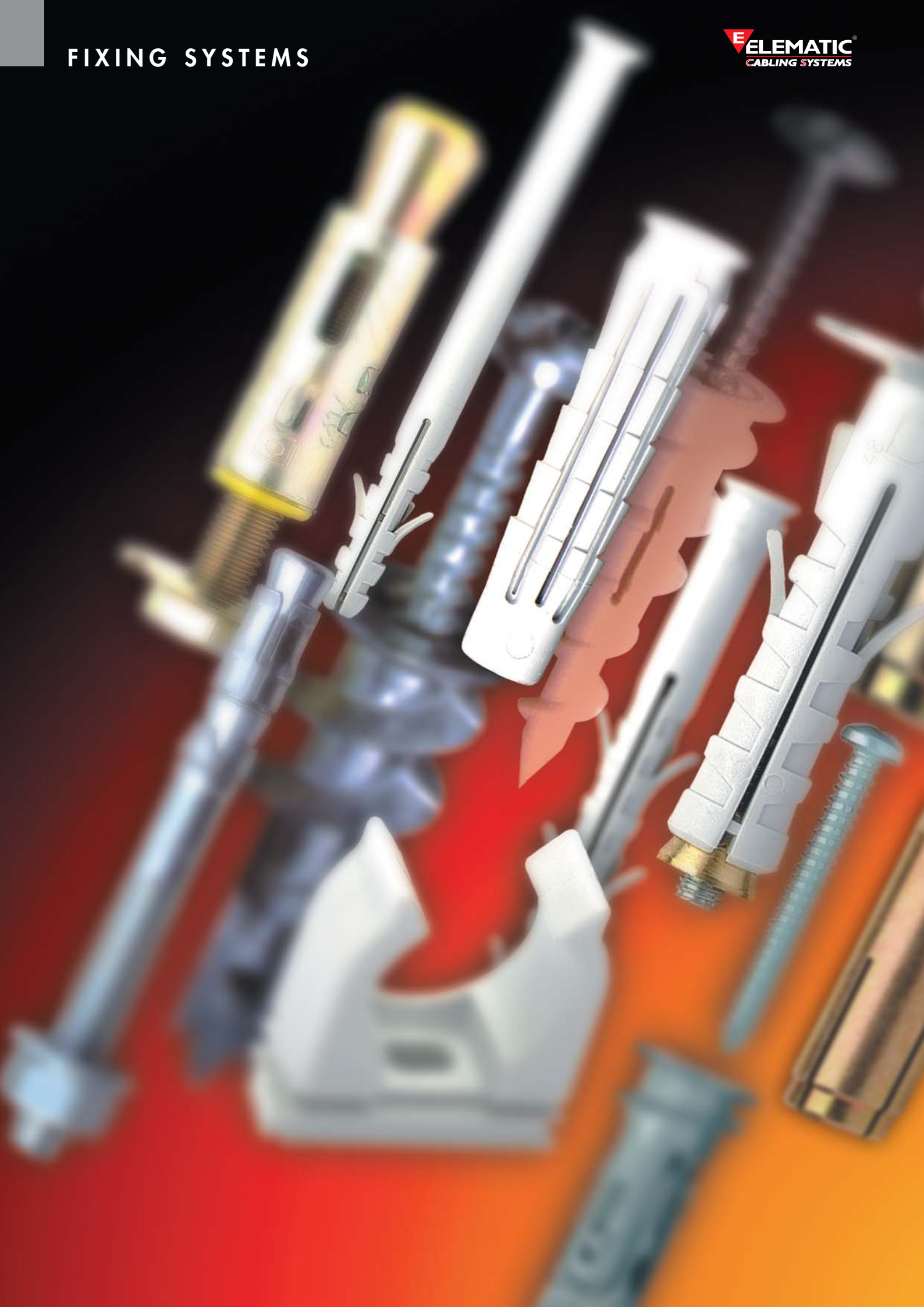
FIXING SYSTEMS

ELEMATIC
CABLING SYSTEMS



Quality and innovation!

Elematic Cabling Systems offers to the market a complete range of fixing systems: light-duty anchors, heavy-duty anchors and chemical fixings, suitable for several kinds of electrical applications.

FIXING SYSTEMS

Introduction

In order to choose the right anchor it is necessary to have at disposal a very large range of information. Only in this way, in fact, it is possible to reach its perfect dimensioning as well as to perform the best and safest installation especially under critical circumstances.
Here therefore the most important parameters for the choice of the most suitable fixing element:

1. the building materials
2. the drilling method
3. the installation
4. the type of load
5. the type of failure
6. the type of operation
7. the type of application
8. cracked concrete and corrosion
9. approvals
10. terminology

1 - Building material

1.1 Concrete

It is the most common building material used in new or recent constructions. It is obtained by a semi-solid mixture made of sand and aggregate (gravel), cement (as binder), water and eventual suitable additives, being all casted in formwork. The ripeness of this compost, complete in 28 days from the day of the casting, gives as result a type of substrate characterized by high homogeneity and excellent compressive strength. Concrete is classified in proportion to this value, called *fck*.
The mentioned high compressive strength is nevertheless contrasted by a relative low tensile strength. For this purpose bars of steel are added to the concrete casting. In consequence of that the material is called reinforced concrete.
Furthermore, concrete varies as per the way it is manufactured:

- Casted in formwork: obtained directly at job site;
- Pre-fabricated concrete: manufactured in workshop and subsequently assembled at building yard, what gives good homogeneity, best superficial finish and, in general, high compressive strength.
- Pre-stressed concrete: with beams or pillars longitudinally reinforced with bars in pre-stressed steel for the best elastic return - able therefore to stand high loads with low deformations. The resistance of the pre-stressed concrete is generally very high and in accordance with the class C40/50 or superior.

As a rule, the higher the compressive strength of the concrete is, the more favourable is the performance of the fixing, whether with resin bonded or with heavy duty anchors.

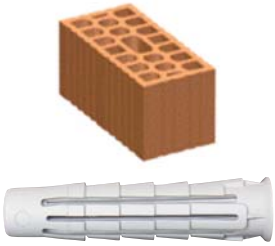
Class	Characteristic strength f_{ck}	
	Cylinder 16x32 cm	Cube 15x15x15 cm
C 16/20	16 Mpa	20 Mpa
C 20/25	20 Mpa	25 Mpa
C 25/30	25 Mpa	30 Mpa
C 30/37	30 Mpa	37 Mpa
C 35/45	35 Mpa	45 Mpa
C 40/50	40 Mpa	50 Mpa
C 45/55	45 Mpa	55 Mpa
C 50/60	50 Mpa	60 Mpa

Fig. 1 subdivision of concrete as per the International standard EN206-1

LE: Medium-heavy duty anchor for concrete or solid bricks

1.2 Solid bricks

They are in different dimensions and shapes, obtained from a paste of clay undergoing cooking. They are commonly used for the construction of bearing brickwork or of curtain walls and may be considerated as solid blocks with up to 15% hole surfaces. The compressive strength of the brickwork is mostly lower in comparison to concrete. The resin bonded anchors, used with wired sleeve in case of partially perforated material and the heavy duty anchors with sleeve for a great expansion or the plastic light duty anchors are the most suitable fixing solutions for this kind of material.



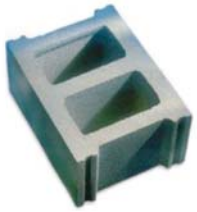
TPF4: General fixings for perforated bricks and blocks

1.3 Hollow bricks

Per dimensions and shapes similar to the previous ones, but provided with cavities (percentage of holes up to 70-75%). They are commonly used for the construction of dividing brickwork or of curtain walls. The resin bonded anchors with wired sleeve are highly recommended for applications in this kind of brick. The choice of heavy duty anchors should be limited to the ones with sleeve able to perform a big expansion force, taking care not to exaggerate with the clamping, because exaggerate expansions could cause cracks seriously compromising the fixing. Among the plastic light duty anchors, products performing undercut anchoring should be preferred. The optimum resistance refers to the point of crack of the substrate.

1.4 Lightened bricks

Characterized by the presence in their paste of light aggregates and of very many pores as well as by a vertically perforated structure. Because of their reduced weight and of properties as soundproofing and thermal insulation they are mostly used for the construction of dividing brickwork or of curtain walls. The choice of light duty anchors with a large expansion surface, of resin bonded anchors or of fixings with a form locking grip is recommended for this type of brick.

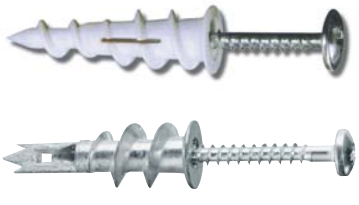


1.5 Hollow blocks

They are manufactured in cementation agglomerates. The thickness of the wall brick is of few centimetres and as they are completely hollow, they grant a good thermal and sound insulation linked to a good mechanical resistance. The choice of resin bonded anchors with wired sleeve or of heavy duty anchors with a large expansion surface is recommended for this kind of substrate, taking particular care not to exceed with the clamping, as exaggerate expansions could cause cracked areas seriously compromising the fixing. Among the plastic light duty anchors, fixings with a form locking grip should be preferred.

1.6 Bricks and elements in cellular concrete

The cellular concrete is made of an additivated paste creating elements of porous and friable consistence. Because of its reduced weight and excellent properties of thermal and sound insulation it is used for the quick construction of both not bearing parametric or dividing brickwork. It has a relative low compressive strength. In case of light loads it is advised to use self drilling anchors for friable materials. In case of heavy loads it is possible to use resin bonded anchors.



DRIVA: General fixings for plasterboard panels or cellular concrete

1.7 Plasterboards panels

These are obtained by coupling layers of paper to a paste made of pressed gypsum. The so called "dry walls" are mostly used in buildings destined to offices or in industrial constructions. But their quick shaping and setting together with their good insulating properties are making them largely used also in buildings destined to habitation. Frequent is also the use of this kind of material for the creation of false ceilings. Walls are composed of a metallic framework on which, on both sides, panels are fixed. Insulating materials are usually set in the hollow space among the layers.
The thickness of every single panel varies from 10 to 13 cm. Sometimes, for a better insulation, walls are composed of two, even three panels. Our solution for this applications is the complete DRIVA RANGE.

2 - Drilling method

In order to get the maximum performance from the anchor, it is fundamental to be able to realize in the best possible way the hole containing the fixing element. For this reason, for getting the right coupling anchor-hole, it is necessary to choose the right diameter of the drill bit, taking particular care to what advised in this catalogue. The typical drawback to face is usually an ovalized drilling, resulting from the use of an old bit or of a bit rotating outside the axis.
A short explanation of the different drilling methods according to the different types of installations is therefore useful:

- Rotary drilling: Using an hammer with rotary drill bit. Suitable in bricks or in materials with low strength. The absence of hammering action avoids damaging the substrate.

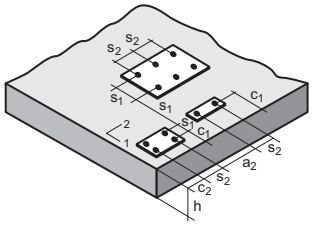


Fig. 2: Representation of s and c as per ETAG 001

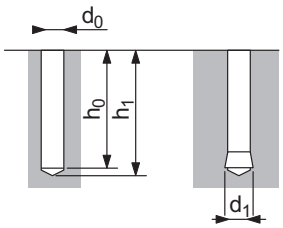
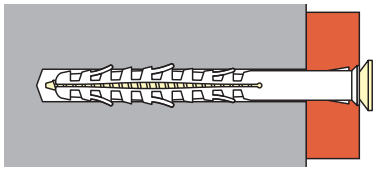


Fig. 3: Representation of the drilling characteristics as per ETAG 001



- Impact drilling: Using an hammer with a drill bit able to perform rotation and a large number of light impacts. Very efficient in all not reinforced materials.

- Hammer drilling: Using an hammer whose drill bit is able to perform short rotations together with a large number of hard impacts. Ideal for concrete and materials with high strength.

- Diamond drilling: Using a core diamond drill bit cutting the material (dry or wet drilling). Suitable for the production of a large drill-hole diameter or where metal reinforcement is encountered.

3 - Assembly and Installation

3.1 Anchor spacing and edge distance

In order to get the total load transmission from the fixing element to the substrate, therefore the total resistance, it is necessary to observe norms coming from international regulations and referring to the critical distances of installations. These are called as follows:

- s : distance between two anchors in group;
- c : distance between the anchor and the edge of the substrate.

Anchors must be set by observing the following relations:

- $s \geq s_{cr}$ and never $s \leq s_{min}$
- $c \geq c_{cr}$ and never $c \leq c_{min}$

where s_{cr} (c_{cr}) is the characteristic distance and s_{min} (c_{min}) the minimum distance.

In general the characteristic distances are in accordance with the anchorage depth called h_{ef} and the relation of well design described as $s_{cr} = 2 \text{ x} c_{cr} = 3 \text{ x} h_{ef}$ is the valid one. In case of applications with values lower than the characteristic ones, the decrease of the values of the anchor resistance through due corrective coefficients is necessary.

3.2 Drill-hole cleaning

After having drilled and before going ahead with the installation, the dust remained in the drill hole must be removed as its presence reduces largely the holding values both in case of use of heavy duty anchors (risk of friction decrease) or of resin bonded anchors (decrease of the resin power). It's necessary cleaning the hole after drilling with suitable brush.

3.3 Drill-hole depth

The drill-hole depth h_0 is the depth of the hole and as a general rule it should be larger than the effective anchorage depth h_{ef} so as to prevent the presence of any drilling dust in the hole or the eventual screw emerging from the plug tip. If on the one hand a limited drill-hole depth can simplify the installation thanks to a quicker operation or a smaller possibility to encounter reinforcements, on the other hand the fixing holding value increases with the increase of h_{ef} and therefore of h_0.

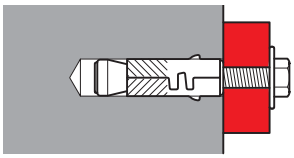
3.4 Thickness of the anchoring substrate

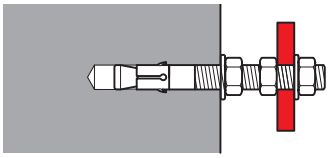
If not better specified and especially in case of use of heavy duty expanding anchors, the thickness of the anchoring substrate should be approximately alike of or two times larger than the anchorage depth, therefore $h_{\min} \geq 2h_{ef}$. The installation of medium heavy fixings or of heavy duty anchors in substrates with a thickness less than 100 mm is generally not suggested, except in presence of specific valuations or preparatory tests advising the contrary.

3.5 Installation types

In order to select an anchor combining functionality with convenience and quickness, three different installation types have to be considered:

- Through fixings: The anchor can be fixed in the substrate through the object you are connecting if this is located in the definitive position. The drill-hole can be made through the object being connected without moving it. The diameter of the object's hole is very important: it must not be too small so as to obstruct the anchor going through or too large to require the use of washers for achieving the proper blocking.





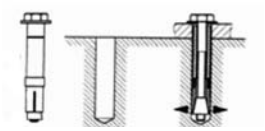
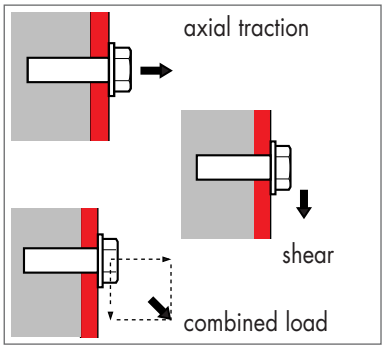


fig. 6: ancorante a controllo di coppia

Fig. 4: Load types



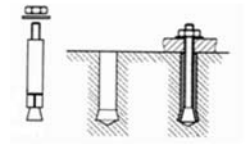


fig. 8: ancorante ad accoppiamento di forma

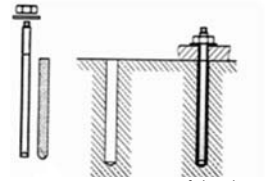


Fig. 5: Representation of the device used for strength tests on anchors

- Non through fixings: In this case the drilling and the inserting of the anchor are made before the positioning of the object to be connected. The hole diameter in the substrate is larger than that of the installation hole of the object to be connected. Hammer-in anchors for concrete are ideal for that.

- Spaced installation: The object to be connected is not adherent with the substrate, but it is fixed at a certain distance away from the anchoring surface. The anchor undergoes in this case significant bending forces. Metal anchors with an internal metric thread, anchors with expanded threads, or in general anchors made in steel with high strength (class 6.8 or 8.8) are therefore recommended for that.

4 - Types of load

In general, the action on the anchor (Fsk) can be of two types:

- Static or quasi static force: including for ex. the dead load of the element fixed (permanent load) or the forces coming from atmospheric disturbances as wind or snow (variable load);

- Dynamic force: referring to actions variable in time with medium or high amplitude as for ex. motor vibrations or regular shocks.

The force F_{Sk} acting on the anchor is also classified according to the direction it takes, therefore as

- normal load or axial traction (N_{Sk}): acts in a direction which is parallel to the longitudinal axe of the anchor with action angle $0° \leq \alpha \leq 30°$;

- shear load (V_{Sk}): acts in a direction which is perpendicular to the longitudinal axe of the anchor with action angle $60° \leq \alpha \leq 90°$;

- combined load (oblique traction): combination of axial traction and shearing force $30° \leq \alpha \leq 60°$;

- Bending moment (M_{Sk}): moment originated by a shearing force obtained through a precise lever arm and generating bending;

- Torsion moment ($M_{T,Sk}$): moment originated by a shearing force generating a torque.

5 - Breakages and design

5.1 Introduction

The design of every anchor is based on the basic knowledge about the fixing technology as well as on the current experience applied to the product. The development is constantly encouraged by strength tests made both in laboratories or in selected yards. Every product is also characterized by a program of tests finalized to understand the resistance of the anchor in comparison to the different types of loads or the different substrates that could be used. The picture on the left shows the device used for the tests on the axial traction of the anchors. The performance of tests allows furthermore the creation of a complete experience around the behaviour of the anchor under different conditions.
Every test permits to achieve what follows:

- the registration of the curve of load or displacement: it shows the course of displacement or slipping out of the anchor in concomitance with the gradual increase of the load applied;
- the registration of the way in which a failure occurs;
- the minimum thickness of the substrate;
- the definition of the characteristic distances for the installation;
- the parameters of resistance of the anchor, as

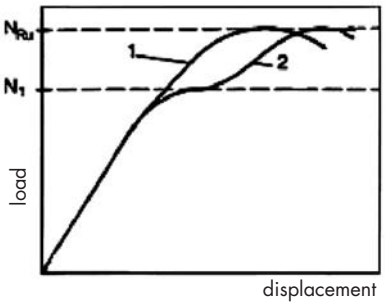


Fig. 6 load-displacement curve
case 1: regular
case 2: not regular

1 Mean ultimate load - $F^t_{Ru,m}$ ($N^t_{Ru,m}$; $V^t_{Ru,m}$): average value of the ultimate load according to axial traction or to shear or, in other words, the average value of the load connected with the failure of the anchor, got through a sequence of at least $n = 5$ tests.
2 Characteristic resistance F_{Rk}: 5% of the mean ultimate resistance calculated as $F^t_{Rk} = F^t_{Ru,m} \times (1 - k_s v)$
3 Design resistance F_{Rd}: it is obtained by dividing the characteristic resistance by the partial safety factor of the material Ym, described as γ_M ovvero $F_{Rd} = F^t_{Rk}/\gamma_M$. The value of the partial safety factor of the material is reported in the international standards and varies according to the type of failure, reaching the maximum value of 2,5.
4 Recommended load F_{rec} : it is obtained by dividing the design resistance by the partial safety factor of the applied load γ_F, described as $F_{rec} = F_{Rd}/\gamma_F$ with the typical value of the partial safety factor equal to1,4.

In the present catalogue it was decided to get the value of the recommended load directly from the mean ultimate load through a global safety factor $\gamma = 5$, the formula $F_{rec} = F^t_{Ru,m}/\gamma$ is therefore valid.

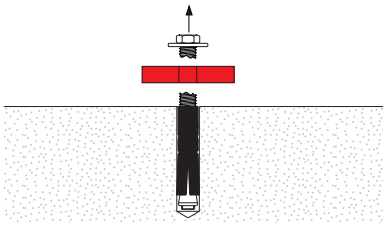
Please find now hereby in detail different kinds of tests made on various fixings together with the description of the typical kinds of failure that may occur.

5.2 Tension test

It provides for the application of an increasing load, going in axial direction in comparison to the anchor, until this fails.

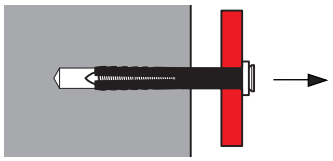
Such a failure might occur because of the following reasons:

- The steel failure: this breakage is due to a failure per traction of the body of the anchor what can generally happen in substrates characterized by high strength, as for example in stones, especially if these are reinforced with bars.



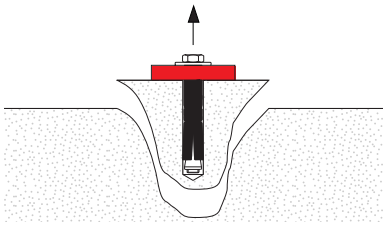
The steel failure

- Pull out failure: the anchor slips out from the drill-hole without the breakage of the substrate. This can be the result of applications with plastic anchors, but also with metal anchors in case these are fixed in substrates with low strength, especially if reinforced with bars.



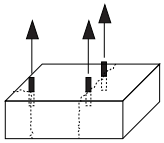
Pull out failure

- The concrete cone failure: the substrate breaks because of an excessive load being transferred by the anchor. The cone-shaped piece of concrete positioned around the anchor comes off from the rest of the base material. This can occur in not reinforced concrete or in concrete with low strength especially when using resin bonded anchors or fixings in steel for heavy loads. It is moreover greatly encouraged in case the anchor is fixed very close to the support's free edges or if it is part of a group of anchors located too close one to each other.



