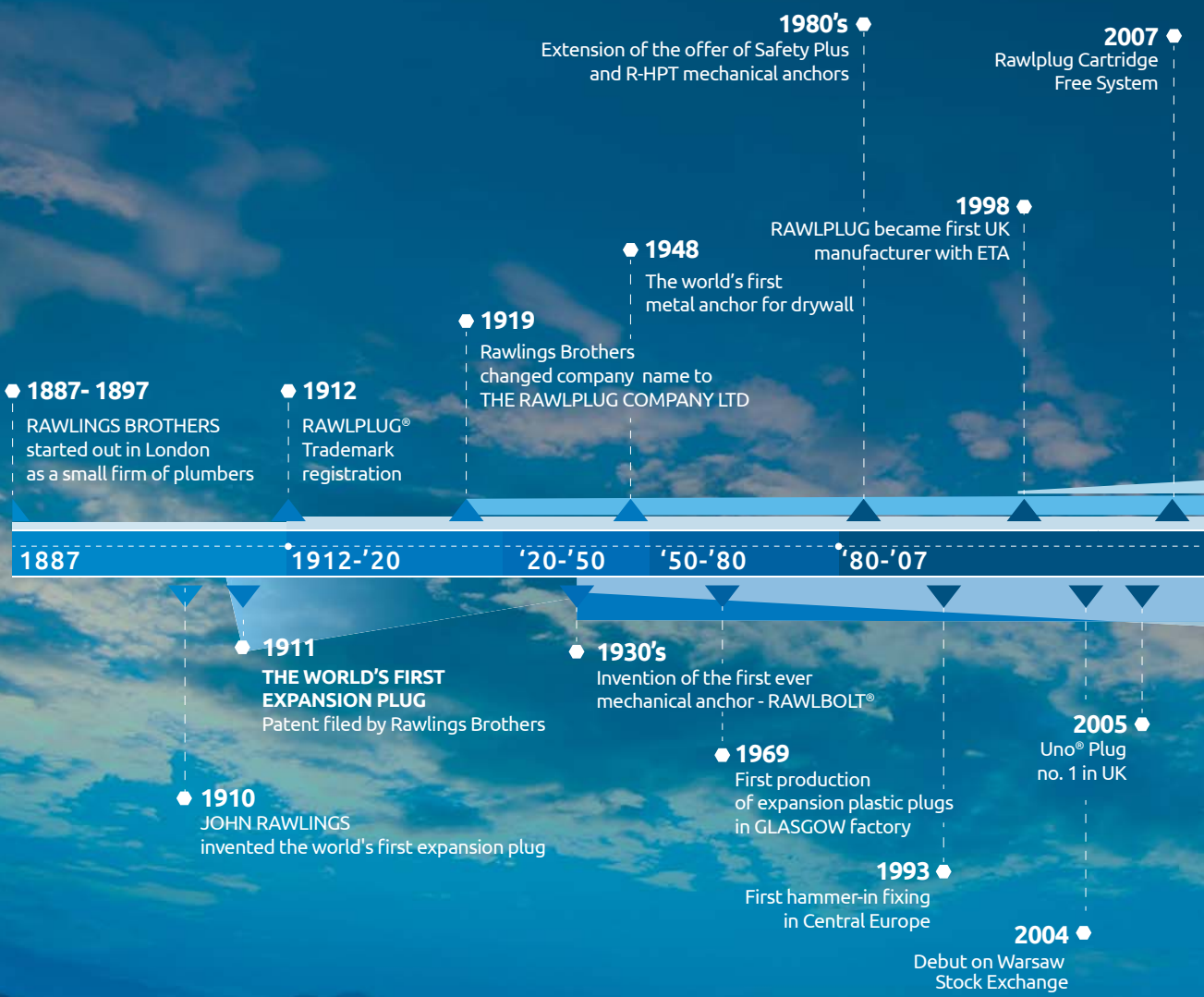


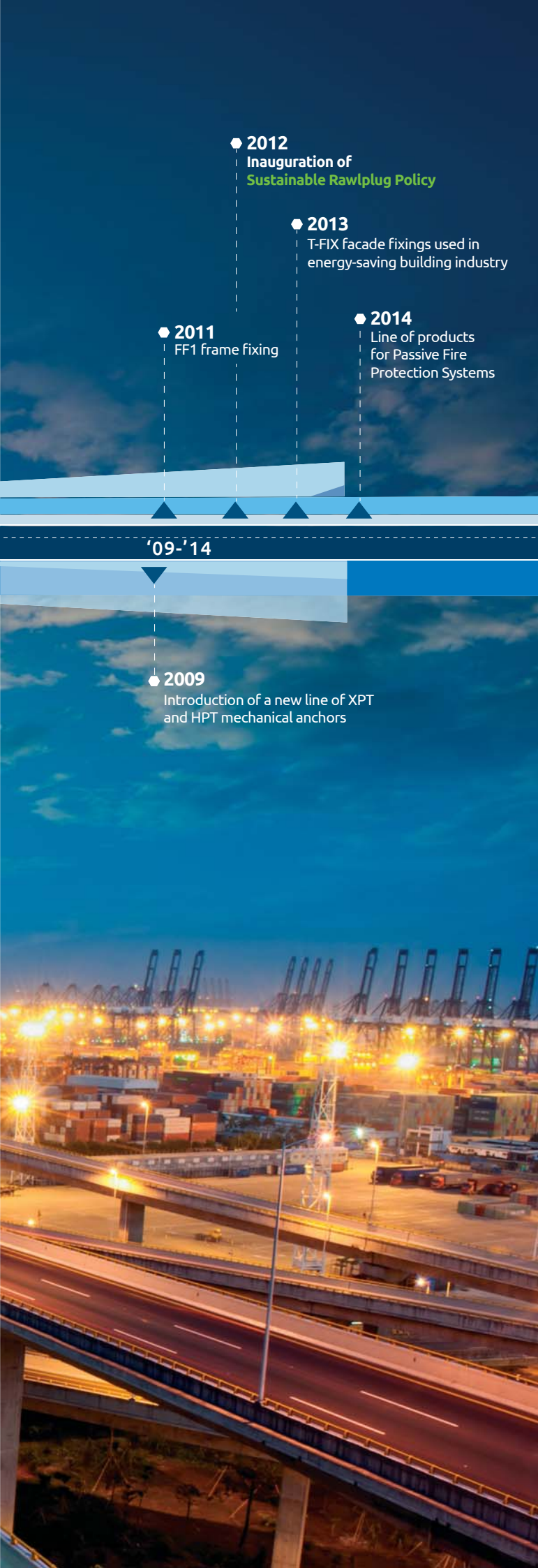


RAWLPLUG®

Lightweight Fixings

Trust & Innovation





● **2012**
Inauguration of
Sustainable Rawlplug Policy

● **2013**
T-FIX facade fixings used in
energy-saving building industry

● **2011**
FF1 frame fixing

● **2014**
Line of products
for Passive Fire
Protection Systems

'09-'14

● **2009**
Introduction of a new line of XPT
and HPT mechanical anchors

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

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

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

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

Fixings & Anchors

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

Fasteners

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

Tools

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

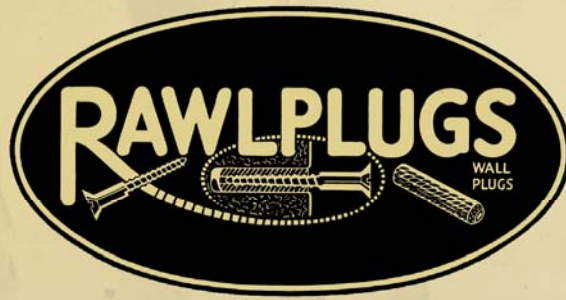
Today Rawlplug continues in its fine tradition of innovation through constant research and development of technologies and processes that minimise the company's impact on the natural environment, making sustainable development one of the pillars of its existence.

Sustainable Rawlplug:

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

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

Sustainable **RAWLPLUG**



For almost 100 years the Rawlplug brand, named after the inventors of the world's first expansion plug, has been inextricably linked with the history of fixings and fixing technology.

A Revolutionary Invention

At the start of the 20th century the British Museum commissioned the Rawlings Brothers, owners of a small electrical engineering and plumbing firm, to install electrical fittings in the famous London museum. At that time, attaching objects to a stone or brick wall in a discrete and unobtrusive way with as little damage as possible was quite a challenge.

The widely used wooden bungs of the day were not always adequate to the task and so John Joseph Rawlings came up with an ingenious new technique which was to revolutionise fixings technology. Made of jute soaked in animal blood and bonded with glue before being rolled into a tube, the new wall plug was designed to fit in to a hand-drilled hole in the wall. It was an ideal solution to the problem.

The ingenuity of this invention lay in the elasticity of the material, allowing it to expand outwards, pressing against the inside of the hole. Thus when necessity once again became the mother of invention, the world's first expansion plug was created, paving the way to for increasingly advanced solutions in the years to follow.

The Original Rawlplug Patent (No. 22680/11)

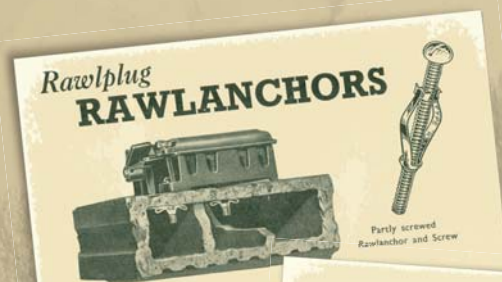
John Rawlings filed a patent for his invention in 1911, which was granted on 14th January 1913 (patent number 22680/11). Now, more than 100 years later, the essence of this original innovation remains unchanged. The plugs, with diameters ranging from 3mm to 30mm, were initially made from natural materials, which were only replaced with plastic in 1960s, all around the world ever since.



Fibre wallplug

The Search for the Perfect Material

The Rawlings brothers did not stop at that. In 1912 The Rawlplug Company Ltd. (as it was to become known soon thereafter) embarked on a quest to create the perfect plug. Thousands of trials were conducted using many diverse materials, ultimately guiding the evolution of the expansion plug. Among the many solutions tested were plugs made of lead, zinc, natural and synthetic rubber, bitumen, glass, wood, paper, casein, wire, tar and asbestos, with many combinations using various proportions and blending techniques.



Rawlplug RAWLANCHORS

WHERE it is difficult to drill, the problem is solved by using Rawlanchors. They are ideal for use in concrete, brick, stone, wood, etc., without any risk of damage to the surface. To manufacturers of prefabricated parts, they provide a fixing device which is also a softer insulating material such as expanded polystyrene.

Rawlplug SPRING TOGGLES

IN this device the toggles are spring actuated but embody the same principle of spreading the strain over a wide area of the back of the material. They are particularly suitable for making fixings to ceilings constructed of laths and plaster or plasterboard, etc., and for materials over half inch thick.

INSTRUCTIONS FOR USE.
Drill a hole in the partition approximately 1/2" diameter (an accurately drilled hole is not essential), put the screw of the Toggle Bolt through the article to be fixed and thread the Toggle on to the screw with two or three turns. Press the two halves of the Toggle together and push through the hole in the partition so that the "wings" of the Toggle can spring open until they are at right angles to the screw then tighten up the latter.

WHITE BRONZE PLUGS

WHITE BRONZE PLUGS meet the requirements of those who wish to use a highly efficient metal plug for certain classes of fixture. They are not designed to replace the original fibre Rawlplugs which have so thoroughly proved themselves to be the best method of carrying out thousands of different of fixing jobs. White Bronze Plug work on the same scientific principle as the fibre plug. I.e., Expansion means Grip. Especially suitable for use where fixings are subject to high temperatures. For best protection against corrosion use stainless-steel or cadmium-plated steel screws. On no account should brass screws be used with White Bronze Plugs.

PLUGS IN BOXES OF 100

Length of White Bronze Plug	1"	1 1/4"	1 1/2"	2"	2 1/2"
1"	*	*	*	*	*
1 1/4"	*	*	*	*	*
1 1/2"	*	*	*	*	*
2"	*	*	*	*	*
2 1/2"	*	*	*	*	*

PLUGS IN BOXES OF 50

Length of White Bronze Plug	1"	1 1/4"	1 1/2"	2"	2 1/2"
1"	*	*	*	*	*
1 1/4"	*	*	*	*	*
1 1/2"	*	*	*	*	*
2"	*	*	*	*	*
2 1/2"	*	*	*	*	*

BOXES OF 25 (FOR COACH SCREWS)

Length of White Bronze Plug	2"	2 1/2"	3"	3 1/2"	4"
2"	*	*	*	*	*
2 1/2"	*	*	*	*	*
3"	*	*	*	*	*
3 1/2"	*	*	*	*	*
4"	*	*	*	*	*

Tools, Rawldrills and Holders as shown on page 17 and Durium Drills as shown on page 18 are suitable for use with White Bronze Plugs up to size No. 20. For larger sizes of White Bronze Plugs the Rawldrills are slightly less in diameter than standard, viz. No. 22 1/2", No. 24 1/2", No. 26 1/2", No. 28 1/2". Please mark W.B. on your order for tools for use with White Bronze Plugs Nos. 22-28 to ensure that you get the right sizes.



Extraordinary Innovations

Many of the ideas tested by the Rawlings brothers during the interwar period were eventually patented. Practically all materials that were known at that time had been investigated for their potential applications in fixing technology. Extraordinary innovations arising from some early projects include:

1. A plug made of jute bonded with glue, pitch, rubber, metallic soap, shellac, viscose, etc.
 2. Plugs made of various thicknesses of paper in combination with glue and other compounds.
 3. A plug of jute fibres in spiral form and plaited, with glue.
 4. A plug of hemp fibres around a core made of paper and metal.
 5. A plug made of spongy metal combined with asbestos, pitch and other compounds.
 6. A plug made using an asbestos mixture.
 7. A plug made of casein, glue and synthetic rubber.
 8. A plug of vulcanized rubber.
 9. A plug made from extruded lead in various forms.
 10. A wooden dowel, slit longitudinally.
- ... to name just a few.

Used today mostly in the manufacture of jewellery as a substitute for nickel and silver, white bronze is corrosion-resistant and non-porous, making it a very durable material for use in fixing applications.



White bronze plug

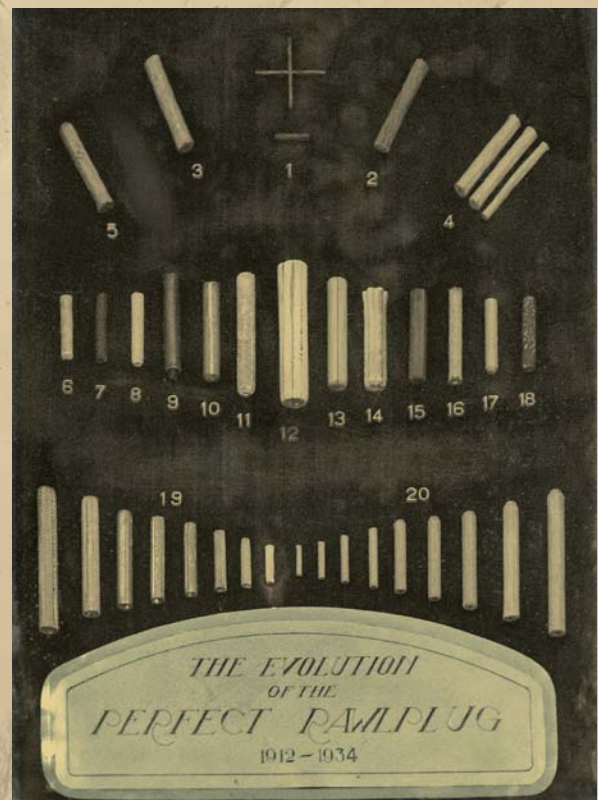
Nonetheless these fixings, along with those made from natural fibres, were eventually to be replaced by a much more modern material - 1967 saw the introduction of the plastic plug. Over further years of constant evolution this has led to the innovative and technologically advanced fixings seen today in the Rawlplug range, such as the FF1, UNO and 4ALL.

The Evolution of the Perfect Rawlplug

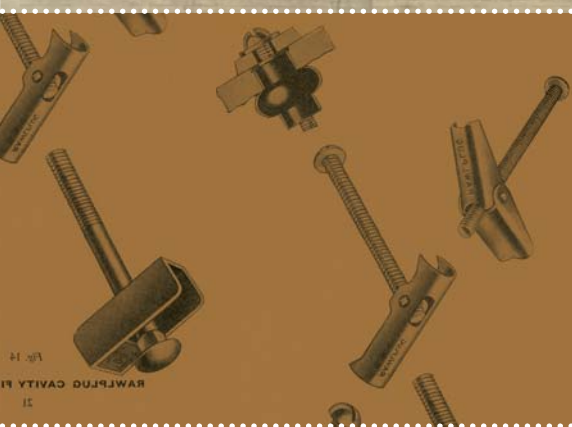
Over time, the myriad of materials and concepts gradually evolved into a complete range of natural plugs and an ancillary assortment of plugs made of white bronze. The development of the range of natural materials centred on mitigating the effects of exposure to mould and other organic factors whilst determining the appropriate turning and ridging features of the fibres in order to obtain optimal outward expansion and surface grip. Indian jute (which, due to the tropical environment, possessed natural resistance to the effects of humidity) was imported for production, before being coated with an additional waterproof layer.

White Bronze

For more challenging service conditions a range of **white bronze plugs** was created, which were widely used in the construction of swimming pools, boiler installations and heated water systems. These designs based on the alloy of copper, tin and zinc provided a solution for the user requiring lightweight fixings suitable for use in damp conditions.



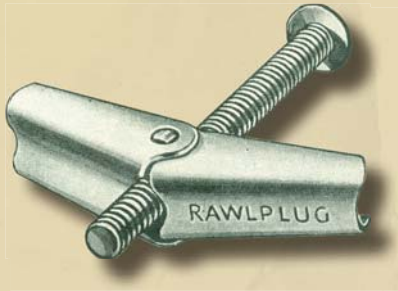
Rawlplug **RAWLANCHORS**



Partly screwed
Rawlanchor and Screw

Early Solutions for Hollow Walls

While the original Rawlplug concepts had been designed for use in solid walls, trends in 20th century construction would eventually give rise to a new challenge. The increasing popularity of plasterboard and other board materials for interiors led to demand for a fixing solution for hollow walls.



Spring Toggle - SPO

This prompted the development of classic fixings such as the Rawlanchor (an early version of today's Intersect) and the self-expanding Spring Toggle (still available as the 'SPO'). These innovative designs are ideal for fixing in to various thicknesses of board and operate on a principle of spreading the applied load over a wide surface area. For example, after insertion in to the hole, the arms of the Rawlanchor/Intersect expand like an umbrella, spreading outwards and pressing back against the rear of the wall. Innovations such as this as well as the Spring Toggle thereby provided the ideal solution for mounting considerable loads to thin board walls and ceilings.

New Products for New Markets

The RAWLNUT, another classic Rawlplug invention, found many applications in the growing automotive, aviation and telecommunication industries. Originally added to the

traditional range for fixing in to brittle or unknown substrates, to this day its design remains essentially unchanged.



Rawlanchor

Thanks to its flexibility this rubber plug with a bonded brass insert is highly resistant to corrosion and vibration and was particularly popular in the automotive industry during its dynamic development at the beginning of the 20th century. These water resistant and soundproof fixings were used on all sorts of interior elements, door handles, mirrors, registration plates lights in vehicles around the world.

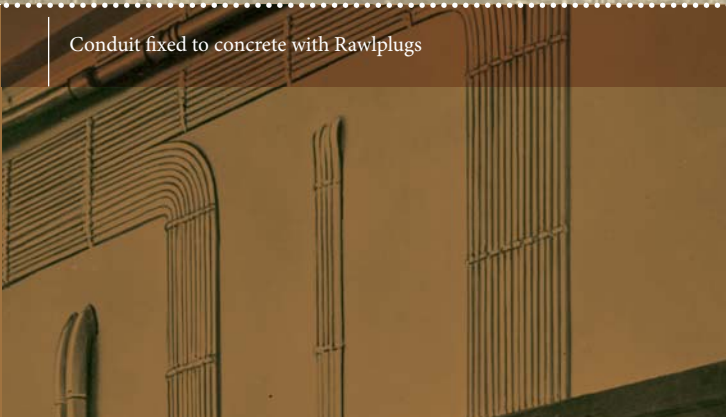
Rawlnuts, made using natural rubber, are also particularly resistant to high temperatures (up to approx. 80°C, or 176°F) making them ideally suited to use in the aviation industry. This suitability was at one time attested by the Royal Aircraft Establishment - a British research establishment that eventually came under the aegis of the UK Ministry of Defence.



Rawlnut

Variants of the Rawlnut made of neoprene rubber were resistant to oil and gasoline and were used in the construction of petrol stations, while those made from non-silver natural rubber proved their worth in the telecommunications industry due to their conductivity.

