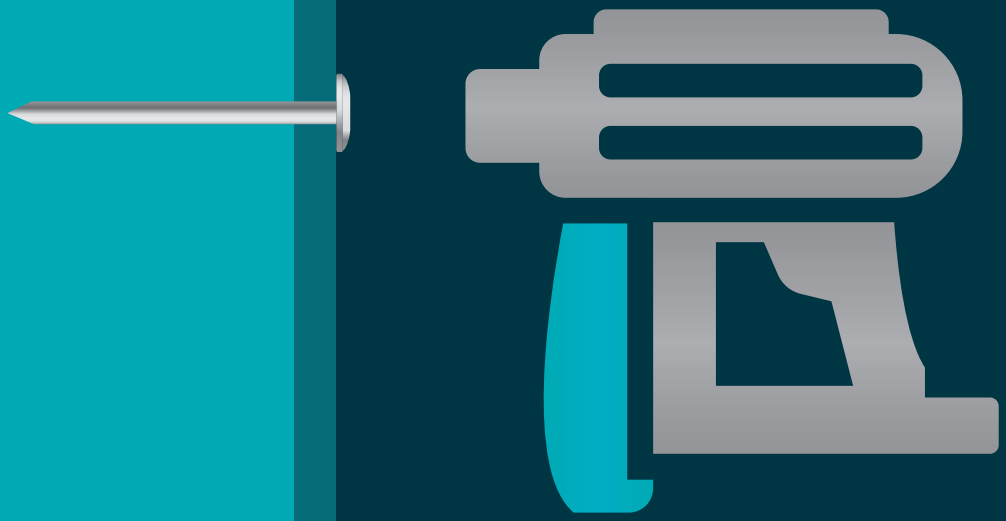
Code and size	RAL	Index	Packaging [pcs]
BPSMNT 4.2 x 16	5003	636530	500
BPSMNT 4.2 x 16	7016	639075	500
BPSMNT 4.2 x 16	7016	639685	1,000
BPSMNT 4.2 x 16	7024	639078	500
BPSMNT 4.2 x 16	7035	639079	500
BPSMNT 4.2 x 16	9002	636529	500
BPSMNT 4.2 x 16	9005	639076	500
BPSMNT 4.2 x 16	9005	638385	1,000
BPSMNT 4.2 x 16	9006	639080	500
BPSMNT 4.2 x 16	9006	639191	1,000

Code and size	RAL	Index	Packaging [pcs]
BPSMNT 4.2 x 16	9010	639077	500
BPSMNT 4.2 x 19	5003	636532	500
BPSMNT 4.2 x 19	7016	639120	500
BPSMNT 4.2 x 19	7024	639102	500
BPSMNT 4.2 x 19	7035	639103	500
BPSMNT 4.2 x 19	9002	636531	500
BPSMNT 4.2 x 19	9005	639100	500
BPSMNT 4.2 x 19	9006	639104	500
BPSMNT 4.2 x 19	9010	639101	500

Direct installation in steel and concrete

Section 5

Powder and gas actuated fixing technique



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SPITFIRE P370 powder-actuated nailer with C60 magazine

NEW

ITB-KOT-2019/0828

P370C60 5906

UPON REQUEST

Designation

Designation	Index	Packaging [pcs]
P370C60 (*)	636622	1

Technical specifications

Weight	2.9 kg
Length	455 mm
Calibre	9 mm
Impact force	350 J
Nail length	15–70 mm
Magazine capacity	10 nails 10 cartridges
Actuation force	17 kg
Vibrations	< 2.5 m/s^2
Material	concrete, steel

Benefits

- Automatic piston return mechanism provides high rate of fixing without reloading.
- Power adjustable by means of a knob – precise fixing adjustment.
- Easier maintenance and cleaning – the piston returns to its original position by means of a rubber spring instead of gas.
- Complete on-site assembly/disassembly in less than 5 minutes without using any tools.
- Metal disc cartridge system – metal discs do not deform and are fully reusable as opposed to plastic discs.
- Easy magazine installation and removal, i.e. easy single shot adaptation.
- Multi-purpose tool with replaceable lugs/adaptors – fixing insulation pins and grids with only one tool.

Basic material

- Concrete, steel

* Available upon request. Contact your consultant to confirm availability.

Collated concrete nails

NEW

ITB-KOT-2019/0828

C9P 5903

Zn ZINC COATING 5 µm

UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

Designation	Length [mm]	Index	Packaging [pcs]
C9P 50 (*)	50	636609	100
C9P 60 (*)	60	636610	100

Nails (10 nails per magazine) for the SPITFIRE P370 powder-actuated nailer

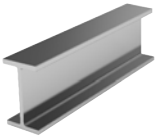
Installation specifications

Fastener designation	Substrate type	Fixture type	h_{ef} [mm]	h_{min} [mm]	s_{min} [mm]	c_{min} [mm]
C9P	Ordinary concrete, C20/25 ÷ C50/60 (*)	Steel sheet, thickness 0.50 ÷ 2.00 mm, minimum grade S280GD	25	80	200	150

(*) In accordance with PN-EN 206+A1:2016

Substrates

Ordinary concrete



Steel

Strength characteristics

Fastener designation	Characteristic pull-out resistance N_{Rk} [kN]	Characteristic shear resistance V_{Rk} [kN]
C9P	0.30	0.30

Application

Used for dynamic multiple-point, non-structural fixing in concrete, class C12/C15 ÷ C50/60, in accordance with PN-EN 206+A1:2016, and in steel substrates of at least 3 mm, with strength properties at least equal to S235JR steel in accordance with PN-EN 10025-1:2007.

* Available upon request. Contact your consultant to confirm availability.

MARCOPOL

Hardened collated nails for nailers

NEW

ITB-KOT-2019/0828

SC9P 5904

Zn ZINC COATING 5 µm

UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

Designation	Length [mm]	Index	Packaging [pcs]
SC9P 15 (*)	15	636611	500
SC9P 20 (*)	20	636612	500
SC9P 25 (*)	25	636613	500

Nails (10 nails per magazine) for the P370 nailer

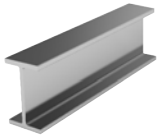
Installation specifications

Fastener designation	Substrate type	Type (*) in accordance with PN-EN 10025-1:2007	h_{ef} [mm]	h_{min} [mm]	s_{min} [mm]	c_{min} [mm]
SC9P	Steel sheet, minimum grade S235JR (*)	Steel sheet, minimum grade S280GD	5	-	25.4	12.7

(*) In accordance with PN-EN 10025-1:2007

Substrates

Ordinary concrete



Steel

Strength characteristics

Fastener designation	Characteristic pull-out resistance N_{Rk} [kN]	Characteristic shear resistance V_{Rk} [kN]
SC9P	5.87	3.85

Application

Used for dynamic multiple-point, non-structural fixing in concrete, class C12/C15 ÷ C50/60, in accordance with PN-EN 206+A1:2016, and in steel substrates of at least 3 mm, with strength properties at least equal to S235JR steel in accordance with PN-EN 10025-1:2007.

* Available upon request. Contact your consultant to confirm availability.

SPITFIRE P560 powder-actuated nailer

NEW

CE ETA 08/0040

P560 5902

UPON REQUEST

Designation

Designation	Index	Packaging [pcs]
P560 (*)	636621	1

Technical specifications

Weight	4.2 kg
Length	363 mm
Calibre	14 mm
Impact force	520 J
Nail length	15–70 mm
Magazine capacity	10 nails 10 cartridges
Actuation force	11.5 kg
Vibrations	< 2.5 m/s2
Material	Basic steel, thickness from 6 mm

Benefits

- Approved method of direct profile sheet installation in steel, minimum 6 mm – the highest tensile strength and shear resistance in accordance with ETA 08/0040.
- The smallest, lightest and most compact nailer in its class available on the market.
- Cost reduction – faster operation thanks to semi-automatic reloading, e.g. when performing vertical installations on roofs.
- Complete assembly/disassembly and cleaning without any tools.
- Easy magazine installation and removal, i.e. easy single shot adaptation.

Basic material

- Steel – maximum thickness of 6 mm

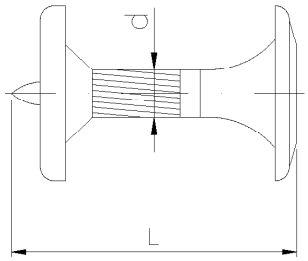
* Available upon request. Contact your consultant to confirm availability.

Single hardened steel nails with washers

NEW

CE ETA 08/0040

HSBR14 5901



Zn ZINC COATING 10 µm

CORROSION CLASS C2

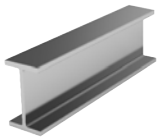
UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

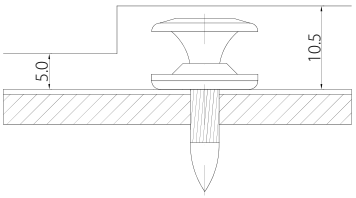
Designation	Diameter d [mm]	Length L [mm]	Washer diameter [mm]	Index	Packaging [pcs]
HSBR14 (*)	4.5	25.5	14	636607	1,000

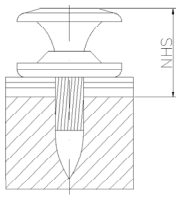
Substrates



Steel

Installation control





5 mm ≤ NHS ≤ 11.5 mm - $\sum_t$

Strength characteristics

Sheet thickness t [mm]	Characteristic pull-out resistance N_{Rk} [kN]	Characteristic shear resistance V_{Rk} [kN]
0.63	5.3	4.2
0.75	6.6	5.8
0.88	7.7	7.5
1.00	8.2	8.6
1.13	9.1	9.1
1.25	9.5	9.5
1.50	10.0	10.0
1.75	10.1	10.0
2.00	10.3	10.0
2.50	10.4	10.0
3.00	10.5	10.0

* Available upon request. Contact your consultant to confirm availability.

Collated hardened steel nails with washers

NEW

CE ETA 08/0040

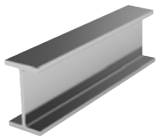
HSBR14P 5901

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

Designation	Length [mm]	Washer diameter [mm]	Index	Packaging [pcs]
HSBR14P (*)	25.5	14	636608	1,000

Substrates



Steel

Strength characteristics

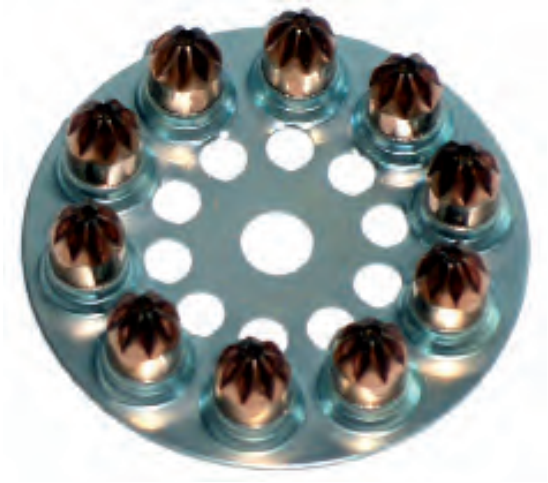
Sheet thickness t [mm]	Characteristic pull-out resistance N_{Rk} [kN]	Characteristic shear resistance V_{Rk} [kN]
0.63	5.3	4.2
0.75	6.6	5.8
0.88	7.7	7.5
1.00	8.2	8.6
1.13	9.1	9.1
1.25	9.5	9.5
1.50	10.0	10.0
1.75	10.1	10.0
2.00	10.3	10.0
2.50	10.4	10.0
3.00	10.5	10.0

* Available upon request. Contact your consultant to confirm availability.

Powder loads on discs

NEW

LPT 5905

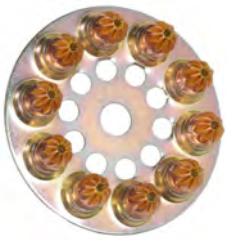


UPON REQUEST

Designation

Designation	Size [mm]	Type	Index	Packaging [pcs]
LPT 10, green (*)	6.3/10	Weak	636618	100
LPT 10, yellow (*)	6.3/10	Strong	636619	100
LPT 10, red (*)	6.3/10	Very strong	636620	100
LPT 16, yellow (*)	6.3/16	Very weak	636614	100
LPT 16, blue (*)	6.3/16	Weak	636615	100
LPT 16, red (*)	6.3/16	Strong	636616	100
LPT 16, black (*)	6.3/16	Very strong	636617	100

Hard steel, up to S355, 10 loads



	Basic material thickness in mm (E24 steel test)*							
	6	8	10	12	14	16	18	>20
Green	◖							
Yellow	●	●	◖					
Blue	◖	◖	●	●	◖			
Red			◖	◖	●	●	◖	
Black					◖	◖	●	●

- Strong ↕ + Strong

* Final selection should be made following the directives

◖ May be suitable, but must be subject to verification ● Perfectly suitable

In case of excessive force change the cartridge colours until a suitable value is achieved.

* Available upon request. Contact your consultant to confirm availability.