The concrete edge failure

- The splitting failure: the failure is due to the clear crack of the substrate. It can occur when the embedment depth is too short.



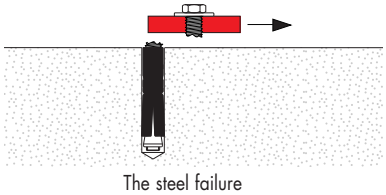
The splitting failure

5.3 Shear test

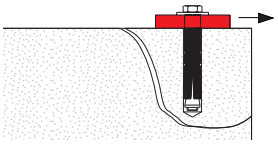
It provides for the application of an increasing load, going in perpendicular direction in comparison to the anchor, until this fails.

Such a failure might typically occur because of the following reasons:

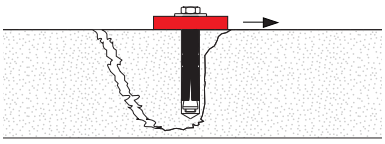
- The steel failure: this breakage is due to a failure of the body of the anchor what can generally occur in substrates characterized by high strength (for example stones), especially if these are reinforced with bars. This type of failure is much more probable as larger is the fixing depth of the anchor. As its resistance corresponds to the specific resistance of the used steel.



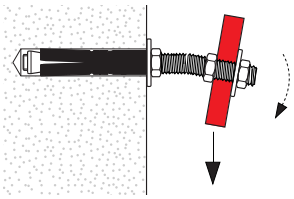
The steel failure



The concrete edge failure



Failure with lever arm



Bending tests

- The concrete edge failure: typical failure because of anchors fixed close or excessively close to the support's free edge. It occurs when the shearing force goes in a perpendicular way in comparison to this area and is encouraged by substrates with low strength or without reinforcement.

- Failure with lever arm: the substrate cracks because of the lever arm effect produced by the load application. This generally occurs in substrates with low strength or without reinforcement by using fixings in steel and for high resistances. It is much more probable as smaller is the fixing depth of the anchor.

5.4 Combined tension and shear test

It provides for the application of a load coming from two sources, the combination of the axial traction with the shearing force. The typology of failures that might occur is similar to the one occurring with the tension tests.

5.5 Bending tests

It provides for the application of a load as per the shear test, which is nevertheless far away from the surface of the substrate. The anchor failure occurs when the maximum admissible bending point is over and shows consequently the total yielding or bending of the external portion of the anchor.

5.6 Check

In general, the following formula about the acting force and the recommended load has to be checked by every applications:

$$F_{Sk} \leq F_{rec}$$

Considering then the type of external force acting on the fixing system, the check provides for what follows:

Axial traction: $N_{Sk} \leq N_{rec}$

Shear: $V_{Sk} \leq V_{rec}$

Combined load: $(\beta_N)^{\alpha} + (\beta_V)^{\alpha} \leq 1{,}2$

with $\beta_N = \dfrac{N_{Sk}}{N_{rec}} \leq 1$; $\beta_V = \dfrac{V_{Sk}}{V_{rec}} \leq 1$

α = 2 in case of steel failure
α = 1,5 for all further types of failure

6 - Subdivision of anchors per way of work

6.1 Expansion anchors

They act by exerting a big force against the walls of the drill-hole, thanks to the expansion of the deformable part of the plug, called expansion sleeve. The resulting friction is necessary for counteracting the load's force applied to the anchor.
Among the metal expanding anchors for concrete we can find:

- Torque controlled expansion anchors: the expansion area is the result of the return of a cone coming from the tightening of a nut or screw.
- Deformation-controlled expansion anchors: the expansion area is the result of the displacement of a cone or of the expansion sleeve.

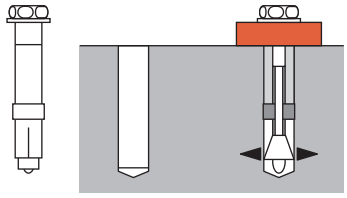


Fig. 7: Torque controlled expansion anchors

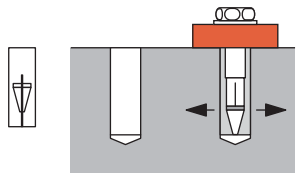


Fig. 8: Deformation-controlled expansion anchors

6.2 Form locking or undercut anchors

The excellent hold to the load's force applied to the anchor is guaranteed by the particular geometry of this product as well as by the great friction it provides against the opposite surfaces of the material. This is achieved, in perforated bricks or cavity walls, through knots or bulbs interacting with the internal surfaces of the material, in solid building materials with the creation or cut of lugs on the surface of the substrate reproducing the shape of the expanding part of the anchor for the best results. Even considering the resistance of the building base or the mechanical resistance of the product, this fixing system has to be considered as highly reliable and safe.

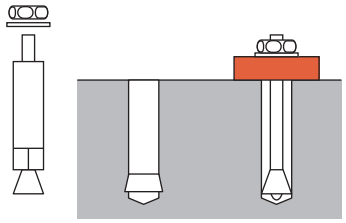


Fig. 9: Form locking anchors

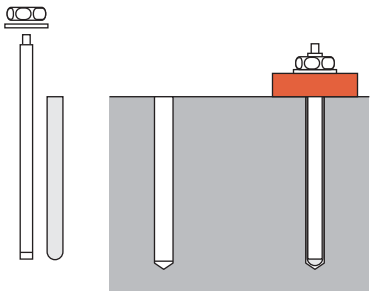


Fig. 10: Bonded anchors

6.3 Bonded anchors

The perfect fixing of the metal part of the anchor to the walls of the drill-hole is guaranteed by the use of a two-component resin becoming solid thanks to a process of polymerization. The degree of hold to the load's force applied to the anchor depends on the characteristics of adherence present between substrate and resin and between resin and metal anchor. The resin bonded anchors grant the maximum exploitation of the substrate strength. They are therefore highly recommended for getting the highest holding performances on substrates with low strength, for ex. on lightweight concrete or for good results on building base with high strength.

7 - Subdivision of anchors per application

7.1 Light-duty anchors

As their application does not require a specific experience, these products are ideal for both professional and non-professional purposes. They can be installed on a very large range of substrates, also on base materials with low strength. They have been designed for a maximum working load of 50N (50kg) and are generally used for standard applications or for applications not critical from the point of view of the safety. For this reason, any very particular advice is necessary for their choice or dimensioning.

7.2 Heavy-medium duty anchors

Ideal for professional purposes. They are characterized by building materials and shapes that make them particular suitable for important installations, which are nevertheless not so critical from the point of view of the safety or of the structural stability of the work.

7.3 Heavy-duty anchors

Designed for critical applications from the point of view of the safety, as for example for installations directly connected with the primary structure of the work. Their choice and dimensioning as well as their right installations (especially studied for the use on concrete) require the careful respect of precise application rules. The performances given by these products are the result of advanced programs of tests and of the best experience in the field.

8 - Cracked concrete and corrosion

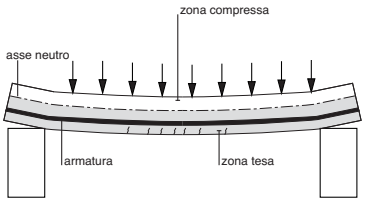


Fig. 11: Tensioned area in the top half of the cross-section olf a bridge

8.1 Cracked concrete

Particular loads applied on the structural elements of the substrate or on part of them may entail tension zones where the conditions for the good application of an anchor are not so favourable as on neutral or compression areas. These forces or stresses may cause microcracks scarcely visible to the naked eye.
Under such conditions, concrete is called cracked concrete.
Installations on the underlying layers of bearing beams, on pre-fabricated ceilings or on the upper side of slabs have to be considered on tensioned areas. The major part of the anchors present in this catalogue, except the ones designed for applications on perforated building materials, are suitable for installations on concrete.

8.2 Corrosion

The reliability in the time of an anchor manufactured partially or totally in metal is influenced by the entity of the corrosion. The resistance against the corrosion can be reached by adopting a treatment of coating (for ex. of zinc-plating) of the surface of the anchor or by using stainless steel in the production.
The choice of a product must be done considering the working conditions it has to undergo:

- in case of external installations or applications in dry areas: the use of cold galvanized zinc coated anchors with consequent (yellow or white) passivation is recommended. The medium coating thickness for quality anchors is 5 µm (micron).
- in case of external installations or of not critical applications: the use of hot zinc coated anchors is advised. The thickness of this coating is 40-60 um. As an alternative, a treatment called Dacromet guarantees a corrosion resistance four times higher than the one with cold galvanized zinc coating (5 µm)
- in case of external installations with medium – high corrosive potential, such as applications in urban or industrial areas, in sea-side zones, in motorway tunnels or installations in areas not easy to be inspected, the choice of stainless steel anchors, preferably according the ISO class A4 or, in uncritical conditions, according class A2 is recommended. The temperature, especially if high may also influence the good fixing hold. The chemical fixings may resist until 80°C.

9 - Approvals

The fixing technology through anchors is constantly object of studies and researches conducted by the ITW Group in cooperation with the most important organisations for research and approvals.
Aim of this work is the constant development and offer in the market of a range of products or systems characterized by maximum security and high quality. With its representatives, ITW takes permanently part in the activities of EOTA (European Organisation for Technical Approvals) for the development of the European standards and directives about the fixing through anchors. Such regulations contained in the ETAG guide (European Technical Approval Guidelines) harmonize for the first time in Europe the directives for the evaluation of the anchors in steel for use in concrete, the way of presentation of their holding performances as well as the rules about the fixing design. All anchors developed and evaluated in accordance with these directives may get the European Technical Approval (ETA) providing the right of displaying the CE mark and therefore the permission of free circulation in whole Europe. Thanks to its technological and productive potential, ITW asserts itself today as European leader for the research, development and distribution of advanced fixing systems for all applications, especially for the ones where the concepts of safety and quality are particular important.

EOTA

Approvals

ETA CE

European Technical Approval-
Option 7 for non-cracked concrete

10 - Terminology

s: Spacing of anchors in group;
c: Edge distance;
s_{cr} : Spacing between two anchors for ensuring the transmission of the max characteristic distance;
c_{cr} : Edge distance for ensuring the transmission of the max characteristic distance;
s_{min} : Minimum permissible spacing between two anchors;
c_{min} : Minimum permissible edge distance;
h_0 : Drill-hole depth;
h_{ef}: Effective anchorage depth;
F_{Sk} (N_{Sk} ; V_{Sk} ; M_{Sk} ; $M_{T,Sk}$): Characteristic value of the force acting on a single anchor (axial traction, shearing force, bending moment, torque);
$F^t_{Ru,m}$ ($N^t_{Ru,m}$; $V^t_{Ru,m}$): Mean ultimate load (axial traction, shear) measured in a test series;
F^t_{Rk} (N^t_{Rk} ; V^t_{Rk}) : Characteristic value of the anchor load;
F_{Rd} (N_{Rd} ; V_{Rd}): Design value of resistance;
F_{rec} (N_{rec} ; V_{rec}): Recommended resistance.

APPLICATIONS

● Suggested applications

UNIVERSAL LIGHT - DUTY ANCHORS		Page	electrical installations	plumbing and heating installations	construction and building	industrial applications	steel carpentry	wood carpentry	diy
T6		150	●	●	●	●			
E-EB		153	●	●	●				●
T4		156	●	●					●
TPF		158	●	●					●
HAMMER-IN ANCHORS									
UCX		160	●		●	●	●	●	
HCX		162	●		●	●	●	●	
FRAME ANCHORS									
APR		163			●			●	
APS		166			●			●	
T88	 NEW	169			●			●	
CAVITY ANCHORS AND SELF-DRILLING PLASTERBOARD FIXINGS									
ETPV		173		●					
ETAF-ETR		174	●	●	●	●			
T-CLICK		178	●	●					●
MINI DRIVA		180	●						●
DRIVA NYLON		181	●						●
DRIVA		182	●	●	●				●
DRIVA PLUS		183	●	●	●				●

natural stone	reinforced concrete	concrete	solid brick	perforated brick (double UNI)	hollow block	hollow brick	composed panel	plasterboard	wood	aerated concrete
										
●	●	●	●	●	●	●				●
●	●	●	●	●	●	●				●
●	●	●	●	●	●	●		●		
●	●	●	●	●	●	●		●		
●		●	●							
●		●	●							
●		●	●	●	●	●				
●		●	●	●	●	●				
●		●	●	●	●	●				
					●	●	●	●		
					●	●	●	●		
							●	●		●
							●	●		
							●	●		●
							●	●		●
							●	●		

● Suggested applications

HEAVY-DUTY ANCHORS		Page	APPLICATIONS							
			electrical installations	plumbing and heating installations	construction and building	industrial applications	steel carpentry	wood carpentry	diy	
LE		184	●	●	●	●	●			
DYNABOLT		186	●	●	●	●	●	●		
ETHD		188		●	●	●	●			
T51		189	●	●		●		●		
ETD II		190	●	●	●	●	●	●		
FIXINGS FOR ELECTRICAL INSTALLATIONS										
E/CL		194		●	●	●	●			
METAL PIPE FIXING		195	●	●		●				
FIXING IN BLISTERS		196							●	

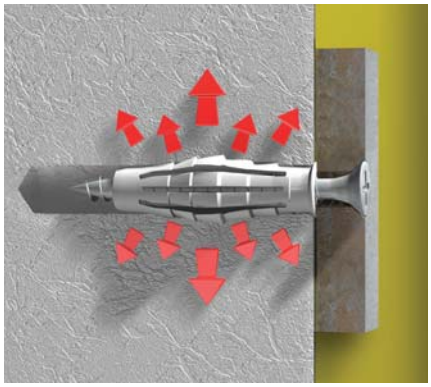
natural stone	reinforced concrete	concrete	solid brick	perforated brick (double UNI)	hollow block	hollow brick	composed panel	plasterboard	wood	aerated concrete
										
●	●	●	●							
●	●	●	●							
●	●	●								
●	●	●	●						●	
●	●	●								
●	●	●	●	●						

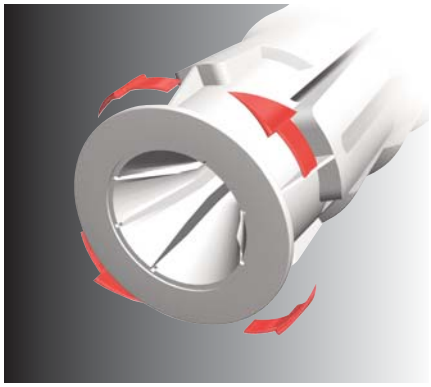
According to the applied fixings

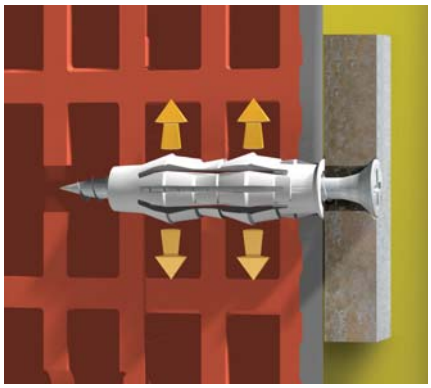
According to the applied fixings

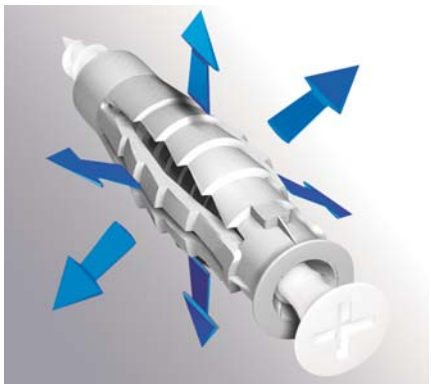
T6

THE ONLY ANCHOR WITH 6 EXPANDABLE ZONES

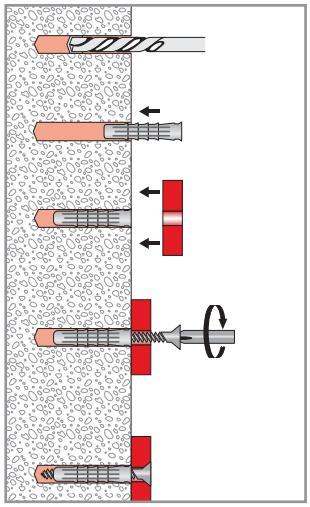




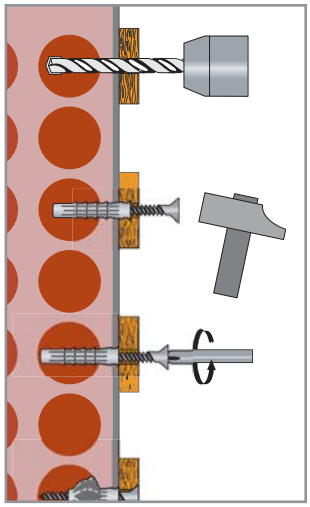




USE IN SOLID MATERIALS



USE IN HOLLOW MATERIALS



VERSATILITY & FLEXIBILITY!

- The versatility on many materials and the flexibility to several types of applications, grant to the professional users the best results and the right solution to the different problems of the light-duty anchors in any situation.
- The revolution T6 increases over 20% the applicable loads capacity respect to the most innovative anchors on the market.

MULTIEXPANSION!

- The innovative multidirectional expansion allows the load capacities optimisation and grants to have safety fixings and anchorage even in the most extreme situations.
- A bigger expansion and load capacity optimization through the radial distribution in 6 different directions.
- A distinct working on hollow/solid, through an innovative and exclusive design of the structure and first quality raw material.
- The dynamic ring allows either the fitting on the board of the wall or the fitting through the object to fix.

MULTIMATERIAL!

- T6 is suitable for many kinds of materials: concrete, solid and hollow bricks, hollow materials.

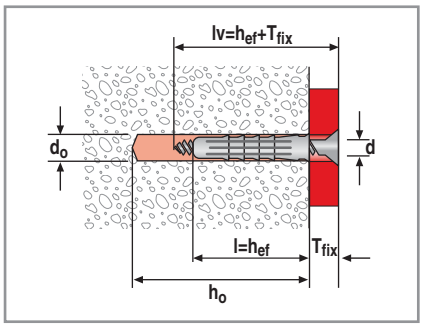
MULTI SCREW!

- T6 can be used with many screws available in the market.

SAFE INSTALLATION!

- Quick, rapid fixing thanks to the exclusive anti-rotation fins.

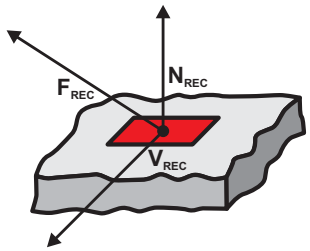
T6



Material: Polyamide 6
Colour: Grey RAL 7035.
Working temperature: -20°C +60°C.
Version: Anchor without screw.

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



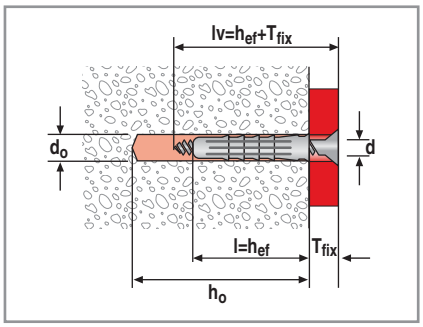
Packed in Box plug without screw		Drill Ø	Anchor length	Min. drill depht	Screw size	Q.ty box	Q.ty carton
Type	Code	d_0/(mm)	l=hef/(mm)	h_0 (mm)	do/(mm)	pcs	pcs
T6 5	**565385**	5	25	35	3,0-4,0	100	3.200
T6 6	**565386**	6	30	40	4,0-5,0	100	3.200
T6 8	**565387**	8	40	50	4,5-6,0	100	1.600
T6 10	**565388**	10	50	65	6,0-8,0	50	800
T6 12	**565281**	12	60	75	8,0-10,0	25	400
T6 14	**565282**	14	70	90	10,0-12,0	20	320

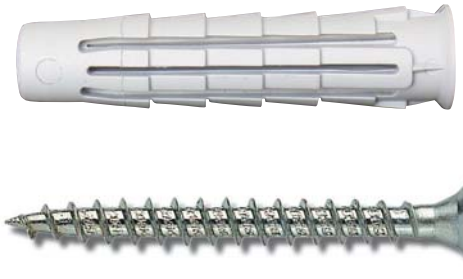
RECOMMENDED LOADS (N_{rec}) AND MEAN ULTIMATE LOADS ($N^{t}_{Ru,m}$)

Description		T6 5		T6 6		T6 8		T6 10		T6 12		T6 14	
Hole diameter	do (mm)	5		6		8		10		12		14	
Drilling depth	ho (mm)	35		40		50		65		75		90	
Max Ø wood screw	dv (mm)	4,0		5,0		6,0		8,0		10,0		12,0	
		N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$
Concrete C20/25[1]	daN	60	300	66	330	104	520	150	750	220	1100	320	1600
Solid bricks	daN	52	260	60	300	90	450	104	520	-	-	-	-
Perforated bricks	daN	28	140	42	210	50	250	50	250	-	-	-	-
Hollow bricks	daN	20	98	20	100	22	110	23	116	-	-	-	-
Hollow blocks of concrete	daN	48	240	50	250	64	320	80	400	103	515	108	540
Aerated concrete (13 mm)	daN	8	40	8	40	15	75	15	75	24	120	30	150

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

T6/VA



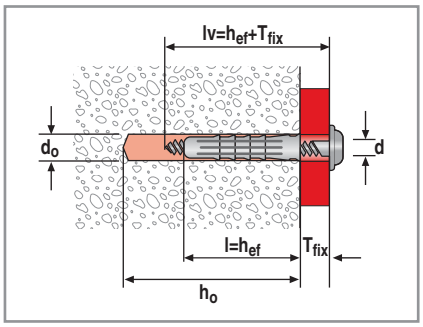


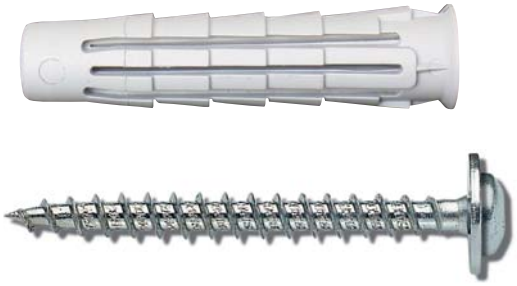
Material: Polyamide 6.

