apolo MEA

Made in Germany

Fastening technology

Catalogue 2017/18

Grupo CELO

The one-stop shop for quality

apolo MEA Fixing Technology
- Light duty fixings
- Heavy duty fixings
- Chemical fastening systems

apolo Fixing Technology
- Electrical fixings
- Sanitary fixings
- Gas actuated tools & accessories

CELO Screws Technology
- Screws

Product news

NEW

Plugs

IPS 80, *p. 54*

IPL 95DS, *p. 53*

MFR 8 with ETA, *p. 27*

ETA CE
European Technical Approval for masonry

IPD 10 with ETA, *p. 50*

ETA CE
European Technical Approval for ETICS

Metal anchors

DA, *p. 61*

ETA CE
For multiple use für non-structural applications in cracked concrete

SA plus 8-25 & 10-25, *p. 63*

ETA CE
For multiple use für non-structural applications in cracked concrete

BAZ with improved ETA, *p. 66*

ETA CE
European Technical Approval Option 1 for cracked concrete

BA plus M6 & M20 with ETA, *p. 69*

ETA CE
European Technical Approval Option 7 for non-cracked concrete

BTS6 and BTS, *p. 74*

ETA CE
European Technical Approval Option 1 for cracked concrete

BTS M, *p. 78*

SLA, *p. 79*

ETA CE
European Technical Approval Option 1 for cracked concrete

Dnbolt, *p. 83*

ETA CE
European Technical Approval Option 8 for non-cracked concrete

Chemical anchors

PATENT PENDING

ResiTHERM® & ResiTHERM® S, *from p. 100*

ETA CE
European Technical Approval Option 1 for cracked concrete

ETA CE
European Technical Approval for masonry

VYSF with improved ETA approvals
VYSF Cool "Winter resin" (-20°C)

ETA CE
European Technical Approval Option 7 for non-cracked concrete

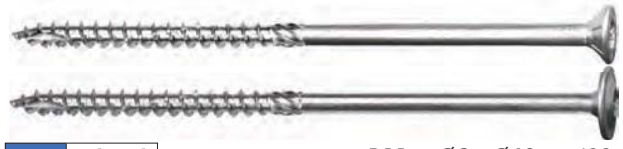
ETA CE
European Technical Approval for masonry

EYSF with improved ETA approvals
EYSF Express "Fast curing resin"

ResiFIX, *from p. 86*

Improved assortment SH, *p. 91*

Screws



ETA CE
European Technical Approval for use in timber constructions

BMax Ø8 - Ø10, *p. 122*

JS zinc plated, *p. 129*

Sanitary and electrical fixings

FRH, *p. 57*

RI, *p. 142*

RIF, *p. 143*

Services

Design software
more information on p. 9

Our competence - Your benefit

We know: There is nothing that cannot be done even better. That is why we put a lot of energy into **developing** new products and **optimising** existing ones.

2009

Grupo CELO

Apolo MEA becomes part of the internationally successful Grupo CELO. You, our customer, profit from a more complete assortment and can still count on the "Made in Germany" quality standard.

2009

Cavity plug universal *BT*
The universal cavity plug
Strong cavity fixing
Fast & easy handling

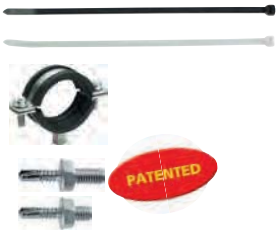
2010

Plug *FX*
The plug for almost everything
Modern light duty fixing
4-side expansion made in Germany

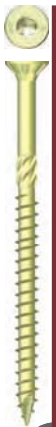
2010

apolo Fixing Technology

Apolo MEA expands the assortment with sanitary and electrical fixings and consequently enlarges the competence in fixing systems.



2011



VELOX® screws
With a true passion for details
Chipboard & Construction screws with ETA approval and SIT recess

2012

Insulation plug *IPL*
Fast, functional, durable
Innovative insulation fixing
No thermal bridge, no pre-drilling

2012

Plasterboard plug *GKD*
The fast one in drywalls
Cavity fixing
Quick installation without pre-drilling

2013

Quick-fix anchor *BA plus*
Your plus for user-friendliness
With ETA approval for non-cracked concrete, setting depth marking ring, long thread, improved load values and larger assortment

Our competence - Your benefit

PATENTED

Insulation plug *IPL 95DS*
Simple, fast, flexible and adjustable! Innovative solution for fastening downpipes in ETICS. Direct fastening into the insulation material - no thermal bridge

2013

Drop-in anchor *SA plus*
Double plus with two ETA approvals
for single use in non-cracked concrete and for multiple use for non-structural applications in cracked concrete
NEW: Two versions with and without lip

2014

ResiFIX VYSF
Definitely the right option
ETA approval expanded to Option 1 for cracked concrete, ETA approval for post-installed rebars and ETA approval for masonry

2015

PATENT PENDING

Insulation screw *IPS*
New solution for fixing metal profiles in ETICS - very fast and easy!
Direct fastening into the insulation material - no thermal bridge!
Available in different colors.

2016

Concrete screw *BTS, BTS-M*
High loads - easy installation
Extended range with ETA approval for cracked concrete, three setting depths. A special type for site facilities.

2016

PATENT PENDING

ResiTHERM®
Innovative system for distance mountings in ETICS
Perfect solution for safety critical fixings in perforated bricks with ETICS. No thermal bridge. Suitable for high loads.

2017

Suspended ceiling anchor *DA*
Reduced anchorage depth
With ETA approval and high installation comfort.

2017

Construction screw BMax
With ETA-Approval
Approved construction screw with waver head or countersunk head

Color guiding system:

- for solid bricks and masonry
- for insulation material
- for boards and cavity fixings
- Adhesives and Sealants
- for concrete
- screws

Innovation, diversity and quality from a single source.

Apolo MEA Fixing Systems is part of the international Grupo CELO and one of the industry leaders for professional solutions in fastening technology. The company offers distributors and end-users a wide range of innovative products, which benefit from the special synergy effects of Grupo CELO and its core competencies.

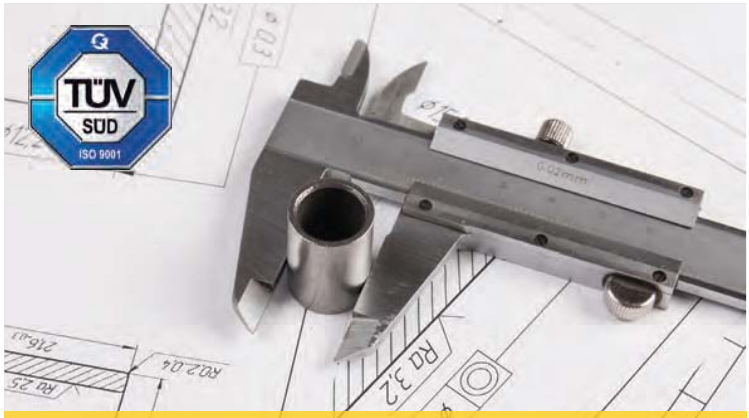
Our in-house development department creates needs-driven products to meet constantly growing demands and requirements. Experienced engineers liaise with the customer and research new solutions for the market of today and tomorrow.

Customer satisfaction and long-term cooperation are top priorities and the reason why we adopt a flexible approach by designing tailor-made solutions to meet specific requirements of our customers.

The name Apolo MEA stands for quality "Made in Germany". Systematic checks in our own laboratories and independent test institutes ensure all processes are of a consistently high level of quality – from selection of the best raw materials to manufacturing. Numerous European Technical Approvals (ETA) validate this claim.

Solutions for every need

In-house development department



Quality „Made in Germany“

Uncompromising customer focus

High level of vertical integration

Your benefits

- **Innovative solutions**
  save the user time and money
- **Extensive range of products**
  for distributors and end consumers
- **Partnership-based cooperation**
  and a fair price-performance ratio
- **Many years of experience**
  in the development and manufacture of fixing systems
- **Highest product quality**
  ensured by top-grade raw materials and proven functionality, as well as ETA approvals
- **Strong partner**
  worldwide presence and manufacturing facilities of Grupo CELO
- **Member of the CFG Trade Association**
  Changes in approval guidelines and new trends in the industry at firsthand

CFG Construction Fixings Germany

Customer Service

Telephone:	+49 (0) 8251 90 485 0
Fax:	+49 (0) 8251 90 485 49
E-Mail:	info@apolofixing.com
Service time:	
Mon - Thu:	7:30 a.m. - 5:00 p.m.
Fri:	7:30 a.m. - 2:00 p.m.

Field Service

- Committed – Competent – Flexible
- Extensive field service care
- Personal consultation
- Product recommendations
- Shelf planning and shelf service
- Roadshow

Democar

- Service for our dealers
- Teaching technical knowledge on site
- Theoretical and practical product training
- Pull-out tests and technical support
- Training and advice of end users*
- Construction site visit*

*in consultation with your specialised dealer

Training Center

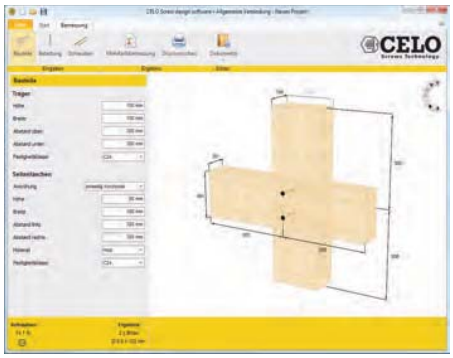
- Teaching technical knowledge of fixing technology
- Theoretical and practical product training
- Exchange of experiences
- Factory tour
- Small seminar groups (max. 15 people)
- Certificate for successful participation

Design Software - Anchors + Screws

NEW

Design Software - Anchors

- Design of Apolo MEA heavy-duty anchors - metal and chemical anchors - in concrete
- Fast real time calculation
- Intuitive user interface including 3-dimensional graphics
- Flexible anchor positioning for various base plate geometries
- Perfect for planners and architects
- Professional and clear documentation
- Available in many languages
- Great features
- Stress visualisation of the base plate (FEM calculation)
- Further modules will follow



Design Software - Screws

- Calculation of on-rafter insulation and universal connections (wood-wood / steel-wood)
- Predefined wind and snow loads in the module on-rafter insulation by postal code
- Support already during the design of each application
- Real-time calculation with automatic determination of the most economic result
- Design of BMax and VELOX® SIT screws according to ETA, EN 19951-1 and DIN EN 1995-1-1 / NA

free download at www.apolofixing.com

Application technology

- Design calculation for anchors, also for facades
- Pull-out tests on construction sites
- Technical telephone advice
- Tips and recommendations for all anchor questions

www.apolofixing.com

- Up-to-date product information with search function
- Approvals, DoPs, safety data sheets
- Installation videos
- Catalogues and flyers
- News and events
- Information on the installation of anchor fastening
- Download link for the design software

Important Information about the 2017/18 Catalogue

- Our General Terms and Conditions apply exclusively
- When using our products, please take note of instructions found in brochures, approvals, and on our homepage
- Our products may be subject to change without notice if these changes serve technical improvements
- Invoicing is only done through commercial customers
- Returning goods only through prior agreement and indication of delivery note number
- Products with blue printed article numbers extended delivery times possible

Notes

Content

Light duty fixings

Colour guiding system:

- for solid bricks and masonry
- for all building materials
- for boards and cavity fixings
- for insulation material
- for concrete
- Adhesives and Sealants

Content

Screws

Drill bits

Our Blister program starts on page 163

Single lable products on page 175

Shelf system on page 178

Clamps

Electrical fixings

Special fixings

Gas nailer and accessory

Colour guiding system:

■ Screws for use in wood

■ Screws for use in drywall constructions

Light duty fixings

	page	Concrete	Natural stone	Solid brick	Solid sand-lime brick	Lightweight solid concrete block	Aerated concrete	Gypsum block	Hollow brick	Hollow sand-lime brick	Lightw. hollow concrete block	Plasterboard	Chipboard	Insulation board	Approval
Standard fixings															
Plug FX	16	●	●	●	●	●	●	●	●	●	●	○	○		
Standard plug F	18	●	●	●	●	●	●	●	○	○	○				
Standard plug FL long	19	●	●	●	●	●	●	●	●	●	●				
Multi-purpose plug MZ/MZK	20	●	●	●	●	●	●	●	●	●	●	●	●		
Universal plug AZ/AZK	22	●	●	●	●	●	●	●	●	●	●	●	●		
Aerated concrete plug GB	24						●	●							
Scaffold plug GR with eyebolt screw OES	25	●	●	●	●										
Blockwork anchor MSD	26	●	●	●	●	●	●	●	●	●	●				
Frame fixings															
Multifunction frame plug MFR	27	●	●	●	●	●	●	○	●	●	●				◆
Hollow block frame plug HBR	31	○	●	●	●	●	○	○	●	●	●				◆
Frame plug R	33	●	●	●	●	●	○	○	○	○	○				
Nail plug NP	35	●	●	●	●	○	○	○	○	○	○				
Nail plug NPZ	37	●	●	●	●	○									
Quick-fix nail BN	38	●	●	●	●	○			○	○					
Window frame fixings															
Window frame screw FBS	39	●	●	●	●	●	●	○	●	●	○				
Metal frame plug MR	41	●	●	●	●	○	○	○	○	○	○				
Cavity fixings															
Cavity plug universal BT	42										○	●	●		
Spring toggle FK	43										○	●	●		
Cavity plug metal HRM	44										○	●	●		
Cavity plug HR	46											●	●		
Plasterboard plug GKD/GKDZ	47											●			
Insulation fixings															
Insulation support DSH	48	●	●	●	●										
Insulation support metal DSH-M	48	●	●	●	●	●	○	●	○	●	○				
Insulation support DST/DSH-T	49	depends on plug used													
Insulation fastener IPD	50	●	●	●	●	●	○		●	●	●				◆
Insulation plug IPL	52													●	
Insulation plug IPL 95DS	53													●	
Insulation screw IPS 80	54													●	

● suitable ○ suitable to a limited extent ◆ with approval

■ for solid bricks and masonry ■ for all building materials ■ for boards and cavity fixings

■ for insulation material ■ for concrete ■ Adhesives and Sealants

Selection table

Sanitary fixings

	page	Concrete	Natural stone	Solid brick	Solid sand-lime brick	Lightweight solid concrete block	Aerated concrete	Gypsum block	Hollow brick	Hollow sand-lime brick	Lightw. hollow concrete block	Plasterboard	Chipboard	Insulation board	Approval
Sanitary installation set SMS	55	●	●	●	●	●	●	●	●	●	●	●	●		
Standing toilet installation set WC	56	●	●	●	●	●	●	●	●	●	●	●	●		
Standing toilet installation set FRH	57	●	●	●	●	●	●	●	●	●	●	○	○		
Vanity installation set WT	58	●	●	●	●	●	●	●	●	●	●	●	●		
Urinal installation set UB	59	●	●	●	●	●	●	●	●	●	●	●	●		

Metal anchor

	page	Concrete	Natural stone	Solid brick	Solid sand-lime brick	Lightweight solid concrete blocks	Aerated concrete	Gypsum blocks	Hollow brick	Hollow sand-lime brick	Lightw. hollow concrete block	Plasterboard	Chipboard	Ext. Thermal Insulation Composite Systems (ETICS)	Approval
Brass plug ME	60	●	●	●	●										
Suspended ceiling anchor DA	61	●	○	○	○										◆
Drop-in anchor SA plus	63	●													◆
Drop-in anchor SA / SA-N	65	●													
Quick-fix anchor BAZ for cracked and non-cracked concrete	66	●	○												◆
Quick-fix anchor BA plus / BA A4 / EKA for non-cracked concrete	69	●	○												◆
Concrete screw BTS6 / BTS / BTS M	74	●	○	○	○										◆
Heavy-duty anchor SLA	79	●	○												◆
Forced expansion anchor ZA	81	●	○												◆
Sleeve anchor Dnbolt®	83	●	○	○	○										◆

Chemical fastening systems

	page	Concrete	Natural stone	Solid brick	Solid sand-lime brick	Lightweight solid concrete blocks	Aerated concrete	Gypsum blocks	Hollow brick	Hollow sand-lime brick	Lightw. hollow concrete block	Plasterboard	Chipboard	Ext. Thermal Insulation Composite Systems (ETICS)	Approval
Injection system ResiFIX Sleeve SH / IGH Metal sleeve SH-1000 Anchor rod RESI AST	86	●	●	●	●	●	●	●	●	●	●				◆
ResiTHERM®	100	○					●		●	●	●				
Bonded anchor VA Anchor stud VA AST	106	●	○												◆

Adhesives and Sealants

	page
StickFX Professional HT StickFX Professional XP StickFX Professional CL	108

● suitable ○ suitable to a limited extent ◆ with approval

■ for solid bricks and masonry ■ for all building materials ■ for boards and cavity fixings

■ for insulation material ■ for concrete ■ Adhesives and Sealants

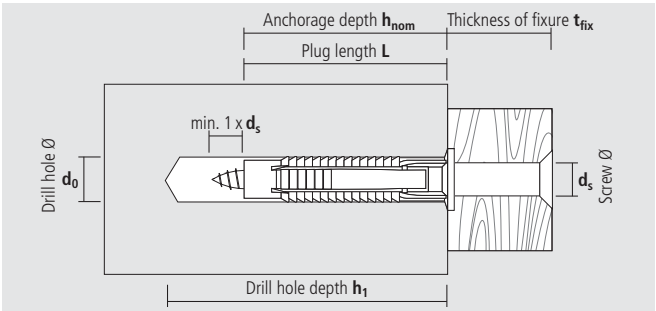
Plug FX

Advantages

- 4-side expansion for high pull out loads
- Compatible with different types of screws such as wood screws, chipboard screws, self-tapping screws, etc.
- Efficient anti-rotation lugs prevents rotation in the drill hole
- Plug collar prevents slipping into the drill hole
- High quality and ageing resistant nylon
- Temperature resistant from -40°C to +80°C

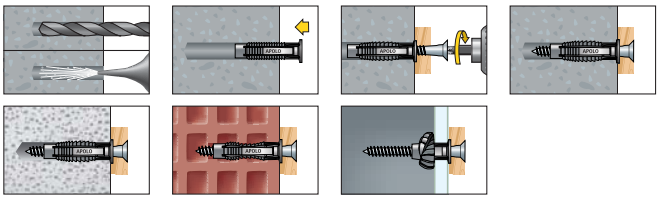
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks



Minimum edge distance: 1x plug length

Mounting



Watch video at www.celo-apolo.de/en

FX without screw							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
FX 5	95FX	5	35	25	25	2,5 - 4		100	6.000
FX 6	96FX	6	40	30	30	3,5 - 5		100	6.000
FX 8	98FX	8	55	40	40	4,5 - 6		100	2.700
FX 10	910FX	10	70	50	50	6 - 8		50	1.350
FX 12	912FX	12	80	60	60	8 - 10		25	675

FX incl. PZ chipboard screw (FX6 and 8) and hex-head wood screw (FX 10) respectively							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s x L_s[1] [mm]	€/ 100 pcs	[pcs]	[pcs]
FX 6 SPS	96FXSZ	6	40	30	30	4,5 x 45		50	3.000
FX 8 SPS	98FXSZ	8	55	40	40	5,0 x 60		50	1.350
FX 10 SKS	910FXK	10	70	50	50	7,0 x 65		25	675

[1] Screw length

Plug FX

FX in round box							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s [mm]	€/ box	[pcs]	[boxes]
FX 6	96EXPFX	6	40	30	30	3,5 - 5		300	10
FX 8	98EXPFX	8	55	40	40	4,5 - 6		125	10
FX 10	910EXPFX	10	70	50	50	6 - 8		70	10

FX Round box dispenser (empty); 44 x 56 x 30 cm (W x H x D)		Price	Packing
Type	Art.-No	€/ pcs	[pcs]
FX-cover for round box dispenser	CARTELAFX		1
Round box dispenser	010507411		1
Hook for dispenser	010507441		1

Recommended loads F_{rec} using wood screws with the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid stone MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]
FX 5	4	0,20	0,21	0,21	0,03	0,05	0,15	0,23
FX 6	5	0,47	0,42	0,42	0,05	0,10	0,20	0,39
FX 8	6	0,52	0,50	0,50	0,10	0,14	0,23	0,60
FX 10	8	1,28	0,90	0,90	0,16	0,30	0,45	0,67
FX 12	10	1,91	1,10	1,10	0,28	0,40	0,50	0,74

F_{rec}: Recommended loads incl. safety factor of 7
Values must be reduced by ca. 40% when using chipboard screws (especially in solid building materials)

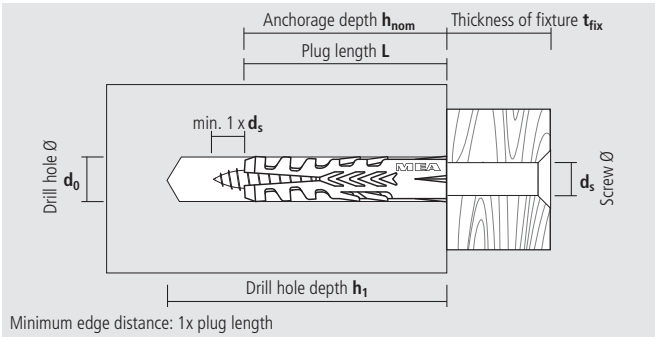
Standard plug F

Advantages

- High pull out loads due to high expansion ability (four-sided expansion in the middle section)
- Very good screw guidance, i.e. the screw cannot move out of the plug during the screwing in
- Good twist resistance
- Strong design prevents bending when hammered in
- Good load values even in many perforated bricks and aerated concrete

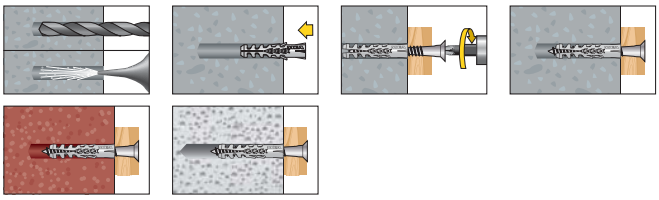
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks



Minimum edge distance: 1x plug length

Mounting



F without screw							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
F 4	94NF	4	30	20	20	2 - 3		200	12.000
F 5	95NF	5	35	25	25	2,5 - 4		100	6.000
F 6	96NF	6	40	30	30	3,5 - 5		100	6.000
F 7	97NF	7	40	30	30	4 - 5,5		50	3.000
F 8	98NF	8	55	40	40	4,5 - 6		100	2.700
F 10	910NF	10	70	50	50	6 - 8		50	1.350
F 12	912NF	12	80	60	60	8 - 10		25	675
F 14	914NF	14	90	70	70	10 - 12		20	540
F 16	916NF	16	100	80	80	12 - 14		10	270
F 20	920NF	20	120	90	90	16		5	135

Recommended loads F_{rec} using wood screws with the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]
F 4	3	0,12	0,14	0,14	–	–	0,08
F 5	4	0,23	0,24	0,33	0,04	0,04	0,09
F 6	5	0,31	0,38	0,37	0,05	0,06	0,12
F 8	6	0,34	0,46	0,43	0,07	0,07	0,13
F 10	8	0,77	0,79	0,78	0,10	0,10	0,22
F 12	10	1,55	1,57	1,90	0,15	0,16	0,30
F 14	12	2,71	–	–	–	0,28	0,43
F 20	16	5,50	–	–	–	–	–

F_{rec}: Recommended loads incl. safety factor of 7
Values must be reduced by ca. 40% when using chipboard screws (especially in solid building materials)

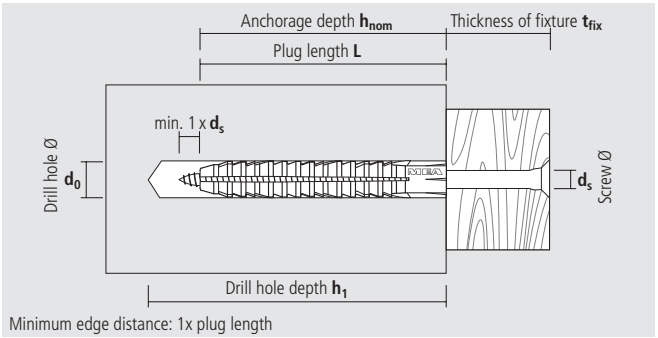
Standard plug FL extra long

FL 6-60, 8-80, 10-90

FL with sleeve: FL 8-100, 8-120

Advantages

- The extra long expansion area enables fixings in solid and perforated material with dense and porous structure (e.g. old buildings)
- The multiple wing construction secures an anti-rotating effect
- The FL has no collar; it can be used for pre-inserted mounting and through-mounting
- The FL is also suitable for reduced setting depth for bridging thin insulations, plaster, etc.

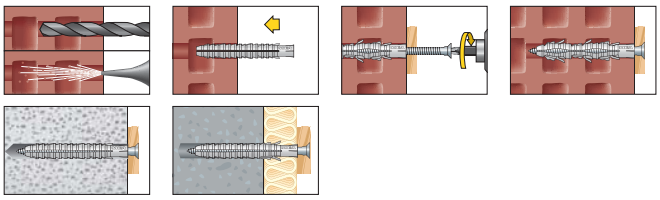


Minimum edge distance: 1x plug length

Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks

Mounting



FL without screw								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
FL 6-60	9660FL	6	70	60	60	–	3,5 - 4,5		100	2.700
FL 8-80	9880FL	8	90	80	80	–	4,5 - 5,5		50	600
FL 8-100*	98100FL	8	90	80	100	20	4,5 - 5,5		50	600
FL 8-120*	98120FL	8	90	80	120	40	4,5 - 5,5		50	600
FL 10-90	91090FL	10	105	90	90	–	6 - 7		25	300

* With sleeve

Recommended loads F_{rec} using wood screws with the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Aerated concrete AAC6 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]
FL 6-60	4,5	0,17	0,05	0,07	0,15	0,13	0,10
FL 8-80, 8-100, 8-120	5,5	0,33	0,09	0,14	0,30	0,15	0,12
FL 10-90	7	0,56	0,19	0,25	0,33	0,22	0,20

F_{rec}: Recommended loads incl. safety factor of 7
In solid building materials use smaller screw diameter
Values must be reduced by ca. 30% when using chipboard screws (especially in solid building materials)

Multi-purpose plug MZ and MZK

Multi-purpose plug MZ

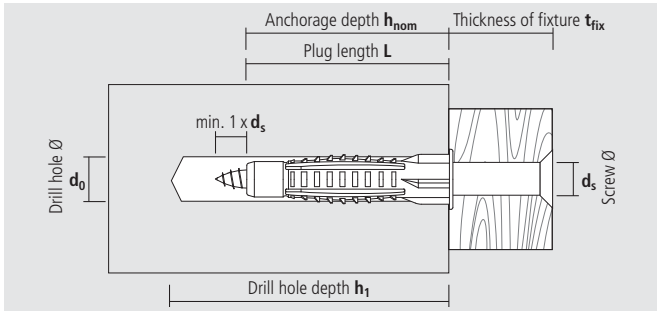
Multi-purpose plug MZK with collar

Advantages

- Knotting plug that has proven its qualities millions of times; excellent performance in almost every building material
- The 4-sided expansion in solid building materials and the knotting in perforated bricks or board materials always provides a secure fixing with high pull out loads
- High quality polyethylene guarantees long lasting elasticity and reliable knotting behaviour
- Compatible with many types and sizes of screws

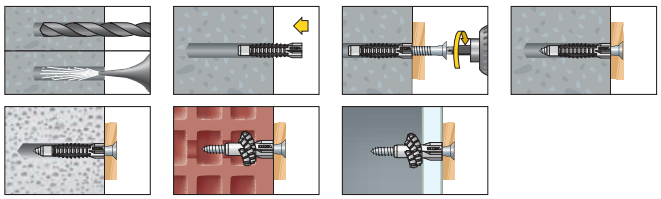
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard



Minimum edge distance: 1x anchorage depth

Mounting



Watch video at www.celo-apolo.de/en

MZ without collar								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min}[1] [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
MZ 6	96MZ	6	40	29	29	7	3-4,5		100	6.000
MZ 6-40	9640MZ	6	50	40	40	7	3-4,5		100	4.800
MZ 8	98MZ	8	60	48	48	9	4-6		100	1.800
MZ 10	910MZ	10	75	59	59	12	6-8		50	900
MZ 12	912MZ	12	85	71	71	15	8-10		50	600
MZ 14	914MZ	14	95	75	75	15	10-12		25	300

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

MZK with collar								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min}[1] [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
MZK 6	96MZK	6	40	29	30	7	3-4,5		100	4.800
MZK 6-41	9641MZK	6	50	40	41	7	3-4,5		100	2.700
MZK 8	98MZK	8	60	48	49	9	4-6		100	1.800
MZK 10	910MZK	10	75	59	60	12	6-8		50	900
MZK 12	912MZK	12	85	71	72	15	8-10		50	600
MZK 14	914MZK	14	95	75	76	15	10-12		25	300

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Multi-purpose plug MZ and MZK

MZK with collar, incl. PZ chipboard screw (MZK 6, 6-41 and 8) and hex-head wood screw (MZK 10) respectively								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min} [1] [mm]	$d_s \times L_s$ [2] [mm]	€/ 100 pcs	[pcs]	[pcs]
MZK 6 SPS	96MZKSZ	6	40	29	30	7,0	4,5x45		50	2.400
MZK 6-41 SPS	9641MZKSZ	6	50	40	41	7,0	4,5x50		50	1.350
MZK 8 SPS	98MZKSZ	8	60	48	49	9,5	5,0x70		50	900
MZK 10 SKS	910MZKK	10	75	59	60	12,0	6,0x80		25	450

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)
[2] Screw length

MZK with collar, in round box								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min} [1] [mm]	d_s [mm]	€/ box	[pcs]	[boxes]
MZK 6-41	9641EXPMZK	6	50	40	41	7,0	3-4,5		200	10
MZK 8	98EXPMZK	8	60	48	49	9,5	4-6		90	10
MZK 10	910EXPMZK	10	75	59	60	12,0	6-8		50	10
MZK 12	912EXPMZK	12	85	71	72	15,0	8-10		25	10

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

MZK Round box dispenser (empty); 44 x 56 x 30 cm (W x H x D)		Price	Packing
Type	Art.-No	€/ pc	[pcs]
MZK-cover for round box dispenser	010507420		1
Round box dispenser	010507411		1
Hook for dispenser	010507441		1

Loads for wood screws F_{rec} for the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Chipboard 16 mm F_{rec} [kN]
MZ/MZK 6	4,5	0,30	0,26	0,16	0,04	0,06	0,22	0,06	0,21
MZ/MZK 6-41	4,5	0,52	0,51	0,27	0,06	0,12	0,21	0,08	0,15
MZ/MZK 8	6	0,72	0,59	0,43	0,11	0,14	0,27	0,09	0,23
MZ/MZK 10	8	1,56	1,07	0,68	0,13	0,25	0,31	0,08	0,25
MZ/MZK 12	10	2,02	1,31	–	0,23	0,39	0,42	0,11	0,37
MZ/MZK 14	12	2,27	–	–	0,37	0,59	0,33	0,09	0,30

F_{rec}: Recommended loads incl. safety factor of 7

Loads for chipboard screws F_{rec} for the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Chipboard 16 mm F_{rec} [kN]
MZ/MZK 6	4,5	0,06	0,06	0,05	0,02	0,03	0,08	0,03	0,14
MZ/MZK 6-41	4,5	0,17	0,15	0,08	0,04	0,05	0,17	0,09	0,21
MZ/MZK 8	6	0,24	0,24	0,21	0,06	0,10	0,26	0,09	0,29
MZ/MZK 10 [1]	6	0,17	0,17	0,16	0,07	0,12	0,35	0,10	0,29

F_{rec}: Recommended loads incl. safety factor of 7
[1] Load values apply to chipboard screws with Ø 6

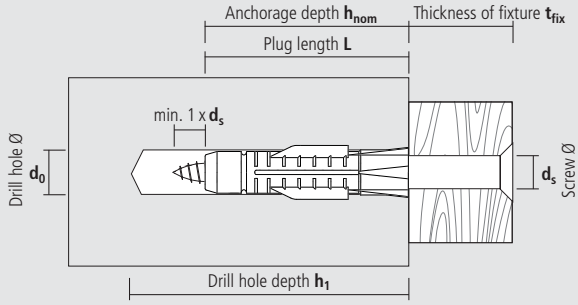
Universal plug AZ and AZK

Universal plug AZ

Universal plug AZK with collar

Advantages

- Suitable for nearly all building materials. In solid building materials the plug's body expands against the drill hole In perforated building materials, plasterboards, etc. the plug knots
- Usable with wood screws and chipboard screws with different diameters
- High-quality polyethylene guarantees long-lasting elasticity and consequently no brittle breaks, even after years

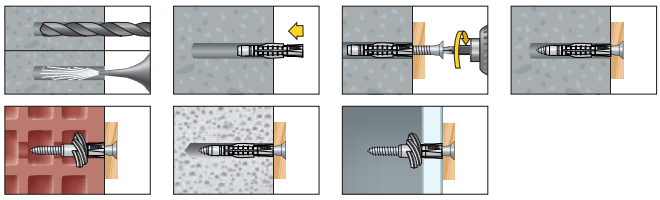


Minimum edge distance: 1x plug length

Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard

Mounting



AZ without collar

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min}[1] [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
AZ 5	95AZ	5	40	30	30	7,0	3-4		100	4.800
AZ 6	96AZ	6	50	37	37	9,5	4-5		100	4.800
AZ 8	98AZ	8	60	50	50	12,5	5-6		100	1.800
AZ 10	910AZ	10	75	60	60	15,0	7-8		50	900
AZ 12	912AZ	12	85	70	70	18,0	8-10		25	450

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

AZK with collar

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	h_{min}[1] [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
AZK 5	95AZK	5	40	30	31	7,0	3-4		100	4.800
AZK 6	96AZK	6	50	37	38	9,5	4-5		100	2.700
AZK 8	98AZK	8	60	50	51	12,5	5-6		100	1.800
AZK 10	910AZK	10	75	60	61	15,0	7-8		50	900
AZK 12	912AZK	12	85	70	71	18,0	8-10		25	450

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Universal plug AZ and AZK

Loads for wood screws F_{rec} for the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid stone KS12 / Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow brick Poroton T12 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Plasterboard 2 x 12,5 mm F_{rec} [kN]
AZ/AZK 5	4	0,16	0,16	0,03	0,17	0,21	0,10	0,07	–
AZ/AZK 6	5	0,23	0,19	0,05	0,34	0,23	0,13	0,09	–
AZ/AZK 8	6	0,46	0,27	0,06	0,31	0,32	0,15	0,09	–
AZ/AZK 10	8	1,25	0,86	0,11	0,52	0,31	0,19	0,09	0,17
AZ/AZK 12	10	1,47	0,91	0,20	0,48	0,35	0,25	–	0,22

F_{rec}: Recommended loads incl. safety factor of 7

Loads for chipboard screws F_{rec} for the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid stone KS12 / Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow brick Poroton T12 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Plasterboard 2 x 12,5 mm F_{rec} [kN]
AZ/AZK 5	4	0,07	0,12	0,02	0,15	0,24	0,14	0,06	–
AZ/AZK 6	5	0,11	0,12	0,05	0,30	0,27	0,12	0,08	–
AZ/AZK 8	6	0,16	0,18	0,07	0,34	0,22	0,13	0,09	–

F_{rec}: Recommended loads incl. safety factor of 7

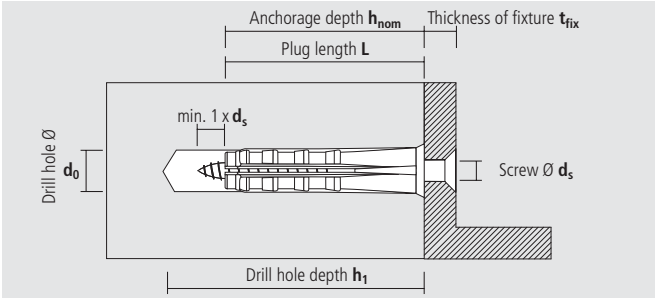
Aerated concrete plug GB

Advantages

- Specialised plug with excellent pull out loads in aerated concrete; to be used with wood screws
- Once the screw has been screwed in, the expansion force is transferred over three flanks optimally by developing a type of undercut
- All Apolo MEA aerated concrete plugs can also be hammered into a smaller drill hole in AAC4 aerated concrete; generally even without pre-drilling in AAC2

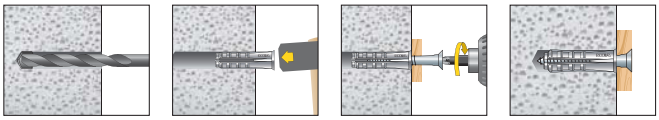
Suitable building materials

✔ Aerated concrete
✔ Gypsum blocks



Minimum edge distance: 1x plug length

Mounting



GB

Type	Art-No	d_0* [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GB 10	910GB	10	65	55	55	4,5 - 6		25	675
GB 12	912GB	12	70	60	60	7 - 8		20	540
GB 14	914GB	14	90	75	75	10		10	270

* All GB sizes can be hammered into a smaller drill hole when used in aerated concrete AAC4, in AAC2 usually without pre-drilling

Loads F_{rec} and F_{eff}

Type	Wood screws Ø [mm]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]
GB 10	6	0,25	0,55
GB 12	7	0,33	0,66
GB 14	10	0,50	1,10

F_{rec}: Recommended loads incl. safety factor of 6

Spacing and edge distance for GB 12 according to former German approval by DIBt

Typ	Axcial spacing a ≥		Edge distance $a_r \geq$		Min. thickness of structural part d
	PB2 / PP2 [mm]	≥ PB4 / PP4 [mm]	PB2 / PP2 [mm]	≥ PB4 / PP4 [mm]	[mm]
GB 12	150	200	100	150	120

Scaffold plug GR

Scaffold plug GR

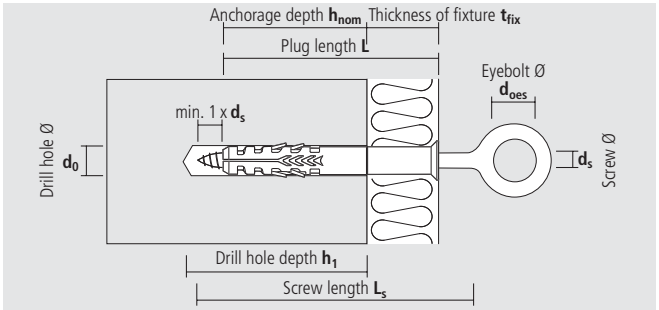
Eyebolt screw OES

Advantages

- Specialised plug for all scaffold installations in solid building materials in according to DIN 4420 and the guidelines of the German professional construction associations
- Nylon Plug GR matches optimally with the eyebolt OES for high pull out loads
- Markings on the eyebolt screw help to screw in the screw with the correct depth
- Cover cap AK to seal the plug

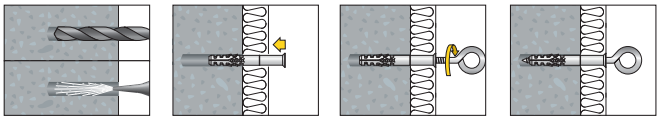
Suitable building materials

✔ Concrete
✔ Natural stone
✔ Solid brick
✔ Solid sand-lime brick



Minimum edge distance: 1x anchorage depth of plug

Mounting



GR

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GR 14-70	91470GR	14	90	70	70	0		40	320
GR 14-100	914100GR	14	90	70	100	30		40	320
GR 14-135	914135GR	14	90	70	135	65		40	320
GR 14-185	914185GR	14	90	70	185	115		40	320

Loads F_{eff} using eyebolt screws OES Ø 12

Type	Concrete C20/25		Solid brick MZ 12		Solid sand-lime brick KSV 12	
	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]
GR 14	3,0	12,2	2,8	11,0	3,0	12,2

F_{rec}: Recommended loads incl. safety factor of 4
F_{eff}: Effective pull out loads / ultimate loads excl. safety factors

OES, zinc plated

Type	Art-No	d_s [mm]	L_s [mm]	d_{oes} [mm]	Price €/ 100 pcs	Packing [pcs]
OES 12-90	91290OES	12	90	23		20
OES 12-120	912120OES	12	120	23		20
OES 12-160	912160OES	12	160	23		20
OES 12-190	912190OES	12	190	23		20
OES 12-230	912230OES	12	230	23		20
OES 12-300	912300OES	12	300	23		20
OES 12-350	912350OES	12	350	23		20

AK cover cap for GR

Type	Art-No	Suitable for d_s [mm]	Length [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
Cover caps AK	91AKGR	GR 14	53		50	600

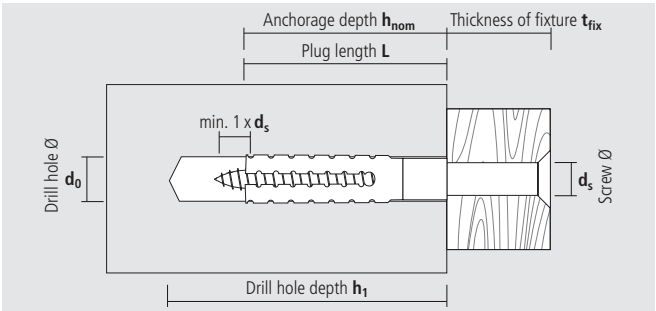
Blockwork anchor MSD

Advantages

- Suitable for fastening water pipes with pipe clamps using wood screws and chipboard screws
- When used with hanger bolts, blockwork anchor MSD complies the technical guidelines for gas pipe installations (TRGI 3.3.7.2.)
- Toothed surface provides a secure grip in different base materials

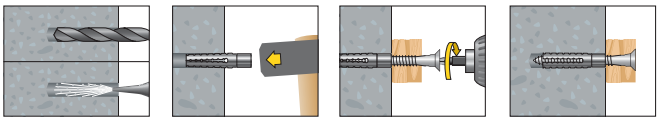
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Ligthweight hollow concrete blocks



Minimum edge distance: 1x plug length

Mounting



MSD

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
MSD 6-32	9B632MSD	7-9*	38	32	32	5-6		100	2.000
MSD 8-38	9B838MSD	10-12*	46	38	38	6-8		100	2.000
MSD 8-60	9B860MSD	10-12*	68	60	60	6-8		50	1.000

* Depending on building material, see following table

Loads F_{eff} at largest applicable screw diameter and full anchorage depth

Type	Concrete		Solid sand-lime brick		Solid brick MZ 12		Aerated concrete AAC2		Aerated concrete AAC4		Lightweight solid concrete blocks		Hollow brick HLz 12	
	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]	d_0 [mm]	F_{rec} [kN]
MSD 6-32	9	0,25	8	0,20	8	0,20	without	0,10	7	0,20	5	0,15	7	0,15
MSD 8-38	12	0,30	11	0,30	11	0,30	without	0,20	10	0,35	6	0,20	10	0,25
MSD 8-60	12	0,55	11	0,50	11	0,50	6	0,30	10	0,45	6	0,30	10	0,30

F_{eff}: Recommended loads in all directions incl. safety factor of 6

Multifunction frame plug MFR


SB TX, zinc plated / A4 / HD


SB SSKS, zinc plated / A4 / HD

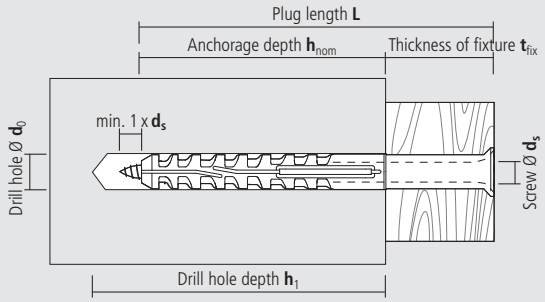

FB SSKS, zinc plated / A4

ETA CE
European Technical Approval – for concrete and masonry

Fire resistance class F 90 see approval

BEST NYLON QUALITY

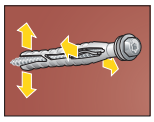
A4 STAINLESS STEEL

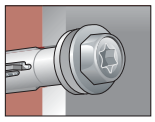


MFR 8: $d_s = 6$ mm, MFR 10: $d_s = 7$ mm, MFR 14: $d_s = 10$ mm

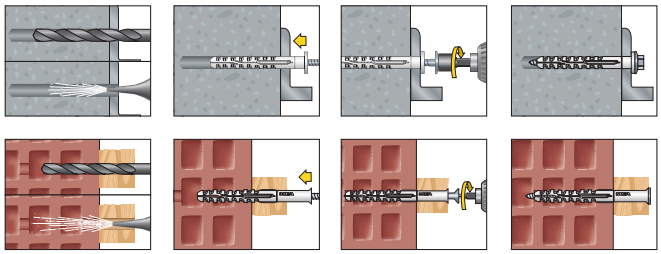
Advantages

- The multifunction frame plug MFR enables universal mounting of facade substructures as well as wood and metal parts in all common base materials
- The long expansion area and early expansion achieved by lateral bars ensure reliable and secure hold
- Approved by company Hörmann for fire protection doors
- MFR 10, MFR 14: setting depth 70 mm, MFR 8: 50 mm
- The flat rim version prevents contact corrosion
- All lenghts up to 160 mm are pre-assembled
- Suitable for windows and door frames installations





Mounting



Watch video at www.celo-apolo.de/en

Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks

MFR 8 / 10 SB TX, zinc plated countersunk plug with countersunk screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-60*	9860MFRST	8	60	50	60	10	TX 30		100	800
8-80*	9880MFRST	8	60	50	80	30	TX 30		100	800
8-100*	98100MFRST	8	60	50	100	50	TX 30		50	400
8-120*	98120MFRST	8	60	50	120	70	TX 30		50	400
10-80*	91080MFRST	10	80	70	80	10	TX 40		50	400
10-100*	910100MFRST	10	80	70	100	30	TX 40		50	400
10-115*	910115MFRST	10	80	70	115	45	TX 40		50	400
10-135*	910135MFRST	10	80	70	135	65	TX 40		50	400
10-160*	910160MFRST	10	80	70	160	90	TX 40		50	400
10-200	910200MFRST	10	80	70	200	130	TX 40		25	200
10-240	910240MFRST	10	80	70	240	170	TX 40		25	200
10-280	910280MFRST	10	80	70	280	210	TX 40		25	–
10-320	910320MFRST	10	80	70	320	250	TX 40		25	–

MFR 8: ETA approval pending
* Pre-assembled

Multifunction frame plug MFR

MFR 14 SB TX, zinc plated countersunk plug with countersunk screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
14-80*	91480MFRST	14	85	70	80	10	TX 50		25	200
14-110*	914110MFRST	14	85	70	110	40	TX 50		25	200
14-140*	914140MFRST	14	85	70	140	70	TX 50		25	200
14-170	914170MFRST	14	85	70	170	100	TX 50		25	200
14-200	914200MFRST	14	85	70	200	130	TX 50		25	200
14-230	914230MFRST	14	85	70	230	160	TX 50		25	200
14-270	914270MFRST	14	85	70	270	200	TX 50		25	–

* Pre-assembled

MFR SB TX, stainless steel A4 countersunk plug with countersunk screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-80 A4*	9X880MFRST	8	60	50	80	30	TX 30		100	800
8-100 A4*	9X8100MFRST	8	60	50	100	50	TX 30		50	400
10-80 A4*	9X1080MFRST	10	80	70	80	10	TX 40		50	400
10-100 A4*	9X10100MFRST	10	80	70	100	30	TX 40		50	400
10-115 A4*	9X10115MFRST	10	80	70	115	45	TX 40		50	400
10-135 A4*	9X10135MFRST	10	80	70	135	65	TX 40		50	400
10-160 A4*	9X10160MFRST	10	80	70	160	90	TX 40		50	400

MFR 8: ETA approval pending
* Pre-assembled

MFR SB TX, hot-dip galvanized countersunk plug with countersunk screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-100 HD*	9HD10100MFRST	10	80	70	100	30	TX 40		50	400
10-135 HD*	9HD10135MFRST	10	80	70	135	65	TX 40		50	400
10-160 HD*	9HD10160MFRST	10	80	70	160	90	TX 40		50	400

Hot-dip galvanized is not part of the ETA approval
* Pre-assembled

Multifunction frame plug MFR

MFR SB SSKS, zinc plated countersunk plug, hex-head screw with integral washer

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Drive/ Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-60*	9860MFRSB	8	60	50	60	10	SW10/TX 30		100	800
8-80*	9880MFRSB	8	60	50	80	30	SW10/TX 30		100	800
8-100*	98100MFRSB	8	60	50	100	50	SW10/TX 30		50	400
8-120*	98120MFRSB	8	60	50	120	70	SW10/TX 30		50	400
10-80*	91080MFRSB	10	80	70	80	10	SW13/TX 40		50	400
10-100*	910100MFRSB	10	80	70	100	30	SW13/TX 40		50	400
10-115*	910115MFRSB	10	80	70	115	45	SW13/TX 40		50	400
10-135*	910135MFRSB	10	80	70	135	65	SW13/TX 40		50	400
10-160*	910160MFRSB	10	80	70	160	90	SW13/TX 40		50	400
10-200	910200MFRSB	10	80	70	200	130	SW13/TX 40		25	200
10-240	910240MFRSB	10	80	70	240	170	SW13/TX 40		25	200
14-80*	91480MFRSB	14	85	70	80	10	SW17/TX 50		25	200
14-110*	914110MFRSB	14	85	70	110	40	SW17/TX 50		25	200
14-140*	914140MFRSB	14	85	70	140	70	SW17/TX 50		25	200
14-170	914170MFRSB	14	85	70	170	100	SW17/TX 50		25	200
14-200	914200MFRSB	14	85	70	200	130	SW17/TX 50		25	200
14-230	914230MFRSB	14	85	70	230	160	SW17/TX 50		25	200
14-270	914270MFRSB	14	85	70	270	200	SW17/TX 50		25	–

MFR 8: ETA approval pending
* Pre-assembled

A4

MFR SB SSKS, stainless steel A4 countersunk plug, hex-head screw with integral washer

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Drive/ Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-80 A4*	9X1080MFRSB	10	80	70	80	10	SW13/TX 40		50	400
10-100 A4*	9X10100MFRSB	10	80	70	100	30	SW13/TX 40		50	400
10-115 A4*	9X10115MFRSB	10	80	70	115	45	SW13/TX 40		50	400
10-135 A4*	9X10135MFRSB	10	80	70	135	65	SW13/TX 40		50	400
10-160 A4*	9X10160MFRSB	10	80	70	160	90	SW13/TX 40		50	400

* Pre-assembled

MFR SB SSKS, hot-dip galvanized countersunk plug, hex-head screw with integral washer

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Drive/ Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-100 HD*	9HD10100MFRSB	10	80	70	100	30	SW13/TX 40		50	400
10-135 HD*	9HD10135MFRSB	10	80	70	135	65	SW13/TX 40		50	400
10-160 HD*	9HD10160MFRSB	10	80	70	160	90	SW13/TX 40		50	400

Hot-dip galvanized is not part of the ETA approval
* Pre-assembled

Multifunction frame plug MFR

MFR FB SSKS, zinc plated flat rim plug, hex-head screw with integral washer

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Drive/ Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-60*	9860MFRFB	8	60	50	60	10	SW10/TX 30		100	800
8-80*	9880MFRFB	8	60	50	80	30	SW10/TX 30		100	800
10-80*	91080MFRFB	10	80	70	80	10	SW13/TX 40		50	400
10-100*	910100MFRFB	10	80	70	100	30	SW13/TX 40		50	400
14-80*	91480MFRFB	14	85	70	80	10	SW17/TX 50		25	200
14-110*	914110MFRFB	14	85	70	110	40	SW17/TX 50		25	200
14-140*	914140MFRFB	14	85	70	140	70	SW17/TX 50		25	200

MFR 8: ETA approval pending
* Pre-assembled

MFR FB SSKS, stainless steel A4 flat rim plug, hex-head screw with integral washer

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Drive/ Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-80 A4*	9X1080MFRFB	10	80	70	80	10	SW13/TX 40		50	400
10-100 A4*	9X10100MFRFB	10	80	70	100	30	SW13/TX 40		50	400

* Pre-assembled

Loads MFR 8 F_{rec}

Type	Concrete ≥ C16/20 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KS 12 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Aerated concrete P2 F_{rec} [kN]	Aerated concrete P4 F_{rec} [kN]
MFR 8	1,20	0,57	1,14	0,17	0,43	0,15	0,30

F_{rec}: Expected loads; ETA-approval pending

Loads MFR 10 / 14 F_{per}

Type	Concrete ≥ C16/20		Solid brick		Solid sand-lime brick		Hollow brick	Hollow sand-lime brick	Aerated concrete		
	N_{per} [kN]	V_{per} [kN]	MZ 10 F_{per} [kN]	MZ 20 F_{per} [kN]	KS 10 F_{per} [kN]	KS 20 F_{per} [kN]	HLz 12 F_{per} [kN]	KSL 12 F_{per} [kN]	AAC2 F_{per} [kN]	AAC4 F_{per} [kN]	AAC6 F_{per} [kN]
MFR 10	1,59	4,05	0,57	0,86	0,57	0,86	0,21	0,26	0,14	0,43	0,71
MFR 14	1,79	7,24	0,86	1,29	0,86	1,29	0,21	0,34	0,11	0,43	0,71

F_{per} resp. N_{per}, V_{per}: F_{per} = permissible load in all directions, N_{per} = permissible tension load, V_{per} = permissible shear load for galvanized screws according to ETA approval
(For MFR with hot-dip galvanized screw: These values can be used as recommended loads)
Values apply to an average temperature range in the wall of max. + 24° C (temporarily + 40° C).
If the sustained average temperature is +50° C (temporarily +80° C) load capacities are reduced. In this case, refer to the approval.
For further information regarding masonry (brick types and sizes) please refer to the approval.