PULSA 800P gas-actuated nailer

NEW

ITB-KOT-2019/0828

PULSA 800P 5909

UPON REQUEST

Designation

Designation	Index	Packaging [pcs]
PULSA 800P (*)	636634	1

Technical specifications

Weight	3.8 kg
Dimensions	385 x 114 x 309 mm
Driving force	82 J
Nail length	15–40 mm
Magazine capacity	20 nails
Long magazine (special accessory)	50 nails
Battery capacity	Up to 3,000 shots
Actuation force	4.5 kg
Vibrations	4.5 m/s2

Benefits

- Special head for aluminium profiles, Rapica mesh, etc.
- Control panel showing gas/battery status – precise control over gas and battery levels helps to avoid downtime at the construction site.
- Complete dust protection – less dust accumulation on the tool – longer service intervals and lower cleaning costs.
- Fast charging feature – the Li-ion battery allows up to 3,000 shots per charge. The fast charging feature provides 500 shots after 25 minutes.
- Tool-free driving depth adjustment with a lever.
- Impact protection – housing elements exposed to severe impacts are separated and covered with a protective material.
- Easy magazine removal without any tools if a nail becomes stuck in the barrel.
- Full performance from -15˚C to +49˚C. High-tech sensors in the injection electronics, innovative gas valve technology and a suitable gas mixture ensure complete functionality despite frost and heat.

* Available upon request. Contact your consultant to confirm availability.

PULSA 800E gas-actuated nailer

NEW

ITB-KOT-2019/0828

PULSA 800E 5909

UPON REQUEST

Designation

Designation	Index	Packaging [pcs]
PULSA 800E (*)	636633	1

Technical specifications

Weight	3.8 kg
Dimensions	385 x 114 x 309 mm
Driving force	82 J
Nail length	15–40 mm
Magazine capacity	20 nails
Long magazine (special accessory)	50 nails
Battery capacity	Up to 3,000 shots
Actuation force	4.5 kg
Vibrations	4.5 m/s2

Benefits

- Special accessories attach directly to the tool – fastening of holders, cable ducts, cable brackets, etc. made of plastic and metal in series.
- Control panel showing gas/battery status – precise control over gas and battery levels helps to avoid downtime at the construction site.
- Complete dust protection – less dust accumulation on the tool – longer service intervals and lower cleaning costs.
- Fast charging feature – the Li-ion battery allows up to 3,000 shots per charge. The fast charging feature provides 500 shots after 25 minutes.
- Impact protection – housing elements exposed to severe impacts are separated and covered with a protective material.
- Tool-free driving depth adjustment with a lever.
- Easy magazine removal without any tools if a nail becomes stuck in the barrel.
- Full performance from -15˚C to +49˚C. High-tech sensors in the injection electronics, innovative gas valve technology and a suitable gas mixture ensure complete functionality despite frost and heat.
- Wide range of accessories – the widest range of nails for a variety of substrates and applications.

* Available upon request. Contact your consultant to confirm availability.

Collated nails for gas-actuated nailers

NEW

ITB-KOT-2019/0828

C6P 5907

Zn ZINC COATING 5 µm

UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

Designation	Length [mm]	Index	Packaging [pcs]
C6P 20 (*)	20	636623	500
C6P 25 (*)	25	636624	500
C6P 30 (*)	30	636625	500
C6P 35 (*)	35	636626	500
C6P 40 (*)	40	636627	500

Nails (10 nails per magazine) for PULSA 800P and PULSA 800E

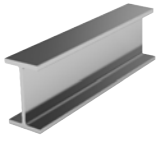
Installation specifications

Fastener designation	Substrate type	Fixture type	h_{ef} [mm]	h_{min} [mm]	s_{min} [mm]	c_{min} [mm]
C6P	Ordinary concrete, C20/25 ÷ C50/60 (*)	Steel sheet, thickness 0.50 ÷ 1.00 mm, minimum grade S280GD	15	80	200	150

(*) In accordance with PN-EN 206+A1:2016

Substrates

Ordinary concrete



Steel

Strength characteristics

Fastener designation	Characteristic pull-out resistance N_{Rk} [kN]	Characteristic shear resistance V_{Rk} [kN]
C6P	0.25	0.25

Basic material

- Ordinary concrete, C20/25, full blocks, bricks and plastered hollow bricks

* Available upon request. Contact your consultant to confirm availability.

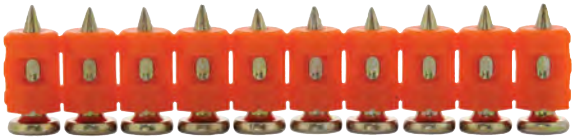
MARCOPOL

Hardened collated nails for gas-actuated nailers

NEW

ITB-KOT-2019/0828

HC6P 5908



Zn ZINC COATING 5 µm

UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

Designation

Designation	Length [mm]	Index	Packaging [pcs]
HC6P 15 (*)	15	636628	500
HC6P 17 (*)	17	636629	500
HC6P 22 (*)	22	636630	500
HC6P 27 (*)	27	636631	500
HC6P 32 (*)	32	636632	500

Nails (10 nails per magazine) for PULSA 800P and PULSA 800E

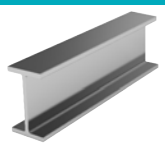
Installation specifications

Fastener designation	Substrate type	Fixture type	h_{ef} [mm]	h_{min} [mm]	s_{min} [mm]	c_{min} [mm]
HC6P	Ordinary concrete, C20/25 ÷ C50/60 (*)	Steel sheet, thickness 0.50 ÷ 1.00 mm, minimum grade S280GD	15	80	200	150
HC6P	Steel sheet, minimum grade S235JR (**)	Steel sheet, minimum grade S280GD	5	-	25.4	12.7

(*) In accordance with PN-EN 206+A1:2016
(**) In accordance with PN-EN 10025-1:2007

Substrates

Ordinary concrete



Steel

Strength characteristics

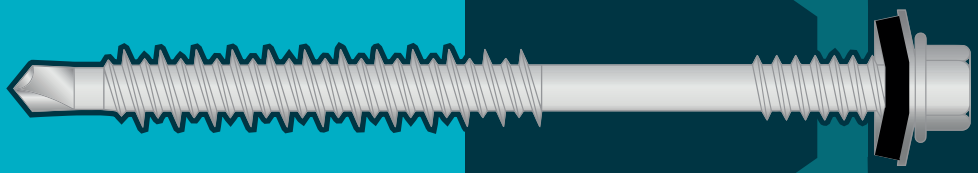
Fastener designation	Substrate	Characteristic shear resistance V_{Rk} [kN]	Characteristic pull-out resistance N_{Rk} [kN]
HC6P	Concrete	0.25	0.25
HC6P	Steel	2.20	1.44

Basic material

- High-strength, hard concrete, up to C60/75, reinforced concrete, steel up to E335

* Available upon request. Contact your consultant to confirm availability.

Section 6
Sandwich panel fixing screws



		Page
1.	MPT 6 SP 5215 sandwich panel fixing screws	199
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4.	MPT 25 SP 5226 sandwich panel fixing screws	202
5.	MPTC SP 5222 sandwich panel fixing screws	203
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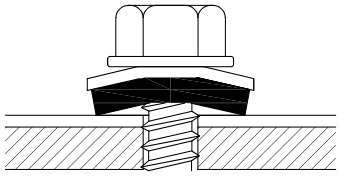
SANDWICH PANEL FIXING SCREWS

Product selection guidelines:

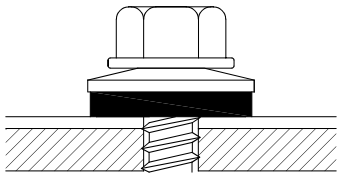
- The MPT SP and MPTC SP screws provide A1 firing performance and can be used within this class.
- The anti-corrosive protection should match the corrosive environment in which the screws are to be used.
- Their length should be adapted to the thickness of all the fixed elements. Remember to account for the SW saddle washer thickness, the RN stress diffuser thickness and other elements, if applicable.
- Additionally, the length of screws should match the substrate embedment depth.
- The SW saddle washer thickness of 5 mm and the MRN stress diffuser thickness of 1.2 mm should be used when selecting the length of screws.

Installation requirements:

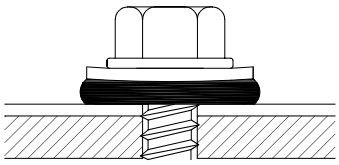
- If the panels are to be fixed to a concrete substrate, holes with a diameter of 5 mm should be pre-drilled.
- Fixing should be perpendicular to the panel plane.
- Installation should be carried out using a screw gun with controllable torque and smooth rotation control.
- Screws with EPDM washers should be fixed as shown in the image below.



Too little
(undertightened)

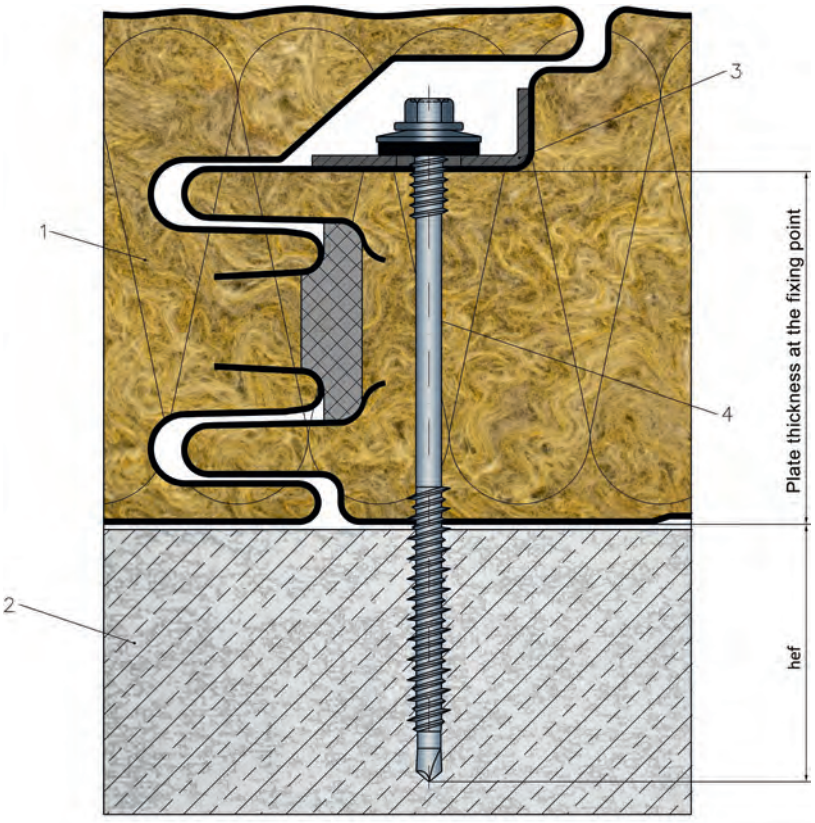


Correct



Too much
(overtightened)

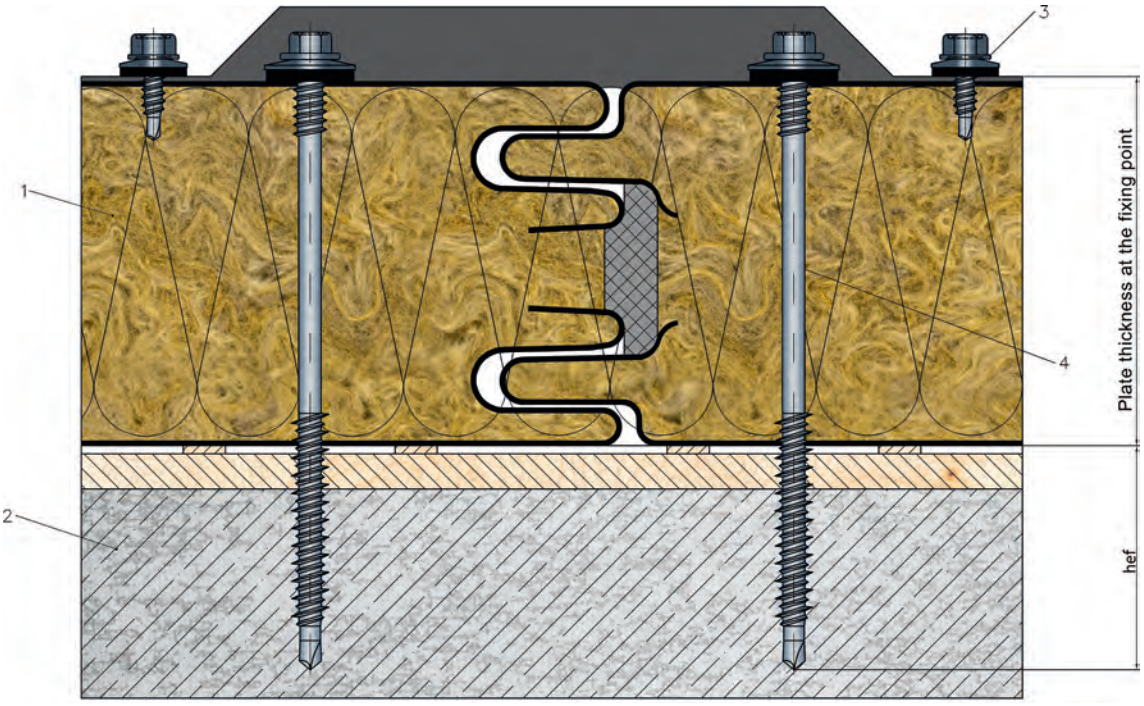
The images below show how to fix screws to a concrete or wood substrate.