Conduit fixed to concrete with Rawlplugs



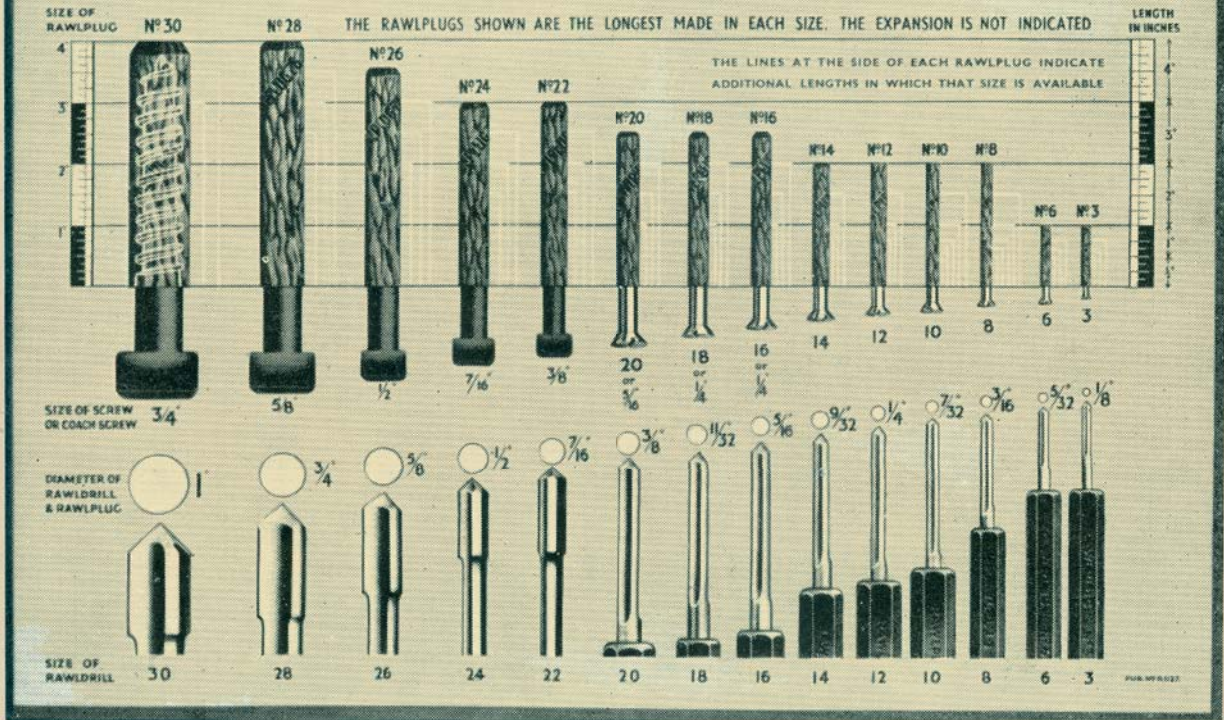
Intricate wiring fixed to steel girders using Rawlplug fixings and screws



ARCHITECTS RAWLPLUG CHART

SIZES AND DIAMETERS OF RAWLDRILLS, RAWPLUGS & SCREWS

BRITISH MADE PATENTED THROUGHOUT THE WORLD



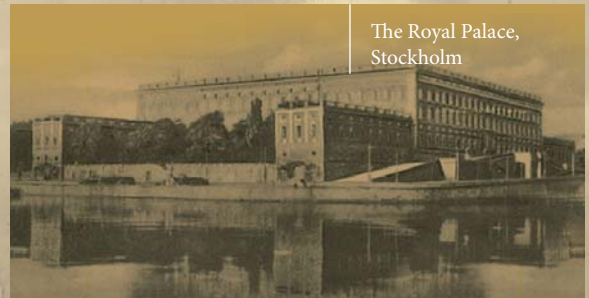
Sydney Harbour Bridge



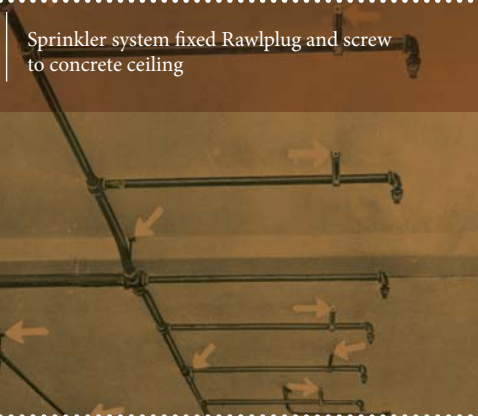
Buckingham Palace London



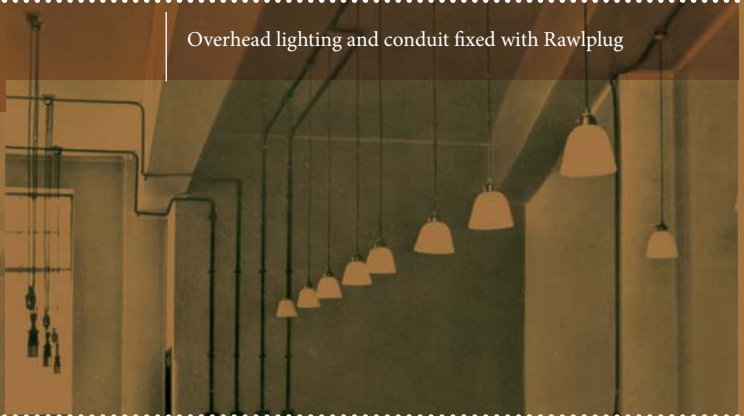
The Houses of Parliament, London



The Royal Palace, Stockholm



Sprinkler system fixed Rawlplug and screw to concrete ceiling



Overhead lighting and conduit fixed with Rawlplug

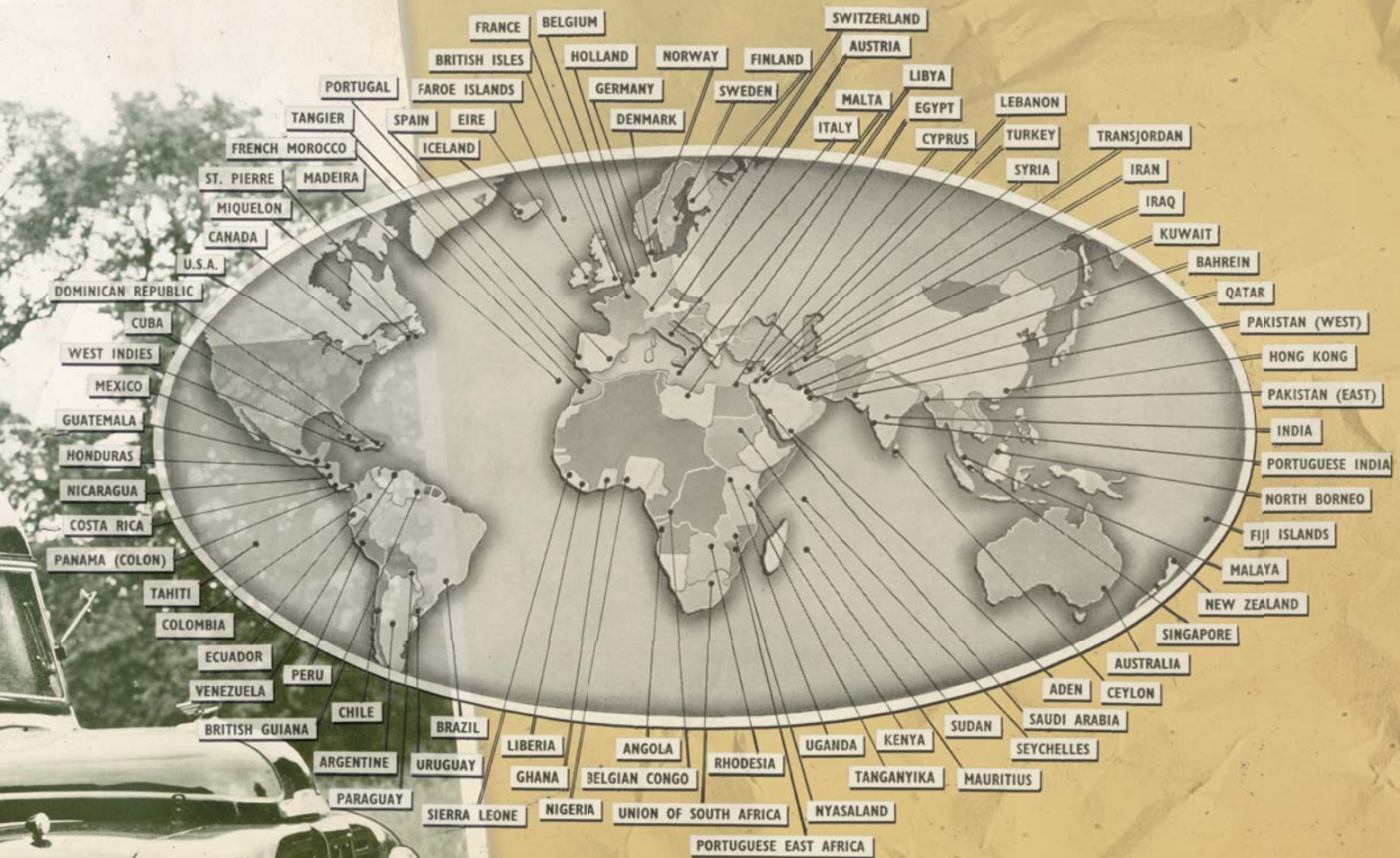


Fixing Devices That Gripped the World

The RAWLPLUG brand legacy dates back to the 1920s and 30s, a time when the RAWLPLUG van - one of the first showcase vehicles in the history of brand awareness marketing - could be seen on the streets as it reached the furthest corners of the civilised world. Presentations in Europe, Asia, Africa, Australia and the Americas popularised the Rawlings brothers' inventions, giving rise to many similar manufacturers who to this day continue to derive benefits from the substantial history and heritage of the RAWLPLUG name.

Traveling Showvans in use in France and directed from Cheville Rawl Paris headquarters





One of the new fleet of Showvans on tour the British Isles

Traveling Showvans now being used for tour of Australasia



Major achievements built around the smallest details

Numerous minor but significant elements define our capabilities in all construction disciplines



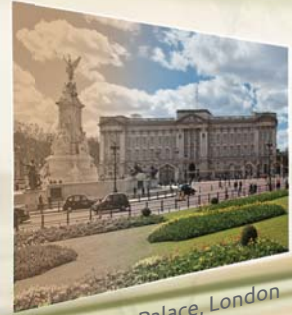
White House, Washington



Statue of Liberty, New York



Houses of Parliament, London



Buckingham Palace, London



Eiffel Tower, Paris



The Stockholm Palace, Stockholm



Westminster Abbey, London



Sydney Harbour Bridge, Sydney

Rawlplug is fully aware that successful accomplishments in the construction industry begin with the correct selection of materials and equipment. Over the years we have developed a comprehensive range of lightweight fixings to meet the expectations of all our customers

Since 1911 our solutions have answered specific requirements from the market utilizing state of the art technology.

Close cooperation with engineers and contractors helps us understand market needs. Our dedicated research and development team generates solutions to match and often exceed these requirements.

The finest confirmation of our unparalleled quality comes from our client endorsements. For example our lightweight fixings are recommended by Europe's leading suppliers of drywall systems.



RAWLPLUG[®]

Trust & Innovation. Since 1919.

Contents

APPLICATIONS			17
OVERVIEW OF OUR RANGE			21
INTRODUCTION			24
FRAME FIXINGS			
FF1 NYLON FRAME FIXING			35
KKS-R FRAME FIXING WITH SHORT EXPANSION ZONE			40
WHO/WHS FRAME SCREWS			42
LIGHTWEIGHT METAL FIXINGS			
GS CEILING WEDGE ANCHOR			46
KGS METAL PLUG			49
HAMMER-IN FIXINGS			
FX HAMMER-IN FIXING			51
PLASTIC EXPANSION PLUGS			
UNO UNIVERSAL PLUG			57
4ALL NYLON UNIVERSAL PLUG			60
RAWL-IN-ONE MULTI PURPOSE PLUG			63
R-OLD PLASTIC PLUG			65

Contents

PLASTERBOARD FIXING

DRA NYLON
SELF-DRILL FIXING FOR DRYWALL



68

DRA METAL
SELF-DRILL FIXING FOR DRYWALL



70

SM INTERSET



72

PROFESSIONAL TOOL
FOR INTERSET



75

SPO
SPRING TOGGLE



76

R-PB
DRIVEN METAL FIXING FOR PLASTERBOARDS



79

SPECIAL FIXING

RAWLNUT
FLEXI PLUG



81





Rawlplug: the first brand in lightweight fixings. Historically and technically.

Rawlplug's impressive 100 year history could be seen as sufficient reason to choose our lightweight fixings. It was our company which recognized the need for lightweight fixings, invented them and popularized them across the world.

However, our impressive history does not stop us in our pursuit of the title of world's most innovative producer of fasteners and fixings. Our key focus continues to be to offer a complete range of reliable and effective products for any substrate and application.

Rawlplug's lightweight fixings provide ease of installation, high load capacity and long term reliability. We focus on the practical aspects of a product's real-world application rather than generating multiple solutions for the same purpose.

RAWLPLUG[®]
Trust & Innovation. Since 1919.

Development, Testing, Approvals, Quality Assurance & Technical Support

RAWLPLUG's® newest additions to the bonded, mechanical and plastic anchor ranges are developed and tested in our comprehensively equipped research and development centres in Glasgow (Scotland) and Wroclaw/Lancut (Poland).

The resultant technical data has been approved in various European Member States and by the following organisations: BBA (UK), CSTB (France), DIBT (Germany), FM Global (USA), SINTEF (Norway) and ITB (Poland).



Our extensive set of European Technical Approvals and Assessments (ETAs) cover our fixings and anchors for concrete, as well as masonry and hollow substrates. (See individual products for approved uses.) Meanwhile our mechanical anchor range also holds several ETAs indicating their suitability for applications in cracked and non-cracked concrete.












Furthermore, we are proud that our production is subject to the control of a quality assurance system approved by the following bodies: BSI (UK), TÜV Rheinland (Germany), AFNOR (France) and ITB (Poland).

Our team of technical consultants are at your disposal for advice, seminars and on-site installer training to support our extensive range of fasteners and fixings. On-site product testing can also be arranged.

Ultimately, the RAWLPLUG® team will help you to ensure that you choose the best solution for your application.



Applications

		FRAME FIXINGS	FRAME SCREW	CEILING WEDGE ANCHOR	LIGHTWEIGHT BLOCK ANCHOR	HAMMER-IN FIXINGS	UNIVERSAL PLUG	HIGH PERFORMANCE NYLON PLUG	SELF-DRILL PLASTERBOARD FIXING	INTERSET CAVITY FIXINGS	SPRING TOGGLE	FLEXI PLUG	
													
LIGHT TYPE:		FF1	WHO	GS	KGS	FX	UNO	4ALL	DRA	SM	SPO	RAWLNUT	
APPLICATIONS	INDUSTRIAL DOORS	✓	✓										
	AIR CONDITIONER	✓	✓										
	WINDOWS	✓	✓										
	GARAGE DOORS	✓	✓										
	GARAGE DOORS	✓	✓										
	GATES	✓	✓										
	DOORS	✓	✓										
	SUSPENDED CEILING			✓									
	CONDUIT AND PIPE CLAMPS			✓									

Applications

		FRAME FIXINGS	FRAME SCREW	CEILING WEDGE ANCHOR	LIGHTWEIGHT BLOCK ANCHOR	HAMMER-IN FIXINGS	UNIVERSAL PLUG	HIGH PERFORMANCE NYLON PLUG	SELF-DRILL PLASTERBOARD FIXING	INTERSET CAVITY FIXINGS	SPRING TOGGLE	FLEXI PLUG
		FF1	WHO	GS	KGS	FX	UNO	4ALL	DRA	SM	SPO	RAWLNUT
LIGHT TYPE:		FF1	WHO	GS	KGS	FX	UNO	4ALL	DRA	SM	SPO	RAWLNUT
APPLICATIONS	TIMBER/METAL BATTENS	✓	✓	✓		✓				✓		
	RADIATORS	✓					✓	✓				
	SWINGS	✓					✓	✓				
	TV BRACKETS	✓						✓				
	LIGHT SHELVES	✓	✓				✓	✓		✓		
	BATHROOM FITTINGS				✓	✓	✓	✓	✓	✓	✓	✓
	TOWEL RAILS				✓	✓	✓	✓	✓	✓	✓	✓
	LIGHTING	✓			✓	✓	✓	✓	✓	✓	✓	✓
	ELECTRICAL OUTLETS				✓	✓	✓	✓	✓		✓	✓

Applications

		FRAME FIXINGS	FRAME SCREW	CEILING WEDGE ANCHOR	LIGHTWEIGHT BLOCK ANCHOR	HAMMER-IN FIXINGS	UNIVERSAL PLUG	HIGH PERFORMANCE NYLON PLUG	SELF-DRILL PLASTERBOARD FIXING	INTERSET CAVITY FIXINGS	SPRING TOGGLE	FLEXI PLUG
		FF1	WHO	GS	KGS	FX	UNO	4ALL	DRA	SM	SPO	RAWLNUT
APPLICATIONS	ELECTRICAL WIRING SYSTEMS	✓			✓	✓	✓	✓	✓	✓	✓	✓
	DOORPHONES	✓			✓	✓	✓	✓	✓	✓	✓	✓
	CABLES	✓		✓			✓	✓	✓	✓		✓
	PLINTHS				✓	✓	✓		✓			✓
	KITCHEN RAILS	✓					✓	✓	✓	✓	✓	✓
	POTS	✓			✓	✓	✓	✓	✓	✓	✓	✓
	PICTURES	✓			✓	✓	✓	✓	✓	✓	✓	✓
	WALL SHELVES	✓			✓	✓	✓	✓	✓	✓	✓	✓
	CLADDING	✓										

Applications

		FRAME FIXINGS	FRAME SCREW	CEILING WEDGE ANCHOR	LIGHTWEIGHT BLOCK ANCHOR	HAMMER-IN FIXINGS	UNIVERSAL PLUG	HIGH PERFORMANCE NYLON PLUG	SELF-DRILL PLASTERBOARD FIXING	INTERSET CAVITY FIXINGS	SPRING TOGGLE	FLEXI PLUG
LIGHT TYPE:		FF1	WHO	GS	KG5	FX	UNO	4ALL	DRA	SM	SPO	RAWLNUT
APPLICATIONS	TEMPORARY WORKS		✓									
	RAINSCREENS	✓	✓	✓		✓						
	SHUTTERS	✓	✓									
	MASONRY SUPPORT	✓										
	SATELLITE DISHES	✓			✓	✓	✓	✓				
	KITCHEN UNITS	✓	✓					✓				
	DRYWALL							✓	✓	✓	✓	✓
	LIGHTING	✓	✓			✓		✓	✓			
	CURTAINS	✓	✓	✓				✓		✓		

Overview of our range

FRAME FIXINGS	
FRAME FIXINGS	FRAME SCREW
Universal frame fixing for installation of door and window frames and many more applications	Frame screw for quick and easy window & door installation in concrete, perforated brick, solid brick and aerated block
	
FEATURES & BENEFITS:	
<ul style="list-style-type: none"> ▪ The countersunk plug for flush fixing of soft material (eg. timber) ▪ The plug is collared for fixing of hard materials such as steel ▪ Specially-formulated Ultramid nylon allows best performance installation for use in all base material categories according to ETAG 020 (A, B, C, D) ▪ Internal plug geometry designed to fit the screw head and ensure multi-axis expansion ▪ A4 stainless steel offers improved load-bearing capacities (relative to standard carbon steel) ▪ Special zinc flake corrosion-resistant coating ▪ Embedment depth markings facilitate precise installation ▪ Plug design ensures multi-axis expansion 	<ul style="list-style-type: none"> ▪ Cylinder head for flush installation with the window and door frames. ▪ Flat head for metal window and door frames ▪ No additional plugs required ensuring quick and simple installation ▪ Expansion-free fixing imposes less stress on substrate during installation ▪ Easy use for temporary works
FRAME FIXINGS AVAILABLE:	
FF1-L , FF1-K	WHO, WHS
LIGHTWEIGHT METAL FIXINGS	
CEILING WEDGE ANCHOR	LIGHTWEIGHT BLOCK ANCHOR
All steel anchor for fixing lightweight ceilings and suspended ceilings to solid building materials	Steel fixing giving good performance in the most challenging base materials, especially lightweight blocks and aerated concrete blocks
	
FEATURES & BENEFITS:	
<ul style="list-style-type: none"> ▪ ETA Option 1 Approval for installation in cracked and non-cracked concrete. ▪ Non-flammable product of A1 fire behaviour class. ▪ When the steel wedge is hit with a hammer, the anchor expands in the base, thus limiting to a minimum any movement of framework under the impact of suspended load. ▪ Two steel expansion elements ensure high load-bearing capacity combined with a long-term operational safety. ▪ Reliable installation is ensured owing to large flange area and simple visual inspection of the installation. 	<ul style="list-style-type: none"> ▪ The inner tothing provides reliable guidance centring of the anchor, whereas the outer tothing guarantees high permissible tensile loads. ▪ The ribbed internal geometry provides for centring and safe guidance of the anchor. ▪ High holding strength even in oversized holes. ▪ Can be used in areas where fire requirements do not allow the use of plastic anchors. ▪ Quick and easy installation with wood and chipboard screws. ▪ A screw installed in the anchor may be removed and re-inserted.
LIGHTWEIGHT METAL FIXINGS AVAILABLE:	
GS	KGS

Overview of our range

HAMMER-IN FIXINGS

HAMMER-IN FIXINGS WITH CYLINDER HEAD

HAMMER-IN FIXING WITH MUSHROOM HEAD

HAMMER-IN FIXING WITH COUNTERSUNK HEAD

The hammer fixing for fast, simple, cost-effective installations



FEATURES & BENEFITS:

- Rapid hammer-set installation reduces the time required and allows for cost-effective, high-volume installation
- Combination of Phillips recess and the helical thread makes removal of the nail possible, facilitating disassembly when necessary
- The extensive range of lengths and diameters ensures availability of the correct fixing for every application
- Designed for push-through installation
- Nylon material for highest quality

HAMMER-IN FIXINGS AVAILABLE:

FX-N-C

FX-N-K

FX-N-L

PLASTIC PLUG

UNIVERSAL PLUG

HIGH PERFORMANCE NYLON PLUG

TRADITIONAL PLASTIC PLUG

Truly universal plug which fixes into any base material, solid or hollow with unique expansion at the top giving instant grip

High performance universal nylon plug which expands in solid materials and forms a reliable knot formation in all cavities

Easy-to-install plugs available with screws, eye screws and hooks giving exceptional performance in solid base materials



FEATURES & BENEFITS:

- Unique geometry guarantees maximum expansion and grip.
- Instant grip resulting from split plug design.
- Anti-rotation features prevent spinning in the hole.
- Lip prevents plug slipping into over-sized holes.
- Unique internal design provides positive grip for screws.
- Anti-rotational lugs promote grip in wide range of substrates including soft masonry materials.
- Rib detail at plug head provides added grip.
- Expanding section designed to collapse in hollow materials and provide positive grip behind surfaces.
- Unique 4 way expansion allowing application in any substrate material and type.
- Solid head design provides strength whilst plug is installed.
- Two-way expansion mechanism provides a strong anchorage in solid base materials.
- Small edge distances achievable.