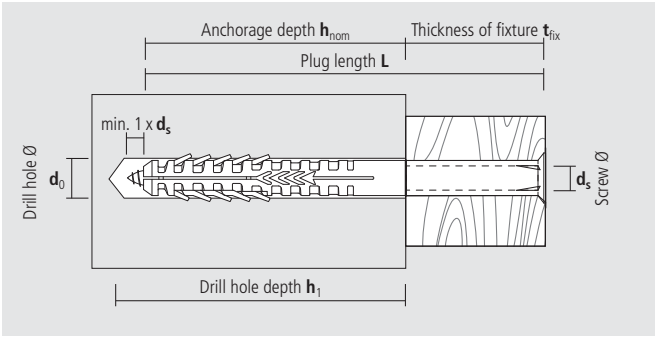
Spacing and edge distance

Type	Distances	Concrete ≥ C16/20 [mm]	Solid brick MZ/ Solid sand-lime brick KS single plug [mm]	Solid brick MZ/ Solid sand-lime brick KS group of plugs [mm]	Hollow brick HLz/ Hollow sand-lime brick KSL single plug [mm]	Hollow brick HLz/ Hollow sand-lime brick KSL group of plugs [mm]	Aerated concrete AAC2 single plug [mm]	Aerated concrete AAC2 group of plugs [mm]	Aerated concrete AAC4 single plug [mm]	Aerated concrete AAC4 group of plugs [mm]	Aerated concrete AAC6 single plug [mm]	Aerated concrete AAC6 group of plugs [mm]
MFR 10	Axcial spacing $s/s_{2,min}$ parallel to edge	50	250	400	250	400	250	200	250	300	250	400
MFR 14		100	250	400	250	480*/400	250	200	250	300	250	400
MFR 10	Axial spacing $s/s_{1,min}$ perpendicular to edge	50	250	400	250	200	250	100	250	150	250	200
MFR 14		100	250	400	250	240*/200	250	100	250	150	250	200
MFR 10	Min. edge distance c_{min}	60	100	100	100	100	50	50	75	75	100	100
MFR 14		100	100	100	120*/100	120*/100	50	50	75	75	100	100
MFR 10	Min. thickness of structural part h_{min}	110	115	115	115	115	100	100	100	100	100	100
MFR 14		120	115	115	240	240	100	100	100	100	100	100

* Value applies to HLz

Hollow block frame plug HBR

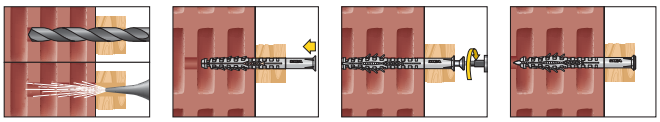
European Technical Approval for masonry
HBR 10



Advantages

- ETA approved specialised frame plug for perforated building materials like hollow bricks and blocks
- Setting depth 90 mm: High pull out loads due to long expansion area and high expansion ability in perforated bricks
- The HBR is suitable for facade installations, fixing of doors and windows, wall cabinets and frames in general
- The HBR 10 is approved only in conjunction with the Apolo MEA safety screws

Mounting



Suitable building materials

- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks

HBR without screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-80*	9880HBR	8	80	70	80	10	5-6		50	900
10-100	910100HBR	10	100	90	100	10	6-7		100	800
10-115	910115HBR	10	100	90	115	25	6-7		100	800
10-135	910135HBR	10	100	90	135	45	6-7		50	400
10-160	910160HBR	10	100	90	160	70	6-7		50	400
10-200	910200HBR	10	100	90	200	110	6-7		50	400
10-240	910240HBR	10	100	90	240	150	6-7		50	400

* Not part of the approval; HBR 10 approved only in conjunction with Apolo MEA safety screw

HBR 8 SP, zinc plated with countersunk wood screw (PZ 3)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-80 SP*	9880HBRSZ	8	80	70	80	10	5,5		25	450

* Not part of the approval

Hollow block frame plug HBR

HBR 10 SP, zinc plated with countersunk screw (PZ 4)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-100 SSP	910100HBRSZ	10	100	90	100	10	7		50	400
10-115 SSP	910115HBRSZ	10	100	90	115	25	7		50	400
10-135 SSP	910135HBRSZ	10	100	90	135	45	7		50	400
10-160 SSP	910160HBRSZ	10	100	90	160	70	7		50	400

HBR 10 TX, zinc plated with countersunk screw (TX 40)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-100 TX	910100HBRST	10	100	90	100	10	7		50	400
10-115 TX	910115HBRST	10	100	90	115	25	7		50	400
10-135 TX	910135HBRST	10	100	90	135	45	7		50	400
10-160 TX	910160HBRST	10	100	90	160	70	7		50	400
10-200 TX	910200HBRST	10	100	90	200	110	7		25	200
10-240 TX	910240HBRST	10	100	90	240	150	7		25	200

HBR 10 SSK, zinc plated with hex-head screw with integral washer (SW13/TX40)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-100 SSK	910100HBRSB	10	100	90	100	10	7		50	400
10-115 SSK	910115HBRSB	10	100	90	115	25	7		50	400
10-135 SSK	910135HBRSB	10	100	90	135	45	7		50	400
10-160 SSK	910160HBRSB	10	100	90	160	70	7		50	400
10-200 SSK	910200HBRSB	10	100	90	200	110	7		25	200
10-240 SSK	910240HBRSB	10	100	90	240	150	7		25	–

Loads F_{per} and F_{rec}

Type	Solid sand-lime brick ≥ KS12		Hollow brick ≥ HLz 12		Hollow sand-lime brick ≥ KSL 12		Hollow concrete blocks Hbl 2		Lightweight solid concrete blocks V2		Permissible bending moment for zinc plated screws
	F_{per} [kN]	F_{rec} [kN]	F_{per} [kN]	F_{rec} [kN]	F_{per} [kN]	F_{rec} [kN]	F_{per} [kN]	F_{rec} [kN]	F_{per} [kN]	F_{rec} [kN]	[Nm]
HBR 8	–	1,30	–	0,40	–	0,50	–	0,37	–	0,37	4,5
HBR 10	0,86	–	0,34	–	0,21	–	0,11	–	–	0,25	13,0

F_{per}: Permissible load in all directions according to ETA approval
F_{rec}: Recommended load in all directions incl. safety factor
Values apply to an average temperature range in the wall of max. + 24° C (temporarily + 40° C).
If the sustained average temperature is +50° C (temporarily +80° C) load capacities are reduced. In this case, refer to the approval.
For further information regarding masonry (brick types and sizes) please refer to the approval.

Spacing and edge distance

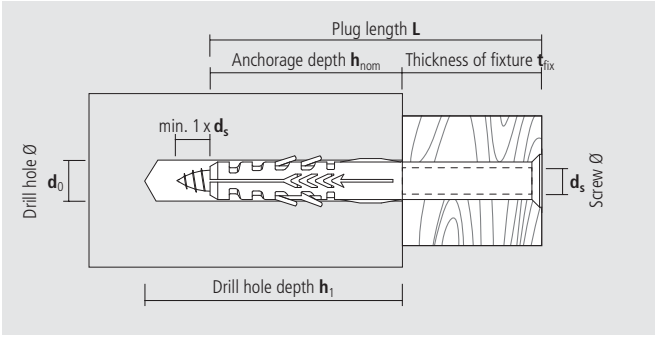
Type	Distances		Solid sand-lime brick KS single plug s [mm]	Solid sand-lime brick KS group of plugs s_1 or s_2 [mm]	Hollow brick HLz single plug s [mm]	Hollow brick HLz group of plugs s_1 or s_2 [mm]	Hollow sand-lime brick KSL single plug [mm]	Hollow sand-lime brick KSL group of plugs [mm]	Hollow concrete blocks Hbl* single plug [mm]	Hollow concrete blocks Hbl* group of plugs [mm]
HBR 10	Axcial spacing parallel to edge	s or s_2	250	400	250	320	250	360	250	200
HBR 10	Axial spacing perpendicular to edge	s or s_1	250	200	250	160	250	180	250	100
HBR 10	Min. edge distance	c_{min}	100	–	80	–	80	–	50	–
HBR 10	Min. thickness of structural part	h_{min}	175	175	175	175	175	175	240	240

* Applies to the installation on the long side of the stone

Frame plug R

R 8

R 10



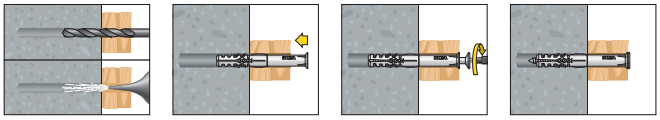
Advantages

- Special frameplug for solid building materials
- Setting depth only 50 mm (R8 only 40 mm)
- Suitable for facade installations, fixing of doors and windows, wall cabinets and frames in general
- The distinctive anti-rotation wings prevent effectively spinning during the installation

Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks

Mounting



R 8 SP, zinc plated incl. countersunk wood screw (PZ 3)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-60 SP	9860RSZ	8	55	40	60	20	5,5		25	450
8-80 SP	9880RSZ	8	55	40	80	40	5,5		25	450
8-100 SP	98100RSZ	8	55	40	100	60	5,5		50	400

R 10 SSP, zinc plated incl. countersunk screw (PZ 4)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
10-80 SSP	91080RSZ	10	60	50	80	30	7		100	800
10-100 SSP	910100RSZ	10	60	50	100	50	7		50	400
10-115 SSP	910115RSZ	10	60	50	115	65	7		50	400
10-135 SSP	910135RSZ	10	60	50	135	85	7		50	400
10-160 SSP	910160RSZ	10	60	50	160	110	7		50	400

Frame plug R

R 10 TX, zinc plated incl. countersunk screw (TX 40)								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
10-80 TX	91080RST	10	60	50	80	30	7		100	800
10-100 TX	910100RST	10	60	50	100	50	7		50	400
10-115 TX	910115RST	10	60	50	115	65	7		50	400
10-135 TX	910135RST	10	60	50	135	85	7		50	400
10-160 TX	910160RST	10	60	50	160	110	7		50	400
10-200 TX	910200RST	10	60	50	200	150	7		25	200
10-240 TX	910240RST	10	60	50	240	190	7		25	200

R 10 SSK, zinc plated incl. hex-head screw with integral washer (SW13)								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	d_s [mm]	€/ 100 pcs	[pcs]	[pcs]
10-60 SSK	91060RK	10	60	50	60	10	7		100	800
10-80 SSK	91080RK	10	60	50	80	30	7		100	800
10-100 SSK	910100RK	10	60	50	100	50	7		50	400
10-115 SSK	910115RK	10	60	50	115	65	7		50	400
10-135 SSK	910135RK	10	60	50	135	85	7		50	400
10-160 SSK	910160RK	10	60	50	160	110	7		50	400
10-200 SSK	910200RK	10	60	50	200	150	7		25	200
10-240 SSK	910240RK	10	60	50	240	190	7		25	200

Loads F_{rec}

Type	Concrete ≥ C12/15 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KS 12 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Lightweight solid concrete blocks V2 F_{rec} [kN]	Bending moment for zinc plated screws [Nm]
R 8	0,85	0,75	0,75	0,45	0,45	–	4,5
R 10*	0,80	0,60	0,60	–	–	0,25	8,7

F_{rec}: Recommended loads in all directions incl. safety factors
* Recommended loads in all directions according to former German approval by DIBt

Spacing and edge distance values for R10 according to former German approval by DIBt

Type	Concrete ≥ C12/15					Solid brick ≥ MZ 12, Solid sand-lime brick ≥ KS 12				
	Spacing		Edge distance		Thickness of structural part	Spacing distance	Edge distance			Min. thickness of structural part
	single plug	pair of plugs	single plug	pair of plugs			with load, to joint without mortar	with load, to joint with mortar	without load	
	a ≥ [mm]	$a_g \geq$ [mm]	$a_r \geq$ [mm]	a_r [mm]	h_{min} [mm]	a ≥ [mm]	$a_r \geq$ [mm]	$a_r \geq$ [mm]	a_r [mm]	h_{min} [mm]
R 8	100	50	50	150	100	100/250	100	30	250	115
R 10	100	50	50	150	100	100/250	100	30	250	115

AKT cover caps suitable for MFR, R and HBR (TX 40)		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
AKT dark brown	9MAKT		100	–
AKT white	91AKT		100	–

Nail plug NP

Countersunk head NPC 5, NPC 6 and NP 8

Flat head NP 5 and NP 6

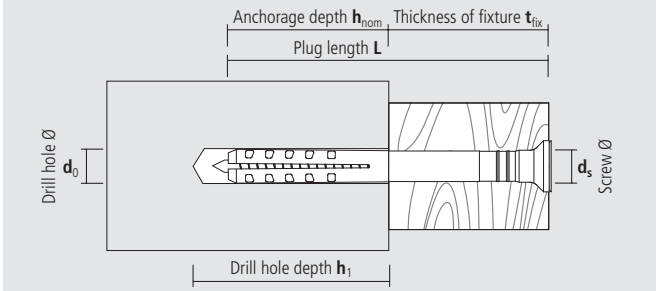
Countersunk NP 6 and NP 8 with metric thread

Advantages

- For the quick fixing of frames, slats, channels, foils, electric clamps, etc.
- Also suitable for window and door frame installation
- An accurate tuning between plug and nailscrew results in optimal expansion and thus high pull out loads
- Integral barrier prevents premature expansion
- Protection of the nailscrew head during hammering-in by a raised ring
- All nailscrews with Pozidriv recess, so screwing in and out is also possible

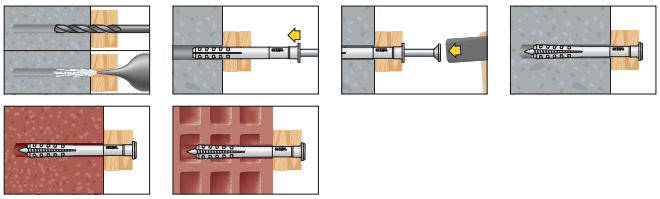
Suitable building materials

- ✔ Concrete
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Natural stone
- ✔ Hollow brick HLz
- ✔ Hollow sand-lime brick KSL



Minimum edge distance: 1x anchorage depth of plug

Mounting



NPC 5 and 6

NP 8

NPC and NP, zinc plated pre-assembled, countersunk head							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
NPC 5-35	9535NPC	5	35	25	35	10		100	1.800
NPC 5-50	9550NPC	5	35	25	50	25		100	1.800
NPC 6-35	9635NPC	6	40	30	35	5		100	1.800
NPC 6-40	9640NPC	6	40	30	40	10		100	1.800
NPC 6-50	9650NPC	6	40	30	50	20		50	900
NPC 6-60	9660NPC	6	40	30	60	30		50	900
NPC 6-80	9680NPC	6	40	30	80	50		50	900
NP 8-60	9860NP	8	50	40	60	20		50	600
NP 8-60 [1]	9860NP100	8	50	40	60	20		100	800
NP 8-80	9880NP	8	50	40	80	40		50	600
NP 8-80 [1]	9880NP100	8	50	40	80	40		100	800
NP 8-100	98100NP	8	50	40	100	60		50	600
NP 8-100 [1]	98100NP100	8	50	40	100	60		100	800
NP 8-120	98120NP	8	50	40	120	80		50	400
NP 8-120 [1]	98120NP100	8	50	40	120	80		100	800
NP 8-135	98135NP	8	50	40	135	95		50	400

[1] Craftsman pack (box without viewing window)

Nail plug NP

NP, zinc plated pre-assembled, flat head							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
NP 5-25	9525NP	5	25	23	25	2		200	3.600
NP 5-35	9535NP	5	35	25	35	10		100	1.800
NP 5-50	9550NP	5	35	25	50	25		100	1.800
NP 6-35	9635NP	6	40	30	35	5		100	1.800
NP 6-40	9640NP	6	40	30	40	10		100	1.800
NP 6-40 [1]	9640NP300	6	40	30	40	10		300	2.400
NP 6-50	9650NP	6	40	30	50	20		50	900
NP 6-60	9660NP	6	40	30	60	30		50	900
NP 6-60 [1]	9660NP250	6	40	30	60	30		250	2.000
NP 6-70	9670NP	6	40	30	70	40		50	900
NP 6-80	9680NP	6	40	30	80	50		50	900
NP 6-80 [1]	9680NP200	6	40	30	80	50		200	1.600

[1] Craftsman pack (box without viewing window)

NP, stainless steel A2 pre-assembled, countersunk head							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
NP 5-35 A2	9X535NP	5	35	25	35	10		100	1.800
NP 5-50 A2	9X550NP	5	35	25	50	25		100	1.800
NP 6-40 A2	9X640NP	6	40	30	40	10		100	1.800
NP 6-60 A2	9X660NP	6	40	30	60	30		50	900
NP 6-80 A2	9X680NP	6	40	30	80	50		50	900

NP, stainless steel A2 pre-assembled, countersunk head							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
NP 8-60 A2	9X860NP	8	50	40	60	20		50	600
NP 8-80 A2	9X880NP	8	50	40	80	40		50	600

NP, zinc plated pre-assembled, countersunk head, nail screw with metric thread							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
NP 6-40 M6*	9640NPM6	6	40	30	40	10		100	1.800
NP 8-45 M8*	9845NPM8	8	50	40	45	5		50	900

*Thread length at M6 and M8: 5 mm

Loads F_{rec} and F_{eff}

Type	Concrete		Solid sand-lime brick KS 12		Aerated concrete P2		Aerated concrete P4		Hollow brick HLz 12	
	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]
NP 5	0,20	1,40	0,17	1,20	0,05	0,35	0,09	0,63	0,08	0,56
NP 6	0,21	1,50	0,19	1,33	0,06	0,42	0,10	0,70	0,09	0,63
NP 8	0,29	2,00	0,26	1,80	0,09	0,63	0,13	0,91	0,10	0,70

F_{rec}: Recommended loads incl. safety factor of 7
F_{eff}: Effective pull out loads excl. safety factor

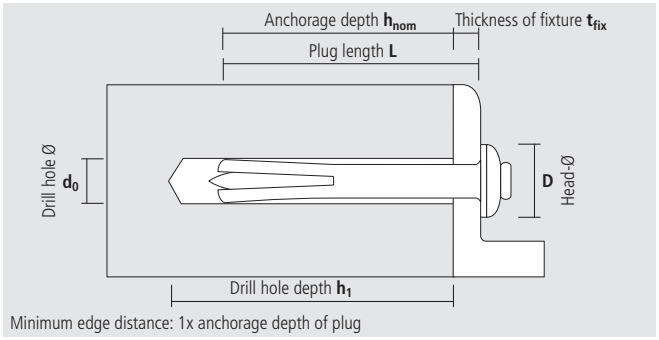
Nail plug NPZ

Advantages

- Metal nail plug for the fixing of rails, clamps, sheet metal, signs, etc.
- Nail made of hardened steel, zinc plated; plug made of zinc die casting
- Not removable due to flat nail head (theft protection)

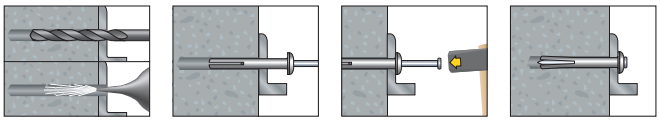
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks



Minimum edge distance: 1x anchorage depth of plug

Mounting



NPZ

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	D [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
NPZ 5-22	9522NPZ	5	22	15	22	7	10,5		100	4.800
NPZ 5-40	9540NPZ	5	25	20	40	20	10,5		100	3.000
NPZ 6-40	9640NPZ	6	25	20	40	20	12,6		100	2.000

Loads F_{rec}

Type	Concrete F_{rec} [kN]
NPZ 5-22	0,70
NPZ 5-40	0,75
NPZ 6-40	1,00

F_{rec}: Recommended loads incl. safety factor of 3

Quick-Fix nail BN

BN

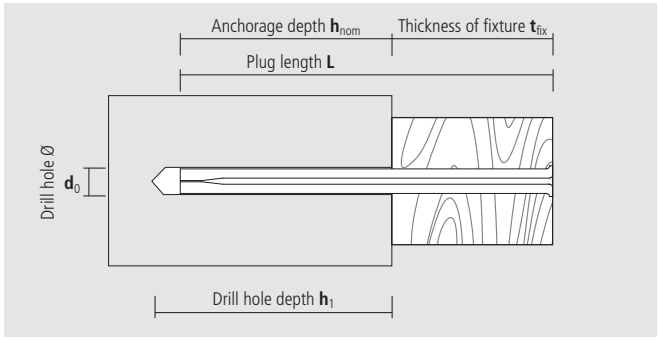
BDN

Advantages

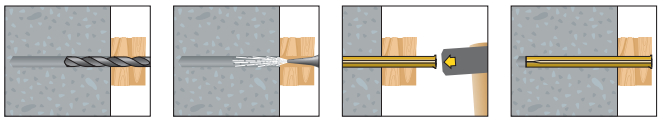
- Suitable for push-through installation of wooden slats, brackets, or the like
- Quick and easy fixing: hammer Quick-Fix nail into predrilled hole – done
- The quick-fix nail is made of high-quality, galvanized spring steel and offers a secure grip in concrete and masonry
- The design of the product prevents interlocking in the box

Suitable building materials

- ✔ Concrete
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Natural stone



Mounting



BN zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
BN 6-30	9B630BN	6	35	25	30	5		100	2.200
BN 6-60	9B660BN	6	40	30	60	30		100	1.200
BN 6-80	9B680BN	6	40	30	80	50		100	1.200
BN 8-70	9B870BN	8	50	40	70	30		50	1.100
BN 8-90	9B890BN	8	50	40	90	50		50	1.100
BN 8-110	9B8110BN	8	50	40	110	70		50	600
BN 8-130	9B8130BN	8	50	40	130	90		50	600
BN 8-150	9B8150BN	8	50	40	150	110		50	500

BDN Quick-Fix nail with punched hole (Perforation: 20 x 7,6 mm), zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	h_{nom} [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
BDN 8-32	9B832BDN	8	35	32		100	800

Loads F_{rec} and F_{eff}

Type	Concrete	
	F_{rec} [kN]	F_{eff} [kN]
BN 6	0,8	2,5
BN 8, BDN	1,1	3,3

F_{rec}: Recommended loads incl. safety factor of 3
F_{eff}: Effective pull out loads excl. safety factor

Window frame screw FBS / FBS-Z

FBS with countersunk head

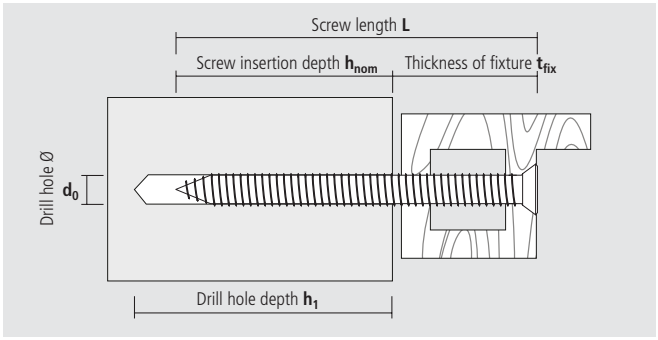
FBS-Z with socket head

Advantages

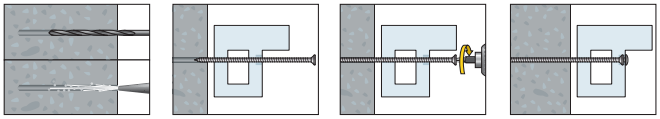
- Special thread with reduced diameter at the screw tip reduces setting torque and therefore allows a longer battery life of your battery screwdriver
- Quick and easy installation
- Suitable for many different window types and a large number of base materials
- Both types with underhead milling ribs

Suitable building materials

✔ Concrete
✔ Natural stone
✔ Solid brick
✔ Lightweight concrete
✔ Hollow brick
✔ Hollow sand-lime brick



Mounting



FBS, zinc plated with countersunk head (ø 11 mm, TX 30), for metal and plastic window frames

Type Ø - L	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	d_f * [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
FBS 7,5 - 72	97572FBS	6	depends on building material, h_{nom} + 10 mm	depends on building material, see table on next page	6,2		100	1.800
FBS 7,5 - 92	97592FBS	6			6,2		100	1.700
FBS 7,5 - 112	975112FBS	6			6,2		100	1.300
FBS 7,5 - 132	975132FBS	6			6,2		100	1.100
FBS 7,5 - 152	975152FBS	6			6,2		100	1.000
FBS 7,5 - 182	975182FBS	6			6,2		100	800
FBS 7,5 - 212	975212FBS	6			6,2		100	700

* d_f: drill hole Ø in window frame

FBS-Z, zinc plated with socket head (ø 8,3 mm, TX 30), for wooden window frames

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	d_f * [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
FBS-Z 7,5 - 72	97572FBSZ	6	depends on building material, h_{nom} + 10 mm	depends on building material, see table on next page	6,2		100	1.800
FBS-Z 7,5 - 92	97592FBSZ	6			6,2		100	1.700
FBS-Z 7,5 - 112	975112FBSZ	6			6,2		100	1.300
FBS-Z 7,5 - 132	975132FBSZ	6			6,2		100	1.100
FBS-Z 7,5 - 152	975152FBSZ	6			6,2		100	1.000
FBS-Z 7,5 - 182	975182FBSZ	6			6,2		100	800
FBS-Z 7,5 - 212	975212FBSZ	6			6,2		100	700

* d_f: drill hole Ø in window frame

Window frame screw FBS / FBS-Z

Loads F_{rec} and installation parameters for FBS and FBS-Z

		Concrete	Solid brick ≥ MZ20	Solid sand-lime brick ≥ KS12	Lightweight concrete [1]	Hollow bricks [1]
Tension load F_{rec}	[kN]	1,0	0,7	1,0	0,2	0,2
Shear load F_{rec}	[kN]	0,5	-	-	-	-
Drill hole Ø	[mm]	6	6	6	6	6
Screw insertion depth h_{nom}	[mm]	≥ 40	≥ 50	≥ 50	≥ 60	≥ 60 min. 2 brick walls
Min. drill hole depth h_1	[mm]	≥ 50	≥ 60	≥ 60	≥ 70	-
Min. edge distance c_{min}	[mm]	50	60	60	60	60

F_{rec} = Recommended loads incl. safety factor
[1] Hole must be made with a rotary drill (hammer switched off)

cover caps ÜKF

ÜKF for FBS / FBS-Z (TX 30)				Price	Packing
Type	Art-No white	Art-No dark brown	Art-No black	€/ 100 pcs	[pcs]
ÜKF	91AKF	9MAKF	94AKF		100

cover caps AKF

AKF for FBS / FBS-Z (TX 30)			Price	Packing
Type	Art-No white	Art-No dark brown	€/ 100 pcs	[pcs]
AKF	91AKFTX30	9MAKFTX30		100

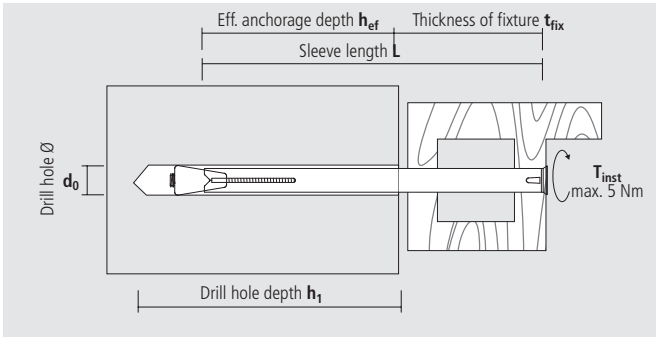
Metal frame plug MR

Advantages

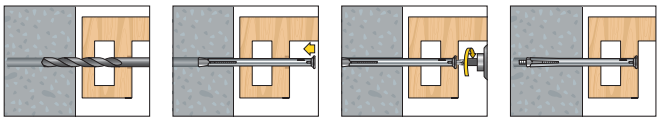
- Window and door frame installation free of constraint forces
- Stable metal design for distance installation
- Sendzimir zinc plated anchor sleeve for good protection against corrosion

Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Hollow brick
- ✔ Lightweight hollow concrete blocks



Mounting



MR with countersunk screw (PZ 3)

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L^1 [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
MR 10-72	91072MR	10	50	30	72	42		100	600
MR 10-92	91092MR	10	50	30	92	62		100	400
MR 10-112	910112MR	10	50	30	112	82		100	400
MR 10-132	910132MR	10	50	30	132	102		100	400
MR 10-152	910152MR	10	50	30	152	122		100	400
MR 10-182	910182MR	10	50	30	182	152		100	400
MR 10-202	910202MR	10	50	30	202	172		100	400

[1] Sleeve length

Loads F_{rec}

Type	Concrete F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Lightweight solid concrete blocks V 12 F_{rec} [kN]	Hollow sand-lime brick KSL 6 F_{rec} [kN]
MR 10	1,35	1,25	1,25	0,45	0,5

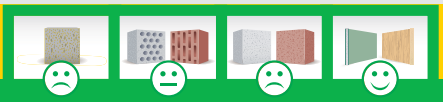
F_{rec}: Recommended loads incl. safety factor of 4


plastic cap ÜK


cover cap AK

ÜK / AK for MR 10 (PZ 3)

Type	Art-No white	Art-No dark brown	Price €/ 100 pcs	Packing [pcs]
Plastic cap ÜK	91UK	9MUK		100
Cover cap AK	91AKMR	9MAKMR		100



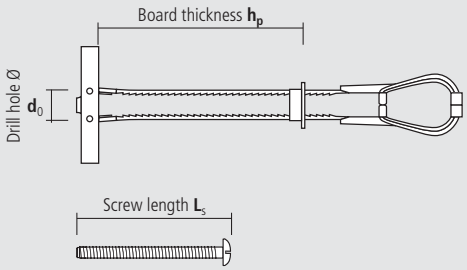
Cavity plug universal BT

Advantages

- Universal: useable for board thicknesses from 10 to 70 mm
- Very good load values
- Quick and easy handling
- No special installation tool required

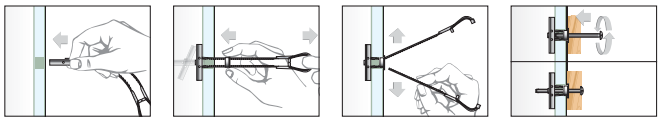
Suitable building materials

- ✔ Plasterboard
- ✔ Chipboard
- ✔ Hollow bricks / blocks with large chambers
- ✔ Hollow concrete slab ceilings



Minimum space behind board: 51 mm

Mounting



Watch video at www.celo-apolo.de/en

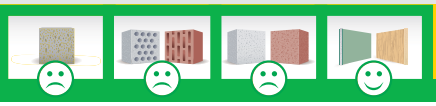
BT without screw					Price	Packing	
Type	Art-No	d_0 [mm]	$h_{p\ min-max}$ [mm]	Thread [mm]	€/ 100 pcs	[pcs]	[pcs]
BT M4	94BT	13	10 - 70	M4		40	320
BT M5	95BT	13	10 - 70	M5		30	240
BT M6	96BT	13	10 - 70	M6		30	240
BT M8	98BT	18 - 19	10 - 70	M8		20	160

BT with screw							Price	Packing	
Type	Art-No	d_0 [mm]	$h_{p\ min-max}$ [mm]	Thread [mm]	L_s [mm]	Recess/Drive	€/ 100 pcs	[pcs]	[pcs]
BT M4	94BTLO	13	10 - 70	M4	50	PZ2 / slot		40	320
BT M5	95BTLO	13	10 - 70	M5	62	PZ2 / slot		30	240
BT M6	96BTLO	13	10 - 70	M6	62	PZ2 / slot		30	240
BT M8	98BTK	18 - 19	10 - 70	M8	60	SW13 / hex		20	160

Loads F_{rec}

Type	d_0	Tension load N_{rec} in plasterboard				Shear load Q_{rec} in plasterboard			
		h_p = 9,5 mm	h_p = 12,5 mm	h_p = 16 mm	h_p = 19 mm	h_p = 9,5 mm	h_p = 12,5 mm	h_p = 16 mm	h_p = 19 mm
	[mm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]
BT M4	13	0,07	0,15	0,15	0,15	0,20	0,20	0,25	0,30
BT M5	13	0,10	0,20	0,20	0,20	0,30	0,30	0,40	0,50
BT M6	13	0,20	0,20	0,20	0,20	0,30	0,30	0,50	0,50
BT M8	19	0,20	0,20	0,20	0,20	0,30	0,40	0,50	0,50

F_{rec}: Recommended loads incl. safety factor of 4



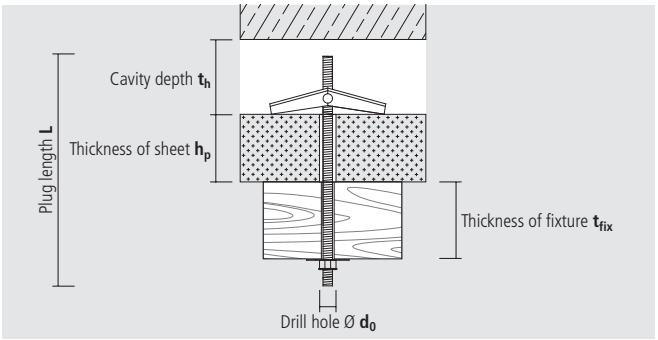
Spring toggle FK

FK-S with washer and hexagon nut

FK-HS with hook, washer and hexagon nut

FK-R with knurled nut, yellow galvanized

FK-UR with knurled nut and washer yellow galvanized



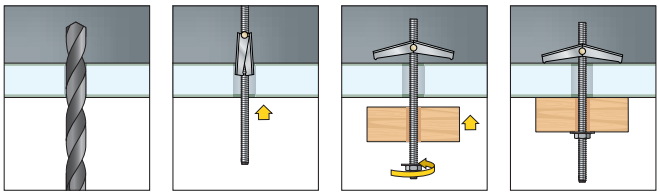
Advantages

- Suitable for fixings in cavity ceilings or walls, and boards like gypsum boards or chipboards

Suitable building materials

- ✔ Cavity ceilings
- ✔ Cavity walls
- ✔ Plasterboard
- ✔ Chipboard

Mounting



FK-S with washer and hexagon nut

Type	Art-No	d_0 [mm]	$h_p + t_{fix} \leq$ [mm]	Thread	L_s [mm]	$t_h \geq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
3 x 85	9390FKS	11	65	M3	85	28		25	400
4 x 90	9495FKS	14	65	M4	90	35		25	400

FK-HS with hook, washer and hexagon nut

Type	Art-No	d_0 [mm]	$h_p + t_{fix} \leq$ [mm]	Thread	L_s [mm]	$t_h \geq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
3 x 100	9385FKHS	11	40	M3	100	28		25	400
4 x 95	94100FKHS	14	30	M4	95	35		25	400

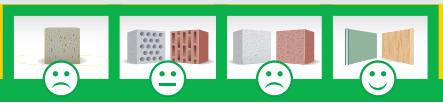
FK-R / FK-UR with knurled nut, yellow galvanized

Type	Art-No	d_0 [mm]	$h_p + t_{fix} \leq$ [mm]	Thread	L_s [mm]	$t_h \geq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
3 x 85 R	9390FKR	11	65	M3	85	28		25	400
4 x 90 R	9495FKR	14	65	M3	90	35		25	400
3 x 85 UR	9385FKUR	11	65	M3	85	28		25	400
4 x 90 UR	9490FKUR	14	65	M4	90	35		25	400

Loads F_{rec}

Type	Plasterboard $h_p = 12,5$ mm F_{rec} [kN]	Chipboard $h_p = 13$ mm F_{rec} [kN]	Fibre cement boards $h_p = 10$ mm F_{rec} [kN]
FK M3	0,07	0,30	0,30
FK M4	0,10	0,36	0,45

F_{rec}: Recommended loads incl. safety factor of 4



Cavity fixing HRM

HRM 4, 5, 6

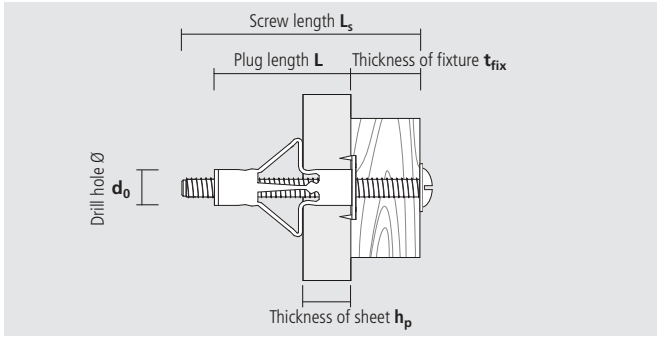
HRM 8

Advantages

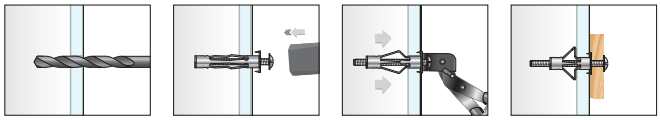
- Suitable for fixings on boards like gypsum boards or chip-boards, but also in hollow ceilings for example
- After successful installation, the anchor expands over a large area, resulting in high load values
- Mounting with installation pliers MZA 100, cordless screwdriver and screwdriver possible; the installation pliers are recommended for a quick and controlled installation
- Not flammable according to DIN 4102, class A1

Suitable building materials

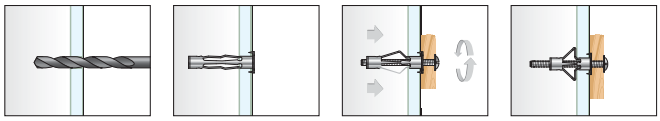
- ✔ Cavity ceilings
- ✔ Cavity walls
- ✔ Plasterboard
- ✔ Chipboard
- ✔ Hollow bricks / blocks with large chambers



Mounting with installation plier (recommended)

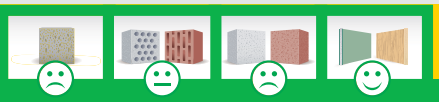


Mounting without installation plier



	HRM								Price	Packing	
	Type	Art-No	d_0 [mm]	$h_{p\ min-max}$ [mm]	Thread	L_s [mm]	L [mm]	t_{fix} [mm]	€/ 100 pcs	[pcs]	[pcs]
small pack (with viewing window)	HRM 4-20	9420HRM50	8	3 - 18	M4	52	46	43 - 28		50	1.350
	HRM 4-24	9424HRM50	8	18 - 24	M4	58	52	34 - 28		50	1.350
	HRM 4-38	9438HRM50	8	32 - 38	M4	72	66	34 - 28		50	1.350
	HRM 5-16	9516HRM50	11	3 - 16	M5	58	52	49 - 36		50	1.350
	HRM 5-32	9532HRM25	11	14 - 32	M5	71	65	51 - 33		25	675
	HRM 5-45	9545HRM25	11	32 - 45	M5	88	80	48 - 35		25	675
	HRM 6-16	9616HRM25	13	3 - 16	M6	58	52	49 - 36		25	675
	HRM 6-32	9632HRM25	13	14 - 32	M6	71	65	51 - 33		25	675
	HRM 6-45	9645HRM25	13	32 - 45	M6	88	80	48 - 35		25	675
	HRM 8-16*	9816HRM25	13	3 - 16	M8	61	53	50 - 37		25	675
	HRM 8-32*	9832HRM20	13	16 - 32	M8	73	66	50 - 34		20	540
craftsman pack	HRM 4-20	9420HRM	8	3 - 18	M4	52	46	43 - 28		100	1.200
	HRM 4-24	9424HRM	8	18 - 24	M4	58	52	34 - 28		100	1.000
	HRM 4-38	9438HRM	8	32 - 38	M4	65	59	34 - 28		100	1.000
	HRM 5-16	9516HRM	11	3 - 16	M5	58	52	49 - 36		100	500
	HRM 5-32	9532HRM	11	14 - 32	M5	71	65	51 - 33		100	500
	HRM 5-45	9545HRM	11	32 - 45	M5	88	80	48 - 35		100	900
	HRM 6-16	9616HRM	13	3 - 16	M6	58	52	49 - 36		100	500
	HRM 6-32	9632HRM	13	14 - 32	M6	71	65	51 - 33		100	900
	HRM 6-45	9645HRM	13	32 - 45	M6	88	80	48 - 35		100	900
	HRM 8-16*	9816HRM	13	3 - 16	M8	61	53	50 - 37		100	300
	HRM 8-32*	9832HRM	13	16 - 32	M8	73	66	50 - 34		100	300

* Hex-head screw, SW 13



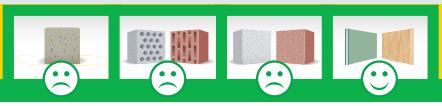
Cavity fixing HRM

Installation pliers MZA 100 for HRM		Price	Packing	
Type	Art-No	€/ pc	[pcs]	[pcs]
MZA 100	9MZA00		1	–

Loads F_{rec}

Type	Plywood 6 mm F_{rec} [kN]	Chipboard 16 mm F_{rec} [kN]	Plasterboard $h_p = 9,5$ mm F_{rec} [kN]	Plasterboard $h_p = 12,5$ mm F_{rec} [kN]	Plasterboard $h_p = 2 \times 12,5$ mm F_{rec} [kN]	Plasterboard $h_p = 3 \times 12,5$ mm F_{rec} [kN]
HRM 4-20	0,15	0,25	0,15	0,15	–	–
HRM 4-24	–	–	–	–	0,15	–
HRM 4-38	–	–	–	–	–	0,25
HRM 5-16	0,20	0,25	0,20	0,20	–	–
HRM 5-32	–	–	–	–	0,35	–
HRM 5-45	–	–	–	–	–	0,35
HRM 6-16	0,25	0,30	0,25	0,25	–	–
HRM 6-32	–	–	–	–	0,35	–
HRM 6-45	–	–	–	–	–	0,40
HRM 8-16	0,30	0,40	0,25	0,25	–	–
HRM 8-32	–	–	–	–	0,40	–

F_{rec}: Recommended loads incl. safety factor of 3



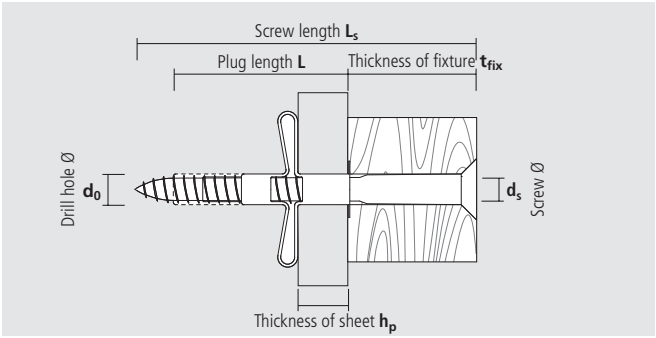
Cavity fixing HR

Advantages

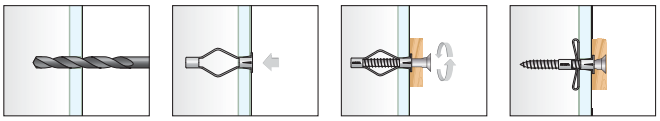
- Suitable for fixings on boards like gypsum boards and chipboards
- Low-cost fixing system for light duty applications
- Installation with wood screws or chipboard screws

Suitable building materials

✔ Plasterboard
✔ Chipboard



Mounting



HR						Price	Packing	
Type	Art-No	d_0 [mm]	$h_{p\ min-max}$ [mm]	d_s [mm]	L [mm]	€/ 100 pcs	[pcs]	[pcs]
HR 6-30	9630HR	6	3 - 14	3,5	30		100	4.800
HR 8-40	9840HR	8	10 - 16	4,0	40		50	2.400

Loads F_{rec}

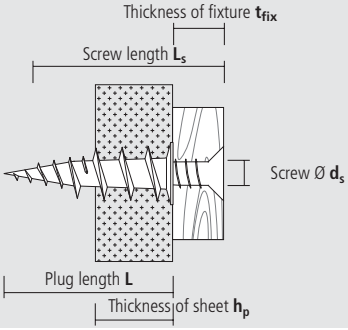
Type	Plywood 6 mm F_{rec} [kN]	Chipboard 16 mm F_{rec} [kN]	Plasterboard $h_p = 9,5$ mm F_{rec} [kN]	Plasterboard $h_p = 12,5$ mm F_{rec} [kN]
HR 6-30	0,10	–	0,08	0,08
HR 8-40	–	0,15	–	0,10

F_{rec}: Recommended loads incl. safety factor of 3

Plasterboard plug GKD / GKDZ

GKD made of nylon (fibre-glass reinforced)

GKDZ made of zinc die casting



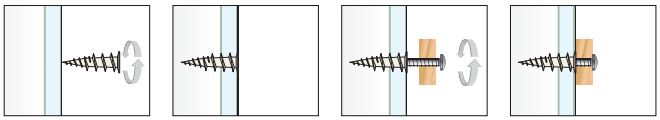
Advantages

- Suitable for fixings in gypsum boards
- Quick installation (no predrilling) for light loads
- Usable with chipboard screws or wood screws; GKDZ also with metric screws M4
- The screw may be too long when used with GKD and GKDZ, because it easily penetrates the tip of both plugs

Suitable building materials

✔ Plasterboard

Mounting



Watch video at www.celo-apolo.de/en

GKD without screw, plug recess: PH 2

Type	Art-No	L [mm]	$h_{p\ max}$ [mm]	$d_{s\ min-max}$ [mm]	$L_s \geq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GKD	9GKD	35	2 x 12,5	3 - 4,5	22 + t_{fix}		50	2.400

GKD with screw 4,0 x 40, plug recess: PH 2

Type	Art-No	L [mm]	$h_{p\ max}$ [mm]	d_s x L_s [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GKD PZ	9GKDPZ	35	2 x 12,5	4,0 x 40	18		50	2.400

GKDZ without screw, plug recess: PH 2

Type	Art-No	L [mm]	$h_{p\ max}$ [mm]	$d_{s\ min-max}$ [mm]	$L_s \geq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GKDZ*	9GKDZ	28	2 x 12,5	4 - 5	22 + t_{fix}		100	1.200
GKDZ	9GKDZ50	28	2 x 12,5	4 - 5	22 + t_{fix}		50	2.400

* Craftsman pack (box without viewing window)

GKDZ with screw 4,5 x 35, plug recess: PH 2

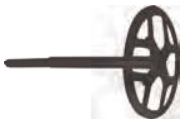
Type	Art-No	L [mm]	$h_{p\ max}$ [mm]	d_s x L_s [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
GKDZ PZ	9GKDZPZ50	28	2 x 12,5	4,5 x 35	18		50	2.400

Loads F_{rec}

Type	Plasterboard h_p = 9,5 mm F_{rec} [kN]	Plasterboard h_p = 12,5 mm F_{rec} [kN]	Plasterboard $h_p \geq$ 2 x 12,5 mm F_{rec} [kN]
GKD	0,07	0,07	–
GKDZ	0,08	0,09	0,09

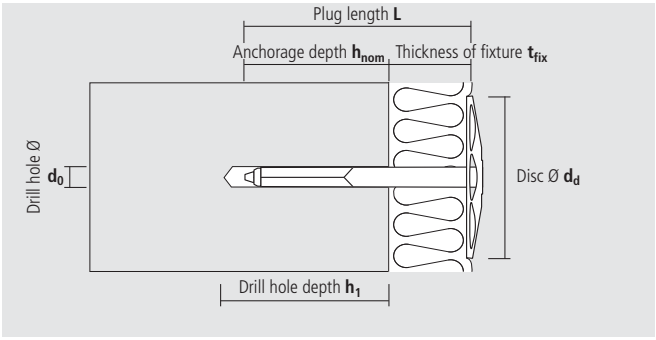
F_{rec}: Recommended loads incl. safety factor of 4

Insulation support DSH / DSH-M



DSH made of impact resistant plastics

DSH-M made of metal



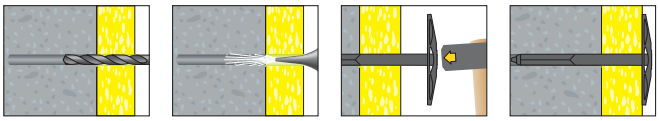
Advantages

- DSH: Stable shape prevents bending when hammered in
- DSH: Suitable for fastening soft insulation materials onto concrete and solid masonry
- DSH-M: Not flammable according to DIN 4102 class A1
- DSH-M: Suitable for fixing insulating material to concrete and masonry

Suitable building materials

✔ Concrete
✔ Solid brick
✔ Natural stone
✔ Solid sand-lime brick

Mounting



DSH

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_d [mm]	t_{fix} [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
DSH 8-20	94860DSH	8	40	30	60	82	20 - 30		100	–
DSH 8-40	94880DSH	8	40	30	80	82	40 - 50		100	–
DSH 8-60	948100DSH	8	40	30	100	82	60 - 70		100	–
DSH 8-80	948120DSH	8	40	30	120	82	80 - 90		100	–
DSH 8-100	948140DSH	8	40	30	140	82	100 - 110		100	–

DSH-M

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	L [mm]	d_d [mm]	$t_{fix} \leq$ [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
DSH-M 10	9860DSHM	8	60	50	60	35	10		250	–
DSH-M 30	9880DSHM	8	60	50	80	35	30		250	–
DSH-M 60	98110DSHM	8	60	50	110	35	60		250	–
DSH-M 90	98140DSHM	8	60	50	140	35	90		250	–
DSH-M 120	98170DSHM	8	60	50	170	35	120		250	–
DSH-M 150	98200DSHM	8	60	50	200	35	150		200	–

Loads F_{eff}

Type	Concrete		Solid brick Mz 12		Solid sand-lime brick KSV 12	
	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]	F_{rec} [kN]	F_{eff} [kN]
DSH	0,09	0,6	0,07	0,5	0,07	0,5
DSH-M	0,16	1,1	0,13	0,9	0,14	1,0

F_{rec}: Recommended loads incl. safety factor of 7
F_{eff}: Effective pull out loads excl. safety factor

Insulation plate DST / DSH-T

DST 50
made of plastics

DST 60
made of plastics
with integrated cap

DST 90
made of plastics

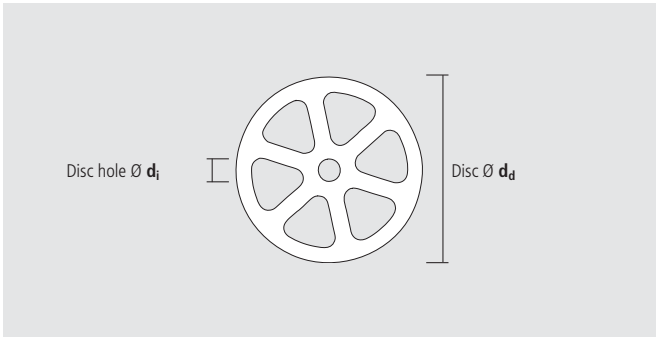
DSH-T 80
only in conjunction
with DSH-M

Advantages

- The insulation discs are suitable for installation of pressure resistant as well as soft insulation materials with frame anchors, quick-fix nails or nail plugs, as well the DSH-M insulation support

Suitable building materials

depending on the plug used



DST						Price	Packing	
Type	Art-No	d_d [mm]	d_i [mm]	Suitable for Type	see page	€/ 100 pcs	[pcs]	[pcs]
DST 50	950DST	50	9	Nail plug NP 8 Quick-Fix nail BN 8 Frame plugs MFR 8, HBR 8, R 8 Screws	35 38 27, 31, 33 114 ff		250	–
DST 60	960DST	60	6	Nail plug NPC 5 and 6, NP 5 and 6 Quick-Fix nail BN 6 Screws	35 38 114 ff		200	–
DST 90	990DST	90	8,5	Nail plug NP 8 Quick-Fix nail BN 8 Frame plugs MFR 8, HBR 8, R 8 Screws	35 38 27, 31, 33 114 ff		250	–

DSH-T						Price	Packing	
Type	Art-No	d_d [mm]	d_i [mm]	Suitable for Type	see page	€/ 100 pcs	[pcs]	[pcs]
DSH-T 80	980DSHT	80	14	Insulation support DSH-M	48		250	–

Insulation fastener IPD

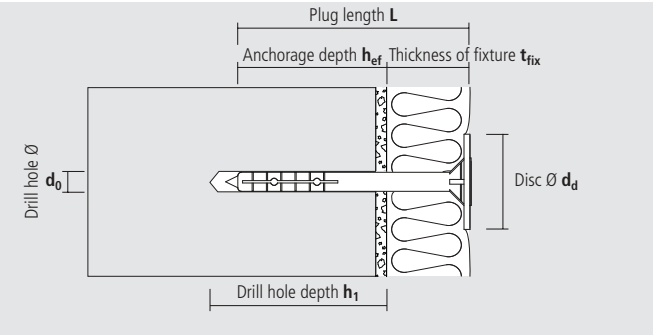
IPD 8 with steel nail

IPD 10 with plastic nail (glass fibre reinforced)

European Technical Approval for ETICS

Advantages

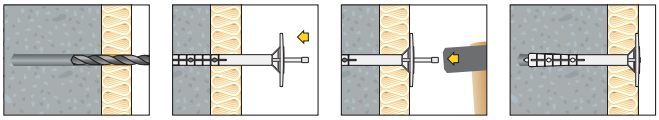
- ETA approved for ETICS (external thermal insulation composite systems)
- Suitable for fastening solid insulation boards
- The textured surface of the plate provides a good bond for plaster
- Stable design and impact resistant material prevents bending when hitting in



Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks

Mounting



IPD 8 with steel nail								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	d_d [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
IPD 8x95	9895IPD	8	35	25	95	60	70		200	–
IPD 8x115	98115IPD	8	35	25	115	60	90		200	–
IPD 8x135	98135IPD	8	35	25	135	60	110		200	–
IPD 8x155	98155IPD	8	35	25	155	60	130		200	–
IPD 8x175	98175IPD	8	35	25	175	60	150		200	–
IPD 8x195	98195IPD	8	35	25	195	60	170		200	–

IPD 10 with plastic nail (glass fibre reinforced)								Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	d_d [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
IPD 10x70	91070IPD200	10	40	30	70	60	40		200	–
IPD 10x90	91090IPD200	10	40	30	90	60	60		200	–
IPD 10x110	910110IPD200	10	40	30	110	60	80		200	–
IPD 10x120	910120IPD200	10	40	30	120	60	90		200	–
IPD 10x140	910140IPD200	10	40	30	140	60	110		200	–
IPD 10x160	910160IPD200	10	40	30	160	60	130		200	–
IPD 10x180	910180IPD200	10	40	30	180	60	150		200	–
IPD 10x200	910200IPD200	10	40	30	200	60	170		200	–
IPD 10x220	910220IPD200	10	40	30	220	60	190		200	–
IPD 10x260	910260IPD200	10	40	30	260	60	230		200	–

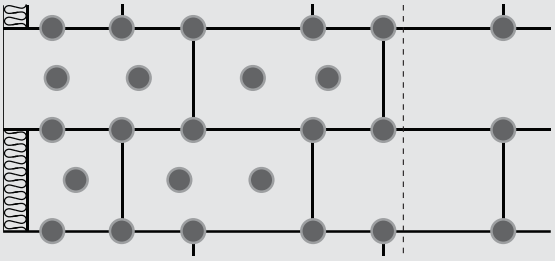
Insulation fastener IPD

Loads F_{per} according to ETA approval

Type	Concrete C12/15 F_{per} [kN]	Concrete ≥ C20/25 F_{per} [kN]	Solid brick MZ F_{per} [kN]	Solid sand-lime brick KS F_{per} [kN]	Hollow sand-lime brick KSL F_{per} [kN]	Hollow brick HLz F_{per} [kN]	Aerated concrete AAC2 F_{per} [kN]
IPD 8	0,18	0,27	0,27	0,27	0,27	0,21	0,27
IPD 10	0,18	0,27	0,27	0,21	0,21	0,21	0,18

F_{per}: Permissible loads according to ETA approval incl. safety factors

Example of anchor arrangement for polystyrene hard foam boards 800x625mm, 1000x500mm

Standard	Area: 4 pcs/m² Edge area: 8 pcs/m²	

For other types of insulation boards, please contact the manufacturer

Edge zone ¦ Normal zone

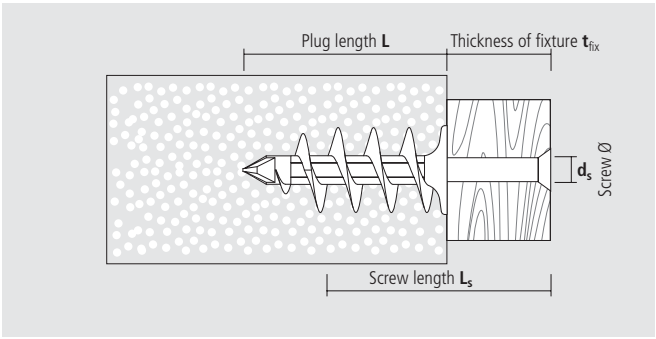
Insulation plug IPL

IPL 60

IPL 95

Advantages

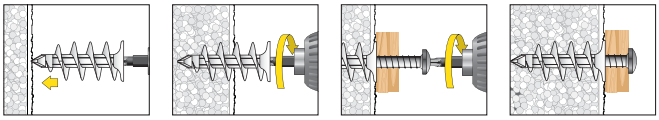
- Special plug for external insulation composite systems
- Direct fastening into the insulation material - no thermal bridge
- No predrilling necessary due to sharp cutting tip; also drills reliably through hard ETICS plaster (≤ 7 mm)
- Nylon plug ageing and weather resistant
- Duo-Bit: One bit for plug (IPL 60) and screw; saves installation time and money because no bit change is necessary. PZ2/TX40, TX20/TX40 and TX25/TX40 available



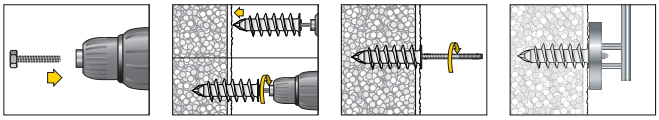
Suitable building materials

- ✔ External Thermal Insulation Composite Systems (ETICS)
- ✔ Polystyrene boards
- ✔ Heraklith boards
- ✔ Hard foam boards
- ✔ Wood fibre insulation boards (Pre-drill: 8mm for IPL60, 13mm for IPL95)

Mounting IPL 60



Mounting IPL 95



Watch video at www.celo-apolo.de/en

IPL

Type	Art-No	L [mm]	Recess	d_s [mm]	L_s [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
IPL 60	960IPL	58	TX 40	4,5 - 5,0	30 + t_{fix}		25	300
IPL 95	995IPL	95	SW 13	8/10/M8	40 + t_{fix}		25	200

IPL 60: head Ø 25 mm
IPL 95: head Ø 32 mm, **incl. 1x screw M8 x 30 as setting tool** 

Loads and dimensions

Type	Applications in Polystyrene EPS (PS15, PS20) F_{rec} [kN]	Applications in Polystyrene XPS F_{rec} [kN]	Use with	Screw insertion depth min. [mm]	Screw insertion depth max. [mm]
IPL 60	0,05	0,10	chipboard screws Ø 4,5 - 5,0	30	50
IPL 95	0,10	0,20	hanger bolts Ø8, Ø10 and M8 screws	40	80

F_{rec}: Recommended load in all directions incl. safety factor of 7

 Duo-Bit TX20/TX40, TX25/TX40  Duo-Bit PZ2/TX40

Duo-Bit for IPL 60

Type	Art-No	Dimensions	For use with	Price €/ pc	Price €/ Blister	Packing [pcs]	Packing [Blister]
TX20/TX40	7DTX20TX40	1/4" x 43 mm	IPL60 and TX20 screw			2	10
TX25/TX40	7DTX25TX40	1/4" x 43 mm	IPL60 and TX25 screw			2	10
PZ2/TX40	7DPZ2TX40	1/4" x 43 mm	IPL60 and PZ2 screw			2	10

Packed 2 pcs in a robust plastic box with EURO-punching

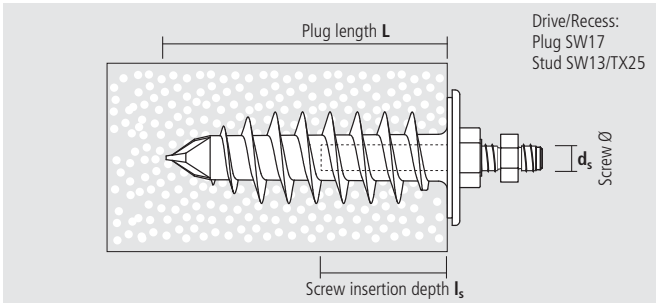
Insulation plug IPL 95DS

Advantages

- Perfect solution for fastening downpipes in ETICS: simple, flexible, fast and **adjustable**!
- Direct fastening into the insulation material - no thermal bridge
- Pre-mounted special threaded stud: ideal distance of 30 mm of the rainwater downpipe from the wall; adjustment of further 25 mm possible
- Pre-assembled sealing ring made out of weather resistant cellular rubber
- Self-drilling (ETICS plaster ≤ 7 mm) and robust nylon plug, ageing resistant
- Special threaded stud made out of stainless steel A2 or zinc flake coating for optimal corrosion resistance

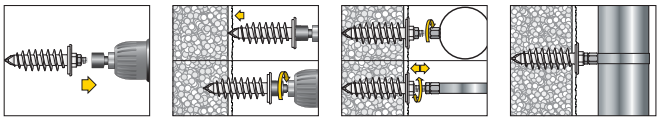
Suitable materials

- ✔ External Thermal Insulation Composite Systems (ETICS)
- ✔ Wood fibre insulation boards (pre-drilling: 13mm)
- ✔ Hard foam boards
- ✔ Polystyrene boards
- ✔ Heraklith boards



Special threaded stud: M10x60 with connecting thread M8 or M10

Mounting



- The IPL 95DS can be installed with a hexagon SW17 (recommended), hexagon SW13 socket or TX25 bit
- The special threaded stud can be adjusted up to 25 mm. Tip: If the plug should rotate, fixate it with a wrench SW17.