1. Sandwich panel
2. Concrete / wood
3. MRN stress diffuser
4. MPTC SP / MPXC SP sandwich panel screw

h_{ef} = 30 mm (concrete) / 40 mm (wood)

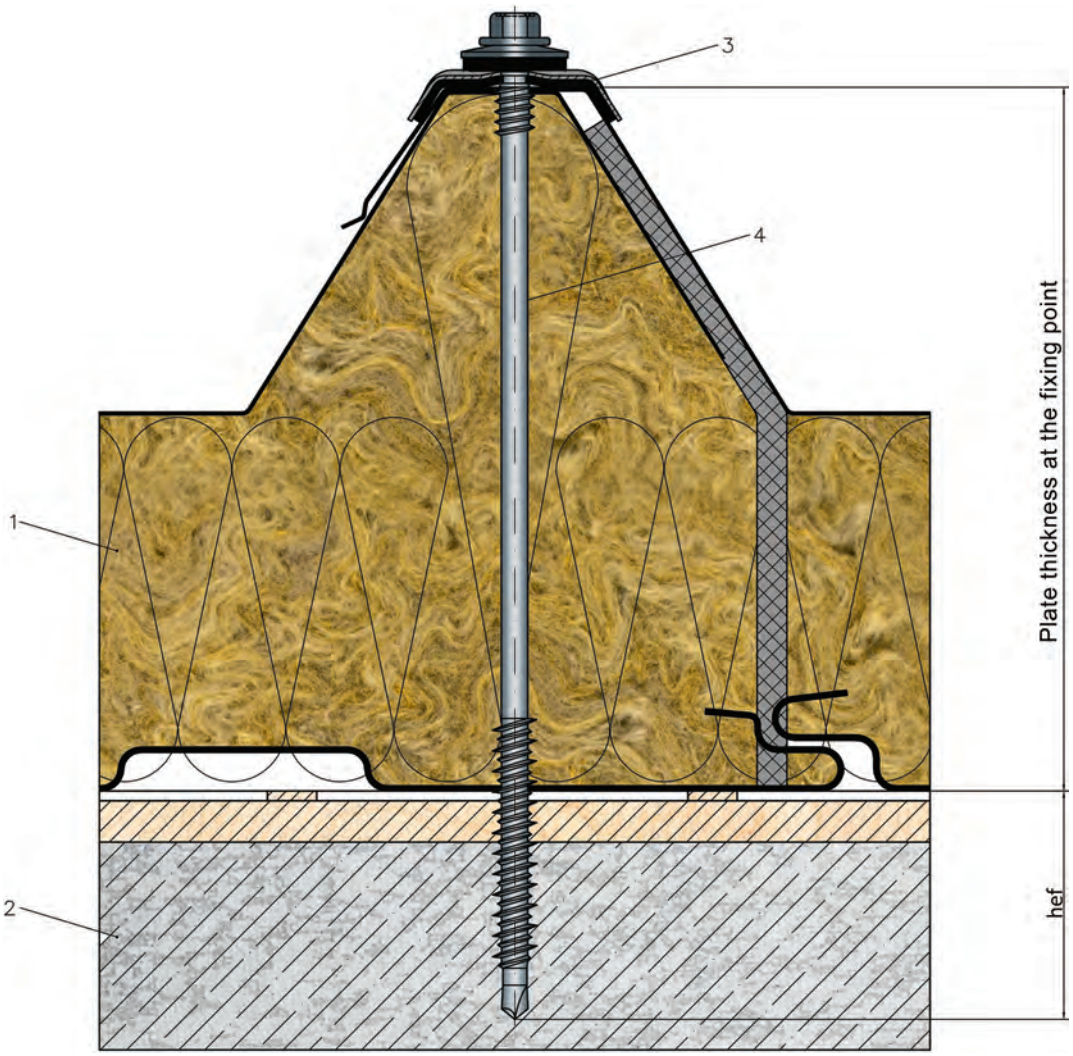
Figure 1. Fixing sandwich panels with a hidden locking mechanism using a MRN stress diffuser



1. Sandwich panel
2. Concrete / wood
3. MPZ 02 / BPSMNT screw
4. MPTC SP / MPXC SP sandwich panel screw

h_{ef} = 30 mm (concrete) / 40 mm (wood)

Figure 2. Visible sandwich panel fixing



1. Sandwich panel
2. Concrete / wood
3. Saddle washer
4. MPTC SP / MPXC SP sandwich panel screw

h_{ef} = 30 mm (concrete) / 40 mm (wood)

Figure 3. Fixing roofing sandwich panels using SW saddle washers

Screw for fixing sandwich panels to steel with a maximum thickness of 6 mm (ceramic coating, A19 washer)

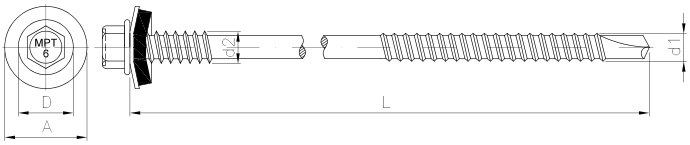
NEW

CE ETA 19/0354

MPT 6 SP 5215

RAL READY TO BE PAINTED IN RAL COLOURS

7 Nm | 1500 rpm max | CORROSION CLASS C4-H C5-M | SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1 [mm]	d2 [mm]	D [mm]	L [mm]	N [mm]	Plate thickness range H_{min} [mm]	Plate thickness range H_{max} [mm]	Index	Packaging [pcs]
MPT 6 SP 5.5/6.3 x 65	5.5	6.3	11.0	65	19	20	40	638884	50
MPT 6 SP 5.5/6.3 x 85	5.5	6.3	11.0	85	19	30	60	638885	50
MPT 6 SP 5.5/6.3 x 105	5.5	6.3	11.0	105	19	50	80	638886	50
MPT 6 SP 5.5/6.3 x 125	5.5	6.3	11.0	125	19	70	100	638887	50
MPT 6 SP 5.5/6.3 x 155	5.5	6.3	11.0	155	19	100	130	638888	50
MPT 6 SP 5.5/6.3 x 175	5.5	6.3	11.0	175	19	120	150	638889	50
MPT 6 SP 5.5/6.3 x 205	5.5	6.3	11.0	205	19	150	180	638890	50
MPT 6 SP 5.5/6.3 x 235	5.5	6.3	11.0	235	19	160	210	638891	50
MPT 6 SP 5.5/6.3 x 275	5.5	6.3	11.0	275	19	200	250	638892	50

Strength characteristics

	Cladding sheet thickness t_1 [mm]	Substrate thickness t_2 [mm] 2.00	2.50	3.00	4.00	5.00
Characteristic shear resistance V_{Rk} [kN]	0.40	0.75	0.75	0.75	0.75	0.75
	0.50	1.33	1.33	1.33	1.33	1.33
	0.55	1.33	1.33	1.33	1.33	1.33
	0.63	1.66	1.66	1.66	1.66	1.66
	0.75	1.97	1.97	1.97	1.97	1.97
	0.88	1.97	1.97	1.97	1.97	1.97
	1.00	1.97	1.97	1.97	1.97	1.97
Characteristic pull-out resistance $N_{R,k}$ [kN]	0.40	2.23	2.23	2.23	2.23	2.23
	0.50	2.26	2.26	2.26	3.23	3.23
	0.55	2.26	2.26	2.26	3.23	3.23
	0.63	2.26	2.26	2.26	4.12	4.12
	0.75	2.26	2.26	2.26	4.73	4.73
	0.88	2.26	2.26	2.26	4.73	4.73
	1.00	2.26	2.26	2.26	4.73	4.73
Maximum head displacement depending on the sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3
	120	2.8	2.8	2.8	2.8	2.8
	> 140	3.2	3.2	3.2	3.2	3.2

Drilling capacity $t_{max} \leq 6$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

MARCOPOL PLUS

Screw for fixing sandwich panels to steel with a maximum thickness of 12 mm (ceramic coating, A19 washer)

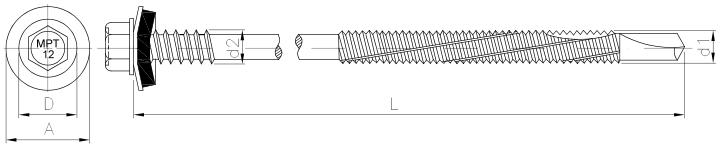
NEW

CE ETA 19/0354

MPT 12 SP 5217

RAL READY TO BE PAINTED IN RAL COLOURS

7 Nm | 1500 rpm max | CORROSION CLASS C4-H C5-M | SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1 [mm]	d2 [mm]	D [mm]	L [mm]	N [mm]	Plate thickness range H_{min} [mm]	Plate thickness range H_{max} [mm]	Index	Packaging [pcs]
MPT 12 SP 5.5/6.3 x 85	5.5	6.3	11.0	85	19	25	50	638893	50
MPT 12 SP 5.5/6.3 x 95	5.5	6.3	11.0	95	19	35	60	638894	50
MPT 12 SP 5.5/6.3 x 115	5.5	6.3	11.0	115	19	50	80	638895	50
MPT 12 SP 5.5/6.3 x 135	5.5	6.3	11.0	135	19	70	100	638896	50
MPT 12 SP 5.5/6.3 x 155	5.5	6.3	11.0	155	19	90	120	638897	50
MPT 12 SP 5.5/6.3 x 175	5.5	6.3	11.0	175	19	110	140	638898	50
MPT 12 SP 5.5/6.3 x 195	5.5	6.3	11.0	195	19	130	160	638899	50
MPT 12 SP 5.5/6.3 x 215	5.5	6.3	11.0	215	19	140	180	638900	50
MPT 12 SP 5.5/6.3 x 235	5.5	6.3	11.0	235	19	160	200	638901	50
MPT 12 SP 5.5/6.3 x 265	5.5	6.3	11.0	265	19	190	230	638902	50
MPT 12 SP 5.5/6.3 x 285	5.5	6.3	11.0	285	19	200	250	637789	50

Strength characteristics

	Cladding sheet thickness t_1 [mm]	Substrate thickness t_2 [mm] 3.00	4.00	5.00	6.00	8.00	10.00	11.00
Characteristic shear resistance V_{Rk} [kN]	0.40	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	0.50	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	0.55	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	0.63	1.66	1.66	1.66	1.66	1.66	1.66	1.66
	0.75	1.97	1.97	1.97	1.97	1.97	1.97	1.97
	0.88	1.97	1.97	1.97	1.97	1.97	1.97	1.97
	1.00	1.97	1.97	1.97	1.97	1.97	1.97	1.97
Characteristic pull-out resistance $N_{R,k}$ [kN]	0.40	2.23	2.23	2.23	2.23	2.23	2.23	2.23
	0.50	3.11	3.23	3.23	3.23	3.23	3.23	3.23
	0.55	3.11	3.23	3.23	3.23	3.23	3.23	3.23
	0.63	3.11	4.12	4.12	4.12	4.12	4.12	4.12
	0.75	3.11	4.73	4.73	4.73	4.73	4.73	4.73
	0.88	311	4.73	4.73	4.73	4.73	4.73	4.73
	1.00	3.11	4.73	4.73	4.73	4.73	4.73	4.73
Maximum head displacement depending on the sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	> 140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Drilling capacity $t_{max} \leq 12$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Screw for fixing sandwich panels to steel with a maximum thickness of 16 mm (ceramic coating, A19 washer)

NEW

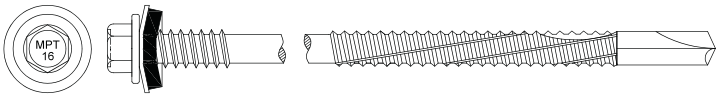
CE ETA 19/0354

MPT 16 SP 5219

RAL READY TO BE PAINTED IN RAL COLOURS

6Nm 1200 rpm max CORROSION CLASS C4-H C5-M

SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1 [mm]	d2 [mm]	D [mm]	L [mm]	N [mm]	Plate thickness range H_{min} [mm]	Plate thickness range H_{max} [mm]	Index	Packaging [pcs]
MPT 16 SP 6.3/7.0 x 85	6.3	7.0	13.0	85	19	35	40	638904	50
MPT 16 SP 6.3/7.0 x 105	6.3	7.0	13.0	105	19	55	60	638904	50
MPT 16 SP 6.3/7.0 x 125	6.3	7.0	13.0	125	19	50	80	638906	50
MPT 16 SP 6.3/7.0 x 145	6.3	7.0	13.0	145	19	70	100	638907	50
MPT 16 SP 6.3/7.0 x 165	6.3	7.0	13.0	165	19	75	120	638908	50
MPT 16 SP 6.3/7.0 x 195	6.3	7.0	13.0	195	19	105	150	638909	50
MPT 16 SP 6.3/7.0 x 205	6.3	7.0	13.0	205	19	115	160	638910	50
MPT 16 SP 6.3/7.0 x 245	6.3	7.0	13.0	245	19	155	200	638911	50
MPT 16 SP 6.3/7.0 x 295	6.3	7.0	13.0	295	19	205	250	638912	50