PLASTIC PLUG PRODUCTS AVAILABLE:


UNO

4ALL

RIO, R-OLD

Overview of our range

PLASTERBOARD FIXING			
SELF-DRILL PLASTERBOARD FIXING	INTERSET CAVITY FIXINGS	SPRING TOGGLE	R-GPB DRIVEN FIXING
Self-drilling light-duty fixing for use in plasterboard sheets and gypsum fibreboards	Inter-set fixing for permanent anchorages in cavity walls	Spring toggle for cavity walls and large fixtures with pan head metric screw	Driven metal fixing for easy installation in plasterboard
			
FEATURES & BENEFITS:			
<ul style="list-style-type: none"> Large flange ensures correct clamping to plasterboard Short length ideally suited for dry lined walls Can be used in single and double thickness plasterboard Supplied complete with screw 	<ul style="list-style-type: none"> Wide range available to accommodate all thickness from 2mm-30mm One piece stamping, with integral thread and flange for increased reliability Hinged legs designed to maximise load-bearing capacity in single or double thickness plasterboard. Fixtures can be removed and re-fitted Supplied complete with screw 	<ul style="list-style-type: none"> Supplied with fully threaded screw for wide range of applications High carrying capacity due to wide load bearing legs Allows easy installation for fastenings behind thick panels in very flat cavities 	<ul style="list-style-type: none"> Steel fixing for light weights Simple installation due to introductory thread Corrugated tip simplifies installation without previous drilling Expanding construction of the fixing prevents it from spinning in the substrate during installation Flat head enables levelling of the fixing with the surface of the substrate Simple uninstillation without harming the substrate
PLASTERBOARD FIXINGS AVAILABLE:			
DRA, DRA-M	SM, SM-K, SN	SPO, SPO-K	R-GPB, R-GPB-PLUS

SPECIAL FIXING
FLEXI PLUG
Easy-to-install plug giving exceptional resistance to vibration and corrosion

FEATURES & BENEFITS:
<ul style="list-style-type: none"> Resistant to vibration and corrosion Ideal for unknown substrates and irregular or oversized holes Flush collar ensures secure clamping Made from synthetic rubber with a bonded brass insert for corrosion resistance
SPECIAL FIXINGS AVAILABLE:
R-RNT

Introduction - Materials

The base material/substrate

Consideration of the base material (and its associated properties) is critical in the selection of fixing or connector technology. It is therefore important to correctly define the material in order to ensure correct fixing installation without substrate damage, as well as safe and reliable subsequent performance under load.

Concrete



concrete

Concrete, in its standard form, is a compound of cement, aggregates and water. It usually possesses high compressive strength, while tensile strength is comparatively low.



lightweight concrete

Lightweight concrete is another derivative, in which case heavy aggregate is replaced by light additives like pumice, slag or Styrofoam. Due to the lower compressive strength of

these materials, lightweight concrete shows lower strength parameters in general when compared to plain concrete.

This document presents anchor performance data for the following concrete grades: C20/25, C30/37, C40/50 and C50/60 (according to ENV 206 standard). In this format, the values before and after the oblique signify characteristic compressive strengths measured for cylinders (150mm diameter, 300mm height) and cubes (150mm edge), respectively.

The table below lists concrete compressive strengths traditionally applied in different countries.

Products suitable for use in cracked concrete:

FF1, WHO, GS, UNO, 4ALL

Grade CE	Characteristic compressive strength F_{ck} (cylinder)	Characteristic compressive strength F_{ck} (cube)	Great Britain	Germany	France	Poland
			Mean compressive strength, tested (150mm cube)	Mean compressive strength, tested (200mm cube)	Mean resistance, tested (cylinder 16x32cm)	PN-B-03264:2002
C12/15	12	15	20	19	17	B15
C16/20	16	20	25	24	21	B20
C20/25	20	25	30	29	25	B25
C25/30	25	30	35	33	30	B30
C30/37	30	37	42	40	35	B37
C35/45	35	45	50	48	40	B45
C40/50	40	50	55	54	45	B50
C45/55	45	55	60	57	50	B55
C50/60	50	60	65	62	55	B60

Masonry

Masonry walls are multi-layer substrates consisting of blocks of heterogeneous material, built in to the desired structure using mortar.

The compressive strength of the block material is usually higher than that of the mortar. Thus the connectors should, as a rule, be installed within the body of the block.

Blocks may take several forms:

- Solid blocks with compact structure. Blocks of various dimensions, without internal cavities, made from ceramic (ceramic or clinker bricks) or sand-lime (silica) materials. These possess relatively high compressive strength.
- Hollow blocks with compact structure. Blocks of various dimensions and shapes, with several internal cavities. Blocks possess reasonably low compressive strength, despite being made from relatively high compressive strength materials (ceramic or silica).

- Solid blocks with porous structure. Blocks of various dimensions, without internal cavities but with high concentrations of pores or inclusions of other materials. Examples include aerated concrete or solid blocks of lightweight concrete. Materials of this category possess low compressive strengths.

- Hollow blocks with porous structure. Similarly to solid porous blocks these elements have low compressive strength, weakened further by internal cavities. In most cases these blocks are made from lightweight concrete.

Products suitable for masonry and hollow walls:

FF1, UNO, 4ALL



solid brick (ceramic or silica)



lightweight concrete



hollow brick



hollow block

Introduction - Materials

Plasterboards

Plasterboards are made of a gypsum core pressed between two outer layers of special multi-ply lining paper. The boards are made of natural or synthetic gypsum. Depending on desired properties, various admixtures are used to modify the board's parameters.

Plasterboards can be used for wall or ceiling linings, partition walls and curtain walls, suspended ceilings and lofts. There are also plasterboards which can be used as floor underlayment.

Plasterboards can be divided into the following types:

- **Standard plasterboard (GKB)** – for general use, thickness: 9.5 or 12.5 mm. Such plasterboards are designed for rooms where relative humidity is below 70%. They can be used for making curvatures of minimum 60 cm radius and they are used for covering walls and ceilings as dry wall.
- **Impregnated plasterboard (GKBI)** – produced with additional hydrophobic gypsum impregnation (admixture of silicone compounds). They can be used in rooms where relative humidity is below 85%, provided that the entire surface is coated with material resistant to moisture and that the room is ventilated. Standard board thickness: 12.5 mm;
- **Fire-retardant plasterboard (GKF)** – plasterboards of increased fire resistance, with an admixture of glass fibre. They can be used for construction of fire-resistant curtain walls on structural components (in rooms where relative humidity is below 70%) and loft lining. Standard board thickness: 12.5 mm;
- **Impregnated fire-retardant plasterboard (GKFI)** – impregnated plasterboards of increased fire resistance. The gypsum core contains an admixture of hydrophobic compound and glass fibres. Such plasterboards can be used for fire-resistant curtain walls on structural components in rooms where air humidity is periodically increased. They are used mostly for lining loft bathrooms.

- **Gypsum baseboard (GKP)** – used mostly on a framework. Such plasterboards have rounded edges and a paper face of high absorptivity intended to receive a gypsum plaster;
- **Gypsum composite board** – produced with the use of insulating materials, such as rigid polystyrene or polyurethane foam. Generally used for interior insulation. The plasterboards can be also combined with mineral fibreboards. They are used in locations where fire protection is essential.



Plasterboard producers have developed a lot of technical instructions collected in complex Steel Stud and Plasterboard Construction Systems. Practitioners emphasize advantages of this technology: lightweight structure, quick installation, immediate availability of rooms upon completion of construction works, fire protection properties and noise insulation.



Rawlplug is a pioneer in production of fixings for thin boards, including plasterboards. Our broad range of fixings includes products for installation of wall and ceiling linings, partition walls, curtain walls, suspended ceilings, loft linings, and fixing lightweight loads to single or double boards. Thanks to the special structure of the Rawlplug plasterboard fixings, the load cooperates with the base in an optimum way, thus guaranteeing ideal distribution of forces. However, it is worth noting that parameters confirmed by ITB tests (technical approvals) can be reached only if technical instructions and installation procedure are observed.

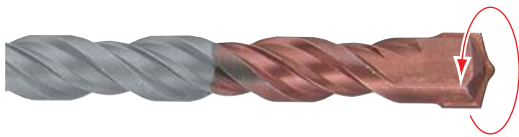
Products recommended for installation in plasterboards: **UNO, 4ALL, INTERSET, DRA, SPO, GPB, RNT.**

Introduction - Fixings installation

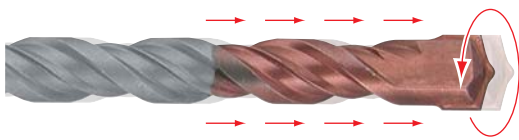
Drilling

The method of drilling a hole for the installation of an anchor depends on the type of substrate material. There are a number of drilling techniques:

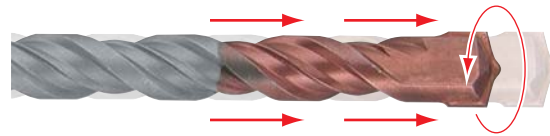
- rotary drilling – drilling by rotation and without percussion (or hammer action), recommended for drilling in materials of low mechanical strength such as bricks & aerated concrete due to the fact that it does not enlarge the hole, nor damage the structure of the material;



- percussive drilling – drilling by rotation with multiple light strikes with the drill bit into the substrate; recommended for drilling materials with high mechanical strength and solid structure such as concrete & solid brick;



- hammer drilling – drilling by rotation with a small number of high energy strikes with the drill bit into the substrate; recommended for drilling in extremely hard structures such as concrete;



A drill bit is a tool, which is subject to wear – its degree and frequency is a derivative of the hardness of the substrate material. The harder the substrate, the greater the wear of the drill bit. Be sure to monitor wear and replace the drill bit whenever necessary.

In the process of drilling a hole for embedding an anchor it is important to be aware of and achieve the correct diameter and depth of the hole.

After the drilling is finished it is essential to clear the hole of dust and drill debris. Failure to do this can be the cause of improper anchoring of the fastener in the substrate.



Fixings installation methods:

1. Push-through installation – convenient and time-efficient method, which allows the user to drill and install directly through the fixture without marking out hole locations and pre-positioning anchors. If the fixture is pre-drilled then it may be used as a drilling template, before the anchors are installed directly through the clearance holes. RAWLPLUG® R-XPT, R-XPTII and R-HPTII throughbolt families are all examples of push-through fixings.
2. Pre-positioning installation – this method requires the installation of the anchors in the base material, before the fixture is moved into place. In this case the anchor diameter

and the drill hole diameter are different. Our RAWLBOLT (R-RBP) and all bonded anchors are examples of products that require pre-positioning.

3. Stand-off installation – attachment of the fixture at an offset distance from the surface of the base material. One common offset application is the use of internally threaded anchors with long rods, studs or bolts. The anchor is installed in the base material before assembling with threaded rod or bolt. The RAWLPLUG® internally threaded wedge anchors - R-DCA, R-DCA-A4 & R-DCL - may be used for stand-off applications.

Corrosion Protection

The only way to provide corrosion protection for steel fasteners is through the use of specialized protective coatings. The coating processes are especially important to us, therefore we perform them ourselves.

The modern Rawlplug processing lines guarantee corrosion protection in accordance with the highest requirements of our clients. This is achieved by means of galvanizing processes, zinc flake systems, or comprehensive multilayer coatings.



Introduction - Corrosion

Protection layers prevent from corrosion

Corrosion causes gradual degradation of steel elements leading to crumbling and loss of technical parameters, exposing the user to risk or damage during use. Therefore one of the key parameters demanded from Rawlplug products is the highest quality of anti-corrosion protection.

Care for the quality of the final product requires constant supervision of the coating process during every stage. An infrastructure is in place at our factory which provides anti-corrosion protection according to the specifications required by the customer. A wide range of anti-corrosion protections offered by Rawlplug, as well as the technological processes which accompany them, guarantees that the final product is of the highest quality.



Classification of protection coatings

Based on the ingredients, the following types of coatings can be distinguished:

Metallic coatings

- a) Electrolytic – zinc
- b) Non-electrolytic
 - Zinc-flake system (Geomet / Deltatone)
 - Galvanizing

Non-metallic coatings

- a) Thermal blackening
- b) Oxidising
- c) Phosphorizing

Organic coatings

- a) Delta-Seal
- b) Magni
- d) KTL (cathodic immersion painting)

Multi-layer coatings

Covering metallic coatings with anti-corrosion organic layers

During preparation of the specification of a product it has to be kept in mind that use of CR(VI) in protection coating needs to be limited. According to EU Parliament and European Council directives it is prohibited to use hexavalent chromium Cr(VI) as anti-corrosion coating in any car which went on sale after July 1st 2007.

According to the directive, the same restriction applies to any electro-mechanic and electronic industry products since July 1st 2006.. The trend of limiting use of CR(VI) is spreading among industries and development areas.

Characteristics of Rawlplug Coatings

1. Electrolytic zinc coatings

Universal standard

Various options of use

So far, galvanic zinc-plating is a standard for most lightweight fixings. Electrolytic zinc plating is qualified as protection, therefore aims only to protect metal from corrosion.



Introduction - Corrosion

Anodic dissolution of zinc plating on a metal allows protection of the substrate. Therefore it follows that the thicker the layer of zinc plating, the longer it can protect a covered surface.

In order to determine the average time of efficient protection provided by zinc plating (presuming the coating is not damaged) both the thickness of the layer (on average 5 to 30 micrometres) and the kind of atmosphere in which the product will be used need to be known. There are 4 kinds of natural

atmospheres from which we can calculate different speeds of corrosion of the zinc coating:

- **Industrial** – corrosion rate equals 5-7 micrometres per year.
- **Urban** – corrosion rate equals 3-5 micrometres per year
- **Coastal** – corrosion rate equals 3-7 micrometres per year
- **Rural** – corrosion rate equals 1-2 micrometres per year

Average rates of corrosion described above do not include specific agents acting locally.



2. Zinc flaked coating placed non-electrolytically

Very good corrosion resistance

Elimination of hydrogen embrittlement

Zinc-flaked coatings

Flaked zinc-aluminium coatings have gained worldwide recognition in specialist automotive, aviation and construction industries. Various base products and surface paints are used on fixings and pressed elements. They meet the high-level requirements of industrial use. Organic and non-organic surface coatings were improved due to the specific characteristic of lamellar zinc coatings. Connection of the base and surface coating meets the majority of requirements of industry, which could not be met before.

Zinc coating applied non-electrolytically finds broad use in industry, due to an extraordinary anti-corrosion characteristic (resistance for salt fog far above 1000 hours, according to PH-EN ISO 9227), very good thermal resistance, the option of choosing demanded friction parameters and the possibility of using modern methods of application. Non-electrolytically applied zinc-flake plating is one of the most advanced methods of anti-corrosion protection.

Zinc coating contains mainly a mix of zinc and aluminium (usually with a 95:5 ratio), binder conducting electricity and depending on the needs, integrated lubricant in order to correct the friction factor.

Non-electrolytically applied zinc-flake plating:

- Does not contain harmful substances – not just chromium, but also lead and cadmium
- Has exceptional resistance to high temperature

- Provides incredible mechanical and chemical resistance
- Does not present hydrogen embrittlement
- Allows for the provision of necessary friction parameters
- Can be placed with popular methods such as dipping, whirling or spraying
- Is ecological – meets the requirements of environmental norms in the automotive industry and European Directive 2000/53/WE regarding cars withdrawn from use.

Basic layers

The main goal of using basic layers is to protect steel substrate from corrosion by the active dissolution of zinc. As zinc is less rare than steel, it corrodes first when two metals are in electric contact. When the coating becomes scratched, zinc corrodes instead of steel. Such a situation occurs as long as the entire matrix is not destroyed. Zinc is incorporated into the surface as small flakes a few micrometres in thickness.

The small dimensions of the flakes enable the achievement of very thin layers (approximately 4µm). The flakes touch each other, and a layer working as zinc matrix is created as a result. In order to reach a level protection comparable to conventional plating containing chromium (VI), chromium-free surface plating is put on basic zinc layers as a supplement.

Surface plating

Surface plating should protect metal (iron, steel) from corrosion. The corrosion process is quickened by the presence of environmental water (air humidity, environmental influence etc.). So surface coating creates a barrier isolating metal from corrosion agents. Surface coating extends the duration of electrochemical activity of zinc coating, thus increasing the durability of protection. Temperature hardening of the surface layer meets the levels of base lacquers.

Introduction - Corrosion

Initial parts processing

Coatings, like most applications, are put on steel surfaces which are clean, dry, and clear of dust and grease. Depending on the history, aim and geometry of a part there are various kinds of initial processing used.



Methods of placing coatings

Dipping and whirling

Elements with a large area of coating are usually covered using dipping method. Elements are placed in a basket. The basket is dipped in a special tank. Paint covers whole surface of the elements. Movement caused by a slow twist of the basket can improve the process of painting and lead to removal of air bubbles.

Once applied, the coating needs to be hardened. There are several parameters influencing the dipping process. The most important of them are: duration of immersion, speed of whirling, time of whirling and size of the load.

Dipping

Immersion in the paint and drying whilst keeping recommended conditions is particularly beneficial in the case

of parts with unique geometry, such as screws, bolts or more complicated elements.

Hardening

Coating hardening is an obligatory step regardless of the application technique. Hardening of the coating is performed in different stoves. Painted elements are transferred from the basket to the stove on a slowly moving belt.

The first part of the stove is the so called evaporation zone, in which the dissolvent, or water in case of water systems evaporates in a the temperature of approx. 80-100°C. Consecutively, coatings are hardened in particular temperature, depending on the paint used. Once hardened, elements are cooled down to 25° or less.

Introduction - Corrosion

Choosing the optimum protecting layer

Having a wide variety of anti-corrosion protections is essential to optimize choice towards the particular application of a product. Taking care of proper quality and cost ratio our R&D department optimizes the quality of coatings to the specification of the product provided by the client. The chart below presents differences in the resistance of protections, guaranteed by Rawlplug coatings.

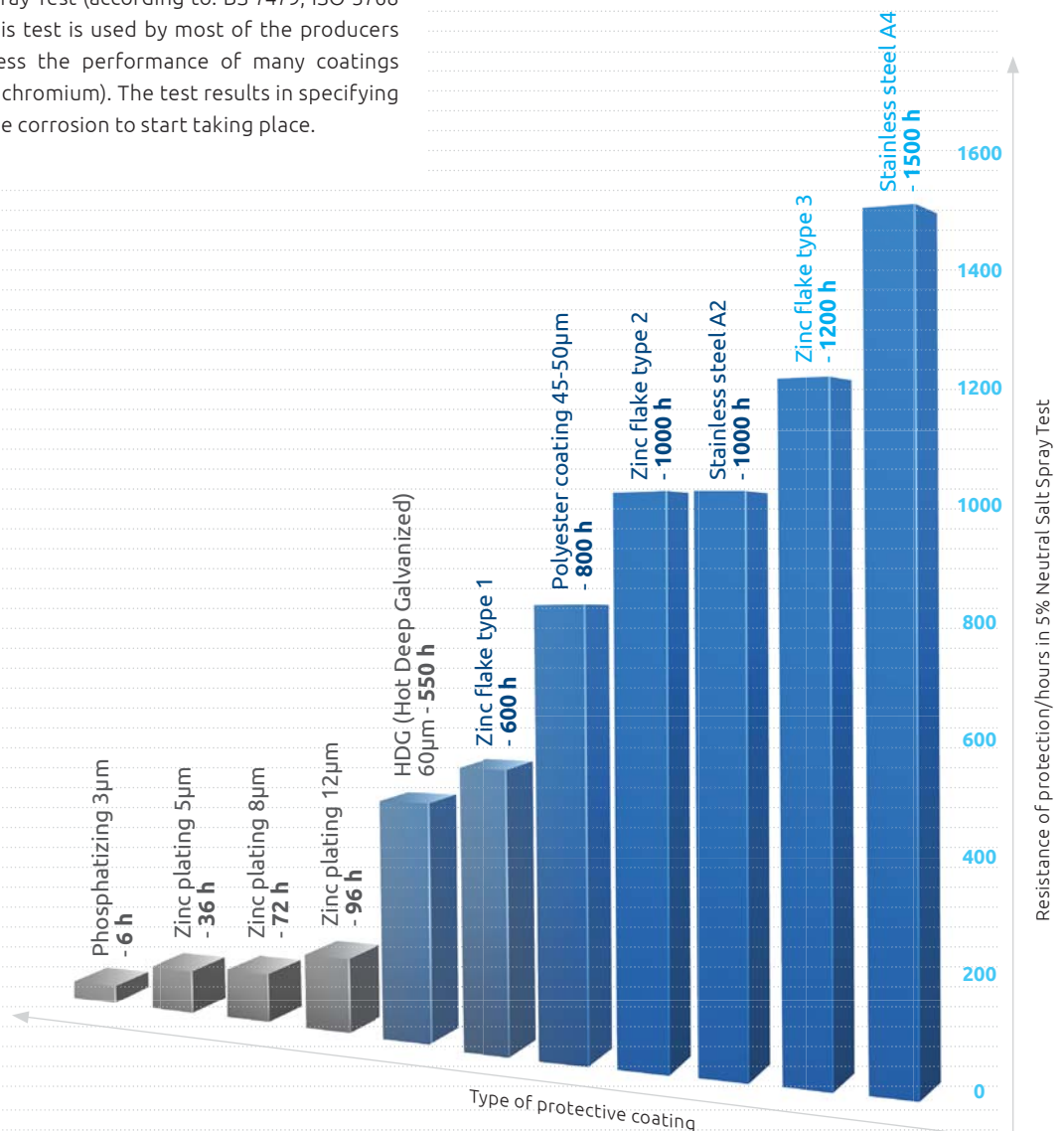
Increased speed corrosion examination

Increased speed corrosion examinations are performed to present the differences between the quality of particular coatings. This gives an idea as to the relative performance of different coatings. They are also used as a „quick” test for quality control purposes (though latest advanced coatings are lasting for 500-1000 hours in accelerated tests, meaning the tests aren't so quick). The most commonly used test is the 5% Neutral Salt Spray Test (according to: BS 7479, ISO 3768 or ASTM B117). This test is used by most of the producers worldwide to assess the performance of many coatings (though not nickel chromium). The test results in specifying time needed for the corrosion to start taking place.

Other corrosion tests are:

- Kesternich – examination performed in sulphur dioxide fog.
- A.S.S. Acetic Acid Salt Spray BS 7479 ISO 3769.
- C.A.S.S. Copper Accelerated Acetic Acid Salt Spray (BS 7479, ISO 3770). A fairly aggressive test used mostly for nickel chromium coatings.

Ingredients of the coatings are chosen according to its desired mechanical parameters, malleability, plasticity, resistance capacity, etc. Consecutive layers made of various materials deliver protection and extend longevity during exposure to harmful agents. Protective coating often has to deliver more than one parameter to provide proper resistance. In order to achieve that, it consists of numerous different layers providing a variety of attributes.



Introduction - Corrosion

Powder coatings

These offer a versatility of use due to the possibility of achieving a coating with various levels of shine for a wide variety of structures, utilizing the entire RAL palette or creating special dedicated colours made to order from colour charts such as NCS and RR.