▶ Watch video at www.celo-apolo.de/en

IPL 95DS sealing cap Ø = 44,5 mm

Type	Art-No	L [mm]	Internal thread d_s	Connecting thread	Material threaded stud	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
IPL 95DS M8	ZG895IPLDS4	95	M10	M8	Zinc flake coating		4	80
IPL 95DS	ZG95IPLDS4	95	M10	M10	Zinc flake coating		4	80
IPL 95DS A2	X95IPLDS4	95	M10	M10	Stainless steel A2		4	80

Packed by 4 pcs incl. installation instruction in a bag

IPL 95D sealing cap Ø = 44,5 mm

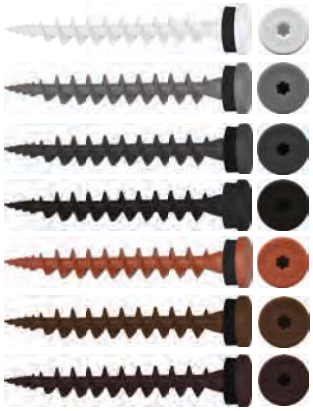
Type	Art.-No	L [mm]	Internal thread d_s	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
IPL 95D	995IPLD	95	M10	SW17		20	160

Loads and dimensions

Type	Application in Polystyrene EPS (PS15, PS20) F_{rec} [kN]	Application in Polystyrene XPS F_{rec} [kN]	Special threaded stud	Screw insertion depth l_s min [mm]	Screw insertion depth l_s max [mm]
IPL 95DS / IPL 95D	0,10	0,20	Total length 60 mm Thread inside the plug: 50 mm	20	50

F_{rec}: Recommended load in all directions incl. safety factor of 7

Insulation screw IPS 80



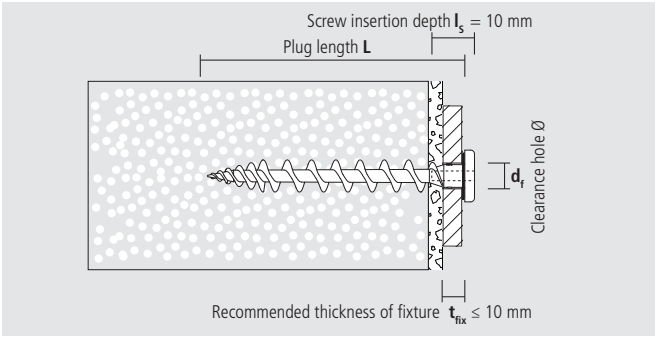
IPS 80 Signal white
IPS 80 Telegrey
IPS 80 Anthracite grey
IPS 80 Traffic black
IPS 80 Copper brown
IPS 80 Sepia brown
IPS 80 Chocolate brown

Advantages

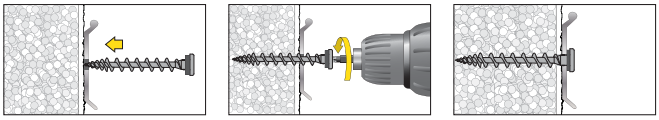
- Special screw for direct fastening into external thermal insulation composite systems (ETICS) - extremely fast and without thermal bridges!
- For fastening of wall connection profiles, metal sheets, base protection profiles, cornice covers, motion detectors, lamps, signs, etc. into the insulation material
- No pre-drilling in plaster (≤ 7 mm) due to sharp drilling tip
- Special screw made out of glass-fibre reinforced nylon with EPDM sealing; aging, weather and UV-resistant
- Stylish flat head, different colors
- Suitable for clearance holes ≥ Ø 8 mm (common for wall profiles)
- Also suitable for light duty fixings in combination with a screw Ø 3,5 mm

Suitable materials

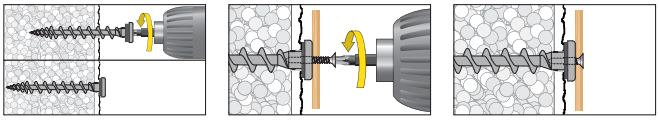
✔ External Thermal Insulation Composite Systems (ETICS)
✔ Hard foam boards
✔ Polystyrene boards
✔ Styrofoam boards



Mounting IPS 80 (wall connection profiles)



Mounting IPS 80 (light duty fixings with screw)



Usable with: Screw Ø 3,5 mm; screw length L_s = 10 mm + thickness of fixture

Watch video at www.celo-apolo.de/en

IPS 80 with EPDM sealing, head Ø = 16,0 mm						Price	Packing	
Type	Art-No	RAL-Code	L [mm]	Drive	d_f [mm]	€/ 100 pcs	[pcs]	[pcs]
IPS 80 Signal white	9180IPS	RAL 9003	80	TX 25	8 – 10		50	900
IPS 80 Telegrey	9GR80IPS	RAL 7045	80	TX 25	8 – 10		50	900
IPS 80 Anthracite grey	9AN80IPS	RAL 7016	80	TX 25	8 – 10		50	900
IPS 80 Traffic black	9480IPS	RAL 9017	80	TX 25	8 – 10		50	900
IPS 80 Copper brown	9CO80IPS	RAL 8004	80	TX 25	8 – 10		50	900
IPS 80 Sepia brown	9M80IPS	RAL 8014	80	TX 25	8 – 10		50	900
IPS 80 Chocolate brown	9MO80IPS	RAL 8017	80	TX 25	8 – 10		50	900

Loads and dimensions

Type	Application in Polystyrene EPS (PS15, PS20) unplastered F_{rec} [kN]	Application in Polystyrene EPS (PS15, PS20) plastered F_{rec} [kN]	Application in Rockwool, Coverrock Plus unplastered F_{rec} [kN]	Thickness of insulation material ≥ [mm]
IPS 80	0,04	ca. 0,06*	0,02	80

F_{rec}: Recommended load in all directions incl. safety factor of 5
* Value may differ depending on the type and thickness of the plaster

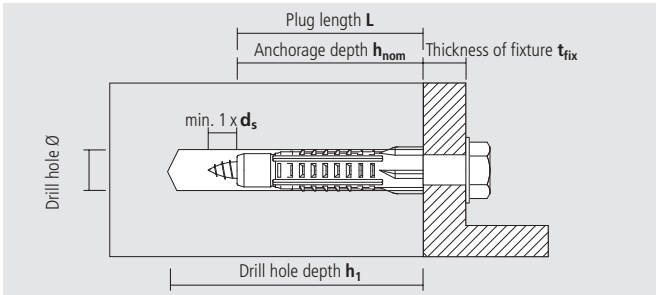
Sanitary installation set SMS

Advantages

- Suitable for fastening of boilers, radiators, metal profiles, electrical appliances, etc.
- Sets with multi-purpose plug MZ can be used for nearly all building materials, see page 20
- Solid washers for strong hold

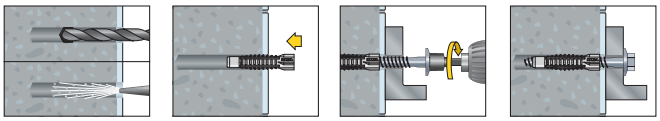
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard



Minimum edge distance: 1x plug length

Mounting



SMS

Type	Art-No	Set contains	d_0 [mm]	$h_1 \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Price €/ set	Packing [sets]
8 x 70	9870SMS	2 plugs MZ 10 2 hex-head wood screws 8 x 70 2 washers 16 x 8,4 x 1,6	10	75	59	5		50
10 x 80	91080SMS	2 plugs MZ 12 2 hex-head wood screws 10 x 80 2 washers 20 x 10,5 x 2,0	12	85	71	5		20

Sets are packed in PVC bags

Loads for wood screws F_{rec} for the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Chipboard 16 mm F_{rec} [kN]
MZ 10	8	1,56	1,07	0,68	0,13	0,25	0,31	0,08	0,25
MZ 12	10	2,02	1,31	–	0,23	0,39	0,42	0,11	0,37

F_{rec}: Recommended loads incl. safety factor of 7

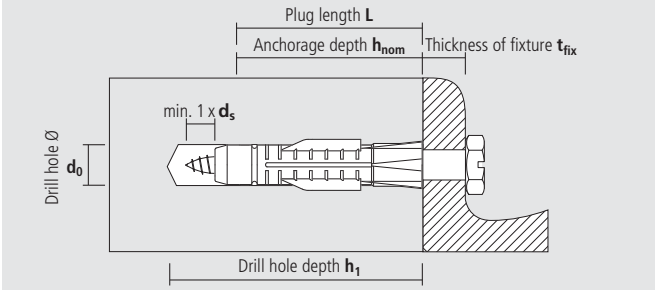
Standing toilet installation set WC

Advantages

- Suitable for fastening of standing toilets
- Sets with universal plugs AZ can be used for nearly all building materials, see page 22
- Brass screws ensure corrosion resistance
- Plastic washers with collar protect the ceramic

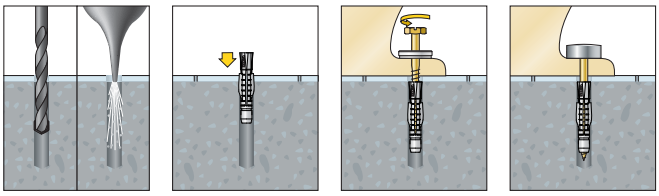
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard



Minimum edge distance: 1x plug length

Mounting



WC							Price	Packing
Type	Art-No	Set contains	d_0 [mm]	$h_1 \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ set	[sets]
white	91WC	2 plugs AZ 8 2 brass hex-head screws 6 x 85 2 protection rings 2 cover caps white	8	60	50	30		50
white/ chrome	9BFWC	2 plugs AZ 8 2 brass hex-head screws 6 x 85 2 protection rings 2 cover caps white 2 cover caps chrome	8	60	50	30		50

Sets are packed in PVC bags

Loads for wood screws F_{rec}

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow brick Poroton T12 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]	Solid stone KS12 / Solid brick MZ 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Plasterboard 12,5 mm F_{rec} [kN]	Plasterboard 2 x 12,5 mm F_{rec} [kN]
AZ8	6	0,46	0,32	0,15	0,31	0,27	0,06	0,09	–

F_{rec}: Recommended loads incl. safety factor of 7

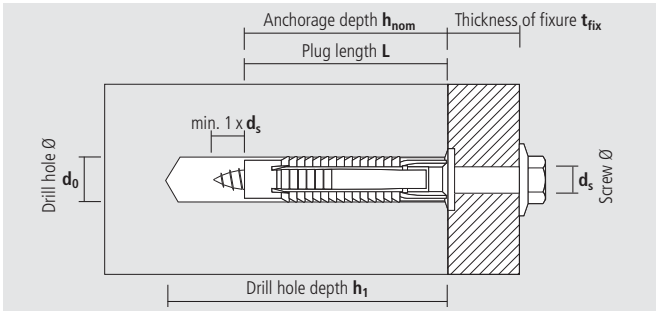
Standing toilet installation set FRH

Advantages

- Fast and easy installation of standing toilets and bidets to the floor
- Sets with plugs FX (+ hex-head screws 6x60) can be used for nearly all building materials, see page 16
- Patented support angles (+ chipboard screw 5x45) can be used for many different standing toilets and bidets
- Flanged bushes protect ceramics
- Screws in stainless steel ensure corrosion resistance

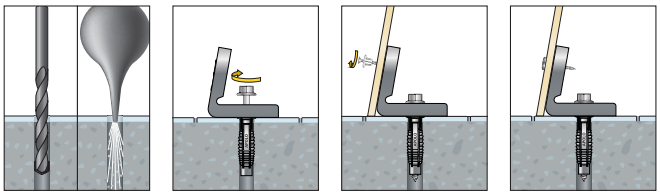
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Aerated concrete
- ✔ Hollow brick
- ✔ Hollow sand-lime brick



Minimum edge distance: 1x plug length

Mounting



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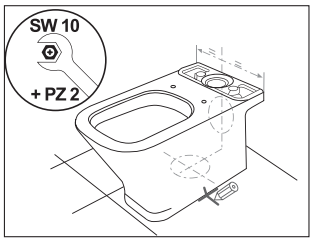
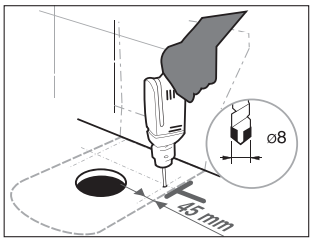




FRH

Type	Art-No	Set contains	d_0 [mm]	$h_1 \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Price €/ set	Packing [sets]
FRH	FRH100	2 plugs FX 8 2 hex-head screws 6 x 60, zinc flake coating 2 patented support angles 2 chipboard screws 5 x 45, stainless steel 2 flanged bushes 2 cover caps chrome	8	55	40	10		100

Set is packed in PVC bags

Recommended loads F_{rec} using wood screws with the largest applicable screw diameter and full anchorage depth

Type	Screw Ø d_s [mm]	Concrete F_{rec} [kN]	Solid stone MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Aerated concrete AAC2 F_{rec} [kN]	Aerated concrete AAC4 F_{rec} [kN]	Hollow brick HLz 12 F_{rec} [kN]	Hollow sand-lime brick KSL 12 F_{rec} [kN]
FX 8	6	0,52	0,50	0,50	0,10	0,14	0,23	0,60

F_{rec}: Recommended loads incl. safety factor of 7

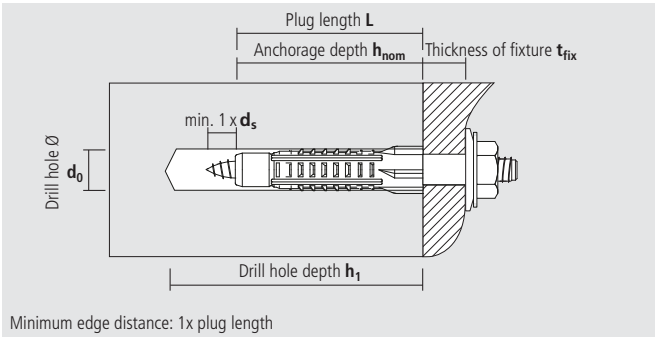
Vanity installation set WT

Advantages

- Suitable for fastening of wash basins
- Set with multi-purpose plug MZ can be used for nearly all building materials, see page 20
- Hanger bolts with TX recess for easy and fast installation
- Solid washers for strong hold
- Plastic washers with collar protect the ceramic

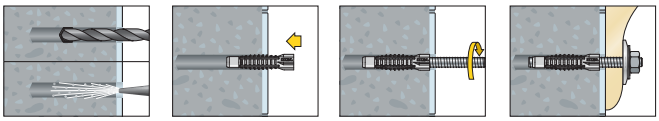
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard



Minimum edge distance: 1x plug length

Mounting



WT							Price	Packing
Type	Art-No	Set contains	d_0 [mm]	$h_1 \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ set	[sets]
10 x 140	910140WT	2 plugs MZ 14 2 hanger bolts M10 x 140 2 flanged bushes 2 washers 35 x 11 x 1,5 2 hex-head nuts M10	14	85	75	40		50

Sets are packed in PVC bags

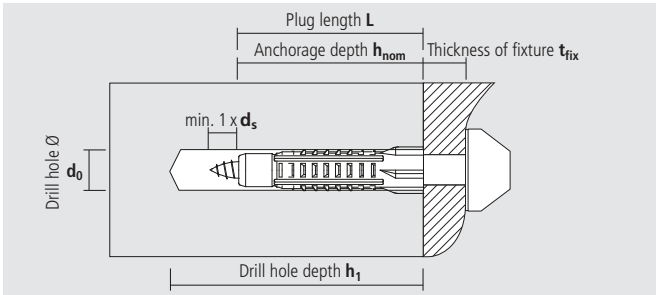
Urinal installation set UB

Advantages

- Suitable for the fastening of urinals and hanging toilets
- Set with multi-purpose plug MZ can be used for nearly all building, see page 20
- Hanger bolts with TX recess for easy and fast installation
- Stable washers for strong hold
- Plastic washers with collar protect the ceramic
- Hexagonal recess in the cover cap secures perfect lock on the nut

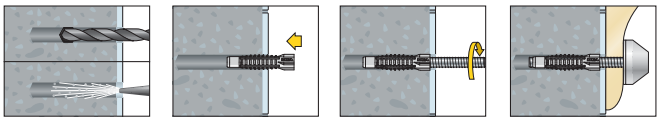
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Gypsum blocks
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks
- ✔ Plasterboard
- ✔ Chipboard



Minimum edge distance: 1x plug length

Mounting

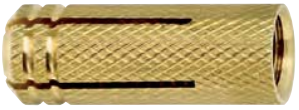


UB

Type	Art-No	Set contains	d_0 [mm]	$h_1 \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Price €/ set	Packing [sets]
10 x 140 white	91UB	2 plugs MZ 14 2 hanger bolts M10 x 140 2 flanged bushes 2 washers 35 x 11 x 1,5 2 hex-head nuts M10 2 cover caps white	14	85	75	40		20
10 x 140 chrome	9CRUB	2 plugs MZ 14 2 hanger bolts M10 x 140 2 flanged bushes 2 washers 35 x 11 x 1,5 2 hex-head nuts M10 2 cover caps chrome	14	85	75	40		20

Sets are packed in PVC bags

Brass plug ME

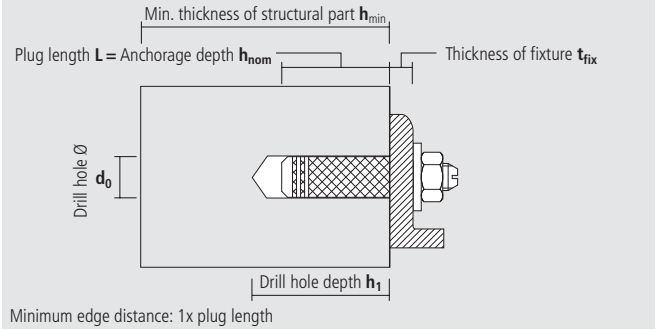


Advantages

- The knurling ensures good antirotation behaviour
- Quick removal of fixture
- Setting depth of the metric screw matches approximately the anchor length (also depends on solidity of base material)
- No special setting tool needed
- Corrosion resistant anchor, therefore also suitable for outdoor use

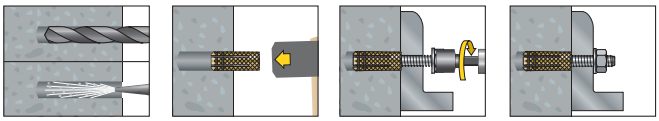
Suitable building materials

✔ Concrete
✔ Solid stone
✔ Natural stone
✔ Solid sand-lime brick



Minimum edge distance: 1x plug length

Mounting

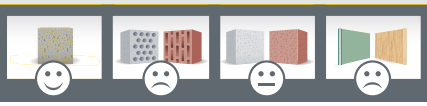


ME						Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$L = h_{nom}$ [mm]	Thread	€/ 100 pcs	[pcs]	[pcs]
ME 4	9L4ME	5	18	16	M4		100	3.200
ME 5	9L5ME	6	22	20	M5		100	3.200
ME 6	9L6ME	8	27	23	M6		100	4.000
ME 8	9L8ME	10	35	30	M8		50	2.000
ME 10	9L10ME	12	39	34	M10		50	1.500
ME 12	9L12ME	15	46	40	M12		25	750
ME 14	9L14ME	18	48	42	M14		25	350
ME 16	9L16ME	20	50	44	M16		25	350

Loads, spacing and edge distance

Type	Concrete C20/25 F_{rec} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Spacing S [mm]	Edge distance C [mm]	h_{min} [mm]
ME 4	0,40	0,30	0,30	60	40	50
ME 5	0,45	0,40	0,40	60	50	50
ME 6	0,65	0,55	0,55	60	60	60
ME 8	1,10	0,90	0,90	80	80	70
ME 10	1,60	1,30	1,30	80	80	80
ME 12	2,20	1,60	1,60	100	100	100
ME 14	2,70	1,90	1,90	100	100	150
ME 16	3,30	2,30	2,30	120	120	150

F_{rec}: Recommended loads incl. safety factor



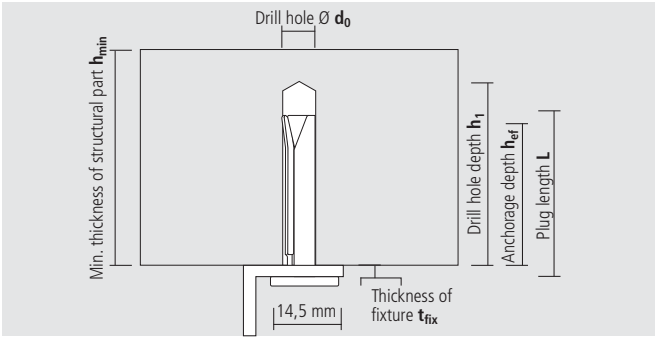
Suspended ceiling anchor DA

For multiple use for non-structural applications in cracked concrete

Fire resistance class **R 120**

Advantages

- Approved as a fixing system for multiple use in non-structural applications in cracked and non-cracked concrete
- Low anchorage depth of only 25 mm, this means less risk of hitting rebars! You save time and money
- Reduced impact force for fatigue-free work
- Especially suited for suspended ceilings

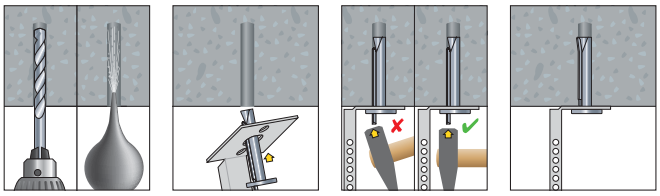


Suitable building materials

✔ Concrete

✔ Solid stone

Mounting



DA							**Price**	**Packing**	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
DA 6-30/5	965DA	6	30	25	30	4,5		100	–
DA 6-60/35	9635DA	6	30	25	60	35		100	–

Expected to be available from June 2017

Loads, spacing and edge distance

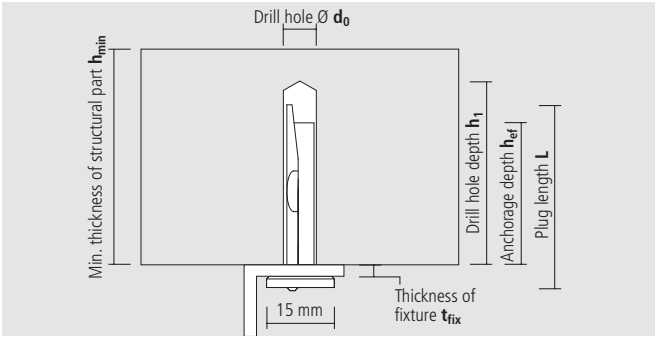
Type	Concrete ≥ C20/25 F_{per} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Spacing S_{min} [mm]	Edge distance C_{min} [mm]	Min. thickness of structural part h_{min} [mm]
DA 6-30/5	0,95	0,60	0,40	200	150	80
DA 6-60/35	0,95	0,60	0,40	200	150	80

F_{per}: Permissible loads according to the approval incl. all safety factors
F_{rec}: Recommended loads incl. safety factor of 5 (solid brick and solid sand-lime brick are not part of the approval)
h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Suspended ceiling anchor MDA-T

For multiple use for non-structural applications in cracked concrete

Fire resistance class **R 120**



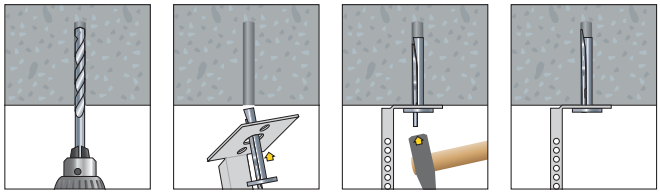
Advantages

- Approved as a fixing system for multiple use in non-structural applications in cracked and non-cracked concrete
- Especially suited for suspended ceilings
- Quick and secure installation; small drill hole with low anchorage depth

Suitable building materials

✔ Concrete
✔ Solid stone

Mounting



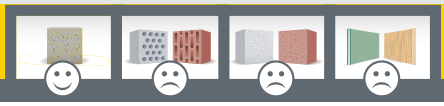
MDA-T							Price	Packing	
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	€/ 100 pcs	[pcs]	[pcs]
MDA-T 6/5	96MDAT	6	42	32	43	4,5		100	–
MDA-T 6/35	9635MDAT	6	42	32	73	35		100	–

Discontinued; delivery while stocks last

Loads, spacing and edge distance

Type	Concrete C20/25 F_{per} [kN]	Solid brick MZ 12 F_{rec} [kN]	Solid sand-lime brick KSV 12 F_{rec} [kN]	Spacing S_{min} [mm]	Edge distance C_{min} [mm]	h_{min} [mm]
MDA-T 6/5	2,38	0,5	0,5	200	150	80
MDA-T 6/35	2,38	0,5	0,5	200	150	80

F_{per}: Permissible loads according to the approval incl. all safety factors
F_{rec}: Recommended loads incl. safety factor of 5 (solid brick and solid sand-lime brick are not part of the approval)
h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.



Drop-in anchor SA plus

SA plus, zinc plated.

SA plus with lip, zinc plated

Setting tool ESW PRO

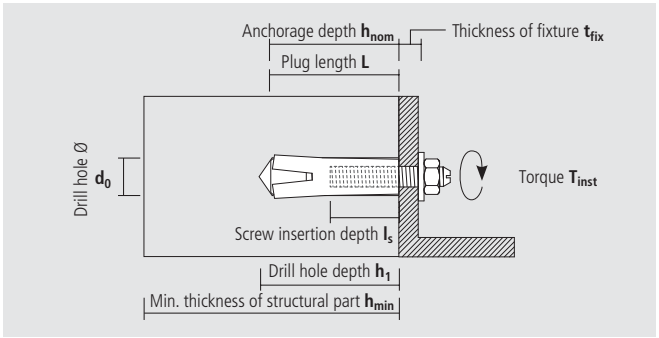
Setting tool ESW

European Technical Approval
Option 7 for non-cracked concrete
M8 - M16

For multiple use for non-structural applications in cracked concrete
M6 - M10

Fire resistant class
R 120
M6 - M10

M8 - M10



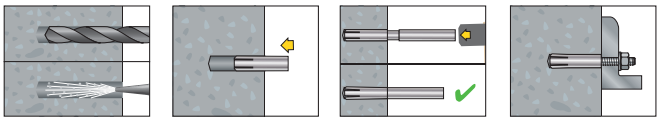
Advantages

- The drop-in anchor SA plus is approved for single use in non-cracked concrete and for multiple use for non-structural applications in cracked concrete
- The high expansion ability of the drop-in anchor anables a small drill hole and low anchorage depth
- The setting tool is necessary for the correct installation

Suitable building materials

✔ Concrete

Mounting



SA plus, zinc plated

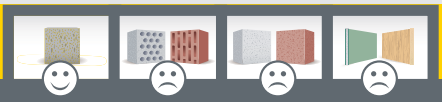
Type	Art-No	d_0 [mm]	h_1 [mm]	L [mm]	$l_{s,\ min\text{-}max}$* [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
SA plus 6	96SAP	8	27	25	6 - 11	M6		100	1.800
SA plus 8	98SAP	10	32	30	8 - 13	M8		100	1.000
SA plus 10	910SAP	12	43	40	10 - 16	M10		50	500
SA plus 12	912SAP	15	54	50	12 - 23	M12		50	300
SA plus 16	916SAP	20	70	65	16 - 32	M16		25	150
SA plus 20 [1]	920SAP	25	85	80	22-35	M20		10	100

[1] Not part of the approval
* Min./max. screw insertion depth in drop-in anchor

SA plus with lip, zinc plated

Type	Art-No	d_0 [mm]	h_1 [mm]	L [mm]	$l_{s,\ min\text{-}max}$* [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
SA plus 6	96SAPK	8	27	25	6 - 11	M6		100	1.800
SA plus 8-25 [1]	9825SAPK	10	27	25	6 - 12	M8		100	1.000
SA plus 8	98SAPK	10	32	30	8 - 13	M8		100	1.000
SA plus 10-25 [1]	91025SAPK	12	27	25	8 - 12	M10		50	900
SA plus 10	910SAPK	12	43	40	10 - 16	M10		50	500
SA plus 12	912SAPK	15	54	50	12 - 23	M12		50	300
SA plus 16	916SAPK	20	70	65	16 - 32	M16		25	150

[1] ETA-approval pending; expected to be available from July 2017
* Min./max. screw insertion depth in drop-in anchor



Drop-in anchor SA plus

ESW PRO for SA plus, SA and SA-N with hand protection		Price	Packing
Type	Art-No	€/ pc	[pcs]
ESW PRO 6	96ESWP		1
ESW PRO 8*	98ESWP		1
ESW PRO 10	910ESWP		1
ESW PRO 12	912ESWP		1
ESW PRO 16	916ESWP		1

* suitable for SA plus 8 and SA plus 8-25

ESW for SA plus, SA and SA-N		Price	Packing
Type	Art-No	€/ pc	[pcs]
ESW 6	96ESW		1
ESW 8*	98ESW		1
ESW 10-25**	91025ESW		1
ESW 10	910ESW		1
ESW 12	912ESW		1
ESW 16	916ESW		1
ESW 20	920ESW		1

* suitable for SA plus 8 and SA plus 8-25
** only suitable for SA plus 10-25; expected to be available from July 2017

Loads, spacing and edge distance for single anchor in non-cracked concrete C20/25

Type	Permissible tension load [1),2),3)] (screw 4.6-8.8)	Permissible shear load [1),2)]		Permissible bending moment [2)]		Spacing	Edge distance	Min. thickness of structural part	Max. torque
		(screw 4.6)	(screw 8.8)	(screw 4.6)	(screw 8.8)				
	N_{per} [kN]	V_{per} [kN]	V_{per} [kN]	M_{per} [Nm]	M_{per} [Nm]	S_{min} [mm]	C_{min} [mm]	h_{min} [mm]	$T_{inst} \leq$ [Nm]
SA plus 8	3,6	3,1	3,8	6,4	17,1	105	105	100	8
SA plus 10	4,8	4,5	4,5	12,8	34,2	105	140	100	15
SA plus 12	6,3	7,3	7,3	22,4	59,8	125	175	120	35
SA plus 16	10,5	12,2	12,2	56,8	151,7	180	230	160	60

[1)] Permissible loads for single anchor without influence of spacing and edge distance.
[2)] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
[3)] For higher concrete strengths up to C50/55 the values increase by max. 55%.
h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Loads, spacing and edge distance for multiple use for non-structural applications in cracked concrete C20/25-C50/60

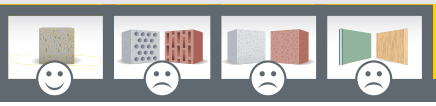
Type	Permissible load in any direction [1),2)] (screw 4.6-8.8)		Permissible bending moment [2)]		Spacing	Edge distance	Min. thickness of structural part	Max. torque
			(screw 4.6)	(screw 8.8)				
	F_{per} [kN]	F_{rec} [kN]	M_{per} [Nm]	M_{per} [Nm]	S_{min} [mm]	C_{min} [mm]	h_{min} [mm]	$T_{inst} \leq$ [Nm]
SA plus 6	0,5		2,6	7,0	70	105	100	4
SA plus 8-25*		0,9	6,4	17,1	105	105	100	8
SA plus 8	1,2		6,4	17,1	105	105	100	8
SA plus 10-25*		1,0	12,8	34,2	105	140	100	15
SA plus 10	3,0		12,8	34,2	105	140	100	15

[1)] Permissible loads without influence of spacing and edge distance.
[2)] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.
* Expected loads; ETA-approval pending

Recommended loads for the not approved anchor size M20 in non-cracked concrete C20/25

SA plus 20	N_{rec} [kN]: 12,0	V_{rec} [kN]: 12,0	Max. torque $T_{inst} \leq$ 120 Nm

N_{rec}: recommended tension load
V_{rec}: recommended shear load



Drop-in anchor SA

Drop-in anchor SA, zinc plated
Drop-in anchor SA-N, stainless steel A4

Setting tool ESW PRO

Setting tool ESW

SA, zinc plated without approval

Type	Art-No	d_0 [mm]	h_1 [mm]	L [mm]	$l_{s\ min-max}$** [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
SA 6	96SA	8	25	25	6 - 12	M6		100	1.000
SA 8	98SA	10	30	30	8 - 13	M8		100	1.000
SA 10	910SA	12	40	40	10 - 15	M10		50	500
SA 12	912SA	15	50	50	12 - 18	M12		50	400
SA 12D*	91216SA	16	50	50	12 - 18	M12		50	250
SA 16	916SA	20	65	65	16 - 23	M16		25	100

* Recommended for fixing diamond core rigs (reinforced anchor sleeve)
** Min. / max. screw insertion depth in drop-in anchor

SA-N, stainless steel A4 without approval

Type	Art-No	d_0 [mm]	h_1 [mm]	L [mm]	$l_{s\ min-max}$* [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
SA-N 6	9X6SAN	8	25	25	6 - 12	M6		100	1.000
SA-N 8	9X8SAN	10	30	30	8 - 13	M8		100	1.000
SA-N 10	9X10SAN	12	40	40	10 - 15	M10		50	500
SA-N 12	9X12SAN	15	50	50	12 - 18	M12		50	400
SA-N 16	9X16SAN	20	65	65	16 - 23	M16		25	250

* Min. / max. screw insertion depth in drop-in anchor

Loads, spacing and edge distance in non-cracked concrete

Type	Concrete C20/25 F_{rec} [kN]	Spacing S_{min} [mm]	Edge distance C_{min} [mm]	Min. thickness of structural part h_{min} [mm]	Max. Torque $T_{inst} \leq$ [Nm]
SA/SA-N 6	1,2	70	80	100	5
SA/SA-N 8	1,8	90	90	100	8
SA/SA-N 10	3,6	120	120	120	15
SA/SA-N 12	5,7	160	160	150	35
SA/SA-N 16	7,4	220	240	200	60

F_{rec}: Recommended loads incl. safety factor of 4

ESW for SA and SA-N

Type	Art-No	Price €/ pc	Packing [pcs]
ESW 6	96ESW		1
ESW 8	98ESW		1
ESW 10	910ESW		1
ESW 12	912ESW		1
ESW 16	916ESW		1

Setting tool ESP PRO with hand protection see page 64

Quick-fix anchor BAZ

BAZ, zinc plated

BAZ A4, stainless steel A4

BAZ HD, hot-dip galvanized

BAZ HCR, high corrosion resistand stainless steel

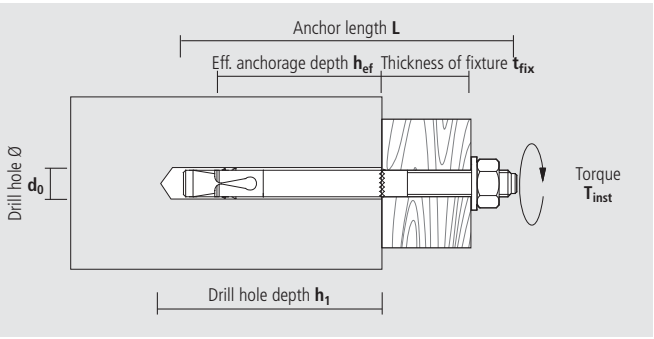
ETA CE
European Technical Approval
Option 1 for cracked concrete

Fire resistance class
R 120

FIXING seismic c1

M8 - M16

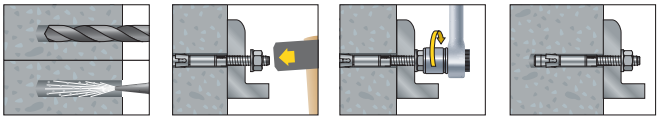
A4 STAINLESS STEEL



Advantages

- Suitable for quick installation in concrete and partly also in dense natural stone (up to M8, without approval)
- Approved for cracked concrete; the BAZ can be used for a wide range of approval relevant applications
- High load values and at the same time small edge and axial distances; usable even in tough installation situations

Mounting



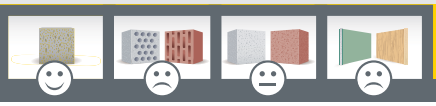
Suitable building materials

✔ Concrete ✔ Dense natural stone

BAZ, zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	[pcs]
6-40/2*	9640BAZ	6	35	25	40	2	M6		150	750
6-65/15*	9665BAZ	6	45	35	65	15	M6		100	500
8-52/2*	9852BAZ	8	45	30	52	2	M8		100	500
8-72/10	9872BAZ	8	60	45	72	10	M8		50	250
8-92/30	9892BAZ	8	60	45	92	30	M8		50	250
8-112/50	98112BAZ	8	60	45	112	50	M8		40	200
8-147/85	98147BAZ	8	60	45	147	85	M8		40	200
10-92/10	91092BAZ	10	75	60	92	10	M10		40	200
10-102/20	910102BAZ	10	75	60	102	20	M10		25	125
10-112/30	910112BAZ	10	75	60	112	30	M10		25	125
10-132/50	910132BAZ	10	75	60	132	50	M10		25	125
10-162/80	910162BAZ	10	75	60	162	80	M10		25	125
12-103/5	912103BAZ	12	90	70	103	5	M12		20	100
12-118/20	912118BAZ	12	90	70	118	20	M12		20	100
12-128/30	912128BAZ	12	90	70	128	30	M12		20	100
12-148/50	912148BAZ	12	90	70	148	50	M12		20	100
12-163/65	912163BAZ	12	90	70	163	65	M12		20	100
12-178/80	912178BAZ	12	90	70	178	80	M12		20	100
16-123/5	916123BAZ	16	110	85	123	5	M16		10	50
16-138/20	916138BAZ	16	110	85	138	20	M16		10	50
16-178/60	916178BAZ	16	110	85	178	60	M16		10	50

* Not part of the approval



Quick-fix anchor BAZ

BAZ A4, stainless steel A4

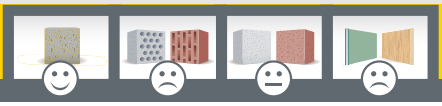
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-40/2* A4	9X640BAZ	6	35	25	40	2	M6		150	750
6-65/15* A4	9X665BAZ	6	45	35	65	15	M6		100	500
8-52/2* A4	9X852BAZ	8	45	30	52	2	M8		100	500
8-72/10 A4	9X872BAZ	8	60	45	72	10	M8		50	250
8-92/30 A4	9X892BAZ	8	60	45	92	30	M8		50	250
8-112/50 A4	9X8112BAZ	8	60	45	112	50	M8		40	200
10-60/10* A4	9X1060BAZ	10	38	23	60	10	M10		50	250
10-92/10 A4	9X1092BAZ	10	75	60	92	10	M10		40	200
10-102/20 A4	9X10102BAZ	10	75	60	102	20	M10		25	125
10-112/30 A4	9X10112BAZ	10	75	60	112	30	M10		25	125
10-132/50 A4	9X10132BAZ	10	75	60	132	50	M10		25	125
12-103/5 A4	9X12103BAZ	12	90	70	103	5	M12		20	100
12-118/20 A4	9X12118BAZ	12	90	70	118	20	M12		20	100
12-128/30 A4	9X12128BAZ	12	90	70	128	30	M12		20	100
12-148/50 A4	9X12148BAZ	12	90	70	148	50	M12		20	100
12-163/65 A4	9X12163BAZ	12	90	70	163	65	M12		20	100
16-123/5 A4	9X16123BAZ	16	110	85	123	5	M16		10	50
16-138/20 A4	9X16138BAZ	16	110	85	138	20	M16		10	50
16-168/50 A4	9X16168BAZ	16	110	85	168	50	M16		10	50

* Not part of the approval

BAZ HD, hot-dip galvanized

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-40/2* HD	9HD640BAZ	6	35	25	40	2	M6		150	750
6-65/15* HD	9HD665BAZ	6	45	35	65	15	M6		100	500
8-52/2* HD	9HD852BAZ	8	45	30	52	2	M8		100	500
8-72/10 HD	9HD872BAZ	8	60	45	72	10	M8		50	250
8-92/30 HD	9HD892BAZ	8	60	45	92	30	M8		50	250
8-112/50 HD	9HD8112BAZ	8	60	45	112	50	M8		40	200
8-147/85 HD	9HD8147BAZ	8	60	45	147	85	M8		40	200
10-60/10* HD	9HD1060BAZ	10	38	23	60	10	M10		50	250
10-92/10 HD	9HD1092BAZ	10	75	60	92	10	M10		40	200
10-102/20 HD	9HD10102BAZ	10	75	60	102	20	M10		25	125
10-112/30 HD	9HD10112BAZ	10	75	60	112	30	M10		25	125
10-132/50 HD	9HD10132BAZ	10	75	60	132	50	M10		25	125
10-162/80 HD	9HD10162BAZ	10	75	60	162	80	M10		25	125
12-103/5 HD	9HD12103BAZ	12	90	70	103	5	M12		20	100
12-118/20 HD	9HD12118BAZ	12	90	70	118	20	M12		20	100
12-128/30 HD	9HD12128BAZ	12	90	70	128	30	M12		20	100
12-148/50 HD	9HD12148BAZ	12	90	70	148	50	M12		20	100
12-163/65 HD	9HD12163BAZ	12	90	70	163	65	M12		20	100
12-178/80 HD	9HD12178BAZ	12	90	70	178	80	M12		20	100
16-123/5 HD	9HD16123BAZ	16	110	85	123	5	M16		10	50
16-138/20 HD	9HD16138BAZ	16	110	85	138	20	M16		10	50
16-168/50 HD	9HD16168BAZ	16	110	85	168	50	M16		10	50
16-178/60 HD	9HD16178BAZ	16	110	85	178	60	M16		10	50

* Not part of the approval



Quick-fix anchor BAZ

BAZ HCR, high corrosion resistant stainless steel

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8-72/10 HCR	9HCR872BAZ	8	60	45	72	10	M8		50	250
10-92/10 HCR	9HCR1092BAZ	10	75	60	92	10	M10		40	200
10-112/30 HCR	9HCR10112BAZ	10	75	60	112	30	M10		25	125
12-118/20 HCR	9HCR12118BAZ	12	90	70	118	20	M12		20	100

Available only on request

Installation parameters

BAZ size		M6*	M8	M10	M12	M16
Torque	T_{inst} [Nm]	7	20	35	50/70**	120
Width across flats	SW [mm]	10	13	17	19	24
Ø of clearance hole in fixture	d_f [mm]	7	9	12	14	18
Washer outer Ø x thickness	[mm]	12 x 1,6	17 x 1,6	21 x 2,0	24 x 2,5	30 x 3,0

* Not part of the approval
** 50 for: BAZ, BAZ HD, 70 for: BAZ A4, BAZ HCR

Spacing and edge distance

BAZ size		M8	M10	M12	M16
Characteristic spacing	S_{cr} [mm]	135	180	210	255
Characteristic edge distance	C_{cr} [mm]	68	90	105	128
Minimum spacing	S_{min} [mm]	50	55	60	70
	for C ≥ [mm]	50	80	90	120
Minimum edge distance	C_{min} [mm]	50	50	55	85
	for S ≥ [mm]	50	100	145	150
Min. thickness of structural part	h_{min} [mm]	100	120	140	170

If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Loads

BAZ size		M8		M10		M12		M16	
BAZ type		BAZ z.p. BAZ HD	BAZ A4 BAZ HCR	BAZ z.p. BAZ HD	BAZ A4 BAZ HCR	BAZ z.p.. BAZ HD	BAZ A4 BAZ HCR	BAZ z.p. BAZ HD	BAZ A4 BAZ HCR
Permissible tension loads for single anchor without influence of spacing and edge distance [1), 2)]									
Cracked concrete C20/25 [3)]	N_{per} [kN]	2,0	2,0	3,6	3,6	4,8	4,8	9,5	9,5
Non-cracked concrete C20/25 [3)]	N_{per} [kN]	3,6	3,6	6,3	6,3	7,9	7,9	16,7	16,7
Permissible shear loads for single anchor without influence of spacing and edge distance [1), 2)]									
Cracked and non-cracked concrete C20/25	V_{per} [kN]	4,8	5,2	8,6	8,1	11,0	11,9	21,0	22,4
Permissible bending moment	M_{per} [Nm]	10,0	10,5	22,9	21,4	34,3	37,6	88,6	95,2

[1)] For further information please refer to the ETA approval.
[2)] Load figures include the resistances' partial safety factors as per approvals and a partial safety factor on the action of $\gamma_F = 1.4$.
Load figures apply for a rebar spacing S ≥ 15 cm or oldernatively for a rebar spacing S ≥ 10 cm in combination with a rebar diameter of $d_s \leq 10$ mm.
[3)] For higher concrete strengths up to C50/60 the values increase by max. 28%.

