

Threaded inserts for plastic and wood

Ensats®
B-Lok®
Mubux®
S-Lok®



Technical publication

No.30



Fastening technology from KerbKonus is in successful application in a wide variety of different industrial sectors around the world.

State-of-the-art production facilities provide our customers with the assurance of quality and reliable delivery, and sophisticated fastening solutions for every conceivable field of application are implemented by our own Research and Development Department.

Close cooperation and exchange of experience and expertise on an international level ensure that our company stays at the cutting edge of technological development.

With independent branches and agencies operating in a number of countries around the world we are a truly reliable partner when it comes to secure fastening technology.

... our products and services

Depending on the required anchoring method in the material, KerbKonus offers a variety of threaded insert options:

- self-tapping threaded inserts for metal, wood and plastics
- Threaded inserts for cold embedding
- Threaded inserts for hot or ultrasound embedding
- Threaded inserts for screwing into an internal thread
- Threaded inserts for riveting

Alongside its long-standing, proven spectrum of threaded inserts for a wide variety of applications, KerbKonus also offers a range of fastening technology-related products and services:

- Punched rivet system for thin mouldings
- Screw locking
- Thread sealing systems
- Insulating plastic coating

If you have a specific problem related to the field of fastening technology - with its rich fund of expertise and comprehensive product range, KerbKonus has the solution for you.

Technical details of KerbKonus products are provided on our website:

www.kerbkonus.de

To access design data, go to the download portal of our website. Here, you will be able to download product data in any required formats or as CAD files.

Kerb-Konus-Vertriebs-GmbH

Wernher-von-Braun-Straße 7
Gewerbegebiet Nord
92224 Amberg



Phone +49 9621 679-0
Fax +49 9621 679444
e-mail KKV-Amberg@kerbkonus.de

Internet www.kerbkonus.de



Dimensions	Product features	Receiving hole	Specifications	Other details
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Threaded inserts from KerbKonus ...

Tested quality; Test methods	Page 2 and 3
Ensats® – the self-tapping threaded insert; Pull-out strength; Installation	Page 4 and 5

Ensats®-driving tools ...

Tools	Page 6 and 8
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Ensats®-installation ...

Manual installation and machine installation	Page 9 and 10
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Ensats®-S 302 / -SI 302 2



M2 to M30	self-tapping with	pre-formed	302 0	Page 11
Imperial thread	cutting slot	or drilled		Page 12
M4 to M12			302 2	Page 13



Ensats®-SB 307 / 308 and Ensats®-SBI 307 2 / 308 2

M3 to M24	self-tapping with	pre-formed	307 0 / 308 0	Page 14
M4 to M12	three cutting bores	or drilled	307 2 / 308 2	Page 15



Ensats®-SD 303 0 and Ensats®-SBD 347 0 / 348 0

M3 to M10	self-tapping with	pre-formed	303 0	Page 16
	cutting slot	or drilled		
M3,5 to M12	self-tapping with	pre-formed	347 0 / 348 0	Page 17
	three cutting bores			



Ensats®-SH 309 0 and Ensats®-SHI 309 2

M2,5 to M16	self-tapping with	pre-formed	309 0	Page 18
M4 to M10	cutting slot	or drilled	309 2	Page 19



Ensats®-3F 305 0

M3 to M6	thread forming	pre-formed	305 0	Page 20
		or drilled		



Mubux®

M2 to M10	press-inn insert with	pre-formed	850 0 / 852 0	Page 21 and 22
M3 to M8	helically knurled	or drilled	856 0 / 857 0	Page 23
	locking profile			



B-Lok®

M2 to M8	expansions insert	pre-formed	812 0 / 842 0	Page 24 to 27
		or drilled		



S-Lok®

M2 to M10	for embedding using	pre-formed	860 0	Page 28 to 34
also as threaded	ultrasonic or	or drilled	to	
pin M3 to M8	heat transmission		867 0	

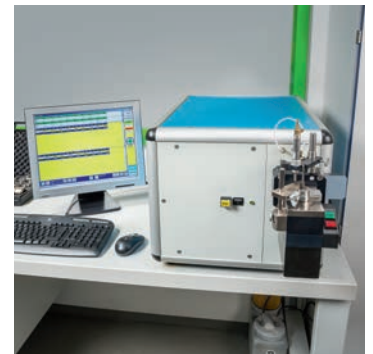


What really counts: tested quality.