Lacquer powder coating from Rawlplug delivers the following characteristics:

- Perfectly fits of the colour of fixed element
- High anti-corrosion resistance - one application of powder paint provides thickness comparable with 3 layers of dissolvent paint,
- Contains UV stabilizers, which guarantee constant colour over long-term exposure
- Is disguised by high installation toughness – entire hardness of paint is achieved after just 1 hour from completion of hardening process
- Elasticity and very good mechanical characteristics – smooth surface with no cavities, bulbs, cracks, blisters, etc.
- Option to paint without priming
- High chemical and thermal resistance (for temperatures up to 100°C)

Powder lacquering is a modern technology, allowing the creation of an even and resistant surface. Paint in the form of powder is placed on metal fixing elements and thermally hardened afterwards.

Rawlplug protection coating quality control

In order to guarantee the highest quality products, a few units are taken from every basket to examine their quality and the thickness of their coating. The examination is performed using daltoscopes, and additional tests are also carried out.

To ensure 100% control of quality, everyday examinations of concentrations and process parameters take place. Further tests happen in our chemical laboratory. Rawlplug's factory cooperates with science institutes and selected world class suppliers of chemical coatings and ingredients. They help us in our constant efforts to surpass the expectations of our customers when it comes to the resistance coatings of Rawlplug Lightweight Fixings.



Introduction - Terminology & symbols

The notations and symbols frequently used in our catalogues are given below. Further notations are given in the text.

Indices

c	Concrete
cp	Concrete pry-out
d	Design value
k	Characteristic value
M	Material
p	Pull-out
R	Resistance
s	Steel
S	Action
sp	Splitting
u	Ultimate
y	Yield

Loads

N	Normal force (positive: tension load, negative: compression load)
N_{Rk}	Characteristic value of resistance of a single anchor or an anchor group (tension load)
$N_{Rk,p}$	Characteristic resistance in case of failure by pull-out (tension load)
$N_{Rk,c}$	Characteristic resistance in case of concrete cone failure (tension load)
$N_{Rk,s}$	Characteristic resistance of an anchor in case of steel failure (tension load)
N_{Rd}	Design value of resistance of a single anchor or an anchor group (tension load)
$N_{Rd,p}$	Design resistance of an anchor in case of failure by pull-out (tension load)
$N_{Rd,c}$	Design resistance for an anchor or an group of anchors in the case of concrete cone failure (tension load)
$N_{Rd,s}$	Design resistance of an anchor in case of steel failure (tension load)
V	Shear force
V_{Rk}	Characteristic resistance of a single anchor or an anchor group (shear load)
$V_{Rk,c}$	Characteristic resistance in case of concrete edge failure (shear load)
$V_{Rk,cp}$	Characteristic resistance in case of failure by pry-out (shear load)
$V_{Rk,s}$	Characteristic resistance in case of steel failure (shear load)

Safety factors

V_{Mc}	Partial safety factor for concrete cone failure
V_{Ms}	Partial safety factor for steel failure

Concrete and steel (mechanical properties)

f_{yk}	Characteristic steel yield strength (nominal value)
f_{uk}	Characteristic steel ultimate tensile strength (nominal value)
A_s	Stressed cross-sectional area of steel
W_{el}	Elastic section modulus calculated from the stressed cross-sectional area of steel
$M_{Rk,s}^0$	Characteristic bending resistance of an individual anchor
M	Allowable bending moment

Characteristic values of anchors

c	Edge distance
c_N	Edge distance (tensile resistance)
c_V	Edge distance (shear resistance)
c_{cr}	Edge distance for ensuring the transmission of the characteristic resistance
$c_{cr,N}$	Edge distance for ensuring the transmission of the characteristic tensile resistance of a single anchor without spacing and edge effects.
$c_{cr,V}$	Edge distance for ensuring the transmission of the characteristic shear resistance of a single anchor without spacing and edge effects.
c_{min}	Minimum allowable edge distance
d	Diameter of anchor bolt or thread diameter
d_f	Drill hole diameter in fixture
d_0	Drill hole diameter in substrate
h	Thickness of substrate
h_{min}	Minimum thickness of substrate
h_{ef}	Effective anchorage depth
h_{nom}	Embedment depth
h_0	Minimum drilled hole depth
k	Factor to be taken from the relevant ETA (pry-out failure)
L	Anchor length
s	Spacing of anchors in a group
s_{cr}	Spacing for ensuring the transmission of the characteristic resistance
s_{min}	Minimum allowable spacing
$s_{cr,N}$	Spacing for ensuring the transmission of the characteristic tensile resistance of a single anchor without spacing and edge effects.
t_{fix}	Fixture thickness
T_{inst}	Installation torque

Approved Body Symbols

	European Technical Approval
	CE Marking
	Building Research Institute (Poland, Warsaw)
	Resistance to fire exposure
	FM Approved

FRAME FIXING

- FF1
- KKS-R
- WHO/WHS



Counter-sunk version for fixing timber



Collared version for fixing metal brackets

Available with corrosion resistant screws in A4 stainless steel and DeltaTone coating



Specially-formulated ultramid nylon allows best performance installation for use in all base material categories according to ETAG 020 (A, B, C, D)

FF1 Nylon frame fixing

Universal frame fixing for many applications



Approvals and Reports

- ETA-12/0398



Versions

- Stainless steel
- Delta-tone coating
- Zinc-plated steel



Installation movie

Product information

Features and benefits

- The countersunk plug for flush fixing of soft material (eg. timber)
- Collared plug for fixing hard materials (eg. steel)
- Specially-formulated Ultramid nylon allows best performance installation for use in all base material categories according to ETAG 020 (A, B, C, D)
- Internal plug geometry designed to fit the screw head and ensures multi-axis expansion
- A4 Stainless steel screw version for the highest corrosion resistance and outdoor applications
- DT Unique zinc-flake coated screw version for applications where basic zinc-plated screw is not enough
- Embedment depth markings facilitate precise installation

Applications

- Door and window frames
- Garage doors
- Gates
- Industrial doors
- Facade (substructures made of wood and metal)
- Wall cabinets
- Satellite dishes
- Shelves
- Handrails
- Cable trays
- Gates, wickets, fences
- Trunking

Base materials

Approved for use in:

- Concrete
- Hollow-core Slab
- Solid Brick
- Solid Sand-lime Brick
- Vertically-perforated clay block
- Hollow Sand-lime Brick
- Aerated Concrete Block

Installation guide

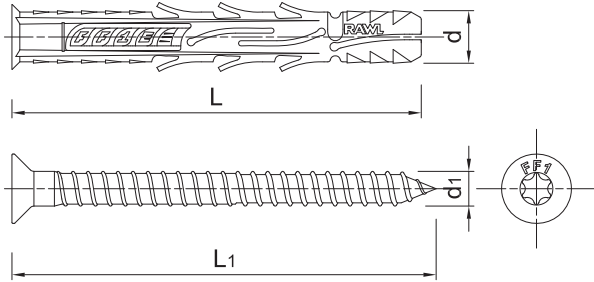


Installation guide (cont.)

1. Drill a hole of required diameter and depth
2. With a hammer, lightly tap the plug through the fixture into hole until fixing depth is reached
3. Tighten the FF1 screw

Product information

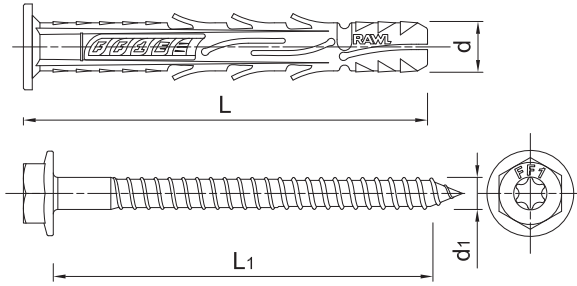
COUNTERSUNK VERSION



Size	Product Code	Plug		Screw		Fixture		
		Diameter	Length	Diameter	Length	Max. thickness		Hole diameter
		d	L	d ₁	L ₁	t _{fix} 50	t _{fix} 70	d _f
[mm]								
FF1-N Frame Fixing countersunk - Stainless Steel								
Ø10	R-FF1-N-10L080-A4	9.8	80	7	89	30	10	10
	R-FF1-N-10L100-A4	9.8	100	7	109	50	30	10
	R-FF1-N-10L120-A4	9.8	120	7	129	70	50	10
	R-FF1-N-10L140-A4	9.8	140	7	149	90	70	10
	R-FF1-N-10L160-A4	9.8	160	7	169	110	90	10
	R-FF1-N-10L200-A4	9.8	200	7	209	150	130	10
	R-FF1-N-10L240-A4	9.8	240	7	249	190	170	10
R-FF1-N-10L300-A4	9.8	300	7	309	250	230	10	
FF1-N Frame Fixing countersunk - Delta Tone								
Ø10	R-FF1-N-10L080/DT	9.8	80	7	89	30	10	10
	R-FF1-N-10L100/DT	9.8	100	7	109	50	30	10
	R-FF1-N-10L120/DT	9.8	120	7	129	70	50	10
	R-FF1-N-10L140/DT	9.8	140	7	149	90	70	10
	R-FF1-N-10L160/DT	9.8	160	7	169	110	90	10
	R-FF1-N-10L200/DT	9.8	200	7	209	150	130	10
	R-FF1-N-10L240/DT	9.8	240	7	249	190	170	10
R-FF1-N-10L300/DT	9.8	300	7	309	250	230	10	
FF1-N Frame Fixing countersunk - Zinc Plated								
Ø10	R-FF1-N-10L080	9.8	80	7	89	30	10	10
	R-FF1-N-10L100	9.8	100	7	109	50	30	10
	R-FF1-N-10L120	9.8	120	7	129	70	50	10
	R-FF1-N-10L140	9.8	140	7	149	90	70	10
	R-FF1-N-10L160	9.8	160	7	169	110	90	10
	R-FF1-N-10L200	9.8	200	7	209	150	130	10
	R-FF1-N-10L240	9.8	240	7	249	190	170	10
R-FF1-N-10L300	9.8	300	7	309	250	230	10	

Product information (cont.)

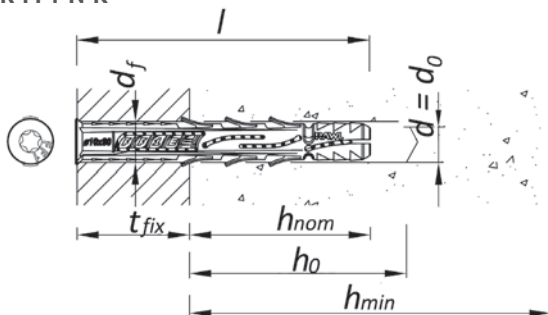
HEX HED VERSION WITH COLLARED PLUG



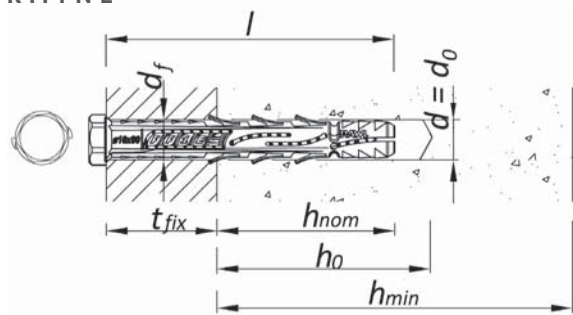
Size	Product Code	Plug		Screw		Fixture		
		Diameter	Length	Diameter	Length	Max. thickness		Hole diameter
		d	L	d ₁	L1	t _{fix} 50	t _{fix} 70	d _f
[mm]								
FF1-N-K Frame Fixing with collar - Stainless Steel								
Ø10	R-FF1-N-10K080-A4	9.8	80	7	89	30	10	10
	R-FF1-N-10K100-A4	9.8	100	7	109	50	30	10
	R-FF1-N-10K120-A4	9.8	120	7	129	70	50	10
	R-FF1-N-10K140-A4	9.8	140	7	149	90	70	10
	R-FF1-N-10K160-A4	9.8	160	7	169	110	90	10
	R-FF1-N-10K200-A4	9.8	200	7	209	150	130	10
	R-FF1-N-10K240-A4	9.8	240	7	249	190	170	10
	R-FF1-N-10K300-A4	9.8	300	7	309	250	230	10
FF1-N-K Frame Fixing with collar - Delta Tone								
Ø10	R-FF1-N-10K080/DT	9.8	80	7	89	30	10	10
	R-FF1-N-10K100/DT	9.8	100	7	109	50	30	10
	R-FF1-N-10K120/DT	9.8	120	7	129	70	50	10
	R-FF1-N-10K140/DT	9.8	140	7	149	90	70	10
	R-FF1-N-10K160/DT	9.8	160	7	169	110	90	10
	R-FF1-N-10K200/DT	9.8	200	7	209	150	130	10
	R-FF1-N-10K240/DT	9.8	240	7	249	190	170	10
	R-FF1-N-10K300/DT	9.8	300	7	309	250	230	10
FF1-N-K Frame Fixing with collar - Zinc Plated								
Ø10	R-FF1-N-10K080	9.8	80	7	89	30	10	10
	R-FF1-N-10K100	9.8	100	7	109	50	30	10
	R-FF1-N-10K120	9.8	120	7	129	70	50	10
	R-FF1-N-10K140	9.8	140	7	149	90	70	10
	R-FF1-N-10K160	9.8	160	7	169	110	90	10
	R-FF1-N-10K200	9.8	200	7	209	150	130	10
	R-FF1-N-10K240	9.8	240	7	249	190	170	10
	R-FF1-N-10K300	9.8	300	7	309	250	230	10

Zalecenia montażowe

R-FF1-N-K



R-FF1-N-L



Installation data

Embedment depth			Embedment depth 50 mm	Embedment depth 70 mm
Fixing diameter	d	[mm]	9.8	9.8
Hole diameter in substrate	d ₀	[mm]	10	10
Min. hole depth in substrate	h ₀	[mm]	60	80
Installation depth	h _{nom}	[mm]	50	70
Min. substrate thickness	h _{min}	[mm]	100	115
Min. spacing	s _{min}	[mm]	90	200
Min. edge distance	c _{min}	[mm]	80	100

Basic performance data

Performance data for single fixing without influence of edge distance and spacing

Substrate			Concrete C12/15	Concrete C20/25	Solid brick min. 50MPa	Sand-lime brick min. 30MPa	Hollow clay block min. 7.5MPa	Hollow brick min. 15MPa	Hollow brick min. 12MPa	Sand-lime hollow block min. 20MPa	Hollow lightweight concrete min. 2MPa	Perforated brick MAX	Perforated brick PW25	Autoclaved aerated concrete AAC 2	Autoclaved aerated concrete AAC 6
			MEAN ULTIMATE LOAD F _{Ru,m}												
Ø10, Embedment depth 50 mm	[kN]	-	3.35	-	3.07	-	-	-	-	-	-	-	-	-	-
Ø10, Embedment depth 70 mm	[kN]	-	-	9.95	-	1.02	1.04	1.24	4.50	1.22	2.13	2.07	0.56	1.73	
CHARACTERISTIC LOAD F _{Rk}															
Ø10, Embedment depth 50 mm	[kN]	0.90	1.50	-	1.20	-	-	-	-	-	-	-	-	-	-
Ø10, Embedment depth 70 mm	[kN]	-	-	4.50	-	0.60	0.60	0.60	2.00	0.60	0.90	0.90	0.30	0.90	
DESIGN LOAD F _{Rd}															
Ø10, Embedment depth 50 mm	[kN]	0.50	0.83	-	0.48	-	-	-	-	-	-	-	-	-	-
Ø10, Embedment depth 70 mm	[kN]	-	-	1.80	-	0.24	0.24	0.24	0.80	0.24	0.36	0.36	0.15	0.45	
RECOMMENDED LOAD F _{rec}															
Ø10, Embedment depth 50 mm	[kN]	3.60	0.60	-	0.34	-	-	-	-	-	-	-	-	-	-
Ø10, Embedment depth 70 mm	[kN]	-	-	1.29	-	0.17	0.17	0.17	0.57	0.17	0.26	0.26	0.11	0.32	

Recommended accessories



Cap type	Color	Box	Weight net [1000 szt.]
		[pcs]	[kg]
R-FF1-CAP-1001	Beige	50	0,532
R-FF1-CAP-6020	Green chromium	50	0,532
R-FF1-CAP-7024	Graphite gray	50	0,532
R-FF1-CAP-7035	Light gray	50	0,532
R-FF1-CAP-7043	Dark gray	50	0,532

Cap type	Color	Box	Weight net [1000 szt.]
		[pcs]	[kg]
R-FF1-CAP-8017	Brown	50	0,532
R-FF1-CAP-9002	White-gray	50	0,532
R-FF1-CAP-9005	Black	50	0,532
R-FF1-CAP-9016	White	50	0,532

Product commercial data

Size	Product Code	Plug		Screw		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
FF1-N Frame Fixing countersunk - Stainless Steel												
Ø10	R-FF1-N-10L080-A4	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675079165
	R-FF1-N-10L100-A4	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675079172
	R-FF1-N-10L120-A4	9.8	120	7	129	25	400	9600	1.55	24.8	625.2	5906675079189
	R-FF1-N-10L140-A4	9.8	140	7	149	25	300	7200	1.22	14.7	382.5	5906675079196
	R-FF1-N-10L160-A4	9.8	160	7	169	25	300	7200	1.56	18.7	479.3	5906675079202
	R-FF1-N-10L200-A4	9.8	200	7	209	25	25	7800	1.90	1.90	622.8	5906675039152
	R-FF1-N-10L240-A4	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675039169
	R-FF1-N-10L300-A4	9.8	300	7	309	10	10	40800	1.08	1.08	4416.0	5906675039176

Product commercial data (cont.)

Size	Product Code	Plug		Screw		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
FF1-N Frame Fixing countersunk - Delta Tone												
Ø10	R-FF1-N-10L080/DT	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675039015
	R-FF1-N-10L100/DT	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675039022
	R-FF1-N-10L120/DT	9.8	120	7	129	25	400	9600	1.55	24.8	625.2	5906675039039
	R-FF1-N-10L140/DT	9.8	140	7	149	25	300	7200	1.41	16.9	435.2	5906675039046
	R-FF1-N-10L160/DT	9.8	160	7	169	25	300	7200	1.56	18.7	479.3	5906675039053
	R-FF1-N-10L200/DT	9.8	200	7	209	25	25	7800	1.90	1.90	622.8	5906675039060
	R-FF1-N-10L240/DT	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675039077
	R-FF1-N-10L300/DT	9.8	300	7	309	10	10	40800	1.08	1.08	4416.0	5906675039084
FF1-N Frame Fixing countersunk - Zinc Plated												
Ø10	R-FF1-N-10L080	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675266909
	R-FF1-N-10L100	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675266916
	R-FF1-N-10L120	9.8	120	7	129	25	300	7200	1.55	18.6	476.4	5906675266923
	R-FF1-N-10L140	9.8	140	7	149	25	300	7200	1.22	14.7	382.5	5906675266930
	R-FF1-N-10L160	9.8	160	7	169	25	25	5250	1.56	1.56	357.6	5906675266947
	R-FF1-N-10L200	9.8	200	7	209	25	25	2250	1.90	1.90	201.0	5906675033983
	R-FF1-N-10L240	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675034102
	R-FF1-N-10L300	9.8	300	7	309	10	10	40800	1.17	1.17	4803.6	5906675034119
FF1-N-K Frame Fixing with collar - hex head - Stainless Steel												
Ø10	R-FF1-N-10K080-A4	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675079110
	R-FF1-N-10K100-A4	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675079127
	R-FF1-N-10K120-A4	9.8	120	7	129	25	400	9600	1.55	24.8	625.2	5906675079134
	R-FF1-N-10K140-A4	9.8	140	7	149	25	300	7200	1.41	16.9	435.2	5906675079141
	R-FF1-N-10K160-A4	9.8	160	7	169	25	300	7200	1.56	18.7	479.3	5906675079158
	R-FF1-N-10K200-A4	9.8	200	7	209	25	25	7800	1.90	1.90	622.8	5906675039121
	R-FF1-N-10K240-A4	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675039138
	R-FF1-N-10K300-A4	9.8	300	7	309	10	10	40800	1.08	1.08	4416.0	5906675039145
FF1-N-K Frame Fixing with collar - hex head - Delta Tone												
Ø10	R-FF1-N-10K080/DT	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675023472
	R-FF1-N-10K100/DT	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675023489
	R-FF1-N-10K120/DT	9.8	120	7	129	25	25	5250	1.55	1.55	355.5	5906675023496
	R-FF1-N-10K140/DT	9.8	140	7	149	25	300	7200	1.41	16.9	435.2	5906675023502
	R-FF1-N-10K160/DT	9.8	160	7	169	25	25	5250	1.56	1.56	357.6	5906675023519
	R-FF1-N-10K200/DT	9.8	200	7	209	25	25	7800	1.90	1.90	622.8	5906675039091
	R-FF1-N-10K240/DT	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675039107
	R-FF1-N-10K300/DT	9.8	300	7	309	10	10	40800	1.08	1.08	4416.0	5906675039114
FF1-N-K Frame Fixing with collar - hex head - Zinc Plated												
Ø10	R-FF1-N-10K080	9.8	80	7	89	50	400	9600	1.40	11.2	298.8	5906675266985
	R-FF1-N-10K100	9.8	100	7	109	25	400	9600	1.07	17.0	439.0	5906675266992
	R-FF1-N-10K120	9.8	120	7	129	25	300	7200	1.55	18.6	476.4	5906675267005
	R-FF1-N-10K140	9.8	140	7	149	25	300	7200	1.41	16.9	435.2	5906675267012
	R-FF1-N-10K160	9.8	160	7	169	25	300	7200	1.56	18.7	479.3	5906675267029
	R-FF1-N-10K200	9.8	200	7	209	25	25	7800	1.90	1.90	622.8	5906675018249
	R-FF1-N-10K240	9.8	240	7	249	25	25	4800	2.3	2.3	468.3	5906675019307
	R-FF1-N-10K300	9.8	300	7	309	10	10	40800	1.08	1.08	4416.0	5906675019321

KKS-R Frame fixing with short expansion zone

Frame fixing with short expansion zone for installation of door and window frames



Product information

Features and benefits

- Durable, high quality PA6 grade nylon plug for extended fixing life
- Tough nylon sleeve prevents frame distortion during tightening
- Zig-zag design ensures enhanced expansion
- Special design with anti-rotation lugs
- No marking out required - drill straight through the frame

Applications

- Door and window frames

Base materials

Approved for use in:

- Concrete
- Solid Brick

Also suitable for use in:

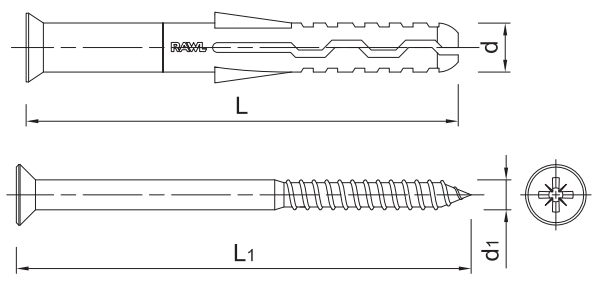
- Natural Stone

Installation guide



1. Drill a hole of required diameter and depth
2. Lightly tap the plug through the fixture into hole with a hammer, until fixing depth is reached
3. Tighten the screw

Product information



Size	Product Code	Plug		Screw		Fixture
		Diameter	Length	Diameter	Length	Max. thickness
		d	L	d ₁	L ₁	t _{fix}
[mm]						
Ø8	R-KKS-08060-R	8	60	5,5	65	20
	R-KKS-08080-R	8	80	5,5	85	40
	R-KKS-08100-R	8	100	5,5	105	60
	R-KKS-08120-R	8	120	5,5	125	80
Ø10	R-KKS-10080-R	10	80	7	85	30
	R-KKS-10100-R	10	100	7	105	50
	R-KKS-10120-R	10	120	7	125	70
	R-KKS-10135-R	10	135	7	140	85
	R-KKS-10160-R	10	160	7	165	110

Installation data

Size	Ø8		Ø10	
Fixing diameter	d	[mm]	8	10
Hole diameter in substrate	d ₀	[mm]	8	10
Min. hole depth in substrate	h ₀	[mm]	50	60
Installation depth	h _{nom}	[mm]	40	50

Product commercial data

Size	Product Code	Plug		Screw		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
Ø8	R-KKS-08060-R	8	60	5,5	65	50	800	19200	0.51	8.1	223.9	5010445213205
	R-KKS-08080-R	8	80	5,5	85	50	800	19200	0.68	10.9	291.1	5010445213236
	R-KKS-08100-R	8	100	5,5	105	50	800	19200	0.67	10.7	287.3	5010445213267
	R-KKS-08120-R	8	120	5,5	125	50	800	19200	0.67	10.7	287.3	5010445213298
Ø10	R-KKS-10080-R	10	80	7	85	50	600	14400	1.42	17.0	439.0	5010445213359
	R-KKS-10100-R	10	100	7	105	50	600	14400	1.42	17.0	439.0	5010445213380
	R-KKS-10120-R	10	120	7	125	50	400	9600	1.22	9.8	264.2	5010445213403
	R-KKS-10135-R	10	135	7	140	50	400	9600	2.0	16.0	414.0	5010445213441
	R-KKS-10160-R	10	160	7	165	50	400	9600	2.9	23.5	594.5	5010445213472

WHO/WHS Frame screws

Special frame screws for window and door installation



WHO



WHS



Approvals and Reports

- AT-15-6977/2012 + Annex no 1



Versions:

- WHO - Flat head
- WHS - Cylinder head

Product information

Features and benefits

- Cylinder head for flush installation with the window and door frames
- Flat head for easy installation into metal window and door frames
- No additional plugs required, making the WHO screw a user-friendly and time-efficient fixing solution
- Expansion-free fixing imposes less stress on substrate during installation
- High load resistances from a relatively small hole diameter
- Easily removed for temporary works

Applications

- Door and window frames
- Securing formwork
- Suspended ceilings
- Lightweight steel angles
- Timber constructions

Base materials

Approved for use in:

- Concrete
- Solid Brick
- Hollow Brick
- Aerated Concrete Block

Also suitable for use in:

- Natural Stone
- Hollow-core Slab
- Timber

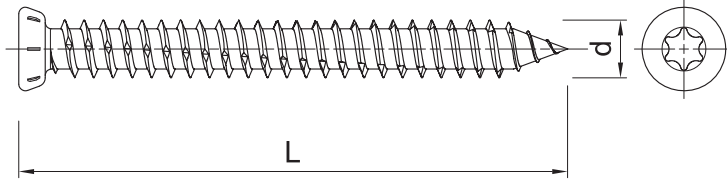
Installation guide



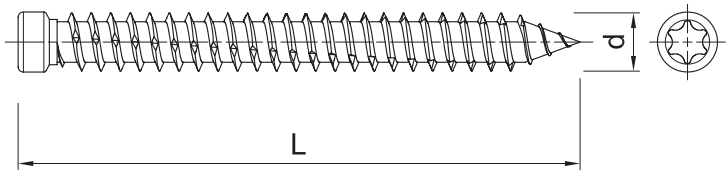
1. Drill a hole of required diameter and depth
2. Lightly screw into hole through the fixture, until fixing depth is reached and fixture is secure

Product information

WHO



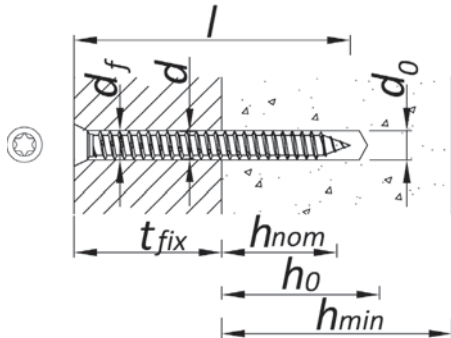
WHS



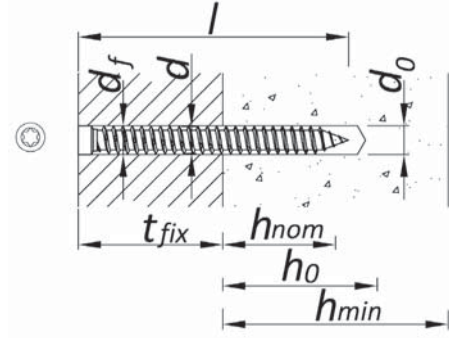
Size	Product Code	Screw		Fixture		Hole diameter d_f
		Diameter	Length	Max. thickness		
		d	L	t_{fix} Concrete	t_{fix} Other	
[mm]						
WHO Screw						
Ø7.5	R-WHO-75052	7.5	52	22	-	8
	R-WHO-75072	7.5	72	42	12	8
	R-WHO-75092	7.5	92	62	32	8
	R-WHO-75112	7.5	112	82	52	8
	R-WHO-75132	7.5	132	102	72	8
	R-WHO-75152	7.5	152	122	92	8
	R-WHO-75182	7.5	182	152	122	8
	R-WHO-75202	7.5	202	172	142	8
	R-WHO-75212	7.5	212	182	152	8
WHS Screw						
Ø7.5	R-WHS-75052	7.5	52	22	-	8
	R-WHS-75072	7.5	72	42	12	8
	R-WHS-75092	7.5	92	62	32	8
	R-WHS-75112	7.5	112	82	52	8
	R-WHS-75132	7.5	132	102	72	8
	R-WHS-75152	7.5	152	122	92	8
	R-WHS-75182	7.5	182	152	122	8
	R-WHS-75202	7.5	202	172	142	8
	R-WHS-75212	7.5	212	182	152	8

Installation data

WHO



WHS



Installation data (cont.)

Substrate			Concrete	Aerated concrete	Other
Fixing diameter	d	[mm]	7.5	7.5	7.5
Hole diameter in substrate	d ₀	[mm]	6	-	6
Min. hole depth in substrate	h ₀	[mm]	40	-	70
Installation depth	h _{nom}	[mm]	30	60	60
Min. substrate thickness	h _{min}	[mm]	60	90	90
Min. spacing	s _{min}	[mm]	15	30	30
Min. edge distance	c _{min}	[mm]	15	50	50

Basic performance data

Performance data for single fixing without influence of edge distance and spacing

Substrate		Concrete C20/25	Solid brick 7.5MPa	Aerated concrete 400	Perforated brick K3
MEAN ULTIMATE LOAD F_{Ru,m}					
Ø7.5, Embedment depth 30 mm	[kN]	6.15	-	-	-
Ø7.5, Embedment depth 60 mm	[kN]	-	2.58	1.27	1.02
CHARACTERISTIC LOAD F_{Rk}					
Ø7.5, Embedment depth 30 mm	[kN]	5.21	-	-	-
Ø7.5, Embedment depth 60 mm	[kN]	-	2.11	1.14	0.90
DESIGN LOAD F_{Rd}					
Ø7.5, Embedment depth 30 mm	[kN]	2.08	-	-	-
Ø7.5, Embedment depth 60 mm	[kN]	-	0.84	0.46	0.36
RECOMMENDED LOAD F_{rec}					
Ø7.5, Embedment depth 30 mm	[kN]	1.49	-	-	-
Ø7.5, Embedment depth 60 mm	[kN]	-	0.60	0.33	0.26

Product commercial data

Size	Product Code	Screw	Quantity [pcs]			Weight [kg]			Bar Codes
		Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-WHO									
Ø7.5	R-WHO-75052	52	100	1600	89600	1.09	17.4	1006.6	5906675174648
	R-WHO-75072	72	100	1600	38400	1.53	24.5	617.5	5906675174662
	R-WHO-75092	92	100	100	36400	2.0	2.0	750.7	5906675174686
	R-WHO-75112	112	100	100	36400	2.5	2.5	925.4	5906675174709
	R-WHO-75132	132	100	100	36400	2.9	2.9	1071.0	5906675174723
	R-WHO-75152	152	100	100	36400	3.3	3.3	1231.2	5906675174747
	R-WHO-75182	182	100	100	36400	4.0	4.0	1471.4	5906675174761
	R-WHO-75202	202	100	100	27300	4.1	4.1	1157.5	5906675174785
R-WHO-75212	212	100	100	27300	4.1	4.1	1157.5	5906675174808	
R-WHS									
Ø7.5	R-WHS-75052	52	100	1600	89600	1.04	16.6	961.8	5906675174822
	R-WHS-75072	72	100	1600	89600	1.47	23.5	1347.1	5906675174846
	R-WHS-75092	92	100	100	15000	1.84	1.84	306.0	5906675174860
	R-WHS-75112	112	100	100	36000	2.2	2.2	818.4	5906675174884
	R-WHS-75132	132	100	100	6000	2.6	2.6	186.6	5906675174907
	R-WHS-75152	152	100	100	27000	3.1	3.1	856.2	5906675174921
	R-WHS-75182	182	100	100	21600	3.7	3.7	827.0	5906675174945
	R-WHS-75202	202	100	800	21600	4.1	32.8	915.6	5906675208787
R-WHS-75212	212	100	800	21600	4.3	34.4	958.8	5906675208794	

LIGHTWEIGHT METAL FIXINGS

- GS
- WW

Fire resistance class A1

Approved for installation in cracked and non-cracked concrete

Reliable setting thanks to the large collar and simple visual check.

Two steel elements provide high load capacity and long-term safety of use.

Approved for installation in cracked and non-cracked concrete

Expansion in the substrate achieved by hammering-in steel wedge enables optimum expansion and minimizes the possibility of displacement of fixed element under load

GS Ceiling wedge anchor

All steel anchor for lightweight and suspended ceilings



Approvals and Reports

- ETA-11/0268



Product information

Features and benefits

- During installation, when the nail is flush with the head, it signifies the complete expansion of the anchor
- Approved for installation in cracked and non-cracked concrete
- Fire resistance class A1
- Reliable setting thanks to the big collar and simple visual check
- Impact expansion by hammer, no setting tool is needed

Applications

- Suspended ceilings
- Coffered ceilings
- Conduit and pipe clamps
- Ventilation systems
- Metal roof profiles
- Punched straps

Base materials

Approved for use in:

- Cracked concrete C20/25-C50/60
- Non-cracked concrete C20/25-C50/60

Also suitable for use in:

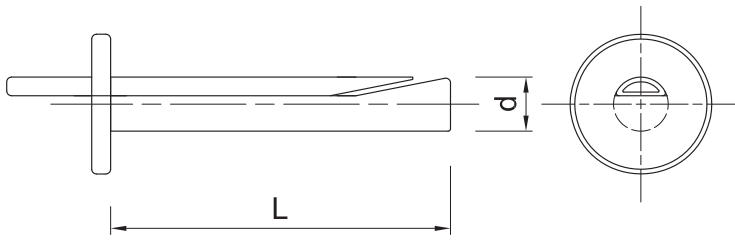
- Natural Stone
- Concrete

Installation guide



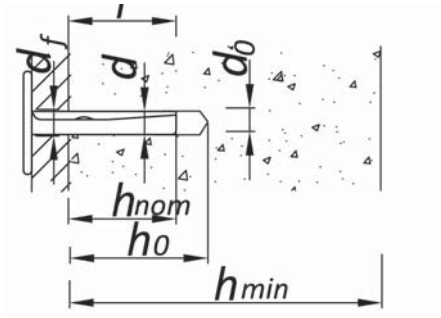
1. Drill a hole of required diameter and depth.
2. Insert anchor through fixture into hole until fixing depth is reached.
3. Hammer in the nail until flush with the anchor head.

Product information



Size	Product Code	Anchor		Fixture	
		Diameter	Length	Max. thickness	Hole diameter
		d	L	t _{fix}	d _f
[mm]					
Ø6	R-GS-06040	5.8	36	4.5	7
	R-GS-06065	5.8	65	35	7

Installation data



Size				Ø6
Fixing diameter	d	[mm]		5.8
Hole diameter in substrate	d _o	[mm]		6
Min. hole depth in substrate	h _o	[mm]		40
Installation depth	h _{nom}	[mm]		32
Min. substrate thickness	h _{min}	[mm]		100
Min. spacing	s _{min}	[mm]		200
Min. edge distance	c _{min}	[mm]		150

Centric tensile stressing

Characteristic resistance			
30 min	N _{Rk,s,fi(30)}	[kN]	0.66
60 min	N _{Rk,s,fi(30)}	[kN]	0.52
90 min	N _{Rk,s,fi(30)}	[kN]	0.39
120 min	N _{Rk,s,fi(30)}	[kN]	0.32

Basic performance data

Performance data for single fixing without influence of edge distance and spacing

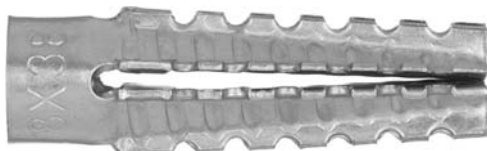
Substrate		Cracked concrete	Non-cracked concrete
MEAN ULTIMATE LOAD $F_{R_{u,m}}$			
Ø06, Embedment depth 32 mm	[kN]	4.27	4.27
CHARACTERISTIC LOAD F_{R_k}			
Ø06, Embedment depth 32 mm	[kN]	3.00	3.00
DESIGN LOAD F_{R_d}			
Ø06, Embedment depth 32 mm	[kN]	2.00	2.00
RECOMMENDED LOAD $F_{R_{rec}}$			
Ø06, Embedment depth 32 mm	[kN]	1.43	1.43

Product commercial data

Size	Product Code	Anchor	Quantity [pcs]			Weight [kg]			Bar Codes
		Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
Ø6	R-GS-06040	36	100	3200	76800	1.26	40.3	997.7	5906675169347
	R-GS-06065	65	100	1600	38400	1.13	18.1	463.9	5906675158105

KGS Metal plug

Metal plug for use in many masonry materials



Product information

Features and benefits

- External teeth expand in base materials ensures high pull-out loads
- The ribbed internal geometry suitable for screws makes it possible to guide the screw securely
- High holding strength even in oversized holes
- Used in areas where fire considerations disallow the use of plastic anchors
- Removable - screw may be removed and reinserted
- Quick and easy installation with wood and chipboard screws

Applications

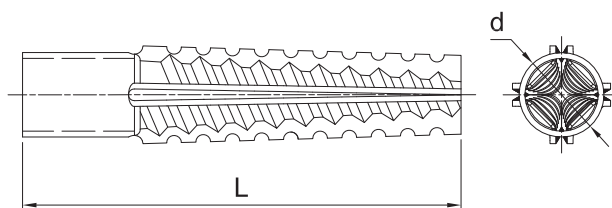
- Light shelving, brackets and hooks
- Water pipes
- Gas pipes
- Cable and pipe clamps

Base materials

Suitable for use in:

- Aerated Concrete Block
- Hollow Lightweight Concrete Block
- Lightweight Concrete Block
- Vertically-perforated clay block
- Hollow Sand-lime Brick
- Solid Sand-lime Brick
- Hollow Brick
- Solid Brick

Product information



Product commercial data

Product Code	Drill diameter [mm]	Plug Length [mm]	Screw diameter [mm]	Quantity [pcs]			Weight [kg]			Bar Codes
				Box	Outer	Pallet	Box	Outer	Pallet	
R-KGS-0632	6	32	4,5-5,0	200	3200	76800	0.51	8.1	223.9	5906675170008
R-KGS-0838	8	38	5,0-6,0	200	3200	76800	1.22	19.5	498.5	5906675170022
R-KGS-0860	8	60	5,0-6,0	100	1600	38400	0.98	15.7	406.3	5906675170046
R-KGS-1060	10	60	6,0-8,0	50	800	19200	0.64	10.2	275.8	5906675170060

Installation guide

1. Drill a hole of required diameter.
2. Insert KGS anchor into hole and tap home.
3. Insert screw of required diameter into anchor through fixture and tighten.
4. The drill diameter is relative to the compressive strength of the building material. The higher the compressive strengths, the greater the drill diameter.

HAMMER-IN FIXING

▪ FX



The extensive range of product lengths, diameters and head types ensures availability of the correct fixing for every application



Combination of Phillips recess and the helical thread makes removal of the nail possible, facilitating disassembly when necessary

Nylon material for best quality

Cylinder head prevents plug slipping into over-sized fixing holes and allows fixing of thin elements



FX Hammer-in fixings

The hammer fixing for fast, simple, cost-effective installations



Approvals and Reports

- ETA-12/0457
- ETA-13/0088



Versions:

- FX-N-C with cylinder head
- FX-N-K with mushroom head
- FX-N-L with countersunk head

Product information

Features and benefits

- Rapid hammer-set installation reduces the time required and allows for cost-effective, high-volume installation
- Cylinder head prevents plug slipping into over-sized holes and allows the fixing of thin elements.
- Combination of Phillips recess and the helical thread makes removal of the nail possible, facilitating disassembly when necessary
- The extensive range of product lengths, diameters and head types ensures availability of the correct fixing for every scenario
- Designed for push-through installation
- Nylon material for best quality

Applications

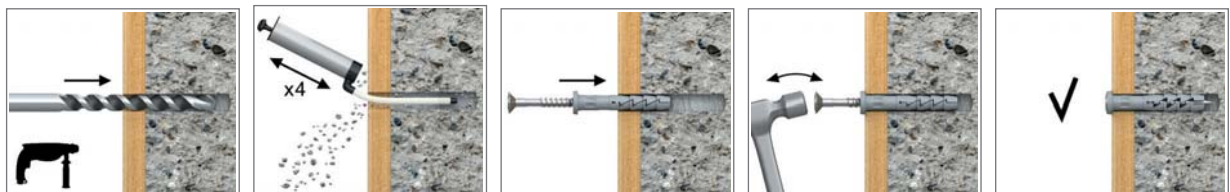
- Timber or metal battens
- Drywall structures
- Skirting / Dado railing
- Cable clamps
- Pipe clamps
- Sheeting

Base materials

Approved for use in:

- Concrete
- Solid Brick
- Solid Sand-lime Brick
- Hollow Sand-lime Brick
- Lightweight Concrete Block
- Hollow Lightweight Concrete Block
- Aerated Concrete Block

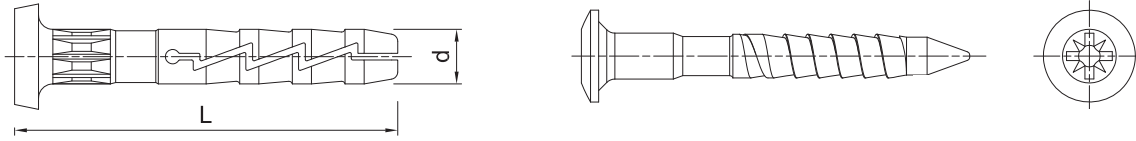
Installation guide



1. Drill a hole of required diameter.
2. Insert FX plug into hole through fixture.
3. Hammer the nail into the plastic sleeve until fixing is secure and flush with the fixture.

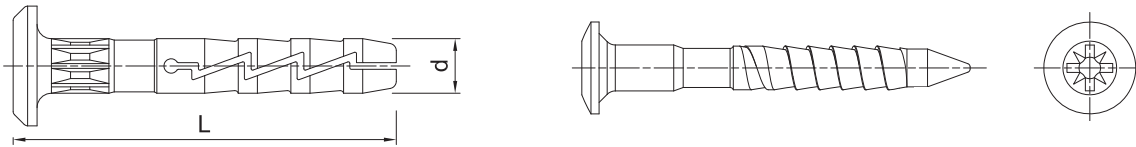
Product information

FX-N-C Nylon hammer-in fixing with cylinder head



Size	Product Code	Plug		Fixture	
		Diameter	Length	Max. thickness	Hole diameter
		d	L	t _{fix}	d _f
[mm]					
Ø5	R-FX-N-05C030	5	30	5	6
	R-FX-N-05C035	5	35	10	6
	R-FX-N-05C050	5	50	25	6
Ø6	R-FX-N-06C035	6	35	6	7
	R-FX-N-06C040	6	40	11	7
	R-FX-N-06C045	6	45	16	7
	R-FX-N-06C060	6	60	31	7
Ø8	R-FX-N-06C080	6	80	51	7
	R-FX-N-08C045	8	45	5	9
	R-FX-N-08C060	8	60	20	9
	R-FX-N-08C080	8	80	40	9
	R-FX-N-08C100	8	100	60	9
	R-FX-N-08C120	8	120	80	9
	R-FX-N-08C140	8	140	100	9
	R-FX-N-08C160	8	160	120	9

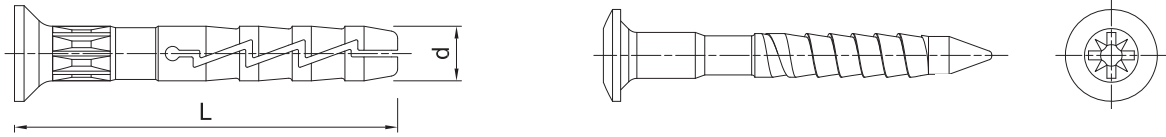
FX-N-K Nylon hammer-in fixing with mushroom head



Size	Product Code	Plug		Fixture	
		Diameter	Length	Max. thickness	Hole diameter
		d	L	t _{fix}	d _f
[mm]					
Ø6	R-FX-N-06K040	6	40	11	7
	R-FX-N-06K045	6	45	16	7
	R-FX-N-06K060	6	60	31	7
	R-FX-N-06K080	6	80	51	7

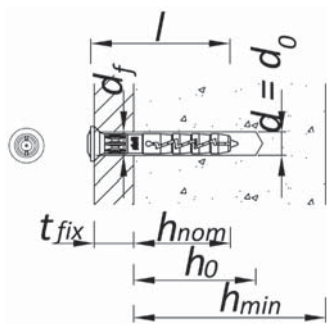
Product information (cont.)