Recommended loads for the not approved anchor sizes in non-cracked concrete C20/25		
BAZ 6-40/2	N_{rec} [kN]: 1,6	V_{rec} [kN]: 1,5
BAZ 6-65/15	N_{rec} [kN]: 1,8	V_{rec} [kN]: 1,8
BAZ 8-52/2	N_{rec} [kN]: 2,6	V_{rec} [kN]: 4,8
BAZ 10-60/10	N_{rec} [kN]: 2,0	V_{rec} [kN]: 5,0

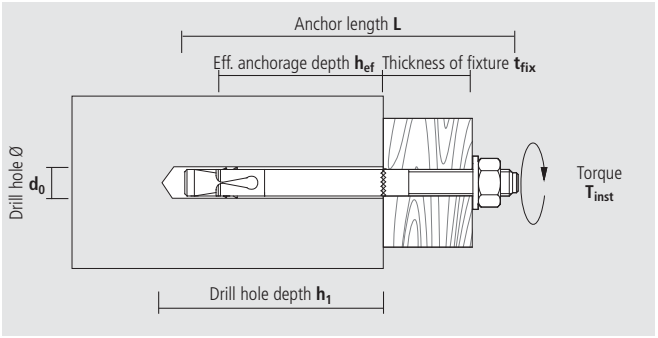
N_{rec}: recommended tension load incl. safety factor
V_{rec}: recommended shear load incl. safety factor

Quick-fix anchor BA plus

BA plus, zinc plated

BA plus with large washer acc. DIN 440 for woodworking

European Technical Approval
Option 7 for non-cracked concrete



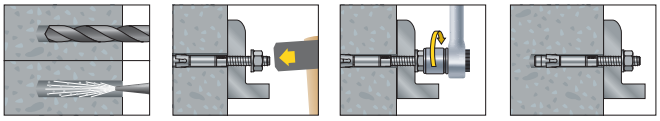
Advantages

- Suitable for quick installation in non-cracked concrete and partly in dense natural stone
- Wide range for woodworking with large washer
- Setting depth marking ring for quick installation
- Long thread for all sizes for higher flexibility

Suitable building materials

✔ Concrete ✔ Dense natural stone

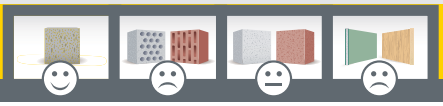
Mounting



BA plus, zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-45/5 [1]	9645BAP	6	38	25	45	5	M6		100	500
6-60/10	9665BAP	6	48	35	60	10	M6		100	500
6-80/30	9685BAP	6	48	35	80	30	M6		100	500
6-85/30 [2]	9685BAP	6	53	40	85	30	M6		100	500
6-100/45 [2]	96100BA	6	53	40	100	45	M6		100	500
6-100/50	96100BAP	6	48	35	100	50	M6		100	500
8-50/5 [1]	9850BAP	8	40	25	50	5	M8		100	500
8-75/10	9875BAP	8	60	45	75	10	M8		50	250
8-85/20	9885BAP	8	60	45	85	20	M8		50	250
8-95/30	9895BAP	8	60	45	95	30	M8		50	250
8-115/50	98115BAP	8	60	45	115	50	M8		40	200
8-135/70	98135BAP	8	60	45	135	70	M8		40	200
10-60/10 [1]	91060BAP	10	42	27	60	10	M10		50	250
10-75/10 [1]	91075BAP	10	55	40	75	10	M10		50	250
10-85/10	91085BAP	10	65	50	85	10	M10		40	200
10-92/17	91092BAP	10	65	50	92	17	M10		40	200
10-105/30	910105BAP	10	65	50	105	30	M10		25	125
10-125/50	910125BAP	10	65	50	125	50	M10		25	125
10-145/70	910145BAP	10	65	50	145	70	M10		25	125
10-175/100	910175BAP	10	65	50	175	100	M10		25	125
10-215/140*	910215BAP	10	65	50	215	140	M10		25	100
12-70/2 [1]	91270BAP	12	58	38	70	2	M12		40	200
12-110/10	912110BAP	12	90	70	110	10	M12		20	100
12-120/20	912120BAP	12	90	70	120	20	M12		20	100
12-130/30	912130BAP	12	90	70	130	30	M12		20	100
12-150/50	912150BAP	12	90	70	150	50	M12		20	100
12-180/80	912180BAP	12	90	70	180	80	M12		20	100

[1] Not part of the approval
[2] Discontinued; delievery while stocks last. Not part of the approval
* With large washer acc. ISO 7094 (DIN 440) for woodworking



Quick-fix anchor BA plus

BA plus, zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
12-200/100*	912200BAP	12	90	70	200	100	M12		20	80
12-220/120*	912220BAP	12	90	70	220	120	M12		20	80
12-240/140*	912240BAP	12	90	70	240	140	M12		20	80
12-260/160*	912260BAP	12	90	70	260	160	M12		20	80
12-300/200*	912300BAP	12	90	70	300	200	M12		15	60
12-320/220*	912320BAP	12	90	70	320	220	M12		15	60
16-95/10 [1]	91695BAP	16	75	50	95	10	M16		15	75
16-135/15	916135BAP	16	110	85	135	15	M16		10	50
16-150/30	916150BAP	16	110	85	150	30	M16		10	50
16-180/60	916180BAP	16	110	85	180	60	M16		10	50
16-200/80	916200BAP	16	110	85	200	80	M16		10	50
16-220/100*	916220BAP	16	110	85	220	100	M16		10	40
16-270/150*	916270BAP	16	110	85	270	150	M16		10	40
16-320/200*	916320BAP	16	110	85	320	200	M16		10	40
20-110/10 [1]	920110BAP	20	90	60	110	10	M20		10	40
20-160/20 [2]	920160BA	20	128	98	160	20	M20		10	40
20-160/20	920160BAP	20	130	100	160	20	M20		10	40
20-215/75 [2]	920215BA	20	128	98	215	75	M20		6	24
20-215/75	920215BAP	20	130	100	215	75	M20		6	24
20-270/130	920270BAP	20	130	100	270	130	M20		5	20

[1] Not part of the approval
[2] Discontinued; delievery while stocks last. Not part of the approval
* With large washer acc. ISO 7094 (DIN 440) for woodworking

Installation parameters

BA plus size		M6	M8	M10	M12	M16	M20
Torque	T_{inst} [Nm]	8	15	30	50	90	180
Width across flats	SW [mm]	10	13	17	19	24	30
Ø of clearance hole in fixture	d_f [mm]	7	9	12	14	18	22
Washer outer Ø x thickness	[mm]	12 x 1,6	16 x 1,6	20 x 2 / 34 x 3	24 x 2,5 / 44 x 4	30 x 3 / 56 x 5	37 x 3 / 72 x 6

Loads, spacing and edge distance BA plus *approved sizes M6 - M20*

Type	Permissible loads in concrete [1),2),3)] C 20/25 Tension N_{per} [kN]	C 20/25 Shear V_{per} [kN]	Permissible bending moment M_{per} [Nm]	Spacing [4)] S_{cr} [mm]	S_{min} [mm]	Edge distance [4)] C_{cr} [mm]	C_{min} [mm]	Min. thickness of structural part h_{min} [mm]
BA plus 6	3,6	3,0	6,9	95	50	95	50	100
BA plus 8	3,0	3,0	13,4	135	50	68	50	100
BA plus 10	7,6	8,5	23,9	150	120	75	90	120
BA plus 12	9,5	15,1	46,8	210	100	105	100	140
BA plus 16	11,9	16,5	94,9	255	140	128	125	200
BA plus 20	23,8	28,9	157,6	300	160	150	150	200

[1] Permissible loads for single anchor without influence of spacing and edge distance.
[2] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
[3] For higher concrete strengths up to C50/60 the values increase by max. 55%.
[4] If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Recommended loads for the not approved anchor sizes M6, M20 in non-cracked concrete C20/25

BA plus 6	N_{rec} [kN]: 1,5	V_{rec} [kN]: 1,5	for setting depth h_{ef} = 38 mm
BA plus 20	N_{rec} [kN]: 11,2	V_{rec} [kN]: 11,2	for setting depth h_{ef} = 98 mm

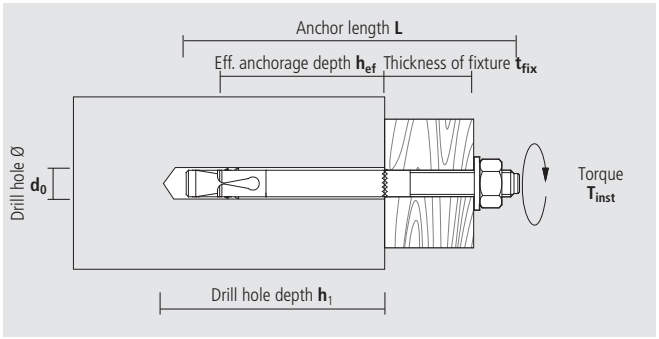
N_{rec}: recommended tension load incl. safety factor
V_{rec}: recommended shear load incl. safety factor

Quick-fix anchor BA A4

- available only outside Europe -

BA A4, stainless steel A4

European Technical Approval
Option 7 for non-cracked concrete



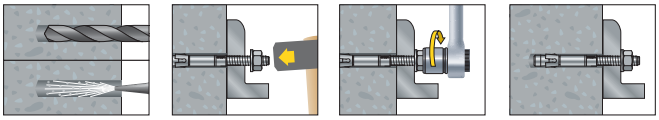
Advantages

- Suitable for quick installations in concrete and partly also in dense natural stone
- European Technical Approval for non-cracked concrete; the BA A4 can be used for a wide range of approval relevant applications for outdoor usage and facade substructures
- High load values and at the same time small edge and axial distances; usable even in tough installation situations

Suitable building materials

✔ Concrete ✔ Dense natural stone

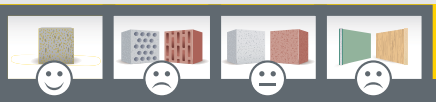
Mounting



BA A4, stainless steel A4

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-40/2 A4*	9X640BAZ	6	35	25	40	2	M6		150	750
6-65/15 A4*	9X665BAZ	6	45	35	65	15	M6		100	500
8-52/2 A4*	9X852BAZ	8	45	30	52	2	M8		100	500
8-72/10 A4	9X872BA	8	60	45	72	10	M8		50	250
8-92/30 A4	9X892BA	8	60	45	92	30	M8		50	250
8-112/50 A4	9X8112BA	8	60	45	112	50	M8		40	200
10-60/10 A4*	9X1060BAZ	10	38	23	60	10	M10		50	250
10-92/10 A4	9X1092BA	10	75	60	92	10	M10		40	200
10-102/20 A4	9X10102BA	10	75	60	102	20	M10		25	125
10-112/30 A4	9X10112BA	10	75	60	112	30	M10		25	125
10-132/50 A4	9X10132BA	10	75	60	132	50	M10		25	125
12-103/5 A4	9X12103BA	12	90	70	103	5	M12		20	100
12-118/20 A4	9X12118BA	12	90	70	118	20	M12		20	100
12-128/30 A4	9X12128BA	12	90	70	128	30	M12		20	100
12-148/50 A4	9X12148BA	12	90	70	148	50	M12		20	100
12-163/65 A4	9X12163BA	12	90	70	163	65	M12		20	100
16-123/5 A4	9X16123BA	16	110	85	123	5	M16		10	50
16-138/20 A4	9X16138BA	16	110	85	138	20	M16		10	50
16-168/50 A4	9X16168BA	16	110	85	168	50	M16		10	50

* Not part of the approval
Available only on request and outside Europe



Installation parameters

BA A4 sizes		M6 [1]	M8	M10	M12	M16
Torque	T_{inst} [Nm]	7	20	35	70	120
Width across flats	SW [mm]	10	13	17	19	24
Ø of clearance hole in fixture	d_f [mm]	7	9	12	14	18
Washer outer Ø x thickness	[mm]	12 x 1,6	16 x 1,6	21 x 2,0	24 x 2,5	30 x 3,0

[1] M6 not part of the approval

Loads, spacing and edge distance BA A4 *approved sizes M8 - M16*

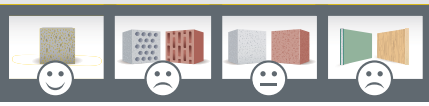
Type	Permissible loads in non-cracked concrete [1),2),3)]		Permissible bending moment	Spacing [4)]		Edge distance [4)]		Min. thickness of structural part
	C 20/25	C 20/25						
	Tension N_{per} [kN]	Shear V_{per} [kN]	M_{per} [Nm]	S_{cr} [mm]	S_{min} [mm]	C_{cr} [mm]	C_{min} [mm]	h_{min} [mm]
BA A4 8	3,6	5,2	10,5	135	50	68	50	100
BA A4 10	6,3	8,1	21,4	180	55	90	50	120
BA A4 12	7,9	11,9	37,6	210	60	105	55	140
BA A4 16	16,7	22,4	95,2	235	70	128	85	170

[1] Permissible loads for single anchor without influence of spacing and edge distance.
[2] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
[3] For higher concrete strengths up to C50/55 the values increase by max. 28%.
[4] If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

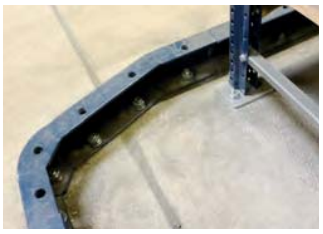
Recommended loads for the not approved anchor sizes in non-cracked concrete C20/25

6-40/2	N_{rec} [kN]: 1,6	V_{rec} [kN]: 1,5
6-65/15	N_{rec} [kN]: 1,8	V_{rec} [kN]: 1,8
8-52/2	N_{rec} [kN]: 2,6	V_{rec} [kN]: 4,8
10-60/10	N_{rec} [kN]: 2,0	V_{rec} [kN]: 5,0

N_{rec}: recommended tension load incl. safety factor
V_{rec}: recommended shear load incl. safety factor



Quick-fix anchor EKA



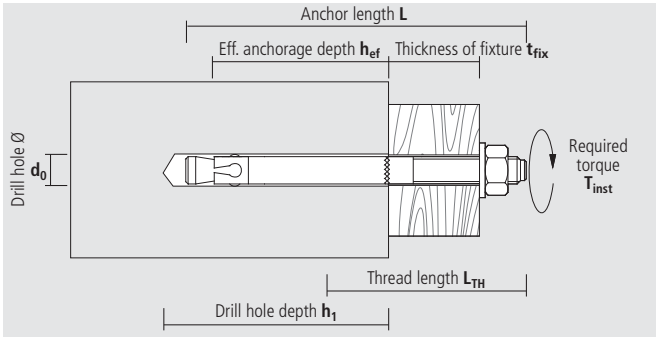
Advantages

- Not approved Quick-fix anchor with a very good price/performance ratio for a wide range of non-approval relevant applications

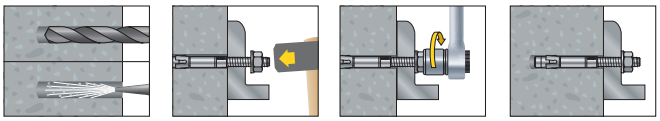
Suitable building materials

✔ Concrete

✔ Dense natural stone



Mounting



EKA, zinc plated

Type	Art-No	do [mm]	h_1 [mm]	h_{ef} [mm]	L [mm]	t_{fix} [mm]	L_{TH} [mm]	Drive [mm]	T_{inst} [mm]	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
M6-40/3	9640EKA	6	32	22	40	3	15	SW10	5		150	750
M6-55/5	9655EKA	6	45	35	55	5	25	SW10	5		100	500
M6-70/15	9670EKA	6	50	40	70	15	40	SW10	5		100	500
M6-100/45	96100EKA	6	50	40	100	45	70	SW10	5		100	500
M8-50/3	9850EKA	8	42	27	50	3	20	SW13	15		100	500
M8-65/12	9865EKA	8	50	35	65	12	35	SW13	15		50	250
M8-75/12	9875EKA	8	60	45	75	12	45	SW13	15		50	250
M8-95/32	9895EKA	8	60	45	95	32	55	SW13	15		50	250
M8-105/42	98105EKA	8	60	45	105	42	65	SW13	15		40	200
M10-60/5	91060EKA	10	45	30	60	5	25	SW17	30		50	250
M10-75/10	91075EKA	10	55	40	75	10	40	SW17	30		50	250
M10-90/15	91090EKA	10	65	50	90	15	50	SW17	30		40	200
M10-120/45	910120EKA	10	65	50	120	45	80	SW17	30		25	125
M10-140/65	910140EKA	10	65	50	140	65	100	SW17	30		25	125
M12-80/3	91280EKA	12	70	50	80	3	35	SW19	50		25	125
M12-95/17	91295EKA	12	70	50	95	17	50	SW19	50		20	100
M12-120/22	912120EKA	12	90	70	120	22	70	SW19	50		20	100
M12-150/52	912150EKA	12	90	70	150	52	100	SW19	50		20	100
M16-100/5	916100EKA	16	85	60	100	5	50	SW24	100		15	75
M16-140/20	916140EKA	16	110	85	140	20	80	SW24	100		10	50
M16-175/55	916175EKA	16	110	85	175	55	115	SW24	100		10	50
M20-110/5	920110EKA	20	95	65	110	5	50	SW30	180		5	25
M20-170/30	920170EKA	20	130	100	170	30	80	SW30	180		5	25
M20-215/75	920215EKA	20	130	100	215	75	100	SW30	180		5	25

Available only on request (delivery time ca. 2 weeks)

Concrete screw BTS6


BTS6 B, Hex-head


BTS6 PT, Pan-Head

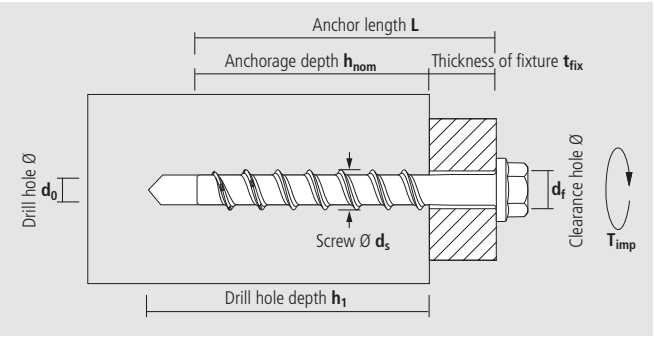

BTS6 E, Connecting thread


BTS6 H, Internal thread

ETA CE
For multiple use for non-structural applications in cracked concrete

Fire resistance class
R 120

M8, M10



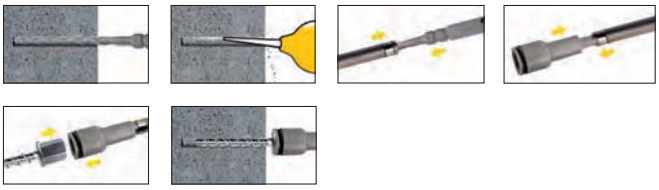
Advantages

- Very fast method for fixing fastening rails etc.
- Easy system with special asseccories: Assembling in just two steps; drilling and fixing with the same tool
- The BTS may be adjusted
- Different heads for various applications
- Two setting depths
- Short lengths, this means less risk of hitting rebars

Suitable building materials

✔ Concrete ✔ Dense natural stone

Mounting



BTS6 B with hex-head and integral washer, washer Ø: 14,0 mm, zinc flake coating

Type d_0 - L	Art-No	d_s x L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-40/5	9ZG640BTSB	7,5 x 40	40	35	5	SW10		100	500
6-55/5	9ZG655BTSB	7,5 x 55	40/55	35/50	20/5	SW10		100	500

Expected to be available from July 2017

BTS6 PT with Pan head (TX 30), head Ø: 14,5 mm, zinc flake coating

Type d_0 - L	Art-No	d_s x L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-40/5	9ZG640BTSPT	7,5 x 40	40	35	5	TX30		100	500
6-55/5	9ZG655BTSPT	7,5 x 55	40/55	35/50	20/5	TX30		100	500

Expected to be available from July 2017

BTS6 E with connecting thread, washer Ø: 14,0 mm, zinc flake coating

Type d_0 - L	Art-No	d_s x L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	Connecting thread	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-35	9ZG635M6BTSE	7,5 x 35	40	35	M6 (L = 5 mm)	SW10		100	500
6-35	9ZG635M8BTSE	7,5 x 35	40	35	M8 (L = 15 mm)	SW10		100	500

Expected to be available from July 2017

Concrete screw BTS6

BTS6 H with internal thread, washer Ø: M6 and M8: Ø 14 mm; M10: Ø 17 mm, zinc flake coating							Price	Packing	
Type d_0 - L	Art-No	d_s x L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	Internal thread	Drive	€/ 100 pcs	[pcs]	[pcs]
6-35	9ZG635M6BTSH	7,5 x 35	40	35	M6 (L = 10 mm)	SW10		100	500
6-35	9ZG635M8BTSH	7,5 x 35	40	35	M8 (L = 15 mm)	SW10		100	500
6-50	9ZG650M8BTSH	7,5 x 50	55	50	M8 (L = 15 mm)	SW10		100	500
6-35	9ZG635M10BTSH	7,5 x 35	40	35	M10 (L = 15 mm)	SW13		100	500

Expected to be available from July 2017

Accessories BTS6



SDS special drill bit Ø6 mm
Usable drill length 105 mm

Special adapter
Put over the drill bit and the socket wrench

Socket wrench 10
Suitable for all sizes BTS6 with SW10

Zubehör für Betonschraube BTS6					Price	Packing	
Type	Art-No	d_0 [mm]	L [mm]	Recess	€/ 1 pc	[pc]	[pc]
Special drill bit SDS 6 mm	6115SDSTRBCA	6	175	SDS plus		1	–
Special adapter	9ATRBCA	13	145	2x hex-head		1	–
Socket wrench 10 (SW10)	910LLTRBCA	18	65	hexagon		1	–

Expected to be available from July 2017

Loads, spacing and edge distance for multiple use for non-structural applications in cracked concrete C20/25-C50/60

Type	Permissible load in any direction [1),2)]		Permissible bending moment [2)]	Spacing		Edge distance		Min. thickness of structural part	Max. torque of the impact wrench
	h_{nom} 35 mm	h_{nom} 50 mm							
	F_{per} [kN]	F_{per} [kN]	M_{per} [Nm]	S_{cr} [mm]	S_{min} [mm]	C_{cr} [mm]	C_{min} [mm]	h_{min} [mm]	$T_{imp} \leq$ [Nm]
BTS 6-35	0,85	–	5,7	160	40	80	40	100	150
BTS 6-40	0,85	–	5,7	160	40	80	40	100	150
BTS 6-50	0,85	1,90	5,7	160	40	80	40	100	150
BTS 6-55	0,85	1,90	5,7	160	40	80	40	100	150

[1)] Permissible loads without influence of spacing and edge distance
[2)] Load figures include the resistances´ partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Concrete screw BTS

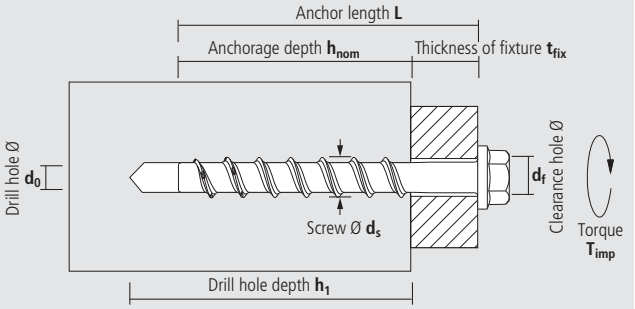
European Technical Approval
Option 1 for cracked concrete

Fire resistance class
R 120

FIXING seismic C1

from Ø8

A4 STAINLESS STEEL



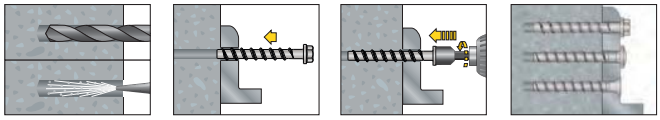
Advantages

- Approved for non-cracked and cracked concrete
- High loads combined with an easy application (the use of a suitable impact wrench is recommended)
- Variable, because of three setting depths
- The BTS may be adjusted
- Big range, also in stainless steel and different head shapes available
- The BTS is also ideal for temporary fixings as it can be removed completely
- Zinc flake coating (ZnAl) for improved corrosion resistance and higher application security

Suitable building materials

✔ Concrete ✔ Dense natural stone

Mounting



TSM 6: Impact wrench max. 160 Nm
BTS 8: Impact wrench max. 300 Nm
BTS 10: Impact wrench max. 400 Nm
BTS 14: Impact wrench max. 500 Nm

The BTS may be adjusted up to two times for max. 10 mm in order to use shims - for details see approval.

Type BTS B:
zinc flake coating

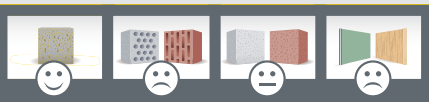
Type BTS B:
stainless steel A4

A4 STAINLESS STEEL

BTS B with hex-head and integral washer (Head Ø: TSM 6: Ø 15,0 mm; BTS 8: Ø 16,2 mm; BTS 10: Ø 20,0 mm; BTS 14: Ø 30,0 mm)

Type d_0 - L	Art-No ZnAl-coating	€/ 100 pcs	Art-No A4	€/ 100 pcs	d_s - L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	Drive	Packing [pcs]	Packing [pcs]
6-60/5**	9660TSM		–		7,5x60	60	55	5	SW 13	100	–
8-50/-	9ZG850BTSB		–		10,6x50	55/-/-	45/-/-	5/-/-	SW 13	50	250
8-70/5	9ZG870BTSB		–		10,6x70	55/65/75	45/55/65	25/15/5	SW 13	50	250
8-80/15	9ZG880BTSB		9X880BTSB		10,6x80	55/65/75	45/55/65	35/25/15	SW 13	50	250
8-90/25	9ZG890BTSB		–		10,6x90	55/65/75	45/55/65	45/35/25	SW 13	50	250
10-60/-	9ZG1060BTSB		–		10,6x60	65/-/-	55/-/-	5/-/-	SW 15	50	250
10-90/5	9ZG1090BTSB		9X1090BTSB		12,6x90	65/85/95	55/75/85	35/15/5	SW 15	40	200
10-100/15	9ZG10100BTSB		9X10100BTSB		12,6x100	65/85/95	55/75/85	45/25/15	SW 15	40	200
10-120/35	9ZG10120BTSB		–		12,6x120	65/85/95	55/75/85	65/45/35	SW 15	40	200
10-140/55	9ZG10140BTSB		–		12,6x140	65/85/95	55/75/85	85/65/55	SW 15	30	150
10-160/75	9ZG10160BTSB		–		12,6x160	65/85/95	55/75/85	105/85/75	SW 15	30	150
10-180/95*	9ZG10180BTSB		–		12,6x180	65/85/95	55/75/85	125/105/95	SW 15	20	100
10-200/115*	9ZG10200BTSB		–		12,6x200	65/85/95	55/75/85	145/125/115	SW 15	20	80
10-240/155*	9ZG10240BTSB		–		12,6x240	65/85/95	55 /75/85	185/165/155	SW 15	20	80
10-280/195*	9ZG10280BTSB		–		12,6x280	65/85/95	55/75/85	225/205/195	SW 15	20	80
14-80/-	9ZG1480BTSB		–		16,6x80	85/-/-	75/-/-	5/-/-	SW 21	20	100
14-110/-	9ZG14110BTSB		–		16,6x110	85/110/125	75/100/115	35/10/-	SW 21	20	100

* with large washer acc. ISO 7094 (DIN 440) for woodworking (included in packing, outer Ø = 44 mm)
** discontinued, delivery while stocks last



Concrete screw BTS

Type BTS ST: zinc plated

Type BTS ST: stainless steel A4

A4

BTS ST with countersunk head (Head-Ø: BTS ST 8: Ø 19,5 mm; BTS ST 10: Ø 21,5 mm)

Type d_0 - L	Art-No zinc plated	€/ 100 pcs	Art-No A4	€/ 100 pcs	d_S - L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	Recess	Packing [pcs]	Packing [pcs]
8-80/15	9880BTSST		9X880BTSST		10 x 80	55/65/75	45/55/65	35/25/15	TX 40	50	250
10-90/5	91090BTSST		9X1090BTSST		12 x 90	65/85/95	55/75/85	35/15/5	TX 50	40	200

TSM B with Pan head (TX 30), head-Ø: 14,5 mm, zinc plated

Type d_0 - L	Art-No	d_S - L [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	Recess	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
6-60/5*	9660TSMT	7,5 x 60	60	55	5	TX 30		100	500

* discontinued; delivery while stocks last

Loads and installation parameters (values are valid for **BTS** in carbon steel and stainless steel and **TSM 6**)

			TSM 6	BTS 8			BTS 10			BTS 14		
Drill hole Ø	d_0	[mm]	6	8			10			14		
Thread Ø	d_s	[mm]	7,5	10,6			12,6			16,6		
Ø of clearance hole in fixture	$d_f \leq$	[mm]	8	12			14			18		
Anchorage depth	h_{nom}	[mm]	55	45	55	65	55	75	85	75	100	115
Permissible tension load in cracked concrete[1), 2), 3)]												
C20/25	N_{per}	[kN]	1,9	2,4	4,3	5,7	4,3	7,9	9,6	7,6	12,0	15,1
Permissible tension load in non-cracked concrete[1), 2), 3)]												
C20/25	N_{per}	[kN]	4,3	3,6	5,7	7,6	5,7	9,5	11,9	10,6	16,9	21,2
Permissible shear load in cracked concrete												
C20/25	V_{per}	[kN]	4,0	3,5	4,8	6,4	4,8	15,9	19,2	7,6	24,1	30,3
Permissible shear load in non-cracked concrete												
C20/25	V_{per}	[kN]	4,0	5,0	6,8	9,0	6,8	19,4	19,4	10,6	32,0	32,0
Permissible bending moment	M_{per}	[Nm]	6	15			32			106		
Spacing and edge distance												
Spacing[4)]	$s_{cr,N}$	[mm]	132	105	129	156	129	180	204	174	237	276
Edge distance[4)]	$c_{cr,N}$	[mm]	66	53	65	78	65	90	102	87	119	138
Minimum spacing[4)]	s_{min}	[mm]	40	40	50	50	50	50	50	50	70	70
Miniumum edge distance[4)]	c_{min}	[mm]	40	40	50	50	50	50	50	50	70	70
Minimum thickness of structural part	h_{min}	[mm]	100	100	100	120	100	130	130	130	150	170
Maximum installation torque for impact wrench	$T_{imp} \leq$	[Nm]	160	300			400			500		

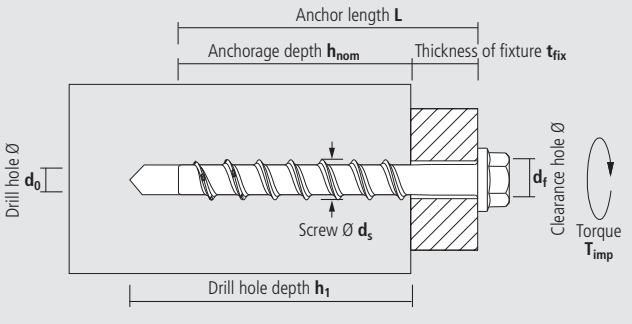
[1)] Permissible loads for single anchor without influence of spacing and edge distance
[2)] Load figures include the resistances´ partial safety factors as per approval and a partial factor on the action of $\gamma_F = 1.4$.
[3)] For higher concrete strenghts up to C50/60 the values increase by max. 55% compard with C20/25.
[4)] If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Concrete screw BTS M

BTS M 14-80

BTS M 14-130

Institut für Massivbau Technische Universität Darmstadt



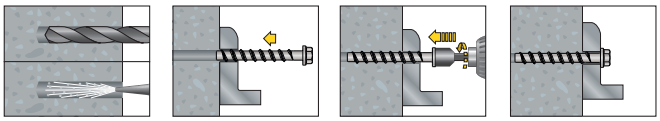
Advantages

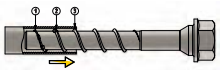
- Special concrete screw: Approved for temporary construction site facilities such as inclined supports, guardrails and scaffoldings
- The approval also regulates the use in fresh concrete (≥ 10 N / mm2), in cracked and non-cracked concrete and for outdoor applications
- Reusable - for details see approval
- Including tube gauge in each box to check the reusability

Suitable building materials

✔ Concrete

Mounting





The BTS M may only be reused if max. 3 threads can penetrate into the tube gauge.

BTS M zinc plated, 1 tube gauge per box included (Head-Ø: 14-80: 28 mm; 14-130: 32 mm)

Type d_0 - L	Art-No	d_S - L [mm]	h_1 ≥ [mm]	h_{nom} ≥ [mm]	t_{fix} ≤ [mm]	Drive	€/ 100 pcs	Packing [pcs]	Packing [pcs]
14-80/5	91480BTSMB	16,6 x 80	85	75	5	SW 22		20	100
14-130/15	914130BTSMB	16,6 x 130	85 / 100 / 125	75 / 90 / 115	55 / 40 / 15	SW 24		15	75

Loads and installation parameters

			BTS M 14-80/5	BTS M 14-130/15			
Drill hole Ø	d_0	[mm]	14	14			
Thread Ø	d_s	[mm]	16,6	16,6			
Ø of clearance hole in fixture	d_f ≤	[mm]	18	18			
Anchorage depth	h_{nom}	[mm]	75	75	90	115	
Minimum thickness of structural part	h_{min}	[mm]	150	150	195	200	225
Permissible load in cracked and non-cracked concrete[1), 2)]							
C8/10	F_{per}	[kN]	4,0	4,0	8,0	10,0	11,3
C12/15	F_{per}	[kN]	4,7	4,7	8,7	12,0	14,0
C16/20	F_{per}	[kN]	5,3	5,3	9,3	13,3	16,0
Spacing and edge distance							
Minimum spacing	s_{min}	[mm]	320	320	390	500	500
Minimum edge distance in load direction	$c_{1,\,min}$	[mm]	105	105	130	165	165
Minimum edge distance vertical to load direction	$c_{2,\,min}$	[mm]	160	160	195	250	250
Maximum installation torque for impact wrench	T_{imp} ≤	[Nm]	450	450			

[1)] Permissible load in all directions for single anchor without influence of spacing and edge distance
[2)] Load figures include the resistances´ partial safety factors as per approval and a partial factor on the action of $\gamma_F = 1,5$.
h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Heavy-duty anchor SLA

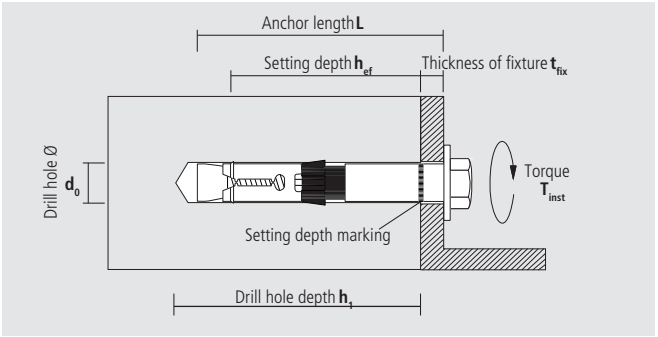
SLA S with hex-head screw

SLA B with bolt

SLA C with countersunk head

European Technical Approval
Option 1 for cracked concrete

Fire resistance class
R 120



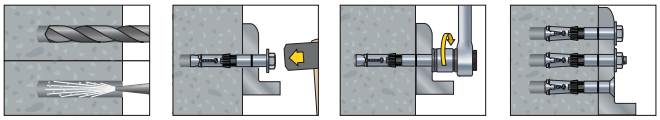
Advantages

- Torque controlled heavy-duty anchor
- Available with various heads
- The integrated plastic ring prevents twisting of the anchor and allows to overcome gaps between the attached part and the concrete surface
- Anchorage depth marking for quick installation

Suitable building materials

✔ Concrete

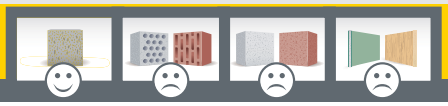
Mounting



SLA S, zinc plated with hex-head screw; steel quality 8.8

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
S 12-80/10	91280SLAS	12	85	59	80	10	M8		30	150
S 12-90/20	91290SLAS	12	85	59	90	20	M8		30	150
S 12-120/50	912120SLAS	12	85	59	120	50	M8		25	125
S 15-90/10	91590SLAS	15	95	67	90	10	M10		20	100
S 15-100/20	915100SLAS	15	95	67	100	20	M10		15	75
S 15-130/50	915130SLAS	15	95	67	130	50	M10		15	75
S 18-110/10	918110SLAS	18	115	88	110	10	M12		10	50
S 18-125/25	918125SLAS	18	115	88	125	25	M12		10	50
S 18-150/50	918150SLAS	18	115	88	150	50	M12		5	25
S 24-125/10	924125SLAS	24	130	99	125	10	M16		5	25
S 24-140/25	924140SLAS	24	130	99	140	25	M16		5	25
S 24-165/50	924165SLAS	24	130	99	165	50	M16		4	20

Expected to be available from May 2017



Heavy-duty anchor SLA

SLA B, zinc plated with bolt; steel quality 8.8

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
B 12-80/10	91280SLAB	12	85	59	80	10	M8		30	150
B 12-90/20	91290SLAB	12	85	59	90	20	M8		30	150
B 12-120/50	912120SLAB	12	85	59	120	50	M8		25	125
B 15-90/10	91590SLAB	15	95	67	90	10	M10		20	100
B 15-100/20	915100SLAB	15	95	67	100	20	M10		15	75
B 15-130/50	915130SLAB	15	95	67	130	50	M10		15	75
B 15-180/100	915180SLAB	15	115	67	180	100	M10		10	50
B 18-110/10	918110SLAB	18	115	88	110	10	M12		10	50
B 18-125/25	918125SLAB	18	115	88	125	25	M12		10	50
B 18-150/50	918150SLAB	18	115	88	150	50	M12		5	25
B 18-200/100	918200SLAB	18	115	88	200	100	M12		5	25
B 24-125/10	924125SLAB	24	130	99	125	10	M16		5	25
B 24-140/25	924140SLAB	24	130	99	140	25	M16		5	25
B 24-165/50	924165SLAB	24	130	99	165	50	M16		4	20
B 24-215/100	924215SLAB	24	130	99	215	100	M16		4	–

Expected to be available from May 2017

SLA C, zinc plated with countersunk head; steel quality 8.8

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
C 12-80/16	91280SLAC	12	85	59	80	16	M8		30	150
C 12-90/26	91290SLAC	12	85	59	90	26	M8		30	150
C 15-90/17	91590SLAC	15	95	67	90	17	M10		20	100
C 15-100/27	915100SLAC	15	95	67	100	27	M10		15	75

Expected to be available from May 2017

Installation parameters

SLA S/B/C Thread		M8	M10	M12	M16
Torque	T_{inst} [Nm]	20	45	80	150
SLA S/B width across flats	SW [mm]	13	17	19	24
SLA C internal hexagon	[mm]	6	8	–	–
Ø of clearance hole in fixture	d_f [mm]	14	17	20	26

Loads, spacing and edge distance

Type	Thread	Cracked concrete [1),2)] C20/25		Non-cracked concrete [1),2)] C20/25		Permissible bending moment	Spacing		Edge distance		Min thickness of structural part
		Tension N_{per} [kN]	Shear V_{per} [kN]	Tension N_{per} [kN]	Shear V_{per} [kN]	M_{per} [Nm]	S_{cr} [mm]	S_{min} [mm]	C_{cr} [mm]	C_{min} [mm]	h_{min} [mm]
SLA 12	M8	5,7	7,8	10,9	10,9	17	177	60	89	60	120
SLA 15	M10	7,6	18,8	13,2	24,0	34	201	70	101	70	140
SLA 18	M12	11,9	28,3	19,8	28,6	60	264	80	132	80	180
SLA 24	M16	16,9	33,8	23,6	47,4	152	297	100	149	100	200

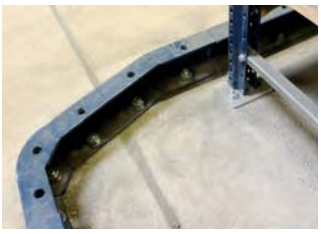
[1)] Permissible loads for single anchor without influence of spacing and edge distance.
[2)] Load values include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
For higher concrete strengths the values N_{per} increase by max. 55% ($N_{per,\ C50/60} = 1{,}55 \times N_{per,\ C20/25}$).
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

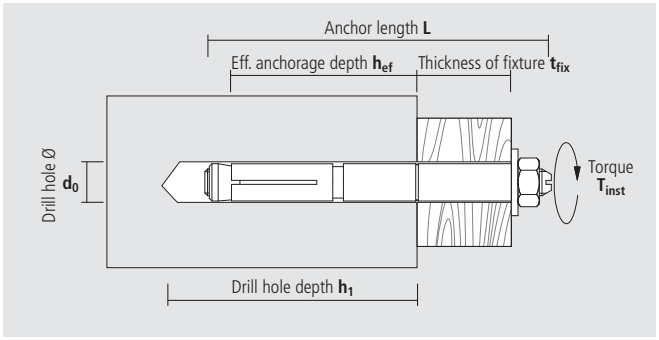
Forced expansion anchor ZA

ZA Type S with hex-head screw

ZA Type B with bolt

European Technical Approval
Option 7 for non-cracked concrete
ZA 12





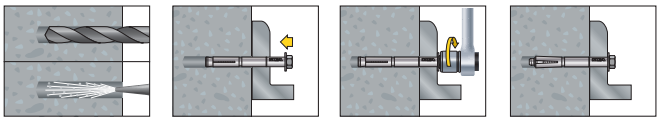
Advantages

- Suitable for heavy fixings in non-cracked concrete
- ZA 12 (M8) with ETA approval
- Force controlled spreading of the sleeve when the screw or nut is tightened
- Easy installation as the plug sleeve spreads easily
- Low setting depth
- Cover unevenness of the ground is possible

Suitable building materials

✔ Concrete

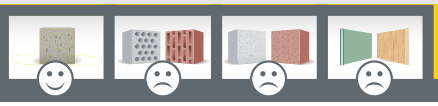
Mounting



ZA Type S, zinc plated with hex-head screw

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
S 10-55/10	91055ZAS	10	55	40	55	10	M6		100	–
S 10-70/25	91070ZAS	10	55	40	70	25	M6		100	–
S 10-95/50	91095ZAS	10	55	40	95	50	M6		100	–
S 12-60/10*	91260ZAS	12	55	40	60	10	M8		50	–
S 12-75/25*	91275ZAS	12	55	40	75	25	M8		50	–
S 12-100/50*	912100ZAS	12	55	40	100	50	M8		50	–
S 14-70/10	91470ZAS	14	70	50	70	10	M10		50	–
S 14-85/25	91485ZAS	14	70	50	85	25	M10		50	–
S 14-110/50	914110ZAS	14	70	50	110	50	M10		25	–
S 18-90/10	91890ZAS	18	80	60	90	10	M12		25	–
S 18-100/25	918100ZAS	18	80	60	100	25	M12		25	–
S 18-130/50	918130ZAS	18	80	60	130	50	M12		25	–

* With ETA approval



Forced expansion anchor ZA

ZA Type B, zinc plates with bolt

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
B 10-65/10	91065ZAB	10	55	40	65	10	M6		100	–
B 10-80/25	91080ZAB	10	55	40	80	25	M6		100	–
B 10-105/50	910105ZAB	10	55	40	105	50	M6		100	–
B 12-70/10*	91270ZAB	12	55	40	70	10	M8		50	–
B 12-85/25*	91285ZAB	12	55	40	85	25	M8		50	–
B 12-110/50*	912110ZAB	12	55	40	110	50	M8		50	–
B 12-160/100*	912160ZAB	12	55	40	160	100	M8		50	–
B 14-80/10	91480ZAB	14	70	50	80	10	M10		50	–
B 14-95/25	91495ZAB	14	70	50	95	25	M10		50	–
B 14-120/50	914120ZAB	14	70	50	120	50	M10		25	–
B 14-170/100	914170ZAB	14	70	50	170	100	M10		25	–
B 18-96/10	91896ZAB	18	80	60	96	10	M12		25	–
B 18-111/25	918111ZAB	18	80	60	111	25	M12		25	–
B 18-136/50	918136ZAB	18	80	60	136	50	M12		25	–

* with ETA approval

Installation parameters

ZA S/B size		M6	M8	M10	M12
Torque	T_{inst} [Nm]	8,5	20	40	70
Width across flats	SW [mm]	10	13	17	19
Clearance hole in fixture	d_f [mm]	12	14	16	22

Loads, spacing and edge distance for ZA 12 according to ETA approval in non-cracked concrete

Type	Thread	Non-cracked concrete[1) 2)] C20/25 Tension N_{per} [kN]	Non-cracked concrete[1) 2)] C20/25 Shear V_{per} [kN]	Permissible bending moment M_{per} [Nm]	Spacing S_{cr} [mm]	Spacing S_{min} [mm]	Edge distance C_{cr} [mm]	Edge distance C_{min} [mm]	Min. thickness of structural part h_{min} [mm]	Torque Type S / Type B T_{inst} [Nm]
ZA 12	M8	5,7	6,1	17,1	120	90	60	60	120	20

[1)] Permissible loads for single anchor without influence of spacing and edge distance.
[2)] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
For higher concrete strenght the values for N_{per} increase up to 55 % ($N_{per, C50/60} = 1,55 \times N_{per, C20/25}$)
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Loads, spacing and edge distance according to former DIBt approval in non-cracked concrete

Type	Thread	non-cracked concrete C12/15 F_{rec} [kN]	non-cracked concrete C20/25 F_{rec} [kN]	non-cracked concrete C30/37 F_{rec} [kN]	Reduction factor[1]	Bending moment M_{rec} [Nm]	Spacing S [mm]	Edge distance[2] C [mm]	Min. thickness of structural part h_{min} [mm]	Torque T_{inst} [Nm]
ZA 10	M6	1,5	2,1	2,5	0,70	7,0	260	130	110	8,5
ZA 14	M10	3,5	5,0	5,9	0,80	34,2	440	220	150	40,0
ZA 18	M12	5,2	7,4	8,7	0,90	60,0	500	250	180	70,0

F_{rec}: Recommended load in all directions in non-cracked concrete
[1] Reduction factor for the permissible load, if a reinforcement steel with an axis clearance of less then 15 cm exists in the area of the anchorage
[2] Edge distance may be reduced by a factor of 0,72, if anchor is inserted at the edge of the structural member, instead of the corner

Sleeve anchor Dnbolt


DT with hex-head screw

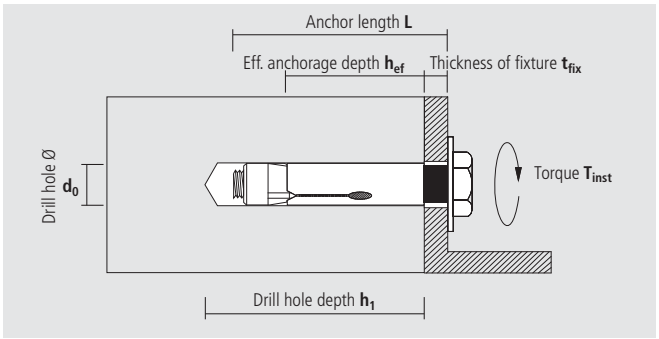

DV with countersunk head


DE with bolt

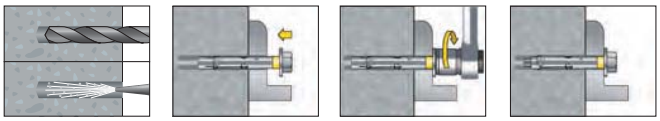

DA with eyebolt


DG with hook

European Technical Approval
Option 8 for non-cracked concrete
Dnbolt DT/DV 8, 10, 12 zinc plated



Mounting



Advantages

- Allrounder for many day-to-day fastenings in the medium loads up to 1.000 kg
- Dnbolt DT and DV with ETA approval for non-cracked concrete
- Anti-rotation cone with ribs for secure expansion
- Due the special sleeve construction, the fixture can be flush close with the concrete surface
- Chamfered sleeve guarantees perfect gliding on the cone and thus a secure fixing

Suitable building materials

✔ Concrete
✔ Dense natural stone
✔ Solid brick (partly)

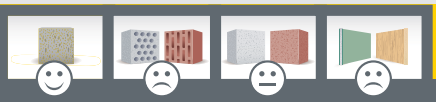

Zinc plated


Stainless steel A2

Dnbolt DT with hex-head screw

Type	Art-No zinc plated	€/ 100 pcs	Art.-No A2	€/ 100 pcs	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Packing [pcs]	Packing [pcs]
8 - 45	9845DT*		9X845DT		8	45	30	45	5	M6	250	–
8 - 60	9860DT*		9X860DT		8	45	30	60	20	M6	200	–
10 - 60	91060DT*		9X1060DT		10	55	37	60	10	M8	100	–
10 - 80	91080DT*		9X1080DT		10	55	37	80	30	M8	100	–
12 - 70	91270DT*		9X1270DT		12	70	43	70	10	M10	50	–
12 - 100	912100DT*		9X12100DT		12	70	43	100	40	M10	50	–
14 - 70	91470DT		9X1470DT		14	70	43	70	10	M10	50	–
14 - 100	914100DT		9X14100DT		14	70	43	100	40	M10	50	–
16 - 80	91680DT		9X1680DT		16	55	55	80	10	M12	40	–
16 - 110	916110DT		–		16	75	55	110	40	M12	25	–
20 - 110	921110DT		–		20	85	65	110	30	M16	10	–
25 - 130	926130DT		–		25	105	80	130	30	M16	8	–

* Part of the ETA approval



Sleeve anchor Dnbolt

 Zinc plated

 Stainless steel A2

Dnbolt DV with countersunk head

Type	Art-No zinc plated	€/ 100 pcs	Art-No A2	€/ 100 pcs	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Packing [pcs]	Packing [pcs]
10 - 60	91060DV*		9X1060DV		10	55	37	60	10	M8	100	–
10 - 80	91080DV*		9X1080DV		10	55	37	80	30	M8	100	–

* Part of the ETA approval

Dnbolt DE with bolt, zinc plated

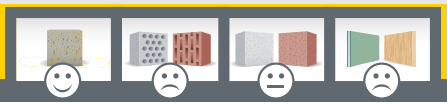
Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8 - 45	9845DE	8	45	30	45	5	M6	SW 10		100	400
10 - 60	91060DE	10	55	37	60	10	M8	SW 13		75	300
10 - 80	91080DE	10	55	37	80	30	M8	SW 13		50	200
12 - 70	91270DE	12	65	43	70	10	M10	SW 17		50	200
12 - 100	912100DE	12	65	43	100	40	M10	SW 17		25	100
14 - 70	91470DE	14	65	43	70	10	M10	SW 17		50	200
14 - 100	914100DE	14	65	43	100	40	M10	SW 17		25	100
16 - 80	91680DE	16	75	51	80	10	M12	SW 19		25	100
20 - 110	921110DE	20	85	65	110	30	M16	SW 24		10	40
25 - 130	926130DE	25	105	75	130	30	M20	SW 30		10	40

Dnbolt DA with eyebolt, zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8 - 45	9845DA	8	50	35	45	–	M6	SW 10		100	400
10 - 60	91060DA	10	65	47	60	–	M8	SW 13		50	200

Dnbolt DG with hook, zinc plated

Type	Art-No	d_0 [mm]	$h_1 \geq$ [mm]	$h_{ef} \geq$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	Thread	Drive	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
8 - 45	9845DG	8	50	35	45	–	M6	SW 10		100	400
10 - 60	91060DG	10	65	47	60	–	M8	SW 13		50	200
16 - 80	91690DG	16	85	61	80	–	M12	SW 19		25	100



Sleeve anchor Dnbolt

Loads, spacing and edge distance for Dnbolt DT/DV 8, 10, 12 according to ETA approval in non-cracked concrete

Type	Thread	Installation torque	Non-cracked concrete [1) 2)] ≥ C20/25			Permissible bending moment		Spacing		Edge distance		Min. thickness of structural part
				Steel 6.8	Steel 8.8	Steel 6.8	Steel 8.8*					h_{min}
		T_{inst} [Nm]	Tension N_{per} [kN]	Shear V_{per} [kN]	Shear V_{per} [kN]	M_{per} [Nm]	M_{per} [Nm]	S_{cr} [mm]	S_{min} [mm]	C_{cr} [mm]	C_{min} [mm]	[mm]
Dnbolt 8	M6	10	2,9	3,4	4,0	5,3	7,0	90	40	45	40	100
Dnbolt 10	M8	15	3,6	5,4	5,4	12,9	17,1	111	50	56	50	100
Dnbolt 12	M10	30	4,8	6,8	6,8	25,7	34,2	129	60	65	60	110

[1)] Permissible loads for single anchor without influence of spacing and edge distance.
[2)] Load figures include the resistances' partial safety factors as per approval and a partial safety factor on the action of $\gamma_F = 1.4$.
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.
* Dnbolts in steel 8.8 only on request

Recommended loads for not approved Dnbolt DT, DV and DE in non-cracked concrete C20/C25

Type	Thread	Installation torque	Drill hole Ø	Zinc plated, steel quality 6.8		Stainless steel A2	
		T_{inst} [Nm]	[mm]	Tension load N_{rec} [kN]	Shear load V_{rec} [kN]	Tension load N_{rec} [kN]	Shear load V_{rec} [kN]
Dnbolt 8	M6	10	8	–	–	1,8	2,0
Dnbolt 10	M8	15	10	–	–	2,0	3,2
Dnbolt 12	M10	30	12	–	–	3,4	4,8
Dnbolt 14	M10	30	14	6,2	8,6	3,5	5,6
Dnbolt 16	M12	65	16	7,5	12,0	4,8	8,5
Dnbolt 20	M16	150	20	8,9	26,0	–	–
Dnbolt 25	M20	300	25	10,6	28,8	–	–

Safety factors included

Recommended loads for not approved Dnbolt DA and DG in non-cracked concrete C20/C25

Type	Thread	Drill hole Ø	DA with eyebolt	DG with hook
		[mm]	F_{rec} [kN]	F_{rec} [kN]
Dnbolt 8	M6	8	0,6	0,6
Dnbolt 9	M6	9	0,6	0,6
Dnbolt 10	M8	10	0,6	0,6
Dnbolt 11	M8	11	0,6	0,6

Safety factors included

Fastening injection system ResiFIX

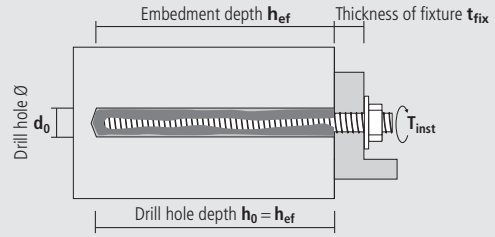
FIXING seismic C1

Fire resistance class R 120

European Technical Approval Option 1 for cracked concrete

European Technical Approval Post-installed rebar connection

European Technical Approval for masonry



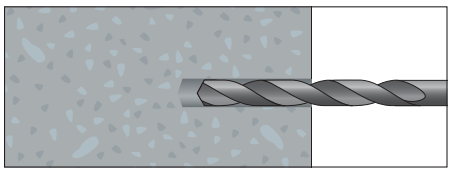
Typical applications

- Steel constructions
- Cantilevers
- Facade substructures
- Machines
- Guard rails
- Canopies
- Distance mountings
- Door and window frames
- Wood constructions

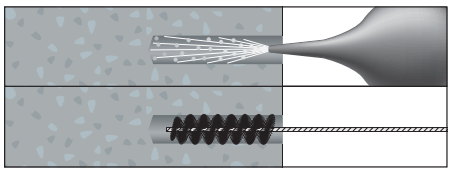
Suitable building materials

- ✔ Concrete
- ✔ Natural stone
- ✔ Solid brick
- ✔ Solid sand-lime brick
- ✔ Lightweight solid concrete blocks
- ✔ Aerated concrete
- ✔ Hollow brick
- ✔ Hollow sand-lime brick
- ✔ Lightweight hollow concrete blocks

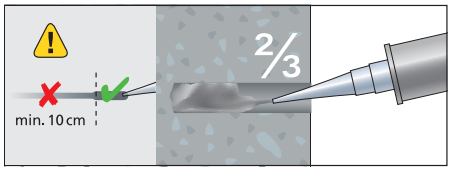
Mounting in concrete and solid brick



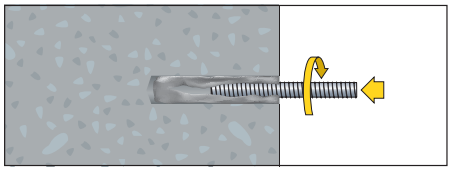
1. Drill hole



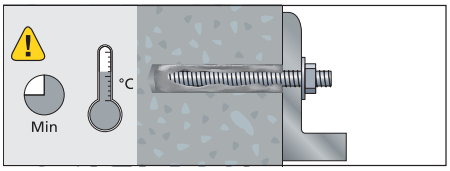
2. Clean hole (blow 4x, brush 4x)



3. Discard first 10 cm. Inject necessary amount of chemical mortar, (min. 2/3 of hole)

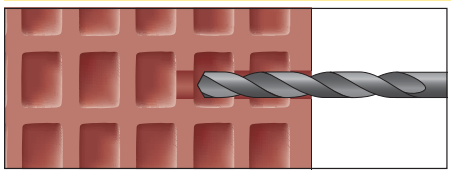


4. Push the anchor rod into the hole while turning

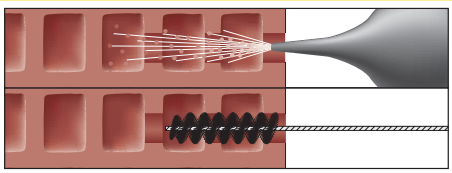


5. Respect curing time before applying any load or torque

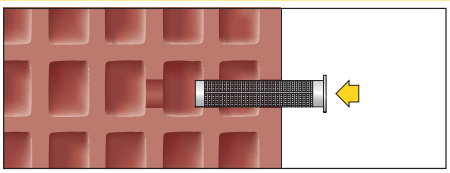
Mounting in hollow brick



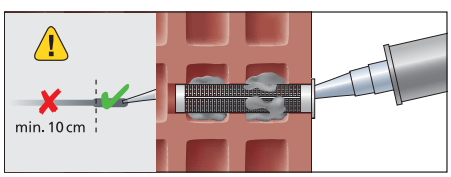
1. Drill hole



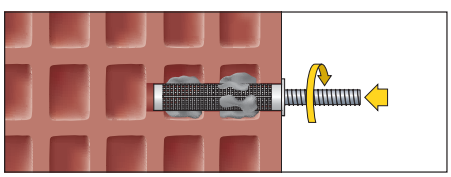
2. Clean hole (blow 2x, brush 2x)



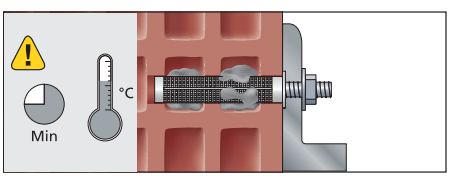
3. Insert anchor sleeve



4. Discard first 10 cm. Inject necessary amount of chemical mortar (fill sleeve completely)



5. Push the anchor rod into the hole while turning



6. Respect curing time before applying any load or torque

For everyone the appropriate system

In comparison

Type	Vinylester VYSF (styrene free) 300	Vinylester VYSF (styrene free) 345	Vinylester VYSF (styrene free) 410	Epoxyacrylate EYSF (styrene free) 300	Epoxyacrylate EYSF (styrene free) 345	Epoxyacrylate EYSF (styrene free) 410	Polyester PYSF (styrene free) 165	Polyester PYSF (styrene free) 300	Polyester PYSF (styrene free) 410	Pure Epoxy BRSF (styrene free) 385
Content	280ml	345ml	410ml	280 ml	345 ml	410 ml	165 ml	300 ml	410 ml	385 ml
Types	Standard, Cool, Tropical			Standard, Express			Standard			Standard
Shelf life (unopened)	18 months			18 months			12 months			24 months
	steel 4.6, 5.8, 8.8 stainless steel			steel 4.6, 5.8, 8.8 stainless steel			✔			steel 4.6, 5.8, 8.8 stainless steel
	✔			–			–			✔
Approval for post-installed rebar connections	ETA CE Ø8 – Ø25			–			–			ETA CE Ø8 – Ø25
Approval for cracked concrete (Option 1)	ETA CE M8 - M30, Ø8 -Ø32			–			–			ETA CE M12 - M30, Ø12 -Ø32
Approval for non-cracked concrete (Option 7)	ETA CE M8 - M30, Ø8 - Ø32			ETA CE M8 – M24			–			ETA CE M8 - M30, Ø8 - Ø32
Approval for masonry	ETA CE M8 - M16			ETA CE M8 – M16			–			–
Fire Test certification (R 120)				–			–			
Usage under seismic action	FIXING seismic C1			–			–			FIXING seismic C1
ICC Approval	ICC ES			–			–			–
Emissions in closed spaces	LEED tested; Émissions dans l'air intérieur A+ (A+ A B C)			LEED tested; Émissions dans l'air intérieur A+ (A+ A B C)			LEED tested; Émissions dans l'air intérieur A+ (A+ A B C)			LEED tested; Émissions dans l'air intérieur A+ (A+ A B C)
Performance in non-cracked concrete C20/25 (M10-90)	1350 Kg			900 Kg			710 Kg			1380 Kg
Performance in hollow brick HLZ 12 (M10-130)	140 Kg			100 Kg			80 Kg			not suitable
Wet drill holes	✔			✔			✔			✔
Waterfilled drill holes	✔			✔			✘			✔
Min. temp. of concrete	≥ -20°C			≥ -10°C			≥ +5°C			≥ +5°C
Temp. range after curing	-40°C bis +120°C			-40°C bis +80°C			-40°C bis +80°C			-40°C bis +72°C
Chemical resistance	very high			high			medium			excellent
Odour	marginal			medium			medium			marginal

Risk of staining in natural stone! Before use, we recommend a 5-day test.