Strength characteristics

	Cladding sheet thickness t_1 [mm]	Substrate thickness t_2 [mm] 8.00	10.00	11.00	12.00	13.00	14.00	15.00
Characteristic shear resistance V_{Rk} [kN]	0.40	0.82	0.82	0.82	0.82	0.82	0.82	0.82
	0.50	1.29	1.29	1.29	1.29	1.29	1.29	1.29
	0.55	1.29	1.29	1.29	1.29	1.29	1.29	1.29
	0.63	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.75	2.01	2.01	2.01	2.01	2.01	2.01	2.01
	0.88	2.01	2.01	2.01	2.01	2.01	2.01	2.01
	1.00	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Characteristic pull-out resistance $N_{R,k}$ [kN]	0.40	2.23	2.23	2.23	2.23	2.23	2.23	2.23
	0.50	3.23	3.23	3.23	3.23	3.23	3.23	3.23
	0.55	3.23	3.23	3.23	3.23	3.23	3.23	3.23
	0.63	4.12	4.12	4.12	4.12	4.12	4.12	4.12
	0.75	3.11	4.73	4.73	4.73	4.73	4.73	4.73
	0.88	311	4.73	4.73	4.73	4.73	4.73	4.73
	1.00	3.11	4.73	4.73	4.73	4.73	4.73	4.73
Maximum head displacement depending on the sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	> 140	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Drilling capacity $t_{max} \leq 16$ mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Screw for fixing sandwich panels to steel with a maximum thickness of 25 mm (ceramic coating, A19 washer)

NEW

CE ETA 19/0354

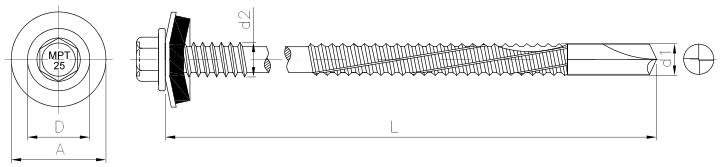
MPT 25 SP 5226

RAL READY TO BE PAINTED IN RAL COLOURS

6Nm 1500 rpm max CORROSION CLASS C4-H C5-M

SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d1 [mm]	d2 [mm]	D [mm]	L [mm]	N [mm]	Plate thickness range H_{min} [mm]	Plate thickness range H_{max} [mm]	Index	Packaging [pcs]
MPT 25 SP 6.3/7.0 x 145	6.3	7.0	13.0	145	19	55	80	636022	50
MPT 25 SP 6.3/7.0 x 165	6.3	7.0	13.0	165	19	75	100	636023	50
MPT 25 SP 6.3/7.0 x 185	6.3	7.0	13.0	185	19	95	120	636024	50
MPT 25 SP 6.3/7.0 x 205	6.3	7.0	13.0	205	19	115	140	636025	50
MPT 25 SP 6.3/7.0 x 225	6.3	7.0	13.0	225	19	135	160	636026	50
MPT 25 SP 6.3/7.0 x 245	6.3	7.0	13.0	245	19	155	180	636027	50
MPT 25 SP 6.3/7.0 x 265	6.3	7.0	13.0	265	19	175	200	636028	50

Strength characteristics

	Cladding sheet thickness t_1 [mm]	Substrate thickness t_2 [mm] 8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00
Characteristic shear resistance V_{Rk} [kN]	0.40	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
	0.50	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
	0.55	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
	0.63	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69
	0.75	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
	0.88	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
	1.00	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01	2.01
Characteristic pull-out resistance $N_{R,k}$ [kN]	0.40	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23
	0.50	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23
	0.55	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23	3.23
	0.63	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
	0.75	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
	0.88	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
	1.00	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73
Maximum head displacement depending on the sandwich panel thickness [mm]	30	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	40	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	50	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	60	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	70	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	80	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	90	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	100	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
	120	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
	> 140	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Drilling capacity $t_{max} \leq 25$mm

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

Screw for fixing sandwich panels to concrete/ wood (ceramic coating, A19 washer)

NEW

CE ETA 19/0354
(substrate – wood)

MPTC SP 5222

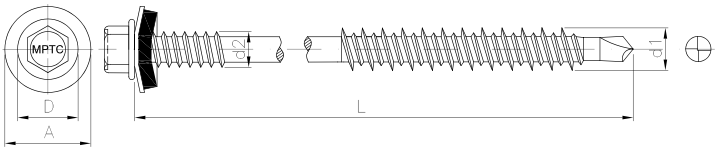
RAL READY TO BE PAINTED IN RAL COLOURS

5 Nm

1000 rpm max

CORROSION CLASS C4-H C5-M

SILVER RUSPERT



A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1 [mm]	d2 [mm]	D [mm]	L [mm]	N [mm]	Plate thickness range H_{min} [mm]	Plate thickness range H_{max} [mm]	Index	Packaging [pcs]
MPTC SP 6.4/7.0 x 105	6.4	7.0	13.0	105	19	50	60	638949	50
MPTC SP 6.4/7.0 x 125	6.4	7.0	13.0	125	19	70	80	638950	50
MPTC SP 6.4/7.0 x 145	6.4	7.0	13.0	145	19	90	100	638951	50
MPTC SP 6.4/7.0 x 165	6.4	7.0	13.0	165	19	110	120	638952	50
MPTC SP 6.4/7.0 x 195	6.4	7.0	13.0	195	19	140	150	638953	50
MPTC SP 6.4/7.0 x 225	6.4	7.0	13.0	225	19	170	180	638954	50
MPTC SP 6.4/7.0 x 245	6.4	7.0	13.0	245	19	190	200	638955	50
MPTC SP 6.4/7.0 x 265	6.4	7.0	13.0	265	19	210	220	638956	50
MPTC SP 6.4/7.0 x 295	6.4	7.0	13.0	295	19	240	250	638957	50

Strength characteristics – ETA

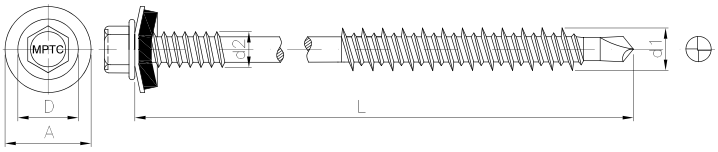
	Wood, class ≥ C24	Substrate thickness t_2 [mm] 20.00	30.00	40.00	50.00	60.00	70.00	80.00	≥ 90.00
Characteristic shear resistance V_{Rk} [kN]	0.40	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
	0.50	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
	0.55	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
	0.63	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61
	0.75	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.88	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	1.00	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Characteristic pull-out resistance $N_{R,k}$ [kN]	0.40	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.50	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.55	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.63	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.75	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	0.88	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
	1.00	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Maximum head displacement depending on the sandwich panel thickness [mm]	0.7	0.9	1.2	1.4	1.6	1.8	2.1	2.3	0.7

Drill length = 11 mm
Effective anchoring depth in concrete = 30 mm
Minimum fixing depth in wood = 20 mm

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

Screw for fixing sandwich panels to concrete/ wood (ceramic coating, A19 washer)

NEW



ITB-KOT-2020/1406
(substrate – concrete)

MPTC SP 5222

RAL READY TO BE PAINTED IN RAL COLOURS

5 Nm

1000 rpm max

CORROSION CLASS C4-H C5-M

SILVER RUSPERT

A detailed description of symbols used in the catalogue can be found on pages 12–15

Installation characteristics – KOT

Code and size	Nominal drilling diameter d_0 [mm]	Effective anchoring depth h_{ef} [mm]	Minimum substrate thickness [mm]	Minimum fastener spacing s_{cr} [mm]	Minimum edge distance c_{cr} [mm]
MPTC SP 6.4/7.0 x L	5	30	80	90	45

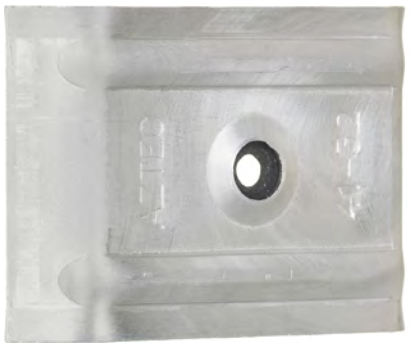
Strength characteristics – KOT

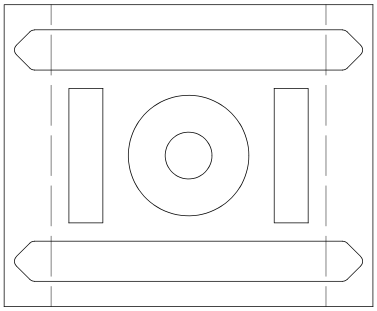
Code and size	Characteristic pull-out resistance – ordinary non-cracked concrete, class C20/25 ÷ C50/60 – single-point fixings N_{Rk} [kN]	Characteristic pull-out resistance – ordinary cracked and non-cracked concrete, class C20/25 ÷ C50/60 – multi-point fixings N_{Rk} [kN]	Characteristic shear resistance – ordinary cracked and non-cracked concrete, class C20/25 ÷ C50/60 – multi-point fixings V_{Rk} [kN]
MPTC SP 6.4/7.0 x L	2.0	0.65	0.65

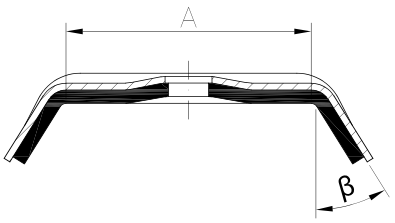
** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

Saddle washer

NEW







CE ETA 19/0354

SW 5281

RAL READY TO BE PAINTED IN RAL COLOURS

Code and size

Code and size	N [mm]	β [°]	Index	Packaging [pcs]
SW 26 mm / 27°	26	27	642950	100
SW 32 mm / 25°	32	25	642951	100
SW 41 mm / 32°	41	32	642952	100

Application

Saddle washers are used for fixing roofing sandwich panels with self-drilling screws. They increase the clamping surface of a roofing panel at the place of installation while also sealing the entire connection by means of a special EPDM elastomer. The use of saddle washers improves load-carrying ability of the fixings.

Benefits

- The highest quality materials: aluminium with a proprietary, low-hardness elastomer (Polymer 36)
- High washer rigidity thanks to additional longitudinal ribs
- High wear and temperature resistance of the elastomer
- Excellent sealing properties

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

Stress diffuser

NEW

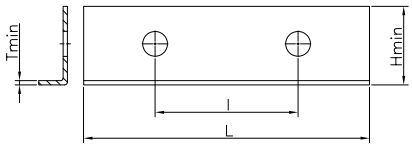
MRN 5280

Zn ZINC COATING 5 µm

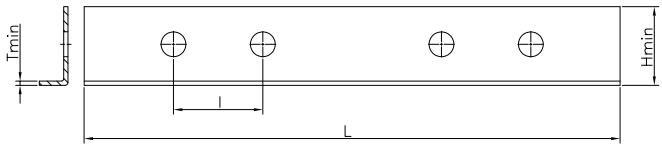
UPON REQUEST

A detailed description of symbols used in the catalogue can be found on pages 12–15

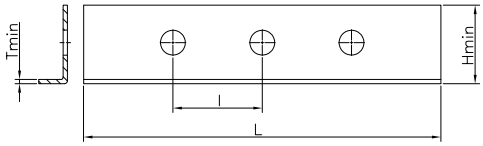
RN 80/22/30



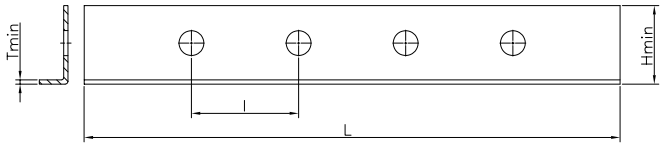
RN 150/22/30



RN 100/22/25



RN 150/22/25



Code and size

Code and size	L [mm]	l [mm]	T_{min} [mm]	H_{min} [mm]	Index	Packaging [pcs]
MRN 80/22/30	80	40	1.2	22	642953	100
MRN 100/22/25	100	25	1.2	22	642954	100
MRN 150/22/30	150	25	1.2	22	642955	50
MRN 150/22/25	150	30	1.2	22	642956	50

Application

Used in panel locks with hidden coupling elements together with the SPS screws.