FX-N-L Nylon hammer-in fixing with countersunk head

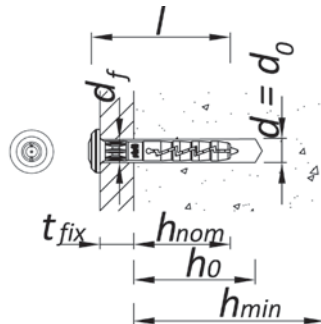


Size	Product Code	Plug		Fixture	
		Diameter	Length	Max. thickness	Hole diameter
		d	L	t_{fix}	d_f
[mm]					
Ø5	R-FX-N-05L025	5	25	1	6
	R-FX-N-05L030	5	30	5	6
	R-FX-N-05L035	5	35	10	6
	R-FX-N-05L040	5	40	15	6
	R-FX-N-05L050	5	50	25	6
Ø6	R-FX-N-06L035	6	35	6	7
	R-FX-N-06L040	6	40	11	7
	R-FX-N-06L045	6	45	16	7
	R-FX-N-06L050	6	50	21	7
	R-FX-N-06L055	6	55	26	7
	R-FX-N-06L060	6	60	31	7
	R-FX-N-06L080	6	80	51	7
Ø8	R-FX-N-08L045	8	45	5	9
	R-FX-N-08L060	8	60	20	9
	R-FX-N-08L080	8	80	40	9
	R-FX-N-08L100	8	100	60	9
	R-FX-N-08L120	8	120	80	9
	R-FX-N-08L140	8	140	100	9
	R-FX-N-08L160	8	160	120	9

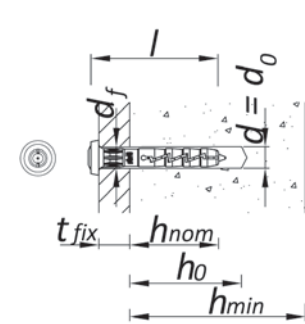
Installation data



FX-N-C



FX-N-K



FX-N-L

Size			Ø5	Ø6	Ø8
Fixing diameter	d	[mm]	5	6	8
Hole diameter in substrate	d_0	[mm]	5	6	8
Min. hole depth in substrate	h_0	[mm]	30	35	45
Installation depth	h_{nom}	[mm]	25	29	40
Min. substrate thickness	h_{min}	[mm]	100	100	100
Min. spacing	s_{min}	[mm]	100	100	100
Min. edge distance	c_{min}	[mm]	100	100	100

Basic performance data

Performance data for single fixing in tension without influence of edge distance and spacing

Substrate		Concrete C12/15	Concrete C20/25 - C50/60	Solid brick	Sand-lime solid brick	Sand-lime hollow brick	Lightweight concrete hollow block	Lightweight concrete block	Auto-claved aerated concrete
FX-N-C, FX-N-K, FX-N-L									
MEAN ULTIMATE LOAD $N_{Ru,m}$									
Ø05, Embedment depth 25 mm	[kN]	0.36	0.51	0.41	0.44	0.49	0.35	0.42	-
Ø06, Embedment depth 29 mm	[kN]	0.37	0.53	0.39	0.55	0.53	0.40	0.49	0.14
Ø08, Embedment depth 40 mm	[kN]	0.55	0.78	0.82	0.55	-	0.50	0.74	0.17
CHARACTERISTIC LOAD N_{Rk}									
Ø05, Embedment depth 25 mm	[kN]	0.20	0.30	0.20	0.20	0.30	0.20	0.20	-
Ø06, Embedment depth 29 mm	[kN]	0.20	0.30	0.20	0.40	0.30	0.30	0.30	0.10
Ø08, Embedment depth 40 mm	[kN]	0.30	0.50	0.50	0.40	-	0.30	0.50	0.10
DESIGN LOAD N_{Rd}									
Ø05, Embedment depth 25 mm	[kN]	0.15	0.15	0.10	0.10	0.15	0.10	0.10	-
Ø06, Embedment depth 29 mm	[kN]	0.15	0.15	0.10	0.20	0.15	0.15	0.15	0.05
Ø08, Embedment depth 40 mm	[kN]	0.25	0.25	0.25	0.20	-	0.15	0.25	0.05
RECOMMENDED LOAD N_{rec}									
Ø05, Embedment depth 25 mm	[kN]	0.11	0.11	0.07	0.07	0.11	0.07	0.07	-
Ø06, Embedment depth 29 mm	[kN]	0.11	0.11	0.07	0.14	0.11	0.11	0.11	0.04
Ø08, Embedment depth 40 mm	[kN]	0.18	0.18	0.18	0.14	-	0.11	0.18	0.04

Product commercial data

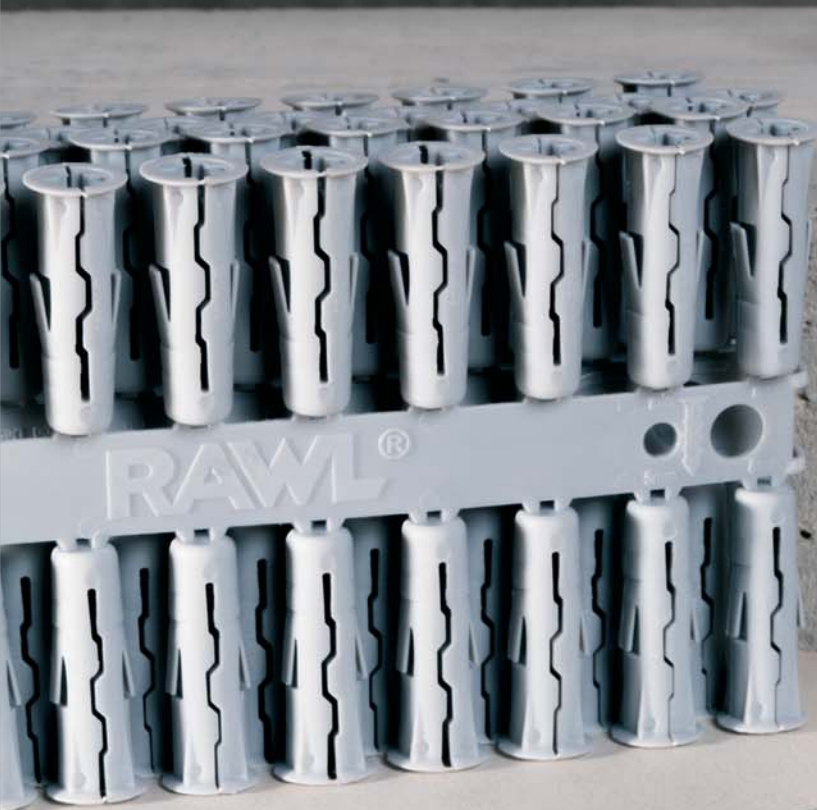
Size	Product Code	Plug		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
FX-N-C Nylon hammer-in fixing with cylinder head										
Ø5	R-FX-N-05C030	5	30	100	2400	57600	0.80	19.2	490.8	5906675176963
	R-FX-N-05C035	5	35	100	2400	57600	0.32	7.7	214.3	5906675176987
	R-FX-N-05C050	5	50	100	2400	57600	0.35	8.5	233.3	5906675212791
Ø6	R-FX-N-06C035	6	35	100	2400	57600	0.80	19.2	490.8	5906675177328
	R-FX-N-06C040	6	40	100	2400	76800	0.80	19.2	644.4	5906675177342
	R-FX-N-06C045	6	45	100	2400	57600	0.44	10.6	283.4	5906675177366
	R-FX-N-06C060	6	60	100	1200	28800	0.80	9.6	260.4	5906675177380
Ø8	R-FX-N-06C080	6	80	100	1200	28800	0.80	9.6	260.4	5906675177403
	R-FX-N-08C045	8	45	100	1200	28800	0.76	9.1	248.9	5906675177601
	R-FX-N-08C060	8	60	100	1200	28800	0.80	9.6	260.4	5906675177625
	R-FX-N-08C080	8	80	50	600	14400	0.68	8.2	227.0	5906675177564
	R-FX-N-08C100	8	100	50	600	14400	0.80	9.7	261.6	5906675177663
	R-FX-N-08C120	8	120	50	600	14400	0.93	11.2	298.7	5906675177588
	R-FX-N-08C140	8	140	50	600	14400	1.05	12.6	333.1	5906675119069
FX-N-K Hammer-in fixing with mushroom head										
Ø6	R-FX-N-06K040	6	40	100	2400	76800	0.80	19.2	644.4	5906675177427
	R-FX-N-06K045	6	45	100	1800	57600	0.47	8.5	300.7	5906675169163
	R-FX-N-06K060	6	60	100	1200	28800	0.65	7.8	217.2	5906675177441
	R-FX-N-06K080	6	80	100	1200	28800	0.80	9.6	260.4	5906675177465

Product commercial data

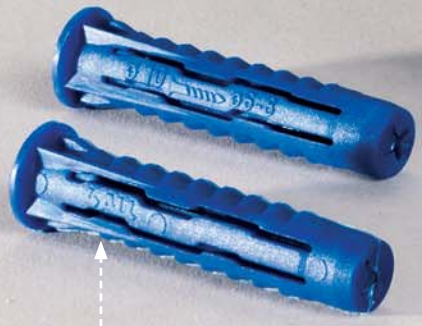
Size	Product Code	Plug		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
FX-N-L hammer-in fixing with countersunk head										
Ø5	R-FX-N-05L025	5	25	100	2400	57600	1.50	36.0	894.0	5906675177045
	R-FX-N-05L030	5	30	100	2400	57600	1.50	36.0	894.0	5906675177069
	R-FX-N-05L035	5	35	100	2400	57600	1.50	36.0	894.0	5906675177144
	R-FX-N-05L040	5	40	100	2400	57600	0.40	9.6	260.4	5906675177168
	R-FX-N-05L050	5	50	100	2400	57600	0.33	7.9	219.8	5906675177021
Ø6	R-FX-N-06L035	6	35	100	2400	57600	0.43	10.3	277.7	5906675177489
	R-FX-N-06L040	6	40	100	2400	57600	0.43	10.3	277.7	5906675169224
	R-FX-N-06L045	6	45	100	2400	57600	0.44	10.6	283.4	5906675205182
	R-FX-N-06L050	6	50	100	1200	28800	0.44	5.3	156.7	5906675253428
	R-FX-N-06L055	6	55	100	1200	38400	0.56	6.7	245.0	5906675177526
	R-FX-N-06L060	6	60	100	1200	28800	0.80	9.6	260.4	5906675169248
Ø8	R-FX-N-08L080	6	80	100	1200	28800	0.77	9.2	251.8	5906675177540
	R-FX-N-08L045	8	45	100	1200	28800	0.84	10.1	271.9	5906675155807
	R-FX-N-08L060	8	60	100	1200	28800	1.04	12.5	329.5	5906675169262
	R-FX-N-08L080	8	80	50	600	14400	0.68	8.2	225.8	5906675169286
	R-FX-N-08L100	8	100	50	600	14400	0.84	10.1	271.9	5906675169309
	R-FX-N-08L120	8	120	50	600	14400	0.81	9.7	263.3	5906675169323
	R-FX-N-08L140	8	140	50	600	14400	1.05	12.6	332.4	5906675171708
R-FX-N-08L160	8	160	50	600	14400	1.22	14.6	381.4	5906675171746	

PLASTIC EXPANSION PLUG

- UNO
- RAWL-IN-ONE
- 4ALL
- R-OLD



Unique geometry guarantees maximum expansion and grip



Unique 4 way expansion allowing application in any substrate material

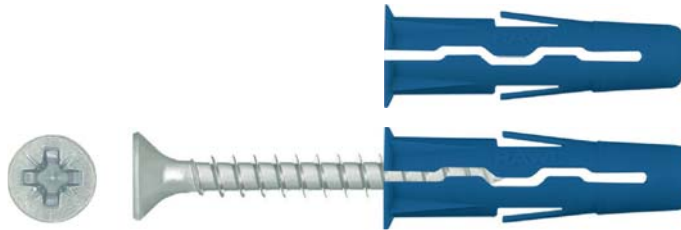
For all base materials

Expanding section designed to collapse in hollow materials and provide positive grip behind surfaces



UNO Universal plug

Truly universal plug which fixes into any base material, solid or hollow



Approvals and Reports

- AT-15-8093/2009 + Annex no 1



Versions:

- Plug
- Plug with screw



Installation movie

Product information

Features and benefits

- Unique geometry guarantees maximum expansion and grip
- Instant grip resulting from split plug design
- Anti-rotation features prevent spinning in the hole
- Lip prevents plug slipping into over-sized holes

Applications

- Shelves
- Suspended ceilings
- Electrical fittings
- Cable trays
- Boilers
- Radiators
- Lighting
- Bathroom fittings

Base materials

Suitable for use in:

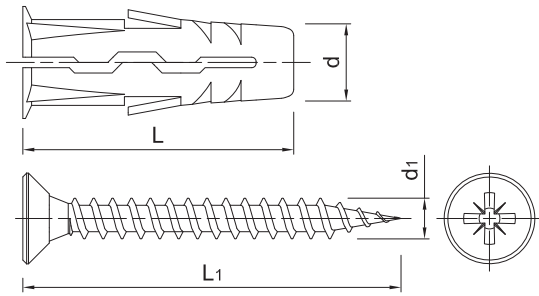
- Concrete
- Hollow-core Slab
- High-Density Natural Stone
- Solid Brick
- Solid Sand-lime Brick
- Hollow Brick
- Vertically-perforated clay block
- Lightweight Concrete Block
- Hollow Lightweight Concrete Block
- Aerated Concrete Block
- Plasterboard

Installation guide



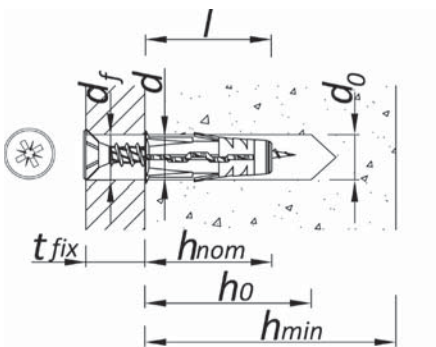
1. Drill a hole of required diameter.
2. Insert UNO plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.

Product information



Size	Product Code	Plug		Screw		Fixture	
		Diameter	Length	Diameter	Length	Max. thickness	Hole diameter
		d	L	d ₁	L ₁	t _{fix}	d _f
[mm]							
R-UNO-K Plug							
Ø5	UNO-K-05	5	24	3.0 - 4.5	min. 25	-	4.0 - 5.0
Ø6	UNO-K-06	6	28	3.5 - 5.0	min. 25	-	4.0 - 6.0
Ø7	UNO-K-07	7	30	4.0 - 6.0	min. 25	-	5.0 - 7.0
Ø8	UNO-K-08	8	32	4.5 - 6.0	min. 30	-	5.0 - 7.0
Ø10	UNO-K-10	10	36	5.0 - 8.0	min. 30	-	6.0 - 9.0
R-UNO Plug with screw							
Ø6	UNO-06+430	6	28	4.0	30	1	5
	UNO-06+435	6	28	4.0	35	5	5
	UNO-06+445	6	28	4.0	45	15	6
Ø8	UNO-08+435	8	32	4.5	35	2	5
	UNO-08+450	8	32	4.5	50	15	6
	UNO-08+560	8	32	5.0	60	25	7
Ø10	UNO-10+540	10	36	5.0	40	2	6
	UNO-10+650	10	36	6.0	50	15	7
	UNO-10+660	10	36	6.0	60	25	9

Installation data



Size	Ø5	Ø6	Ø7	Ø8	Ø10		
Fixing diameter	d	[mm]	5	6	7	8	10
Hole diameter in substrate	d ₀	[mm]	5	6	7	8	10
Min. hole depth in substrate	h ₀	[mm]	34	38	40	42	46
Installation depth	h _{nom}	[mm]	24	28	30	32	36
Min. substrate thickness	h _{min}	[mm]	50	55	60	65	70
Min. spacing	s _{min}	[mm]	24	28	30	32	36
Min. edge distance	c _{min}	[mm]	24	28	30	32	36

Basic performance data

Performance data for single fixing in tension without influence of edge distance and spacing

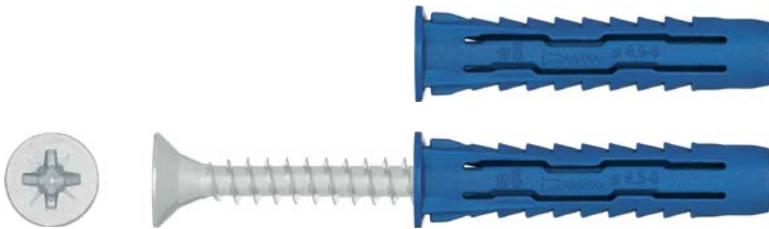
Substrate		Concrete C20/25	Solid clay brick 15MPa	Hollow brick 15MPa	Perforated brick 15MPa	Aerated concrete 600 Mark V	Plasterboard min. 12.5 mm
MEAN ULTIMATE LOAD $N_{R,u,m}$							
Plug Ø5 + screw Ø3.5	[kN]	1.77	0.79	0.94	0.62	0.28	0.24
Plug Ø6 + screw Ø3.5	[kN]	1.63	1.18	0.87	0.72	0.73	0.30
Plug Ø7 + screw Ø4.0	[kN]	1.67	0.88	1.32	0.87	0.86	0.37
Plug Ø8 + screw Ø4.5	[kN]	2.49	1.39	1.15	0.94	0.84	0.40
Plug Ø10 + screw Ø5.0	[kN]	6.81	1.50	1.42	1.66	0.73	0.45
CHARACTERISTIC LOAD N_{Rk}							
Plug Ø5 + screw Ø3.5	[kN]	1.39	0.47	0.72	0.39	0.27	0.17
Plug Ø6 + screw Ø3.5	[kN]	1.48	0.85	0.51	0.21	0.63	0.21
Plug Ø7 + screw Ø4.0	[kN]	0.89	0.32	0.71	0.60	0.51	0.25
Plug Ø8 + screw Ø4.5	[kN]	1.25	0.68	0.95	0.81	0.48	0.26
Plug Ø10 + screw Ø5.0	[kN]	3.59	0.69	1.18	0.92	0.42	0.34
DESIGN LOAD N_{Rd}							
Plug Ø5 + screw Ø3.5	[kN]	0.77	0.19	0.29	0.15	0.13	0.07
Plug Ø6 + screw Ø3.5	[kN]	0.82	0.34	0.20	0.20	0.31	0.08
Plug Ø7 + screw Ø4.0	[kN]	0.49	0.13	0.28	0.24	0.25	0.10
Plug Ø8 + screw Ø4.5	[kN]	0.69	0.38	0.38	0.32	0.24	0.10
Plug Ø10 + screw Ø5.0	[kN]	1.99	0.38	0.47	0.37	0.21	0.13
RECOMMENDED LOAD N_{rec}							
Plug Ø5 + screw Ø3.5	[kN]	0.55	0.14	0.21	0.11	0.09	0.05
Plug Ø6 + screw Ø3.5	[kN]	0.59	0.24	0.14	0.14	0.22	0.06
Plug Ø7 + screw Ø4.0	[kN]	0.35	0.09	0.20	0.17	0.18	0.07
Plug Ø8 + screw Ø4.5	[kN]	0.49	0.27	0.27	0.23	0.17	0.07
Plug Ø10 + screw Ø5.0	[kN]	1.42	0.27	0.34	0.26	0.15	0.09

Product commercial data

Size	Product Code	Plug		Screw		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Length [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
UNO Plug												
Ø5	UNO-K-05	5	24	-	25 - 40	200	6400	153600	0.32	10.2	275.8	5906675009513
Ø6	UNO-K-06	6	28	-	25 - 50	200	6400	153600	0.32	10.2	275.8	5906675009544
Ø7	UNO-K-07	7	30	-	25 - 80	100	3200	76800	0.32	10.2	275.8	5906675009575
Ø8	UNO-K-08	8	32	-	25 - 80	100	3200	76800	0.32	10.2	275.8	5906675009599
Ø10	UNO-K-10	10	36	-	30 - 260	50	1600	38400	0.32	10.2	275.8	5906675009612
UNO Plug with screw												
Ø6	UNO-06+430	6	28	4	30	100	3200	76800	0.32	10.2	275.8	5906675250236
	UNO-06+435	6	28	4	35	100	3200	76800	0.32	10.2	275.8	5906675199641
	UNO-06+445	6	28	4	45	100	3200	76800	0.32	10.2	275.8	5906675199634
Ø8	UNO-08+435	8	32	4.5	35	100	1600	38400	0.32	5.1	152.9	5906675250243
	UNO-08+450	8	32	4.5	50	100	1600	38400	0.32	5.1	152.9	5906675199658
	UNO-08+560	8	32	5	60	100	1600	38400	0.95	15.2	394.8	5906675199665
Ø10	UNO-10+540	10	36	5	40	100	1600	38400	1.81	29.0	725.0	5906675250250
	UNO-10+650	10	36	6	50	100	1600	38400	1.81	29.0	725.0	5906675199672
	UNO-10+660	10	36	6	60	100	1600	38400	1.81	29.0	725.0	5906675199689

4ALL Universal plug

High performance nylon plug for all types of substrates



Approvals and Reports

- Pending

Versions:

- Plug
- Plug with screw



Installation movie

Product information

Features and benefits

- Unique internal design provides positive grip for screws
- Anti-rotational lugs promote grip in wide range of substrates including soft masonry materials
- Rib detail at plug head provides added grip
- Expanding section designed to collapse in hollow materials and provide positive grip behind surfaces
- Unique 4 way expansion allowing application in any substrate material and type
- Solid head design provides strength whilst plug is installed

Applications

- Lighting
- Wall cabinets
- Wardrobes
- Letterboxes
- TV brackets
- Bathroom fittings
- Electrical fittings
- Shelves

Base materials

Suitable for use in:

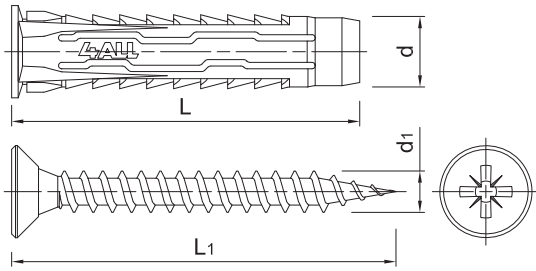
- Concrete
- Natural Stone
- Solid Brick
- Hollow Brick
- Lightweight Concrete Block
- Hollow Lightweight Concrete Block
- Aerated Concrete Block
- Plasterboard

Installation guide



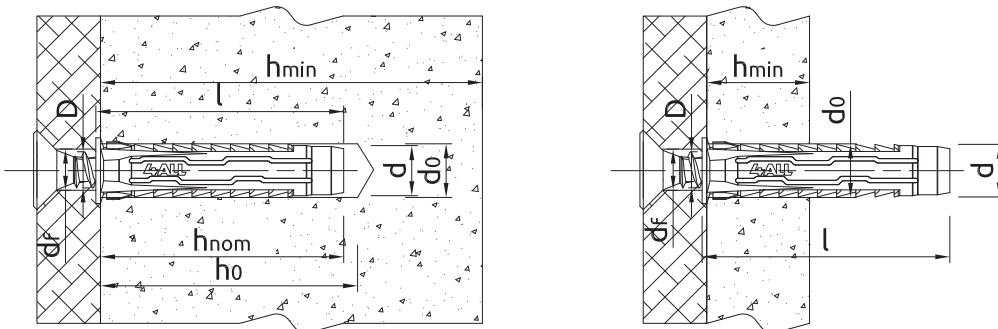
1. Drill a hole of required diameter.
2. Insert 4ALL plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.