Colour: Grey RAL 7035.

T6/VA: anchor with hardened and white zinc-plated screw, countersunk head, pozidrive slot.

T6/VX

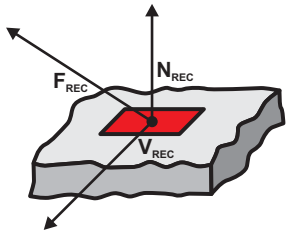




T6/VX: anchor with hardened and white zinc-plated screw, cylindrical head, pozidrive slot.

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



Packed in Box plug with screw		Drill Ø	Anchor length	Min. drill hole depht	Max thickness to fix	Screw size	Q.ty box	Q.ty carton
Type	Code	d_0/(mm)	l=hef/(mm)	h_0	T_{fix}/(mm)	do/(mm)	pcs	pcs
T6/VA 5	**565389**	5	25	35	2	4,0x30	100	3.200
T6/VA 6	**565390**	6	30	40	5	4,5x40	100	1.600
T6/VA 8	**565391**	8	40	50	5	5,0x50	50	800
T6/VA 10	**565392**	10	50	65	5	6,0x60	25	400
T6/VX 6	**565395**	6	30	40	5	4,5x45	100	1.600
T6/VX 8	**565396**	8	40	50	5	5,0x55	50	800

* When use other screws, these values should be reduced by 50%.

RECOMMENDED LOADS (N_{rec}) AND MEAN ULTIMATE LOADS ($N^{t}_{Ru,m}$)

Description		T6/VA 5		T6/VA 6		T6/VX 6		T6/VA 8		T6/VX 8		T6/VA 10	
Hole diameter	do mm	5		6		6		8		8		10	
Drilling depth	ho mm	35		40		40		50		50		65	
Max Ø Screw	dv mm	4,0		4,5		4,5		5,0		5,0		6,0	
		N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$
Concrete C20/25[1]	daN	32	160	32	160	32	160	55	275	55	275	68	340
Solid bricks	daN	20	100	26	130	26	130	35	175	35	175	60	300
Perforated bricks (double UNI)	daN	26	130	26	130	26	130	45	225	45	225	46	230
Hollow bricks	daN	19	95	19	95	19	95	23	115	23	115	23	116
Hollow blocks of concrete	daN	36	180	36	180	36	180	50	250	50	250	52	260
Aerated concrete	daN	-	-	-	-	-	-	-	-	-	-	-	-
Plasterboard (13 mm)	daN	-	-	-	-	-	-	-	-	-	-	-	-
Plasterboard (13+13 mm)	daN	-	-	-	-	-	-	-	-	-	-	-	-

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

E-EB

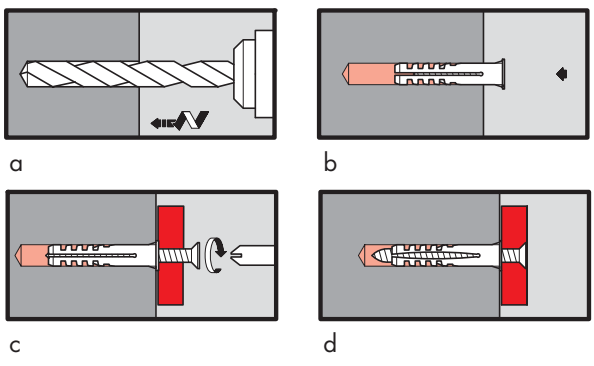
Applications

- Light-duty anchor for professional and DIY applications.
- For fixing of pictures, letter boxes, electric switches, lamps, lightweight mirror cabinets, ect.
- Suitable for all materials such as concrete, solid and hollow brick, natural stone.

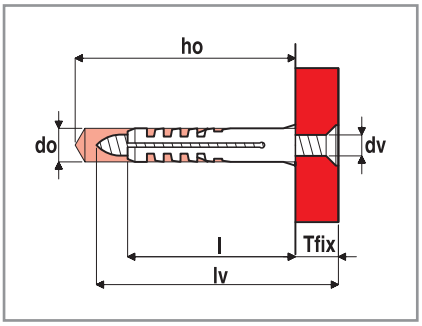
Characteristics

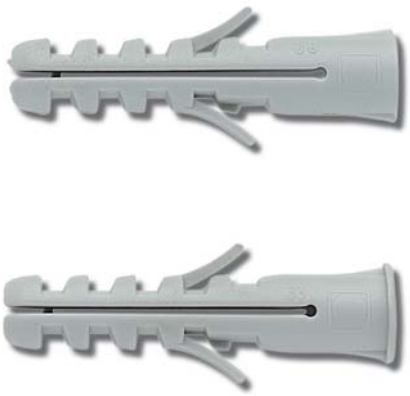
- Made of high quality polyamide, for an optimal performance and easy application.
- Wide and uniform expansion.
- Big anti-rotation fins.
- Available with or without lip and in several packaging solutions.

INSTALLATION METHOD



E-EB





Material: Polyamide 6.
Colour: Grey RAL 7035.

Working temperature: -20°C +60°C.

Version **E :** Without lip.

Version **EB :** With lip.

Packed in Box plug without screw		Anchor length	Drill Ø	Min. drill depth	Suggested ø mini/maxi	Minimum length screw	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	ho/(mm)	dv/(mm)	lv/(mm)	pcs	pcs
E 4	**8701001**	20	4	30	2,0-3,0	25	200	20.000
E 5	**8701002**	25	5	35	2,5-4,0	30	200	20.000
E 6	**8701003**	30	6	40	3,5-5,0	35	100	10.000
E 7	**8701000**	30	7	40	4,0-5,5	35	100	10.000
E 8	**8701004**	40	8	55	4,5-6,0	50	100	4.400
E 10x50	**8701005**	50	10	65	6,0-8,0	60	50	2.200
E 10x60	**8701008**	60	10	75	6,0-8,0	70	50	2.200
E 12	**8701006**	60	12	75	8,0-10,0	70	25	1.100
E 14	**8701007**	75	14	90	10,0-12,0	90	20	880
E 14x100	**8701037**	100	14	120	10,0-12,0	115	10	-
E 16	**8701009**	80	16	100	12,0-14,0	95	10	350
E 16x110	**8701036**	110	16	130	12,0-14,0	125	10	350

Type	Code	l/(mm)	do/(mm)	ho/(mm)	dv/(mm)	lv/(mm)	box pcs	carton pcs
EB 5	**8701052**	25	5	35	2,5-4,0	30	200	20.000
EB 6	**8701053**	30	6	40	3,5-5,0	35	100	10.000
EB 7	**8701050**	30	7	40	4,0-5,5	35	100	10.000
EB 8	**8701054**	40	8	55	4,5-6,0	50	100	4.400
EB 10x50	**8701055**	50	10	65	6,0-8,0	60	50	2.200
EB 10x60	**8701058**	60	10	75	6,0-8,0	70	50	2.200
EB 12	**8701056**	60	12	75	8,0-10,0	70	25	1.100

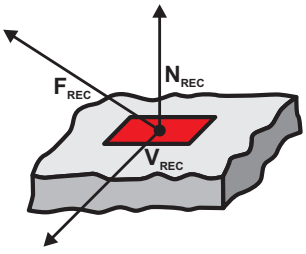
RECOMMENDED LOADS (F_{rec}) AND MEAN ULTIMATE LOADS ($F^{t}_{Ru,m}$)

Description		Ø Screw (mm)	Ø Drill (mm)	Natural stone C 20/25[1]		Solid brick		Perforated brick (double UNI)	
		dv	do	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$
E 4		3,0	4	15	75	10	50	8	40
E 5	EB 5	4,0	5	40	200	32	160	20	100
E 6	EB 6	5,0	6	60	300	52	260	40	200
E 7	EB 7	5,5	7	70	350	60	300	50	250
E 8	EB 8	6,0	8	90	450	80	400	60	300
E 10	EB 10	8,0	10	180	900	84	420	68	340
E 12	EB 12	10,0	12	220	1100	88	440	-	-
E 14		12,0	14	380	1900	-	-	-	-

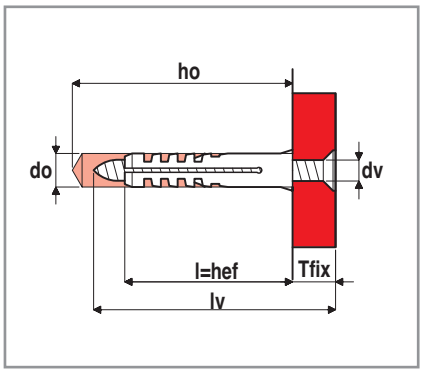
1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

$F_{Sk} \leq F_{rec} = F^{t}_{Ru,m} / \gamma$

F_{Sk}: Characteristics value of actions.
F_{rec}: Recommended load value.
$F^{t}_{Ru,m}$: Mean ultimate load.
γ : Global safety factor=5



E/VA-EB/VA



Material: Polyamide 6.

Colour: Grey RAL 7035.

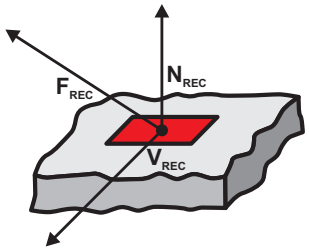
Version: Anchor with lip (EB/VA) and without lip (E/VA) complete of a hardened and white zinc-plated screw, countersunk head, pozidrive slot.

Packed in Box		Anchor length	Drill Ø	Min. drill depth	Suggested screw size	Fixable thickness	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	ho/(mm)	dvxlv/(mm)	Tfix/(mm)	pcs	pcs
E/VA 5	**8702052**	25	5	35	4,0x30	2	100	9.600
E/VA 6	**8702053**	30	6	40	4,5x40	5	100	4.000
E/VA 8	**8702054**	40	8	55	5,0x50	5	50	2.000
E/VA 10	**8702055**	50	10	65	6,0x60	5	50	1.600

Type	Code	l/(mm)	do/(mm)	ho/(mm)	dv/(mm)	Tfix/(mm)	pcs	pcs
EB/VA 5	**8702262**	25	5	35	4,0x30	2	100	9.600
EB/VA 6	**8702263**	30	6	40	4,5x40	5	100	4.000
EB/VA 8	**8702264**	40	8	55	5,0x50	5	50	2.000
EB/VA 10	**8702265**	50	10	65	6,0x60	5	50	1.600

$F_{Sk} \leq F_{rec} = F^{t}_{Ru,m} / \gamma$

F_{Sk}: Characteristics value of actions.
F_{rec}: Recomended load value.
$F^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



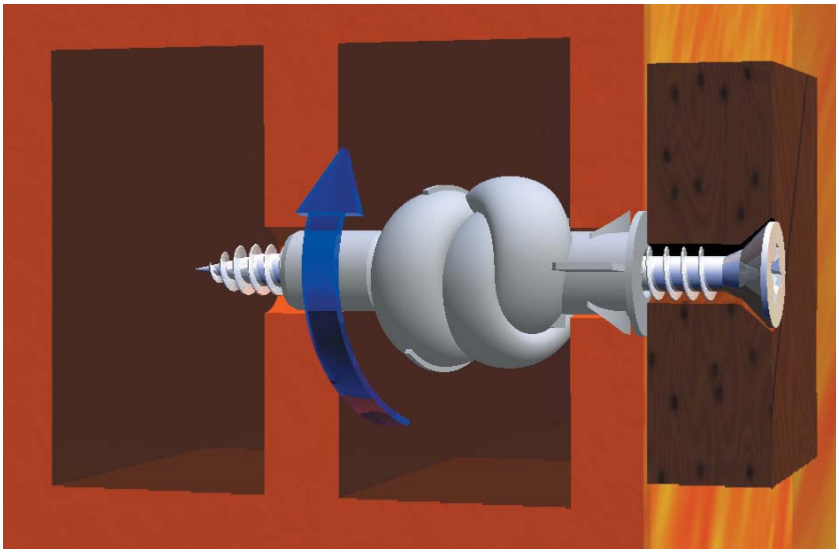
MEAN ULTIMATE AND RECOMMENDED LOADS (daN)

Description		Ø Screw (mm)	Ø Drill (mm)	Concrete C 20/25[1]		Solid brick		Perforated brick (double UNI)	
		dv	do	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$
E/VA 5	EB/VA 5	4,0	5	11	55	9	45	6	30
E/VA 6	EB/VA 6	4,5	6	18	90	14	70	10	50
E/VA 8	EB/VA 8	5,0	8	46	230	40	200	30	150
E/VA 10	EB/VA 10	6,0	10	70	350	50	250	40	200

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

T4

THE SPECIALIST FOR HOLLOW MATERIALS!



DIVERSIFIED APPLICATION!

T4 is the nylon anchor that guarantees a perfect and easy installation on hollow materials.
The special geometry of the fixing achieves a positive form-locking in **perforated bricks, cavity walls and drywall** and high performance **on concrete and solid bricks.**

VERSATILITY & FLEXIBILITY!

The 4 expansion sleeve guarantees a good flexibility on hollow materials and a good anchorage by friction grip in solid material.

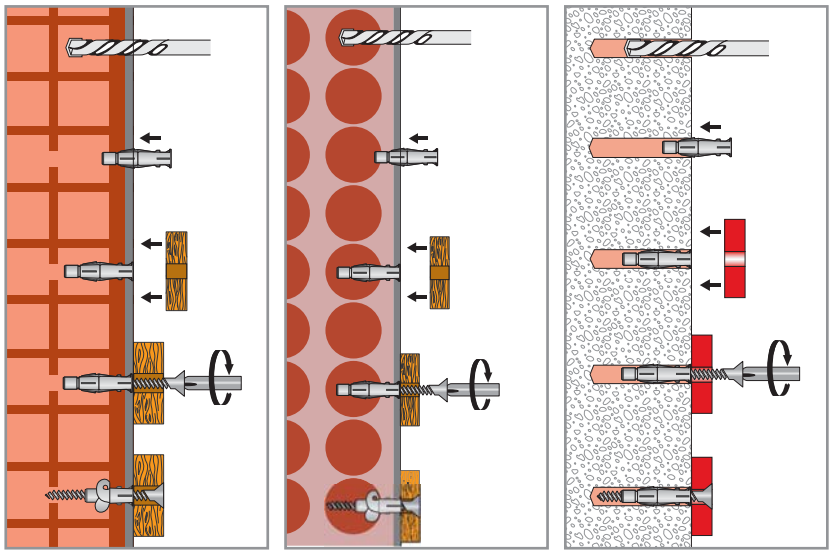
QUICK & EASY INSTALLATION!

The rotation block fins stop the plug rotating in the drill hole.
The special collar prevents the plug slipping into the hole.

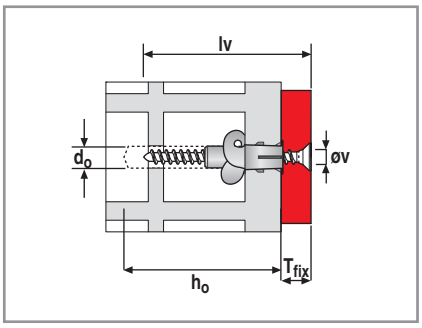
MULTI SCREW!

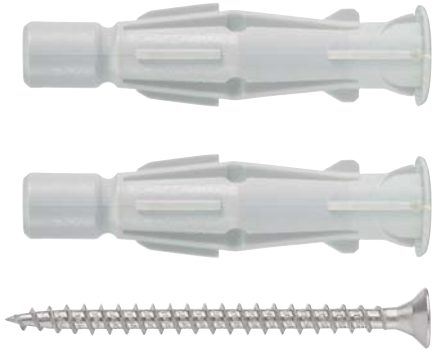
T4 is reliable for **chipboard and wood screw**. Using chipboard screws (with a thread up to the head) the best form-locking will always obtained.
Using wood screws, the maximum grip in solid material will be achieved.

INSTALLATION METHOD



T4-T4/VA





T4: Anchor without screw.

T4/VA: Anchor with hardened and white zinc-plated screw, countersunk head, pozidrive slot.

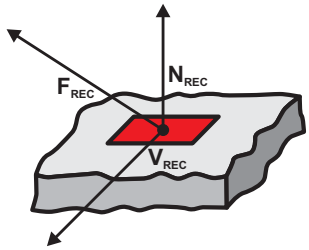
Material: Polyamide 6
Halogen free according to UL94HB

Colour: Grey RAL 7035.

Working temperature: -20°C +60°C.

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



Packed in Box plug without screw		Diameter drill	Anchor length	Min. drill depht	Max thickness to fix	Suggested screw size	Q.ty box	Q.ty carton
Type	Code	d_0/(mm)	lv/(mm)	h_0(mm)	T_{fix}/(mm)	do/(mm)	pcs	pcs
T4 6x35	**566130**	6	35	45	10	3,5	100	3.000
T4 6x45	**566131**	6	45	55	10	3,5	100	3.000
T4 8x50	**566132**	8	50	60	10	4,5	50	1.500
T4 10x60	**566133**	10	60	80	20	6,0	25	750

Packed in Box plug without screw		Diameter drill	Anchor length	Min. drill depht	Max thickness to fix	Fixable dimensions	Q.ty box	Q.ty carton
Type	Code	d_0/(mm)	lv/(mm)	h_0(mm)	T_{fix}/(mm)	do/(mm)	pcs	pcs
T4/VA 6x35	**566135**	6	35	45	10	3,5x45	100	3.000
T4/VA 6x45	**566136**	6	45	55	10	3,5x55	50	3.000
T4/VA 8x50	**566137**	8	50	60	10	4,5x60	50	1.500
T4/VA 10x60	**566138**	10	60	80	20	6,0x80	25	750

RECOMMENDED LOADS (N_{rec}) AND MEAN ULTIMATE LOADS ($N^{t}_{Ru,m}$)

Description		T4/VA 6x35		T4/VA 6x45		T4/VA 8x50		T4/VA 10x60	
Hole diameter	do mm	6		6		8		10	
Drilling depth	ho mm	45		55		60		80	
Max Ø chipboard screw	dv mm	3,5		3,5		4,5		6,0	
		N_{rec}	$N_{u,m}$	N_{rec}	$N_{u,m}$	N_{rec}	$N_{u,m}$	N_{rec}	$N_{u,m}$
Perforated brick	daN	30	150	30	150	38	190	42	210
Hollow brick	daN	30	150	30	150	38	190	42	210
Plasterboard h 10	daN	8	40	-	-	-	-	-	-
Plasterboard h 13	daN	8	40	10	50	12	60	12	60
Plasterboard h 13+13	daN	-	-	18	90	26	130	32	160
Aerated concrete	daN	8	40	9	45	11	55	19	95
Solid brick	daN	26	130	32	160	48	240	56	280
Concrete C20/25[1]	daN	26	130	32	160	50	250	66	330

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

TPF-TPFC

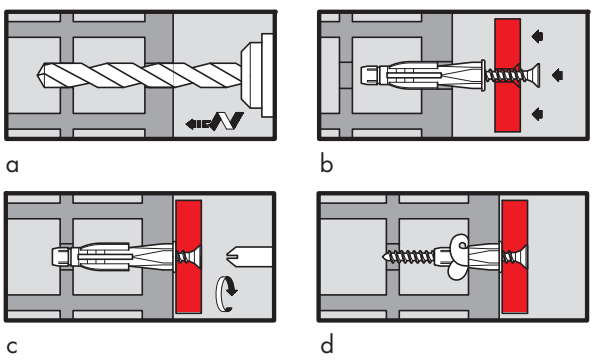
Applications

- Universal fixing for any kind of building materials.
- For fixing of lamps, pictures, letter boxes, electric switches, towel rails, lightweight mirror cabinets, ect.

Characteristics

- Different working anchor: it expands in solid materials and it knots in hollow materials.
- Big expansion.
- Safety anti-rotation and blocking fins prevent the plug rotating in the drill hole.
- Available with or without lip.

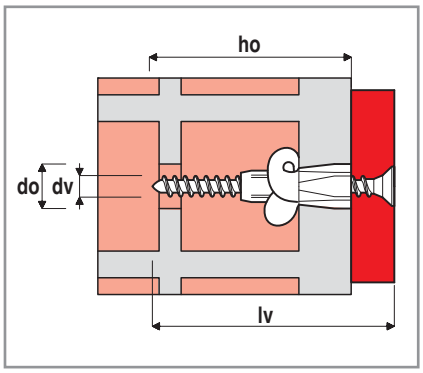
INSTALLATION METHOD



TPF-TPFC

Version **TPF**: Without lip.

Version **TPFC**: With lip.



Material: Polyethylene HD.

Colour: Grey RAL 7035

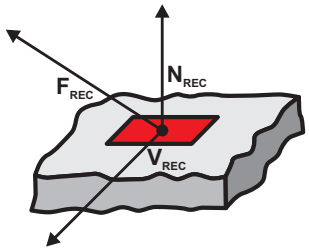
Working temperature: -10°C +60°C.