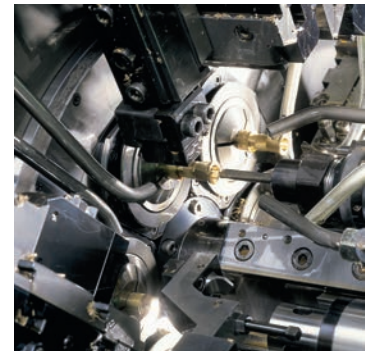


At our parent plant in Amberg, we produce threaded inserts using efficient production methods. A team of qualified and highly motivated staff guarantees a consistent, high standard of production.

The number of products manufactured over the company's history reaches into the billions. State-of-the-art automation lines manufacture around the clock in a precise and high standard of quality. The efficient and low-cost production of large-scale product series is one of the strengths on which we have based our success.

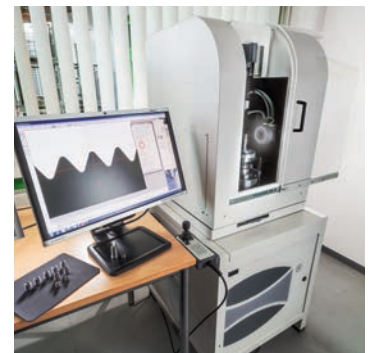


But our high-volume production output in no way compromises flexibility. We are able to quickly and efficiently produce even small batches of nonstandard items.



Our state-of-the-art stock control system permits the reliable, prompt delivery of standard products, keeping your production running to schedule at all times and helping to minimize your warehousing costs.

We are particularly proud of a cost-to-performance ratio which ensures satisfied customers the world over. This has made KerbKonus a reputable and respected partner to industry in the global marketplace.



Quality and environment are top priority issues at KerbKonus. Quality consciousness is a continuous thread running through every aspect of the company's work and all its products and services. Quality is lived and breathed at KerbKonus.

As manufacturer in the metal processing industry we are aware of our responsibility for an environmentally compatible production. With this in mind we follow up a policy of sensible resource spending and environmental friendly production both in our process engineering and our product range.



Quality System
DEKRA Certificat in accordance with
ISO 9001:2015 Reg.No. 30507428
ISO 14001:2015 Reg.No. 170507049
ISO 50001:2011 Reg.No. 181115119

Applications on the test stand ...



Threaded inserts from KerbKonus are manufactured in large piece numbers. Human lives and safety can often depend upon these tiny components, for instance in the case of airbag receiving fasteners.

Because we bear this heavy responsibility, our products are tested and monitored in line with the most stringent directives. In the case of particularly critical applications, each and every part is exhaustively tested on state-of-the-art test equipment before it is delivered to you e.g. dimensional check, foreign particles.