Product information



Size	Product Code	Plug		Screw		Fixture	
		Diameter	Length	Diameter	Length	Max. thickness	Hole diameter
		d	L	d ₁	L ₁	t _{fix}	d _f
[mm]							
4ALL							
Ø05	4ALL-05	5	25	3.0 - 4.0	min. 25	-	4.0 - 5.0
Ø06	4ALL-06	6	30	4.0 - 5.0	min. 30	-	5.0 - 6.0
Ø08	4ALL-08	8	40	4.5 - 6.0	min. 40	-	6.0 - 8.0
Ø10	4ALL-10	10	50	6.0 - 8.0	min. 50	-	7.0 - 9.0
Ø12	4ALL-10	12	60	8.0 - 10.0	min. 60	-	9.0 - 11.0
Ø14	4ALL-14	14	70	10.0	min. 70	-	11.0
4ALL with screw							
Ø5	4ALL-05+3530	5	25	3.5	30	10	4
Ø6	4ALL-06+4540	6	30	4.5	40	10	5
Ø8	4ALL-08+5060	8	40	5	60	20	6
Ø10	4ALL-10+6060	10	50	6	60	10	7
Ø12	4ALL-12/80	12	60	8	80	20	9
	4ALL-12/100	12	60	8	100	40	9
Ø14	4ALL-14/100	14	70	10	100	30	11

Installation data



Size	Ø5	Ø6	Ø8	Ø10	Ø12	Ø14		
Fixing diameter	d	[mm]	5	6	8	10	12	14
Hole diameter in substrate	d ₀	[mm]	5	6	8	10	12	14
Min. hole depth in substrate	h ₀	[mm]	35	40	50	60	70	80
Installation depth	h _{nom}	[mm]	25	30	40	50	60	70
Min. substrate thickness	h _{min}	[mm]	65	70	80	90	100	100
Min. spacing	s _{min}	[mm]	25	30	40	50	60	70
Min. edge distance	c _{min}	[mm]	25	30	40	50	60	70

Basic performance data

Performance data for single fixing without influence of edge distance and spacing

Substrate		Concrete C20/25 - C50/60	Solid clay brick min 20MPa (eg Mizz0/2.0)	Sand-lime solid brick	Perforated brick 15MPa	Sand-lime hollow block min. 20MPa	Aerated concrete 600 Mark V	Plasterboard min. 12.5 mm	Plasterboard min. 2x12.5 mm
CHARACTERISTIC LOAD F_{Rk}									
Ø5, Embedment depth 25mm	[kN]	0.10	-	0.20	0.15	0.50	0.20	0.11	-
Ø6, Embedment depth 30mm	[kN]	0.20	0.15	0.60	0.30	0.60	0.30	0.12	-
Ø8, Embedment depth 40mm	[kN]	0.50	0.75	0.90	0.50	0.75	0.50	0.15	-
Ø10, Embedment depth 50mm	[kN]	0.50	0.90	1.20	0.50	0.75	0.60	0.26	-
Ø12, Embedment depth 60mm	[kN]	4.50	4.00	7.00	2.50	4.50	3.50	-	0.66
Ø14, Embedment depth 70mm	[kN]	5.50	6.00	10.5	1.50	5.00	5.50	-	0.74
DESIGN LOAD F_{Rd}									
Ø5, Embedment depth 25mm	[kN]	0.06	-	0.08	0.06	0.20	0.10	0.06	-
Ø6, Embedment depth 30mm	[kN]	0.11	0.06	0.24	0.12	0.24	0.15	0.06	-
Ø8, Embedment depth 40mm	[kN]	0.28	0.30	0.36	0.20	0.30	0.25	0.08	-
Ø10, Embedment depth 50mm	[kN]	0.28	0.36	0.48	0.20	0.30	0.30	0.13	-
Ø12, Embedment depth 60mm	[kN]	2.50	1.60	2.80	1.00	1.80	1.75	-	0.33
Ø14, Embedment depth 70mm	[kN]	3.06	2.40	4.20	0.60	2.00	2.75	-	0.37
RECOMMENDED LOAD F_{rec}									
Ø5, Embedment depth 25mm	[kN]	0.04	-	0.06	0.04	0.14	0.07	0.04	-
Ø6, Embedment depth 30mm	[kN]	0.08	0.04	0.17	0.09	0.17	0.11	0.04	-
Ø8, Embedment depth 40mm	[kN]	0.20	0.21	0.26	0.14	0.21	0.18	0.05	-
Ø10, Embedment depth 50mm	[kN]	0.20	0.26	0.34	0.14	0.21	0.21	0.09	-
Ø12, Embedment depth 60mm	[kN]	1.79	1.14	2.00	0.71	1.29	1.25	-	0.24
Ø14, Embedment depth 70mm	[kN]	2.18	1.71	3.00	0.43	1.43	1.96	-	0.26

Product commercial data

Size	Product Code	Plug		Screw		Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Length [mm]	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
4ALL Plug												
Ø5	4ALL-05	5	25	-	-	100	3200	204800	0.07	2.1	165.6	5906675028408
Ø6	4ALL-06	6	30	-	-	100	3200	204800	0.08	2.7	201.0	5906675028903
Ø8	4ALL-08	8	40	-	-	100	1600	102400	0.19	3.1	229.0	5906675028910
Ø10	4ALL-10	10	50	-	-	50	800	51200	0.19	3.0	223.2	5906675028927
Ø12	4ALL-12	12	40	-	-	20	320	17920	0.10	1.60	119.6	5906675159454
Ø14	4ALL-14	10	14	-	-	10	160	8960	0.08	1.22	98.1	5906675159478
4ALL Plug with screw												
Ø5	4ALL-05+3530	5	25	3.5	30	50	1600	102400	0.11	3.5	253.5	5906675028934
Ø6	4ALL-06+4540	6	30	4.5	40	50	1600	76800	0.20	6.3	333.5	5906675028941
Ø8	4ALL-08+5060	8	40	5	60	50	800	38400	0.37	6.0	315.8	5906675028958
Ø10	4ALL-10+6060	10	50	6	60	25	400	19200	0.30	4.8	260.5	5906675028965
Ø12	4ALL-12/80	12	60	8	80	10	160	8960	0.32	5.0	312.2	5906675159492
Ø12	4ALL-12/100	12	60	8	100	10	160	8960	0.59	9.4	557.7	5906675159515
Ø14	4ALL-14/100	14	70	10	100	10	160	8960	0.62	9.8	581.0	5906675159539

RAWL-IN-ONE Multi purpose plug

The all-purpose plug which accepts a variety of screw sizes



Product information

Features and benefits

- Flange ensures flush fit to surface. Can be collapsed for deep setting in solid materials
- Anti-rotation fins prevent spinning when tightening screw
- Engineered grip feature for extra holding power
- Twin expansion points for a strong fix in hollow, solid or combination materials
- Hollow walls (plasterboard, plywood, chipboard etc) sizes 5 & 6mm only
- Solid walls (brickwork, blockwork, concrete etc) and combination walls (dry lined walls) all plugs

Applications

- Lighting
- Pictures
- Skirting / Dado railing
- Shelves
- Trunking
- Cable trays
- Electrical fittings

Base materials

Approved for use in:

- Concrete
- Solid Brick
- Hollow Brick
- Lightweight Concrete Block
- Aerated Concrete Block
- Chipboard
- Plasterboard
- Plywood

Installation guide



1. Drill a hole of required diameter.
2. Insert FIX plug into hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.

Product information

Product Code	Plug	Screw	Hole diameter	
	Diameter	Range	Solid substrates	Hollow & Combination substrates
	[mm]			
R-RIO-48-C	5	3.0-5.0	5	4.5
	6	3.5-5.5	6	5.5
	8	4.5-6.0	8	7
	10	5.0-8.0	10	9

Basic performance data

Substrate	5 mm	6 mm	8 mm	10 mm
MAXIMUM RECOMMENDED LOAD [kg] _{rec}				
Blockwork (Solid)	20	25	30	40
Brickwork (Solid)	25	30	35	50

Product commercial data

Size	Product Code	Plug	Quantity [pcs]			Weight [kg]			Bar Codes
		Diameter [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
Ø5-Ø10	R-RIO-48-C	5-10	1	1	168	0,62	0,62	104,16	5010445676147

R-OLD Plastic Plug

All purpose cost effective fixing for medium and lightweight applications



Product information

Features and benefits

- Profiled body for extra grip
- Anti-rotation fins prevent spinning during tightening of the screw
- Three colour coded sizes for screws from 3-6mm diameter
- Additional sizes for screws 3-10mm

Applications

- Pictures
- Lighting
- Skirting / Dado railing
- Shelves
- Trunking
- Cable trays
- Electrical fittings

Base materials

Suitable for use in:

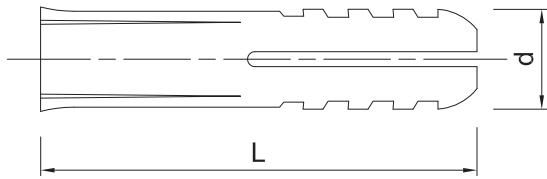
- Concrete
- Solid Brick

Installation guide



1. Drill a hole of required diameter.
2. Insert FIX plug into the hole and tap home.
3. Insert screw of required diameter into plug through fixture and tighten.

Product information



Product Code	Description	Screw dimensions	Plug	Hole diameter
			Length	
			L	d
[mm]				
R-OLD-YEL-20-NC	YELLOW	3.0-5.0	25	5
R-OLD-YEL-100-NC	YELLOW	3.0-5.0	25	5
R-OLD-YEL-100-C	YELLOW	3.0-5.0	25	5
R-OLD-YEL-300	YELLOW	3.0-5.0	25	5
R-OLD-YEL-1000	YELLOW	3.0-5.0	25	5
R-OLD-RED-20-NC	RED	3.5-5.5	35	6
R-OLD-RED-100-NC	RED	3.5-5.5	35	6
R-OLD-RED-100-C	RED	3.5-5.5	35	6
R-OLD-RED-300	RED	3.5-5.5	35	6
R-OLD-RED-1000	RED	3.5-5.5	35	6
R-OLD-BRN-20-NC	BROWN	5.0-6.0	45	7
R-OLD-BRN-100-NC	BROWN	5.0-6.0	45	7
R-OLD-BRN-100-C	BROWN	5.0-6.0	45	7
R-OLD-BRN-1000	BROWN	5.0-6.0	45	7
R-OLD-BRN-300	BROWN	5.0-6.0	45	7
R-OLD-MIX-300	ASSORTED yellow, red, brown	3.0-6.0	25.45	5.7

Product commercial data

Product Code	Description	Screw dimensions [mm]	Plug	Hole diameter [mm]	Quantity [pcs]			Weight [kg]			Bar Codes
			Length [mm]		Box	Outer	Pallet	Box	Outer	Pallet	
R-OLD-YEL-20-NC	YELLOW	3.0-5.0	25	5							5010445671258
R-OLD-YEL-100-NC	YELLOW	3.0-5.0	25	5	1	1	345	0.35	0.35	120.8	5010445671258
R-OLD-YEL-100-C	YELLOW	3.0-5.0	25	5	1	1	280	0.40	0.40	112.0	5010445671265
R-OLD-YEL-300	YELLOW	3.0-5.0	25	5	1	1	40	2.0	2.0	80.0	5010445679001
R-OLD-YEL-1000	YELLOW	3.0-5.0	25	5	1	50	320	5.4	270.0	1728.0	5010445679100
R-OLD-RED-20-NC	RED	3.5-5.5	35	6							5010445671388
R-OLD-RED-100-NC	RED	3.5-5.5	35	6	1	1	168	0.64	0.64	107.5	5010445671302
R-OLD-RED-100-C	RED	3.5-5.5	35	6	1	1	168	0.70	0.70	116.9	5010445671364
R-OLD-RED-300	RED	3.5-5.5	35	6	1	1	48	4.5	4.5	214.6	5010445679025
R-OLD-RED-1000	RED	3.5-5.5	35	6	1	24	288	0.55	13.3	159.3	5010445679131
R-OLD-BRN-20-NC	BROWN	5.0-6.0	45	7	1	10	120	1.04	10.4	124.8	5010445672378
R-OLD-BRN-100-NC	BROWN	5.0-6.0	45	7	1	1	56	1.02	1.02	57.2	5010445672316
R-OLD-BRN-100-C	BROWN	5.0-6.0	45	7	1	1	56	1.05	1.05	59.0	5010445672330
R-OLD-BRN-1000	BROWN	5.0-6.0	45	7	1	15	180	0.55	8.3	99.5	5010445679162
R-OLD-BRN-300	BROWN	5.0-6.0	45	7	1	1	21	6.24	6.24	131.0	5010445679049
R-OLD-MIX-300	ASSORTED yellow, red, brown	3.0-6.0	25.45	5.7	1	1	24	4.18	4.18	100.3	5010445679056

PLASTERBOARD FIXING

- DRA
- SM/SN Interaset
- Tools
- SPO
- R-PB

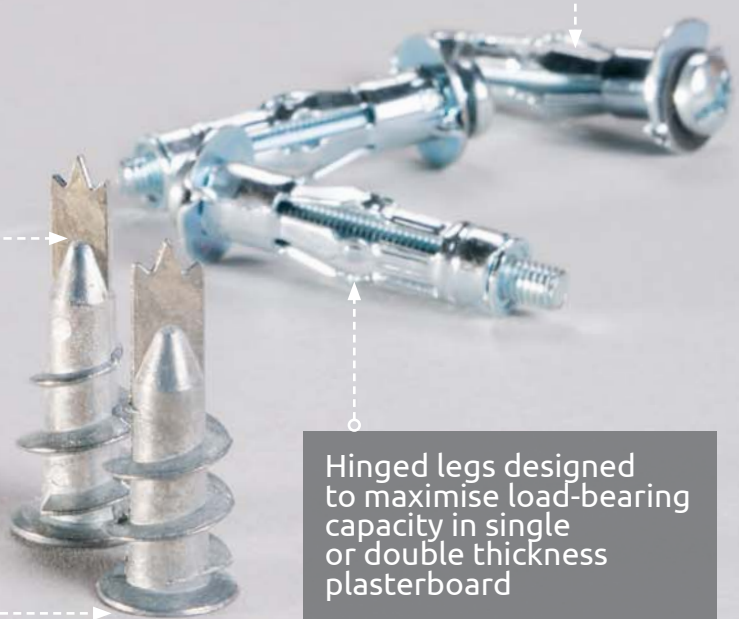


Large contact area of expanded arms increases load-bearing capacity and security

No drill required - simply pierce paper skin and screw home

Flange prevents accidental pull through in plasterboard

Hinged legs designed to maximise load-bearing capacity in single or double thickness plasterboard



DRA Nylon self-drill fixing

Self-drilling light-duty nylon fixing for use in plasterboard and gypsum fibreboards



Product information

Features and benefits

- Flange prevents accidental pull through in plasterboard
- Can be used in single and double thickness plasterboard
- Short length ideally suited for dry lined walls
- Installation with a standard screwdriver means that no special tools are necessary
- Recommended screw diameter: 3.5 - 4.2 mm
- Must only be used with screws provided

Applications

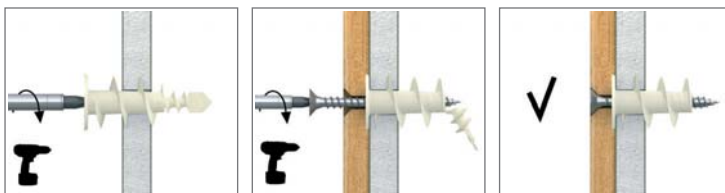
- Sockets, light switches and other electrical fittings
- Shelves and bathroom accessories on standard plasterboard
- Installation of ceiling fixtures, such as light fittings
- Light shelving, brackets and hooks
- Pictures
- Wood battens

Base materials

Suitable for use in:

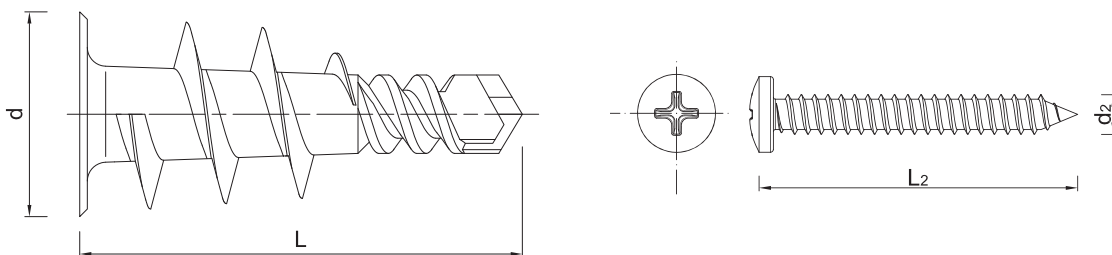
- Plasterboard
- Gypsum fibreboards

Installation guide



1. Using a PZ2 screwdriver, push fixing point firmly into the board until thread engages.
2. Maintaining a firm pressure, screw in fixing until flush with the base material.
3. Place fixture in position, insert screw and tighten until secure.

Product information



Product Code	Plug		Screw		Fixture	
	Diameter	Length	Diameter	Length	Max. thickness	Hole diameter
	d	L	d2	L2	t _{fix}	d _f
[mm]						
DRA Nylon self-drill fixing						
R-DRA-01	14	22	-	-	12	5
DRA Nylon self-drill fixing with screw						
R-DRA-01PLUS	14	22	3.9	32	12	5

Installation data

Size	DRA-01		
Fixing diameter	d	[mm]	22
Min. substrate thickness	h _{min}	[mm]	9.5
Installation depth	h _{nom}	[mm]	9.5
Min. spacing	s _{min}	[mm]	22
Min. edge distance	c _{min}	[mm]	22

Basic performance data

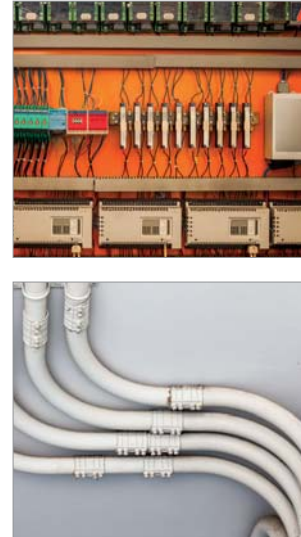
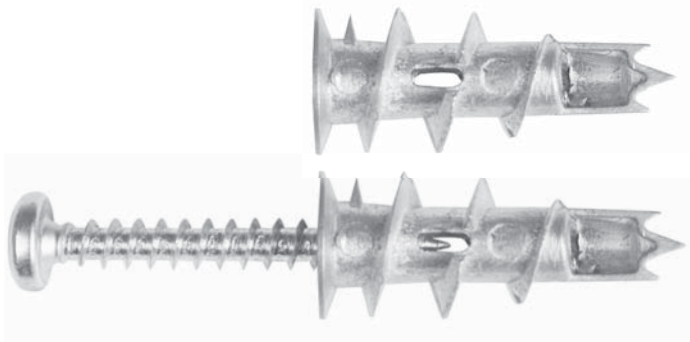
Substrate	Plasterboard min. 9.5 mm		Plasterboard min. 12.5 mm	
CHARACTERISTIC LOAD F _{Rk}				
DRA-01	[kN]	0.23	0.25	
DRA-01PLUS	[kN]	0.23	0.25	
DESIGN LOAD F _{Rd}				
DRA-01	[kN]	0.09	0.10	
DRA-01PLUS	[kN]	0.09	0.10	

Product commercial data

Product Code	Plug		Screw	Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]		Box	Outer	Pallet	Box	Outer	Pallet	
DRA Nylon self-drill fixing										
R-DRA-01	14	22	-	100	1800	57600	0.15	2.7	116.4	5906675161044
DRA Nylon self-drill fixing with screw										
R-DRA-01PLUS	14	22	32	100	1600	38400	0.44	7.0	199.0	5906675161068

DRA Metal self-drill fixing for drywall

Self-drilling light-duty metal fixing for use in plasterboard sheets



Product information

Features and benefits

- Can be used in single and double thickness plasterboard
- Short length ideally suited for dry lined walls
- No drill required - simply pierce paper skin and screw home
- Ideal for use with either a power or manual PZ screwdriver in hard surface of base materials
- Must only be used with screws provided

Applications

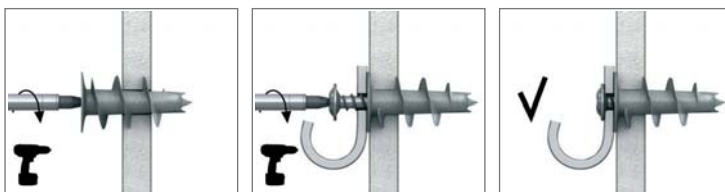
- Fixing electrical boxes, cable trunking, etc.
- Shelves and bathroom accessories on standard plasterboard
- Sockets, light switches and other electrical fittings
- Light shelving, brackets and hooks
- Timber or metal battens
- Pictures

Base materials

Suitable for use in:

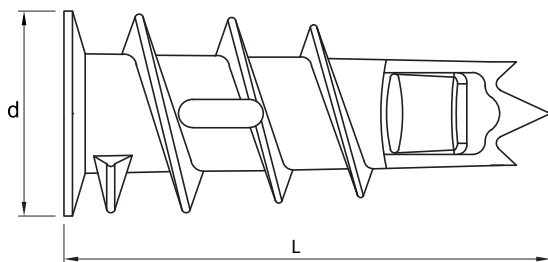
- Plasterboard
- Gypsum fibreboards
- Chipboard
- Oriented Strand Board
- Aerated Concrete Block

Installation guide



1. Using a PZ2 screwdriver, push fixing point firmly into the board until thread engages.
2. Maintaining a firm pressure, screw in fixing until flush with the base material.
3. Place fixture in position, insert screw and tighten until secure.