Packed in Box plug without screw		Anchor length	Drill Ø	Min. drill depth	Suggested screw size	Minimum length screw	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	ho/(mm)	dv/(mm)	lv/(mm)	pcs	pcs
TPF 5x30	**8705014**	30	5	40	3,0-4,0	35	100	3.200
TPF 6x37	**8705011**	37	6	50	4,0-4,5	45	100	3.200
TPF 6x50	**8705015**	50	6	60	4,0-4,5	55	50	1.600
TPF 8x50	**8705012**	50	8	60	5,0-6,0	55	50	1.600
TPF 10x60	**8705013**	60	10	70	6,0-7,0	65	25	800
TPF 12x70	**8705017**	70	12	80	7,0-8,0	75	25	800

Type	Code	l/(mm)	do/(mm)	ho/(mm)	dv/(mm)	lv/(mm)	box pcs	carton pcs
TPFC 5x31	**8705114**	31	5	40	3,0-4,0	35	100	3.200
TPFC 6x38	**8705111**	38	6	50	4,0-4,5	45	100	3.200
TPFC 6x51	**8705115**	51	6	60	4,0-4,5	55	50	1.600
TPFC 7x36	**8705116**	36	7	50	4,0-4,5	40	100	3.200
TPFC 8x51	**8705112**	51	8	60	5,0-6,0	55	50	1.600
TPFC 10x61	**8705113**	61	10	70	6,0-7,0	65	25	800
TPFC 12x71	**8705117**	71	12	80	7,0-8,0	75	25	800

$F_{Sk} \leq F_{rec} = F^{t}_{Ru,m} / \gamma$

F_{Sk}: Characteristics value of actions.
F_{rec}: Recommended load value.
$F^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



MEAN ULTIMATE AND RECOMMENDED LOADS (daN)

Description		Ø Screw	Ø Hole	Concrete C 20/25[1]		Solid brick		Perforated brick (double UNI)		Plasterboard (h13)	
		dv (mm)	do (mm)	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$
TPF 5	TPFC 5	4,0	5	16	80	16	80	16	80	4	20
TPF 6	TPFC 6	4,5	6	28	140	28	140	22	110	4	20
TPF 7	TPFC 7	4,5	7	30	150	28	140	24	120	4	20
TPF 8	TPFC 8	6,0	8	40	200	40	200	30	150	9	45
TPF 10	TPFC 10	7,0	10	60	300	60	300	32	160	9	45
TPF 12	TPFC 12	8,0	12	70	350	68	340	32	160	9	45

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

UCX-HCX

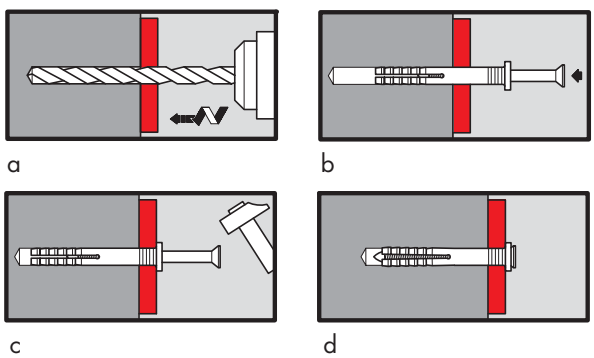
Applications

- UCX and UCX/TS are nylon hammer-in anchor, suitable to fix compact materials of the substructures, frames outlines, raceways,gutters, accessories and components for electrical and hydraulic applications.
- HCX is ideal to fix in light carpentry, general covering, raceways, signalising, guides and profiles.
- The particular internal end external geometry of the polyamide body of the plug and a special nail screw, allow a rapid fixing with a light hammering.

Characteristics

- Made of nylon 6 and special pre-assembled steel nail screw.
- UCX has got cylindrical lip plug and UCX/TS has got countersunk lip plug, both available in three diameters 5,6,8.
- Expands by hammering or screwing.
- Quick and simple push-through installation.
- Large expansion.
- HCX are available with 3 different lips plug
- Just a few hammer blows are enough to give a safe attachment of timbers, cable ducts, skirting, etc.
- The special preassembled nail screw allows the removal and realigning of fixture.

INSTALLATION METHOD



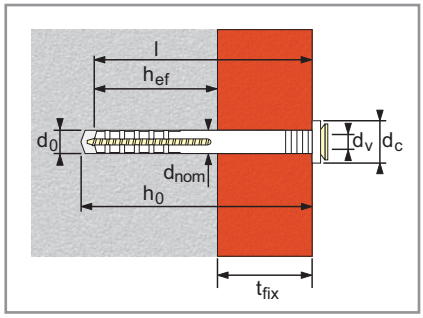
UCX

Version: hammer-in anchor
with cylindrical head.

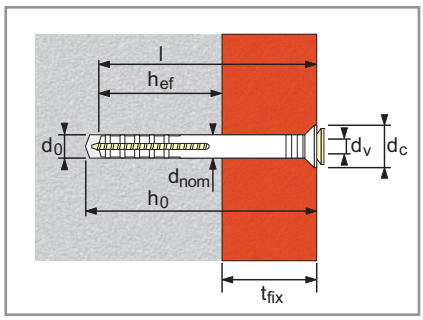
UCX TS

Version: hammer-in anchor
with countersunk head.

Material: Polyamide 6
Colour: Grey RAL 7035



Packed in Box		Screw Ø	Anchor length	anch. depth	Drill Ø	Min. drill depth	Fixable thickness	Collar Ø	Q.ty box	Q.ty carton
Type	Code	dv/(mm)	l/(mm)	hef(mm)	do/(mm)	ho/(mm)	Tfix/(mm)	dc/(mm)	pcs	pcs
UCX 5x25V	**8710001**	3,6	25	24	5	35	1	9	100	3.200
UCX 5x36V	**8710002**	3,6	36	31	5	45	5	9	100	3.200
UCX 5x45V	**8710003**	3,6	45	30	5	55	15	9	100	3.200
UCX 6x35V	**8710004**	4,0	35	30	6	45	5	10	100	3.200
UCX 6x45V	**8710005**	4,0	45	30	6	55	15	10	100	3.200
UCX 6x55V	**8710006**	4,0	55	30	6	65	25	10	100	2.400
UCX 6x70V	**8710007**	4,0	70	30	6	80	40	10	100	2.400
UCX 8x45V	**8710008**	5,0	45	40	8	55	5	11	100	2.400
UCX 8x60V	**8710009**	5,0	57	45	8	67	12	11	50	1.600
UCX 8x75V	**8710010**	5,0	75	45	8	85	30	11	50	1.600
UCX 8x100V	**8710011**	5,0	100	40	8	110	60	11	50	1.200
UCX 8x120V	**8710012**	5,0	120	40	8	150	80	11	50	1.200
UCX 8x135V	**8710013**	5,0	135	40	8	145	95	11	50	1.200



Type	Code	dv/(mm)	l/(mm)	hef(mm)	do/(mm)	ho/(mm)	Tfix/(mm)	dc/(mm)	pcs	pcs
UCX TS 4x35V	**8710500***	2,5	35	25	4	45	10	9	100	9.600
UCX TS 5x25V	**8710501**	3,6	25	25	5	35	1	9	100	3.200
UCX TS 5x30V	**8710502**	3,6	30	25	5	40	5	9	100	3.200
UCX TS 5x45V	**8710503**	3,6	45	30	5	55	15	9	100	3.200
UCX TS 6x35V	**8710504**	4,0	35	30	6	45	5	10	100	3.200
UCX TS 6x40V	**8710505**	4,0	40	30	6	50	10	10	100	3.200
UCX TS 6x55V	**8710506**	4,0	55	30	6	65	25	10	100	2.400
UCX TS 6x70V	**8710507**	4,0	70	30	6	80	40	10	100	2.400
UCX TS 8x45V	**8710508**	5,0	45	40	8	55	5	11	100	2.400
UCX TS 8x60V	**8710509**	5,0	57	45	8	67	12	11	50	1.600
UCX TS 8x75V	**8710510**	5,0	75	45	8	85	30	11	50	1.600
UCX TS 8x100V	**8710511**	5,0	100	40	8	110	60	11	50	1.200
UCX TS 8x120V	**8710512**	5,0	120	40	8	130	80	11	50	1.200
UCX TS 8x135V	**8710513**	5,0	135	40	8	145	95	11	50	1.200

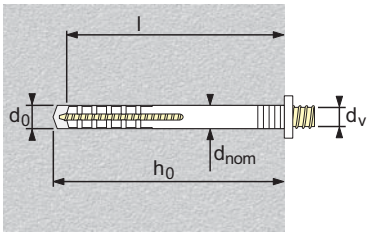
*The packaging in bulk is available on request

UCX VM

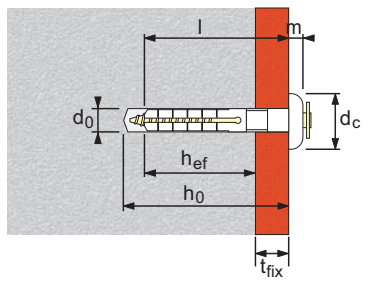
Version: hammer-in anchor with metric thread screw.

HCX TB V

Version: hammer-in anchor with mushroom head.



Packed in Box		Screw Ø	Anchor length	Drill Ø	Min. drill depth	Threaded screw size	Axial pitch	Q.ty box	Q.ty carton
Type	Code	dv/(mm)	l/(mm)	do/(mm)	ho/(mm)	do/(mm)		pcs	pcs
UCX 6x35 VM6	**8710014**	4,0	35	6	45	M6	1,00	100	3.500
UCX 6x35 VM7	**8710017**	4,0	35	6	45	M7	1,00	100	3.500



Packed in Box		Plug Ø	Anchor length	Anchor depth	Drill depth	Fixable thickness	Head thickness	Head Ø	Q.ty pack	Q.ty carton
Type	Code	do/(mm)	l/(mm)	hef(mm)	ho/(mm)	Tfix/(mm)	m/(mm)	dc/(mm)	pcs	pcs
HCX TB 6x35 V	**8709001**	6	36	28	45	8	3,5	14	100	3.500
HCX TB 6x45 V	**8709002**	6	46	31	55	15	3,5	14	100	2.400
HCX TB 6x60 V	**8709003**	6	62	32	70	30	3,5	14	100	2.400
HCX TB 6x70 V	**8709004**	6	72	37	80	35	3,5	14	50	1.200

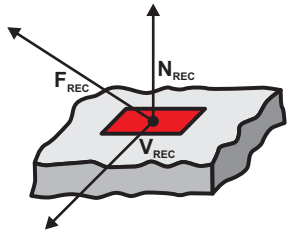
MEAN ULTIMATE LOADS $N^t_{Ru,m}$ (TENSILE) AND $V^t_{Ru,m}$ (SHEAR) AND daN

Description	Plug length	Drill Ø	Concrete C 20/25[1]		Solid brick	
			daN		daN	
	(mm)	(mm)	$N^t_{Ru,m}$	$V^t_{Ru,m}$	$N^t_{Ru,m}$	$V^t_{Ru,m}$
UCX 5	25	5	80	90	80	90
	≥35	5	90	100	90	100
UCX 6	≥45	6	100	100	100	100
	≥55	6	110	110	100	100
UCX 8		8	160	150	150	150
HCX 6	≤45	6	100	110	80	90
HCX 8	≥60	6	100	170	80	140

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

$N_{Sk} \leq N_{rec} = N^t_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^t_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



APR

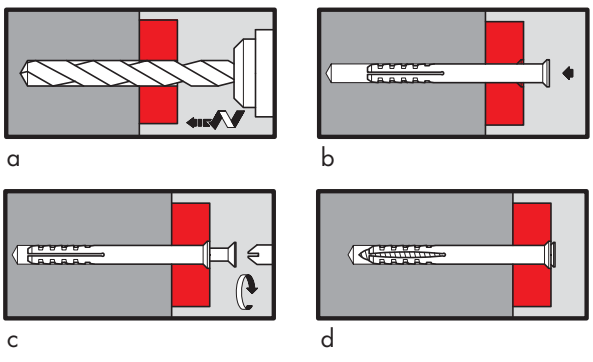
Applications

- Nylon expansion frame anchor.
- For fixing of doors and windows frames, kitchen cabinets, wood strips, coverings, wall plates, sole plates, battens.
- Suitable for concrete, stone, solid brick, solid block.

Characteristics

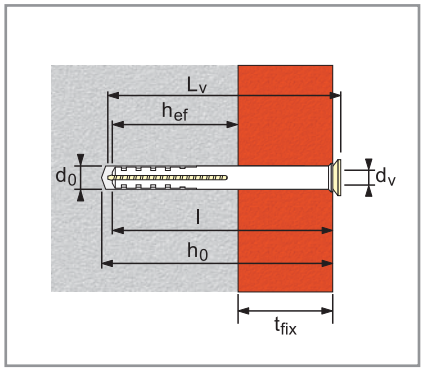
- Body made of polyamide 6 resistant to weathering, ageing and rotting.
- Screw: cl. 5.8 zinc-coated available in two versions: countersunk head and hexagonal head screw.
- Anti-rotation fins prevent the anchor from rotating in the hole.
- Countersunk sleeve and screw allow flush finish.
- Nylon sleeve assists shear capacity.
- Deep expansion.

INSTALLATION METHOD



APR

Material: Polyamide 6
Colour: Grey RAL 7035
Version: Anchor without screw.



Packed in Box		Anchor length	Drill Ø	Anchor depth	Min. drill depth	Suggested screw size	Fixable thickness	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	dvxlv/(mm)	Tfix/(mm)	pcs	pcs
APR 6x35	**8722051**	35	6	30	50	4,0x40	5	200	4.800
APR 6x50	**8722052**	50	6	30	60	4,0x55	20	150	3.600
APR 6x60	**8722053**	60	6	30	70	4,0x65	30	100	2.400
APR 8x60	**8722054**	60	8	40	70	5,5x65	20	100	2.400
APR 8x80	**8722055**	80	8	40	90	5,5x85	40	100	2.400
APR 8x100	**8722056**	100	8	50	110	5,5x105	50	50	960
APR 8x120	**8722062**	120	8	50	130	5,5x125	70	40	960
APR 8x135	**8722063**	135	8	50	145	5,5x140	85	40	960
APR 8x160	**8722064**	160	8	50	170	5,5x165	110	40	960
APR 10x80	**8722057**	80	10	50	90	7,0x85	30	50	1.200
APR 10x100	**8722058**	100	10	50	110	7,0x105	50	50	1.200
APR 10x115	**8722059**	115	10	50	125	7,0x120	65	40	960
APR 10x135	**8722060**	135	10	50	145	7,0x140	85	40	960
APR 10x160	**8722061**	160	10	50	170	7,0x165	110	40	960

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5

MEAN ULTIMATE AND RECOMMENDED LOADS (daN)

Description	Ø Hole	Concrete C 20/25[1]	Solid Brick
	(mm)	$N^{t}_{Ru,m}$	$N^{t}_{Ru,m}$
APR/V 6	6	225	160
APR/V 8	8	400	360
APR/V 10	10	450	380

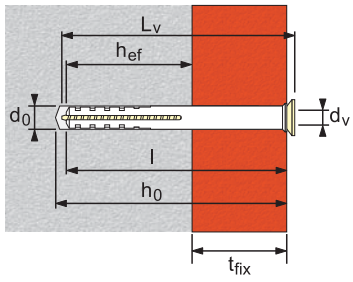
1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

APR/V

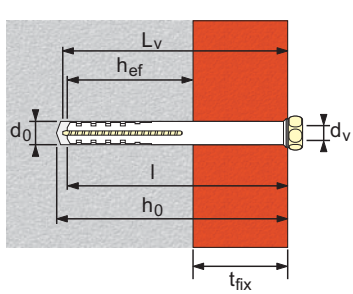
Version: Anchor with zinc-plated screw cl. 5.8, countersunk head.

APR/V TE

Version: Anchor with zinc-plated screw cl. 5.8, hexagonal head.



Packed in Box		Anchor length	Drill Ø	Anchor depth	Min. drill depth	Suggested screw size	Fixable thickness	Imprint	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	dvxlv/(mm)	Tfix/(mm)	Pz	pcs	pcs
APR/V 6x35	**8722001**	35	6	30	50	4,0x40	5	2	100	2.400
APR/V 6x50	**8722002**	50	6	30	60	4,0x55	20	2	100	2.400
APR/V 6x60	**8722003**	60	6	30	70	4,0x65	30	2	100	2.400
APR/V 8x60	**8722004**	60	8	40	70	5,5x65	20	3	50	1.200
APR/V 8x80	**8722005**	80	8	40	90	5,5x85	40	3	50	1.200
APR/V 8x100	**8722006**	100	8	50	110	5,5x105	50	3	50	1.100
APR/V 8x120	**8722012**	120	8	50	130	5,5x125	70	3	25	600
APR/V 8x135	**8722013**	135	8	50	145	5,5x135	85	3	25	600
APR/V 8x160	**8722014**	160	8	50	170	5,5x165	110	3	25	600
APR/V 10x80	**8722007**	80	10	50	90	7,0x85	30	4	25	600
APR/V 10x100	**8722008**	100	10	50	110	7,0x105	50	4	25	600
APR/V 10x115	**8722009**	115	10	50	125	7,0x120	65	4	20	480
APR/V 10x135	**8722010**	135	10	50	145	7,0x140	85	4	20	480
APR/V 10x160	**8722011**	160	10	50	170	7,0x165	110	4	20	480



Packed in Box		Anchor length	Plug Ø	Anchor depth	Min. drill depth	Suggested screw size	Fixable thickness	Imprint	Q.ty pack	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	dvxlv/(mm)	Tfix/(mm)	Pz	pcs	pcs
APR/V TE 8x60	**8722024**	60	8	40	70	5,5x65	20	10	50	1.200
APR/V TE 8x80	**8722025**	80	8	40	90	5,5x85	40	10	50	1.200
APR/V TE 8x100	**8722026**	100	8	50	110	5,5x105	50	10	50	1.100
APR/V TE 8x120	**8722032**	120	8	50	130	5,5x125	70	10	25	600
APR/V TE 8x135	**8722033**	135	8	50	145	5,5x140	85	10	25	600
APR/V TE 8x160	**8722034**	160	8	50	170	5,5x165	110	10	25	600
APR/V TE 10x80	**8722027**	80	10	50	90	7,0x85	30	10	25	600
APR/V TE 10x100	**8722028**	100	10	50	110	7,0x105	50	10	25	600
APR/V TE 10x115	**8722029**	115	10	50	125	7,0x120	65	10	20	480
APR/V TE 10x135	**8722030**	135	10	50	145	7,0x140	85	10	20	480
APR/V TE 10x160	**8722031**	160	10	50	170	7,0x160	110	10	20	480

APS

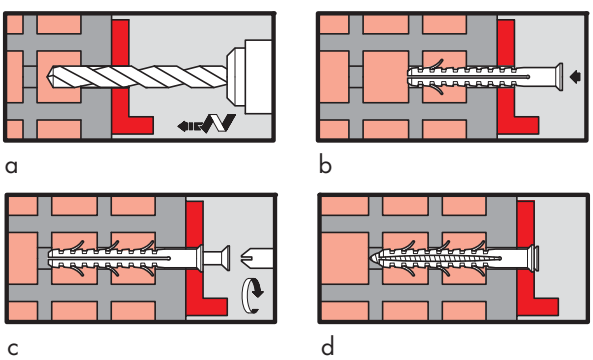
Applications

- Expansion frame anchor.
- For fixing of door frames, kitchen cabinets, wood strips, coverings, gates and wardrobes.
- Suitable for perforated and hollow bricks, light construction materials.

Characteristics

- Body made of polyamide 6 (nylon 6).
- Screw: zinc-plated steel cl. 5.8, available in two version: countersunk head and hexagonal head.
- Special geometry with jons expansion zone.
- 6 safety, anti-rotation fins.
- Push-through installation.

INSTALLATION METHOD



APS

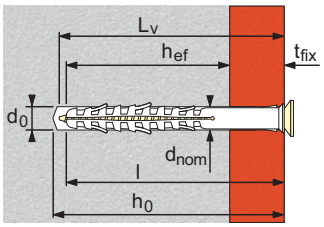
Material: Polyamide 6

Colour: Grey RAL 7035

Version: Anchor without screw.

APS/V

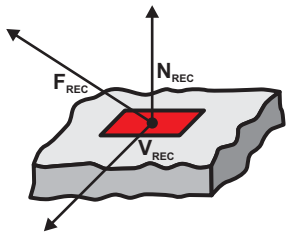
Version: Anchor with zinc-plated screw cl. 5.8, countersunk head.



Packed in Box		Anchor length	Plug Ø	Anchor depth	Min. drill depth	Fixable thickness	Suggested screw size	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	Tfix/(mm)	dv/(mm)	pcs	pcs
APS 8x80	**8722505**	80	8	70	90	10	5,5	100	2.400
APS 8x100	**8722506**	100	8	70	110	30	5,5	50	1.200
APS 8x120	**8722512**	120	8	70	130	50	5,5	50	1.200
APS 10x80	**8722507**	80	10	70	90	10	7,0	50	1.200
APS 10x100	**8722508**	100	10	70	110	30	7,0	50	1.200
APS 10x115	**8722509**	115	10	70	125	45	7,0	50	1.200
APS 10x135	**8722510**	135	10	70	145	65	7,0	50	1.200
APS 10x160	**8722511**	160	10	70	170	90	7,0	50	1.200

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

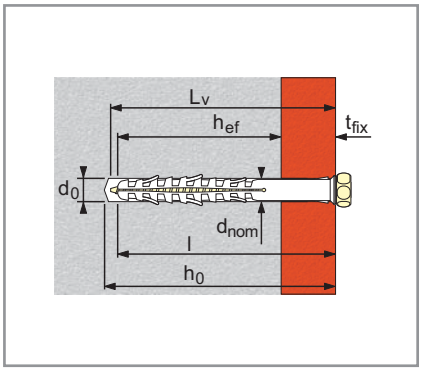
N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



Packed in Box		Anchor length	Plug Ø	Anchor depth	Min. drill depth	Suggested screw size	Fixable thickness	Q.ty box	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	Tfix/(mm)	dv/(mm)	pcs	pcs
APS/V 8x80	**8722555**	80	8	70	90	10	5,5x85	50	1.200
APS/V 8x100	**8722556**	100	8	70	110	30	5,5x105	25	600
APS/V 8x120	**8722562**	120	8	70	130	50	5,5x125	25	600
APS/V 10x80	**8722557**	80	10	70	90	10	7,0x85	25	600
APS/V 10x100	**8722558**	100	10	70	110	30	7,0x105	25	600
APS/V 10x115	**8722559**	115	10	70	125	45	7,0x120	25	600
APS/V 10x135	**8722560**	135	10	70	145	65	7,0x140	25	300
APS/V 10x160	**8722561**	160	10	70	170	90	7,0x165	25	300

APS/V TE

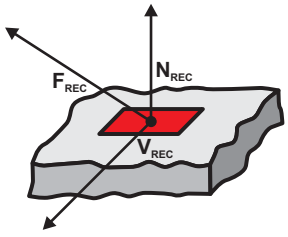
Version: Anchor with zinc-plated screw cl. 5.8, hexagonal head.