Section 7

Blind rivets

		Page
1.	ZSS standard blind rivets	208
2.	ZAS standard blind rivets	209
3.	SSS sealed blind rivets	210
4.	SAS sealed blind rivets	211
5.	ZXX standard blind rivets	212
6.	ZAX standard blind rivets	213

MARCOPOL

St/St standard (open end) blind rivets

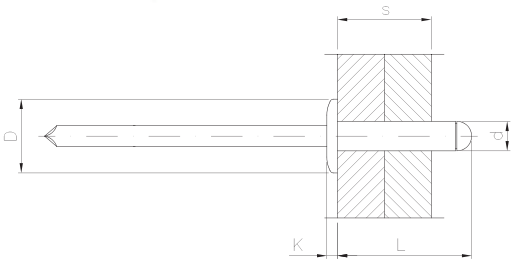
Related standards:
PN-EN ISO 15979

ZSS 2401

RAL (*) READY TO BE PAINTED IN RAL COLOURS

Zn ZINC COATING 5 µm

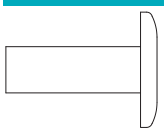
A detailed description of symbols used in the catalogue can be found on pages 12–15



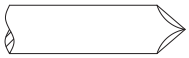
Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
ZSS 3.0 x 6	3.0	6	6.5	0.8	1.5-3.5	3.1	641474	1,000
ZSS 3.0 x 8	3.0	8	6.5	0.8	3.5-5.5	3.1	641475	1,000
ZSS 3.0 x 10	3.0	10	6.5	0.8	5.5-7.0	3.1	641476	1,000
ZSS 3.0 x 12	3.0	12	6.5	0.8	7.0-9.0	3.1	641477	1,000
ZSS 3.2 x 6	3.2	6	6.5	0.8	1.5-3.5	3.3	641478	1,000
ZSS 3.2 x 8	3.2	8	6.5	0.8	3.5-5.5	3.3	641479	1,000
ZSS 3.2 x 10	3.2	10	6.5	0.8	5.5-7.0	3.3	641480	1,000
ZSS 4.0 x 6	4.0	6	8.0	1.0	1.5–3.0	4.1	641481	1,000
ZSS 4.0 x 8	4.0	8	8.0	1.0	3.0-5.0	4.1	641607	1,000
ZSS 4.0 x 10	4.0	10	8.0	1.0	5.0-6.5	4.1	641482	1,000
ZSS 4.0 x 12	4.0	12	8.0	1.0	6.5-8.5	4.1	641483	500
ZSS 4.0 x 14	4.0	14	8.0	1.0	8.5-10.5	4.1	641484	500
ZSS 4.0 x 16	4.0	16	8.0	1.0	10.5-12.5	4.1	641485	500
ZSS 4.0 x 18	4.0	18	8.0	1.0	12.5-14.5	4.1	641486	500
ZSS 4.0 x 20	4.0	20	8.0	1.0	14.5-16.5	4.1	641487	500
ZSS 4.8 x 6	4.8	6	9.5	1.1	0.5–3.0	4.9	641488	500
ZSS 4.8 x 8	4.8	8	9.5	1.1	3.0-4.5	4.9	641489	500
ZSS 4.8 x 10	4.8	10	9.5	1.1	4.5-6.0	4.9	641490	500
ZSS 4.8 x 12	4.8	12	9.5	1.1	6.0-8.0	4.9	641491	500
ZSS 4.8 x 14	4.8	14	9.5	1.1	8.0-10.0	4.9	641492	500
ZSS 4.8 x 16	4.8	16	9.5	1.1	10.0-12.0	4.9	641493	500
ZSS 4.8 x 18	4.8	18	9.5	1.1	12.0-14.0	4.9	641494	500
ZSS 4.8 x 20	4.8	20	9.5	1.1	12.0-15.0	4.9	641495	250
ZSS 4.8 x 21	4.8	21	9.5	1.1	14.0-16.0	4.9	641496	250
ZSS 4.8 x 24	4.8	24	9.5	1.1	16.0-19.0	4.9	641497	250
ZSS 4.8 x 30	4.8	30	9.5	1.1	20.0-25.0	4.9	641498	250
ZSS 4.8 x 35	4.8	35	9.5	1.1	25.0-30.0	4.9	641499	250
ZSS 5.0 x 8	5.0	8	9.5	1.1	3.0-4.5	5.1	641500	500
ZSS 5.0 x 10	5.0	10	9.5	1.1	4.5-6.0	5.1	641501	500
ZSS 5.0 x 12	5.0	12	9.5	1.1	6.0-8.0	5.1	641502	500
ZSS 5.0 x 14	5.0	14	9.5	1.1	8.0-10.0	5.1	641503	250
ZSS 5.0 x 16	5.0	16	9.5	1.1	10.0-11.5	5.1	641504	250
ZSS 5.0 x 18	5.0	18	9.5	1.1	12.0-14.0	5.1	641505	250
ZSS 5.0 x 20	5.0	20	9.5	1.1	13.0-15.0	5.1	641506	250
ZSS 5.0 x 25	5.0	25	9.5	1.1	16.0-21.0	5.1	641507	250
ZSS 5.0 x 30	5.0	30	9.5	1.1	21.0-25.0	5.1	641508	250
ZSS 6.0 x 10	6.0	10	12.0	1.5	3.0-4.5	6.1	641509	250
ZSS 6.0 x 12	6.0	12	12.0	1.5	4.5-6.0	6.1	641510	250
ZSS 6.0 x 16	6.0	16	12.0	1.5	8.5-12.0	6.1	641511	200
ZSS 6.0 x 18	6.0	18	12.0	1.5	10.5-12.5	6.1	641512	200
ZSS 6.0 x 30	6.0	30	12.0	1.5	19.0-25.0	6.1	641513	200
ZSS 6.4 x 12	6.4	12	13.0	1.8	2.0-6.0	6.5	641514	150
ZSS 6.4 x 15	6.4	15	13.0	1.8	6.0-9.0	6.5	641515	150
ZSS 6.4 x 18	6.4	18	13.0	1.8	9.0-12.0	6.5	641516	150
ZSS 6.4 x 20	6.4	20	13.0	1.8	12.0-14.0	6.5	641517	100
ZSS 6.4 x 25	6.4	25	13.0	1.8	13.0-19.0	6.5	641518	100
ZSS 6.4 x 30	6.4	30	13.0	1.8	19.0-24.0	6.5	641519	100

Material



Steel



Steel

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

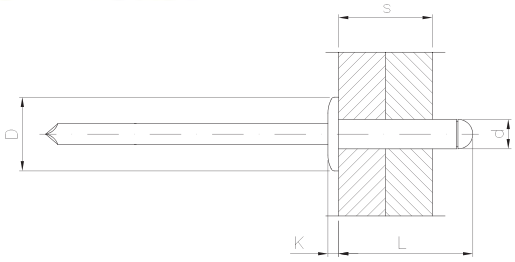
ALU/St standard (open end) blind rivets

Related standards:
PN-EN ISO 15977

ZAS 2402

(*) READY TO BE PAINTED IN RAL COLOURS

Zn ZINC COATING 5µm

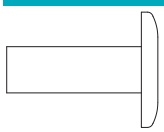


A detailed description of symbols used in the catalogue can be found on pages 12–15

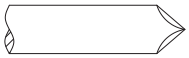
Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
ZAS 3.0 x 6	3.0	6	6.5	0.8	1.5-3.5	3.1	641319	1,000
ZAS 3.0 x 8	3.0	8	6.5	0.8	3.5-5.5	3.1	641320	1,000
ZAS 3.0 x 10	3.0	10	6.5	0.8	5.5-7.0	3.1	641321	1,000
ZAS 3.0 x 12	3.0	12	6.5	0.8	7.0-9.0	3.1	641322	1,000
ZAS 3.0 x 16	3.0	16	6.5	0.8	11.0-13.0	3.1	641323	1,000
ZAS 3.2 x 6	3.2	6	6.5	0.8	1.5-3.5	3.3	641324	1,000
ZAS 3.2 x 8	3.2	8	6.5	0.8	3.5-5.5	3.3	641325	1,000
ZAS 3.2 x 10	3.2	10	6.5	0.8	5.5-7.0	3.3	641326	1,000
ZAS 3.2 x 12	3.2	12	6.5	0.8	7.0-9.0	3.3	641327	1,000
ZAS 3.2 x 16	3.2	16	6.5	0.8	9.0-12.0	3.3	641328	1,000
ZAS 4.0 x 6	4.0	6	8.0	1.0	1.5–3.0	4.1	641329	1,000
ZAS 4.0 x 8	4.0	8	8.0	1.0	3.0-5.0	4.1	641333	1,000
ZAS 4.0 x 10	4.0	10	8.0	1.0	5.0-6.5	4.1	641336	1,000
ZAS 4.0 x 12	4.0	12	8.0	1.0	6.5-8.5	4.1	641337	500
ZAS 4.0 x 14	4.0	14	8.0	1.0	8.5-10.5	4.1	641338	500
ZAS 4.0 x 16	4.0	16	8.0	1.0	10.5-12.5	4.1	641339	500
ZAS 4.0 x 18	4.0	18	8.0	1.0	12.5-14.5	4.1	641340	500
ZAS 4.0 x 20	4.0	20	8.0	1.0	14.5-16.5	4.1	641341	500
ZAS 4.0 x 25	4.0	25	8.0	1.0	16.5-21.5	4.1	641342	500
ZAS 4.0 x 30	4.0	30	8.0	1.0	21.5-26.0	4.1	641343	250
ZAS 4.8 x 6	4.8	6	9.5	1.1	0.5–3.0	4.9	641344	500
ZAS 4.8 x 8	4.8	8	9.5	1.1	3.0-4.5	4.9	641345	500
ZAS 4.8 x 10	4.8	10	9.5	1.1	4.5-6.0	4.9	641346	500
ZAS 4.8 x 12	4.8	12	9.5	1.1	6.0-8.0	4.9	641347	500
ZAS 4.8 x 14	4.8	14	9.5	1.1	8.0-10.0	4.9	641348	500
ZAS 4.8 x 16	4.8	16	9.5	1.1	10.0-12.0	4.9	641349	500
ZAS 4.8 x 18	4.8	18	9.5	1.1	12.0-14.0	4.9	641350	500
ZAS 4.8 x 24	4.8	24	9.5	1.1	16.0-19.0	4.9	641351	500
ZAS 4.8 x 30	4.8	30	9.5	1.1	20.0-25.0	4.9	641352	250
ZAS 4.8 x 35	4.8	35	9.5	1.1	25.0-30.0	4.9	641353	250
ZAS 5.0 x 8	5.0	8	9.5	1.1	3.0-4.5	5.1	641354	500
ZAS 5.0 x 10	5.0	10	9.5	1.1	4.5-6.0	5.1	641355	500
ZAS 5.0 x 12	5.0	12	9.5	1.1	6.0-8.0	5.1	641356	500
ZAS 5.0 x 14	5.0	14	9.5	1.1	8.0-10.0	5.1	641357	500
ZAS 5.0 x 16	5.0	16	9.5	1.1	10.0-11.5	5.1	641358	500
ZAS 5.0 x 18	5.0	18	9.5	1.1	12.0-14.0	5.1	641359	500
ZAS 5.0 x 20	5.0	20	9.5	1.1	13.0-15.0	5.1	641360	500
ZAS 5.0 x 25	5.0	25	9.5	1.1	16.0-21.0	5.1	641361	250
ZAS 5.0 x 30	5.0	30	9.5	1.1	21.0-25.0	5.1	641362	250
ZAS 6.0 x 10	6.0	10	12.0	1.5	3.0-4.5	6.1	641363	250
ZAS 6.0 x 12	6.0	12	12.0	1.5	4.5-6.0	6.1	641364	250
ZAS 6.0 x 16	6.0	16	12.0	1.5	8.5-12.0	6.1	641365	200
ZAS 6.0 x 18	6.0	18	12.0	1.5	10.5-12.5	6.1	641366	200
ZAS 6.0 x 20	6.0	20	12.0	1.5	11.0-15.0	6.1	641367	200
ZAS 6.0 x 25	6.0	25	12.0	1.5	15.0-19.0	6.1	641368	200
ZAS 6.0 x 30	6.0	30	12.0	1.5	19.0-25.0	6.1	641369	200

Material



Aluminium



Steel

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

St/St sealed (closed end) blind rivets

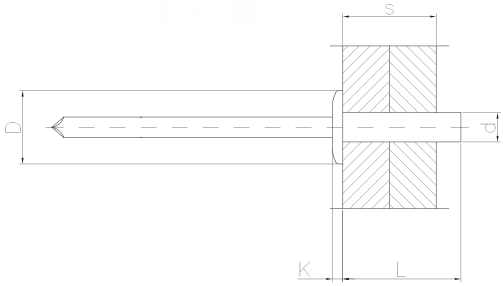
Related standards:
PN-EN ISO 15976

SSS 2406

(*) READY TO BE PAINTED IN RAL COLOURS

ZINC COATING 5 µm

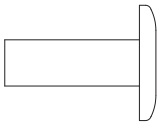
A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
SSS 4.0 x 8	4.0	8	8.0	1.4	1.5–3.0	4.1	641570	500
SSS 4.0 x 10	4.0	10	8.0	1.4	3.0-5.0	4.1	641571	500
SSS 4.0 x 12	4.0	12	8.0	1.4	5.0-6.5	4.1	641572	500
SSS 4.0 x 15	4.0	15	8.0	1.4	6.5-10.5	4.1	641573	500
SSS 4.8 x 9.5	4.8	9.5	9.5	1.7	1.0-3.5	4.9	641574	500
SSS 4.8 x 12	4.8	12	9.5	1.7	4.0-5.0	4.9	641575	500