ResiFIX assortment


VY 300 SF


VY 345 SF


VY 410 SF

ICC ES | FIXING seismic C1

ETA CE	ETA CE	ETA CE		ETA CE
European Technical Approval Option 7 for non-cracked concrete	European Technical Approval Option 1 for cracked concrete	European Technical Approval Post-installed rebar connection	Fire resistance class	European Technical Approval for masonry
M8 – M30, Ø8 – Ø32	M8 – M30, Ø8 – Ø32	Ø8 – Ø25	**R 120**	M8 - M16

Vinylester VYSF (styrene free)

Type	Art-No	Content [ml]	Nozzles included [pcs]	Price €/pc	Packing [pcs]
VY 300 SF	300VSF	280	2		12
VY 345 SF	345VSF	345	2		12
VY 410 SF	410VYSF	410	1		12

Curing times and technical data, from page 93

ETA CE	ETA CE		ETA CE	
European Technical Approval Option 7 for non-cracked concrete	European Technical Approval Option 1 for cracked concrete	Fire resistance class	European Technical Approval for masonry	FIXING seismic C1
M8 – M30, Ø8 – Ø32	M8 – M30, Ø8 – Ø32	**R 120**	M8 - M16	

Vinylester VYSF Cool (styrene free) for -20°C to +10°C

Type	Art-No	Content [ml]	Nozzles included [pcs]	Price €/pc	Packing [pcs]
VY 300 SF Cool	300VCSF	300	2		12

Curing times and technical data, from page 93
seasonal article


VY 300 SF

Vinylester VYSF Tropical (styrene free) extended curing time

Type	Art-No	Content [ml]	Nozzles included [pcs]	Price €/pc	Packing [pcs]
VT 300 SF	300VTSF	280	2		12

Curing times and technical data, from page 93


EY 300 SF


EY 345 SF


EY 410 SF

ETA CE	ETA CE
European Technical Approval Option 7 for non-cracked concrete	European Technical Approval for mansonry
M8 – M24	M8 – M16

Epoxyacrylate (styrene free)

Type	Art-No	Content [ml]	Nozzles included [pcs]	Price €/pc	Packing [pcs]
EY 300 SF	300EYSF	280	2		12
EY 345 SF	345EYSF	345	2		12
EY 410 SF	410EYSF	410	1		12

Curing times and technical data, from page 93

ETA CE	ETA CE
European Technical Approval Option 7 for non-cracked concrete	European Technical Approval for mansonry
M8 – M24	M8 – M16

Epoxyacrylate EYSF Express (styrene free) reduced curing time, for -10°C to +30°C

Typ	Art.-Nr.	Inhalt [ml]	Mischdüsen inkl. [Stück]	Preis €/Stück	Verpackung [Stück]
EY 300 SF Express	300EXSF	280	2		12

Curing times and technical data, from page 93

ResiFIX assortment


PY 165 SF


PY 300 SF


PY 410 SF

Polyester PYSF (styrene free)				Price	Packing
Type	Art-No	Content [ml]	Nozzles included [pcs]	€/ pc	[pcs]
PY 165 SF	165PSF	165	2		1 / 12
PY 300 SF	300PSF	300	2		12
PY 410 SF	410PYSF	410	1		12

Curing times and technical data, from page 93


BR 385

ETA CE — European Technical Approval Option 7 for non-cracked concrete — M8 – M30, Ø8 – Ø32
ETA CE — European Technical Approval Option 1 for cracked concrete — M12 – M30, Ø12 – Ø32
ETA CE — European Technical Approval Post-installed rebar connection — Ø8 – Ø25
Fire resistance class R 120
FIXING seismic C1

Pure Epoxy (styrene free)				Price	Packing
Type	Art-No	Content [ml]	Nozzles included [pcs]	€/ pc	[pcs]
BR 385 SF	385CRPE	385	1		12
BR 585 SF	585CRPE	585	1	on request	12
BR 1400 SF	1400CRPE	1300	1	on request	12

1 extension tube (length 200 mm) included
Curing times and technical data, from page 93


30 x 40 x 23 cm

ETA CE — European Technical Approval Option 7 for non-cracked concrete — M8 – M30, Ø8 – Ø32
ETA CE — European Technical Approval Option 1 for cracked concrete — M8 – M30, Ø8 – Ø32
ETA CE — European Technical Approval Post-installed rebar connection — Ø8 – Ø25
Fire resistance class R 120
ETA CE — European Technical Approval for masonry — M8 - M10
FIXING seismic C1
ICC ES

Universal box with ResiFIX VY 300 SF, VY 345 SF				Price	Packing
Type	Art-No	Content [cartridges]	Nozzles included [pcs]	€/ box	[pcs]
VY 300 SF in universal box	SYS300VSF20	20	40		1
VY 345 SF in universal box	SYS345VSF20	20	40		1

Curing times and technical data, from page 93

ResiFIX accessories


APP 300
APP 380


APVM


OL 385

Caulking gun APP / APVM / OL			Price	Packing	
Type	Art-No	Suitable for ResiFIX type	€/ pc	[pcs]	[pcs]
APP 300	300APP	300 / 165		1	–
APP 380	380APP	410		1	–
APVM	345APVM	345 / 300 / 165		1	–
OL 385	385OL	385 / 585		1	–

ResiFIX accessories

Mixing nozzle MD transparent			Price	Packing	
Type	Art-No	Suitable cartridges	€/ pc	[pcs]	[pcs]
MD	9MRMEA	all except BR 385 SF		20	–

Mixing nozzle extension for MD			Price	Packing	
Type	Art-No	Length [mm]	€/ pc	[pcs]	[pcs]
MDV	9MDV	200		10	–

Blow out pump AB			Price	Packing	
Type	Art-No	Tube Ø [mm]	€/ pc	[pcs]	[pcs]
AB	BOP	8		1	–

Cleaning brush RBK nylon, for masonry				Price	Packing	
Type	Art-No	Length [mm]	Suitable for hole Ø [mm]	€/ pc	[pcs]	[pcs]
RBK Ø20	9PLRBK	300	≤ 20		5	–

Cleaning brush RBS steel, for concrete						Preis	Verpackung	
Type	Art-No	Length [mm]	Suitable for hole Ø [mm]	Suitable for anchor rod	Connecting thread	€/ Stück	[Stück]	[Stück]
RBS Ø12	9M12RBK	170	10	M8	M6		5	–
RBS Ø14	9M14RBK	170	12	M10	M6		5	–
RBS Ø16	9M16RBK	200	14	M12	M6		5	–
RBS Ø20	9M20RBK	200	18	M16	M6		5	–
RBS Ø26	9M26RBK	250	24	M20	M6		5	–
RBS Ø30	9M30RBK	300	28	M24	M6		5	–

MRBKV: Extension for RBS

MRBKH: Handle for RBS

Handle and Extension for RBS					Price	Packing	
Type	Art.-No	Length [mm]	Suitable for RBS Ø	Connecting thread	€/ pc	[pcs]	[pcs]
MRBKV	MRBKV	140	alle	M 6		5	–
MRBKH	MRBKH	–	alle	M 6		5	–

ResiFIX accessories

with centering cap

European Technical Approval for mansonry

Plastic sleeves SH

Type	Art-No	d_0 [mm]	L [mm]	h_0 [mm]	Suitable for thread Ø	Price €/ 100 pcs	Packing [pcs]	[pcs]
SH 12-60[1)]	91260SH	12	60	65	M6, M8		24	432
SH 12-80	91280SH	12	80	85	M6, M8		24	432
SH 16-85	91585SH	16	85	90	M8, M10		12	216
SH 16-130	915130SH	16	130	135	M8, M10		12	144
SH 20-85	92085SH	20	85	90	M12, M16		12	216
SH 20-130	920130SH	20	130	135	M12, M16		20	160
SH 20-200	920200SH	20	200	205	M12, M16		20	160

Note: The system (resin, sleeve and anchor rod) is only approved completely if approved components are used.
[1)] Not part of the ETA-approval

Plastic sleeves SH without approval

Type	Art-No	d_0 [mm]	L [mm]	h_0 [mm]	Suitable for thread Ø	Price €/ 100 pcs	Packing [pcs]	[pcs]
SH 13-100	913100SH	14	100	105	M8		12	216
SH 15-100	915100SH	16	100	105	M10		12	216

Discontinued, delivery while stocks last

Metal sleeves SH-1000 can be cut individually (length 1m)

Type	Art-No	d_0 [mm]	h_0 [mm]	Suitable for thread Ø	Price €/ pc	Packing [pcs]	[pcs]
SH 12-1000	12TMRMEA	12	flexible	M6 – M8		10	–
SH 16-1000	16TMRMEA	16	flexible	M8 – M12		10	–
SH 22-1000	22TMRMEA	22	flexible	M12 – M16		8	–

Internal threaded sleeves IGH

Type	Art-No	d_0 [mm]	h_0 [mm]	Suitable for thread Ø	Thread L* [mm]	Outer Ø [mm]	Suitable for sleeve	Price €/ 100 pcs	Packing [pcs]	[pcs]
IGH M8-80	9880IGH	14	90	M8	26	12	SH 16-85 SH 20-85		12	216
IGH M10-80	91080IGH	16	90	M10	26	14	SH 20-85		12	216
IGH M12-80	91280IGH	18	90	M12	26	16	SH 20-85		12	144

*Internal thread length

incl.

Heavy-duty sleeve ResiTHERM® S Set for heavy-duty applications in hollow / perforated brick walls

Type	Art-No	Set contains (packed in bag)	L [mm]	Insulation thickness h_D [mm]	Price €/ set	Packing [set]	[sets]
RTH S	RTHS2	2x ResiTHERM® S 2x Threaded stud M12x70 mm, stainless steel A4 2x Washer M12 DIN 125, stainless steel A4 2x Hexagon nut M12 DIN 934, stainless steel A4 1x ResiFIX VY300SF	125	0		1	10

For further information see page 102

Anchor rods RESI AST

European Technical Approval Option 7 for non-cracked concrete | European Technical Approval Option 1 for cracked concrete | European Technical Approval for masonry | Fire resistance class R 120 | FIXING seismic C1

RESI AST zinc plated 5.8 with nut and washer

Type d_s - L	Art-No	in concrete d_0 [mm]	$h_{ef,min}$ [mm]	$t_{fix,max}$ for $h_{ef,min}$ [mm]	$h_{ef,Stand}$ [1] [mm]	$t_{fix,max}$ for $h_{ef,Stand}$ [mm]	in solid brick d_0 - h_0 [mm]	$t_{fix,max}$ [mm]	in perforated brick sleeve	$t_{fix,max}$ [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
M8-110	98110RAST	10	60	40	80	20	10 - 80	20	SH 12-80	20		10	100
M8-130	98130RAST	10	60	60	80	40	10 - 80	40	SH 12-80	40		10	100
M10-110	910110RAST	12	60	40	90	10	12 - 90	10	SH 16-85	15		10	100
M10-130	910130RAST	12	60	60	90	30	12 - 90	30	SH 16-85	35		10	100
M10-170	910170RAST	12	60	100	90	70	12 - 90	70	SH 16-85	75		10	100
M10-200	910200RAST	12	60	130	90	100	12 - 90	100	SH 16-85	105		10	60
M12-130	912130RAST	14	70	45	110	5	14 - 100	15	SH 20-85	30		10	100
M12-160	912160RAST	14	70	75	110	35	14 - 100	45	SH 20-85	60		10	100
M12-210	912210RAST	14	70	125	110	85	14 - 100	95	SH 20-85	110		10	60
M16-160	916160RAST	18	80	60	125	15	18 - 100	40	SH 20-85	60		10	60
M16-190	916190RAST	18	80	90	125	45	18 - 100	70	SH 20-85	90		10	60
M16-235	916235RAST	18	80	135	125	90	18 - 100	115	SH 20-85	135		10	40
M20-240	920240RAST	24	90	130	170	50	not suitable		not suitable			5	20
M24-300	924300RAST	28	96	180	210	65	not suitable		not suitable			5	20

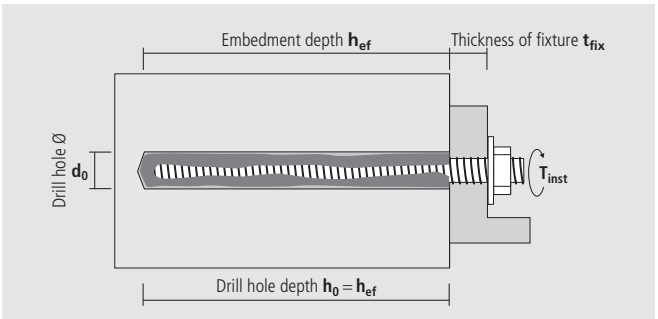
A4 | European Technical Approval Option 7 for non-cracked concrete | European Technical Approval Option 1 for cracked concrete | European Technical Approval for masonry | Fire resistance class R 120 | FIXING seismic C1

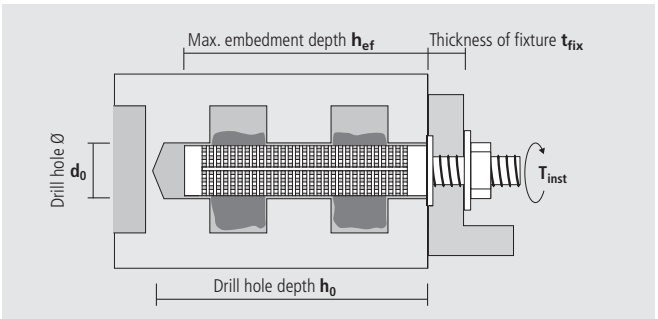
RESI AST stainless steel A4 with nut and washer

Type d_s - L	Art-No	in concrete d_0 [mm]	$h_{ef,min}$ [mm]	$t_{fix,max}$ for $h_{ef,min}$ [mm]	$h_{ef,Stand}$ [1] [mm]	$t_{fix,max}$ for $h_{ef,Stand}$ [mm]	in solid brick d_0 - h_0 [mm]	$t_{fix,max}$ [mm]	in perforated brick sleeve [Type]	$t_{fix,max}$ [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
M8-110	9X8110RAST	10	60	40	80	20	10 - 80	20	SH 12-80	20		10	100
M8-130	9X8130RAST	10	60	60	80	40	10 - 80	40	SH 12-80	40		10	100
M10-110	9X10110RAST	12	60	40	90	10	12 - 90	10	SH 16-85	15		10	100
M10-130	9X10130RAST	12	60	60	90	30	12 - 90	30	SH 16-85	35		10	100
M10-170	9X10170RAST	12	60	100	90	70	12 - 90	70	SH 16-85	75		10	100
M10-200	9X10200RAST	12	60	130	90	100	12 - 90	100	SH 16-85	105		10	60
M12-130	9X12130RAST	14	70	45	110	5	14 - 100	15	SH 20-85	30		10	100
M12-160	9X12160RAST	14	70	75	110	35	14 - 100	45	SH 20-85	60		10	100
M12-210	9X12210RAST	14	70	125	110	85	14 - 100	95	SH 20-85	110		10	60
M16-160	9X16160RAST	18	80	60	125	15	18 - 100	40	SH 20-85	60		10	60
M16-190	9X16190RAST	18	80	90	125	45	18 - 100	70	SH 20-85	90		10	60
M16-235	9X16235RAST	18	80	135	125	90	18 - 100	115	SH 20-85	135		10	40
M20-240	9X20240RAST	24	90	130	170	50	not suitable		not suitable			5	20
M24-300	9X24300RAST	28	96	180	210	65	not suitable		not suitable			5	20

Also suitable for ResiFIX: Anchor rods VA AST for the bonded anchor (with outer hexagon)
Further lengths, steel 8.8, hot-dip galvanized steel and stainless steel HCR on request

[1] Standard embedment depth means the usually used embedment depth. Min. embedment depth according to ETA-approvals





ResiFIX curing times

Curing time Vinylester VYSF

Temperature of building material	[°C]	> -10 [1]	> -5	> 0	> +5	> +10	> +20	> +30	> +40
Min. working time	[min]	90	90	45	25	15	**6**	4	1,5
Min. curing time [2]	[min]	24h	14h	7h	2h	80	**45**	25	15

[1] Cartridge temp. min. 15 °C
[2] Double curing time in wet concrete

Curing time ResiFIX Vinylester VYSF Cool

Temperature of building material	[°C]	> -20	> -15	> -10	> -5	> 0	> +5	+10	
Min. working time	[min]	75	55	35	20	10	6	6	X
Min. curing time [1]	[min]	24h	16h	10h	5h	2,5h	80	60	

[1] Double curing time in wet concrete

Curing time Vinylester VYSF Tropical

Temperature of building material	[°C]	> -10 [1]	> -5	> 0	> +5	> +10	> +20	> +30	> +40
Min. working time	[min]	180	180	90	50	30	**12**	8	3
Min. curing time [2]	[min]	48h	28h	14h	4h	160	**90**	48	30

[1] Cartridge temp. min. 15 °C
[2] Double curing time in wet concrete

Curing time Epoxyacrylate EYSF

Temperature of building material	[°C]	> -10	> -5	> 0	> +5	> +10	> +20	> +30	> +40
Min. working time	[min]	–	90	45	25	20	**6**	4	1,5
Min. curing time [1]	[min]	–	6h	3h	2h	100	**45**	25	15

[1] Double curing time in wet concrete

Curing time ResiFIX Epoxyacrylat EYSF Express

Temperature of building material	[°C]	> -10	> -5	> 0	> +5	> +10	> +15	> +20	+30
Min. working time	[min]	60	45	25	10	4	3	**2**	1,5
Min. curing time [1]	[min]	4h	2h	80	45	25	20	**15**	10

[1] Double curing time in wet concrete

Curing time Polyester PYSF

Temperature of building material	[°C]	> -10	> -5	> 0	> +5	> +10	> +20	> +30	> +40
Min. working time	[min]	–	–	–	25	15	**6**	4	2
Min. curing time [1]	[min]	–	–	–	2h	80	**45**	24	15

[1] Double curing time in wet concrete

Curing time Pure Epoxy BRSF

Temperature of building material	[°C]	> -10	> -5	> 0	> +5	> +10	> +20	> +30	> +40
Min. working time	[min]	–	–	–	120	90	**30**	20	12
Min. curing time [1]	[min]	–	–	–	50h	30h	**10h**	6h	4h

[1] Double curing time in wet concrete

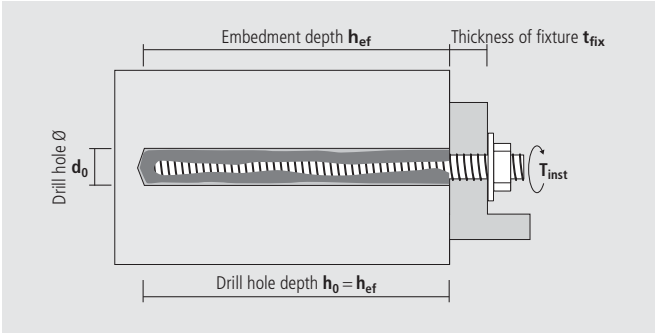
ResiFIX technical data in concrete

Fastening in concrete the professional system Vinylester VYSF (Standard and Cool)

Permissible loads F_{per} in [kN] in non-cracked (Option 7) concrete C20/25 and cracked (Option 1) concrete C20/25 for single anchor without influence of spacing and edge distance, installation parameters and unit dimensions. Total safety factors as per ETAG 001 included (γ_M und γ_F). Design according to TR029. See ETA-approval for design and calculations.

Anchor rods RESI AST, VA AST			M8	M10	M12	M16	M20	M24	M30
Drill hole Ø	d_0	[mm]	10	12	14	18	24	28	35
Embedment depth $h_{ef,min}/h_{ef,stand}/h_{ef,max}$		[mm]	60/80/160	60/90/200	70/110/240	80/125/320	90/170/400	96/210/480	120/280/600
Tension load [1) 2)] (24 °C / 40 °C) [3)] non-cracked concrete (dry or wet)									
Zinc plated 5.8	N_{per}	[kN]	7,2/8,6/8,6	9,0/13,5/13,8	11,7/19,7/20,0	14,3/28,0/37,1	17,1/44,4/58,1	18,8/61,0/83,8	26,3/93,4/133,3
Stainless steel A4	N_{per}	[kN]	7,2/9,6/9,9	9,0/13,5/15,7	11,7/19,7/22,5	14,3/28,0/42,0	17,1/44,4/65,3	18,8/61,0/94,3	26,3/70,2/70,2
Tension load [1) 2)] (24 °C / 40 °C) [3)] cracked concrete (dry or wet)									
Zinc plated 5.8	N_{per}	[kN]	2,9/3,8/7,7	3,7/5,6/12,5	5,8/9,1/19,7	8,8/13,7/35,1	12,3/23,3/54,9	15,8/34,6/79,0	26,3/68,1/133,3
Stainless steel A4	N_{per}	[kN]	2,9/3,8/7,7	3,7/5,6/12,5	5,8/9,1/19,7	8,8/13,7/35,1	12,3/23,3/54,9	15,8/34,6/79,0	26,3/68,1/70,2
Tension load [1) 2)] (50 °C / 80 °C) [3)] non-cracked concrete (dry or wet)									
Zinc plated 5.8	N_{per}	[kN]	5,4/7,2/8,6	6,7/10,1/13,8	9,4/14,8/20,0	14,3/22,4/37,6	17,1/38,1/58,6	18,8/53,4/83,8	26,3/68,1/133,3
Stainless steel A4	N_{per}	[kN]	5,4/7,2/9,9	6,7/10,1/15,7	9,4/14,8/22,5	14,3/22,4/42,0	17,1/38,1/65,3	18,8/53,4/94,3	26,3/68,1/70,2
Tension load [1) 2)] (50 °C / 80 °C) [3)] cracked concrete (dry or wet)									
Zinc plated 5.8	N_{per}	[kN]	1,8/2,4/4,8	2,6/3,9/8,7	4,2/6,6/14,4	6,4/10,0/25,5	9,0/17,0/39,9	11,5/25,1/57,4	20,2/47,1/101,0
Stainless steel A4	N_{per}	[kN]	1,8/2,4/4,8	2,6/3,9/8,7	4,2/6,6/14,4	6,4/10,0/25,5	9,0/17,0/39,9	11,5/25,1/57,4	20,2/47,1 /70,2
Shear load [1)] non-cracked concrete									
Zinc plated 5.8	V_{per}	[kN]	5,1	8,6	12,0	22,3	34,9	45,2/50,3/50,3	63,2/80/80,0
Stainless steel A4	V_{per}	[kN]	6,0	9,2	13,7	25,2	39,4	45,2/ 56,8 / 56,8	42,0/ 80,0 / 80,0
Shear load [1)] cracked concrete									
Zinc plated 5.8	V_{per}	[kN]	5,1	8,6	12,0	22,3	29,3/34,9/34,9	32,2/50,3/50,3	45,1/80,0/80,0
Stainless steel A4	V_{per}	[kN]	6,0	9,2	13,7	25,2	29,3/50,3/39,4	32,2/ 56,8 / 56,8	42,0/ 80,0 / 80,0
Bending moment (Zinc plated 5.8)	M_{per}	[Nm]	10,9	21,1	37,1	94,9	185,1	320,0	641,7
Bending moment (Stainless steel A4)	M_{per}	[Nm]	11,9	23,8	42,1	106,2	207,9	359,0	337,6
Spacing and edge distance									
Spacing [4)]	$s_{cr,N}$	[mm]	185	253	304	375	506	581	657
Edge distance [4)]	$c_{cr,N}$	[mm]	92	126	152	188	253	291	329
Minimum spacing distance	s_{min}	[mm]	40	50	60	80	100	120	150
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120	150
Minimum thickness of concrete	h_{min}	[mm]	$h_{ef} + 30\,mm \geq 100\,mm$			$h_{ef} + 2d_0$			
Maximum installation torque	$T_{inst} \leq$	[Nm]	10	20	40	80	120	160	200

[1)] Values are valid for $h_{ef,\,min}$ / $h_{ef,\,stand}$ / $h_{ef,\,max}$.
[2)] Increasing factors for cracked and non-cracked concrete C30/37 = 1.04, C40/50 = 1.08, C50/60 = 1.10.
[3)] Max. long term temperature / max. short term temperature after installation. For temperature range 72°C/120°C please see ETA-approval.
[4)] Depends on h_{ef}. Values are valid for $h_{ef,\,stand}$.
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.



ResiFIX technical data in concrete

Fastening in concrete with Epoxyacrylate EYSF (Standard and Express)

Permissible loads F_{per} in [kN] in non-cracked concrete C20/25 for single anchor without influence of spacing and edge distance, installation parameters and unit dimensions. Total safety factors as per ETAG 001 included (γ_M und γ_F). See ETA-approval for design and calculations.

Anchor rods RESI AST, VA AST			M8	M10	M12	M16	M20	M24
Drill hole Ø	d_0	[mm]	10	12	14	18	24	28
Embedment depth $h_{ef,min}/h_{ef,stand}/h_{ef,max}$		[mm]	60/80/160	60/90/200	70/110/240	80/125/320	90/170/400	96/210/480
Tension load [1] (24 °C / 40 °C) [2] in non-cracked concrete (dry or wet)								
Zinc plated 5.8	N_{per}	[kN]	5,1/6,8/8,6	6,0/9,0/13,8	8,4/13,2/20,0	12,8/19,9/37,1	17,1/33,9/58,1	18,8/50,3/83,8
Stainless steel A4	N_{per}	[kN]	5,1/6,8/9,9	6,0/9,0/15,7	8,4/13,2/22,5	12,8/19,9/42,0	17,1/33,9/65,3	18,8/50,3/94,3
Shear load [1] (24 °C / 40 °C) [2]								
Zinc plated 5.8	V_{per}	[kN]	5,1	8,6	12,0	22,3	34,9	45,2/50,3/50,3
Stainless steel A4	V_{per}	[kN]	6,0	9,2	13,7	25,2	39,4	45,2/56,8/56,8
Bending moment (Zinc plated 5.8)	M_{per}	[Nm]	10,9	21,1	37,7	94,9	185,7	320,6
Bending moment (Stainless steel A4)	M_{per}	[Nm]	11,9	23,8	42,1	106,7	207,9	359,9
Spacing and edge distance								
Spacing	$s_{cr,N}$	[mm]	185	253	304	375	506	581
Edge distance	$c_{cr,N}$	[mm]	92	126	152	188	253	329
Minimum spacing distance	s_{min}	[mm]	40	50	60	80	100	120
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120
Minimum thickness of concrete	h_{min}	[mm]	$h_{ef} + 30\,mm \geq 100\,mm$			$h_{ef} + 2d_0$		
Installation torque	$T_{inst} \leq$	[Nm]	10	20	40	80	120	160

[1] Increasing factors for cracked and non-cracked concrete C30/37 = 1.08, C40/50 = 1.15, C50/60 = 1.19.
[2] Max. long term temperature / max. short term temperature after installation. For temperature range 50°C/80°C please see ETA-approval.
[3] Depends on h_{ef}. Values are valid for $h_{ef,\,stand}$.
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.

Fastening in concrete with ResiFIX Vinylester VYSF Tropical

Recommended load F_{rec} in [kN] in non-cracked concrete C20/25 for single anchor without influence of spacing and edge distance. The safety factors are included.

Anchor rods RESI AST, VA AST			M8	M10	M12	M16	M20
Embedment depth	h_{ef}	[mm]	80	90	110	125	170
Edge distance	$c_{cr,N}$	[mm]	92	126	152	188	253
Spacing	$s_{cr,N}$	[mm]			2 x c_{cr}		
Recommended tension load 50 °C / 80 °C [1]	N_{rec}	[kN]	6,3	9,9	13,8	19,8	38,2
Recommended shear load for steel 5.8	V_{rec}	[kN]	5,1	8,6	12,0	22,3	34,9

[1] Long term temperature / short term temperature. Long term concrete temperature is roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of day / night cycle.

Fastening in concrete with ResiFIX Polyester PYSF

Recommended load F_{rec} in [kN] in non-cracked concrete C20/25 for single anchor without influence of spacing and edge distance. The safety factors are included.

Anchor rods RESI AST, VA AST			M8	M10	M12	M16	M20
Embedment depth	h_{ef}	[mm]	80	90	110	125	170
Edge distance	$c_{cr,N}$	[mm]			1,5 x h_{ef}		
Spacing	$s_{cr,N}$	[mm]			3,0 x h_{ef}		
Recommended tension load 50 °C / 80 °C [1]	N_{rec}	[kN]	4,5	6,9	9,6	10,8	18,1
Recommended shear load for steel 5.8	V_{rec}	[kN]	5,1	8,6	12,0	22,3	34,9

[1] Long term temperature / short term temperature. Long term concrete temperature is roughly constant over significant periods of time. Short term elevated temperatures are those that occur over brief intervals, e.g. as a result of day / night cycle.

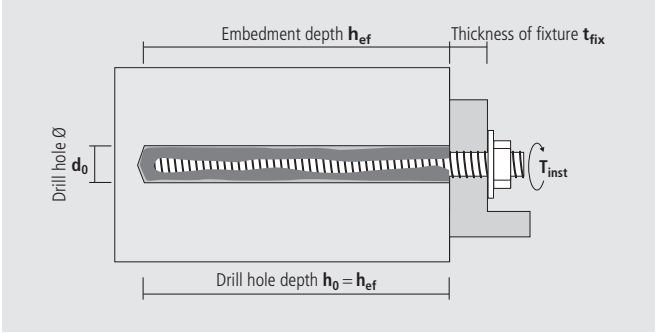
ResiFIX technical data in concrete

Fastening in concrete with the professional system Pure Epoxy BRSF

Permissible loads F_{per} in [kN] in non-cracked (Option 7) concrete C20/25 and cracked (Option 1) concrete C20/25 for single anchor without influence of spacing and edge distance, installation parameters and unit dimensions. Total safety factors as per ETAG 001 included (γ_M und γ_F). Design according to TR029. See ETA-approval for design and calculations.

Anchor rods RESI AST, VA AST			M8	M10	M12	M16	M20	M24	M30
Drill hole Ø	d_0	[mm]	10	12	14	18	24	28	35
Embedment depth $h_{ef,min}$/$h_{ef,stand}$/$h_{ef,max}$		[mm]	60 / 80 / 96	60 / 90 / 120	70 / 110 / 144	80 / 125 / 192	90 / 170 / 240	96 / 210 / 288	120 / 280 / 360
Tension load [1) 2)] (24 °C / 40 °C) [3)] non-cracked concrete									
Zinc plated 5.8	N_{per}	[kN]	8,6 / 8,6 / 8,6	9,3 / 13,8 / 13,8	11,7 / 20,0 / 20,0	14,3 / 28,0 / 37,1	14,7 / 38,1 / 58,1	16,2 / 52,3 / 83,8	22,6 / 80,5 / 117,3
Stainless steel A4	N_{per}	[kN]	9,3 / 9,9 / 9,9	9,3 / 15,7 / 15,7	11,7 / 22,5 / 22,5	14,3 / 28,0 / 42,0	14,7 / 38,1 / 63,9	16,2 / 52,3 / 84,0	22,6 / 70,2 / 70,2
Tension load [1) 2)] (24 °C / 40 °C) [3)] cracked concrete									
Zinc plated 5.8	N_{per}	[kN]	-	-	7,9 / 12,3 / 16,2	10,2 / 16,2 / 24,9	10,5 / 21,8 / 30,8	11,5 / 29,6 / 40,6	16,1 / 49,4 / 63,5
Stainless steel A4	N_{per}	[kN]	-	-	7,9 / 12,3 / 16,2	10,2 / 16,2 / 24,9	10,5 / 21,8 / 30,8	11,5 / 29,6 / 40,6	16,1 / 49,4 / 63,5
Tension load [1) 2)] (43 °C / 60 °C) [3)] non-cracked concrete									
Zinc plated 5.8	N_{per}	[kN]	6,8 / 8,6 / 8,6	7,1 / 10,7 / 13,8	9,4 / 14,8 / 19,4	13,6 / 21,2 / 32,6	14,7 / 29,1 / 41,0	16,2 / 40,4 / 55,4	22,6 / 67,3 / 86,6
Stainless steel A4	N_{per}	[kN]	6,8 / 9,1 / 9,9	7,1 / 10,7 / 14,2	9,4 / 14,8 / 19,4	13,6 / 21,2 / 32,6	14,7 / 29,1 / 41,0	16,2 / 40,4 / 55,4	22,6 / 67,3 / 70,2
Tension load [1) 2)] (43 °C / 60 °C) [3)] cracked concrete									
Zinc plated 5.8	N_{per}	[kN]	-	-	4,7 / 7,4 / 9,7	6,4 / 10,0 / 15,3	6,7 / 12,7 / 18,0	8,6 / 18,8 / 25,9	13,5 / 31,4 / 40,4
Stainless steel A4	N_{per}	[kN]	-	-	4,7 / 7,4 / 9,7	6,4 / 10,0 / 15,3	6,7 / 12,7 / 18,0	8,6 / 18,8 / 25,9	13,5 / 31,4 / 40,4
Shear load [1)] non-cracked concrete									
Zinc plated 5.8	V_{per}	[kN]	5,1	8,6	12,0	22,3	34,9	45,2 / 50,3 / 50,3	63,2 / 80,0 / 80,0
Stainless steel A4	V_{per}	[kN]	6,0	9,2	13,7	25,2	39,4	45,2 / 56,8 / 56,8	42,0 / 80,0 / 80,0
Shear load [1)] cracked concrete									
Zinc plated 5.8	V_{per}	[kN]	5,1	8,6	12,0	22,3	29,3 / 34,9 / 34,9	32,2 / 50,3 / 50,3	45,1 / 80,0 / 80,0
Stainless steel A4	V_{per}	[kN]	6,0	9,2	13,7	24,5	29,3 / 39,4 / 39,4	32,2 / 56,8 / 56,8	42,0 / 80,0 / 80,0
Bending moment (Zinc plated 5.8)	M_{per}	[Nm]	10,9	21,1	37,1	94,9	185,1	320,0	641,7
Bending moment (Stainless steel A4)	M_{per}	[Nm]	11,9	23,8	42,1	106,2	207,9	359,0	337,6
Spacing and edge distance									
Spacing [4)]	$s_{cr,N}$	[mm]	226	270	330	375	510	607	759
Edge distance [4)]	$c_{cr,N}$	[mm]	113	135	165	188	255	304	380
Minimum spacing distance	s_{min}	[mm]	40	50	60	80	100	120	150
Minimum edge distance	c_{min}	[mm]	40	50	60	80	100	120	150
Minimum thickness of concrete	h_{min}	[mm]	$h_{ef} + 30\,mm \geq 100\,mm$			$h_{ef} + 2d_0$			
Installation torque	$T_{inst} \leq$	[Nm]	10	20	40	80	120	160	200

[1)] Values are valid for $h_{ef,\,min}$ / $h_{ef,\,stand}$ / $h_{ef,\,max}$.
[2)] Increasing factors for cracked and non-cracked concrete C30/37 = 1.04, C40/50 = 1.08, C50/60 = 1.10.
[3)] Max. long term temperature / max. short term temperature after installation.
[4)] Depends on h_{ef}. Values are valid for $h_{ef,\,stand}$.
If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min}, S_{min} and C_{min} shall not remain under the given minimum values.



ResiFIX technical data in masonry

Fastening in masonry with Vinylester VYSF (Standard and Cool)

Permissible loads in [kN] and installation parameters - selection; for additional brick types and application conditions see ETA-approval.

Fastenings in solid and hollow masonry

Suitable building materials		Density ρ [kg/dm³]	Compressive strength f_b [N/mm²]	Anchor rods RESI AST, VA AST Size	Sleeve Size	Min. embedment dept h_{ef} [mm]	Use category dry / dry 24°C/40°C [1] Tension load N_{per} [kN]	Shear V_{per} [kN]
Solid sand-lime brick KSV		≥ 2,0	≥ 20	M8	without / SH 12-80	80 / 80	1,71 / 1,57	1,14 / 1,14
				M10	without / SH 16-85	90 / 85	1,71 / 1,43	1,29 / 1,14
				M12	without / SH 20-85	100 / 85	1,71 / 1,14	1,14 / 1,14
				M16	without / SH 20-85	100 / 85	1,43 / 1,14	1,14 / 1,14
Solid brick Mz		≥ 1,6	≥ 20	M8	without / SH 12-80	80 / 80	1,29 / 1,29	1,43 / 1,43
				M10	without / SH 16-85	90 / 85	1,57 / 1,43	1,43 / 1,43
				M12	without / SH 20-85	100 / 85	1,71 / 1,43	1,43 / 1,43
				M16	without / SH 20-85	100 / 85	1,71 / 1,43	2,29 / 1,43
Aerated concrete AAC6		≥ 0,6	≥ 6	M8	without	80	0,71	1,71
				M10	without	90	1,14	2,86
				M12	without	100	1,43	2,86
				M16	without	100	1,86	2,86
Hollow sand-lime brick KSL (KSL 3DF)		≥ 1,4	≥ 12	M8	SH 12-80	80	0,57	0,86
				M10	SH 16-85	85	0,57	1,29
				M10	SH 16-130	130	0,86	1,29
				M12	SH 20-85	85	1,71	1,29
				M16	SH 20-85	85	1,71	1,29
Hollow brick HLz (HLz 16DF)		≥ 0,8	≥ 12	M8	SH 12-80	80	1,00	1,14
				M10	SH 16-85	85	1,00	1,86
				M10	SH 16-130	130	1,43	1,86
				M12	SH 20-85	85	1,00	2,00
				M16	SH 20-85	85	1,00	2,00

N_{per}, V_{per}: Permissible loads incl. safety factors (γ_M and γ_F = 1,4), without influence of spacing and edge distance.
Drilling method: KSV and MZL hammer drilling; aerated concrete, KSL and HLz: rotary drilling
[1] Max. long-term temperature / max. short-term temperature after installation.

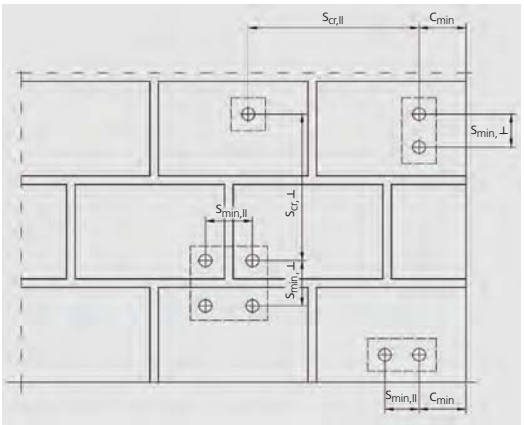
Spacing and edge distances

Suitable building materials	Anchor rod	Sleeve	Char. edge distance c_{cr} [mm]	Min. edge distance c_{min} [mm]	Char. spacing parallel to the bearing joint $s_{cr,II}$ [mm]	Char. spacing perpendicular to the bearing joint $s_{cr,\perp}$ [mm]	Min. spacing s_{min} [mm]
Solid sand-lime brick KSV	M8	without	120	60	240	240	120
	M10	without	135	60	270	270	120
	M12	without	150	60	300	300	120
	M16	without	150	60	300	300	120
Solid brick Mz	M8	without	120	60	240	240	120
	M10	without	135	60	270	270	120
	M12	without	150	60	300	300	120
	M16	without	150	60	300	300	120
Aerated concrete AAC6	M8	without	120	75*	240	240	100
	M10	without	135	75*	270	270	100
	M12	without	150	75*	300	300	100
	M16	without	150	75*	300	300	100
Hollow sand-lime brick KSL (KSL 3DF)	M8	SH 12-80	120	60	240	120	120
	M10	SH 16-85	120	60	240	120	120
	M10	SH 16-130	120	60	240	120	120
	M12,M16	SH 20-85	120	60	240	120	120
Hollow brick HLz (HLz 16DF)	M8	SH 12-80	120	120	497	238	100
	M10	SH 16-85	120	120	497	238	100
	M10	SH 16-130	120	120	497	238	100
	M12,M16	SH 20-85	120	120	497	238	100

* valid for tension load; for shear load parallel to the free edge: 75 mm, for shear load perpendicular to the free edge 1,5 x h_{ef}
Group factor for anchor group in case of tension load, shear load parallel respectively perpendicular to the free edge: see ETA-approval

Bending moment

Steel			Anchor size M8	M10	M12	M16
Zinc plated 5.8	M_{zul}	[Nm]	10,8	21,2	37,7	94,8
Stainless steel A4	M_{zul}	[Nm]	11,9	23,8	42,1	106,7



ResiFIX technical data in masonry

Fastening in masonry with Epoxyacrylate EYSF (Standard and Express)

Permissible loads in [kN] and installation parameters - selection; for additional brick types and application conditions see ETA-approval.

Fastenings in solid and hollow masonry

Suitable building materials	Density ρ [kg/dm³]	Compressive strength f_b [N/mm²]	Anchor rods RESI AST, VA AST Size	Sleeve Size	Min. embedment dept h_{ef} [mm]	Use category dry / dry 24°C/40°C [1] Tension load N_{per} [kN]	Use category dry / dry 24°C/40°C [1] Shear V_{per} [kN]
Solid sand-lime brick KSV 	≥ 2,0	≥ 20	M8	without / SH 12-80	80 / 80	1,29 / 1,14	1,29 / 1,14
			M10	without / SH 16-85	90 / 85	1,29 / 1,14	1,29 / 1,29
			M12	without / SH 20-85	100 / 85	1,60 / 1,14	1,43 / 1,43
			M16	without / SH 20-85	100 / 85	1,29 / 1,14	1,43 / 1,43
Solid brick Mz 	≥ 1,64	≥ 20	M8	without / SH 12-80	80 / 80	0,71 / 0,86	1,29 / 1,14
			M10	without / SH 16-85	90 / 85	0,71 / 0,86	1,57 / 1,43
			M12	without / SH 20-85	100 / 85	0,57 / 0,86	2,14 / 1,43
			M16	without / SH 20-85	100 / 85	1,00 / 0,86	2,14 / 1,43
Aerated concrete AAC4 	≥ 0,50	≥ 4	M8	without	80	0,32	0,54
			M10	without	90	0,90	0,71
			M12	without	100	0,90	0,90
			M16	without	100	1,25	1,25
Hollow sand-lime brick KSL (KSL 3DF) 	≥ 1,4	≥ 12	M8	SH 12-80	80	0,57	0,71
			M10	SH 16-85	85	0,57	1,00
			M10	SH 16-130	130	1,00	1,29
			M12	SH 20-85	85	0,57	1,00
			M16	SH 20-85	85	0,57	1,00
Hollow brick HLz (HLz 16DF) 	≥ 0,83	≥ 12	M8	SH 12-80	80	0,43	1,00
			M10	SH 16-85	85	0,71	1,71
			M10	SH 16-130	130	1,00	2,30
			M12	SH 20-85	85	1,00	1,71
			M16	SH 20-85	85	1,00	1,71

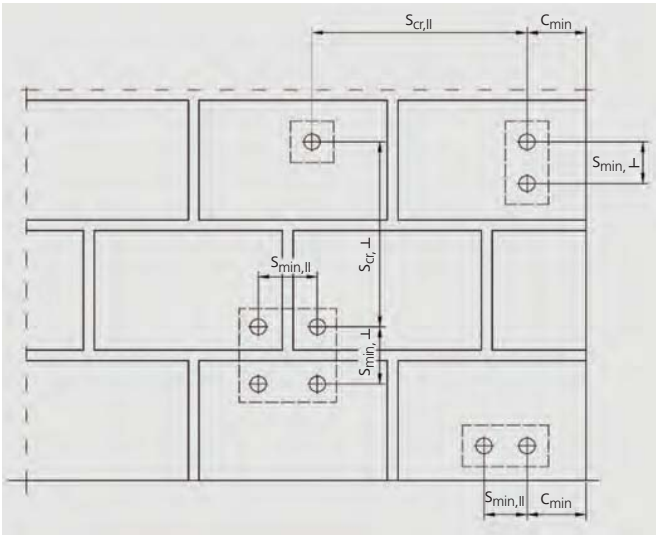
N_{per}, V_{per}: Permissible loads incl. safety factors (γ_M and $\gamma_F = 1,4$), without influence of spacing and edge distance.
Drilling method: KSV and MZL hammer drilling; aerated concrete, KSL and HLz: rotary drilling
[1] Max. long-term temperature / max. short-term temperature after installation.

Spacing and edge distances

Suitable building materials	Anchor rod	Sleeve	Min. edge distance $c_{cr} = c_{min}$ [mm]	Min. spacing parallel to the bearing joint $s_{min,II} = s_{cr,II}$ [mm]	Min. spacing perpendicular to the bearing joint $s_{min,\perp} = s_{cr,\perp}$ [mm]
Solid sand-lime brick KSV	M8	without	120	240	240
	M10	without	135	270	240
	M12	without	150	300	300
	M16	without	150	300	300
Solid brick Mz	M8	without	120	240	240
	M10	without	135	270	270
	M12	without	150	300	300
	M16	without	150	300	300
Aerated concrete AAC6	M8	SH 12-80	120	240	240
	M10	SH 16-85	135	270	270
	M10	SH 16-130	150	300	300
	M12,M16	SH 20-85	150	300	300
Hollow sand-lime brick KSL (KSL 3DF)	M8	SH 12-80	100	240	113
	M10	SH 16-85	100	240	113
	M10	SH 16-130	100	240	113
	M12,M16	SH 20-85	120	240	113
Hollow brick HLz (HLz 16DF)	M8	SH 12-80	100	497	238
	M10	SH 16-85	100	497	238
	M10	SH 16-130	100	497	238
	M12,M16	SH 20-85	120	497	238

Bending moment

Steel			Anchor size M8	M10	M12	M16
Zinc plated 5.8	M_{per}	[Nm]	10,8	21,2	37,7	94,8
Stainless steel A4	M_{per}	[Nm]	11,9	23,8	42,1	106,7

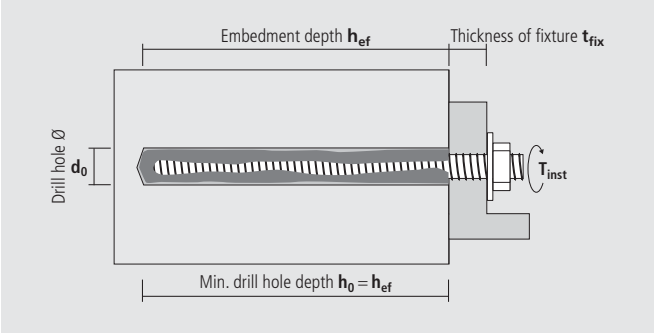


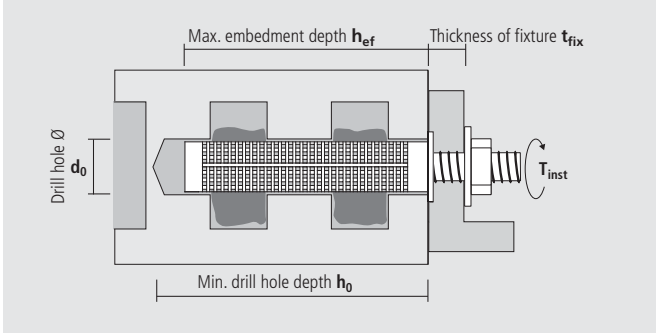
ResiFIX technical data in masonry

Fastening in masonry with Polyester PYSF

Recommended loads F_{rec} in [kN] for all load directions and installation parameters.

Anchor rods RESI AST, VA AST				M6	M8	M10	M12
Fastenings in solid masonry (without sleeve)							
Solid clay brick	Mz 12	F_{rec}	[kN]	0,5	1,7	1,7	1,7
Solid sand-lime brick	KS 12	F_{rec}	[kN]	0,5	1,7	1,7	1,7
Drill hole Ø		d_0	[mm]	8	10	12	14
Min. drill hole depth		h_0	[mm]	65	85	95	115
Min. embedment depth		h_{ef}	[mm]	60	80	90	110
Fastenings in hollow masonry (with sleeve)							
Sleeve				SH 12-60	SH 16-85	SH 16-85	SH 20-85
Hollow clay brick	HLz 4	F_{rec}	[kN]	0,3	0,3	0,3	0,3
	HLz 6	F_{rec}	[kN]	0,4	0,4	0,4	0,4
	HLz 12	F_{rec}	[kN]	0,7	0,8	0,8	0,8
Hollow sand-lime brick	KSL 4	F_{rec}	[kN]	0,3	0,3	0,3	0,3
	KSL 6	F_{rec}	[kN]	0,4	0,4	0,4	0,4
	KSL 12	F_{rec}	[kN]	0,7	0,8	0,8	0,8
Lightweight hollow concrete block	Hbl 2	F_{rec}	[kN]	0,3	0,3	0,3	0,3
	Hbl 4	F_{rec}	[kN]	0,5	0,6	0,6	0,6
Concrete hollow block	Hbn 4	F_{rec}	[kN]	0,5	0,6	0,6	0,6
Drill hole Ø		d_0	[mm]	12	16	16	20
Min. drill hole depth		h_0	[mm]	65	90	90	90
Min. embedment depth		h_{ef}	[mm]	60	85	85	85
Spacing and edge distance							
Spacing (anchor group)		$S_{cr,\,N\,Group} \geq$	[mm]	100 (Hbl and Hbn = 200)			
Min. spacing (anchor group)		$S_{min\,Group}$	[mm]	50 (Hbl and Hbn = 200)			
Min. spacing (single anchor)		$S_{min\,Single}$	[mm]	250			
Edge distance		$C_{cr,\,N} \geq$	[mm]	250			
Min. edge distance		C_{min}	[mm]	250			
Min. thickness of base material (masonry)		h_{min}	[mm]	110			125
Diameter of clearance hole in fixture		d_f	[mm]	7	9	12	14
Installation torque		$T_{inst} \leq$	[Nm]	3	8	8	8





ResiTHERM®

ResiTHERM® 200
ResiTHERM® 160
ResiTHERM® 120

IFBT tested
Institut für Fassaden- und Befestigungstechnik

PATENT PENDING

BEST NYLON QUALITY

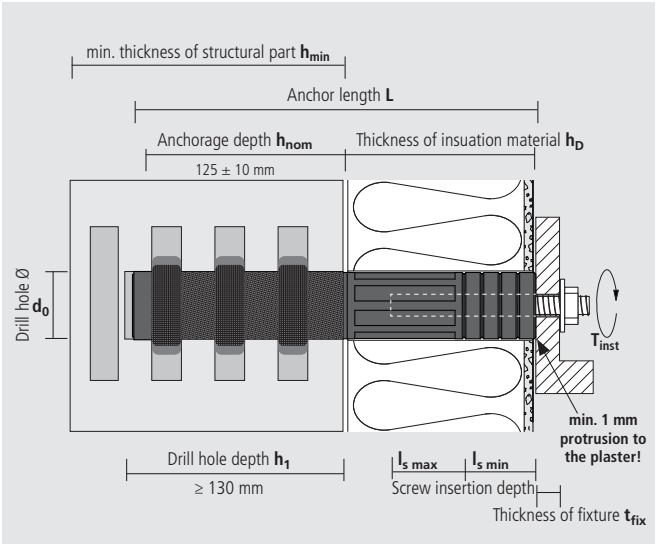
A4 STAINLESS STEEL

Advantages

- The perfect solution for distance installations in hollow bricks
- Heavy-duty system for fastening of awnings, canopies, French balconies, railings, satellite dishes etc. in ETICS
- Excellent thermal separation, almost no thermal bridge
- Outstanding high values in hollow bricks
- Easy and fast installation saves time and money
- Product is ready to use: available in four standard lengths
- Suitable for large insulation thickness up to 200 mm
- For non-insulated hollow brick walls: ResiTHERM® S (p. 102 f.)

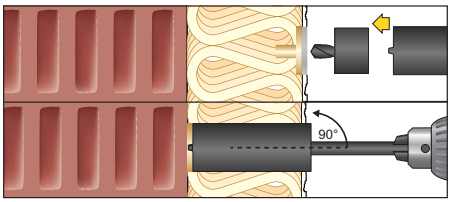
Suitable building materials

- ✔ Hollow bricks
- ✔ Hollow sand-lime brick
- ✔ Aerated concrete
- ✔ Lightweight hollow concrete block

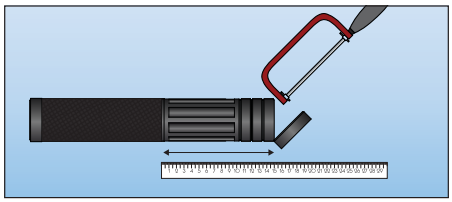


Watch video at www.celo-apolo.de/en

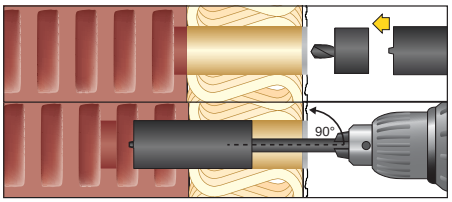
Mounting in hollow brick



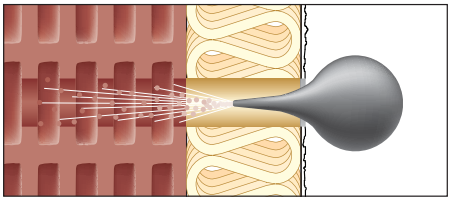
1. Put drilling aid on core bit; drill with cordless screwdriver (without impact) through the insulation material up to the hollow brick wall (remove drilling aid after the first 10 mm)



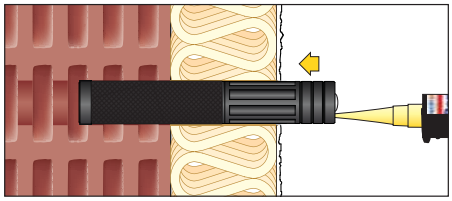
2. Measure the thickness of insulation and cut ResiTHERM® if needed (max. 40 mm)



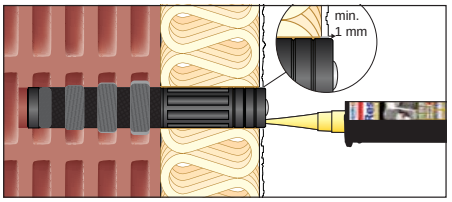
3. Put drilling aid on core bit and drill min. 130 mm into the hollow brick wall (remove drilling aid after the first 10 mm)



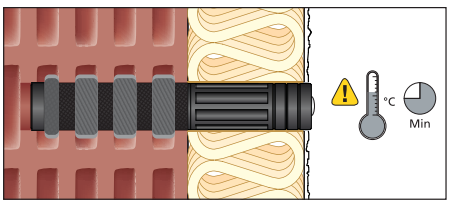
4. Clean hole



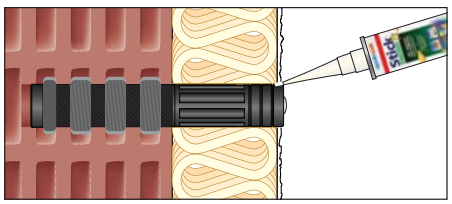
5. Press ResiTHERM® onto mixing nozzle and push it carefully into the drill hole



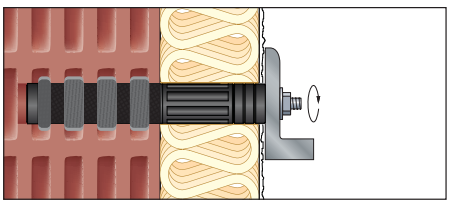
6. Fill ResiTHERM® with injection system ResiFIX; the end of the filling process can be clearly felt



7. Respect curing time



8. Fill annular gap with sealant StickFX XP, MS Polymer



9. Install fixture T_{inst} ≤ 20 Nm

ResiTHERM®


incl.