Packed in Box		Anchor length	Plug Ø	Anchor depth	Min. drill depth	Suggested screw size	Fixable thickness	Q.ty pack	Q.ty carton
Type	Code	l/(mm)	do/(mm)	hef(mm)	ho/(mm)	Tfix/(mm)	dv/(mm)	pcs	pcs
APS/V 8x80 TE	**8722575**	80	8	70	90	10	5,5x85	50	1.200
APS/V 8x100 TE	**8722576**	100	8	70	110	30	5,5x105	25	600
APS/V 8x120 TE	**8722582**	120	8	70	130	50	5,5x125	25	600
APS/V 10x80 TE	**8722577**	80	10	70	90	10	7,0x85	25	600
APS/V 10x100 TE	**8722578**	100	10	70	110	30	7,0x105	25	600
APS/V 10x115 TE	**8722579**	115	10	70	125	45	7,0x120	25	300
APS/V 10x135 TE	**8722580**	135	10	70	145	65	7,0x140	25	300
APS/V 10x160 TE	**8722581**	160	10	70	170	90	7,0x165	25	300
APS/V 12x130 TER	**8722584**	130	12	65	140	65	10,0x140	25	-
APS/V 12x200 TER	**8722585**	200	12	65	210	135	10,0x210	20	-
APS/V 12x240 TER	**8722586**	240	12	65	250	175	10,0x250	20	-
APS/V 16x140 TER	**8722587**	140	16	75	150	65	12,0x150	20	-
APS/V 16x160 TER	**8722588**	160	16	75	170	85	12,0x170	20	-
APS/V 16x200 TER	**8722589**	200	16	80	210	120	12,0x210	20	-
APS/V 16x240 TER	**8722590**	240	16	80	250	160	12,0x250	20	-

$N_{Sk} \leq N_{rec} = N^{t}_{Ru,m} / \gamma$

N_{Sk}: Characteristics value of actions.
N_{rec}: Recommended load value.
$N^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



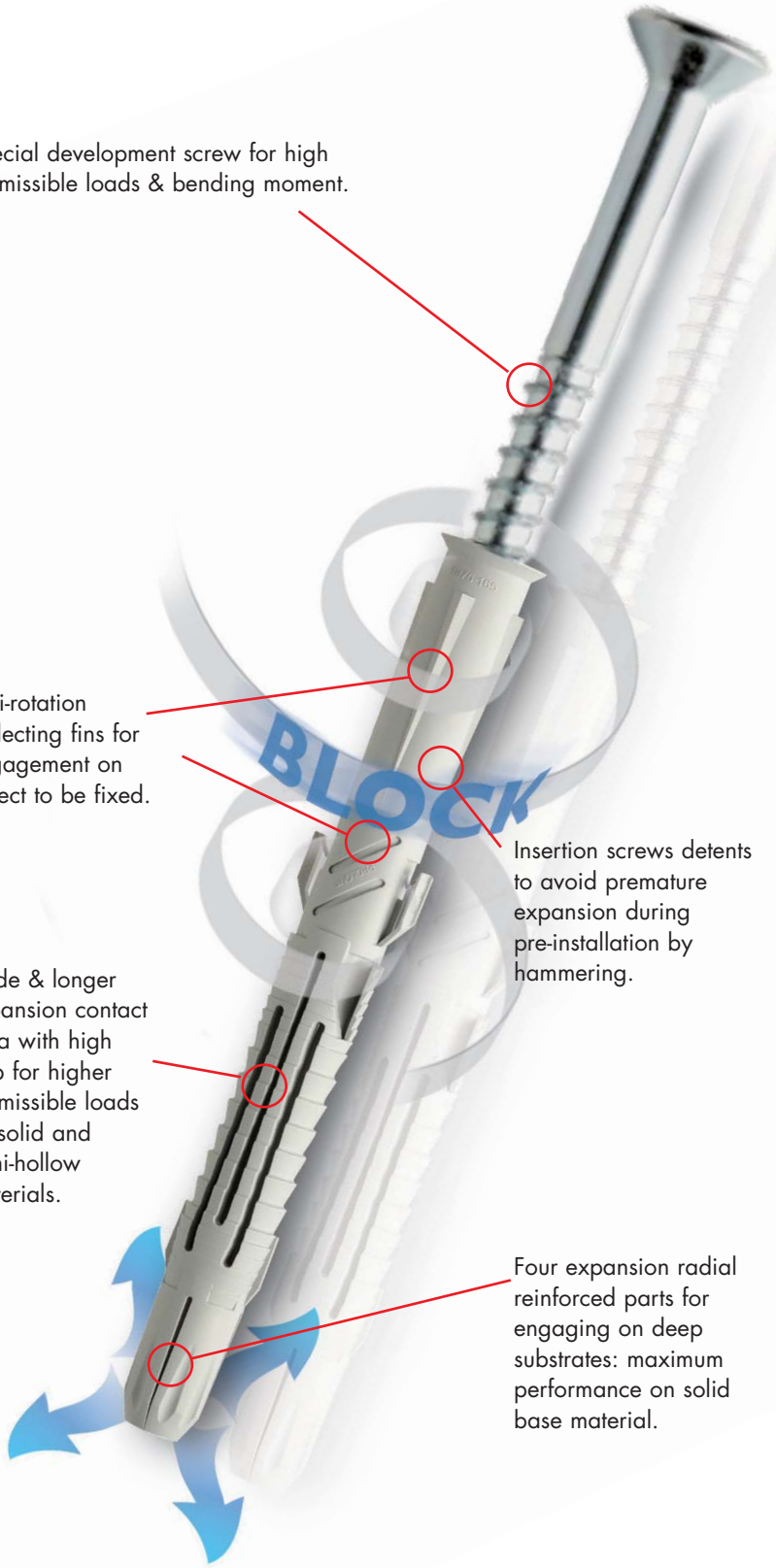
MEAN ULTIMATE AND SUGGESTED LOADS AT AXIAL TRACTION (daN)

Description	Wood Ø Screw	Ø Hole	Concrete C 20/25[1]		Solid brick		Perforated brick (double UNI)	
	(mm)	(mm)	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$	N_{rec}	$N^{t}_{Ru,m}$
APS/V 8	5,5	8	80	400	74	370	35	180
APS/V 10	7,0	10	108	540	79	395	68	340
APS/V 12	10,0	12	140	700	84	420	72	360
APS/V 16	12,0	16	170	850	100	500		

1 C20/25 ≅ 250 kg/cm² • 1 daN ≅ 1 kg • 1 kN ≅ 100 kg

T88
UNIVERSAL FRAME ANCHOR

NEW



Special development screw for high permissible loads & bending moment.

Anti-rotation deflecting fins for engagement on object to be fixed.

Insertion screws detents to avoid premature expansion during pre-installation by hammering.

Wide & longer expansion contact area with high grip for higher permissible loads on solid and semi-hollow materials.

Four expansion radial reinforced parts for engaging on deep substrates: maximum performance on solid base material.

UNIVERSAL AND VERSATILE

T88 is the new universal frame anchor with push-trough system, suitable for fixing support frames, timber frames, metal construction parts, curtain walling, door and window frames.

The use of T88 guarantees:

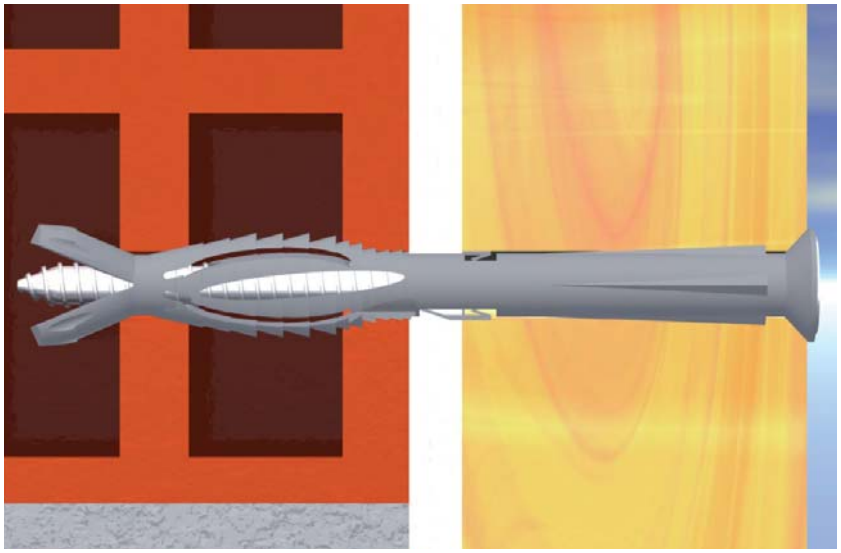
- **Versatility and innovation on functionality on several base materials** with expansion in solid building material and reinforced knot formation in hollow material.
- **Unique special design.**
- **Different versions of screws suitable for different applications.**

TE/V TORX
Countershunk head for fastening of wooden structures.

TER W
Large flat head for fastening of metallic brackets, facing elements, metallic shelves and prevention of contact corrosion.

T88

1



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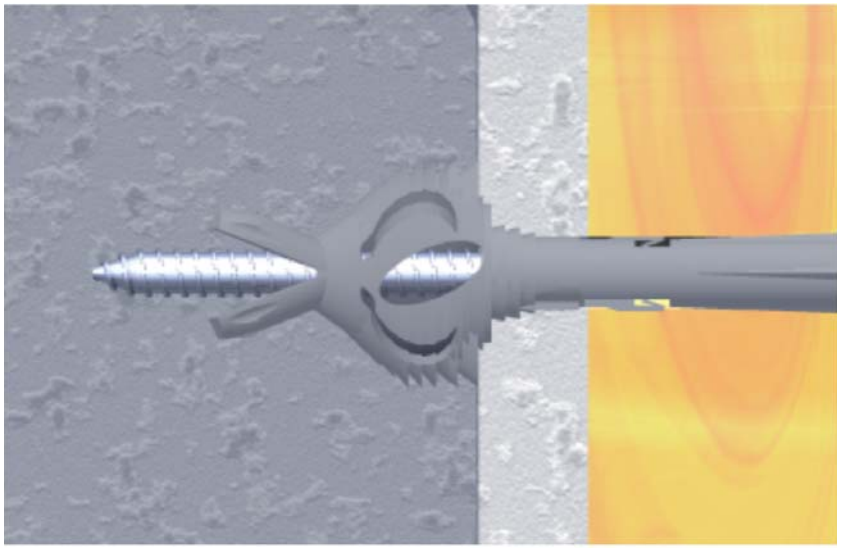


3

MAXIMUM EXPANSION

- The 4 radial reinforced parts guarantee the maximum expansion on **deep substrate** and the maximum support from the maximum area of substrate.
- The 6 radial flexible parts guarantee the best distribution of expansion of the first substrate and the best engagement between polymeric sleeves and solid substrate.

DISTRIBUTED EXPANSION

- The best homogeneous and sheared pressure against the drill-hole wall.
- Different points to bear the loads through friction on low compressive **strength substrate.**

KNOT FORMATION

Where the **hollow materials are used** and where normally the push-through fixings are problematic or almost impossible, the flexibility of T88's technology permits a safely transmission of the loads in all conditions and a mechanical strong interlocking for the **hollow base material.**

TE/V TORX

V TORX

TE/V TORX: countershunk head.

TE

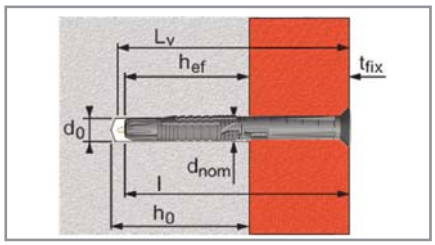
TE: hexagonal head.

Sleeve:
Material: Polyamide - Nylon
Colour: Grey RAL 7035. Halogen free

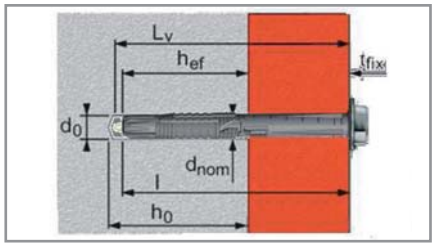
in accordance with ELV 2000/53/EC
in accordance with RoHS 2002/95/EC
in accordance with 2003/11/EC

Installation temperature: -5°C / +40°C

Working temperature: -40°C / +80°C



Description TORX	Code	Ø drill bit d_0/(mm)	Lenght anch. depth hef/(mm)	Max thickness part fixed t_{fix}/(mm)	Total sleeve lenght l(mm)	Drill depth h_0/(mm)	Min. thickness of substrate (cocrete) h_{min}/(mm)	Tight. torque on concrete t_{inst}/(mm)	Box pcs.
8x80/10	**567001**	8	70	10	80	85	140	10	50
8x100/30	**567002**	8	70	30	100	85	140	10	50
8x120/50	**567003**	8	70	50	120	85	140	10	50
10x80/10	**567004**	10	70	10	80	85	140	13	50
10x100/30	**567005**	10	70	30	100	85	140	13	50
10x115/45	**567006**	10	70	45	115	85	140	13	50
10x145/75	**567007**	10	70	75	145	85	140	13	50
10x160/90	**567008**	10	70	90	160	85	140	13	50



Description TE	Code	Ø drill bit d_0/(mm)	Lenght anch. depth hef/(mm)	Max thickness part fixed t_{fix}/(mm)	Total sleeve lenght l(mm)	Drill depth h_0/(mm)	Min. thickness of substrate (cocrete) h_{min}/(mm)	Tight. torque on concrete t_{inst}/(mm)	Box pcs.
8x80/10	**566733**	8	70	10	80	85	140	10	50
8x100/30	**566734**	8	70	30	100	85	140	10	50
8x120/50	**566735**	8	70	50	120	85	140	10	50
10x80/10	**566746**	10	70	10	80	85	140	13	50
10x100/30	**566747**	10	70	30	100	85	140	13	50
10x115/45	**566748**	10	70	45	115	85	140	13	50
10x145/75	**566749**	10	70	75	145	85	140	13	50
10x160/90	**566750**	10	70	90	160	85	140	13	50

Screw
Galvanised ≥ 5 microns

	Concrete C20/25			
	Edge distance Ccr for tensile and shear and minimum spacing			
	mm	mm	mm	mm
Diam.	Ccr,N	Ccr,V	Cmin	Smin
8	50	70	30	40
10	50	70	30	40

RECOMMENDED LOADS (single anchor-without edge or spacing influence) N_{Rec} - V_{Rec}

Anchor size		mm	8		10	
load type			tensile	shear	tensile	shear
substrate		unit	N_{Rec}	V_{Rec}	N_{Rec}	V_{Rec}
Concrete C20/25		daN	130	162	152	190
Solid brick		daN	126	140	144	170
Perforated (vertically) clay brick LD EN 771-1	≥45% ≥4 N/mm^2	daN	8	48	13	60
Perforated (vertically) clay brick LD EN 771-1	≤45% ≥8 N/mm^2	daN	38	-	42	-
Engineer (vertically) clay brick LD EN 771-1	≤45% ≥14 N/mm^2	daN	46	-	52	-
Perforated (orizzontally) clay brick EN 771-1	≥45% ≥2 N/mm^2	daN	22	-	23	-
Perforated concrete block EN 771-3	≥60% ≥8 N/mm^2	daN	40	-	42	-

TER W

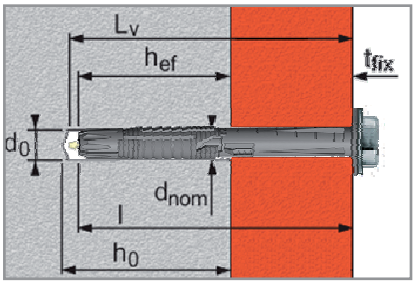
TER W: hexagonal head with washer-Torx slot

Sleeve:
Material: Polyamide - Nylon
Colour: Grey RAL 7035.
Halogen free

in accordance with ELV 2000/53/EC
in accordance with RoHS 2002/95/EC
in accordance with 2003/11/EC

Installation temperature: -5°C / +40°C

Working temperature: -40°C / +80°C



Type sleeve TER W	Code	Ø anchor d_0/(mm)	Lenght anch. depth hef/(mm)	Max thickness part fixed t_{fix}/(mm)	Total sleeve lenght l(mm)	Drill bit diameter h_0/(mm)	Min. thickness of substrate h_{min}/(mm)	Tight. torque on concrete t_{inst}/(mm)	Box pcs.
14x120/50	**566775**	14	70	50	120	90	140	25	25
14x145/75	**566776**	14	70	75	145	90	140	25	25
14x165/95	**566777**	14	70	95	165	90	140	25	25

Hexagonal head with washer
Torx slot
Galvanised ≥ 5 microns

	Concrete C20/25			
	Edge distance Ccr for tensile and shear and minimum spacing			
	mm	mm	mm	mm
Diam.	Ccr,N	Ccr,V	Cmin	Smin
14	50	105	50	50

RECOMMENDED LOADS (single anchor-without edge or spacing influence) N_{Rec} - V_{Rec}

Anchor size	mm	14	
load type		tensile	shear
substrate	unit	N_{Rec}	V_{Rec}
Concrete C20/25	daN	160	284
Perforated (vertically) clay brick LD EN 771-1 ≥45% ≥4 N/mm^2	daN	24	90
Perforated (vertically) clay brick LD EN 771-1 ≤45% ≥8 N/mm^2	daN	52	-
Engineer (vertically) clay brick LD EN 771-1 ≤45% ≥14 N/mm^2	daN	58	-
Perforated (orizzontally) clay brick EN 771-1 ≥45% ≥2 N/mm^2	daN	24	-
Perforated concrete block EN 771-3 ≥60% ≥8 N/mm^2	daN	60	-

ETPV

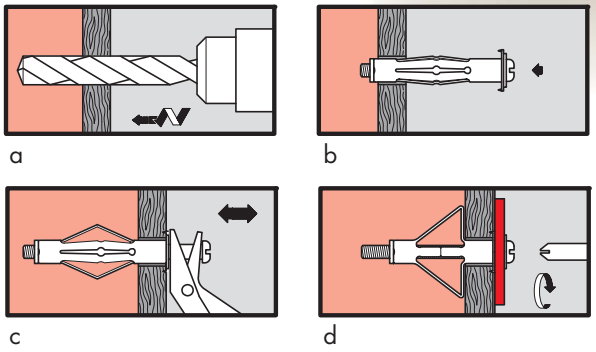
Applications

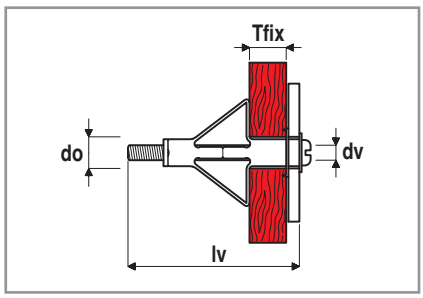
- Hollow wall anchor pre-assembled cavity fixing.
- For fixing of consoles, stirrups, lamps, electric switches, bathroom fixtures, kitchen fixtures, shelving brackets, ceiling fixtures.
- Suitable for hollow block, hollow brick, plasterboard.

Characteristics

- White zinc-plated steel body with metric screw.
- Expansion due to the return of the cone using the relative tool (cod.707070) or screwdriver.
- Anti-rotation fins prevent spinning in the hole.

INSTALLATION METHOD





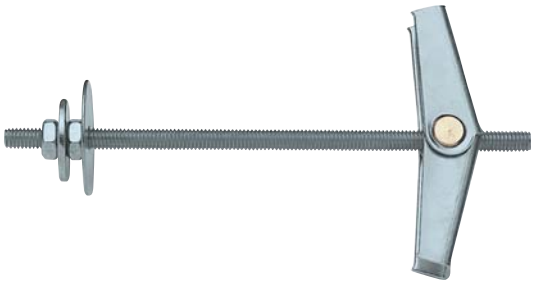
Packed in Box		Drill Ø	Anchor length	Min-Max thickness on the support	Screw size dimensions	Q.ty box	Q.ty carton
Type	Code	do/(mm)	lv/(mm)	Tfix/(mm)	dvxlv /(mm)	pcs	pcs
ETPV 7/20	**707002**	7	20	3-13	M4x28	100	-
ETPV 7/32	**707003**	7	32	3-13	M4x38	100	-
ETPV 7/45	**707005**	7	45	3-13	M4x52	100	-
ETPV 7/45	**707006**	7	45	5-19	M4x52	100	-
ETPV 7/59	**707007**	7	59	19-32	M6x65	100	-
ETPV 9/52	**707010**	9	52	6-15	M5x58	100	-
ETPV 9/65	**707011**	9	65	10-21	M5x71	100	-
ETPV 10/52	**707020**	10	52	6-15	M6x58	50	-
ETPV 10/65	**707021**	10	65	10-21	M6x71	50	-

MEAN ULTIMATE LOADS IN ALL DIRECTIONS (daN)

Description		Plasterboard 13 (mm) F_{rec}	$N^{t}_{Ru,m}$
ETPV 7	daN	10	50
ETPV 9	daN	12	60
ETPV 10	daN	12	60

Tool code 707070

ETAF



Material: All the components are in zinc-plated white steel ≥ 5µm

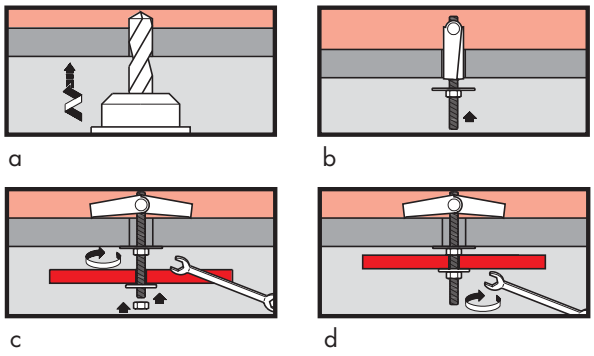
Applications

- Cavity toggle fixing, with many accessories.
- For fixing suspension elements or illuminating groups on ceiling.
- Suitable for hollow bricks, gypsum plasterboard, dry partition walls and ceilings.