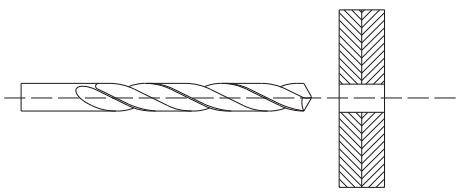
Material



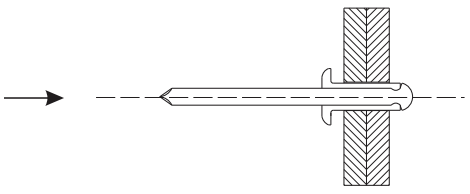
Steel

Steel

Blind rivet installation



1. Drill a hole with a diameter specified in the table for a given rivet

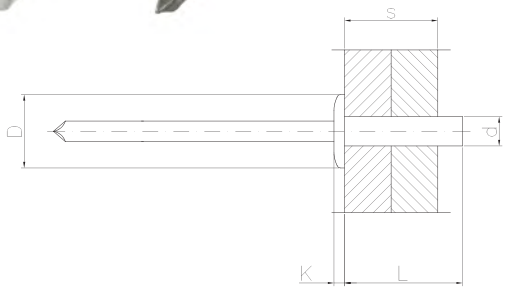


2. Insert a rivet in the hole

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

ALU/St sealed (closed end) blind rivets

Related standards:
PN-EN ISO 15973



SAS 2407

RAL (*) READY TO BE PAINTED IN RAL COLOURS

Zn ZINC COATING 5µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

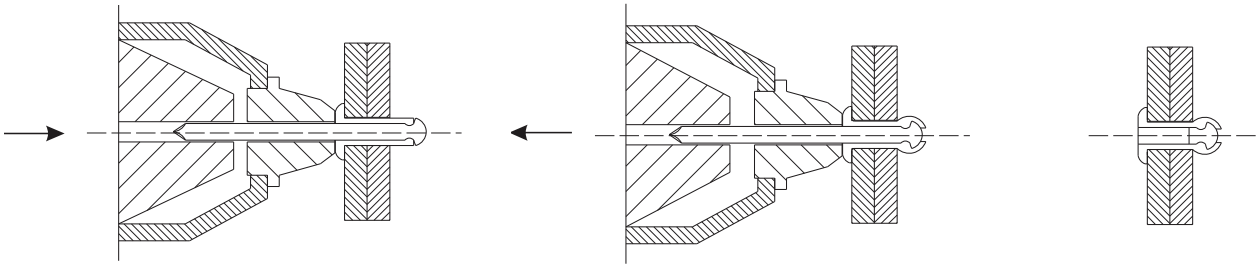
Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
SAS 3.2 x 8	3.2	8	6.0	0.9	2.0-3.5	3.3	641576	1,000
SAS 3.2 x 9.5	3.2	9.5	6.0	0.9	3.5-5.0	3.3	641577	1,000
SAS 3.2 x 12.5	3.2	12.5	6.0	0.9	6.5-8.0	3.3	641578	1,000
SAS 4.0 x 8	4.0	8	8.0	1.3	0.5-3.5	4.1	641579	500
SAS 4.0 x 9.5	4.0	9.5	8.0	1.3	3.5-5.0	4.1	641580	500
SAS 4.0 x 12.5	4.0	12.5	8.0	1.3	6.5-8.0	4.1	641582	500
SAS 4.8 x 8.5	4.8	8.5	9.5	1.5	0.5-3.5	4.9	641583	500
SAS 4.8 x 9.5	4.8	9.5	9.5	1.5	3.5-5.0	4.9	641584	500
SAS 4.8 x 11	4.8	11	9.5	1.5	5.0-6.5	4.9	641585	500
SAS 4.8 x 12.5	4.8	12.5	9.5	1.5	6.0-8.0	4.9	641586	500
SAS 4.8 x 13	4.8	13	9.5	1.5	6.5-8.0	4.9	641587	500
SAS 4.8 x 14.5	4.8	14.5	9.5	1.5	8.0-9.5	4.9	641588	250
SAS 4.8 x 16	4.8	16	9.5	1.5	9.5-11.0	4.9	641589	250
SAS 4.8 x 21	4.8	21	9.5	1.5	13.0-16.0	4.9	641590	250

Material

Aluminium

Steel



3. Place the rivet tool on the shank of the rivet.

4. Tighten the rivet device on the shank until it breaks off

5. Riveting is complete

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

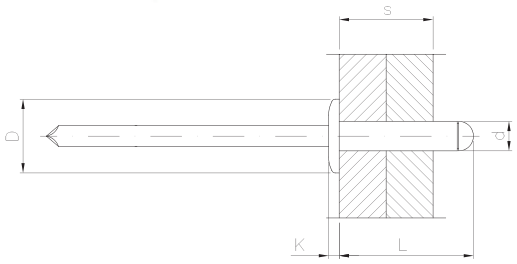
A2/A2 standard (open end) blind rivets

Related standards:
PN EN ISO 15983

ZXX I2401

(*) READY TO BE PAINTED IN RAL COLOURS

A2 ACID-RESISTANT STEEL

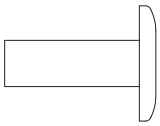


A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
ZXX 3.0 x 6	3.0	6	6.5	0.8	1.5-3.5	3.1	98657	500
ZXX 3.0 x 8	3.0	8	6.5	0.8	3.5-5.5	3.1	84108	500
ZXX 3.0 x 10	3.0	10	6.5	0.8	5.5-7.0	3.1	98666	500
ZXX 3.0 x 12	3.0	12	6.5	0.8	7.0-9.0	3.1	98668	500
ZXX 3.2 x 6	3.2	6	6.5	0.8	1.5-3.5	3.3	98671	500
ZXX 3.2 x 8	3.2	8	6.5	0.8	3.5-5.5	3.3	643063	500
ZXX 4.0 x 8	4.0	8	8.0	1.0	3.0-5.0	4.1	643062	500
ZXX 4.0 x 10	4.0	10	8.0	1.0	5.0-6.5	4.1	54463	500
ZXX 4.0 x 12	4.0	12	8.0	1.0	6.5-8.5	4.1	54464	500
ZXX 4.0 x 16	4.0	16	8.0	1.0	10.5-12.5	4.1	84117	500
ZXX 4.8 x 10	4.8	10	9.5	1.1	4.5-6.0	4.9	35942	500
ZXX 4.8 x 12	4.8	12	9.5	1.1	6.0-8.0	4.9	84119	500
ZXX 4.8 x 16	4.8	16	9.5	1.1	10.0-12.0	4.9	84120	500
ZXX 4.8 x 18	4.8	18	9.5	1.1	12.0-14.0	4.9	84122	500
ZXX 4.8 x 20	4.8	20	9.5	1.1	14.0-16.0	4.9	98676	250

Material


A2


A2

** Screws painted in RAL colours available upon request.
Contact your consultant to confirm availability.

ALU/A2 standard (open end) blind rivets

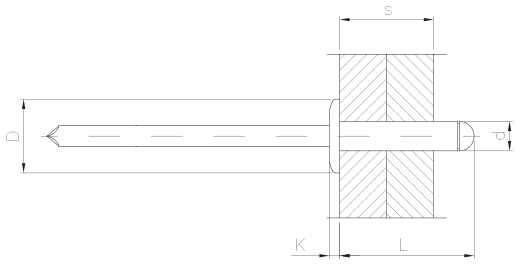
ZAX I2402

(*) READY TO BE PAINTED IN RAL COLOURS

A2 ACID-RESISTANT STEEL

UPON REQUEST

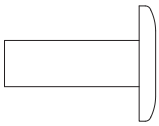
A detailed description of symbols used in the catalogue can be found on pages 12–15



Code and size

Code and size	d [mm]	L [mm]	D [mm]	K [mm]	Rivet range s [mm]	d_{nom} [mm]	Index	Packaging [pcs]
ZAX 3.0 x 10	3.0	10	6.5	0.8	5.5-7.0	3.1	45284	1,000
ZAX 3.2 x 6	3.2	6	6.5	0.8	1.5-3.5	3.3	84171	1,000
ZAX 3.2 x 10	3.2	10	6.5	0.8	5.0-6.5	3.3	51547	1,000
ZAX 4.0 x 18	4.0	18	8.0	1.0	12.5-14.5	4.1	96419	500
ZAX 4.8 x 10	4.8	10	9.5	1.1	4.0-6.0	4.9	84170	1,000
ZAX 4.8 x 12	4.8	12	9.5	1.1	6.0-8.0	4.9	76524	500
ZAX 4.8 x 18	4.8	16	9.5	1.1	12.0-14.0	4.9	35994	250
ZAX 4.8 x 21	4.8	18	9.5	1.1	13.0-16.0	4.9	48982	1,000
ZAX 5.0 x 20	5.0	20	9.5	1.1	12.0-15.0	5.1	42504	1,000

Material



Aluminium

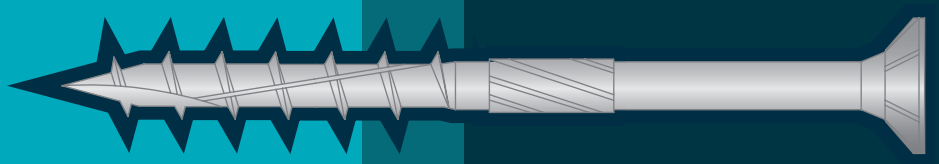
A2

** Screws painted in RAL colours available upon request. Contact your consultant to confirm availability.

** Product available upon request.

Structural fixing of wooden elements

Section 8
Structural screws for wood



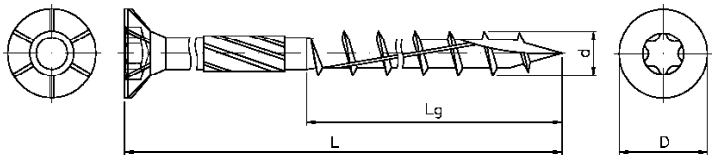
		Page
1.	Structural screws with steeple head, partially threaded	216
2.	Washers for chipboard screws with steeple head	217
3.	Structural screws with washer head, partially threaded	218
4.	Cylindrical head screws with double thread	220
5.	Washer head screws with double thread	221

MARCOPOL

Structural screws with steeple head, partially threaded

EN 14592:2008+A1:2012

HUS 3110



Zn ZINC COATING 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

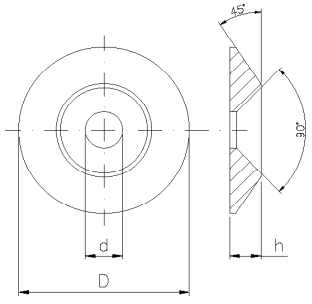
Code and size	d [mm]	L [mm]	D [mm]	Lg [mm]	Recesses	Index	Package [pcs]
HUS 5.0 x 50	5.0	50	10.0	30	TX 25	37191	500
HUS 5.0 x 60	5.0	60	10.0	40	TX 25	16840	250
HUS 5.0 x 70	5.0	70	10.0	40	TX 25	16842	250
HUS 5.0 x 80	5.0	80	10.0	50	TX 25	16846	250
HUS 5.0 x 90	5.0	90	10.0	50	TX 25	16847	250
HUS 5.0 x 100	5.0	100	10.0	60	TX 25	16848	250
HUS 5.0 x 120	5.0	120	10.0	60	TX 25	37192	250
HUS 6.0 x 60	6.0	60	12.0	32	TX 30	14090	100
HUS 6.0 x 70	6.0	70	12.0	32	TX 30	14091	100
HUS 6.0 x 80	6.0	80	12.0	50	TX 30	14096	100
HUS 6.0 x 90	6.0	90	12.0	60	TX 30	14097	100
HUS 6.0 x 100	6.0	100	12.0	60	TX 30	14098	100
HUS 6.0 x 120	6.0	120	12.0	70	TX 30	14099	100
HUS 6.0 x 140	6.0	140	12.0	70	TX 30	14074	100
HUS 6.0 x 160	6.0	160	12.0	70	TX 30	14075	100
HUS 6.0 x 180	6.0	180	12.0	70	TX 30	14076	100
HUS 6.0 x 200	6.0	200	12.0	70	TX 30	14077	100
HUS 6.0 x 220	6.0	220	12.0	70	TX 30	14078	100
HUS 6.0 x 240	6.0	240	12.0	70	TX 30	14079	100
HUS 8.0 x 80	8.0	80	15.0	50	TX 40	37193	50
HUS 8.0 x 100	8.0	100	15.0	50	TX 40	37194	50
HUS 8.0 x 120	8.0	120	15.0	50	TX 40	14080	50
HUS 8.0 x 140	8.0	140	15.0	80	TX 40	14081	50
HUS 8.0 x 160	8.0	160	15.0	80	TX 40	14082	50
HUS 8.0 x 180	8.0	180	15.0	80	TX 40	14083	50
HUS 8.0 x 200	8.0	200	15.0	80	TX 40	14084	50
HUS 8.0 x 220	8.0	220	15.0	80	TX 40	14085	50
HUS 8.0 x 240	8.0	240	15.0	80	TX 40	14086	50
HUS 8.0 x 260	8.0	260	15.0	80	TX 40	14087	50
HUS 8.0 x 280	8.0	280	15.0	80	TX 40	14088	50
HUS 8.0 x 300	8.0	300	15.0	80	TX 40	14089	50
HUS 8.0 x 320	8.0	320	15.0	80	TX 40	36344	50
HUS 8.0 x 340	8.0	340	15.0	80	TX 40	36346	50
HUS 8.0 x 360	8.0	360	15.0	80	TX 40	36350	50
HUS 8.0 x 380	8.0	380	15.0	80	TX 40	36351	50
HUS 8.0 x 400	8.0	400	15.0	80	TX 40	36352	50
HUS 10.0 x 120	10.0	120	18.5	80	TX 40	36353	50
HUS 10.0 x 140	10.0	140	18.5	80	TX 40	36358	50
HUS 10.0 x 160	10.0	160	18.5	80	TX 40	36359	50
HUS 10.0 x 180	10.0	180	18.5	80	TX 40	36364	50
HUS 10.0 x 200	10.0	200	18.5	80	TX 40	36368	50
HUS 10.0 x 220	10.0	220	18.5	80	TX 40	36376	50
HUS 10.0 x 240	10.0	240	18.5	80	TX 40	36379	50
HUS 10.0 x 260	10.0	260	18.5	80	TX 40	36385	50
HUS 10.0 x 280	10.0	280	18.5	80	TX 40	36386	50
HUS 10.0 x 300	10.0	300	18.5	80	TX 40	36390	50
HUS 10.0 x 320	10.0	320	18.5	80	TX 40	36391	50
HUS 10.0 x 340	10.0	340	18.5	80	TX 40	36392	50
HUS 10.0 x 360	10.0	360	18.5	80	TX 40	36396	50
HUS 10.0 x 380	10.0	380	18.5	80	TX 40	36397	50
HUS 10.0 x 400	10.0	400	18.5	80	TX 40	36399	50

Strength characteristics

Basic characteristics		Performance		
		[mm]	Threaded part	Unthreaded part
Characteristic yield moment	$M_{y,k}$ [Nmm]	ø 5.0	7,533	13,678
		ø 6.0	14,152	14,152
		ø 8.0	33,244	43,023
		ø 10.0	50,969	84,389
Characteristic pull-out strength – for wood density of 350 kg/m³	$f_{ax,k}$ [N/mm²]	[mm]	Perpendicular to fibres	Parallel to fibres
		ø 5.0	19.00	13.11
		ø 6.0	18.67	12.49
		ø 8.0	15.12	11.77
		ø 10.0	14.16	10.50
Characteristic head pull-through strength – for wood density of 350 kg/m³	$f_{head,k}$ [N/mm²]	ø 5.0	23.09	
		ø 6.0	21.12	
		ø 8.0	24.34	
		ø 10.0	20.46	
Characteristic tensile strength	$f_{tens,k}$ [kN]	ø 5.0	8.66	
		ø 6.0	14.58	
		ø 8.0	23.31	
		ø 10.0	31.48	
Characteristic torsional strength to torsional breaking moment ratio – for wood density of 450 kg/m³		ø 5.0	2.15	
		ø 6.0	3.0	
		ø 8.0	3.90	
		ø 10.0	2.99	

Washer for chipboard screws with steeple head

PHUS 1431



Zn ZINC COATING 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Application

Used together with chipboard screws with steeple heads to improve clamping.