Product information



Product Code	Plug		Screw		Fixture	
	Diameter	Length	Diameter	Length	Max. thickness	Hole diameter
	d	L	d	L	t _{fix}	d _f
[mm]						
R-DRA-02	14	28	-	-	12	5
R-DRA-02PLUS	14	28	4.2	32	12	5

Installation data

Size	DRA-02		
Fixing diameter	d	[mm]	14
Min. substrate thickness	h _{min}	[mm]	9.5
Max. substrate thickness	h _{max}	[mm]	12
Installation depth	h _{nom}	[mm]	9.5
Min. spacing	s _{min}	[mm]	28
Min. edge distance	c _{min}	[mm]	28

Basic performance data

Substrate		Plasterboard min. 9.5 mm	Plasterboard min. 12.5 mm
CHARACTERISTIC LOAD F _{Rk}			
DRA-02	[kN]	0.15	0.19
DRA-03	[kN]	0.16	0.24
DRA-02PLUS	[kN]	0.15	0.19
DRA-03PLUS	[kN]	0.16	0.24
DESIGN LOAD F _{Rd}			
DRA-02	[kN]	0.06	0.08
DRA-03	[kN]	0.06	0.10
DRA-02PLUS	[kN]	0.06	0.08
DRA-03PLUS	[kN]	0.06	0.10

Product commercial data

Product Code	Plug		Screw	Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]		Box	Outer	Pallet	Box	Outer	Pallet	
DRA										
R-DRA-02	14	28	-	100	3200	76800	0.38	12.2	321.8	5906675135823
DRA with screw										
R-DRA-02PLUS	14	28	32	100	1600	38400	0.67	10.7	287.3	5906675235271

SM Interaset

Interaset fixing for permanent anchorages in cavity walls. Zinc-plated metal fixing with metric screw



Versions:

- SM Interaset with screw
- SM-K with Angle Hook
- SM-S with Eye Hook

Product information

Features and benefits

- Product recommended for applications in fire resistant boards
- Due to extensive range the SM INTERSET is suitable for board building materials with a thickness 2-38mm, it allows for a number of different applications
- The fixing can be installed using normal screwdriver, or installation pliers
- One piece stamping, with integral thread and flange for increased reliability
- Hinged legs designed to maximise load-bearing capacity in single or double thickness plasterboard
- Large contact area of expanded arms increases load-bearing capacity and security
- Integral anti-rotation lugs
- Fixtures can be removed and re-fitted
- Combination head screw supplied

Applications

- Shelves and bathroom accessories on standard plasterboard
- Radiators and kitchen cabinets on double thickness and tiled plasterboard
- Pictures
- Lamps
- Towel rails
- Curtain rails
- Mirrors

Base materials

Suitable for use in:

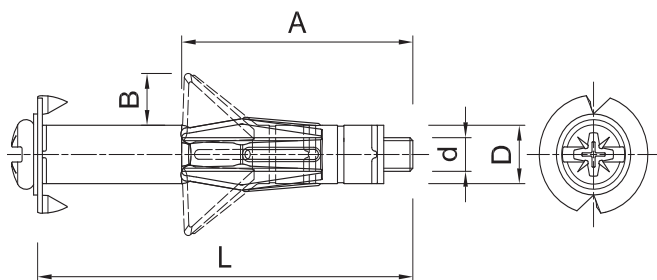
- Plasterboard
- Chipboard
- Oriented Strand Board

Installation guide



1. Drill a hole of required diameter.
2. Insert the fixing into the hole. Tap in lightly, ensuring that the anti-rotation lugs penetrate the face of the base material
3. With the hole drilled and the fixing inserted, the setting tool is used to pull the screw head, thus expanding the fixing body.

Product information



Product Code	Plug		Screw		Minimum clearance		Board thickness	Fixture	
	Diameter		Length		A	B	t_{fix}	Hole diameter	Max. thickness
	d	D	L						
R-SM-04020	8	4	20		16	5	2 - 5	8	15
R-SM-04032	8	4	32		25	7	2 - 10	8	15
R-SM-04038	8	4	40		25	8	8 - 15	8	15
R-SM-04046	8	4	54		26	7	15 - 21	8	17
R-SM-04059	8	4	66		16	8	34 - 38	8	17
R-SM-05037	10	5	40		27	9	5 - 13	10	15
R-SM-05052	10	5	52		40	13	6 - 16	10	24
R-SM-05065	10	5	65		38	15	15 - 28	10	20
R-SM-06037	12	6	37		27	8	8 - 12	12	18
R-SM-06052	12	6	52		38	13	13 - 15	12	20
R-SM-06065	12	6	65		38	13	15 - 28	12	25
R-SM-06080	12	6	80		40	12	32 - 35	12	23

Installation data

Size			Ø4	Ø5	Ø6
Fixing diameter	d	[mm]	4	5	6
Hole diameter in substrate	d_0	[mm]	8	10	12
Min. substrate thickness	h_{min}	[mm]	9.5	9.5	9.5
Installation depth	$h_{\text{nom, min}}$	[mm]	9.5	9.5	9.5
Min. spacing	s_{min}	[mm]	25	25	25
Min. edge distance	c_{min}	[mm]	25	25	25

Basic performance data

Performance data for single fixing without influence of edge distance and spacing

Substrate	Plasterboard			Hollow door
	Board thickness 9.5mm	Board thickness 12mm		
CHARACTERISTIC LOAD F_{Rk}				
R-SM-04020	[kN]	-	-	10
R-SM-04032	[kN]	9	-	12
R-SM-04040	[kN]	10	12	-
R-SM-05040	[kN]	12	14	-
R-SM-05065	[kN]	-	16	-
R-SM-06052	[kN]	-	18	-

Product commercial data

Product Code	Plug	Screw	Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-SM-04020	8	20	100	3200	76800	0.52	16.6	429.4	5906675172323
R-SM-04032	8	32	100	3200	76800	0.72	23.0	583.0	5906675172347
R-SM-04038	8	40	100	1600	38400	0.81	13.0	341.0	5906675172361
R-SM-04046	8	54	100	1600	38400	0.92	14.7	383.3	5906675004655
R-SM-04059	8	66	100	1600	38400	1.13	18.1	463.9	5906675004662
R-SM-05037	10	40	100	1600	38400	1.30	20.8	529.2	5906675172385
R-SM-05052	10	52	100	1600	38400	1.67	26.7	671.3	5906675172408
R-SM-05065	10	65	100	1200	28800	2.1	25.4	640.6	5906675172422
R-SM-06037	12	37	100	1200	28800	1.76	21.1	536.9	5906675172446
R-SM-06052	12	52	100	1200	28800	2.3	27.6	692.4	5906675172460
R-SM-06065	12	65	50	600	14400	1.31	15.7	407.3	5906675172484
R-SM-06080	12	80	50	600	14400	0.41	4.9	148.1	5906675004679

Professional Tool for Interaset

Setting tool for easy setting of interaset cavity fixings

Professional Tool for Interaset



Product Code	Use	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
AT-88RAWL	Professional	1	10	350	0.63	6.3	250.5	5906675906300

AT DIY Tool

Economical setting tool for interaset cavity fixing

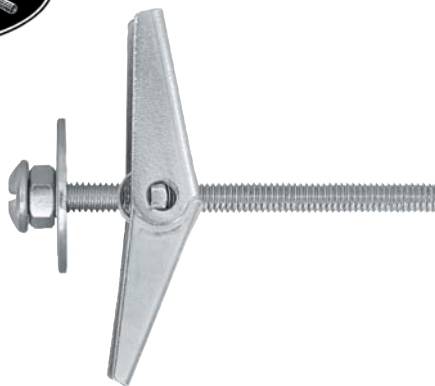
AT DIY Tool



Product Code	Use	Quantity [pcs]			Weight [kg]			Bar Codes
		Box	Outer	Pallet	Box	Outer	Pallet	
AT-88M	DIY	1	30	540	0.32	9.6	202.8	5906675906201

SPO Spring toggle

Spring toggle for cavity walls and large fixtures with pan head metric screw



Product information

Features and benefits

- The long threaded screw of the toggle fixings allows for use with different board thickness and thick attachments, offers maximum flexibility
- The wide transition beams ensure a good load distribution. This achieves a high load-bearing capacity
- Self-acting anchor with easy installation
- Suitable for overhead applications

Applications

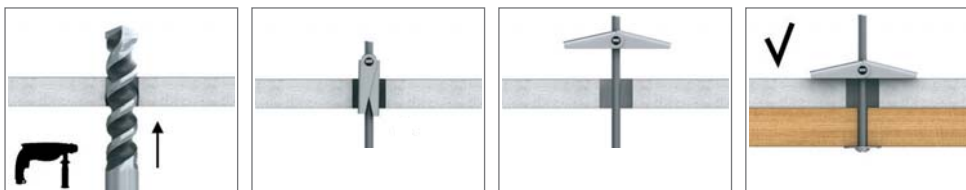
- Light shelving
- Brackets, grips and hooks
- Paintings
- Lamps
- Lighting
- Mirrors
- Shelves
- Other decorative elements

Base materials

Suitable for use in:

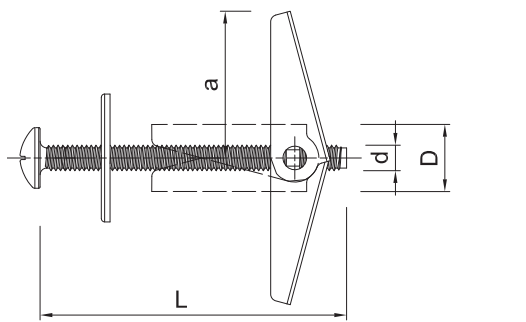
- Plasterboard
- Chipboard
- Oriented Strand Board
- Plastic

Installation guide



1. Drill a hole of the required diameter.
2. Compress the "wings" and push the fixing into the hole.
3. While tightening the screw, pull the fixture out from the wall or ceiling to prevent the "wings" spinning freely.

Product information



Product Code	Screw type	Wing		Screw		Fixture
		Diameter	Radius	Diameter	Length	Hole diameter
		d	a	d	L	d _f
[mm]						
R-SPO450	pan head metric screw	12	25	4	50	14
R-SPO475Z	eye hook	12	25	4	75	14
R-SPO475	round hook	12	25	4	75	14
R-SPO-03050	metric screw	10	20	3	50	11
R-SPO-05050	metric screw	12	25	5	50	14
R-SPO-05080	metric screw	14	25	5	80	14
R-SPO-06060	metric screw	18	30	6	60	18
R-SPO-06080	metric screw	18	30	6	80	18

Installation data

Substrate			Plasterboard min. 9.5 mm	Plasterboard min. 12.5 mm
Fixing diameter	d	[mm]	4	4
Hole diameter in substrate	d ₀	[mm]	14	14
Min. substrate thickness	h _{min}	[mm]	9.5	12
Installation depth	h _{nom}	[mm]	9.5	12
Min. spacing	s _{min}	[mm]	100	100
Min. edge distance	c _{min}	[mm]	100	100

Basic performance data

Substrate		Plasterboard min. 9.5 mm	Plasterboard min. 12.5 mm
MEAN ULTIMATE LOAD F_{RU,m}			
SPO450	[kN]	0.55	0.56
SPO475Z	[kN]	0.58	0.54
SPO475	[kN]	0.59	0.58
CHARACTERISTIC LOAD F_{Rk}			
SPO450	[kN]	0.36	0.46
SPO475Z	[kN]	0.39	0.43
SPO475	[kN]	0.38	0.42
DESIGN LOAD F_{Rd}			
SPO450	[kN]	0.17	0.22
SPO475Z	[kN]	0.18	0.20
SPO475	[kN]	0.19	0.20
RECOMMENDED LOAD F_{rec}			
SPO450	[kN]	0.12	0.16
SPO475Z	[kN]	0.13	0.14
SPO475	[kN]	0.14	0.14

Product commercial data

Product Code	Wing	Screw	Quantity [pcs]			Weight [kg]			Bar Codes
	Diameter [mm]	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-SPO450	12	50	50	800	19200	0.67	10.7	286.3	5906675172743
R-SPO475Z	12	75	50	600	864000	0.03	0.34	522.5	5906675172781
R-SPO475	12	75	50	600	864000	0.03	0.32	487.9	5906675172767
R-SPO-03050	10	50	100	1600	38400	0.59	9.4	256.6	5010445944307
R-SPO-05050	12	50	100	100	40000	0.59	0.59	266.0	5906675206950
R-SPO-05080	14	80	100	100	40000	1.74	1.74	726.0	5010445944390
R-SPO-06060	18	60	50	50	20000	1.74	1.74	726.0	5010445944420
R-SPO-06080	18	80	50	50	11500	1.31	1.31	330.6	5010445944451

R-PB driven metal fixing for plasterboards

Metal fixing for plasterboards



Versions:

- R-BP
- R-BP-PLUS with screw

Product information

Features and benefits

- Steel fixing for medium and heavy weights
- Simple installation due to introductory thread
- Corrugated tip simplifies installation without previous drilling
- Expanding construction of the fixing prevents from its spin in the substrate during installation
- Flat head enables leveling fixing with the surface of the substrate
- Simple uninstallation without harming the substrate

Applications

- Sanitary appliances
- Wardrobes
- Curtain rods support
- Shelves support
- Heaters
- Convector heaters
- Kitchen appliances

Base materials

Suitable for use in:

- Plasterboard

Installation guide



Product commercial data

Product Code	Dimensions	Wall thickness	Screw diameter	Quantity [pcs]	Bar Codes
	mm	mm	mm	Box	
R-PB	30x12	9-13	Ø 3,5-5,0	100	5906675218977
R-PB-PLUS	30x12	9-13	Ø 4,0x40 mm	100	-

SPECIAL FIXINGS

- RAWLNUT Flexi Plug



Flush collar ensures secure clamping

Made from synthetic rubber with a bonded brass insert for corrosion resistance



Resistant to vibration and corrosion

Bonded brass insert for corrosion resistance

RAWLNUT Flexi Plug

Easy-to-install plug giving exceptional resistance to vibration and corrosion



R-RNT-RAWLNUT



R-RNT-RAWLNUT with screw



Product information

Features and benefits

- Resistant to vibration and corrosion
- Ideal for unknown substrates and irregular or oversized holes.
- Flush collar ensures secure clamping
- Made from synthetic rubber with a bonded brass insert for corrosion resistance

Applications

- Lighting
- Shelves
- Trunking
- Cable trays
- Electrical fittings
- Brackets, grips and hooks
- Pictures

Base materials

Suitable for use in:

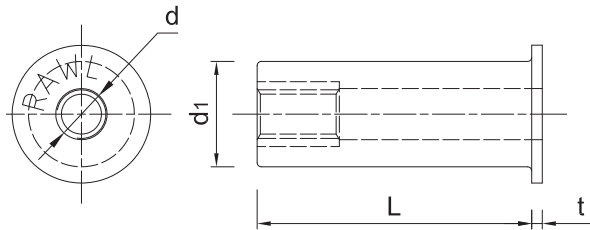
- Solid Brick
- Hollow Brick
- Vertically-perforated clay block
- Lightweight Concrete Block
- Hollow Lightweight Concrete Block
- Aerated Concrete Block
- Plasterboard
- Chipboard
- Oriented Strand Board
- Plastic

Installation guide

1. Drill appropriate hole. For solid materials, drill hole to length of screw. Clean out hole and remove sharp edges to avoid damaging fixing.
2. Insert the fixing up to its flange.
3. Place fixture in position. Insert screw and tighten to compress sleeve and form a secure fixing. Do not overtighten.
4. Work equally well in uniform or irregularly shaped holes.

Product information

R-RNT_RAWLNUT



Product Code	Length	Hole diameter	Flange thickness	Grip range	Screw length
	L	d ₁	t	d	l
	[m]	[mm]			
RAWLNUT Flexi Plug					
R-RNT-M4/12	12.6	8	1.4	0-4	-
R-RNT-M5/14	14.1	10	1.3	0-5	-
R-RNT-M6/16	16	13	1.3	0-3	-
R-RNT-M6/35	35	13	1.3	11-23	-
R-RNT-M6/50	50	13	1.2	26-38	-
R-RNT-M8/18	27.9	16	5	4-10	-
R-RNT-M8/50	50	18	2	15-39	-
R-RNT-M12/80	80	24	1.3	30-50	-
RAWLNUT Flexi Plug with screw					
R-RNT-M3X30	24	8	1.2	6-14	30
R-RNT-M4X20	12.6	8	1.4	0-4	20
R-RNT-M4X30	24	8	1.2	6-14	30
R-RNT-M5X40-50	39.8	10	1.3	20-30	50

Product commercial data

Product Code	Length [mm]	Hole diameter [mm]	Screw length [mm]	Quantity [pcs]			Weight [kg]			Bar Codes
				Box	Outer	Pallet	Box	Outer	Pallet	
RAWLNUT Flexi Plug										
R-RNT-M4/12	12.6	8	-	50	900	21600	0.30	5.4	159.6	5010445090936
R-RNT-M5/14	14.1	10	-	50	900	21600	0.30	5.4	159.6	5010445091841
R-RNT-M6/16	16	13	-	50	900	21600	0.30	5.4	159.6	5906675087993
R-RNT-M6/35	35	13	-	50	900	21600	0.30	5.4	159.6	5010445094156
R-RNT-M6/50	50	13	-	50	900	21600	0.30	5.4	159.6	5906675088006
R-RNT-M8/18	27.9	16	-	50	800	19200	0.60	9.6	260.4	5906675088013
R-RNT-M8/50	50	18	-	50	900	21600	0.30	5.4	159.6	5010445095337
R-RNT-M12/80	80	24	-	20	360	8640	0.68	12.2	323.8	5010445096549
RAWLNUT Flexi Plug with screw										
R-RNT-M3X30	24	8	30	50	900	21600	0.30	5.4	159.6	5906675087986
R-RNT-M4X20	12.6	8	20	50	900	21600	0.30	5.4	159.6	5010445091001
R-RNT-M4X30	24	8	30	50	900	21600	0.30	5.4	159.6	5010445091308
R-RNT-M5X40-50	39.8	10	50	50	900	21600	0.55	9.9	267.6	5010445093173

More from Rawlplug

Efficacy in the hardest conditions

We are proud to present innovative fixing from the **Bonded Anchors and Mechanical Anchors** group designed for the heavy loads demanded by industrial construction. Among our products you will find unique solutions to enable you to achieve maximal amounts with any kind of substrate. Knowledge backed-up with experience guarantees the effectiveness of our fixings and the success of your investment.

Durability and versatility

Our wide range of expansion plugs made of synthetic materials and metal, for low and medium loads, have been used for years for both industrial and residential construction. Incredibly durable FF1 from frame fixings group, universal in use 4ALL and UNO Plug, no. 1 on the UK market, are leading products of RAWLPLUG®'s offer in the field of **Lightweight Fixings**, designed with every substrate in mind.

Innovations in Energy Saving construction

As a leading producer of façade insulation fixings we would like to present to you our wide array of products used in energy saving constructions. The Reliability and simplicity of our solutions combined with their ease of installation make them the most popular and desired by professionals. We invite you to familiarize yourselves with our offer for **Façade Insulations Fixings**.

Excellent resistance for high loads

Thanks to our close cooperation with roof covering product producers, and our insight into the needs of investment contractors, our **Roofing Insulations Fixings** are one of the most popular among European roof fixing system producers. We invite cooperation from engineers, architects, and roof works contractors. And encourage you to try out our calculation software "ROOFIX" today.

Safety Certificate

Stepping towards the needs of customers, and increasing the general level of safety in closed spaces, we have created a protection system event of which in the combustion prevents fire and smoke from spreading. We invite you to acquaint with our offer for **Passive Fire Protection Systems**, which hold the European Conformity Assessment.

Guarantee of lasting quality

Thanks to our constant monitoring of the production of assortments from our **Foams, Sealants and Adhesives** range we guarantee the constant and repeatable quality of our products. Their wide range of application possibilities and high efficiency has enabled us to rank among the top 5 of companies in the construction chemistry industry for years.

Maximal weather resistance

Rawlplug® **Fasteners** guarantee reliability of connections and maximal weather resistance. Our products, thanks to the use of appropriate materials and adoption of modern anticorrosion coating, pass even the hardest tests, matching the expectations of the most demanding clients. In our rich offer of screws characterized by extraordinary ease of installation, one may find perfect kind of connection for any kind of material and substrate.

Save time and minimize costs

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

Maximal effect of optimal offer

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

Ergonomics for construction and at home

We offer high-quality **Stapling, Tacking and Gluing** tools that are recommended for both professionals and home DIY. Rawlplug's stapling tools are especially intended for construction, finishing works and repairs while our hot-melt adhesive system includes a new line of glue guns and glues for a wide range of applications - all of which are exceptionally easy to use and provide maximum efficiency and a high degree of flexibility for routine work

Unique and exclusive exposition

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

Foams, Sealants & Adhesives

Stapling, Tacking & Gluing

Lightweight Fixings

Direct Fastening Systems

Power Tool Accessories

POS Rawlplug Essentials

Passive Fire Protection Systems

Bonded Anchors & Mechanical Anchors

Roofing Insulation Fixings

Facade Insulation Fixings

Fasteners

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Trust & Innovation. Since 1919.



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