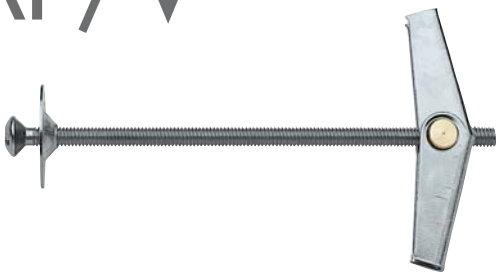
Characteristics

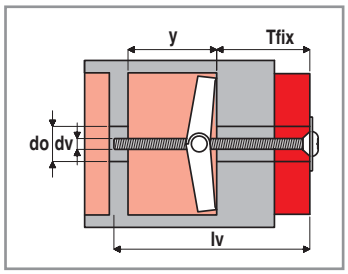
- White zinc-plated steel body with metric screw.
- Expands by spring force into any cavity.
- Surface-flush allows the attached item to be removed and refitted several times.
- The shanks of ETAF open up through spring action when the toggle is pushed through the drill hole. ETAF can be used for tensile force only.
- All the components are in zinc-plated white steel >= 5µm
- Accessories are available to satisfy any electric needs.

INSTALLATION METHOD



ETAF/V

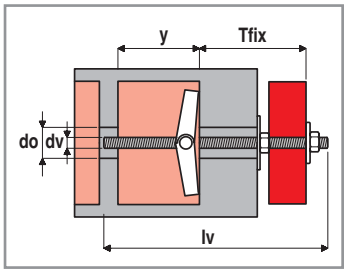




Version: toggle with countersunk head screw cl. 4.8.

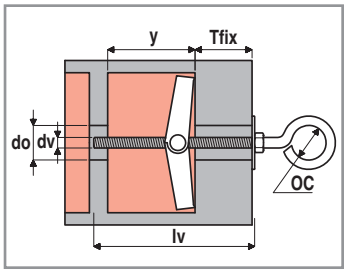
Packed in Box		Drill Ø	Minimum cavity space	Max wall thickness	Accessory sizes	Q.ty box	Q.ty carton
Type	Code	do/(mm)	y/(mm)	Tfix/(mm)	dvxlv/(mm)	pcs	pcs
ETAF/V 4/14	**8706002**	14	32	40	M4x75	50	600

ETAF/DD



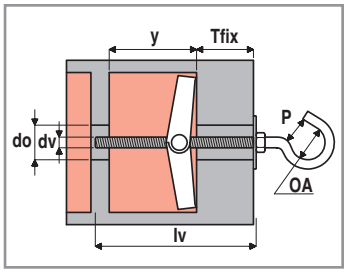
Version: toggle with threaded bar.

ETAF/OC



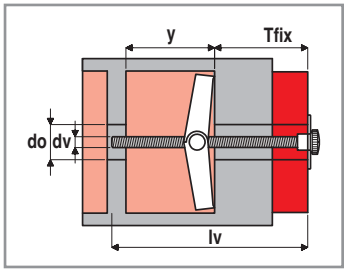
Version: toggle with closed eyebolt.

ETAF/OA



Version: toggle with open eyebolt.

ETAF/DC



Version: toggle with brass nut.

Packed in Box		Drill Ø	Minimum cavity space	Max wall thickness	Thread (ø x length)	Q.ty box	Q.ty carton
Type	Code	do/(mm)	y/(mm)	Tfix/(mm)	dvxlv/(mm)	pcs	pcs
ETAF/DD 4/14	**8706302**	14	32	53	M4x95	50	600
ETAF/OC 4/14	**8706102**	14	32	31	M4x65	50	600
ETAF/OA 4/14	**8706202**	14	32	31	M4x65	50	600
ETAF/DC 4/14	**8706352**	14	32	50	M4x95	50	600

$F_{Sk} \leq F_{rec} = F^{t}_{Ru,m} / \gamma$

F_{Sk}: Characteristics value of actions.
F_{rec}: Recommended load value.
$F^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5

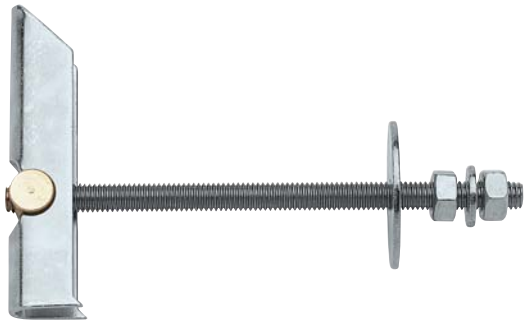
MEAN ULTIMATE LOADS AT BREACK OF THE ACCESSORY (daN)

Description		DD threaded bar		OC closed eyebolt		OA open eyebolt		V screw		DC brass nut	
		F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$
ETAF 4/14	daN	40	200	8	40	8	40	40	200	40	200

1 daN ≅ 1 kg • 1 kN ≅ 100 kg

ETR

Material: All the components are in zinc-plated white steel ≥ 5µ



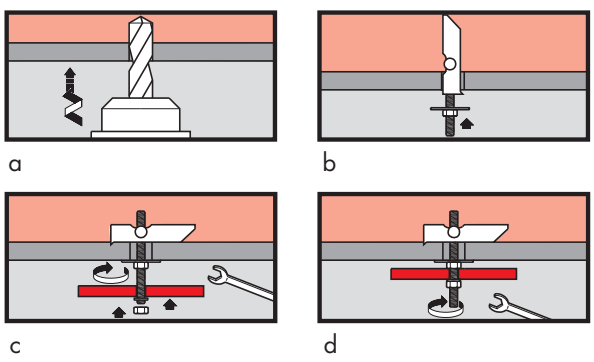
Applications

- Gravity toggle fixing for electrical heating ductwork and decorative fittings.
- Suitable for hollow bricks, gypsum plasterboard hollow block and wood board.

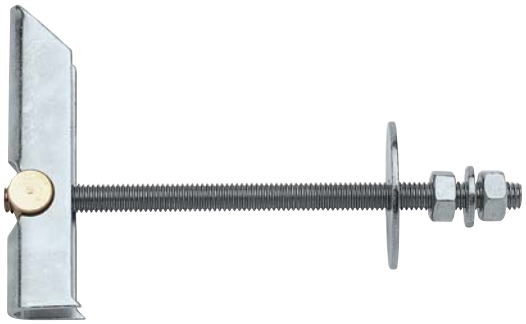
Characteristics

- White zinc-plated steel body with metric screw.
- Expands by spring force into any cavity.
- ETR is available in two version: with threaded bar and open eyebolt.

INSTALLATION METHOD

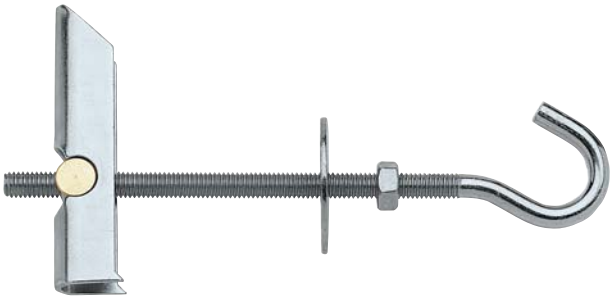


ETR/DD

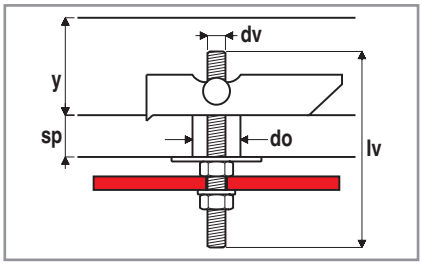


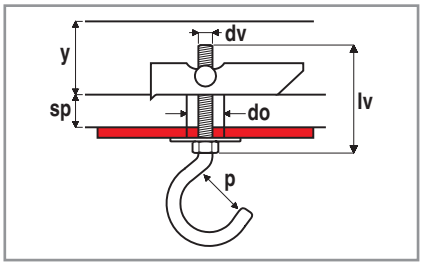
Version: toggle with threaded bar.

ETR/OA



Version: toggle with open eyebolt.

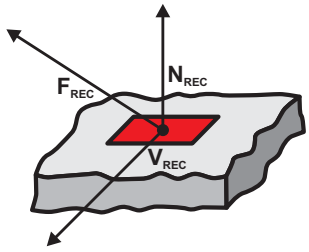




Packed in Box		Drill diameter	Mnimum cavity space	Max wall thickness	Dimensions		Q.ty box	Q.ty carton
Type	Code	do/(mm)	y/(mm)	sp/(mm)	dv/(mm)	lv/(mm)	pcs	pcs
ETR/DD 6	**8706303**	16	69	31	M6	100	25	300
ETR/OA 6	**8706203**	16	69	31	M6	14	25	300

$F_{Sk} \leq F_{rec} = F^{t}_{Ru,m} / \gamma$

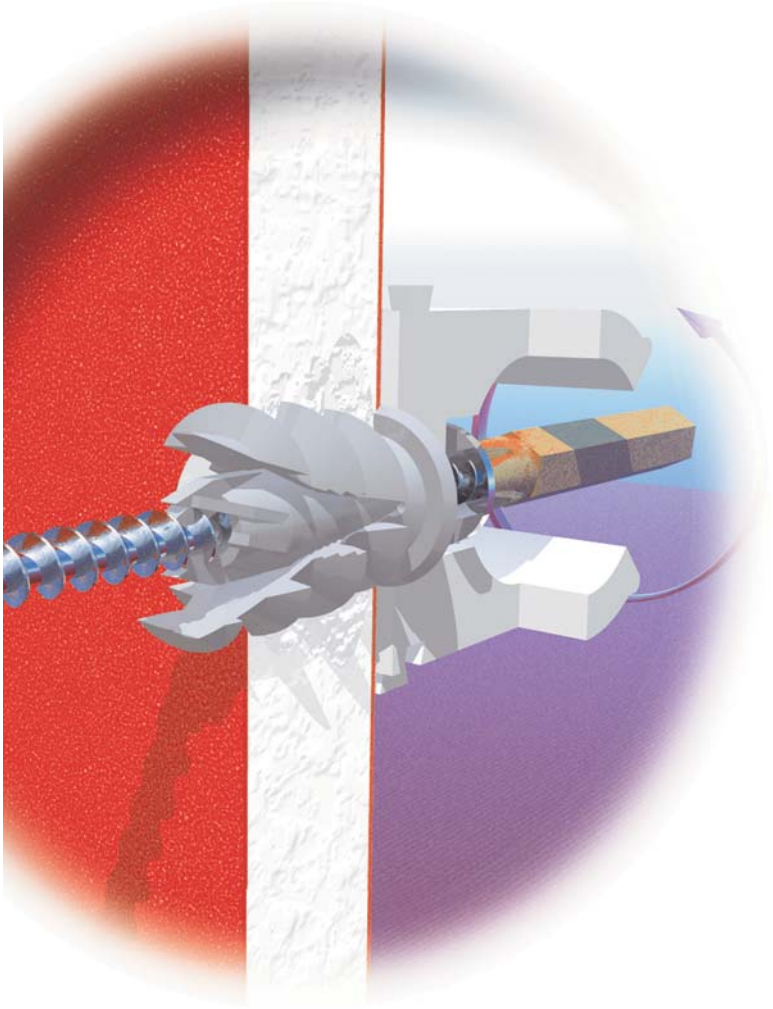
F_{Sk}: Characteristics value of actions.
F_{rec}: Recommended load value.
$F^{t}_{Ru,m}$: Mean ultimate load.
γ: Global safety factor=5



PULL-OUT VALUES in daN

Description		DD threaded bar		OA open eyebolt	
		F_{rec}	$F^{t}_{Ru,m}$	F_{rec}	$F^{t}_{Ru,m}$
ETR 6	daN	72	360	20	100

T-click



Applications

- **T-CLICK is a self-drilling anchor for hollow materials.**

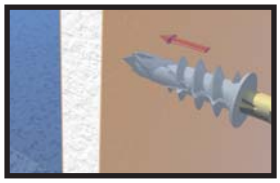
Characteristics

- T-CLICK is made of **POLYAMIDE FG** for the maximum resistance, safety and reliability.
- **SELF-DRILLING** special drawings for a fast and easy setting and a reduced damage of the plasterboard.
- **DOUBLE EXPANSION** sleeve to increase the loading area of the support for the max pull out performance.
- **BLOCK FINS** to permit the adjustment of the screw when anchor is installed.
- **COLLAPSIBLE JOINTS** to permit the expansion and cone retraction.
- Special drawing of the head for a **WALL FLAT SETTING.**

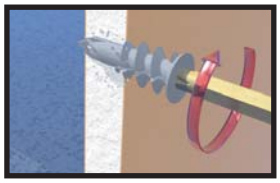
Benefits

- Installation of the anchor with a standard screwdriver or electric tool without drilling.
- Quick, safety and perfect installation.
- No preliminary drilling necessary for board thicknesses up to 15 mm.

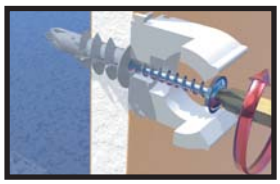
INSTALLATION METHOD



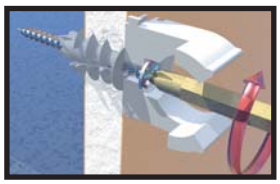
a



b



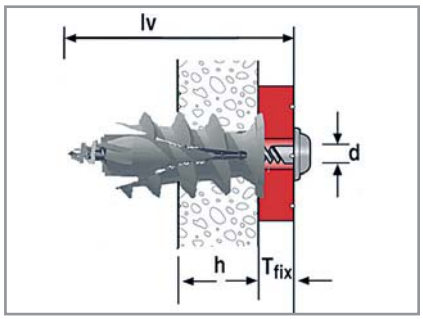
c



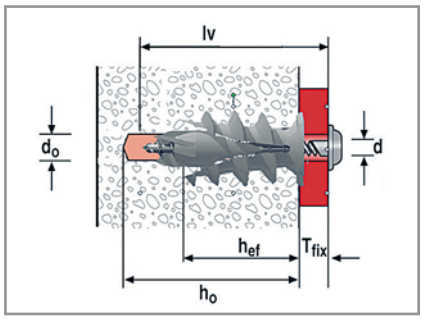
d

Tclick

Material: Polyamide (Nylon) FG
Colour: Grey RAL 7035
Working temperature:
-10°C / +80°C
Polyamide halogen free
Polyamide according to:
ELV 2000/53/EC
RoHS 2002/95/EC
2003/11/EC



Description		Max pasterboard thickness	Max thickness to fix	Screw length	Screw diameter	Q.ty box	Q.ty carton
Type	Code	h/(mm)	Tfix/(mm)	lv/(mm)	d/(mm)	pcs	pcs
TP 10 - tester box	**566261**	15	10	45	4,5	25	800
TP 10	**566301**	15	10	45	4,5	100	800



MEAN ULTIMATE AND SUGGESTED LOADS

Description		Application on panels: h<15mm				Application on materials: h>15mm			
Drill diameter	do/(mm)	-		-		8		8	
Drill depth	ho/(mm)	self drilling		self drilling		45		45	
Screw diameter	d/(mm)	4,5		4,5		4,5		4,5	
		Tensile		Shear		Tensile		Shear	
Material		N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$
Plasterboard≥10 (mm)	daN	6	29	15	75	-	-	-	-
Plasterboard≥13 (mm)	daN	9	45	24	110	-	-	-	-
Plasterboard≥26 (mm)	daN	-	-	-	-	15	80	27	140
Aerated concrete	daN	-	-	-	-	9,5	49	25	120

Resistance are calculated with large axial spacing and edge distance.

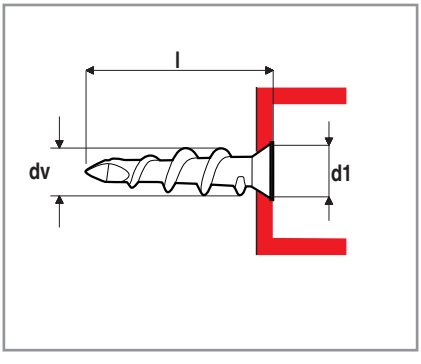
MINI DRIVA

Applications

- Self-drilling plasterboard fixing.
- For fixing electrical wares ducts, small frames, strips lamps and trunking.
- Suitable for plasterboards and aerated concrete.

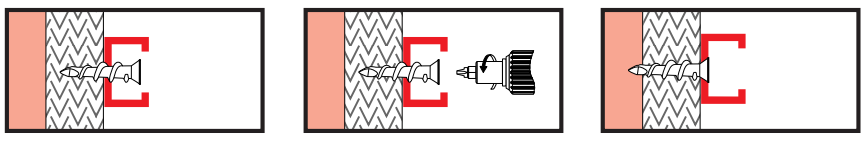
Characteristics

- Made of alluminum.
- Easy and quick installation with a screwdriver with no pre-drilling.
- Self-drilling.
- Flush head finish.



Packed in Box		Total plug length	External thread	Ø Collar	Q.ty box	Q.ty carton
Type	Code	l/(mm)	dv/(mm)	d1/(mm)	pcs	pcs
MINI DRIVA	**565398**	26,5	6,5	7,5	200	1.600

INSTALLATION METHOD



a b c

DRIVA NYLON

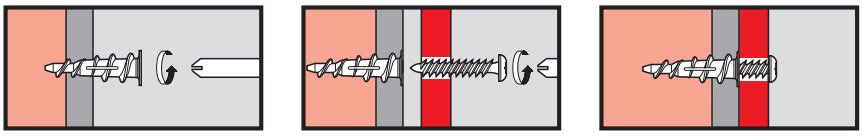
Applications

- Self-drilling plasterboard fixing.
- For fixing electrical wares ducts, small frames, strips and lamps.
- Suitable for plasterboard and aerated concrete.

Characteristics

- Made of glass fibre-reinforced nylon.
- Easy and quick installation with a screwdriver with no pre-drilling
- Large screw head.

INSTALLATION METHOD



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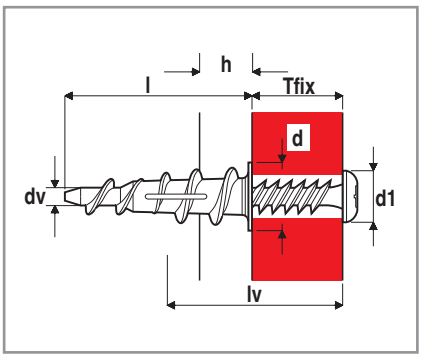


Packed in Box		Screw size	Max thickness to fix	Head plug size	Head screw size	Total plug length	Q.ty box/carton
Type	Code	dvxlv /(mm)	Tfix/(mm)	do/(mm)	d1/(mm)	l/(mm)	pcs
DRIVA NYLON	**8704216**	3,0x25	12	9,5	8,6	30	200

RECOMMENDED AND MEAN ULTIMATE LOADS (daN)

Description	Aerated concrete				Plasterboard h≥13 (mm)			
	Tensile		Shear		Tensile		Shear	
	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$
DRIVA NYLON	4,5	23	15	75	4,5	22	16	80

DRIVA

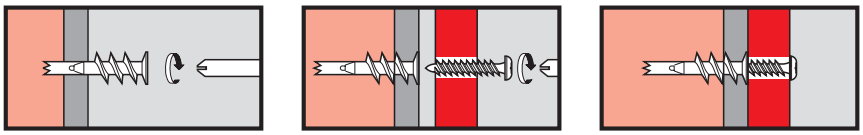
Applications

- Self-drilling plasterboard fixing.
- For fixing electric switches, small frames, pictures, shelves, lamps.
- Suitable for hollow bricks, gypsum plasterboard, aerated concrete and wood.

Characteristics

- High-strength body in zamak.
- Quick and easy installation using only a screwdriver.
- Available with a range of screws for different applications.
- Positive tightening of the anchor.

INSTALLATION METHOD



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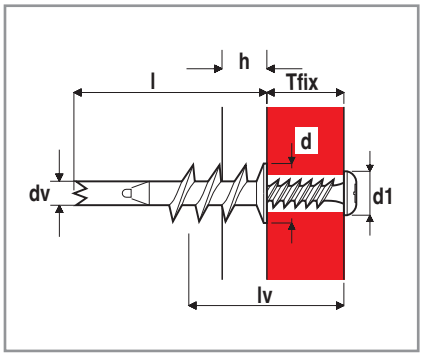


Packed in Box		Screw size	Max thickness to fix	Head plug size	Head screw size	Total plug length	Q.ty box	Q.ty carton
Type	Code	dvxlv/(mm)	Tfix/(mm)	do/(mm)	d1/(mm)	l/(mm)	pcs	pcs
DRIVA TP 12	**8704226**	4,5x35	12	13	9,2	37	100	3.200
DRIVA TF 5	**8704227**	4,5x25	5	13	8,2	37	100	3.200
DRIVA TF 27	**8704228**	4,5x50	27	13	8,8	37	100	3.200

TP = rounded head screw TF = countersunk head screw.