Code and size

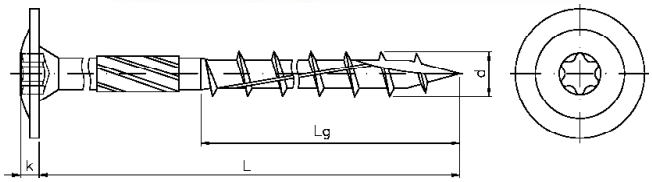
Code and size	D [mm]	d [mm	h [mm	Index	Package [pcs]
PHUS 6	19.5	7.5	4.6	38910	50
PHUS 8	24.5	8.5	5.4	38911	50
PHUS 10	30.0	10.8	6.6	38913	50

MARCOPOL

Structural screws with washer head, partially threaded

CE EN 14592:2008+A1:2012

HUP 3111



Zn ZINC COATING 5 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d [mm]	L [mm]	D [mm]	Lg [mm]	Recesses	Index	Package [pcs]
HUP 6.0 x 80	6.0	80	15	50	TX 30	36431	100
HUP 6.0 x 100	6.0	100	15	50	TX 30	36433	100
HUP 6.0 x 120	6.0	120	15	75	TX 30	38980	100
HUP 6.0 x 140	6.0	140	15	75	TX 30	37198	100
HUP 6.0 x 160	6.0	160	15	75	TX 30	37205	100
HUP 6.0 x 180	6.0	180	15	75	TX 30	37207	100
HUP 6.0 x 200	6.0	200	15	75	TX 30	37209	100
HUP 6.0 x 220	6.0	220	15	75	TX 30	37213	100
HUP 6.0 x 240	6.0	240	15	75	TX 30	37214	100
HUP 6.0 x 260	6.0	260	15	75	TX 30	37225	100
HUP 6.0 x 280	6.0	280	15	75	TX 30	37226	100
HUP 6.0 x 300	6.0	300	15	75	TX 30	37227	100
HUP 8.0 x 80	8.0	80	22	50	TX 40	13096	50
HUP 8.0 x 100	8.0	100	22	50	TX 40	13130	50
HUP 8.0 x 120	8.0	120	22	50	TX 40	13142	50
HUP 8.0 x 140	8.0	140	22	80	TX 40	13145	50
HUP 8.0 x 160	8.0	160	22	80	TX 40	13147	50
HUP 8.0 x 180	8.0	180	22	80	TX 40	13148	50
HUP 8.0 x 200	8.0	200	22	80	TX 40	13171	50
HUP 8.0 x 220	8.0	220	22	100	TX 40	13172	50
HUP 8.0 x 240	8.0	240	22	100	TX 40	13176	50
HUP 8.0 x 260	8.0	260	22	100	TX 40	13177	50
HUP 8.0 x 280	8.0	280	22	100	TX 40	13182	50
HUP 8.0 x 300	8.0	300	22	100	TX 40	13183	50
HUP 8.0 x 320	8.0	320	22	100	TX 40	36400	50
HUP 8.0 x 340	8.0	340	22	100	TX 40	36406	50
HUP 8.0 x 360	8.0	360	22	100	TX 40	36412	50
HUP 8.0 x 380	8.0	380	22	100	TX 40	36413	50
HUP 8.0 x 400	8.0	400	22	100	TX 40	36415	50
HUP 10.0 x 120	10.0	120	25	80	TX 50	13185	50
HUP 10.0 x 140	10.0	140	25	80	TX 50	13188	50
HUP 10.0 x 160	10.0	160	25	80	TX 50	13189	25
HUP 10.0 x 180	10.0	180	25	80	TX 50	13191	25
HUP 10.0 x 200	10.0	200	25	80	TX 50	13192	25
HUP 10.0 x 220	10.0	220	25	100	TX 50	13196	25
HUP 10.0 x 240	10.0	240	25	100	TX 50	13199	25
HUP 10.0 x 260	10.0	260	25	100	TX 50	13201	25
HUP 10.0 x 280	10.0	280	25	100	TX 50	13202	25
HUP 10.0 x 300	10.0	300	25	100	TX 50	13203	25
HUP 10.0 x 320	10.0	320	25	100	TX 50	36417	25
HUP 10.0 x 340	10.0	340	25	100	TX 50	36419	25
HUP 10.0 x 360	10.0	360	25	100	TX 50	36420	25
HUP 10.0 x 380	10.0	380	25	100	TX 50	36426	25
HUP 10.0 x 400	10.0	400	25	100	TX 50	36427	25

Strength characteristics

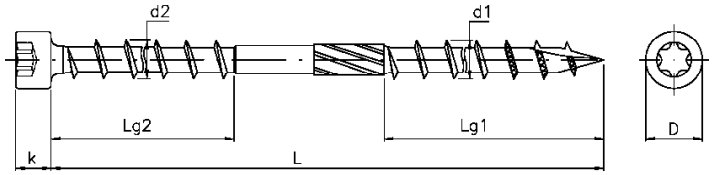
Basic characteristics		Performance		
		[mm]	Threaded part	Unthreaded part
Characteristic yield moment	$M_{y,k}$	ø 6.0	14,152	14,152
		ø 8.0	33,244	43,023
	[Nmm]	ø 10.0	50,969	84,389
Characteristic pull-out strength – for wood density of 350 kg/m³	$f_{ax,k}$	[mm]	Perpendicular to fibres	Parallel to fibres
		ø 6.0	18.67	12.49
	[N/mm2]	ø 8.0	15.12	11.77
		ø 10.0	14.16	10.50
Characteristic head pull-through strength – for wood density of 350 kg/m³	$f_{head,k}$	ø 6.0	30.00	
		ø 8.0	26.46	
	[N/mm2]	ø 10.0	31.24	
Characteristic tensile strength	$f_{tens,k}$	ø 6.0	14.58	
		ø 8.0	23.31	
	[kN]	ø 10.0	31.48	
Characteristic torsional strength to torsional breaking moment ratio – for wood density of 450 kg/m³		ø 6.0	3.0	
		ø 8.0	3.90	
		ø 10.0	2.99	

MARCOPOL

Cylindrical head screws with double thread

CE EN 14592:2008+A1:2012

IUC 3117



Zn ZINC COATING 8 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1=d2 [mm]	L [mm]	D [mm]	Lg1 [mm]	Lg2 [mm]	k [mm]	Recesses	Index	Package [pcs]
IUC 8.0 x 165	8.0	165	11.0	80	60	6.0	TX 40	48671	50
IUC 8.0 x 195	8.0	195	11.0	80	60	6.0	TX 40	48672	50
IUC 8.0 x 225	8.0	225	11.0	100	60	6.0	TX 40	48673	50
IUC 8.0 x 235	8.0	235	11.0	100	60	6.0	TX 40	48674	50
IUC 8.0 x 255	8.0	255	11.0	100	60	6.0	TX 40	48675	50
IUC 8.0 x 275	8.0	275	11.0	100	60	6.0	TX 40	48676	50
IUC 8.0 x 302	8.0	302	11.0	100	60	6.0	TX 40	48677	50
IUC 8.0 x 335	8.0	335	11.0	100	60	6.0	TX 40	48678	50
IUC 8.0 x 365	8.0	365	11.0	100	60	6.0	TX 40	48679	50
IUC 8.0 x 400	8.0	400	11.0	100	60	6.0	TX 40	48680	50
IUC 8.0 x 435	8.0	435	11.0	100	60	6.0	TX 40	48681	50
IUC 8.0 x 472	8.0	472	11.0	100	60	6.0	TX 40	48682	50
IUC 8.0 x 535	8.0	535	11.0	100	60	6.0	TX 40	48683	50

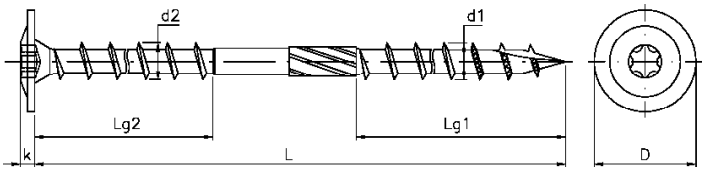
Strength characteristics

Basic characteristics		Performance		
		[mm]	Threaded part	Unthreaded part
Characteristic yield moment	$M_{y,k}$ [Nmm]	ø 8.0	28,850	45,014
		[mm]	Perpendicular to fibres	Parallel to fibres
Characteristic head pull-through strength for wood density of 370 kg/m³ [waxed screws]	$f_{ax,k}$ [N/mm2]	ø 8.0	14.05	10.10
Characteristic pull-out strength for wood density of 480 kg/m³	$f_{head,k}$ [N/mm2]	ø 8.0	44.21	
Characteristic tensile strength	$f_{tens,k}$ [kN]	ø 8.0	27.03	
Characteristic torsional strength to torsional breaking moment ratio – for wood density of 450 kg/m³		ø 8.0	5.29	

Washer head screws with double thread

EN 14592:2008+A1:2012

IUP 3116



Zn ZINC COATING 8 µm

A detailed description of symbols used in the catalogue can be found on pages 12–15

Code and size

Code and size	d1=d2 [mm]	L [mm]	D [mm]	Lg1 [mm]	Lg2 [mm]	Recesses	Index	Package [pcs]
IUP 8.0 x 165	8.0	165	22.0	80	60	TX 40	48684	50
IUP 8.0 x 195	8.0	195	22.0	80	60	TX 40	48685	50
IUP 8.0 x 225	8.0	225	22.0	100	60	TX 40	48686	50
IUP 8.0 x 235	8.0	235	22.0	100	60	TX 40	48688	50
IUP 8.0 x 255	8.0	255	22.0	100	60	TX 40	48689	50
IUP 8.0 x 275	8.0	275	22.0	100	60	TX 40	48690	50
IUP 8.0 x 302	8.0	302	22.0	100	60	TX 40	48691	50
IUP 8.0 x 335	8.0	335	22.0	100	60	TX 40	48692	50
IUP 8.0 x 365	8.0	365	22.0	100	60	TX 40	48693	50
IUP 8.0 x 400	8.0	400	22.0	100	60	TX 40	48694	50
IUP 8.0 x 435	8.0	435	22.0	100	60	TX 40	48695	50
IUP 8.0 x 472	8.0	472	22.0	100	60	TX 40	48696	50
IUP 8.0 x 535	8.0	535	22.0	100	60	TX 40	48697	50

Strength characteristics

Basic characteristics		Performance		
		[mm]	Threaded part	Unthreaded part
Characteristic yield moment	$M_{y,k}$ [Nmm]	ø 8.0	28,850	45,014
		[mm]	Perpendicular to fibres	Parallel to fibres
Characteristic head pull-through strength for wood density of 370 kg/m³ [waxed screws]	$f_{ax,k}$ [N/mm²]	ø 8.0	14.05	10.10
Characteristic pull-out strength for wood density of 480 kg/m³	$f_{head,k}$ [N/mm²]	ø 8.0	25.12	
Characteristic tensile strength	$f_{tens,k}$ [kN]	ø 8.0	27.03	
Characteristic torsional strength to torsional breaking moment ratio – for wood density of 450 kg/m³		ø 8.0	5.29	

Sealing and filling joints, gaps and ducts

Section 9

Construction chemicals

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Standard polyurethane foams

AT-15-5723/2016

5801

Standard polyurethane foams are characterised by excellent expandability and insulating properties upon curing. They adhere perfectly to most construction materials and substrates. Curing occurs by absorbing moisture from air. In dry environments and lower temperatures with low humidity, moisture should be introduced into the gap. A cured foam is not resistant to UV radiation. It must therefore be protected against such.

Designation

Type	Operating temperature	Capacity [ml]	Index	Packaging [pcs]
Summer formula	+5°C/+30°C	750	39390	12
Winter formula	-10°C/+30°C	750	9053	12

Application

Polyurethane foams are used for the sealing and filling of cracks, gaps and pipe ducts in wall barriers. They can be used for filling gaps in wall and floor joints and for sound-insulation of partition walls in frame constructions. Due to their great adhesion to most foundations and excellent insulating properties, they are widely used in thermal insulation works. They are used for filling gaps and cracks in external wall insulation layers. They fill cavities and air gaps. Upon curing, they form a uniform base for an adhesive layer and reinforcement mesh along with polystyrene foam.