ResiTHERM® 200 for insulation thicknesses 160 - 200 mm					Price	Packing	
Type	Art-No	Set contains (packed in bag)	L [mm]	Insulation thickness h_D [1] [mm]	€/ set	[set]	[sets]
RTH 200	200RTH2	2x ResiTHERM® 200 2x Threaded stud M12x70 mm, stainless steel A4 2x Washer M12 DIN 125, stainless steel A4 2x Hexagon nut M12 DIN 934, stainless steel A4 1x ResiFIX VY300SF	325	160 - 200		1	10

[1] ResiTHERM® may be cut up to 40 mm if needed.
Longer lengths of ResiTHERM® on request.


incl.


ResiTHERM® 160 for insulation thicknesses 120 - 160 mm					Price	Packing	
Type	Art-No	Set contains (packed in bag)	L [mm]	Insulation thickness h_D [1] [mm]	€/ set	[set]	[sets]
RTH 160	160RTH2	2x ResiTHERM® 160 2x Threaded stud M12x70 mm, stainless steel A4 2x Washer M12 DIN 125, stainless steel A4 2x Hexagon nut M12 DIN 934, stainless steel A4 1x ResiFIX VY300SF	285	120 - 160		1	10

[1] ResiTHERM® may be cut up to 40 mm if needed.


incl.


ResiTHERM® 120 for insulation thicknesses 80 - 120 mm					Price	Packing	
Type	Art-No	Set contains (packed in bag)	L [mm]	Insulation thickness h_D [1] [mm]	€/ set	[set]	[sets]
RTH 120	120RTH2	2x ResiTHERM® 120 2x Threaded stud M12x70 mm, stainless steel A4 2x Washer M12 DIN 125, stainless steel A4 2x Hexagon nut M12 DIN 934, stainless steel A4 1x ResiFIX VY300SF	245	80 - 120		1	10

[1] ResiTHERM® may be cut up to 40 mm if needed.


1x

4x 2x

per 1x

1x

1x

50x

1x

Starter set ResiTHERM® in universal box (30 x 40 x 23 cm)						Price	Packing
Type	Art-No	Set contains		Art-No Accessories		€/ box	[pcs]
SYS120RTH4	Starter set RTH 120	4x ResiTHERM® 120	+	–	4x Threaded stud M12x70 mm, stainless steel A4		1
				–	4x Washer M12 DIN 125, stainless steel A4		
				–	4x Hexagon nut M12 DIN 934, stainless steel A4		
				300VSF	2x Injection system ResiFIX VY300SF incl. 4x mixing nozzle MD		
				39ABH	1x Drilling aid for core bit		
SYS160RTH4	Starter set RTH 160	4x ResiTHERM® 160		39220BST	1x Core bit Ø 39 x 220 mm		1
				100M16AD	1x Adapter shank hexagon M16, 100 mm for core bit		
				200M16AD	1x Adapter shank hexagon M16, 200 mm for core bit		
				BL290MSXP	1x StickFX XP white, MS Polymer		
				345APVM	1x Caulking gun APVM		
SYS200RTH4	Starter set RTH 200	4x ResiTHERM® 200		129021AS	50x Distance washer DIN 9021 for M12 (13x37x3 mm)		1
				–	1 pair work gloves		

ResiTHERM® S

IFBT tested Institut für Fassaden- und Befestigungstechnik

PATENT PENDING

BEST NYLON QUALITY

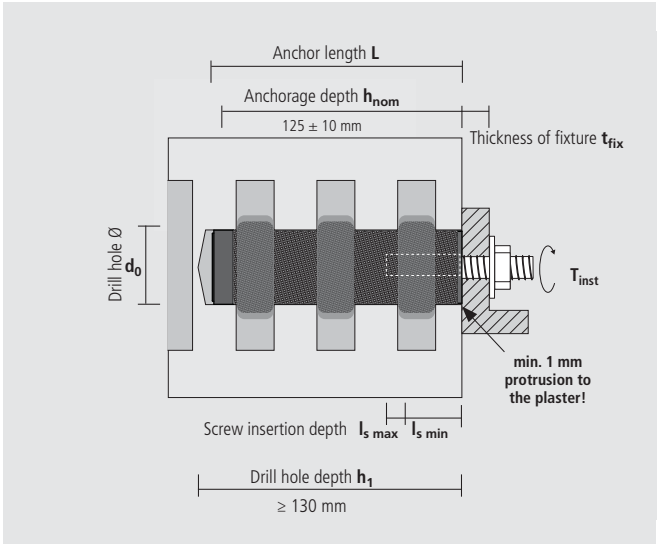
A4 STAINLESS STEEL

Advantages

- The perfect solution for heavy-duty applications in hollow / perforated brick walls (not insulated)
- Heavy-duty system for fastening of awnings, canopies, French balconies, railings, satellite dishes etc.
- Outstanding high values also in thin-walled perforated bricks
- Excellent thermal separation, almost no thermal bridge
- For insulated hollow brick walls use ResiTHERM®

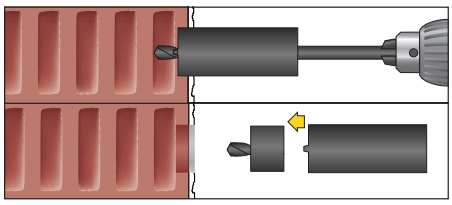
Suitable building materials

- ✔ Hollow / perforated bricks
- ✔ Hollow sand-lime brick
- ✔ Aerated concrete
- ✔ Lightweight hollow concrete block

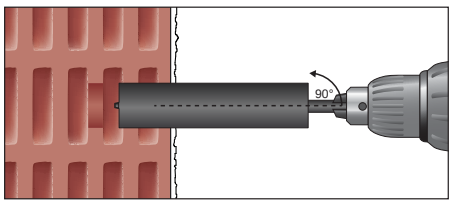


Watch video at www.celo-apolo.de/en

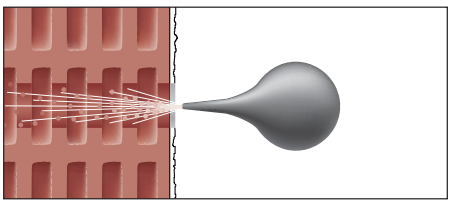
Mounting in hollow brick



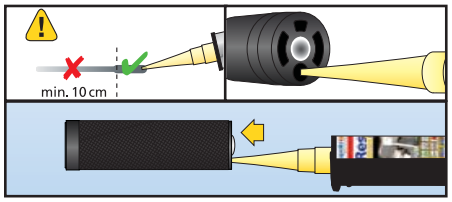
1. Put drilling aid on core bit; drill with cordless screwdriver (without impact) into the hollow brick wall; remove drilling aid alter the first 10 mm)



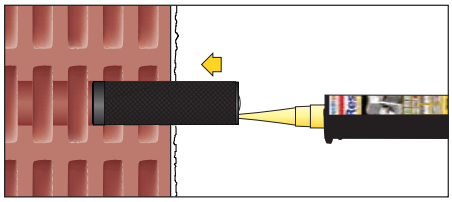
2. Drill hole (without impact); drill hole depth min. 130 mm



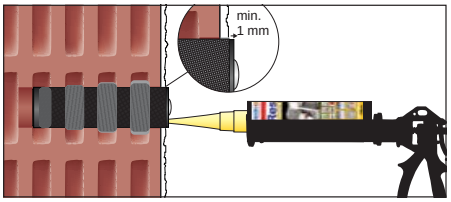
3. Clean hole



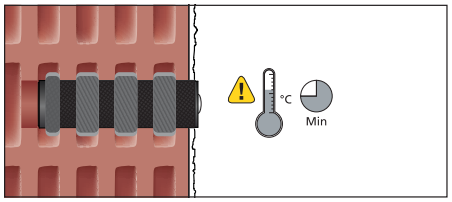
4. Press ResiTHERM® S onto the mixing nozzle



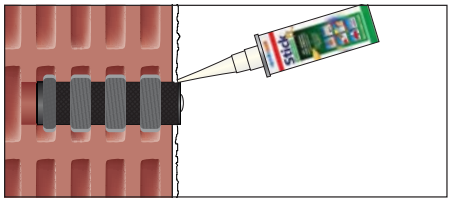
5. Push ResiTHERM® S carefully into the drill hole



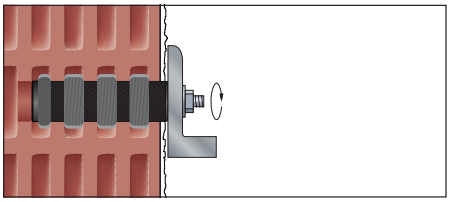
6. Fill ResiTHERM® S with injection system ResiFIX; the end of the filling process can be clearly felt



7. Respect curing time



8. Fill annular gap with sealant StickFX XP, MS Polymer



9. Install fixture T_{inst} ≤ 20 Nm

ResiTHERM® S


incl.

Heavy-duty sleeve ResiTHERM® S for non-insulated hollow brick walls					Price	Packing	
Type	Art-No	Set contains (packed in bag)	L [mm]	Insulation thickness h_D [mm]	€/ set	[set]	[sets]
RTH S	RTHS2	2x ResiTHERM® S 2x Threaded stud M12x70 mm, stainless steel A4 2x Washer M12 DIN 125, stainless steel A4 2x Hexagon nut M12 DIN 934, stainless steel A4 1x ResiFIX VY300SF	125	0		1	10

ResiTHERM® / ResiTHERM® S Accessories

Core bit for perforated brick BST

Drilling aid for core bit ABH

Core bit and drilling aid for ResiTHERM®					Price	Packing	
Type	Art-No	d [mm]	L [mm]	Connecting thread	€/ pc	[pcs]	[pcs]
BST 39 x 220	39220BST	39	220	M16		1	–
ABH	39ABH	35	60	–		1	–

AD 100

AD 200

Adapter shank AD hexagon for core bit BST						Price	Packing	
Type	Art-No	L [mm]	Connecting thread	Shank for drilling machine	Insulation thickness ≤ [mm]	€/ pc	[pcs]	[pcs]
AD 100	100M16AD	100	M16	hexagon	160		1	–
AD 200	200M16AD	200	M16	hexagon	260		1	–

ResiTHERM® / ResiTHERM® S Accessories

European Technical Approval Option 7 for non-cracked concrete: M8 – M30, Ø8 – Ø32

European Technical Approval Option 1 for cracked concrete: M12 – M30, Ø12 – Ø32

European Technical Approval Post-installed rebar connection: Ø8 – Ø25

Fire resistance class R 120

European Technical Approval for masonry: M8, M10

FIXING seismic C1

Vinylester VYSF (styrene free)

Type	Art-No	Content [ml]	Nozzles included [pcs]	Price €/pc	Packing [pcs]
VY 300 SF	300VSF	280	2		12

Curing times see page 93.

StickFX Professional all-purpose adhesive XP

Type	Art-No	Content [ml]	Colour	Description	Price €/pc	Packing [pcs]
XP white	BL290MSXP	290	white	All-purpose adhesive, fills gaps		12

Distance washer AS Polyamid, DIN 9021 for M12

Type	Art-No	Outer Ø [mm]	Internal Ø [mm]	h [mm]	Price €/100 pcs	Packing [pcs]	[pcs]
AS	129021AS	37	13	3		50	–

To use as a distance washer for relining (if needed).

APVM

Caulking gun APVM

Type	Art-No	Suitable for ResiFIX type	Price €/pc	Packing [pcs]	[pcs]
APVM	345APVM	345/300/165		1	–

Caulking gun APVM is recommended to read the scale units of ResiFIX VY (outer rod serves as a pointer).

Blow out pump AB

Type	Art-No	Tube Ø [mm]	Price €/pc	Packing [pcs]	[pcs]
AB	BOP	8		1	–

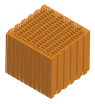
ResiTHERM® / ResiTHERM® S technical data

Installation parameters

			ResiTHERM® S	ResiTHERM® 120	ResiTHERM® 160	ResiTHERM® 200
Anchor length	L	[mm]	125	245	285	325
Thickness of insulation material	h_D	[mm]	0	60[1] - 120	120[1] - 160	160[1] - 200
Anchor Ø	d	[mm]	37		37	
Drill hole Ø	d_0	[mm]	39 - 40		39 - 40	
Drill hole depth	$h_1 \geq$	[mm]	130		130	
Anchorage depth	h_{nom}	[mm]	125 ± 10[2]		125 ± 10[2]	
Connection thread		[mm]	M12		M12	
Insertion depth of M12 threaded stud	$l_{s\ min-max}$	[mm]	35 - 40		35 - 80	
Thickness of fixture	$t_{fix} \leq$	[mm]	22[3]		22[3]	
Ø of clearance hole in fixture	$d_f \leq$	[mm]	14		14	
Required volume of ResiFIX VY per ResiTHERM®		[ml]	ca. 140		ca. 140	
Installation torque for mounting the fixture	$T_{inst} \leq$	[Nm]	20		20	

[1] ResiTHERM® may be cut up to 40 mm if needed. ResiTHERM® 120: If thickness of insulation material is 60 mm, set 20 mm deeper.
[2] Tests with a minimum anchorage depth of 115 mm showed the same pulled-out values, see test report from IFBT, Leipzig.
[3] When using the included threaded stud with L=70 mm. If needed a longer threaded stud or metric screw can be used.

Loads and displacements/deflections ResiTHERM®: tested system with injection system ResiFIX VY

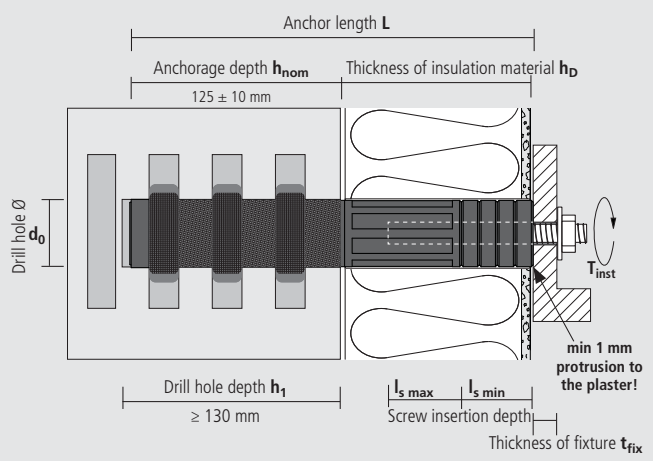
Building material	System	Thickness of insulation material	Recommended load[1]	Displacement/deflection at recommended load*)
Recommended tension load			N_{rec} [kN]	δ [mm]
Hollow brick T1.0-240	Single fastening	all	1,74	0,24
Hollow brick T10-300	Single fastening	all	1,56	0,31
Aerated concrete PP2-0,35	Single fastening	all	1,21	0,14
Aerated concrete PP4-0,55	Single fastening	all	2,12	0,32
Recommended pressure load			F_{rec} [kN]	δ [mm]
Hollow brick T1.0-240	Single fastening	all	4,23	0,57
Hollow brick T10-300	Single fastening	all	1,17	0,11
Recommended shear load[2]			V_{rec} [kN]	δ [mm]
Hollow brick T1.0-240 	Single fastening	0	3,77	1,80
		120	0,97	3,90
		160	0,90	6,31
		200	0,49	5,81
	Double fastening[3]	120	1,27	1,61
		160	0,98	2,45
		200	0,41	1,37
Hollow brick T10-300 	Single fastening	0	1,39	0,39
		120	0,97	2,50
		160	0,90	7,10
		200	0,49	5,52
	Double fastening[3]	120	0,52	0,54
		160	0,41	0,69
		200	0,40	2,02

[1] Recommended loads include the partial safety factor on action of $\gamma_F = 1.4$.
[2] For interpolated values see test report from IFBT, Leipzig.
[3] Spacing of 77 mm (standard awning console).
*) Movement of ResiTHERM® in load direction at recommended load.

Application of ResiTHERM® in solid building materials is possible.
For details please contact Apolo MEA or see test report from IFBT, Leipzig.

Spacing and edge distance

			ResiTHERM® S, 120, 160, 200
Minimum spacing	S_{min}	[mm]	77[3]
Minimum edge distance	C_{min}	[mm]	250
Min. thickness of structural part	h_{min}	[mm]	200



Bonded anchor VA and anchor studs VA AST

Bonded anchor VA


Anchor stud VA AST

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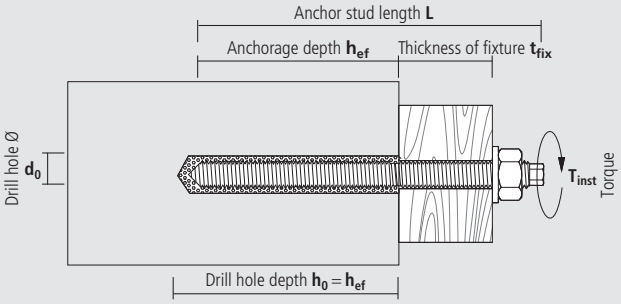
Option 8 for non-cracked concrete



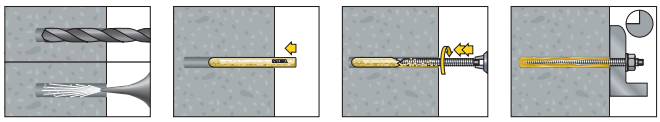
Advantages

- Suitable for fastening heavy loads in concrete with small edge distances
- The VA bonded anchor utilises the joint between the steel, the mortar and the concrete
- During installation the small glass tube is crushed and mixes with the resin, hardener and the aggregates
- The bonded anchor VA made of two components contains styrene free vinylester
- Long shelf life of min. 2.5 years

Suitable building materials

✔ Concrete

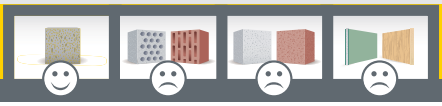
Montage



Mounting only possible with anchor rods VA AST (anchor rod must be sharpened)

VA					Price	Packing	
Type	Art-No	d_0 [mm]	h_0 [mm]	Suitable for VA AST	€/ 100 pcs	[pcs]	[pcs]
VA M8	98VA	10	80	M8		10	200
VA M10	910VA	12	90	M10		10	200
VA M12	912VA	14	110	M12		10	200
VA M16	916VA	18	125	M16		10	200
VA M20	920VA	25	170	M20		5	50
VA M24	924VA	28	210	M24		5	50
VA M30*	930VAS	35	280	M30		5	25

* Not part of the approval



Bonded anchor VA and anchor studs VA AST

European Technical Approval

VA AST zinc plated 5.8 with nut and washer

Type d_s - L	Art-No	d_0 [mm]	$h_{ef} = h_0$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	nut	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
M8-110	98100AST	10	80	110	16	SW 13		10	200
M10-130	910130AST	12	90	130	22	SW 17		10	200
M10-165	910165AST	12	90	165	58	SW 17		10	200
M10-190	910190AST	12	90	190	82	SW 17		10	100
M12-160	912160AST	14	110	160	30	SW 19		10	100
M12-220	912220AST	14	110	220	90	SW 19		10	80
M12-250	912250AST	14	110	250	120	SW 19		10	80
M12-300	912300AST	14	110	300	170	SW 19		10	60
M16-165	916165AST	18	125	165	13	SW 24		10	50
M16-190	916190AST	18	125	190	38	SW 24		10	50
M16-250	916250AST	18	125	250	98	SW 24		10	40
M20-260	920260AST	25	170	260	70	SW 30		5	30
M24-300	924300AST	28	210	300	65	SW 36		5	25
M30-380*	930380AST	35	280	380	70	SW 46		5	5

* Not part of the approval; without hexagon head
Every box contains a setting tool (Allen screw)

A4

European Technical Approval

VA AST stainless steel A4 with nut and washer

Type	Art-No	d_0 [mm]	$h_{ef} = h_0$ [mm]	L [mm]	$t_{fix} \leq$ [mm]	nut	Price €/ 100 pcs	Packing [pcs]	Packing [pcs]
M8-110	9X8100AST	10	80	110	16	SW 13		10	200
M10-130	9X10130AST	12	90	130	22	SW 17		10	200
M12-160	9X12160AST	14	110	160	30	SW 19		10	100
M16-190	9X16190AST	18	125	190	38	SW 24		10	50
M20-260	9X20260VMAST	25	170	260	70	SW 30		5	30

Every box contains a setting tool (Allen screw)

Loads, spacing and edge distance in concrete

Type	Concrete C20/25 – C50/60					Spacing		Edge distance		Min. thickness of structural part	Max. torque
	Tension load	Shear load		Bending moment							
		zinc plated	A4	zinc plated	A4						
	N_{per} [kN]	V_{per} [kN]	V_{per} [kN]	M_{per} [Nm]	M_{per} [Nm]	S_{cr} [mm]	S_{min} [mm]	$C_{cr,N}$ [mm]	C_{min} [mm]	d [mm]	$T_{inst} \leq$ [Nm]
M8	3,6	4,4	5,0	8,8	10,1	240	60	120	60	110	10
M10	4,8	7,2	7,8	16,5	18,8	270	70	135	70	120	20
M12	6,4	10,4	11,9	30,8	34,3	330	85	165	85	150	40
M16	9,9	19,8	22,4	79,1	88,8	380	95	190	95	160	60
M20	15,9	31,3	35,3	156,6	175,8	510	130	255	130	220	120
M24	23,8	45,6	50,8	273,6	306,6	630	160	315	160	300	150
M30*	60,0	60,0	60,0	642,0	402,0	700	280	350	140	330	400

If underrun the char. space or edge distance (C_{cr} or S_{cr}) the loads must be reduced. h_{min} / S_{min} and C_{min} shall not remain under the given minimum values.
* Not part of the ETA approval. Values according to former DIBt approval

Curing times in dry concrete

Temperature inside drill hole	[°C]	> -5	> 0	> +5	> +10	> +20
Min. curing time	[min]	360	180	90	40	20

Installation possible in dry or wet concrete.
Installation for anchor sizes M12 to M24 possible in holes filled with water (no sea water) as well.
For wet concrete curing time must be doubled.

StickFX Professional

MS Polymer

Multiple applications in the area of sanitary, heating and air conditioning, maintenance and repairs, doors and windows, construction in general, interior finishing, nautics aso.






Advantages

- Neutral, single-component adhesive and sealant with strong and quick initial adhesion
- Free of any hazardous substances, odourless
- No solvent, therefore especially suitable for fastening on tiles, Styrofoam, wood, and many plastics, etc.
- Can be painted over, even with water based paints
- Constant elasticity and vibration resistance once hardened
- Can be used on absorbent and non-absorbent base materials
- Surfaces can even be wet; underwater application also possible
- For indoor and outdoor use
- Colour fastness, weather resistant and UV resistant
- Temperature resistant -40°C to +90°C

StickFX Professional adhesive and sealant crystal CL					Price	Packing
Type	Art-No	Content [ml]	Colour	Description	€/ pc	[pcs]
CL	TR290MSCL	290	crystal clear	Adhesive and sealant		12

StickFX Professional all-purpose adhesive XP					Price	Packing
Type	Art-No	Content [ml]	Colour	Description	€/ pc	[pcs]
XP white	BL290MSXP	290	white	All-purpose adhesive, fills gaps		12
XP grey	GR290MSXP	290	grey	All-purpose adhesive, fills gaps		12

StickFX Professional mounting adhesive HT					Price	Packing
Type	Art-No	Content [ml]	Colour	Description	€/ pc	[pcs]
HT	BL290MSHT	290	white	Mounting adhesive, high initial tack		12

Shelf adhesives and sealants empty, 32 x 160 x 31 cm (W x H x D)			Price	Packing
Type	Art-No	Description	€/ pc	[pcs]
Empty shelf	EXPADH	for 3 x 30 StickFX	on request	1

StickFX Professional

Technical data at +20 °C and 65 % relative humidity

	StickFX Professional CL 	StickFX Professional XP 	StickFX Professional HT 
Description	Crystal clear adhesive and sealant	All-purpose adhesive and sealant	Mounting adhesive and sealant
Colour	100% transparent	white, grey	white
Base	MS Polymer	MS Polymer	MS Polymer
Curing system	Moisture cure	Moisture cure	Moisture cure
Initial tack	16 kg/m²	40 kg/m²	ca. 200 kg/m²
Final tack	24 kg/cm²	18 kg/cm²	24 kg/cm²
Skin formation	ca. 10 min.	ca. 10 min.	ca. 10 min.
Curing rate	2 - 3 mm / 24 hours	2 - 3 mm / 24 hours	2 - 3 mm / 24 hours
Processing temperature	0 °C to +35 °C	0°C to +35 °C	0°C to +35 °C
Temperature resistance	-40 °C to +90 °C	-40 °C to +90 °C	-40 °C to +90 °C
Specific gravity (DIN 53479)	1,04 g/ml	1,67 g/ml	1,62 g/ml
Maximum deformation (DIN EN ISO 11600)	20 %	20 %	20 %
Elongation at break (DIN 53504)	300 %	750 %	400 %
Tear strength (DIN 53504)	2,4 N/mm²	1,8 N/mm²	3,5 N/mm²
Hardness (DIN 53505)	38 ± 5	40 ± 5	65 ± 5
Storage	+5 °C to +25 °C	+5 °C to +25 °C	+5 °C to +25 °C
Shelf life*	12 months	12 months	12 months

* In unopened packaging

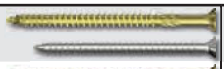
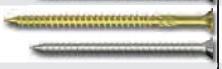
Further Installation Instructions/Guidelines

- The surfaces need to be clean, dust free, and fat free
- Outstanding adhesion on a number of surfaces such as metals, plastics/synthetic materials (polystyrene, polycarbonate, PVC, polyamide, and GFK – not ABS, PP, PE, PMMA, PTFE, and silicone), Styrofoam/polystyrene, cork, concrete, glass, wood, etc.
- Chemical resistance:
  Good resistance against water (including seawater), aliphatic solvents, diluted inorganic acids and bases, oils, and fats/greases
  Low resistance against aromatic solvents, concentrated acids and chlorinated hydrocarbons
- Joint dimensions:
  StickFX Professional CL: 1 - 3 mm for adhesion, 2 - 3 mm for sealing
  StickFX Professional XP: 2 - 10 mm for adhesion, 5 - 30 mm for sealing
  StickFX Professional HT: 2 - 10 mm for adhesion, 5 - 30 mm for sealing

Notes

Selection table

Screws

	page	Ø range [mm]	Black phosphatized	Yellow zinc plated	Blue zinc plated	Stainless steel A2	SIT	TX	PZ	PH	SW	with approval
Chipboard screws VELOX®												
VELOX® SIT 	114	3-8		●	●	●	●					◆
VELOX® Pozi 	117	3-6		●	●				●			◆
VELOX® B 	120	3-5			●				●			◆
VELOX® Quick 	121	3,5-4			●				●			◆
Construction screws												
BMax 	122	8-10			●			●				◆
Other screws												
Wood screw DIN 571 	124	6-10			●						●	
NICE with centre hole 	125	4,5-5			●					●		
Standard chipboard screw SPS 	126	3-6		●	●			●	●			
Adjustment screw JS 	129	6		●				●				
Eyebolt screw OES 	130	12			●							
Hanger bolt EDR 	131	8-12			●			●				
Clamp attachment screw TF 	132	5-8		●								
Wood screw with internal thread Torab® P 	133	4,5-5,5			●						●	
Screws for drywall constuctions												
Fine thread screw SSF 	134	3,5-5,0	●							●		
Coarse thread screw SSG 	134	3,9-5,0	●							●		
Drill point screw SSB 	135	3,5	●							●		
Fibreboard screw GSH 	135	3,9	●							●		
Drywall-to-drywall screw GGS 	135	5,0	●							●		
Metal framing screw PVS 	135	4,2			●					●		
Accessories												
Self-adhesive PVC cover Magic Tab 	136											
Bits (SIT®, PH, PZ, TX) 	137											

■ for wood / chipboard ■ for drywall constuctions

VELOX®

No splitting

For highest requirements

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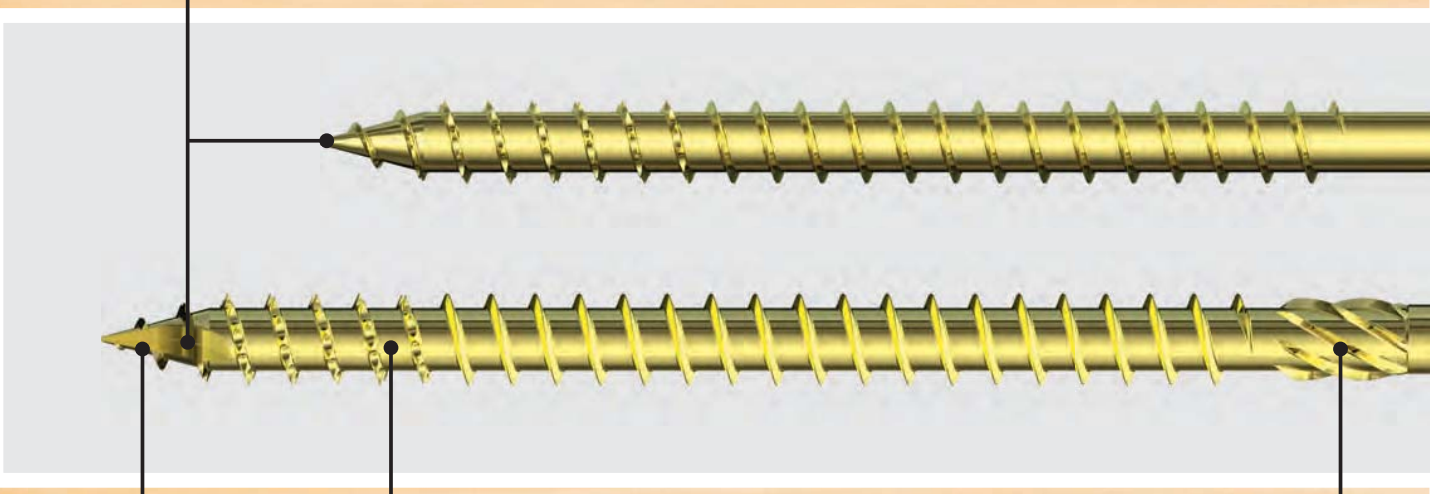
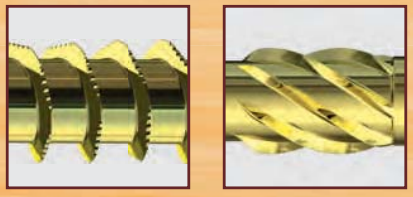
For use in timber constructions



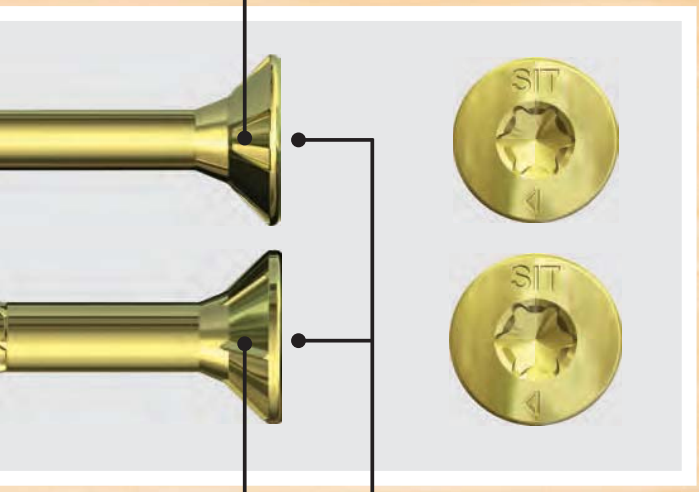
Quick bite

Reduced setting torque

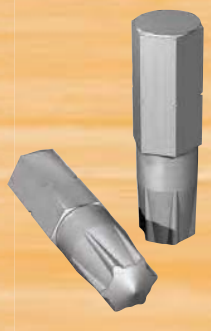


Robust box with window and colour code system

Flush finishing in wood and metal fittings



Perfect power transfer, low wear, and tight fit on the bit



SIT®-Recess

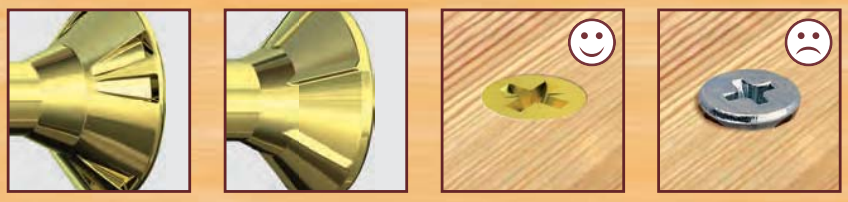
Ø	Bit size	Advantages
3,0	10	
3,5*	20	1 bit for 4 screw diameters
4,0	20	
4,5	20	No changing of bits
5,0**	20	
6,0	30	
8,0	40	

*for stainless steel: SIT 10
**for stainless steel: SIT 25

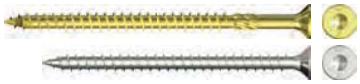
Innovative SIT®-Recess:

SIT®-Recess TX-Recess

Flush finishing in wood



VELOX® SIT



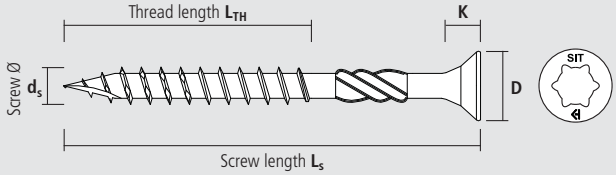
European Technical Approval
For use in timber constructions

A2 STAINLESS STEEL

Advantages

- SIT recess (=AW recess from Würth)
  - Perfect power transfer
  - Long-lasting SIT bit
  - No damage to the screw head / zinc coating
  - Large improved working comfort; the conical recess centers the screw (no tumbling) and sticks on the bit
  - TX bits can also be used, but without the mentioned advantages
- Only one bit size for four screw diameters
- Underhead milling ribs and underhead milling pockets: perfect for wood and metal fittings because of flush fitting and fewer wood shavings on surface (for metal fittings: use screws with underhead milling pockets, E-type)
- Patented tip thread area, shank cutter, notch tip
- Approved product for your safety
- Large and small packages

High performance from tip to head



d_s [mm]	3	3,5*	4	4,5	5**	6	8
D [mm]	6	7	8	9	10	12	15
K [mm]	1,8	2,0	2,35	2,55	2,85	3,85	4,50
Recess	SIT 10	SIT 20	SIT 20	SIT 20	SIT 20	SIT 30	SIT 40

* SIT 10 for stainless steel A2, ** SIT 25 for stainless steel A2

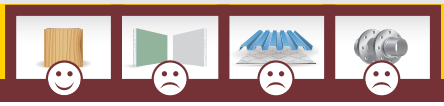
Ø6: Shank cutter for lengths ≥ 80 mm, no notch tip
Ø8: Shank cutter and notch tip for all lengths

VELOX® SIT

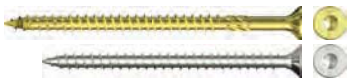
	Type	L_{TH}	Yellow zinc plated		Blue zinc plated		Stainless steel A2		Packing		
		[mm]	Art-No	€/100 pcs	Art-No	€/100 pcs	Art-No	€/100 pcs	[pcs]	[pcs]	[pcs]
	3x13*	V	9B313VLOXS		9313VLOXS		–		1.000	8.000	32.000
	3x15*	V	9B315VLOXS300		–		–		300	2.400	9.600
	3x15*	V	9B315VLOXS		9315VLOXS		–		1.000	8.000	32.000
	3x17	V	9B317VLOXS300		–		–		300	2.400	9.600
	3x17	V	9B317VLOXS		9317VLOXS		–		1.000	4.000	16.000
	3x20	V	9B320VLOXS300		–		–		300	2.400	9.600
	3x20	V	9B320VLOXS		9320VLOXS		9X320VLOXS		1.000	4.000	16.000
	3x25	V	9B325VLOXS300		–		–		300	2.400	9.600
	3x25	V	9B325VLOXS		9325VLOXS		–		1.000	4.000	16.000
	3x30	V	9B330VLOXS300		–		–		300	1.200	4.800
	3x30	V	9B330VLOXS		9330VLOXS		9X330VLOXS		1.000	4.000	8.000
	3x35/20	20	9B335VLOXSP		9335VLOXSP		–		1.000	4.000	8.000
	3,5x15*	V	9B3515VLOXS		93515VLOXS		9X3515VLOXS		1.000	4.000	16.000
	3,5x17*	V	9B3517VLOXS		93517VLOXS		–		1.000	4.000	16.000
	3,5x20	V	9B3520VLOXS		93520VLOXS		9X3520VLOXS		1.000	4.000	16.000
External underhead milling ribs, except A2	3,5x25	V	9B3525VLOXS300		–		–		300	1.200	4.800
	3,5x25	V	9B3525VLOXS		93525VLOXS		9X3525VLOXS		1.000	4.000	8.000
	3,5x30	V	9B3530VLOXS200		–		–		200	800	3.200
	3,5x30	V	9B3530VLOXS		93530VLOXS		9X3530VLOXS		1.000	4.000	8.000
	3,5x35	V	9B3535VLOXS200		–		–		200	800	3.200
	3,5x35	V	9B3535VLOXS		93535VLOXS		–		500	2.000	8.000
	3,5x35/20	20	9B3535VLOXSP		93535VLOXSP		–		500	2.000	8.000
	3,5x40/25	25	9B3540VLOXSP200		–		–		200	800	3.200
	3,5x40/25	25	9B3540VLOXSP		93540VLOXSP		9X3540VLOXSP		500	2.000	4.000
	3,5x45/30	30	9B3545VLOXSP200		–		–		200	800	3.200
	3,5x45/30	30	9B3545VLOXSP		93545VLOXSP		–		500	2.000	4.000
	3,5x50/30	30	9B3550VLOXSP200		–		–		200	800	3.200
	3,5x50/30	30	9B3550VLOXSP		93550VLOXSP		–		500	2.000	4.000

V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

* Not part of the approval



VELOX® SIT



A2

ETA CE
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For use in timber constructions

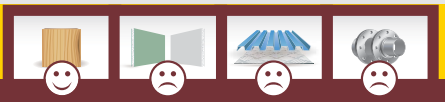
VELOX® SIT

Galvanized screws: internal underhead milling pockets, A2: external underhead milling ribs

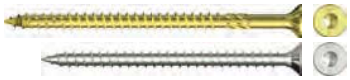
Type	L_{TH}	Yellow zinc plated		Blue zinc plated		Stainless steel A2		Packing		
	[mm]	Art-No	€/100 pcs	Art-No	€/100 pcs	Art-No	€/100 pcs	[pcs]	[pcs]	[pcs]
4x17*	V	9B417VLOXS		9417VLOXS		–		1.000	4.000	16.000
4x20*	V	9B420VLOXS200		–		–		200	800	3.200
4x20*	V	9B420VLOXS		9420VLOXS		9X420VLOXS		1.000	4.000	8.000
4x25	V	9B425VLOXS200		–		–		200	800	3.200
4x25	V	9B425VLOXS		9425VLOXS		9X425VLOXS		1.000	4.000	8.000
4x30	V	9B430VLOXS200		–		–		200	800	3.200
4x30	V	9B430VLOXS		9430VLOXS		9X430VLOXS		500	2.000	8.000
4x35	V	9B435VLOXS200		–		–		200	800	3.200
4x35	V	9B435VLOXS		9435VLOXS		9X435VLOXS		500	2.000	4.000
4x40/25	25	9B440VLOXSP200		–		–		200	800	3.200
4x40/25	25	9B440VLOXSP		9440VLOXSP		9X440VLOXSP		500	2.000	4.000
4x40	V	9B440VLOXS200		–		–		200	800	3.200
4x40	V	9B440VLOXS		9440VLOXS		–		500	2.000	4.000
4x45/30	30	9B445VLOXSP200		–		–		200	800	3.200
4x45/30	30	9B445VLOXSP		9445VLOXSP		–		500	2.000	4.000
4x45	V	9B445VLOXS200		–		–		200	800	3.200
4x45	V	9B445VLOXS		9445VLOXS		–		500	2.000	4.000
4x50/30	30	9B450VLOXSP200		–		–		200	800	3.200
4x50/30	30	9B450VLOXSP		9450VLOXSP		9X450VLOXSP		500	2.000	4.000
4x50	V	9B450VLOXS200		–		–		200	800	3.200
4x50	V	9B450VLOXS		9450VLOXS		–		500	2.000	4.000
4x60/35	35	9B460VLOXSP		9460VLOXSP		9X460VLOXSP		250	1.000	2.000
4x60	V	9B460VLOXS		9460VLOXS		–		250	1.000	2.000
4x70/40	40	9B470VLOXSP		–		–		250	1.000	2.000
4x70/40	40	–		9470VLOXSP		–		200	800	1.600
4,5x30	V	9B4530VLOXS200		–		–		200	800	3.200
4,5x30	V	9B4530VLOXS		94530VLOXS		9X4530VLOXS		500	2.000	4.000
4,5x35	V	9B4535VLOXS200		–		–		200	800	3.200
4,5x35	V	9B4535VLOXS		94535VLOXS		–		500	2.000	4.000
4,5x40/25	25	9B4540VLOXSP200		–		–		200	800	3.200
4,5x40/25	25	9B4540VLOXSP		94540VLOXSP		9X4540VLOXSP		500	2.000	4.000
4,5x40	V	9B4540VLOXS200		–		–		200	800	3.200
4,5x40	V	9B4540VLOXS		94540VLOXS		9X4540VLOXS		500	2.000	4.000
4,5x45/30	30	9B4545VLOXSP		94545VLOXSP		–		250	1.000	2.000
4,5x45	V	9B4545VLOXS		94545VLOXS		–		250	1.000	2.000
4,5x50/30	30	9B4550VLOXSP		94550VLOXSP		9X4550VLOXSP		250	1.000	2.000
4,5x50	V	9B4550VLOXS		94550VLOXS		–		250	1.000	2.000
4,5x60/35	35	9B4560VLOXSP		94560VLOXSP		9X4560VLOXSP		250	1.000	2.000
4,5x70/40	40	9B4570VLOXSP		94570VLOXSP		9X4570VLOXSP		200	800	1.600
4,5x80/50	50	9B4580VLOXSP		94580VLOXSP		–		100	400	800
5x30	V	9B530VLOXS		9530VLOXS		–		250	1.000	4.000
5x35	V	9B535VLOXS		9535VLOXS		–		250	1.000	4.000
5x40/25	25	9B540VLOXSP		9540VLOXSP		9X540VLOXSP		250	1.000	4.000
5x45/30	30	9B545VLOXSP		9545VLOXSP		–		250	1.000	2.000
5x50/30	30	9B550VLOXSP		9550VLOXSP		9X550VLOXSP		250	1.000	2.000
5x50	V	9B550VLOXS		9550VLOXS		–		250	1.000	2.000
5x60/35	35	9B560VLOXSP		9560VLOXSP		9X560VLOXSP		250	1.000	2.000
5x60	V	9B560VLOXS		9560VLOXS		–		250	1.000	2.000
5x70/40	40	9B570VLOXSP		9570VLOXSP		9X570VLOXSP		200	800	1.600
5x70	V	9B570VLOXS		9570VLOXS		–		200	800	1.600
5x80/50	50	9B580VLOXSP		9580VLOXSP		9X580VLOXSP		100	400	800
5x80	V	9B580VLOXS		9580VLOXS		–		100	400	800
5x90/60	60	9B590VLOXSP		9590VLOXSP		9X590VLOXSP		100	400	800
5x100/60	60	9B5100VLOXSP		95100VLOXSP		9X5100VLOXSP		50	200	400
5x120/70	70	–		95120VLOXSP		–		100	–	1.400

V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

* Not part of the approval



VELOX® SIT



European Technical Approval
For use in timber constructions

VELOX® SIT								Packing		
	Type	L_{TH} [mm]	Yellow zinc plated Art-No	€/100 pcs	Blue zinc plated Art-No	€/100 pcs	Stainless steel A2 Art-No	€/100 pcs	[pcs]	[pcs]	[pcs]
External underhead milling ribs	6x40	V	9B640VLOXS		–		–		250	1.000	2.000
	6x50/30	30	9B650VLOXSP		–		9X650VLOXSP		250	1.000	2.000
	6x50	V	9B650VLOXS		–		–		250	1.000	2.000
	6x60/35	35	9B660VLOXSP		–		9X660VLOXSP		200	800	1.600
	6x60	V	9B660VLOXS		–		–		200	800	1.600
	6x70/40	40	9B670VLOXSP		–		9X670VLOXSP		100	400	800
	6x70	V	9B670VLOXS		–		–		100	400	800
	6x80/50	50	9B680VLOXSP		–		9X680VLOXSP		100	400	800
	6x80	V	9B680VLOXS		–		–		100	400	800
	6x90/60	60	9B690VLOXSP		–		9X690VLOXSP		50	200	400
	6x100/60	60	9B6100VLOXSP		–		9X6100VLOXSP		50	200	400
	6x120/70	70	9B6120VLOXSP		–		9X6120VLOXSP		100	–	800
	6x140/70	70	9B6140VLOXSP		–		–		100	–	800
	6x160/70	70	9B6160VLOXSP		–		–		100	–	800
	6x180/70	70	9B6180VLOXSP		–		–		100	–	400
	6x200/70	70	9B6200VLOXSP		–		–		100	–	400
	6x220/70	70	9B6220VLOXSP		–		–		100	–	400
	8x80/50*	50	9B880VLOXSP		–		–		100	–	800
	8x100/60*	60	9B8100VLOXSP		–		–		100	–	800
	8x120/70*	70	9B8120VLOXSP		–		–		100	–	400
	8x140/70*	70	9B8140VLOXSP		–		–		50	–	200
	8x160/100*	100	9B8160VLOXSP		–		–		50	–	200
	8x180/100*	100	9B8180VLOXSP		–		–		50	–	200
	8x200/100*	100	9B8200VLOXSP		–		–		50	–	200
	8x220/100*	100	9B8220VLOXSP		–		–		50	–	200
	8x240/100*	100	9B8240VLOXSP		–		–		50	–	200
	8x260/100*	100	9B8260VLOXSP		–		–		50	–	200
	8x280/100*	100	9B8280VLOXSP		–		–		50	–	200
	8x300/100*	100	9B8300VLOXSP		–		–		50	–	200
	8x340/100*	100	9B8340VLOXSP		–		–		50	–	200

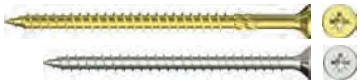
V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread
* discontinued, delivery while stocks last. Please note new product BMax (see page 122)

VELOX® SIT Screw-Set yellow zinc plated			Price	Packing	
Type	Art-No	Content	€/ box	[pcs]	[pcs]
VELOX SIT Screw-Set	MIXVLOXS	(each 20x: 3,5x20, 4,0x40, 4,5x50 and 5,0x60, incl. 1x SIT20 Bit)		80	2.560

VELOX® countersunk washer* for VELOX® and BMax screws Ø 8 mm					Price	Packing	
Type	Yellow zinc plated Art-No	d2 [mm]	d1 [mm]	h [mm]	€/100 pcs	[pcs]	[pcs]
8,5x25	9B8OVAL	25	8,5	5		100	–

*Part of the approval

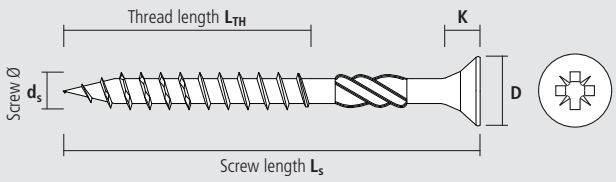
VELOX® Pozi



European Technical Approval
For use in timber constructions

Advantages

- Underhead milling ribs and underhead milling pockets: perfect for wood and metal fittings because of flush fitting and fewer wood shavings on surface (for metal fittings: use screws with underhead milling pockets)
- Patented tip thread area reduces splitting as well as setting torque, which provides a perfect appearance and a longer battery life
- Approved product for your safety
- Large and small packages



d_s [mm]	3	3,5	4	4,5	5	6	8
D [mm]	6	7	8	9	10	12	15
K [mm]	1,8	2,0	2,35	2,55	2,85	3,85	4,50
Recess	PZ 1	PZ 2	PZ 2	PZ 2	PZ 2	PZ 3	PZ 3

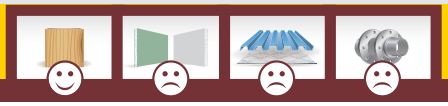
Ø6: Shank cutter for lengths ≥ 80 mm, no notch tip

VELOX® Pozi

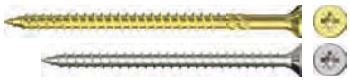
	Type	L_{TH} [mm]	Yellow zinc plated Art-No	€/100 pcs	Blue zinc plated Art-No	€/100 pcs	Packing [pcs]	[pcs]	[pcs]
	3 x 13*	V	9B313VLOX		9313VLOX		1.000	8.000	32.000
	3 x 15*	V	9B315VLOX300		–		300	2.400	9.600
	3 x 15*	V	9B315VLOX		9315VLOX		1.000	8.000	32.000
	3 x 17	V	9B317VLOX300		–		300	2.400	9.600
	3 x 17	V	9B317VLOX		9317VLOX		1.000	4.000	16.000
	3 x 20	V	9B320VLOX300		–		300	2.400	9.600
	3 x 20	V	9B320VLOX		9320VLOX		1.000	4.000	16.000
	3 x 25	V	9B325VLOX300		–		300	2.400	9.600
	3 x 25	V	9B325VLOX		9325VLOX		1.000	4.000	16.000
	3 x 30	V	9B330VLOX300		–		300	1.200	4.800
	3 x 30	V	9B330VLOX		9330VLOX		1.000	4.000	8.000
	3 x 35 / 20	20	–		9335VLOXP		1.000	4.000	8.000
	3,5 x 13*	V	9B3513VLOX		93513VLOX		1.000	8.000	32.000
	3,5 x 15*	V	9B3515VLOX		93515VLOX		1.000	4.000	16.000
	3,5 x 17*	V	9B3517VLOX		93517VLOX		1.000	4.000	16.000
	3,5 x 20	V	9B3520VLOX		93520VLOX		1.000	4.000	16.000
Internal underhead milling pockets	3,5 x 25	V	9B3525VLOX300		–		300	1.200	4.800
	3,5 x 25	V	9B3525VLOX		93525VLOX		1.000	4.000	8.000
	3,5 x 30	V	9B3530VLOX200		–		200	800	3.200
	3,5 x 30	V	9B3530VLOX		93530VLOX		1.000	4.000	8.000
	3,5 x 35	V	9B3535VLOX200		–		200	800	3.200
	3,5 x 35	V	9B3535VLOX		93535VLOX		500	2.000	8.000
	3,5 x 35 / 20	20	9B3535VLOXP		93535VLOXP		500	2.000	8.000
	3,5 x 40 / 25	25	9B3540VLOXP200		–		200	800	3.200
	3,5 x 40 / 25	25	9B3540VLOXP		93540VLOXP		500	2.000	4.000
	3,5 x 45 / 30	30	9B3545VLOXP200		–		200	800	3.200
	3,5 x 45 / 30	30	9B3545VLOXP		93545VLOXP		500	2.000	4.000
	3,5 x 50 / 30	30	9B3550VLOXP200		–		200	800	3.200
	3,5 x 50 / 30	30	9B3550VLOXP		93550VLOXP		500	2.000	4.000

V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

* Not part of the approval



VELOX® Pozi



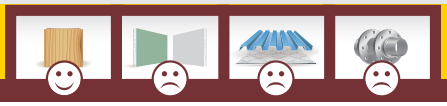
European Technical Approval
For use in timber constructions

VELOX® Pozi						Packing		
Type	L_{TH} [mm]	Yellow zinc plated Art-No	€/100 pcs	Blue zinc plated Art-No	€/100 pcs	[pcs]	[pcs]	[pcs]
4x17*	V	9B417VLOX		9417VLOX		1.000	4.000	16.000
4x20*	V	9B420VLOX200		–		200	800	3.200
4x20*	V	9B420VLOX		9420VLOX		1.000	4.000	8.000
4x25	V	9B425VLOX200		–		200	800	3.200
4x25	V	9B425VLOX		9425VLOX		1.000	4.000	8.000
4x30	V	9B430VLOX200		–		200	800	3.200
4x30	V	9B430VLOX		9430VLOX		500	2.000	8.000
4x35	V	9B435VLOX200		–		200	800	3.200
4x35	V	9B435VLOX		9435VLOX		500	2.000	4.000
4x40/25	25	9B440VLOXP200		–		200	800	3.200
4x40/25	25	9B440VLOXP		9440VLOXP		500	2.000	4.000
4x40	V	9B440VLOX200		–		200	800	3.200
4x40	V	9B440VLOX		9440VLOX		500	2.000	4.000
4x45/30	30	9B445VLOXP200		–		200	800	3.200
4x45/30	30	9B445VLOXP		9445VLOXP		500	2.000	4.000
4x45	V	9B445VLOX200		–		200	800	3.200
4x45	V	9B445VLOX		9445VLOX		500	2.000	4.000
4x50/30	30	9B450VLOXP200		–		200	800	3.200
4x50/30	30	9B450VLOXP		9450VLOXP		500	2.000	4.000
4x50	V	9B450VLOX200		–		200	800	3.200
4x50	V	9B450VLOX		9450VLOX		500	2.000	4.000
4x60/35	35	9B460VLOXP		9460VLOXP		250	1.000	2.000
4x60	V	9B460VLOX		9460VLOX		250	1.000	2.000
4x70/40	40	9B470VLOXP		9470VLOXP		200	800	1.600
4,5x30	V	9B4530VLOX200		–		200	800	3.200
4,5x30	V	9B4530VLOX		94530VLOX		500	2.000	4.000
4,5x35	V	9B4535VLOX200		–		200	800	3.200
4,5x35	V	9B4535VLOX		94535VLOX		500	2.000	4.000
4,5x40/25	25	9B4540VLOXP200		–		200	800	3.200
4,5x40/25	25	9B4540VLOXP		94540VLOXP		500	2.000	4.000
4,5x40	V	9B4540VLOX200		–		200	800	3.200
4,5x40	V	9B4540VLOX		94540VLOX		500	2.000	4.000
4,5x45/30	30	9B4545VLOXP		94545VLOXP		250	1.000	2.000
4,5x45	V	9B4545VLOX		94545VLOX		250	1.000	2.000
4,5x50/30	30	9B4550VLOXP		94550VLOXP		250	1.000	2.000
4,5x50	V	9B4550VLOX		94550VLOX		250	1.000	2.000
4,5x60/35	35	9B4560VLOXP		94560VLOXP		250	1.000	2.000
4,5x70/40	40	9B4570VLOXP		94570VLOXP		200	800	1.600
4,5x80/50	50	9B4580VLOXP		94580VLOXP		100	400	800
5x30	V	9B530VLOX		9530VLOX		250	1.000	4.000
5x35	V	9B535VLOX		9535VLOX		250	1.000	4.000
5x40/25	25	9B540VLOXP		9540VLOXP		500	2.000	4.000
5x45/30	30	9B545VLOXP		9545VLOXP		250	1.000	2.000
5x50/30	30	9B550VLOXP		9550VLOXP		250	1.000	2.000
5x50	V	9B550VLOX		9550VLOX		250	1.000	2.000
5x60/35	35	9B560VLOXP		9560VLOXP		250	1.000	2.000
5x60	V	9B560VLOX		9560VLOX		250	1.000	2.000
5x70/40	40	9B570VLOXP		9570VLOXP		200	800	1.600
5x70	V	9B570VLOX		9570VLOX		200	800	1.600
5x80/50	50	9B580VLOXP		9580VLOXP		100	400	800
5x80	V	9B580VLOX		9580VLOX		100	400	800
5x90/60	60	9B590VLOXP		9590VLOXP		100	400	800
5x100/60	60	9B5100VLOXP		95100VLOXP		50	200	400