RECOMMENDED AND MEAN ULTIMATE LOADS (daN)

Description	Aerated concrete				Plasterboard h≥13 (mm)			
	Tensile		Shear		Tensile		Shear	
	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$
DRIVA	6	30	18	90	6	30	18	90

DRIVA PLUS

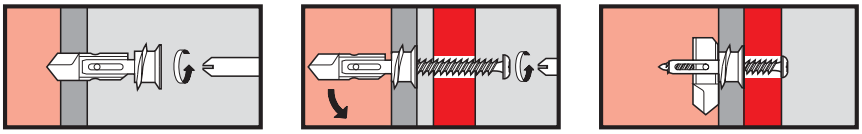
Applications

- Self-drilling plasterboard fixing.
- For fixing electrical wares ducts, small frames, strips lamps, radiators.
- Suitable for hollow bricks, gypsum plasterboard and gypsum fibreboards.

Characteristics

- Body made of zamak.
- Quick and easy installation using only a screwdriver.
- Large screw head.

INSTALLATION METHOD



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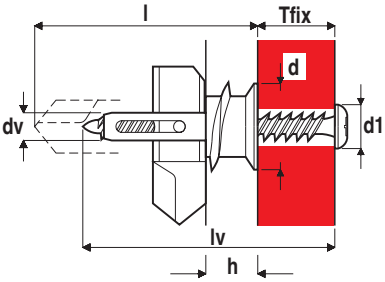


Packed in Box		Screw size	Max thickness to fix	Head plug size	Head screw size	Total plug length	Q.ty box	Q.ty carton
Type	Code	dvxlv/(mm)	Tfix/(mm)	do/(mm)	d1/(mm)	l/(mm)	pcs	pcs
DRIVA PLUS TP 12	**8704236**	4,5x45	12	16	9,2	39	100	800
DRIVA PLUS TF 30	**8704237**	4,5x60	30	16	8,8	39	100	800

RECOMMENDED AND MEAN ULTIMATE LOADS (daN)

Désignation	Plasterboard h≥10 (mm)				Plasterboard h≥13 (mm)			
	Tensile		Shear		Tensile		Shear	
	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$	N_{rec}	$N_{u,m}$	V_{rec}	$V_{u,m}$
DRIVA PLUS	8,5	42	23	115	12	60	28	140

LE-LEX

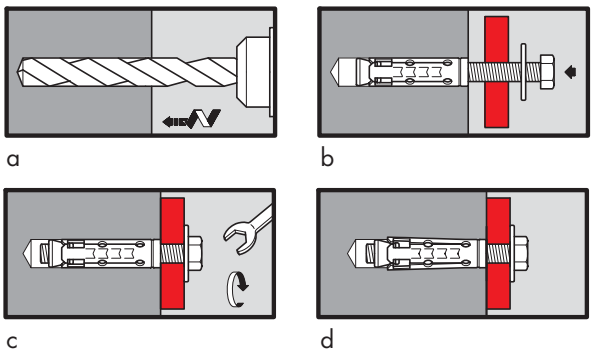
Applications

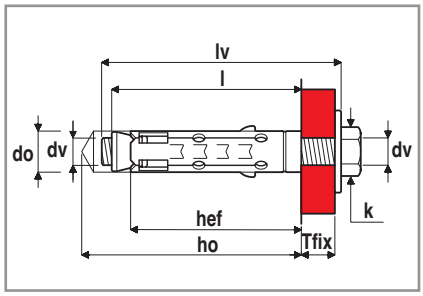
- Medium heavy-duty anchor, used in metallic carpentry and installations where versatility is required (thanks to all the accessories).
- Suitable for concrete, solid bricks, natural stone and compact materials.

Characteristics

- Expansion in 4 different sectors.
- Special geometry of the cone.
- Anti-rotation fins.
- Anchorage relieves on the surface.
- Available in different versions: zinc-plated steel version LE, A2 steel version LEX, A4 stainless steel version on request.
- Available with accessoires.
- Suitable for all studs with metric thread.

INSTALLATION METHOD





Version: This anchor can be utilized with many different screws and accessories with thread from M6 till to M12.

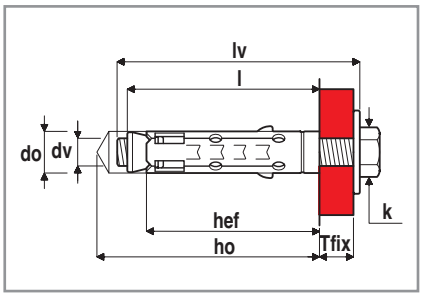
Packed in Box		Drill Ø	Anchor lenght	Thread Ø	Min. drill depth	Anchorage depth	Q.ty box	Q.ty carton
Type	Code	do/(mm)	l/(mm)	dv/(mm)	ho/(mm)	hef/(mm)	pcs	pcs
LE 6	**8717001**	10	45	M6	55	40	100	800
LE 8	**8717002**	12	50	M8	60	54	100	800
LE 10	**8717003**	15	60	M10	75	67	50	400
LE 12	**8717004**	18	74	M12	90	80	25	200
Stainless steel A2								
LEX 6	**8717011**	10	45	M6	55	40	100	800
LEX 8	**8717012**	12	50	M8	60	54	100	800
LEX 10	**8717013**	15	60	M10	75	72	50	400
LEX 12	**8717014**	18	74	M12	90	80	25	200

LE/B-LEX/B

Version: anchor with hexagonal zinc-plated head screw cl. 8.8.

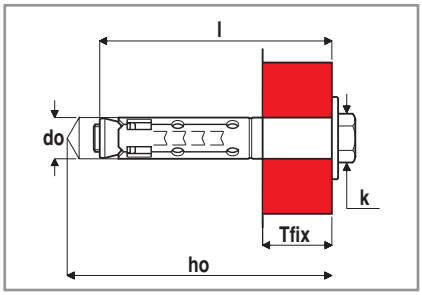
LE/BP

Version: anchor with long hexagonal zinc-plated head screw cl. 8.8.



Version **LE/B**
Version **LEX/B**

Type	Code	Drill Ø do/(mm)	Min. drill hole depht ho/(mm)	Thread Ø lenght dvxlv/(mm)	Fixable thickness Tfix/(mm)	Wrench size k/(mm)	Tightening couple M/Nm	Q.ty box pcs	Q.ty carton pcs
Hexagonal head screw cl. 8.8 version									
LE/B 6	**8717101**	10	55	M6x55	5	10	10	50	400
LE/B 8	**8717102**	12	60	M8x60	10	13	25	50	400
LE/B 10	**8717103**	15	75	M10x80	20	17	45	25	200
LE/B 12	**8717104**	18	90	M12x90	25	19	75	20	160
LEX/B hexagonal head screw in stainless steel A2 (on request)									
Long hexagonal head screw cl. 8.8 version									
LE/BP 6	**8717106**	10	80	M6x70	25	10	10	50	400
LE/BP 8	**8717107**	12	85	M8x75	25	13	25	50	400
LE/BP 10	**8717108**	15	100	M10x90	25	17	45	25	200
LE/BP 12	**8717109**	18	120	M12x105	30	19	75	20	80

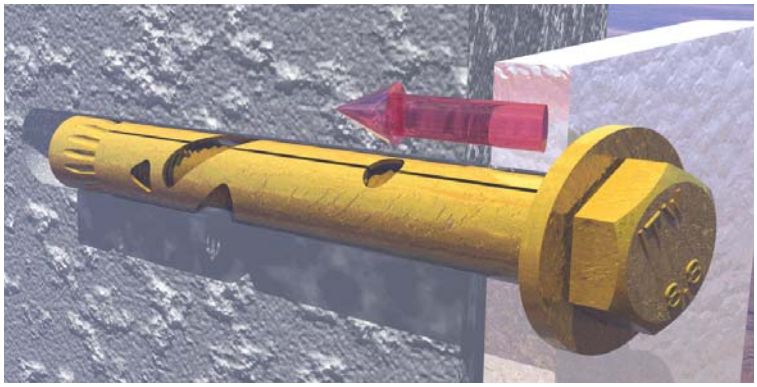


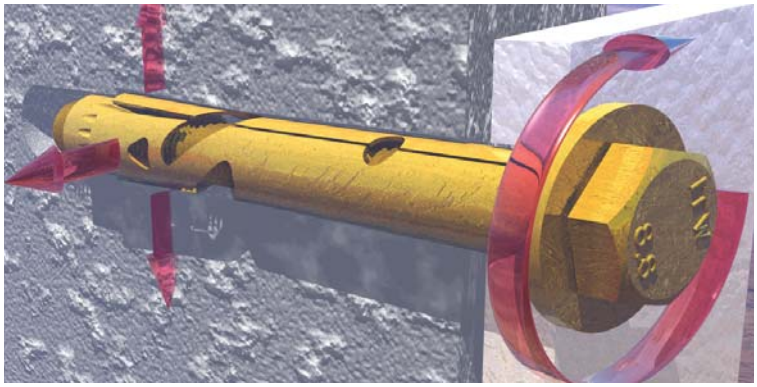
Version **LE/BP**

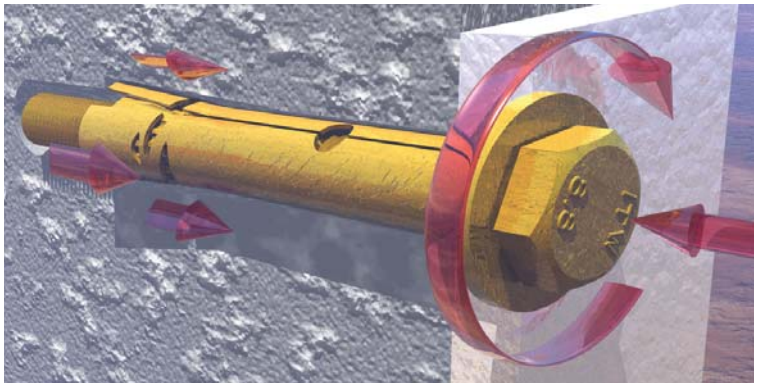
RECOMMENDED LOADS (kN)

					Non cracked concrete C20/25	
	hef	hmin	smin	cmin	N_{rec}	V_{rec}
LE M6	35	110	70	50	2,5	3,2
LE M8	40	110	80	190	3,0	4,6
LE M10	51	110	145	60	4,2	5,3
LE M12	63	140	200	75	6,6	9,8
LEX M6 A2	35	110	70	50	2,5	3,2
LEX M8 A2	40	110	80	55	3,0	4,6
LEX M10 A2	51	110	145	60	4,2	5,3
LEX M12 A2	63	140	200	75	6,6	9,8

DYNABOLT PLUS







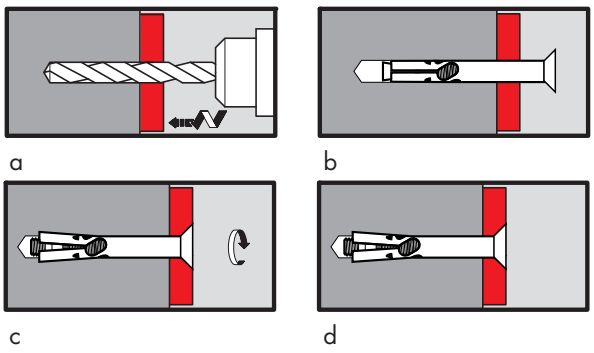
Applications

- Sleeve anchor at expansion for medium loads.
- For fixing of steel constructions, cable trays, ventilation systems.
- Suitable for concrete, solid brick, solid block.

Characteristics

- Zinc-plated steel body.
- On request, Dynabolt Plus is available in stainless steel.
- Through fixing installation.
- Quick and easy installation through the part to be fixed.
- High expansion on any type of base material.
- Finished head anchor, bolt can be easily removed.
- Torque controlled expansion anchor.

INSTALLATION METHOD



RECOMMENDED LOADS (kN)

						Non cracked concrete C20/25	
	hef	hmin	smin	cmin	Tfix	N_{rec}	V_{rec}
DP 08040	26	60	50	50	9	2,3	4,0
DP 08065	30	90	50	50	30	3,0	4,0
DP 10050	26	60	55	55	17	2,3	6,4
DP 10075	34	100	55	55	29	4,6	6,4
DP 10105	34	70	55	55	56	4,6	6,4
DP 12070	34	130	55	55	27	3,8	7,9
DP 12100	50	160	60	60	40	6,5	7,9
DP 12125	50	215	65	65	68	6,5	7,9
DP 16140	65				64	9,6	10,5
DP 20080	85				20	14,4	14,6
DP 20115	85				52	14,4	14,6
DP 20160	85				96	14,4	14,6

DP B

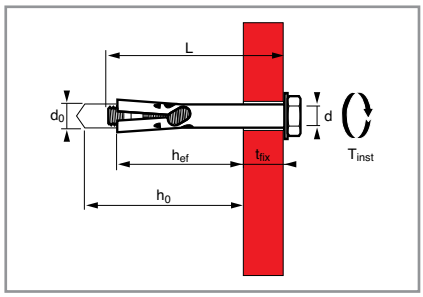
Version **B**: Anchor with hexagonal head cl. 8.8.

DP D

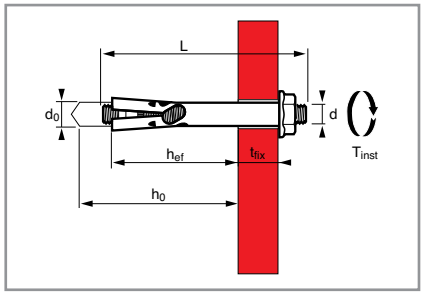
Version **D**: Anchor with threaded bar.

DP E

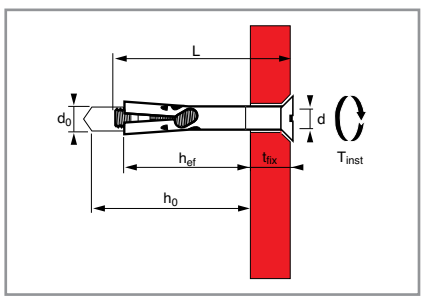
Version **E**: Anchor with countersunk head.



Version B



Version D



Version E

Type	Code	Screw Ø do/(mm)	Drill do/(mm)	Min. drill hole depth ho/(mm)	Anchor lenght L/(mm)	Fixable fixing Tfix/(mm)	Q.ty box pcs	Q.ty carton pcs
Anchor with hexagonal screw cl. 8.8								
DP 08045B	**050489**	M6	8	35	45	8	100	800
DP 08070B	**050491**	M6	8	40	70	30	50	400
DP 08095B	**050492**	M6	8	40	95	55	50	400
DP 10055B	**050493**	M8	10	37	55	17	50	400
DP 10080B	**050494**	M8	10	52	80	29	50	400
DP 10105B	**050495**	M8	10	52	105	56	25	200
DP 12075B	**050496**	M10	12	49	75	27	25	200
DP 12105B	**050497**	M10	12	64	105	40	20	160
Anchor with threaded bar								
DP 08040D	**565252**	M6	8	35	40	9	100	800
DP 08065D	**565253**	M6	8	40	66	30	50	400
DP 10050D	**565255**	M8	10	37	49	17	50	400
DP 10075D	**565256**	M8	10	52	76	29	50	400
DP 10105D	**565257**	M8	10	52	103	56	25	400
DP 10125D	**565258**	M8	10	52	125	76	25	200
DP 12070D	**565260**	M10	12	49	70	27	25	200
DP 12100D	**565261**	M10	12	64	98	40	20	200
DP 12125D	**565262**	M10	12	64	126	68	20	160
DP 16140D	**565265**	M12	16	84	140	64	10	80
DP 20080D	**565266**	M16	20	84	80	20	10	80
DP 20115D	**565267**	M16	20	84	115	52	10	80
DP 20160D	**565268**	M16	20	84	160	96	5	80
Anchor with countersunk head								
DP 08045E	**8723091**	M6	8	55	45	10	100	800
DP 08065E	**8723092**	M6	8	75	65	25	100	800
DP 10050E	**8723093**	M8	10	60	50	10	50	400
DP 10070E	**8723094**	M8	10	90	70	25	50	400
DP 12080E	**8723096**	M10	12	90	80	25	50	400

ETHD + tool

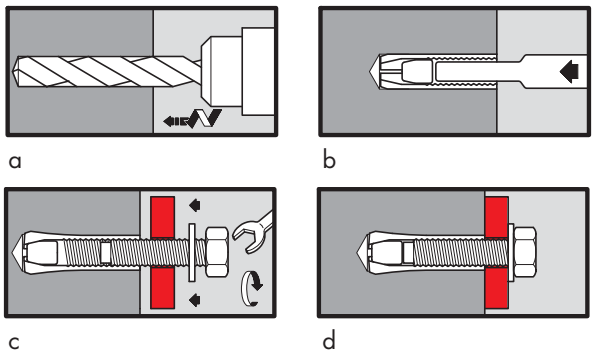
Applications

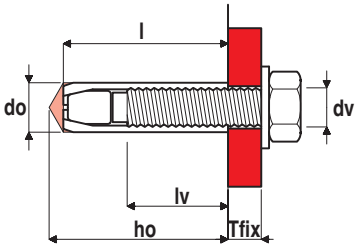
- Drop-in anchor for fixing of suspended ceilings, facades, gratings, steel constructions, consoles, ventilation and sprinkler systems.
- Suitable for concrete.

Characteristics

- Steel body.
- On request ETHD is available in stainless steel.
- Push-through installation.
- Anchor with internal thread for quick installation with any metric screws from 6 till to 20 mm.
- High expansion on any type of base material.
- Neat bolt head finish.

INSTALLATION METHOD





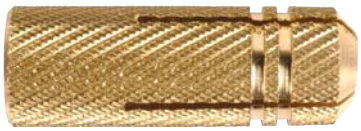
Material: zinc-plated steel

Type	Code	Tool code	Drill Ø do/(mm)	Anchor length l/(mm)	Thread length lv/(mm)	Min. drill depth ho/(mm)	Thread Ø dv/(mm)	Tightening couple Tinst/Nm	Q.ty box pcs	Q.ty carton pcs
ETHD 6	**8724001**	8724801	8	30	11,5	32	M6	4	200	1200
ETHD 8	**8724002**	8724802	10	30	13,5	32	M8	8	100	600
ETHD 10	**8724003**	8724803	12	40	16,0	42	M10	15	100	300
ETHD 12	**8724004**	8724804	15	50	21,0	53	M12	35	50	120

MEAN ULTIMATE LOADS (mm)

	hef	hmin	smin	cmin	Nk
ETHD M6	32	160	100	70	2,7
ETHD M8	32	160	120	85	3,4
ETHD M10	42	180	160	100	5,0
ETHD M12	53	220	200	130	6,8
ETHD M16	70	280	250	170	10,9

T51



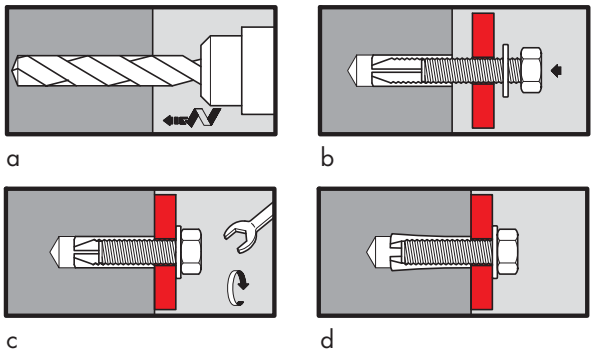
Applications

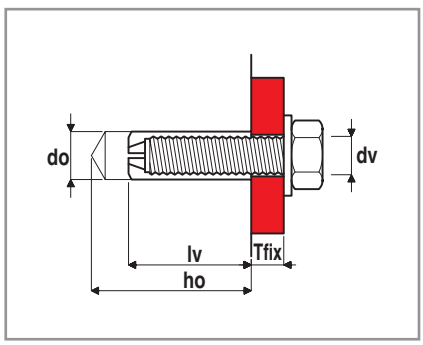
- Brass expansion anchor for metric screws for fixing of suspended ceilings, facades, gratings, steel constructions, consoles, ventilation and sprinkler systems.
- Suitable for concrete, natural stone and wood.

Characteristics

- Shallow embedment.
- T51 can be used with all types of bolts and metric screws.
- The anchor is suitable in corrosive environments.

INSTALLATION METHOD





Type	Code	Drill ø do/(mm)	Anchor lenght l/(mm)	Min. drill depth ho/(mm)	Bolt penetration lv/(mm)	Thread ø dv/(mm)	Q.ty box pcs	Q.ty carton pcs
T51 5	**8727002**	6,5	21	26	21	M5	200	3200
T51 6	**8727003**	8	24	29	24	M6	300	3600
T51 8	**8727004**	10	29	35	31	M8	200	1600
T51 10	**8727005**	12	32	37	34	M10	100	1200

ETD II

Approvals

European Technical Approval-
Option 7 for non-cracked concrete

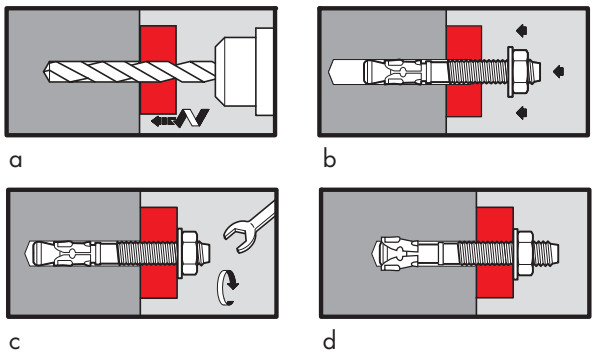
APPLICATIONS

- Through bolt anchor, self expanding stud, for fixing steel and timber framework and beams, industrial doors and gates, storage systems, stadium seating.
- Suitable for non-cracked concrete with good resistance to the compression.