Technical specifications

Initial curing time	30–40 min
Full curing time	24 h
Thermal resistance (upon curing)	-50°C/+90°C
Storage temperature	+5°C/+35°C
Efficiency	up to 45 l (depending on temperature and humidity)

Mega polyurethane foams

AT-15-5723/2016

5836

Standard polyurethane foams are characterised by excellent expandability and insulating properties upon curing. They adhere perfectly to most construction materials and foundations. Curing occurs by absorbing moisture from air. In dry environments and lower temperatures with low humidity, moisture should be introduced into the gap. A cured foam is not resistant to UV radiation. It must therefore be protected against such.

Designation

Type	Operating temperature	Capacity [ml]	Index	Packaging [pcs]
Summer formula	+5°C/+30°C	840	39391	12
Winter formula	-10°C/+30°C	840	9056	12

Application

Polyurethane foams are used for the sealing and filling of cracks, gaps and pipe ducts in wall barriers. They can be used for filling gaps in wall and floor joints and for sound-insulation of partition walls in frame constructions. Due to their great adhesion to most foundations and excellent insulating properties, they are widely used in thermal insulation works. They are used for filling gaps and cracks in external wall insulation layers. They fill cavities and air gaps. Upon curing, they form a uniform base for an adhesive layer and reinforcement mesh along with polystyrene foam.

Technical specifications

Initial curing time	30–40 min
Full curing time	24 h
Thermal resistance (upon curing)	-50°C/+90°C
Storage temperature	+5°C/+35°C
Efficiency	up to 65 l (depending on temperature and humidity)

Low-expansion polyurethane foams

AT-15-5723/2016

5802

Low-expansion polyurethane foams have a special formula that guarantees a low level of expansion. They are characterised by excellent adhesion to most construction substrates such as concrete, aerated concrete, bricks, structural clay tiles, calcium-silicate bricks, wood, PVC, steel and aluminium.

Designation

Type	Operating temperature	Capacity [ml]	Index	Packaging [pcs]
Summer formula	+5°C/+30°C	750	10256	12
Winter formula	-10°C/+30°C	750	9057	12

Application

Low-expansion foams are mainly intended for sealing the edges of installation gaps during woodwork installation. A low level of expansion guarantees effective filling of installation gaps, which in turn, lowers the risk of damaging window and door frames. It is suitable for filling gaps during installation of MDF, PVC, wooden and aluminium frames. The foam can also be used for filling and sound-insulation of sills, stair steps, installation boxes and cable ducts.

Technical specifications

Initial curing time	45 min
Full curing time	24 h
Thermal resistance (upon curing)	-50°C/+90°C
Storage temperature	+5°C/+35°C
Efficiency	Up to 45 l (depending on temperature and humidity)

B1 fireproof polyurethane foam

CE ETA-13/1075
ETA-13/1076

5834

The B1 fireproof polyurethane foam has a technologically advanced low-expansion formula that makes it suitable for filling gaps during installation of joinery projects in fire-rated wall barriers. The foam is used for sealing 0–40 mm wide installation gaps with a maximum fire resistance rating of EI 60, 0–20 mm wide installation gaps with a fire resistance rating of EI 90 and 0–10 mm wide gaps with fire resistance rating of EI 120. The product is rated to Bs1, i.e. it is non-flammable and fire retardant.

Designation

Type	Colour	Operating temperature	Capacity [ml]	Index	Packaging [pcs]
B1	Light red	+5°C/+30°C	750	93717	12

Application

The foam is used for filling gaps during installation of joinery projects in fire-rated wall barriers. It can also be used for filling wall gaps and ducts (with the exception of fire-rated ducts) in accordance with certain requirements regarding gap widths set out in the requisite technical approvals. Before carrying out work, the requirements on duct rating included in any design documentation should be considered.

Fire rating of gaps filled with B1 foam

Fire rating for the filling	Vertically-oriented filling	Movement capacity	Seals made on site	Minimum fire-rated barrier thickness, A2 [mm]	Gap width range [mm]
EI 15	V	No	Yes	100	0.0 ≤ W ≤ 40.0
EI 20	V	No	Yes	100	0.0 ≤ W ≤ 20.0
EI 45	V	No	Yes	100	0.0 ≤ W ≤ 10.0
EI 45	V	No	Yes	200	0.0 ≤ W ≤ 20.0
EI 60	V	No	Yes	200	0.0 ≤ W ≤ 40.0
EI 90	V	No	Yes	200	0.0 ≤ W ≤ 20.0
EI 120	V	No	Yes	200	0.0 ≤ W ≤ 10.0

Technical specifications

Full curing time	24 h
Thermal resistance (upon curing)	-40°C/+80°C
Storage temperature	+5°C/+30°C
Fire performance class	Bs-1
Efficiency	Up to 45 l (depending on temperature and humidity)

Flexi polyurethane foam

AT-15-5723/2016

5833

HIGHLY FLEXIBLE

DOES NOT CRUMBLE IN LOW TEMPERATURES

LOW LEVEL OF EXPANSION

HIGH THERMAL AND ACOUSTIC INSULATION

DOES NOT DAMAGE WINDOW FRAMES

The Flexi polyurethane foam has a formula that was created specifically for the filling and sealing of elements subject to elastic deformation. The foam maintains full flexibility and unchanged internal structure when facing size deformation up to 40%. Standard foams maintain flexibility at a maximum level 10%.

Designation

Type	Operating temperature	Capacity [ml]	Index	Packaging [pcs]
Flexi	+5°C/+30°C	750	93720	12

Application

The foam is designed for filling gaps around the perimeter when installing joinery projects subject to high daily temperatures, humidity fluctuations or elastic deformation of installation openings, particularly in wooden frame constructions. It may be used for sealing and the sound-insulation of stair steps and stud walls subject to vibrations. It perfectly seals installation ducts, particularly in installations subject to vibrations, e.g. ventilation systems.

Technical specifications

Initial curing time	45 min
Full curing time	24 h
Thermal resistance (upon curing)	-50°C/+90°C
Storage temperature	+5°C/+35°C
Efficiency	Up to 45 l (depending on temperature and humidity)

Thermo-Fix polystyrene adhesive

ITB-KOT-2018/0531

5803 / 5826

EASY APPLICATION

EXCELLENT ADHESION

HIGH THERMAL AND ACOUSTIC INSULATION

SHORT CURING TI MEDZIANIA

Thermo-Fix is a one-component polyurethane adhesive designed for fixing heat-insulation cladding to wall barrier surfaces. It is an excellent product, mainly used for fixing EPS and XPS panels as part of thermal insulation works during the thermal renovation of buildings. The Thermo-Fix adhesive can also be used for fixing EPS and XPS panels that form perimeter thermal insulation systems to foundations covered with asphalt-based damp-proof materials. The product is also available with a special formula created for fixing graphite polystyrene boards. Polyurethane adhesives are easy to use. Individual sheets should be fixed at the edge by first applying a strip of adhesive along the edges and maintaining a distance of 2 cm and then a strip of adhesive running through the centre of the sheet. In the case of the foundation perimeter, insulation panels should be fixed by applying at least four equally spaced vertical strips of adhesive of approximately 3 cm in width. The use of polyurethane adhesives considerably decreases the amount of labour and increases the rate at which thermal insulation panels can be installed.

Designation

Colour	Capacity [ml]	Index	Packaging [pcs]
Light yellow	750	49741	12
Graphite	750	87855	12
Light yellow XXL – NEW	850	641632	12

Application

Thermo-Fix is designed for fixing EPS and XPS panels to concrete, ceramic, silicate, aerated concrete and cellular concrete construction substrates during thermal insulation works. The adhesive may also be used for fixing EPS and XPS panels that form perimeter thermal insulation systems to foundations covered with asphalt-based damp-proof materials.

Technical specifications

Operating temperature	-5°C/+30°C
Studding	After approx. 2 h
Correction time	Approx. 10 min (at +23°C / RH 50%)
Storage temperature	+5°C/+35°C
Thermal resistance	-50°C/+90°C

Thermo-Fast polyurethane mortar

AT-15-9562/2015

5825

EASY APPLICATION

THIN-LAYER BOND

SHORT CURING TI MEDZA NIA

HIGH YIELD

Thermo-Fast is a one-component polyurethane mix with a special formula that provides the benefits of both low-expansion foams and polyurethane adhesives. It easily bonds load-bearing and partition walls erected with vertically cored structural clay tiles, cellular concrete blocks and vertically cored tongue and groove silicate blocks. It makes it possible to quickly and easily create thin joints in load-bearing and partition walls. Joints in load-bearing walls, built using Thermo-Fast, should consist of two parallel strips of the mix. One strip may be used when erecting the partition walls. Block surfaces should be dampened before applying strips of material.

Application

Thin horizontal joints in load-bearing and partition walls erected with vertically cored, ground structural clay tiles, vertically cored silicate blocks and structural clay tiles made of autoclaved aerated concrete. It is designed specifically to be used when erecting internal partition walls. The product is easy to use. It makes it possible to quickly erect successive wall layers while entirely eliminating wet processes. Walls erected with Thermo-Fast mortar for thin joints may be finished immediately, which considerably accelerates the finishing work.

Designation

Colour	Capacity [ml]	Index	Packaging [pcs]
Light grey	750	59920	12

Technical specifications

Operating temperature	-5°C/+30°C
Skin forming time	5–12 min (at +23°C / RH 50%)
Full curing time	24 h (at +23°C / RH 50%)
Storage temperature	+5°C/+35°C

Thermo-Roof flat roofing adhesive

ITB-KOT-2018/0532

5827

EASY APPLICATION

EXCELLENT ADHESION

HIGH THERMAL AND ACOUSTIC INSULATION

SHORT CURING TI MEDIUM

HIGH YIELD

A low-expansion, one-component polyurethane adhesive designed for fixing thermal insulation when insulating a flat roof.

Application

The Thermo-Roof polyurethane adhesive is used for fixing XPS and EPS panels when insulating a flat roof with galvanized sheet or roofing paper. The adhesive may be used for fixing panels and other EPS and XPS elements to substrates made of concrete, clay bricks, wood, oriented strand boards, steel galvanized sheets or polyester coated sheets. After 2 hours, the initial curing is complete and studding work can be resumed. The polyurethane joint is considered fully cured after 24 hours.

Designation

Colour	Capacity [ml]	Index	Packaging [pcs]
Brown	750	25942	12

Technical specifications

Ambient temperature	-5°C/+30°C
Full curing time	24 h
Skin forming time	4 min
Storage temperature	+5°C/+35°C
Studding after approx. 2 h.	

Foam cleaner with grease

5814

EASY APPLICATION

A state-of-the-art, multicomponent aerosol created for professional use. The new formula guarantees excellent cleaning performance. It cleans surfaces contaminated with fresh foams and polyurethane adhesives. In addition, it lubricates and preserves mechanical parts in guns and dosing devices, extending their service life.

Designation

Capacity [ml]	Operating temperature	Storage temperature	Index	Packaging [pcs]
500	-5°C/+35°C	-5°C/+35°C	79129	12

Application

The product is recommended for polishing and maintaining fixing and sealing foam guns.

Standard foam cleaner

5804

EASY APPLICATION

An acetone solvent used for cleaning uncured polyurethane foams. It is excellent for degreasing steel surfaces before the use of silicone and polyurethane products. A mixture of propane and butane that does not contribute to ozone depletion is used as a pre-fill gas.

Designation

Capacity [ml]	Operating temperature	Storage temperature	Index	Packaging [pcs]
500	0°C/+30°C	-5°C/+25°C	8954	12

Application

It is mainly recommended for cleaning fixing and sealing foam guns.

Disclaimer

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POLAND
Marcopol Sp. z o.o.
Chwaszczyno
Oliwska 100 Street
80-209 Chwaszczyno
Tel.: **+48 58 55 40 410**
Fax: **+48 58 55 40 419**
export@marcopol.eu
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LITHUANIA
UAB Marcopol Baltija
Vilnius
Pirklių g.5
LT-02300 Vilnius, Lietuva
Tel.: +370 52 306 183
Fax: +370 52 137 184
baltija@marcopol.lt

Kaunas
Draugystės 13A
LT-51224 Kaunas, Lietuva
Tel.: +370 37 280 832
Fax: +370 52 137 184
kaunas@marcopolbaltija.lt

Klaipėda
Mainų g. 8 / Šilutės plentas 79
LT-94101 Klaipėda, Lietuva
Tel.: +370 46 470 413
Mob.: +370 602 19 601
Fax: +370 52 137 184
klaipeda@marcopolbaltija.lt

Šiauliai
Metalistų g. 6h
LT-78107 Šiauliai, Lietuva
Tel.: +370 41 201 212
Fax: +370 52 137 184
siauliai@marcopolbaltija.lt

FINLAND
Marcopol Finland OY
Lehtotie 10
62940 Hoisko, Finland
Tel.: +358 103 195 100
myynti@marcopol.fi

RUSSIA
ООО Маркопол КЛД Трейдинг
Россия
г. Калининград
Ул. Гагарина 239
Тел.: +7 (4012) 51 50 35
Моб. тел. +7 962 260 1940
kaliningrad@marcopol.ru

ESTONIA
Marcopol Estonia OÜ
Sepa 15G
50113 Tartu, Eesti
Tel.: +372 7401 410
Fax: +372 7401 411
Mob.: +372 5097 923
estonia@marcopol.ee

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