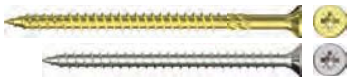
Internal underhead milling pockets

V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

* Not part of the approval



VELOX® Pozi



European Technical Approval
For use in timber constructions

VELOX® Pozi						Packing		
	Type	L_{TH} [mm]	Yellow zinc plated Art-No	€/100 pcs	Blue zinc plated Art-No	€/100 pcs	[pcs]	[pcs]	[pcs]
External underhead milling ribs	6 x 40	V	9B640VLOX		–		250	1.000	2.000
	6 x 50 / 30	30	9B650VLOXP		–		250	1.000	2.000
	6 x 50	V	9B650VLOX		–		250	1.000	2.000
	6 x 60 / 35	35	9B660VLOXP		–		200	800	1.600
	6 x 60	V	9B660VLOX		–		200	800	1.600
	6 x 70 / 40	40	9B670VLOXP		–		100	400	800
	6 x 70	V	9B670VLOX		–		100	400	800
	6 x 80 / 50	50	9B680VLOXP		–		100	400	800
	6 x 80	V	9B680VLOX		–		100	400	800
	6 x 90 / 60	60	9B690VLOXP		–		50	200	400
	6 x 100 / 60	60	9B6100VLOXP		–		50	200	400
	6 x 120 / 70	70	9B6120VLOXP		–		100	–	800
	6 x 140 / 70	70	9B6140VLOXP		–		100	–	800
	6 x 160 / 70	70	9B6160VLOXP		–		100	–	400
	6 x 180 / 70	70	9B6180VLOXP		–		100	–	400
	6 x 200 / 70	70	9B6200VLOXP		–		100	–	400
	6 x 220 / 70	70	9B6220VLOXP		–		100	–	400

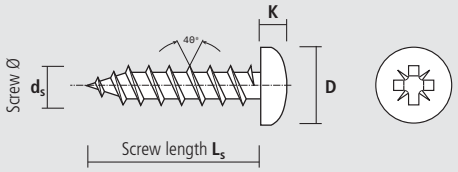
V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

VELOX® B

European Technical Approval
For use in timber constructions

Advantages

- Patented tip thread area reduces splitting as well as setting torque, which provides a perfect appearance and a longer battery life
- Approved product for your safety
- Pan Head



d_s	[mm]	3	3,5	4	4,5	5
D	[mm]	6	7	8	9	9,5
K	[mm]	2,25	2,60	2,80	3,0	3,3
Recess		PZ 1	PZ 2	PZ 2	PZ 2	PZ 3

VELOX® B zinc plated			Price	Packing		
Type	L_{TH} [mm]	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
3 x 15	V	9315VLOXB		1.000	4.000	16.000
3 x 20	V	9320VLOXB		1.000	4.000	16.000
3,5 x 20	V	93520VLOXB		1.000	4.000	8.000
3,5 x 25	V	93525VLOXB		1.000	4.000	8.000
3,5 x 30	V	93530VLOXB		1.000	4.000	8.000
3,5 x 35	V	93535VLOXB		500	2.000	4.000
3,5 x 40	V	93540VLOXB		500	2.000	4.000
4 x 15*	V	9415VLOXB		1.000	4.000	16.000
4 x 20	V	9420VLOXB		1.000	4.000	8.000
4 x 30	V	9430VLOXB		500	2.000	8.000
4 x 35	V	9435VLOXB		500	2.000	4.000
4 x 40	V	9440VLOXB		500	2.000	4.000
4 x 50	V	9450VLOXB		250	1.000	2.000
4 x 60	V	9460VLOXB		250	1.000	2.000
4,5 x 30	V	94530VLOXB		500	2.000	4.000
4,5 x 35	V	94535VLOXB		500	2.000	4.000
4,5 x 40	V	94540VLOXB		500	2.000	4.000
4,5 x 45	V	94545VLOXB		250	1.000	2.000
4,5 x 50	V	94550VLOXB		250	1.000	2.000
5 x 25	V	9525VLOXB		500	2.000	4.000
5 x 30	V	9530VLOXB		250	1.000	4.000
5 x 35	V	9535VLOXB		250	1.000	4.000
5 x 40	V	9540VLOXB		250	1.000	2.000

V = full thread

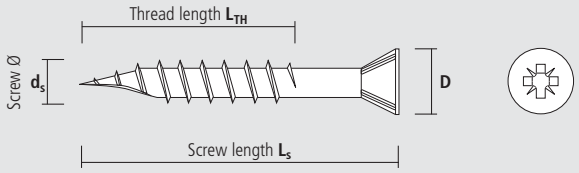
* Not part of the approval

VELOX® Quick

European Technical Approval
For use in timber constructions

Advantages

- Sharp cutting tip for low splitting tendency and therefore small edge distance
- Designed especially for work with MDF boards
- Approved product for your safety



d_s	[mm]	3,5	4
D	[mm]	6	7
Recess		PZ 2	PZ 2

VELOX® Quick zinc plated			**Price**	**Packing**		
Type	L_{TH} [mm]	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
3,5 x 50	38	93550VLOXQ		500	2.000	4.000
4 x 30	V	9430VLOXQ		500	2.000	8.000
4 x 40	29	9440VLOXQ		500	2.000	4.000
4 x 45	32	9445VLOXQ		500	2.000	4.000
4 x 50	35	9450VLOXQ		500	2.000	4.000
4 x 60	44	9460VLOXQ		250	1.000	2.000

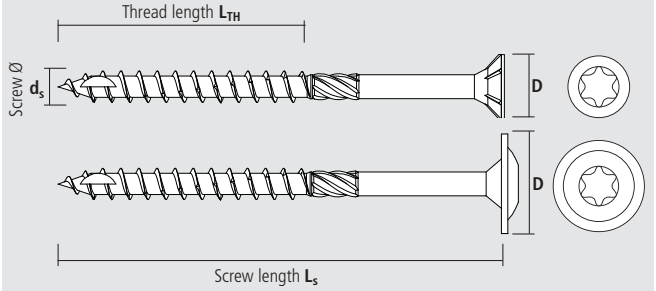
V = full thread; values indicate thread length L_{TH} (in mm) for screws with partial thread

Construction screw BMax

European Technical Approval
For use in timber construction

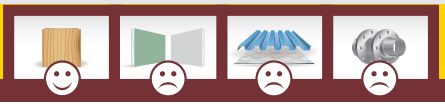
Advantages

- ETA approval for highest requirements and constant quality
- Flush finishing in wood due to external underhead milling ribs
- Special notch tip for quick bite without splitting
- Shank cutter reduces the setting torque and increases the battery life (especially for long screws)
- Wafer head screw for a better contact pressure (bigger contact area on boards)
- See new screw design software at: www.apolofixing.com



Ø8: Shank cutter and notch tip for all lengths
Ø10: Shank cutter and notch tip for all lengths

BMax countersunk screw, zinc plated							Price	Packing	
Type	Art-No	d_s [mm]	L_s [mm]	L_{TH} [mm]	D [mm]	Recess	€ / 100 pcs	[pcs]	[pcs]
8 x 80	9880BMP	8	80	52	15,0	TX 40		50	800
8 x 100	98100BMP	8	100	52	15,0	TX 40		50	800
8 x 120	98120BMP	8	120	52	15,0	TX 40		50	600
8 x 140	98140BMP	8	140	80	15,0	TX 40		50	600
8 x 160	98160BMP	8	160	80	15,0	TX 40		50	400
8 x 180	98180BMP	8	180	80	15,0	TX 40		50	400
8 x 200	98200BMP	8	200	80	15,0	TX 40		50	400
8 x 220	98220BMP	8	220	100	15,0	TX 40		50	400
8 x 240	98240BMP	8	240	100	15,0	TX 40		50	300
8 x 260	98260BMP	8	260	100	15,0	TX 40		50	300
8 x 280	98280BMP	8	280	100	15,0	TX 40		50	300
8 x 300	98300BMP	8	300	100	15,0	TX 40		50	300
8 x 320	98320BMP	8	320	100	15,0	TX 40		50	300
8 x 340	98340BMP	8	340	100	15,0	TX 40		50	300
8 x 360	98360BMP	8	360	100	15,0	TX 40		50	200
8 x 380	98380BMP	8	380	100	15,0	TX 40		50	200
8 x 400	98400BMP	8	400	100	15,0	TX 40		50	200
10 x 80	91080BMP	10	80	52	18,5	TX 50		50	800
10 x 100	910100BMP	10	100	52	18,5	TX 50		50	800
10 x 120	910120BMP	10	120	52	18,5	TX 50		50	600
10 x 140	910140BMP	10	140	80	18,5	TX 50		50	600
10 x 160	910160BMP	10	160	80	18,5	TX 50		50	400
10 x 180	910180BMP	10	180	80	18,5	TX 50		50	400
10 x 200	910200BMP	10	200	80	18,5	TX 50		50	400
10 x 220	910220BMP	10	220	100	18,5	TX 50		50	400
10 x 240	910240BMP	10	240	100	18,5	TX 50		50	300
10 x 260	910260BMP	10	260	100	18,5	TX 50		50	300
10 x 280	910280BMP	10	280	100	18,5	TX 50		50	300
10 x 300	910300BMP	10	300	100	18,5	TX 50		50	300
10 x 320	910320BMP	10	320	100	18,5	TX 50		50	300
10 x 340	910340BMP	10	340	100	18,5	TX 50		50	300
10 x 360	910360BMP	10	360	100	18,5	TX 50		50	200
10 x 380	910380BMP	10	380	100	18,5	TX 50		50	200
10 x 400	910400BMP	10	400	100	18,5	TX 50		50	200



Construction screw BMax

BMax wafer head screw, zinc plated							Price	Packing	
Type	Art-No	d_s [mm]	L_s [mm]	L_{TH} [mm]	D [mm]	Recess	€ / 100 pcs	[pcs]	[pcs]
8 x 80	9880BMLP	8	80	52	22,0	TX 40		50	800
8 x 100	98100BMLP	8	100	52	22,0	TX 40		50	600
8 x 120	98120BMLP	8	120	52	22,0	TX 40		50	600
8 x 140	98140BMLP	8	140	80	22,0	TX 40		50	400
8 x 160	98160BMLP	8	160	80	22,0	TX 40		50	400
8 x 180	98180BMLP	8	180	80	22,0	TX 40		50	400
8 x 200	98200BMLP	8	200	80	22,0	TX 40		50	400
8 x 220	98220BMLP	8	220	100	22,0	TX 40		50	400
8 x 240	98240BMLP	8	240	100	22,0	TX 40		50	300
8 x 260	98260BMLP	8	260	100	22,0	TX 40		50	300
8 x 280	98280BMLP	8	280	100	22,0	TX 40		50	300
8 x 300	98300BMLP	8	300	100	22,0	TX 40		50	300
8 x 320	98320BMLP	8	320	100	22,0	TX 40		50	300
8 x 340	98340BMLP	8	340	100	22,0	TX 40		50	200
8 x 360	98360BMLP	8	360	100	22,0	TX 40		50	200
8 x 380	98380BMLP	8	380	100	22,0	TX 40		50	200
8 x 400	98400BMLP	8	400	100	22,0	TX 40		50	200
10 x 80	91080BMLP	10	80	52	25,0	TX 50		50	600
10 x 100	910100BMLP	10	100	52	25,0	TX 50		50	400
10 x 120	910120BMLP	10	120	52	25,0	TX 50		50	400
10 x 140	910140BMLP	10	140	80	25,0	TX 50		50	400
10 x 160	910160BMLP	10	160	80	25,0	TX 50		50	400
10 x 180	910180BMLP	10	180	80	25,0	TX 50		50	300
10 x 200	910200BMLP	10	200	80	25,0	TX 50		50	300
10 x 220	910220BMLP	10	220	100	25,0	TX 50		50	300
10 x 240	910240BMLP	10	240	100	25,0	TX 50		50	300
10 x 260	910260BMLP	10	260	100	25,0	TX 50		50	300
10 x 280	910280BMLP	10	280	100	25,0	TX 50		50	300
10 x 300	910300BMLP	10	300	100	25,0	TX 50		50	200
10 x 320	910320BMLP	10	320	100	25,0	TX 50		50	200
10 x 340	910340BMLP	10	340	100	25,0	TX 50		50	-
10 x 360	910360BMLP	10	360	100	25,0	TX 50		50	-
10 x 380	910380BMLP	10	380	100	25,0	TX 50		50	-
10 x 400	910400BMLP	10	400	100	25,0	TX 50		50	-

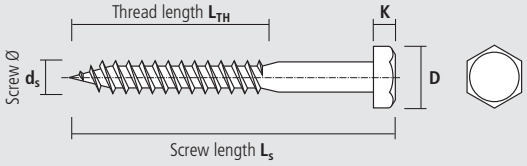
Wood screw DIN 571

Advantages

- Classic wood screw, manufactured in accordance with DIN 571
- Especially well-suited for nylon plugs

Suitable for

✔ Wood
✔ Nylon plugs



d_s	[mm]	6	8	10
D	[mm]	10	13	17
K	[mm]	4	5,85	7
Drive		SW 10	SW 13	SW 17

DIN 571 zinc plated			Price	Packing		
Type $d_s \times L_s$	Min. L_{TH} [mm]	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
6 x 30	18	9630571		250	1.000	4.000
6 x 40	24	9640571		250	1.000	2.000
6 x 50	30	9650571		250	1.000	2.000
6 x 60	36	9660571		100	400	800
6 x 70	42	9670571		100	400	800
6 x 80	48	9680571		100	400	800
6 x 100	60	96100571		200	–	800
8 x 40	24	9840571		200	800	1.600
8 x 50	30	9850571		250	–	1.000
8 x 60	36	9860571		250	–	1.000
8 x 70	42	9870571		200	–	800
8 x 80	48	9880571		100	–	400
8 x 90	54	9890571		100	–	400
8 x 100	60	98100571		100	–	400
8 x 120	72	98120571		100	–	400
8 x 140	84	98140571		100	–	400
8 x 150	90	98150571		100	–	400
10 x 50	30	91050571		200	–	800
10 x 60	36	91060571		100	–	400
10 x 70	42	91070571		100	–	400
10 x 80	48	91080571		100	–	400
10 x 90	54	91090571		100	–	400
10 x 100	60	910100571		100	–	400
10 x 120	72	910120571		50	–	200
10 x 140	84	910140571		50	–	200
10 x 160	102	910160571		50	–	200
10 x 180	110	910180571		50	–	200

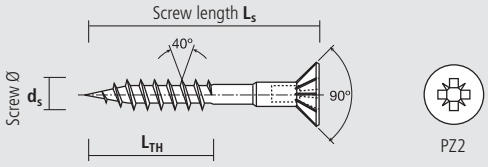
NICE

Advantages

- Head hole allows cover cap placement
- Blue zinc-coated
- Matching cover caps in assorted colours

Suitable building materials

✔ Chipboard
✔ MDF boards
✔ Solid wood



Head hole: Ø 2,5 mm

NICE zinc plated			Price	Packing		
Type $d_s \times L_s$	L_{TH} [mm]	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
4,5 x 30	19	94530NICE		500	2.000	4.000
4,5 x 40	24	94540NICE		500	2.000	4.000
4,5 x 50	30	94550NICE		250	1.000	2.000
4,5 x 60	35	94560NICE		250	1.000	2.000
4,5 x 70	40	94570NICE		200	800	1.600
5 x 40	24	9540NICE		500	2.000	4.000
5 x 50	30	9550NICE		250	1.000	2.000
5 x 60	35	9560NICE		250	1.000	2.000
5 x 70	40	9570NICE		200	800	1.600
5 x 90	54	9590NICE		100	400	800

ÜK Nice plastic cap with crown Ø 13 mm		Price	Packing		
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
white	91NICEB		1.000	4.000	8.000
black	94NICEB		1.000	4.000	8.000

AK Nice plastic cap Ø 13 mm		Price	Packing		
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]	[pcs]
white	91NICEN		1.000	4.000	16.000
black	94NICEN		1.000	4.000	16.000
brown	9MNICEN		1.000	4.000	16.000
dark brown	9MONICEN		1.000	4.000	16.000
grey	9GRNICEN		1.000	4.000	16.000

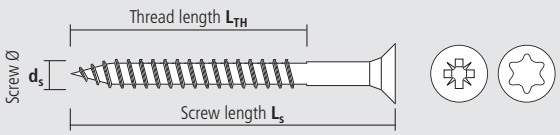
Standard chipboard screw SPS

Advantages

- Chipboard screws with a good price-performance ratio
- Without aggressive thread, therefore also very suitable as plug screw
- Coating reduces setting torque

Suitable building materials

✔ Soft and hard wood (hard wood: with pre-drilling)
✔ Chipboard
✔ MDF boards

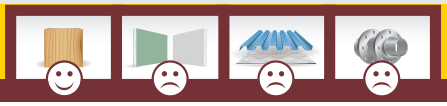


Partial thread T: $L_{TH} = 2/3 \times L_s$ for $L_s \leq 100$ mm, $L_{TH} = 72$ mm for $L_s > 100$ mm

d_s [mm]	3	3,5	4	4,5	5	6
Recess	PZ1 / TX10	PZ2 / TX10	PZ2 / TX20	PZ2 / TX25	PZ3 / TX25	PZ3 / TX30

SPS, Pozidriv yellow zinc plated and coated			Price	Packing	
Type $d_s \times L_s$	Thread [V/T]	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,0 x 12	V	9B312SPS		1.000	30.000
3,0 x 16	V	9B316SPS		1.000	30.000
3,0 x 20	V	9B320SPS		1.000	24.000
3,0 x 25	V	9B325SPS		1.000	16.000
3,0 x 30	V	9B330SPS		1.000	16.000
3,0 x 35	V	9B335SPS		1.000	16.000
3,0 x 40	V	9B340SPS		1.000	12.000
3,5 x 16*	V	9B3516SPS		1.000	24.000
3,5 x 20*	V	9B3520SPS		1.000	24.000
3,5 x 25	T	9B3525SPS		1.000	16.000
3,5 x 30	T	9B3530SPS		1.000	16.000
3,5 x 35	T	9B3535SPS		1.000	16.000
3,5 x 40	T	9B3540SPS		1.000	12.000
3,5 x 45	T	9B3545SPS		1.000	8.000
3,5 x 50	T	9B3550SPS		500	8.000
4,0 x 20	V	9B420SPS		1.000	16.000
4,0 x 25	V	9B425SPS		1.000	16.000
4,0 x 30	T	9B430SPS		1.000	12.000
4,0 x 35	T	9B435SPS		1.000	12.000
4,0 x 40	T	9B440SPS		1.000	8.000
4,0 x 45	T	9B445SPS		500	8.000
4,0 x 50	T	9B450SPS		500	6.000
4,0 x 60	T	9B460SPS		500	4.000
4,0 x 70	T	9B470SPS		500	4.000

V = full thread, T = partial thread
*Blue zinc plated, coated



Standard chipboard screw SPS

SPS, Pozidriv yellow zinc plated and coated			Price	Packing	
Type $d_s \times L_s$	Thread [V/T]	Art-No	€/ 100 pcs	[pcs]	[pcs]
4,5 x 25	V	9B4525SPS		1.000	12.000
4,5 x 30	V	9B4530SPS		1.000	12.000
4,5 x 35	V	9B4535SPS		500	8.000
4,5 x 40	T	9B4540SPS		500	6.000
4,5 x 45	T	9B4545SPS		500	6.000
4,5 x 50	T	9B4550SPS		500	6.000
4,5 x 60	T	9B4560SPS		500	4.000
4,5 x 70	T	9B4570SPS		500	4.000
4,5 x 80	T	9B4580SPS		200	2.400
5,0 x 40	T	9B540SPS		500	6.000
5,0 x 50	T	9B550SPS		500	4.000
5,0 x 60	T	9B560SPS		500	4.000
5,0 x 70	T	9B570SPS		200	2.400
5,0 x 80	T	9B580SPS		200	2.400
5,0 x 90	T	9B590SPS		200	1.600
5,0 x 100	T	9B5100SPS		200	1.600
5,0 x 110	T	9B5110SPS		200	1.600
5,0 x 120	T	9B5120SPS		200	1.600
6,0 x 60	T	9B660SPS		200	2.400
6,0 x 70	T	9B670SPS		200	1.600
6,0 x 80	T	9B680SPS		200	1.600
6,0 x 90	T	9B690SPS		200	1.600
6,0 x 100	T	9B6100SPS		100	1.600
6,0 x 120	T	9B6120SPS		100	1.200

V = full thread, T = partial thread

SPS, TX yellow zinc plated and coated			Price	Packing	
Type $d_s \times L_s$	Thread [V/T]	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,0 x 12	V	9B312SPST		1.000	30.000
3,0 x 16	V	9B316SPST		1.000	30.000
3,0 x 20	V	9B320SPST		1.000	24.000
3,0 x 25	V	9B325SPST		1.000	16.000
3,0 x 30	V	9B330SPST		1.000	16.000
3,0 x 35	T	9B335SPST		1.000	16.000
3,0 x 40	T	9B340SPST		1.000	12.000
3,5 x 16*	V	9B3516SPST		1.000	24.000
3,5 x 20*	V	9B3520SPST		1.000	24.000
3,5 x 25	T	9B3525SPST		1.000	16.000
3,5 x 30	T	9B3530SPST		1.000	16.000
3,5 x 35	T	9B3535SPST		1.000	16.000
3,5 x 40	T	9B3540SPST		1.000	12.000
3,5 x 45	T	9B3545SPST		1.000	8.000
3,5 x 50	T	9B3550SPST		500	8.000

V = full thread, T = partial thread
*Blue zinc plated, coated

Standard chipboard screw SPS

SPS, TX yellow zinc plated and coated			Price	Packing	
Type $d_s \times L_s$	Thread [V/T]	Art-No	€/ 100 pcs	[pcs]	[pcs]
4,0 x 20	V	9B420SPST		1.000	16.000
4,0 x 25	T	9B425SPST		1.000	16.000
4,0 x 30	T	9B430SPST		1.000	12.000
4,0 x 35	T	9B435SPST		1.000	12.000
4,0 x 40	T	9B440SPST		1.000	8.000
4,0 x 45	T	9B445SPST		500	8.000
4,0 x 50	T	9B450SPST		500	6.000
4,0 x 60	T	9B460SPST		500	4.000
4,0 x 70	T	9B470SPST		500	4.000
4,5 x 30	T	9B4530SPST		1.000	12.000
4,5 x 35	T	9B4535SPST		500	8.000
4,5 x 40	T	9B4540SPST		500	6.000
4,5 x 45	T	9B4545SPST		500	6.000
4,5 x 50	T	9B4550SPST		500	6.000
4,5 x 60	T	9B4560SPST		500	4.000
4,5 x 70	T	9B4570SPST		500	4.000
4,5 x 80	T	9B4580SPST		200	2400
5,0 x 40	T	9B540SPST		500	6.000
5,0 x 45	T	9B545SPST		500	4.000
5,0 x 50	T	9B550SPST		500	4.000
5,0 x 60	T	9B560SPST		500	4.000
5,0 x 70	T	9B570SPST		200	2.400
5,0 x 80	T	9B580SPST		200	2.400
5,0 x 90	T	9B590SPST		200	1.600
5,0 x 100	T	9B5100SPST		200	1.600
5,0 x 110	T	9B5110SPST		200	1.600
5,0 x 120	T	9B5120SPST		200	1.600
6,0 x 50	T	9B650SPST		200	2.400
6,0 x 60	T	9B660SPST		200	2.400
6,0 x 70	T	9B670SPST		200	1.600
6,0 x 80	T	9B680SPST		200	1.600
6,0 x 90	T	9B690SPST		200	1.600
6,0 x 100	T	9B6100SPST		100	1.600
6,0 x 120	T	9B6120SPST		100	1.200
6,0 x 130	T	9B6130SPST		100	1.200
6,0 x 140	T	9B6140SPST		100	800
6,0 x 150	T	9B6150SPST		100	800
6,0 x 160	T	9B6160SPST		100	800
6,0 x 180	T	9B6180SPST		100	800
6,0 x 200	T	9B6200SPST		100	800

V = full thread, T = partial thread

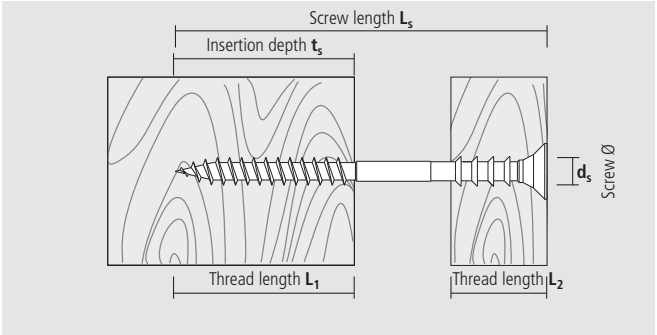
Adjustment screw JS

Advantages

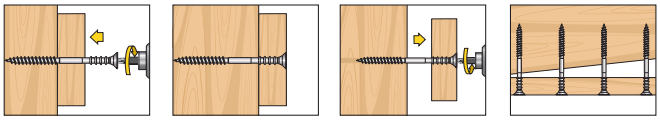
- Suitable for the adjustment of substructures of wooden battens
- Easy and variable alignment of battens to the desired spacing
- Can also be used in combination with plugs (for example F, FX, MZK, etc.)
- Underhead milling ribs for flush finishing in wood

Suitable for

✔ Nylon plugs
✔ Wood



Mounting



JS zinc plated, TX25							Price	Packing	
Type $d_s \times L_s$	Art-No	d_s [mm]	L_s [mm]	t_s [mm]	L_1 [mm]	L_2 [mm]	€/ 100 pcs	[pcs]	[pcs]
6 x 60	9B660JS	6	60	40	30	20		100	2.000
6 x 70	9B670JS	6	70	40	40	25		100	1.600
6 x 80	9B680JS	6	80	40	50	25		100	1.500
6 x 100	9B6100JS	6	100	40	60	25		100	1.000
6 x 120	9B6120JS	6	120	40	80	25		100	800
6 x 145	9B6145JS	6	145	40	80	25		100	600

During the year 2017 partial deliveries of yellow zinc plated JS screw might be possible.

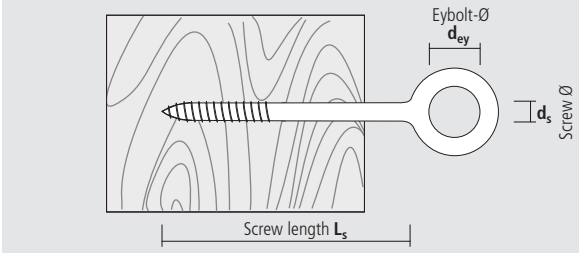
Eyebolt screw OES

Advantages

- The scaffold plug GR (see page 25) matches optimally with the eybolt screw OES for high load values
- Markings on the eyebolt screw facilitate controlled screwing-in
- The eyebolt can also be screwed directly into wood

Suitable for

✔ Scaffold plugs GR (see page 25)
✔ Wood



OES zinc plated					Price	Packing	
Type d_s x L_s	Art-No	d_s [mm]	L_s [mm]	d_{ey} [mm]	€/ 100 pcs	[pcs]	[pcs]
12 x 90	91290OES	12	90	23		20	–
12 x 120	912120OES	12	120	23		20	–
12 x 160	912160OES	12	160	23		20	–
12 x 190	912190OES	12	190	23		20	–
12 x 230	912230OES	12	230	23		20	–
12 x 300	912300OES	12	300	23		20	–
12 x 350	912350OES	12	350	23		20	–

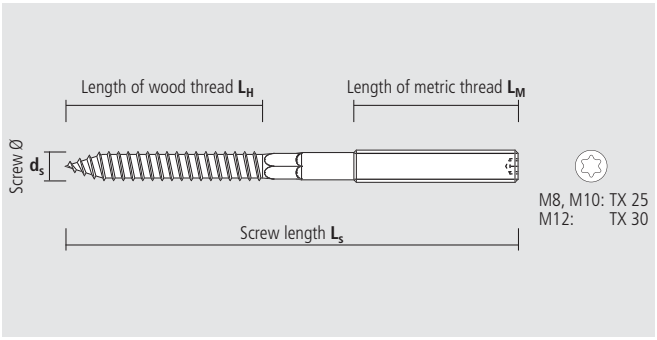
Hanger bolt EDR

Advantages

- Hanger bolts have a wooden thread on one side and a metric thread on the other
- Suitable for fixing directly into wood or in combination with plugs into other base materials
- For easy installation with external hex and TX recess

Suitable for

✔ Nylon plugs
✔ Wood



EDR zinc plated						Price	Packing	
Type $d_s \times L_s$	Art-No	d_s [mm]	L_s [mm]	L_H [mm]	L_M [mm]	€/ 100 pcs	[pcs]	[pcs]
M8 x 50	9850EDR	8	50	30	15		100	1.800
M8 x 60	9860EDR	8	60	30	20		100	1.800
M8 x 80	9880EDR	8	80	40	30		50	900
M8 x 100	98100EDR	8	100	45	40		50	900
M8 x 120	98120EDR	8	120	50	50		50	900
M10 x 80	91080EDR	10	80	40	30		50	600
M10 x 100	910100EDR	10	100	60	30		50	600
M10 x 120	910120EDR	10	120	60	40		50	600
M10 x 140	910140EDR	10	140	60	50		50	600
M12 x 125	912125EDR	12	125	60	40		50	250

Clamp attachment screw TF

Advantages

- Double pitch of thread provides quick screw-in
- Practical screw for comfortable fixing of clamps

Suitable for

✔ Wood
✔ Nylon plugs

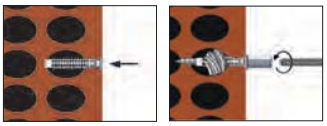
TF slotted, zinc plated, yellow pass.					Price	Packing	
Type	Art-No	Wood thread	Metric thread	Suitable for plug Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
M 6x30	9B630TF	5x30	M6	6		100	4.000
M 6x44	9B644TF	5x44	M6	6		100	1.800
M 8x30	9B830TF	6x30	M8	8		100	1.800
M 8x50	9B850TF	6x50	M8	8		100	1.800
M 10x50	9B1050TF	8x50	M10	10		50	900

Wood screw with internal thread Torab® P

Advantages

- Wood screw with internal thread M6 or M8 for e.g. threaded rods; nor further adaptors necessary
- Almost 50% less installation time necessary compared to oldernative methods
- Double thread for quick screwing in
- Perfect solution when combined with e.g. multi-purpose plug MZK, especially for perforated bricks, boards, etc.

Alternative method: 15 seconds



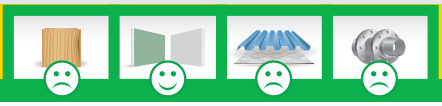
Torab® P: 8 seconds

Suitable for

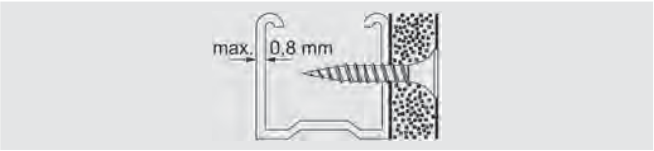
✔ Wood
✔ Nylon plugs

Torab® P zinc plated						Price	Packing	
Type	Art-No	Wood thread	Internal thread	Drive	Suitable for plug Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
Torab P M6	9635TRBP	4,5 x 35	M6	SW 10	6		100	900
Torab P M8	9845TRBP	5,5 x 45	M8	SW 10	8		50	450

Socket wrench for installing the Torab® P		Price	Packing	
Type	Art-No	€/ 1 pcs	[pc]	[pcs]
Socket wrench 10	910LLTRBCA		1	–

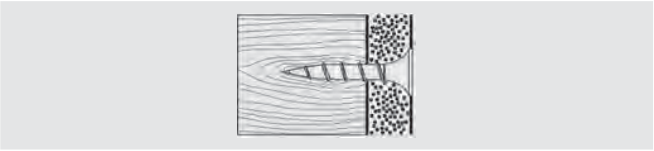


Fine thread screw SSF

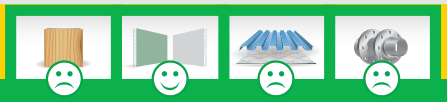


SSF PH 2		**Price**	**Packing**	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,5x25	9F3525SSF		1.000	16.000
3,5x35	9F3535SSF		1.000	12.000
3,5x45	9F3545SSF		500	6.000
3,5x55	9F3555SSF		500	6.000
3,9x25	9F3925SSF250		250	8.000
3,9x25	9F3925SSF		1.000	16.000
3,9x35	9F3935SSF250		250	8.000
3,9x35	9F3935SSF		1.000	12.000
3,9x45	9F3945SSF100		100	3.200
3,9x45	9F3945SSF		500	6.000
3,9x55	9F3955SSF100		100	3.200
3,9x55	9F3955SSF		500	6.000
3,9x65	9F3965SSF100		100	3.200
3,9x65	9F3965SSF		500	4.000
4,2x75	9F4275SSF		200	3.200
5,0x90	9F590SSF		200	2.400

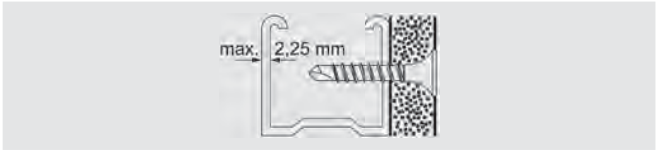
Coarse thread screw SSG



SSG PH 2		**Price**	**Packing**	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,9x25	9F3925SSG250		250	8.000
3,9x25	9F3925SSG		1.000	16.000
3,9x35	9F3935SSG250		250	8.000
3,9x35	9F3935SSG		1.000	12.000
3,9x45	9F3945SSG100		100	3.200
3,9x45	9F3945SSG		500	6.000
3,9x55	9F3955SSG100		100	3.200
3,9x55	9F3955SSG		500	6.000
4,2x75	9F4275SSG		200	3.200
5,0x90	9F590SSG		200	3.000

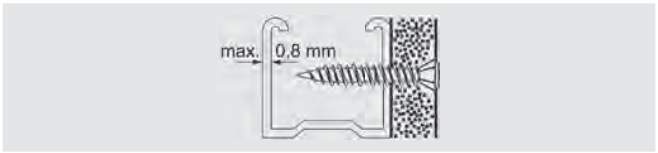


Drill point screw SSB



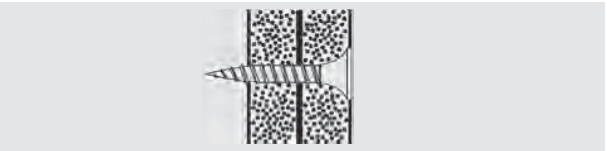
SSB PH 2		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,5 x 25	9F3525SSB		1.000	16.000
3,5 x 35	9F3535SSB		1.000	12.000
3,5 x 45	9F3545SSB		500	6.000
3,5 x 55	9F3555SSB		500	6.000

Fibreboard screw GSH



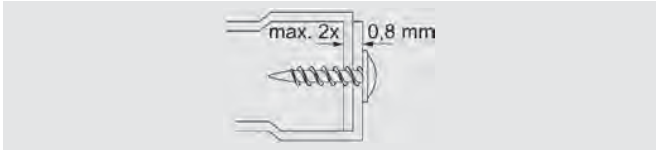
GSH PH 2		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
3,9 x 19	9F3919GSH		1.000	16.000
3,9 x 22	9F3922GSH		1.000	16.000
3,9 x 30	9F3930GSH		1.000	16.000
3,9 x 35	9F3935GSH		500	6.000
3,9 x 45	9F3945GSH		500	6.000
3,9 x 55	9F3955GSH		500	6.000
3,9 x 65	9F3965GSH		500	4.000

Drywall-to-drywall screw GGS



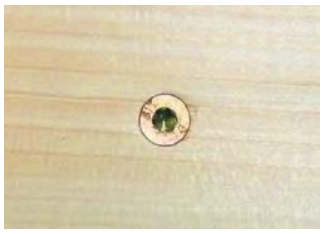
GGS PH 2		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
5,0 x 38	9F538GGS		500	6.000

Metal framing screw PVS



PVS PH 2		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
4,2 x 13	94213PVS		1.000	24.000

Self-adhesive PVC cover Magic Tap


before


after

Advantages

- Nearly invisible
- Extreme adhesive strength on wood veneer and smooth surfaces
- Permanently durable material, water resistant
- Matches all countersunk screws
- 14 colours

Magic Tap in blister				Price	Packing	
Type	Art-No	Colour*	Ø [mm]	€ / Blister	[pcs]	[Blister]
Magic Tap white	51MT20		13		20	10
Magic Tap beech tree	5HMT20		13		20	10
Magic Tap grey	5GRMT20		13		20	10
Magic Tap grained white	5WPMT20		13		20	10
Magic Tap black	54MT20		13		20	10
Magic Tap oak tree	5ROMT20		13		20	10
Magic Tap cherry tree	5CMT20		13		20	10
Magic Tap pine tree	5PIMT20		13		20	10
Magic Tap sapely	5SMT20		13		20	10
Magic Tap maple	5MAMT20		13		20	10
Magic Tap beige	5BEMT20		13		20	10
Magic Tap wengue	5WEMT20		13		20	10
Magic Tap walnut tree	5NOMT20		13		20	10
Magic Tap aluminum	5ALMT20		13		20	10

* Minor deviations of the colour possible

Magic Tap in box				Price	Packing	
Type	Art-No	Colour*	Ø [mm]	€ / 100 pcs	[pcs]	[pcs]
Magic Tap white	91MT		13		1.000	16.000
Magic Tap beech tree	9HMT		13		1.000	16.000
Magic Tap grey	9GRMT		13		1.000	16.000
Magic Tap grained white	9WPMT		13		1.000	16.000
Magic Tap black	94MT		13		1.000	16.000
Magic Tap oak tree	9ROMT		13		1.000	16.000
Magic Tap cherry tree	9CMT		13		1.000	16.000
Magic Tap pine tree	9PIMT		13		1.000	16.000
Magic Tap sapely	9SMT		13		1.000	16.000
Magic Tap maple	9MAMT		13		1.000	16.000
Magic Tap beige	9BEMT		13		1.000	16.000
Magic Tap wengue	9WEMT		13		1.000	16.000
Magic Tap walnut tree	9NOMT		13		1.000	16.000
Magic Tap aluminum	9ALMT		13		1.000	16.000

* Minor deviations of the colour possible

SIT®-Bits

Small pack

Craftsman pack

Advantages

- SIT®-Bit for chipboard screws VELOX® SIT (=AW recess from Würth)
- Significantly improved working comfort, because the screw easily gets stuck on the bit and cannot tumble
- Perfect power transfer due to conical form; the SIT®-Bit centers itself, the flanks also transfer high screw-in moments optimally
- Minimal wear and tear of the bit due to perfect fit between bit and screw
- Robust plastic box with EURO-punching

SIT®-Bit		Price		Packing	
Type	Art-No	€/ pc	€/ Blister	[pcs]	[Blister]
SIT 10 Small pack	7USIT10			2	10
SIT 20 Small pack	7USIT20			2	10
SIT 25 Small pack	7USIT25			2	10
SIT 30 Small pack	7USIT30			2	10
SIT 40 Small pack	7USIT40			2	10
SIT 10 Craftsman pack	9USIT10			10	10
SIT 20 Craftsman pack	9USIT20			10	10
SIT 25 Craftsman pack	9USIT25			10	10
SIT 30 Craftsman pack	9USIT30			10	10
SIT 40 Craftsman pack	9USIT40			10	10

Dispenser for Bits empty, 20 x 42 x 16 cm (W x H x D)		Price	Packing
Type	Art-No	€/ pc	[pcs]
Dispenser for Bits empty	9SURARPHO	on request	1

Other Bits


PH

Wera

PH-Bits 1/4" x 25		Price		Packing	
Type	Art-No	€/ pc	€/ Blister	[pcs]	[Blister]
PH 1	9UH1			10	–
PH 2	9UH2			10	–
PH 3	9UH3			10	–


PZ

Wera

PZ-Bits 1/4" x 25		Price		Packing	
Type	Art-No	€/ pc	€/ Blister	[pcs]	[Blister]
PZ 1	9UZ1			10	–
PZ 2	9UZ2			10	–
PZ 3	9UZ3			10	–


TX

Wera

TX-Bits 1/4" x 25		Price		Packing	
Type	Art-No	€/ pc	€/ Blister	[pcs]	[Blister]
TX 10	9UTX10			10	–
TX 15	9UTX15			10	–
TX 20	9UTX20			10	–
TX 25	9UTX25			10	–
TX 30	9UTX30			10	–
TX 40	9UTX40			10	–

Clamps Abranyl® multidiameter


AN


ABM


ABT

kiwa Partner for progress

RoHS

Advantages

- The clamps close automatically when the pipe is pushed in; you save time and money
- Installation with screws, nail plugs, Tacomax, or Insermax
- Approved by KIWA; clamp can be used for warm water pipes with temperatures up to 90°C
- High application reliability
- Black colour: UV-resistant

Mounting

Watch video at www.celo-apolo.de/en

Installation possibilities

Type	with plug and screw[1]	with profile[2]	with nailplug[3]	with Tacomax®	with Insermax®	with gas nailer	Notes
AN	●	●	●	–	–	–	Sold millions, well-accepted
ABM	●	●	○	●	●	–	Best clamp for any type of installation due to its versatility
ABT	○	●	–	–	–	●	Preferred clamp for larger projects; great speed of installation with gas nailer

● Very suitable ○ Suitable
[1] With plug Ø6 like FX 6, MZK 6 etc.
[2] Apolo profiles PVC 1000, E2000PG, E2000PB
[3] NP 5x35

Advantages

- Multidiameter; one clamp size covers two pipe diameters

AN "Classic"

Type	Art-No grey	Art-No black	Art-No white	Pipe Ø metric [mm]	Pipe Ø copper [mm]	Pipe Ø steel [inch]	Pipe Ø plastics [mm]	Recommended distance between clamps [m]	Price €/100 pcs	Packing [pcs]	Packing [pcs]
AN 12[1]	912AN	–	–	–	12	–	–	0,50		100	900
AN 14[1]	914AN	–	–	–	–	1/4"	–	0,50		100	900
AN 15-16	915AN	9415AN	9115AN	16	15	–	16	0,50		100	900
AN 18-20	918AN	9418AN	9118AN	20	18	3/8"	20	0,60		100	600
AN 22-25	922AN	9422AN	9122AN	25	22	1/2"	25	0,75		100	600
AN 26-28	926AN	–	9126AN	–	28	3/4"	–	0,75		100	600
AN 30-32	930AN	9430AN	9130AN	32	32	–	–	0,85		100	–
AN 35-40	935AN	9435AN	–	40	35	1"	40	1,00		100	–
AN 47-50	947AN	–	–	50	–	1–1/2"	50	1,10		50	–

[1] Not to be used in profiles

Clamps Abranyl® multidiameter

Advantages

- Multidiameter; one clamp size covers three pipe diameters
- Patented fastening system

ABM "Max"	Art-No			Pipe Ø				Price	Packing	
Type Ø	grey	black	white	metric [mm]	copper [mm]	steel [inch]	plastics [mm]	€/ 100 pcs	[pcs]	[pcs]
ABM 10/14	914ABM	–	–	–	10-12	1/8"-1/4"	–		100	900
ABM 14/18	918ABM	9418ABM	9118ABM	16	14-15-18	3/8"	16		100	900
ABM 20/25	925ABM	9425ABM	9125ABM	20-25	22	1/2"	20-25		50	450
ABM 25/32	932ABM	9432ABM	9132ABM	32	28	3/4"	32		100	–
ABM 35/42	942ABM	9442ABM	9142ABM	40	35-42	1"-1/4"	40-42		100	–

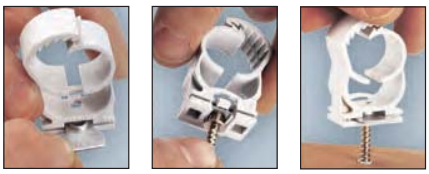
TACOMAX®

INSERMAX®

Mounting

Application with Tacomax® Ø6

Application with M6-adapter Insermax®



TACOMAX®

INSERMAX®

Accessories for Abranyl® ABM "Max"	Art-No	Size [mm]	Price €/ 100 pcs	Packing [pcs]	[pcs]
TACOMAX®	9630TMX	6 x 30		200	1.800
INSERMAX®	96IMX	M6		100	4.000

Watch video at www.celo-apolo.de/en

Advantages

- Recommended for the usage of gas nailers
- Multidiameter; one clamp size covers three pipe diameters
- Patented fastening system

ABT	Art-No			Pipe Ø				Price	Packing	
Type Ø	grey	black	white	metric [mm]	copper [mm]	steel [inch]	plastics [mm]	€/ 100 pcs	[pcs]	[pcs]
ABT 14/18	918ABT	9418ABT	9118ABT	16	14-15-18	3/8"	16		100	600
ABT 20/25	925ABT	9425ABT	9125ABT	20-25	22	1/2"	20-25		50	450
ABT 25/32	932ABT	9432ABT	9132ABT	32	28	3/4"	32		50	300
ABT 35/42	942ABT	9442ABT	9142ABT	40	35-42	1"-1/4"	40-42		25	150

Multiclip MC

Advantages

- Inner hole 4.5mm
- Halogen-free
- Clamps can be locked into each other
- Marking nib eases orientation

MC grey				Price	Packing	
Type	Art-No	Pipe-Ø		€/ 100 pcs	[pcs]	[pcs]
		metric [mm]	copper [mm]			
MC 16	916MC	16	–		100	900
MC 18	918MC	–	18		100	900
MC 20	920MC	20	–		100	900
MC 22	922MC	–	22		100	1.000
MC 25	925MC	25	–		100	600
MC 32	932MC	32	–		50	450
MC 40	940MC	40	–		50	300

Clamp RI

IMPROVED

Advantages

- High strength due to double reinforcing ribs
- Thick EPDM inlay: (sound-) insulated
- Screws are impossible to lose
- Solid welding of the nut
- Nut with M8 and M10 thread for higher flexibility
- Temperature resistance: -50°C to +110 °C, suitable for hot water and heating pipes

RI zinc plated, M8 + M10 connecting thread									**Price**	**Packing**
Type	Art-No	Pipe Ø			Inner Ø	Load* ≤	Sheet thickness	Clamp width	€/ 100 pcs	[pcs]
		copper [mm]	steel [inch]	plastics [mm]	[mm]	[kg]	[mm]	[mm]		
RI 18	918RI	18	3/8"	–	15 - 19	80	1,5	20		100
RI 22	922RI	22	1/2"	–	20 - 24	80	1,5	20		100
RI 28	928RI	28	3/4"	25	23 - 28	80	1,5	20		100
RI 35	935RI	35	1"	32	31 - 36	80	1,5	20		100
RI 40	940RI	42	1 - 1/4"	40	38 - 44	100	1,5	20		100
RI 48	948RI	–	1 - 1/2"	50	44 - 50	100	1,5	20		100
RI 54	954RI	54	–	–	54 - 58	100	1,5	20		50
RI 60	960RI	–	2"	–	59 - 65	100	1,5	20		50
RI 75	975RI	76	2 - 1/2"	75	74 - 80	150	2,0	25		50
RI 90	990RI	89	3"	90	83 - 93	150	2,0	25		50
RI 100	9100RI	–	3 - 1/2"	100	95 - 103	150	2,0	25		50
RI 110	9110RI	108	4"	110	108 - 118	150	2,0	25		50
RI 125	9125RI	–	4 - 1/2"	125	121 - 127	150	2,0	25		50
RI 140	9140RI	–	5"	140	133 - 143	150	2,0	25		50
RI 160	9160RI	–	6"	160	159 - 169	150	2,0	25		40
RI 200	9200RI	–	–	200	198 - 202	150	2,0	25		40
RI 220 [1]	9220RI	220	8"	–	216 - 225	150	2,0	25		25
RI 250	9250RI	–	–	250	249 - 254	200	2,0	25		30
RI 355 [1]	9355RI	–	–	355	354 - 359	200	2,3	20		20

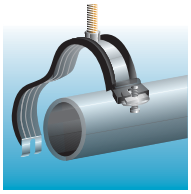
* Incl. safety factor
[1] discontinued; delivery while stocks last

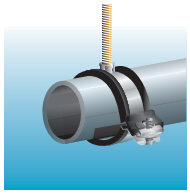
Quick clamp RIF

Advantages

- EPDM inlay: (sound-) insulated according to DIN 4109
- Not flammable according to DIN 4102, class B2
- Quick installation: 30% less installation time than standard clamps with two screws
- Solid welding of the nut
- Nut with M8 and M10 thread for higher flexibility
- Temperature resistance: -50°C to +110 °C, suitable for hot water and heating pipes

Mounting





RIF zinc plated, M8 + M10 connecting thread

Type	Art-No	Pipe Ø			Inner Ø	Load* ≤	Sheet thickness	Clamp width	Price	Packing	
		copper [mm]	steel [inch]	plastics [mm]	[mm]	[kg]	[mm]	[mm]	€/ 100 pcs	[pcs]	[pcs]
RIF 15	915RIF	15	1/4"	-	13 - 15	80	1,25	20		25	225
RIF 18	918RIF	18	3/8"	16	14 - 18	80	1,25	20		25	225
RIF 22	922RIF	22	1/2"	20	20 - 22	80	1,25	20		20	180
RIF 28	928RIF	28	3/4"	25	25 - 28	80	1,25	20		25	225
RIF 35	935RIF	35	1"	32	32 - 35	80	1,25	20		25	150
RIF 40	940RIF	42	1-1/4"	40	40 - 42	80	1,25	20		25	150
RIF 48	948RIF	54	1-1/2"	50	48 - 54	80	1,25	20		20	120
RIF 60	960RIF	-	2"	-	57 - 60	80	1,25	20		10	90

* Incl. safety factor

Metal clamp LI

Watch video at www.celo-apolo.de/en

Advantages

- EPDM inlay: (sound-) insulated
- Easy to use
- Quick installation
- Connection thread: M6
- Strong design
- Temperature resistance: -30°C to +100 °C, suitable for hot water and heating pipes

LI yellow zinc plated, M6 connecting thread									Price	Packing	
Type	Art-No	Pipe Ø				Recommended load[1]	Thickness	Width	€ / 100 pcs	[pcs]	[pcs]
		metric [mm]	copper [mm]	steel [inch]	plastics [mm]	≤ [Kg]	[mm]	[mm]			
LI 12	9B12LI	–	12	–	–	55	1,2	11/12		100	900
LI 15	9B15LI	–	15	1/4"	–	55	1,2	11/12		100	900
LI 18	9B18LI	–	18	3/8"	–	55	1,2	11/12		100	900
LI 22	9B22LI	–	22	1/2"	–	55	1,2	11/12		50	450
LI 28	9B28LI	–	28	–	–	55	1,2	11/12		50	450
LI 35	9B35LI	–	35	1	–	55	1,2	11/12		25	225
LI 42	9B42LI	–	42	1 1/4	42	55	1,2	11/12		25	225
LI 54	9B54LI	–	54	–	–	55	1,2	12/14		25	150

[1] Safety factor included.