CHARACTERISTICS

- More load, maximum resistance to the stress, maximum resistance to the corrosion, versatility, rapid application, totale expansion with less turn of spanner.
- Anti-rotation expansion sleeve
- Expansion sleeve design ensures maximum expansion.
- Rolled thread to increase the strength.
- Zinc-coated expansion sleeve.

INSTALLATION METHOD



ETD II

Superior loads in the most different conditions thanks to the new structure of the expansion BUSSOLA with its 120° three directional aperture for a better distribution of the anchoring strengths on concrete (1).

Versatility to the maximum levels: several depths of setting, wide range of thickness, possibility of distanced fixings. The new lengths of threading allow to vary the depth of setting and the fixable thickness with the same anchor or to operate with distanced fixings.

Immediate grip on concrete. The 6 wings present on the anchoring BUSSOLA avoid any rotation also partial during the clenching and assure an immediate grip on the concrete.

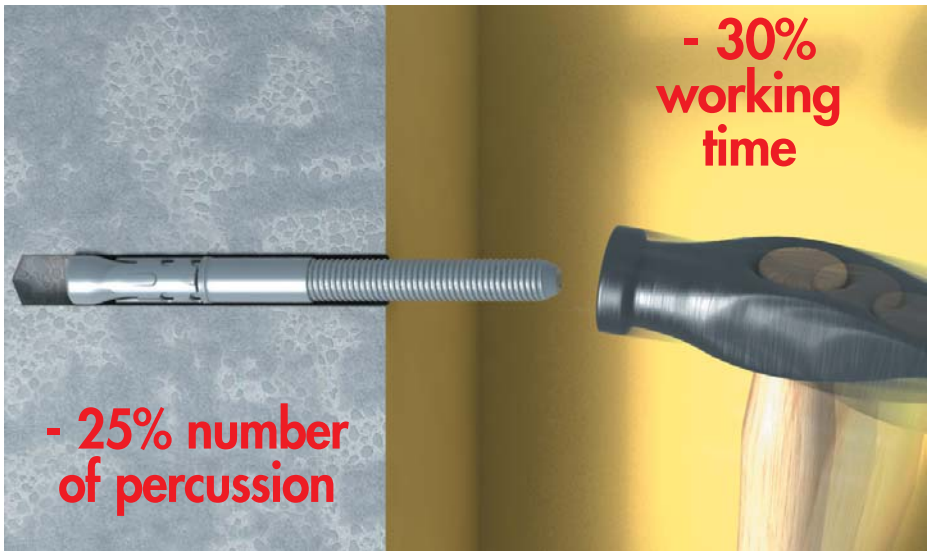
Maximum resistance to the solicitations. Thanks to the innovative production processes, to the new geometries, to the new materials, the resistance to the solicitations achieves the maximum levels of the category.

No waste of time in assembling. Bolt and washer are preassembled and ready for the clenching. The washers have special dimensions with a diameter bigger than the one normally assembled on such kind of anchor.

Total expansion with less turns of nutdrive (-30%). The wings of BUSSOLA have an internal plane inclined for facilitating and speeding up the installation to the maximum.

1

2



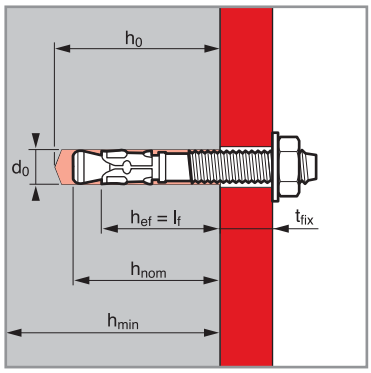
HLE: maximum resistance to the corrosion, thanks to the innovative and exclusive HLE treatment (HIGH ELASTIC LIMIT) applied to the girdle and to the zinc-plated body with a thickness of 10 microns.

Inox A4: for outdoor applications and in corrosive environments, INOX A4 for all the components.

Faster fixing (-25% number of percussions). The particular overall geometry allows a faster fixing in the concrete, with less hammer hits.

Awareness and possibility of verification in every moment. Although the anchor is installed, the letter engraved on the head allows to know immediately the anchoring depth and consequently to verify the installation.

ETD II



MINIMUM ANCHORAGE DEPTH

Description	Code	Anchor sizes	Anchorage depth: Installation depth	Max fixable thickness: Min thickness of the support	Ø Hole on the object: Drill depth	Ø Drill: Tightening couple	Check letter	Q.ty carton: Q.ty pack
Zinc-plated version Packed in BOX		hef min	Tfix max: hnom	Tfix max: hmin	df: ho	do: Tinst		pcs
ETD II 8x70/20-7	**050517**	M8 x 70	35	42	20	100	9	52	8	15	C	100	800
ETD II 8x90/40-27	**050518**	M8 x 90			40						E	100	600
ETD II 8x130/80-67	**050519**	M8 x 130			80						H	50	400
ETD II 10x75/15-5	**050522**	M10 x 75	42	50	15	100	12	62	10	30	C	50	400
ETD II 10x95/35-25	**050523**	M10 x 95			35						E	50	400
ETD II 10x140/80-70	**050524**	M10 x 140			80						I	25	200
ETD II 12x100/25-8	**050526**	M12 x 100	50	60	25	100	14	75	12	40	E	25	200
ETD II 12x140/65-48	**050527**	M12 x 140			65						I	25	200
ETD II 12x180/105-88	**050528**	M12 x 180			105						L	25	150
ETD II 12x220/145-128	**050529**	M12 x 220			145						O	20	80
ETD II 16x125/30-8	**050532**	M16 x 125	64	78	30	128	18	95	16	100	G	20	120
ETD II16x170/75-53	**050533**	M16 x 170			75						K	20	120
ETD II 20x160/50-25	**050535**	M20 x 160	74	89	50	148	22	110	20	160	J	10	60
ETD II 20x215/105-80	**050536**	M20 x 215			105						N	10	40
Stainless steel A4 version (nut and washer are not assembled)													
ETD II 8x55/5	**050542**	M8 x 55	35	42	5	100	9	52	8	15	-	100	800
ETD II 8x70/20-7	**050543**	M8 x 70			20						C	100	800
ETD II 8x90/40-27	**050544**	M8 x 90			40						E	100	600
ETD II 10x75/15-5	**050546**	M10 x 75	42	50	5	100	12	62	10	30	-	50	400
ETD II 10x95/35-25	**050547**	M10 x 95			15						C	50	400
ETD II 12x80/5	**050551**	M12 x 80	50	60	35	100	14	75	12	40	E	25	200
ETD II 12x100/25-8	**050552**	M12 x 100			5						-	25	200
ETD II 12x140/65-48	**050553**	M12 x 140			25						E	25	200
ETD II 16x125/30-8	**050555**	M16 x 125	64	78	65	128	18	95	16	100	I	20	120
ETD II 16x170/75-53	**050556**	M16 x 170			30						G	20	120

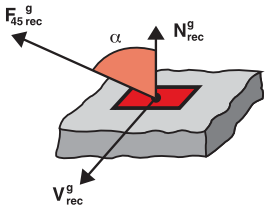
RECOMMENDED LOADS (kN)*

MINIMUM ANCHORAGE DEPHT

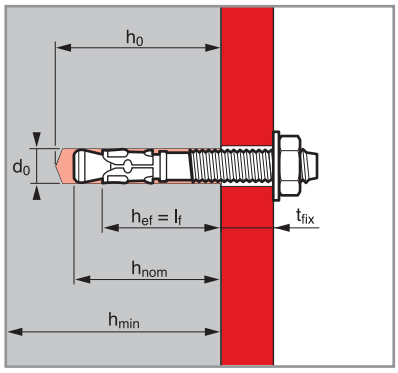
Single anchorage				Concrete C20/25		
	h≥	hef	c≥	N^g_{rec}	$F45^g_{rec}$	Vg^g_{rec}
ETD II M8	150	36	130	2,0	2,0	2,7
ETD II M10	150	42	250	3,0	3,4	5,4
ETD II M12	150	50	310	5,3	5,4	7,1
ETD II M16	180	64	490	8,3	9,0	12,1
ETD II M20	250	74	640	9,9	12,1	25,5
ETD II M8 A4	150	35	150	2,5	2,1	2,3
ETD II M10 A4	150	42	250	3,0	3,4	5,4
ETD II M12 A4	150	50	310	4,0	4,4	7,1
ETD II M16 A4	180	64	490	7,1	7,2	9,6

* See ETA appovals.

without edges



ETD II



MAXIMUM ANCHORAGE DEPTH

Description	Code	Anchorage depth: Anchor sizes	hef min	Installation depth: hnom	Max fixable thickness: Tfix max	Min thickness of the support: hmin	Ø Hole on the object: df	Drill depth: ho	Ø Drill: do	Tightening couple: Tinst	Check letter	Q.ty pack: pcs	Q.ty carton: pcs
Zinc-plated version Packed in BOX													
ETD II 8x70/20-7	**050517**	M8 x 70	48	55	7	100	9	65	8	15	C	100	800
ETD II 8x90/40-27	**050518**	M8 x 90			27						E	100	600
ETD II 8x130/80-67	**050519**	M8 x 130			67						H	50	400
ETD II 10x75/15-5	**050522**	M10 x 75	52	60	5	104	12	72	10	30	C	50	400
ETD II 10x95/35-25	**050523**	M10 x 95			25						E	50	400
ETD II 10x140/80-70	**050524**	M10 x 140			70						I	25	200
ETD II 12x100/25-8	**050526**	M12 x 100	68	78	8	136	14	93	12	40	E	25	200
ETD II 12x140/65-80	**050527**	M12 x 140			48						I	25	200
ETD II 12x180/105-88	**050528**	M12 x 180			88						L	25	150
ETD II 12x220/145-128	**050529**	M12 x 220			128						O	20	80
ETD II 16x125/30-8	**050532**	M16 x 125	86	100	8	172	18	117	16	100	G	20	120
ETD II16x170/75-53	**050533**	M16 x 170			53						K	20	120
ETD II 20x160/50-25	**050535**	M20 x 160	100	115	25	200	22	136	20	160	J	10	60
ETD II 20x215/105-80	**050536**	M20 x 215			80						N	10	40
Stainless steel A4 version (nut and washer are not assembled)													
ETD II 8x70/20-7	**050543**	M8 x 55	48	55	7	100	9	65	8	15	C	100	800
ETD II 8x90/40-27	**050544**	M8 x 90			27						E	100	600
ETD II 10x75/15-5	**050546**	M10 x 75	52	60	5	104	12	72	10	30	C	50	400
ETD II 10x95/35-25	**050547**	M10 x 95			25						E	50	400
ETD II 12x100/25-8	**050552**	M12 x 100	68	78	8	136	14	93	12	40	E	25	200
ETD II 12x140/65-48	**050553**	M12 x 140			48						I	25	200
ETD II 16x125/30-8	**050555**	M16 x 125	86	100	8	172	18	117	16	100	G	20	120

Zinc-plated version:
ETA Option 7 n° ETA-02/0046
Inox A4 version:
ETA Option 7 n° ETA-02/0047

given by CSTB

Approvals

European Technical Approval- Option 7 for non-cracked concrete

Zinc-plated: 0679-CPD-0006
Inox A4: 0679-CPD-0007

CSTB
le futur en construction

Method of calculation of the Guide ETA

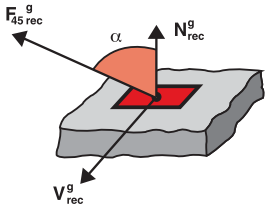
RECOMMENDED LOADS (kN)*

MAXIMUM ANCHORAGE DEPTH

Single anchorage				Concrete C20/25		
	h≥	hef	c≥	N^g_{rec}	$F_{45}{}^g_{rec}$	Vg^g_{rec}
ETD II M8	150	48	140	3,0	2,5	2,7
ETD II M10	150	52	350	4,0	4,5	7,5
ETD II M12	200	68	450	6,6	7,6	13,0
ETD II M16	250	86	350	13,2	11,9	13,5
ETD II M8 A4	150	48	140	4,0	2,5	2,3
ETD II M10 A4	150	52	350	4,0	4,4	6,8
ETD II M12 A4	200	68	450	6,6	7,2	11,0
ETD II M16 A4	250	86	350	9,9	8,7	9,6

* See ETA appovals.

without edges



E/CL

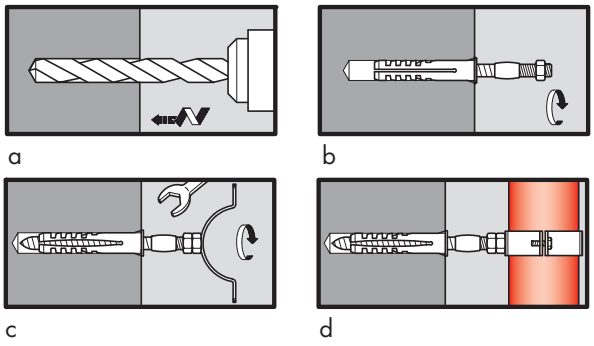
E/CL

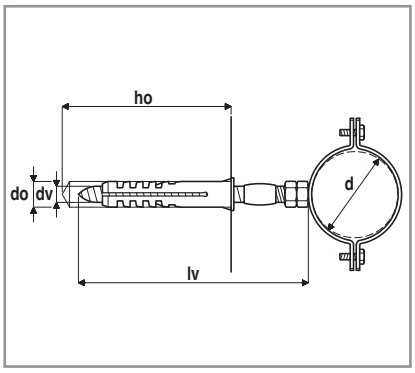
Heavy-duty collar in zinc-plated steel for 3/8" to 4" pipes.

The system is composed by a zinc-plated steel collar, double threaded screw and E wallplug.

Thanks to the E plug, the system is suitable for concrete, solid brick, and hollow mansonry.

INSTALLATION METHOD





Description		Pipe ø	Thread	Drill ø	Min. drill hole depth	Q.ty bag	Q.ty box
Type	Code	d/inch.	dv/(mm)	do/(mm)	ho/(mm)	pcs	pcs
E/CL 3/8"	**8411001**	3/8"	M8	10	75	2	100
E/CL 1/2"	**8411002**	1/2"	M8	10	75	2	100
E/CL 3/4"	**8411003**	3/4"	M8	10	75	2	100
E/CL 1"	**8411004**	1"	M8	10	75	2	100
E/CL 1 1/4"	**8411005**	1 1/4"	M8	10	75	2	100
E/CL 1 1/2"	**8411006**	1 1/2"	M8	10	75	2	100
E/CL 2"	**8411007**	2"	M8	10	75	2	50
E/CL 2 1/2"	**8411008**	2 1/2"	M10	12	85	2	50
E/CL 3"	**8411009**	3"	M10	12	85	2	50
E/CL 4"	**8411010**	4"	M10	12	85	2	50

METAL PIPE FIXING

Pipe brackets, for electricians, in zinc-plated steel, suitable for fixing light-weight pipes or cables with diameters from 10 to 50 mm.

Description	Code	Nominal diameter (mm)	Pipe IEC423 diameter (mm)	Pipe diameter (mm)	Packaging box pcs
Light-duty brackets 10	**8730200**	10	-	10	300
Light-duty brackets 13	**8730201**	13	-	13	200
Light-duty brackets 16	**8730202**	16	16	16	100
Light-duty brackets 20	**8730203**	20	20	20	100
Light-duty brackets 22	**8730204**	22	-	22	100
Light-duty brackets 24	**8730205**	24	-	24	100
Light-duty brackets 25	**8730206**	25	25	25	100
Light-duty brackets 26	**8730207**	26	-	26	100
Light-duty brackets 28	**8730208**	28	-	28	100
Light-duty brackets 32	**8730209**	32	32	32	50
Light-duty brackets 40	**8730210**	40	40	40	50
Light-duty brackets 50	**8730211**	50	50	50	50

Pipe collars, in zinc-plated steel, with M6 thread, suitable for fixing light-weight pipes with diameters from 10 to 60 mm. The collars are complete of fixing screws.

Description	Code	Nominal diameter (mm)	Pipe IEC423 diameter (mm)	Pipe diameter (mm)	Packaging box pcs
Collars M6 - 10	**8730220**	10	-	10-11	100
Collars M6 - 12	**8730221**	12	12	12-13	100
Collars M6 - 14	**8730222**	14	-	14-15	100
Collars M6 - 16	**8730223**	16	16	16-17	100
Collars M6 - 18	**8730224**	18	18	18-19	100
Collars M6 - 20	**8730225**	20	20	19-20	100
Collars M6 - 22	**8730226**	22	-	21-22	100
Collars M6 - 24	**8730227**	24	-	24-26	100
Collars M6 - 26	**8730228**	26	-	25-26	100
Collars M6 - 32	**8730229**	32	32	31-32	50
Collars M6 - 40	**8730230**	40	-	38-40	25
Collars M6 - 50	**8730231**	50	-	48-50	25
Collars M6 - 60	**8730232**	60	-	60	25

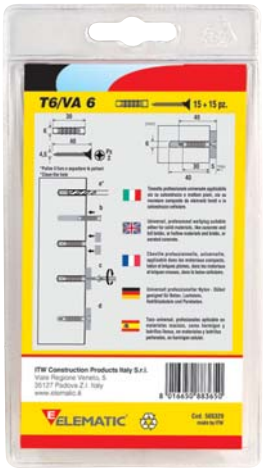
Heavy-duty pipe brackets, for plumbers, in zinc-plated steel, suitable for fixing light-weight pipes with diameters from 16 to 38 mm.

Description	Code	Nominal diameter (mm)	Pipe IEC423 diameter (mm)	Pipe diameter (mm)	Packaging box pcs
Heavy-duty brackets 16	**8730240**	16	-	16	100
Heavy-duty brackets 19	**8730241**	18	-	18	100
Heavy-duty brackets 20	**8730242**	20	-	20	100
Heavy-duty brackets 22	**8730243**	22	-	22	50
Heavy-duty brackets 24	**8730244**	24	-	24	50
Heavy-duty brackets 28	**8730245**	28	-	28	50
Heavy-duty brackets 38	**8730246**	38	-	38	25

BLISTER

Legend

Blister blue:	**light-duty anchors**
Blister green:	**heavy-duty anchors**
Blister orange:	**special anchors**
Blister violet:	**chemicals anchors**



Code	Description	Packaging pcs for blisters	Packaging blisters for box
Light-duty anchors			
565964	T6 5x25	35	15
565965	T6 6x30	30	15
565966	T6 8x4	20	15
565967	T6 10x50	10	15
565969	T6/VA 5 with screw TS 4,0x30	20	15
565329	T6/VA 6 with screw TS 4,5x40	15	15
565401	T6/VA 8 with screw TS 5,5x50	10	15
565970	T6/VA 10 with screw TS 6,0x60	4	15
565971	T6/VN 6 with screw TGS 4,5x40	15	15
565972	T6/VN 8 with screw TGS 5,5x50	10	15
565402	E 5	35	15
565403	E 6	30	15
565404	E 8	20	15
565405	E 10	10	15
565406	EB 6 with lip	30	15
565407	EB 8 with lip	20	15
565414	EB/GC 6 with short hook	10	15
565415	EB/GM 6 with medium hook	10	15
565416	EB/OA 6 with eyebolt	10	15
565417	EB/OC 6 with closed eyebolt	10	15
565418	EB/GO 5 with brassed hook	10	15
565977	EB/VA 5 with screw TPS 3,5x30	20	15
565978	EB/VA 6 with screw TPS 4,5x40	15	15
565979	EB/VA 8 with screw TPS 5,0x50	10	15
565980	EB/VA 10 with screw TPS 6,0x60	4	15
565983	TPFC/GC 8x51 with short hook	4	10
565985	TPFC/GM 8x51 with medium hook	4	10
565987	TPFC/OA 8x51 with eyebolt	4	10
565443	UCX TS 4x35 with countersunk head	25	10
565444	UCX 6x35 with pre-assembled screw	20	10
565445	UCX 6x55 with pre-assembled screw	15	10
565446	UCX 6x70 with pre-assembled screw	15	10
565447	UCX 8x75 with pre-assembled screw	10	10
565448	UCX 8x100 with pre-assembled screw	6	10
565449	APS/V 8x100 with screw TSP	10	10
565997	APS/V 8x80 with screw TSP	10	10
565998	APS/V 8x120 with screw TSP	10	10
565999	APS/V 10x80 with screw TSP	6	10
565450	APS/V 10x100 with screw TSP	10	10
565451	T51 5	10	10
565452	T51 6	8	10
565453	T51 8	6	10
565454	E 6	50	8
565455	E 8	50	8
Spring toggle			
565459	ETAF/V 4/14 with screw TSC	2	8
565460	ETAF/DC 4/14 with brass nut	2	8

BLISTER

Closed packaging

Code	Description	Packaging pcs for blisters	Packaging blisters for box
565461	ETAF/OA 4/14 with eyebolt	2	8
565462	ETAF/DC 4/10 with brass nut	2	8
Self-drilling plasterboard fixings			
565463	DRIVA NYLON with screw TPC 3,0x25	10	15
565464	DRIVA with screw TB 4,5x35	4	15
565465	DRIVA PLUS with screw TB 4,5x45	2	15

Open packaging

Heavy-duty anchors			
565469	LE/B 6 with screw TE 8.8 M6	4	8
565470	LE/B 8 with screw TE 8.8 M8	4	8
565471	LE/G 6 with printed hook M6	2	8
565472	LE/G 8 with printed hook M8	2	8
565473	LE/O 6 with printed eyebolt M6	2	8
565474	LE/O 8 with printed eyebolt M8	2	8