Metal clamp L

Advantages

- Easy to use
- Quick installation
- Fire resistance test
- Connection thread: M6

Fire resistance class
R 90

L M6 M6 thread										**Price**	**Packing**	
Type	Zinc plated, yellow passivated	Zinc plated, blue passivated	Pipe Ø				Recommended load[1]	Thickness	Width	€/ 100 pcs		
	Art-No	Art-No	metric [mm]	copper [mm]	steel [inch]	plastic [mm]	≤ [Kg]	[mm]	[mm]		[pcs]	[pcs]
L 6	–	96L	–	6	–	–	50	1,2	11/12		100	1.800
L 8	–	98L	–	8	–	–	50	1,2	11/12		100	1.800
L 10	9B10L	910L	–	10	1/8"	–	50	1,2	11/12		100	1.800
L 12	9B12L	912L	–	12	–	–	50	1,2	11/12		100	900
L 14	–	914L	–	–	1/4"	–	50	1,2	11/12		100	900
L 15	9B15L	–	–	15	–	–	50	1,2	11/12		100	900
L 16	–	916L	16	–	–	16	50	1,2	11/12		100	900
L 18	9B18L	–	–	18	3/8"	–	50	1,2	11/12		100	900
L 20	–	920L	20	–	–	20	50	1,2	11/12		100	900
L 22	9B22L	–	–	22	1/2"	–	50	1,2	11/12		100	900
L 25	–	925L	25	–	–	25	50	1,2	11/12		100	900
L 26	–	926L	–	–	3/4"	–	50	1,2	11/12		100	900
L 28	9B28L	–	–	28	–	–	50	1,2	11/12		100	900
L 32	–	932L	32	–	–	32	50	12,	11/12		50	450
L 35	9B35L	–	–	35	1"	–	50	1,2	11/12		50	450
L 40	–	940L	40	–	–	40	50	1,2	11/12		50	450
L 42	9B42L	–	–	42	1–1/4"	42	50	1,2	11/14		50	450
L 50	–	950L	50	–	–	50	50	1,2	12/14		25	225
L 55	9B55L	–	–	54	–	–	50	1,2	12/14		25	225
L 60	–	960L	–	–	2"	60	50	1,2	12/14		25	225
L 63	9B63L	963L	63	63	–	63	50	1,2	12/14		25	225

[1] Safety factor included

Heavy-duty metal drainage clamp D

Advantages

- Connection thread: M8
- Sendzimir galvanized for high corrosion protection
- No damage of the pipe at the connection thread
- Captive screws and nuts

D sendzimir galvanized, M8 thread						Price	Packing	
Type	Art-No	Pipes Ø [mm]	Recommended load[1] ≤ [kg]	Thickness [mm]	Width [mm]	€/ 100 pcs	[pcs]	[pcs]
D 50	950D	50	110	0,8	28		50	–
D 60	960D	60	110	0,8	28		50	–
D 75	975D	75	110	0,8	28		50	–
D 80	980D	–	110	0,8	28		50	–
D 90	990D	90	110	0,8	28		50	–
D 100	9100D	–	110	0,8	28		50	–
D 110	9110D	110	110	0,8	28		50	–
D 125	9125D	125	110	0,8	28		50	–
D 150	9150D	–	110	0,8	28		50	–
D 160	9160D	160	110	1,0	28		50	–
D 200	9200D	200	110	1,0	28		50	–

[1] Safety factor included

Hose clamp SIN-FIN

Advantages

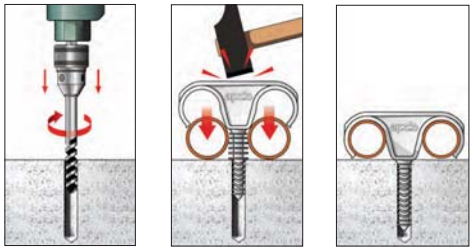
- Worm drive clamp to tighten around a hose
- Rounded edges to avoid damaging the hose or tube
- Perfect for hose connections

SIN-FIN zinc plated						Price	Packing	
Type	Art-No	Pipes Ø [mm]	Thickness [mm]	Width [mm]	Torque [kg•cm]	€/ 100 pcs	[pcs]	[pcs]
SF 10/16	910SF	10-16	0,8	9	2,5		100	900
SF 12/20	912SF	12-20	0,8	9	2,5		100	900
SF 15/25	915SF	15-25	0,8	9	2,5		100	900
SF 20/32	920SF	20-32	0,8	9	3,0		100	900
SF 25/40	925SF	25-40	0,8	9	3,0		100	600
SF 32/50	932SF	32-50	0,8	9	3,0		100	600
SF 40/60	940SF	40-60	0,8	9	3,0		100	–
SF 50/70	950SF	50-70	0,8	9	3,0		50	300
SF 90/110	990SF	90-110	0,8	9	3,0		25	–
SF 100/120	9100SF	10-120	0,8	9	3,0		25	–
SF 130	9130SF	130	0,8	9	3,0		25	–

Clip TACLIP®

single double

Mounting



Watch video at www.celo-apolo.de/en

Advantages

- Quick installation, good grip
- Halogen-free
- Self-centering

TACLIP® single made of nylon, self-centering							Price	Packing	
Type	Art-No	Drill hole Ø [mm]	Pipe Ø metric [mm]	Pipe Ø steel [inch]	Pipe Ø copper [mm]	Pipe Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
FTS 18	918FTS	8	16	3/8"	18	16 - 19		100	900
FTS 22	922FTS	8	20	1/2"	22	20 - 23		100	600
FTS 28	928FTS	8	25	3/4"	28	25 - 29		50	450

TACLIP® double made of nylon, self-centering							Price	Packing	
Type	Art-No	Drill hole Ø [mm]	Pipe Ø metric [mm]	Pipe Ø steel [inch]	Pipe Ø copper [mm]	Pipe Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
FTD 18	918FTD	8	16	3/8"	18	16 - 19		50	450
FTD 22	922FTD	8	20	1/2"	22	20 - 23		50	300
FTD 28	928FTD	8	25	3/4"	28	25 - 29		50	–

TACCABLE®

Advantages

- Large clamping size for diameters 3-38 mm for cables or empty conduits
- Small drill diameter of 6 mm
- Pull-out load approx. 30 kg

Mounting

Watch video at www.celo-apolo.de/en

TACCABLE® made of nylon				Price	Packing	
Type	Art-No	Drill hole Ø [mm]	Pipe Ø / Cable Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
TCB 3/13	913TCB	6	3 - 13		200	3.600
TCB 13/28	928TCB	6	13 - 28		100	900

Cable clip Plastigrap®

5 bags
à 100 pcs

Advantages

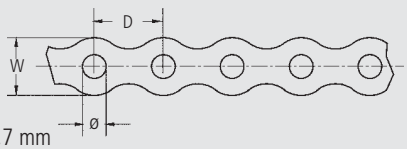
- Hardened nails, usable for bricks and natural stone

Plastigrap®				Price	Packing	
Colour	Type	Art-No	Cable Ø	€/ 100 pcs	[pcs]	[pcs]
white	RB 4	14PLG	4		500	9000
	RB 5	15PLG	5		500	9000
	RB 6	16PLG	6		500	4500
	RB 7	17PLG	7		500	4500
	RB 8	18PLG	8		500	4500
	RB 9	19PLG	9		500	4500
	RB 10	110PLG	10		500	4500
black	RN 6	46PLG	6		500	4500
	RN 7	47PLG	7		500	4500
	RN 8	48PLG	8		500	4500
	RN 9	49PLG	9		500	4500
	RN 10	410PLG	10		500	4500

Galvanized steel Cintapolo

Advantages

- Made of soft steel for eased bending
- Can also be used in combination with gas nailer



Thickness: 0,7 mm

Cintapolo surface galvanized, 10 m per roll						Price	Packing	
Type	Art-No	Width W [mm]	Ø Hole [mm]	Distance D [mm]	Tensional strength ≤ [kg]	€/ pc	[pcs]	[pcs]
Cintapolo 12	12CA	12	5,1	14	50		10	–
Cintapolo 17	CA	17	7	20	95		10	–

Cable tie Bridapolo

Advantages

- Cable tie tapered down continuously to a rounded tip for easy pull through
- Robust design
- Black: UV resistant
- Temperature resistance: -40°C to + 85°C

Bridapolo made of nylon						**Price**	**Packing**		
Type	Art-No		Width x Length	Ø ≤	Load ≤	€/ 100 pcs			Min. order quantity
	natural-coloured	black	[mm]	[mm]	[kg]		[pcs]	[pcs]	[pcs]
BD 2,5 x 100	125102BAN	425102BAN	2,5 x 100	23	8		100	50.000	1.000
BD 2,5 x 202	125203BAN	425203BAN	2,5 x 202	50	8		100	35.000	1.000
BD 3,6 x 140	136140BAN	436140BAN	3,6 x 140	34	18		100	30.000	1.000
BD 3,6 x 201	136204BAN	436204BAN	3,6 x 201	54	18		100	20.000	1.000
BD 3,6 x 290	136302BAN	436302BAN	3,6 x 290	82	18		100	15.000	1.000
BD 3,6 x 372	136372BAN	436372BAN	3,6 x 372	106	18		100	13.000	–
BD 4,8 x 188	148186BAN	448186BAN	4,8 x 188	51	22		100	13.000	1.000
BD 4,8 x 288	148286BAN	448286BAN	4,8 x 288	75	22		100	10.000	–
BD 4,8 x 371	148368BAN	448368BAN	4,8 x 371	106	22		100	9.000	–
BD 7,6 x 200	176202BAN	476202BAN	7,6 x 200	54	54		100	8.000	–
BD 7,6 x 290	176292BAN	476292BAN	7,6 x 290	82	54		100	5.000	–
BD 7,6 x 370	176368BAN	476368BAN	7,6 x 370	106	54		100	3.500	–
BD 7,6 x 450	176450BAN	476450BAN	7,6 x 450	130	54		100	3.500	–
BD 8,8 x 806	190798BAN	490798BAN	8,8 x 806	230	79		50	1.600	–

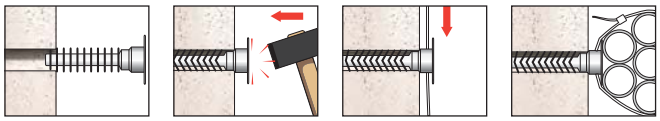
Bridapolo made of nylon, craftsman pack							**Price**	**Packing**		
	Type	Art.-No		Width x Length	Ø ≤	Load ≤	€/ 100 pcs			Min. order quantity
		natural-coloured	black	[mm]	[mm]	[kg]		[pcs]	[pcs]	[pcs]
Craftsman pack	BD 2,5 x 100	G125102BAN	G425102BAN	2,5 x 100	23	8		100	50.000	50.000
	BD 2,5 x 202	G125203BAN	G425203BAN	2,5 x 202	50	8		100	35.000	35.000
	BD 3,6 x 140	G136140BAN	G436140BAN	3,6 x 140	34	18		100	30.000	30.000
	BD 3,6 x 201	G136204BAN	G436204BAN	3,6 x 201	54	18		100	20.000	20.000
	BD 3,6 x 290	G136302BAN	G436302BAN	3,6 x 290	82	18		100	15.000	15.000
	BD 3,6 x 372	G136372BAN	G436372BAN	3,6 x 372	106	18		100	13.000	13.000
	BD 4,8 x 188	G148186BAN	G448186BAN	4,8 x 188	51	22		100	13.000	13.000
	BD 4,8 x 288	G148286BAN	G448286BAN	4,8 x 288	75	22		100	10.000	10.000
	BD 4,8 x 371	G148368BAN	G448368BAN	4,8 x 371	106	22		100	9.000	9.000
	BD 7,6 x 200	G176202BAN	G476202BAN	7,6 x 200	54	54		100	8.000	8.000
	BD 7,6 x 290	G176292BAN	G476292BAN	7,6 x 290	82	54		100	5.000	5.000
	BD 7,6 x 370	G176368BAN	G476368BAN	7,6 x 370	106	54		100	3.500	3.500
	BD 7,6 x 450	G176450BAN	G476450BAN	7,6 x 450	130	54		100	3.500	3.500
	BD 8,8 x 806	G190798BAN	G490798BAN	8,8 x 806	230	79		50	1.600	1.600

Plug Tacobrid

Advantages

- Self-centering for easy installation
- Robust head area for mounting of cable tie

Mounting



Watch video at www.celo-apolo.de/en

Tacobrid						Price	Packing	
Type	Art-No	Ø – Length [mm]	Drill hole Ø [mm]	Drill hole depth ≥ [mm]	Loads F_{rec} in concrete and solid stone [kg]	€/ 100 pcs	[pcs]	[pcs]
Tacobrid 6	946TB	6 - 35	6	25	5		100	1.800
Tacobrid 8	948TB	8 - 40	8	35	7		100	900

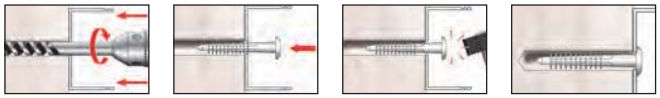
* Safety factor included

Nylon plug direct fixing MAS

Advantages

- Quick installation, good grip
- Ideal for electrical applications such as cable channels, junction boxes, etc. but also i.e. floor threshold strips

Mounting

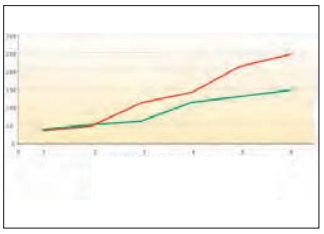


MAS made of nylon						Price	Packing	
Type	Art-No		Ø - Length [mm]	Anchorage depth h_{nom} ≥ [mm]	Thickness of fixture t_{fix} ≤ [mm]	€/ 100 pcs	[pcs]	[pcs]
	white	grey						
MAS 5 - 30	91530MAS	–	5 - 30	25	5		200	1.800
MAS 6 - 40	91640MAS	9640MAS	6 - 40	32	8		200	1.800
MAS 6 - 65	91665MAS	–	6 - 65	52	13		100	900

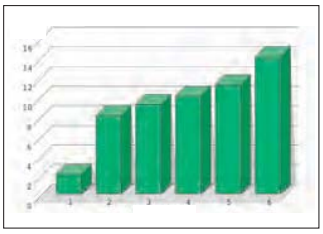
Torab® ST

Fire resistance class
R 120

PATENTED



Recommended tension (red) and shear (green) forces in kg depending on the metal sheet thickness; incl. safety factor

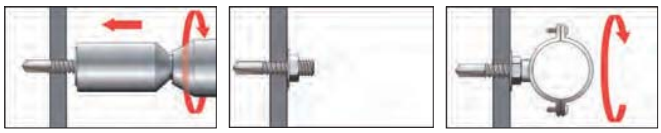


Drilling time in seconds for different metal sheet thicknesses

Advantages

- Self-tapping screws for metal sheets with a thickness 1-6 mm and a metric thread for the efficient installation of clamps, etc.
- Fire resistance up to R 120

Mounting



Watch video at www.celo-apolo.de/en

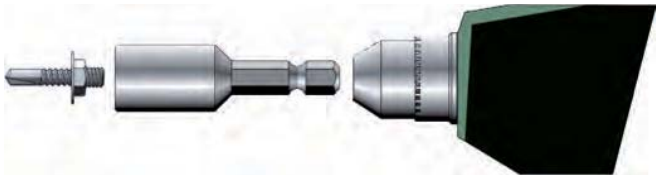
Torab® ST zinc plated						**Price**	**Packing**	
Type	Art-No	Thread	Thread length [mm]	Drive	Metal sheet thickness [mm]	€/ 100 pcs	[pcs]	[pcs]
M6 x 6	96319M6TRB	M6	6	SW 10	1 - 6		200	3.600
M8 x 10	96320M810TRB	M8	10	SW 13	1 - 6		100	1.800
M8 x 15	96320M815TRB	M8	15	SW 13	1 - 6		100	1.800

Socket wrench LL for Torab® ST

Advantages

- Special socket wrench for Torab ST with magnet for quick screwing-in

Mounting



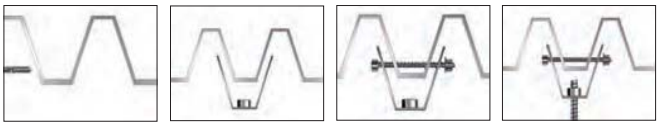
Socket wrench LL			**Price**	**Packing**	
Type	Art-No	Suitable for	€/ pc	[pcs]	[pcs]
LL TB-M6	910M6LLTRB	Torab® M6		1	–
LL TB-M8	913M8LLTRB	Torab® M8		1	–

Trapezoidal metal sheet hanger TPZ

Advantages

- Zinc plated
- Thickness: 2,5 mm
- Width: 25 mm
- Height adjustment possible
- Fire resistance certificate
- Connection thread M8 or M10
- Use M8 screw/threaded rod to install TPZ

Mounting



TPZ zinc plated		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
TPZ8F	98TPZF		25	150
TPZ10F	910TPZF		25	150

Masonry drill bit BST

BST drill cylindrical shaft, for masonry				Price	Packing	
Type	Art-No	Drill Ø [mm]	Usable drill length [mm]	€/ pc	[pcs]	Min. order quantity [pcs]
4x75	475BST	4	40		1	10
5x85	585BST	5	40		1	10
6x100	6100BST	6	55		1	10
8x120	8120BST	8	70		1	10
10x120	10120BST	10	70		1	10
12x150	12150BST	12	90		1	10

SDS Plus drill bit

SDS Plus drill for concrete				Price	Packing	
Type	Art-No	Drill Ø [mm]	Usable drill length [mm]	€/ pc	[pcs]	Min. order quantity [pcs]
5x110	5110BSDS	5	50		1	10
6x110	6110BSDS	6	50		1	10
8x110	8110BSDS	8	50		1	10
8x160	8160BSDS	8	100		1	10
10x110	10110BSDS	10	50		1	10
10x160	10160BSDS	10	100		1	10
10x450	10450BSDS	10	400		1	–
12x160	12160BSDS	12	100		1	–
12x450	12450BSDS	12	400		1	–
14x166	14166BSDS	14	100		1	–
14x310	14310BSDS	14	250		1	–
15x266	15266BSDS	15	200		1	–
15x450	15450BSDS	15	400		1	–
16x450	16450BSDS	16	400		1	–
16x600	16600BSDS	16	550		1	–
18x450	18450BSDS	18	400		1	–
20x450	20450BSDS	20	400		1	–
22x450	22450BSDS	22	400		1	–
25x450	25450BSDS	25	400		1	–
26x450	26450BSDS	26	400		1	–

Drill bit display empty, 21 x 81 x 33 cm (W x H x D)		Price	Packing
Type	Art-No	€/ pc	[pcs]
Empty display	EBC	on request	1

Gas Nailer AGII

Watch video at www.celo-apolo.de/en

Advantages

- Depth adjustment
- Fast: two fixings per second
- Easy to remove jammed nails due to quickly removable nose piece
- For different materials: concrete, steel and wood (partly masonry)
- Lightweight tool (3,6 kg)
- Compact and balanced
- Two batteries included (NiMh), battery lasts for 3000 fixings
- AGII 20: Nail magazine for 20 nails (compact design)
- AGII 40: Nail magazine for 40 nails (greater autonomy)
- Energy: 85 Joule

Complete kit		Price
Type	Art-No	€/pc
AGII 40	AG40	
AGII 20	AG20	

Nails XHA

Fire resistance class **R60/R90**

Features

- Compatible also with Spit Pulsa and Würth DIGA® CS-1
- Specifically hardened nails for usage also in hard materials
- Grooved nails to improve grip
- Each box includes one gas cell

XHA		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
13XHA	9131000XHA		1.000	5.000
17XHA	9171000XHA		1.000	5.000
22XHA	9221000XHA		1.000	5.000
27XHA	9271000XHA		1.000	5.000

Gas cell

Features

- Compatible also with Würth DIGA® CS-1 and Index FP
- Content: 80 ml
- Drives up to max. 1.200 nails
- Operating temperature: -5°C to +50°C

Gas cell		Price	Packing	
Type	Art-No	€/pc	[pcs]	[pcs]
GAS/1000	91GASA		1	1

Cable tie fasteners TBB


TBB black


TBB grey


TBL black


TBL grey


TBD


TBM (metal)

Mounting TBB

Mounting TBL

Mounting TBD

Watch video at www.celo-apolo.de/en

Advantages

- Compatible with gas nailer AG, AGII, Powers Trak-It®, Würth DIGA®, Spit Pulsa and HILTI GX
- Shape enables self-centering the pipe
- Halogen free
- ROHS compliant
- TBM: metal version with 6 mm hole for mounting a screw

Applications

✔ Electrical installation with cable ties

TBB		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
TBB black	9TBB[1] / 94NTBB[2]		100	900
TBB grey	9NTBB[2]		100	900
TBL black*	94TBBL[1]		200	900
TBL grey*	9TBBL[1]		200	900
TBD	9TBBD[1]		100	600
TBM	9TBM[1]		100	900

* Box includes 200 cable ties 4,8 x 288
[1] Compatible for gas nailer AG, AGII, Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
[2] Compatible for gas nailer AG, AGII, Powers Trak It® C5, Spit Pulsa 700E/800E, Würth DIGA® CS-2, HILTI GX 120

Pipe ring clip UT

Mounting

Watch video at www.celo-apolo.de/en

Advantages

- Fast installation with the gas nailer AG and AGII
- Also compatible with Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- UT clips can be mounted in series due to lateral slots
- A marking allows quick alignment
- Halogen free

UT			**Price**	**Packing**	
Type	Art-No	Pipe Ø plastics [mm]	€/ 100 pcs	[pcs]	[pcs]
UT 16	916UT	16		100	900
UT 20	920UT	20		100	900
UT 25	925UT	25		100	600
UT 32	932UT	32		50	450
UT 40	940UT	40		50	300

Double conduit clip FPD

Watch video at www.celo-apolo.de/en

Advantages

- Multi-diameter: each clip FPD fits for 3 pipe diameters
- Can be fixed with any gas nailer
- The clip FPD clamps the pipe
- Halogen free

Line Marking

FPD						Price	Packing	
Type	Art-No	Ø Pipe			Pipe Sizes	€/ 100 pcs	[pcs]	[pcs]
		copper [mm]	steel [inch]	plastic [mm]	[mm]			
FPD 16	916FPD	18	3/8"	16	16 - 19		100	900
FPD 20	920FPD	22	1/2"	20	20 - 23		50	450
FPD 25	925FPD	28	3/4"	25	25 - 28		50	450

Conduit clip FP

Watch video at www.celo-apolo.de/en

Advantages

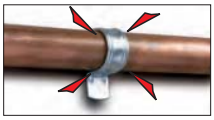
- Can be fixed with any gas nailer
- Halogen free

FP						Price	Packing	
Type	Art-No	Ø Pipe				€/ 100 pcs	[pcs]	[pcs]
		metric [mm]	steel [inch]	copper [mm]	plastic [mm]			
FP 16	916FP	16	–	–	16		100	900
FP 18	918FP	–	3/8"	18	–		100	900
FP 20	920FP	20	–	–	20		100	600
FP 22	922FP	–	1/2"	22	–		100	600
FP 25	925FP	25	–	–	25		100	600
FP 28	928FP	–	3/4"	28	–		100	600
FP 32	932FP	32	–	–	32		50	450

Conduit clip FT

Fire resistance class
R60/R90

Mounting



Watch video at www.celo-apolo.de/en

Advantages

- Can be fixed with any gas nailer
- High stability

FT						Price	Packing	
Type	Art-No	Ø Pipe				€/ 100 pcs	[pcs]	[pcs]
		metric [mm]	copper [mm]	steel [inch]	plastic [mm]			
FT 10	910FT	–	10	–	–		100	1.800
FT 16	916FT	16	–	–	16		100	1.800
FT 18	918FT	–	18	3/8"	–		100	900
FT 20	920FT	20	–	–	20		100	900
FT 22	922FT	–	22	1/2"	–		100	900
FT 25	925FT	25	–	1/8"	25		100	900
FT 28	928FT	–	28	–	–		100	900
FT 32	932FT	–	–	–	32		100	900

Metal washer AW



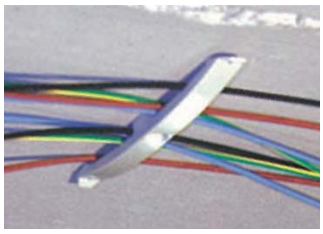
Watch video at www.celo-apolo.de/en

Advantages

- The washer AW sticks onto the gas nailer AG and AGII
- Also compatible with Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- Available in two diameters

AW			Price	Packing	
Type	Art-No·	Ø [mm]	€/ 100 pcs	[pcs]	[pcs]
AW 15	915AW	15		200	3.600
AW 25	925AW	25		200	3.600

Wire conduit WSC / WDC



Watch video at www.celo-apolo.de/en

Advantages

- Versatile
- Quick installation with gas nailer AG and AGII
- Also compatible with Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- Can also be fixed with a plug Ø6 or nailplug
- RoHs compliant
- Halogen free

WSC / WDC		Price	Packing	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
WSC	9WSC		100	900
WDC	9WDC		50	450

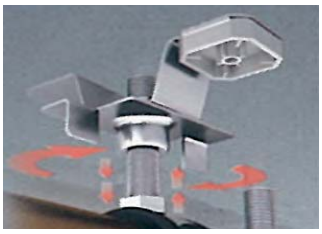
Rod hanger ATV

ATV 4, 5, 6

ATV 8

with height adjustment

ATVS 8



Mounting ATV 4, 5, 6



Mounting ATV 8





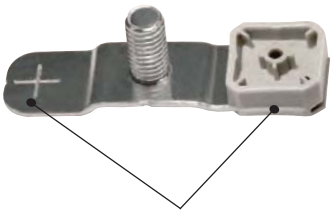
Watch video at www.celo-apolo.de/en

Advantages

- Fast installation with gas nailer AG and AGII
- Also compatible with Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- ATV8: easy and quick height-adjustment of threaded rod

AV M6 & M8			Price	Packing	
Type	Art-No	Thread	€/ 100 pcs	[pcs]	[pcs]
ATV4	9TV4	M4		100	600
ATV5	9TV5	M5		100	600
ATV6	9TV6	M6		100	600
ATV8	9TV8	M8		50	450
ATVS8	9TVS8	M8		50	450

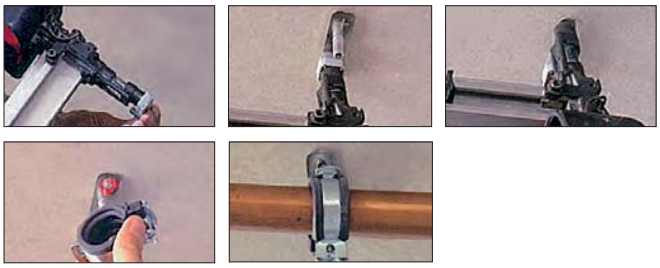
Stud accessory ATR



Fire resistance class
R 90

Mounting ATR 6

Mounting ATR 8



Watch video at www.celo-apolo.de/en

Advantages

- Compatible with gas nailer AG, AGII, Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- Stable design ensures high resistance
- Marking allows quick alignment
- For M6 and M8 threaded sleeves

Type	Thread	Rod length	Recom. load
9TR6	M6	6,5	30 kg
9TR8	M8	10/16	50 kg

ATR			Price	Packing	
Type	Art-No	Dimensions thread x length	€/ 100 pcs	[pcs]	[pcs]
ATR 6	9TR6	M6x6,5		100	900
ATR 8C	9TR8C	M8x10		100	900
ATR 8L	9TR8L	M8x16		100	900

Ceiling hanger AAT

Advantages

- Compatible with gas nailer AG, AGII, Powers Trak It® C3, Spit Pulsa 700E/800E, Würth DIGA® CS-1
- Quick installation in 10-15 sec
- Hole 7 mm

Applications

✔ To use with a wire for suspended ceilings, lamps etc.

AAT		**Price**	**Packing**	
Type	Art-No	€/ 100 pcs	[pcs]	[pcs]
AAT	9AAT		100	900

Content

Blisters

Assortment boxes

Single label products

Shelf systems

Colour guiding system:

- for solid bricks and masonry
- for all building materials
- for boards and cavity fixings
- for insulation material
- for concrete
- Adhesives and Sealants

Blisters

Multi-purpose plug MZ without collar

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of structural part [1] h_{min} [mm]	Screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
MZ 6	56MZ20	6	40	29	29	7,0	3-4,5		20	10
MZ 6-40	5640MZ10	6	50	40	40	7,0	3-4,5		10	10
MZ 8	58MZ15	8	60	48	48	9,5	4-6		15	10
MZ 10	510MZ10	10	75	59	59	12,0	6-8		10	10
MZ 12	512MZ5	12	85	71	71	15,0	8-10		5	10

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Multi-purpose plug MZ without collar, incl. screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of structural part [1] h_{min} [mm]	Screw Ø x length d_s x L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
MZ 6 SPS	56MZSZ20	6	40	29	29	7,0	4,5x40			20	10
MZ 6-40 SPS	5640MZSZ10	6	50	40	40	7,0	4,5x50			10	10
MZ 8 SPS	58MZSZ8	8	60	48	48	9,5	5,0x70			8	10
MZ 10 SKS	510MZK5	10	75	59	59	12,0	6,0x80			5	10
MZ 12 SKS	512MZK2	12	85	71	72	15,0	8,0x90			2	10

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Multi-purpose plug MZK with collar

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of structural part [1] h_{min} [mm]	Screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
MZK 6	56MZK20	6	40	29	30	7,0	3-4,5		20	10
MZK 6-41	5641MZK10	6	50	40	41	7,0	3-4,5		10	10
MZK 8	58MZK15	8	60	48	49	9,5	4-6		15	10
MZK 10	510MZK10	10	75	59	60	12,0	6-8		10	10
MZK 12	512MZK5	12	85	71	72	15,0	8-10		5	10

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Multi-purpose plug MZK with collar, incl. screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of structural part [1] h_{min} [mm]	Screw Ø x length d_s x L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
MZK 6 SPS	56MZKSZ20	6	40	29	30	7,0	4,5x40			20	10
MZK 6-41 SPS	5641MZKSZ10	6	50	40	41	7,0	4,5x50			10	10
MZK 6-41 WH	5641MZKWH5	6	50	40	41	7,0	4,5x52			5	10
MZK 6-41 RH	5641MZKRH5	6	50	40	41	7,0	4,5x68			5	10
MZK 8 SPS	58MZKSZ8	8	60	48	49	9,5	5,0x70			8	10
MZK 8 WH	58MZKWH5	8	60	48	49	9,5	5,0x70			5	10
MZK 8 RH	58MZKRH5	8	60	48	49	9,5	5,0x86			5	10
MZK 10 SKS	510MZKK5	10	75	59	60	12,0	6,0x80			5	10
MZK 12 SKS	512MZKK2	12	85	71	72	15,0	8,0x90			2	10

[1] Min. thickness of structural part or board (e. g. for applications in plasterboard)

Blisters

Plug FX without screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
FX 5	55FX50	5	35	25	25	2,5 - 4		50	10
FX 6	56FX30	6	40	30	30	3,5 - 5		30	10
FX 8	58FX20	8	55	40	40	4,5 - 6		20	10
FX 10	510FX10	10	70	50	50	6 - 8		10	10
FX 12	512FX6	12	80	60	60	8 - 10		6	10

Plug FX incl. PZ chipboard screw (FX6 and 8) and hex-head wood screw (FX 10) respectively

Type	Art-No	Drill hole- Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Screw Ø x Length d_s x L_s [mm]	Screw type	Price €/ Blister	Packing [pcs]	Packing [Blister]
FX 5 SPS	55FXSZ20	5	35	25	25	3,5 x 35			20	10
FX 6 SPS	56FXSZ15	6	40	30	30	4,5 x 45			15	10
FX 8 SPS	58FXSZ10	8	55	40	40	5,0 x 60			10	10
FX 10 SKS	510FXK5	10	70	50	50	7,0 x 65			5	10
FX 12 SKS	512FXK2	12	80	60	60	8,0 x 80			2	10

Standard plug F without screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
F 4	54NF20	4	30	20	20	2 - 3		20	10
F 4	54NF50	4	30	20	20	2 - 3		50	10
F 5	55NF20	5	35	25	25	2,5 - 4		20	10
F 5	55NF50	5	35	25	25	2,5 - 4		50	10
F 6	56NF20	6	40	30	30	3,5 - 5		20	10
F 6	56NF50	6	40	30	30	3,5 - 5		50	10
F 7	57NF20	7	40	30	30	4 - 5,5		20	10
F 7	57NF50	7	40	30	30	4 - 5,5		50	10
F 8	58NF20	8	55	40	40	4,5 - 6		20	10
F 8	58NF40	8	55	40	40	4,5 - 6		40	10
F 10	510NF5	10	70	50	50	6 - 8		5	10
F 10	510NF20	10	70	50	50	6 - 8		20	10
F 12	512NF5	12	80	60	60	8 - 10		5	10
F 12	512NF8	12	80	60	60	8 - 10		8	10

Blisters

Standard plug F with screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Screw Ø x length $d_s \times L_s$ [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
F 4 SPS	54NFSZ20	4	30	20	20	3,0 x 25			20	10
F 5 SPS	55NFSZ20	5	35	25	25	3,0 x 35			20	10
F 6 SPS	56NFSZ20	6	40	30	30	4,0 x 40			20	10
F 6 WH	56NFWH5	6	40	30	30	4,2 x 40			5	10
F 6 RH	56NFRH5	6	40	30	30	4,2 x 65			5	10
F 8 SKS	58NFK5	8	55	40	40	5,0 x 50			5	10
F 8 WH	58NFWH5	8	55	40	40	5,0 x 50			5	10
F 8 RH	58NFRH5	8	55	40	40	5,4 x 80			5	10
F 8 SPS	58NFSZ20	8	55	40	40	5,0 x 50			20	10
F 10 SKS	510NFK5	10	70	50	50	7,0 x 65			5	10
F 12 SKS	512NFK2	12	80	60	60	8,0 x 80			2	10
F 12 SKS	512NFK5	12	80	60	60	8,0 x 80			5	10
F 14 SKS	514NFK2	14	90	70	70	10,0 x 90			2	10

Standard plug FL extra long without screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
FL 6-60	5660FL10	6	70	60	60	3,5 - 4,5		10	10
FL 8-80	5880FL10	8	90	80	80	3,5 - 5,5		10	10
FL 10-90	51090FL5	10	105	90	90	6 - 7		5	10

Aerated concrete plug GB without screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Wood screw Ø d_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
GB 10	510GB4	10	65	55	55	4,5 - 6		4	10
GB 12	512GB4	12	70	60	60	7 - 8		4	10

Nail plug NP, zinc plated pre-assembled, NP 5 and 6: flat head, NP8: countersunk

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
NP 5-35	5535NP20	5	35	25	35	10		20	10
NP 5-50	5550NP20	5	35	25	50	25		20	10
NP 6-40	5640NP15	6	40	30	40	10		15	10
NP 6-60	5660NP15	6	40	30	60	30		15	10
NP 6-80	5680NP10	6	40	30	80	50		10	10
NP 8-60	5860NP10	8	50	40	60	20		10	10
NP 8-80	5880NP10	8	50	40	80	40		10	10
NP 8-100	58100NP10	8	50	40	100	60		10	10
NP 8-120	58120NP5	8	50	40	120	80		5	10
NP 8-135	58135NP5	8	50	40	135	95		5	10

All nail plugs with Pozidriv

Blisters

Hollow block frame plug HBR, zinc plated with safety screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Screw Ø x length $d_s \times L_s$ [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
10-100 TX	510100HBRST5	10	100	90	100	10	7,0 x 107			5	10
10-100 SSK	510100HBSK5	10	100	90	100	10	7,0 x 107			5	10
10-135 TX	510135HBRST5	10	100	90	135	45	7,0 x 142			5	10
10-135 SSK	510135HBSK5	10	100	90	135	45	7,0 x 142			5	10
10-160 TX	510160HBRST5	10	100	90	160	70	7,0 x 167			5	10
10-160 SSK	510160HBSK3	10	100	90	160	70	7,0 x 167			3	10

Frame plug R, zinc plated with safety screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Screw Ø x length $d_s \times L_s$ [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
8-60 SP	5860RSZ10	8	55	40	60	20	5,5 x 65			10	10
8-80 SP	5880RSZ10	8	55	40	80	40	5,5 x 85			10	10
10-80 TX	51080RST5	10	60	50	80	30	7,0 x 87			5	10
10-80 SSK	51080SK5	10	60	50	80	30	7,0 x 87			5	10
10-100 TX	510100RST5	10	60	50	100	50	7,0 x 107			5	10
10-100 SSK	510100SK5	10	60	50	100	50	7,0 x 107			5	10
10-115 TX	510115RST5	10	60	50	115	65	7,0 x 122			5	10
10-115 SSK	510115SK5	10	60	50	115	65	7,0 x 122			5	10
10-135 TX	510135RST5	10	60	50	135	85	7,0 x 142			5	10
10-135 SSK	510135SK4	10	60	50	135	85	7,0 x 142			4	10
10-160 TX	510160RST5	10	60	50	160	110	7,0 x 167			5	10
10-160 SSK	510160SK3	10	60	50	160	110	7,0 x 167			3	10

Metal frame plug MR with countersunk screw (PZ 3)

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Sleeve length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
MR 10-92	51092MR6	10	50	30	92	62		6	10
MR 10-112	510112MR6	10	50	30	112	82		6	10
MR 10-132	510132MR6	10	50	30	132	102		6	10
MR 10-152	510152MR6	10	50	30	152	122		6	10

Incl. cover caps: 6 x white, 6 x brown

Window frame screw FBS zinc plated

countersunk head (ø 11 mm, TX 30), for wooden and plastic window frames

Type Ø - L	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Drill hole Ø in window frame d_f [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
FBS 7,5 - 112	575112FBS6	6	depends on building material, h_{nom} + 10 mm	depends on building material, see following table	6,2		6	10
FBS 7,5 - 132	575132FBS6	6			6,2		6	10
FBS 7,5 - 152	575152FBS6	6			6,2		6	10

Incl. cover caps: 6 x white, 6 x brown

Screw insertion depth h_{nom} for FBS and FBS-Z depending on building material

Type	Concrete [mm]	Solid brick [mm]	Solid sand-lime brick [mm]	Bims [mm]	Solid leight weight concrete [mm]	Hollow blocks
FBS/FBS-Z	≥ 30	≥ 40	≥ 40	≥ 50	≥ 60	≥ 60, min. 2 brick walls

Blisters

Fastening injection system ResiFIX PY			Price	Packing	
Type	Art-No	Content [ml]	€/ Blister	[pcs]	[Blister]
PY 165 SF	165PSF	165		1	12

2 mixing nozzles MD included

with centering cap

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Sleeve SH					Price	Packing	
Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth h_0 [mm]	Suitable for thread Ø	€/ Blister	[pcs]	[Blister]
SH 12-80	51280SH4	12	85	M8		4	10
SH 16-85	51685SH4	16	90	M8, M10		4	10
SH 16-130	515130SH4	16	135	M8, M10		4	10
SH 20-85	52085SH4	20	90	M12, M16		4	10

Note: The system (resin, sleeve and anchor rod) is only approved completely if approved components are used.

Sleeve SH without approval					Price	Packing	
Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth h_0 [mm]	Suitable for thread Ø	€/ Blister	[pcs]	[Blister]
SH 13-100*	513100SH4	14	105	M8		4	10
SH 15-100*	515100SH4	16	105	M10		4	10

* discontinued; delivery while stocks last

Sleeve IGH internally threaded						Price	Packing	
Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth h_0 [mm]	Suitable for thread Ø	Outer Ø [mm]	€/ Blister	[pcs]	[Blister]
IGH M8-80	5880IGHM4	14	90	M8	12		4	10
IGH M10-80	51080IGHM4	16	90	M10	14		4	10

European Technical Approval Option 1 for cracked concrete

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Fire resistance class F 120

Anchor rod RESI AST zinc plated				Price	Packing	
Type	Art-No	Thread	Length L [mm]	€/ Blister	[pcs]	[Blister]
8-110	58110VMAST4	M8	110		4	10
10-130	510130VMAST4	M10	130		4	10
12-160	512160VMAST4	M12	160		4	10

Note: The system (resin, sleeve and anchor rod) is only approved completely if approved components are used

Blisters

Standing toilet installation set WCS

Type	Art-No	Plug Ø d_p [mm]	Plug length L [mm]	Screw Ø d_s [mm]	Screw length L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
WCS	5WCS2	8	50	6	85			2	10

Vanity installation set WT

Type	Art-No	Plug Ø d_p [mm]	Plug length L [mm]	Screw Ø d_s [mm]	Screw length L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
WT	5WT2	14	75	10	140			2	10

Cavity fixing HR

Type	Art-No	Drill hole Ø d_0 [mm]	Board thickness $h_{p\ min-max}$ [mm]	Screw Ø x length d_s x L_s [mm]	Plug length L [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
HR 6-30 SPS	56HRSZ20	6	3 - 14	3,5 x 50	30		20	10
HR 8-40 SPS	58HRSZ20	8	10 - 16	4,0 x 60	40		20	10

Cavity fixing HRM

Type	Art-No	Drill hole Ø d_0 [mm]	Board thickness $h_{p\ min-max}$ [mm]	Thread	Screw length L_s [mm]	Plug length L [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
4-20	5420HRM5	8	3 - 18	M4	52	46			5	10
4-24	5424HRM5	8	18-24	M4	58	52			5	10
5-16	5516HRM5	11	3 - 16	M5	58	52			5	10
5-16 RH	5516HRMRH4	11	3 - 16	M5	58	52			4	10
5-16 WH	5516HRMWH4	11	3 - 16	M5	58	52			4	10
5-32	5532HRM5	11	14 - 32	M5	71	65			5	10
5-32 RH	5532HRMRH4	11	14 - 32	M5	75	66			4	10
5-32 WH*	5532HRMWH4	11	14 - 32	M5	75	66			4	10
6-16	5616HRM5	13	3 - 16	M6	58	52			5	10
6-32	5632HRM5	13	14 - 32	M6	71	65			5	10

* expexted to be available from July 2017

Installation pliers MZA 100 for HRM

Type	Art-No	Price €/ pc	Packing [pcs]	Packing [pcs]
MZA 100	9MZA00		1	–

See page 45

Blisters

Plasterboard plug GKDZ without screw

Type	Art-No	Plug length L [mm]	Max board thickness $h_{p\ max}$ [mm]	Screw Ø $d_{s\ min-max}$ [mm]	Screw length L_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
GKDZ	5GKDZ10	28	2 x 12,5	4 - 5	22 + t_{fix}		10	10

Plasterboard plug GKDZ with screw

Type	Art-No	Plug length L [mm]	Max board thickness $h_{p\ max}$ [mm]	Screw Ø x length d_s x L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
GKDZ PZ	5GKDZSZ6	28	2 x 12,5	4,5 x 35			6	10

Plasterboard plug GKD without screw

Type	Art-No	Plug length L [mm]	Max board thickness $h_{p\ max}$ [mm]	Screw Ø $d_{s\ min-max}$ [mm]	Type of screw L_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
GKD	5GKD10	33	1 x 12,5	3 - 4,5	22 + t_{fix}		10	10

Plasterboard plug GKD with screw

Type	Art-No	Plug length L [mm]	Max board thickness $h_{p\ max}$ [mm]	Screw Ø x length d_s x L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
GKD PZ	5GKDPZ6	33	1 x 12,5	4,0 x 40			6	10

Cavity plug universal BT with screw

Type	Art-No	Drill hole Ø d_0 [mm]	Board thickness $h_{p\ min-max}$ [mm]	Thread	Screw length L_s [mm]	Recess/ Drive	Price €/ Blister	Packing [pcs]	Packing [Blister]
BT M4 LO	54BTLO4	13	10 - 70	M4	50	PZ2 / slot		4	10
BT M5 LO	55BTLO4	13	10 - 70	M5	62	PZ2 / slot		4	10
BT M6 LO	56BTLO4	13	10 - 70	M6	62	PZ2 / slot		4	10
BT M8 K	58BTK2	19	10 - 70	M8	60	SW13 / hex		2	10

Blisters

Spring toggle FK-S with washer and nut
Spring toggle FK-HS with hook, washer and nut

Type	Art-No	Drill hole Ø d_0 [mm]	Max. board thickness $h_{p\ max}$ [mm]	Thread	Screw length L_s [mm]	Min. space behind board [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
FK-S 3 x 85	5390FKS2	11	65	M3	85	28		2	10
FK-S 4 x 90	5495FKS2	14	65	M4	90	35		2	10
FK-HS 3 x 100	5385FKHS2	11	40	M3	100	28		2	10
FK-HS 4 x 95	54100FKHS2	14	30	M4	95	35		2	10

Insulation plug IPL

Type	Art-No	Plug length L [mm]	Recess	Screw Ø d_s [mm]	Screw length L_s [mm]	Price €/ Blister	Packing [pcs]	Packing [Blister]
IPL 60	560IPL4	58	TX 40	4,5 - 5,0	30 + t_{fix}		4	10
IPL 95	595IPL2	95	SW 13	8 / 10 / M8	40 + t_{fix}		2	10

IPL 60: head Ø 25 mm
IPL 95: head Ø 32 mm, **incl. 1x screw M8 x 30 as setting tool**

Insulation plug IPL with screw

Type	Art-No	Plug length L [mm]	Recess [mm]	Screw Ø x length d_s x L_s [mm]	Type of screw	Price €/ Blister	Packing [pcs]	Packing [Blister]
IPL 60	560IPLPZ4	58	TX 40	4,5 x 40			4	10

Insulation screw IPS with stainless steel A2 screws, PH2

Type	Art-No	Plug length L [mm]	Plug recess	Clearance hole d_f [mm]	Screw- Ø x length d_s x L_s [mm]	Type of srew	Price €/ Blister	Packing [pcs]	Packing [Blister]
IPS 80 PH	5180IPSPH4	80	TX 25	8 – 10	3,5 x 13 + 3,5 x 16			4	10

Blisters

Brass plug ME

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Plug length L [mm]	Thread	Price €/ Blister	Packing [pcs]	Packing [Blister]
ME 6	5L6ME5	8	27	23	M6		5	10
ME 8	5L8ME4	10	35	30	M8		4	10

Quick-fix anchor BA plus for non-cracked concrete

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/ Blister	Packing [pcs]	Packing [Blister]
8-85/20	5885BA2	8	60	45	85	20	M8		2	10
10-92/17	51090BA2	10	65	50	92	17	M10		2	10
10-125/50	510120BA2	10	65	50	125	50	M10		2	10

Quick-fix anchor BAZ for cracked and non-cracked concrete

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/ Blister	Packing [pcs]	Packing [Blister]
8-72/10	5874BAZ2	8	60	45	72	10	M8		2	10
10-92/10	51095BAZ2	10	75	60	92	10	M10		2	10
12-118/20	512115BAZ2	12	90	70	118	20	M12		2	10

Forced expansion anchor ZA Type S, zinc plated with hex-head screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/ Blister	Packing [pcs]	Packing [Blister]
10-55/10	51055ZAS2	10	55	40	55	10	M6		2	10
12-75/25	51275ZAS2	12	55	40	75	25	M8		2	10

Blisters

Expansion anchor ZT / ZE / M / MO zinc plated

Type	Art-No	Plug length L [mm]	Outside Ø [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Type	Price €/ Blister	Packing [pcs]	Packing [Blister]
ZT 6-50	5B650ZT4	50	12	5	M6			4	10
ZT 8-60	5B860ZT4	60	14	10	M8			4	10
ZT 10-80	5B1080ZT2	80	16	20	M10			2	10
ZT 10-100	5B10100ZT2	100	16	40	M10			2	10
ZE 6-65	5B665ZE4	65	12	10	M6			4	10
ZE 6-85	5B685ZE4	85	12	25	M6			4	10
ZE 8-70	5B870ZE4	70	14	10	M8			4	10
ZE 8-120	5B8120ZE2	120	14	60	M8			2	10
ZE 10-85	5B1085ZE2	85	16	15	M10			2	10
ZE 10-130	5B10130ZE2	130	16	60	M10			2	10
ZE 12-100	5B12100ZE2	100	20	15	M12			2	10
ZE 12-115	5B12115ZE2	115	20	30	M12			2	10
M 6-50	5B650ZM2	50	12	–	M6			2	10
M 8-65	5B865ZM2	65	14	–	M8			2	10
MO 6-50	5B650ZMO2	50	12	–	M6			2	10
MO 8-65	5B865ZMO2	65	14	–	M8			2	10

RI clamp set

Type	Art-No	Plug Ø [mm]	Plug length [mm]	Load* ≤ [kg]	Content	Price €/ Blister	Packing [pcs]	Packing [Blister]
FX 10 RI 22	22RIEDRN	10	50	100	FX 10 + M8 x 80 + RI 22		2	15
FX 10 RI 28	28RIEDRN	10	50	100	FX 10 + M8 x 80 + RI 28		2	15
FX 10 RI 35	35RIEDRN	10	50	130	FX 10 + M8 x 80 + RI 35		2	15
FX 10 RI 40	40RIEDRN	10	50	130	FX 10 + M8 x 80 + RI 40		2	15
FX 10 RI 50	50RIEDRN	10	50	130	FX 10 + M8 x 80 + RI 50		2	15
FX 10 RI 60	60RIEDRN	10	50	130	FX 10 + M8 x 80 + RI 60		2	15
FX 10 RI 75	75RIEDRN	10	50	150	FX 10 + M8 x 80 + RI 75		2	15
FX 12 RI 90	90RIEDRN	12	60	150	FX 12 + M10 x 100 + RI 90		2	15
FX 12 RI 110	110RIEDRN	12	60	200	FX 12 + M10 x 100 + RI 110		2	15
FX 12 RI 140	140RIEDRN	12	60	200	FX 12 + M10 x 100 + RI 140		2	15

Suitable pipe diameters see page 142
* Incl. safety factor

Assortment box

Assortment box MZK with screw (total pcs in box: 102)

Type	Art-No	Content box	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Plug length L [mm]	Screw d_s x L [mm]	Price €/ Box	Packing [Box]
MZK	MIXMZKSZ102	30 Multi-purpose plug MZK 6 incl. SPS 4,5x45 V, Pozi 15 Multi-purpose plug MZK 8 incl. SPS 5,0x60 V, Pozi 6 Multi-purpose plug MZK 10 incl. SKS 6,0x80 DIN 571	6 8 10	40 60 75	30 49 60	4,5 x 60 5,0 x 60 6,0 x 80		1

Packed in robust plastic box
Expected to be available from August 2017

Assortment box MZK and F without screw (total pcs in box: 156)

Type	Art-No	Content box	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Plug length L [mm]	Screw d_s x L [mm]	Preis €/ Box	Verpackung [Box]
MZK und F	MIXNFMZK156	30 Multi-purpose plug MZK 6 15 Multi-purpose plug MZK 8 6 Multi-purpose plug MZK 10 60 Standard plug F 5 30 Standard plug F 6 15 Standard plug F 8	6 8 10 5 6 8	40 60 75 35 40 55	30 49 60 25 30 40	3,0 - 4,5 4,0 - 6,0 6,0 - 8,0 2,5 - 4,0 3,5 - 5,0 4,5 - 6,0		1

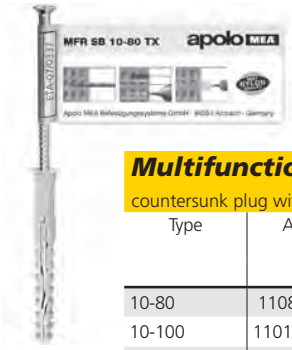
Packed in robust plastic box
Expected to be available from August 2017

Assortment box F with screw (total pcs in box: 210)

Type	Art-No	Content box	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Plug length L [mm]	Screw d_s x L [mm]	Preis €/ Box	Verpackung [Box]
F	MIXNFSZ210	60 Standard plug F 5 incl. SPS 3,5x35 V, Pozi 30 Standard plug F 6 incl. SPS 4,5x45 V, Pozi 15 Standard plug F 8 incl. SPS 5,0x60 V, Pozi	5 6 8	35 40 55	25 30 40	3,5 x 35 4,5 x 45 5,0 x 60		1

Packed in robust plastic box
Expected to be available from August 2017

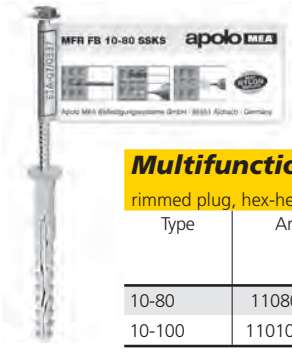
Single lable



Multifunction frame plug MFR SB TX, zinc plated

countersunk plug with countersunk screw

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Recess	Price €/pc	Packing [pcs]
10-80	11080MFRST	10	80	70	80	10	TX 40		50
10-100	110100MFRST	10	80	70	100	30	TX 40		50
10-115	110115MFRST	10	80	70	115	45	TX 40		50
10-135	110135MFRST	10	80	70	135	65	TX 40		50
10-160	110160MFRST	10	80	70	160	90	TX 40		50
10-200	110200MFRST	10	80	70	200	130	TX 40		50



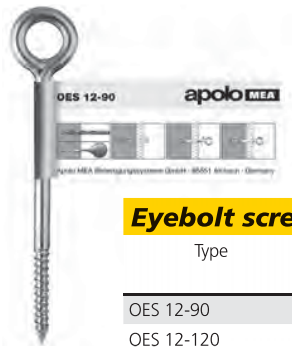
Multifunction frame plug MFR FB SSKS, zinc plated

rimmed plug, hex-head screw with integral washer

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Drive/Recess	Price €/pc	Packing [pcs]
10-80	11080MFRFB	10	80	70	80	10	SW13/TX40		50
10-100	110100MFRFB	10	80	70	100	30	SW13/TX40		50

Scaffold plug GR

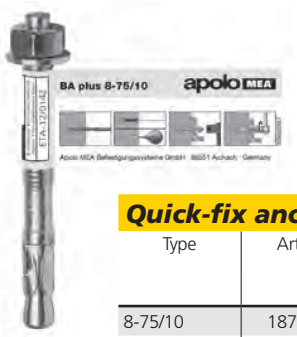
Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{nom} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Price €/pc	Packing [pcs]
GR 14-70	11470GR	14	90	70	70	0		40
GR 14-100	114100GR	14	90	70	100	30		40



Eyebolt screw OES, zinc plated

Type	Art-No	Screw Ø d_s [mm]	Screw length L_s [mm]	Eyebolt Ø d_{oes} [mm]	Price €/pc	Packing [pcs]
OES 12-90	11290OES	12	90	23		20
OES 12-120	112120OES	12	120	23		20
OES 12-160	112160OES	12	160	23		20
OES 12-190	112190OES	12	190	23		20
OES 12-230	112230OES	12	230	23		20

Single labels



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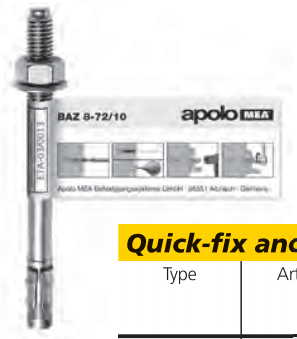
Quick-fix anchor BA plus, zinc plated

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/pc	Packing [pcs]
8-75/10	1875BAP	8	60	45	75	10	M8		50
10-92/17	11092BAP	10	65	50	92	17	M10		40
10-125/50	110125BAP	10	65	50	125	50	M10		25
12-110/10	112110BAP	12	90	70	110	10	M12		20
12-150/50	112150BAP	12	90	70	150	50	M12		20
12-180/80	112180BAP	12	90	70	180	80	M12		20
12-200/100*	112200BAP	12	90	70	200	100	M12		10
12-240/140*	112240BAP	12	90	70	240	140	M12		10

* With large washer acc. DIN 440 for woodworking

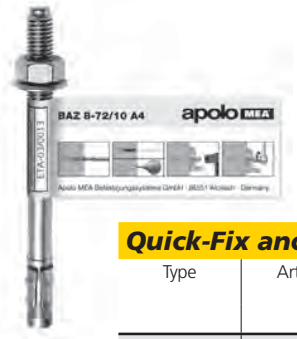


European Technical Approval
Option 1 for cracked concrete

Fire resistance class
F 120

Quick-fix anchor BAZ, zinc plated

Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/pc	Packing [pcs]
8-72/10	1872BAZ	8	60	45	72	10	M8		50
8-92/30	1892BAZ	8	60	45	92	30	M8		50
10-92/10	11092BAZ	10	75	60	92	10	M10		40
10-112/30	110112BAZ	10	75	60	112	30	M10		25
12-118/20	112118BAZ	12	90	70	118	20	M12		20
12-148/50	112148BAZ	12	90	70	148	50	M12		20



A4 STAINLESS STEEL

European Technical Approval
Option 1 for cracked concrete

Fire resistance class
F 120

Quick-Fix anchor BAZ A4, stainless steel A4

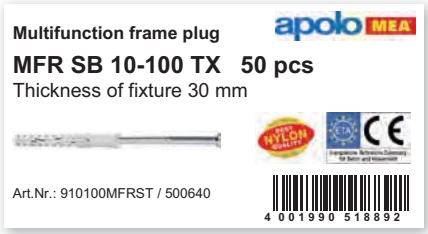
Type	Art-No	Drill hole Ø d_0 [mm]	Drill hole depth $h_1 \geq$ [mm]	Anchorage depth $h_{ef} \geq$ [mm]	Plug length L [mm]	Thickness of fixture $t_{fix} \leq$ [mm]	Thread	Price €/pc	Packing [pcs]
8-72/10 A4	1X872BAZ	8	60	45	72	10	M8		50
8-92/30 A4	1X892BAZ	8	60	45	92	30	M8		50
10-92/10 A4	1X1092BAZ	10	75	60	92	10	M10		40
10-112/30 A4	1X10112BAZ	10	75	60	112	30	M10		25
12-118/20 A4	1X12118BAZ	12	90	70	118	20	M12		20

Notes

Shelf system for plugs

Space-saving round box dispenser
box dispenser Art-No 010507411
cover plate MZK for box dispenser Art-No 010507420
cover plate FX for box dispenser Art-No CARTELAFX
hooks for box dispenser Art-No 010507441

Robust round box



Clearly arranged shelf label

Apolo MEA colour guiding system
placed directly at the bottom of the shelf to quickly locate the searched product

for all building materials

for solid bricks and masonry

for boards and cavity fixings

for concrete

Customer-friendly colour guiding system
Length 1,00 m **Art-No 010507418**
Length 1,25 m **Art-No 010507431**

Blister with
colour guiding system

Practical boxes with viewing window
and colour guiding system

Display body (800 x Ø 570 mm)
Bottom 200 mm deep
Art-No 010507488

Special boxes for single
lable products

430 x 240 x 150 mm
Art-No 010507465

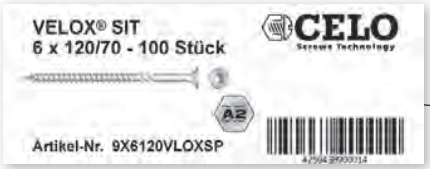
300 x 114 x 101 mm
Art-No 010507446

Shelf system for screws

Cover cap Magic Tap
in blister

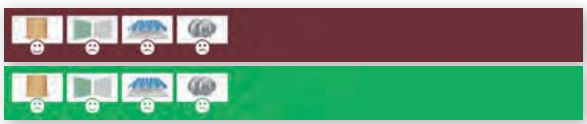
Innovative SIT®-Bit in robust box

Hook rail for 12 blisters
Art-No 010507449



Clearly arranged shelf label

CELO colour guiding system
placed directly at the bottom of the shelf to quickly locate the searched product



for wood

for drywall constructions

300 x 114 x 101 mm
Art-No 010507446

Customer-friendly colour guiding system
Length 1,00 m **Art-No 010507452**
Length 1,25 m **Art-No 010507454**

Practical and robust box with viewing window and colour guiding system

Test and information center focused on the VELOX® screw and its innovative SIT® recess. Description of the advantages and haptic test possibilities with over-sized screw head and bit models

125 cm: **Art-No 010507457**
100 cm: **Art-No 010507456**
30 cm: **Art-No 010507459**

Notes

Notes

Made in Germany

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CATEN 02/17 EN

Grupo CELO