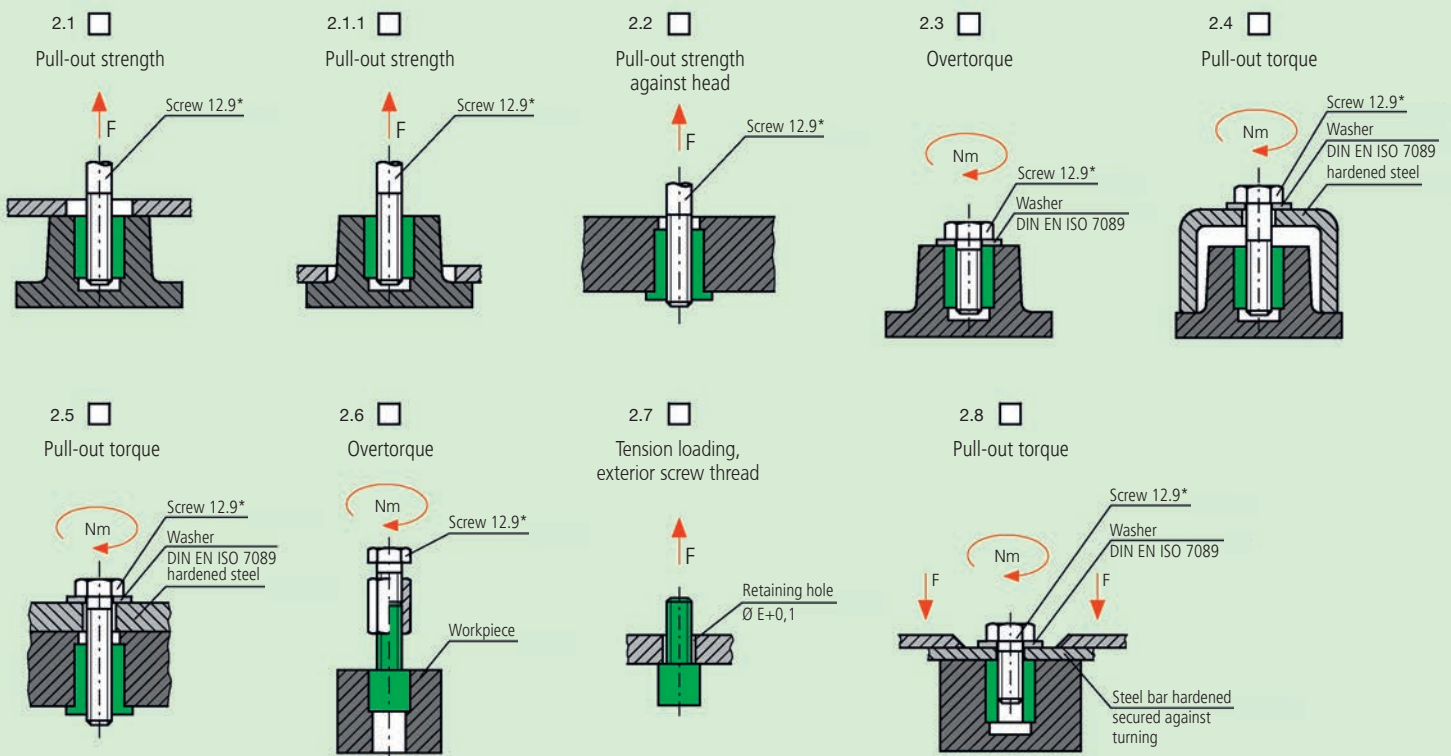
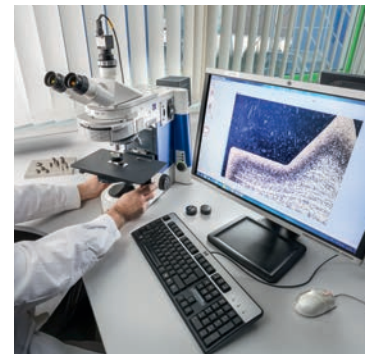
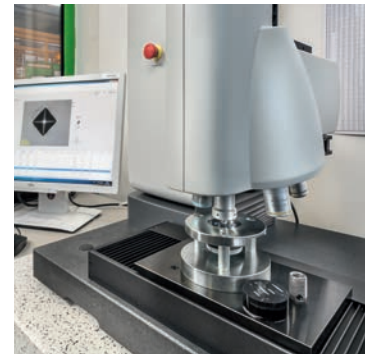
- dimensional check
- foreign particles

Test methods

The loading capacity of a thread depends primarily on the surface shell of the component which is exposed to shearing stress.

By selecting just the right threaded insert for each application, maximum reliability can be achieved.

Using tried and tested, practically oriented test methods (see the table below) set of reliable specifications to ensure safe, reliable compliance with any application requirement, however unusual. In most cases, this can even be achieved using standard threaded inserts.



Note: *Because the connection elements often achieve higher stress values compared with components of strength class 12/12.9, at KKV testing is generally conducted using testing pin 14.9 and hardened circular blank.



The Ensats® – self-tapping threaded insert ...

Ensats® is a self-tapping threaded insert with external and internal threads, cutting slots or cutting bores.

A continuous process of further development has brought about a number of major improvements to product characteristics. These inserts are protected by German and also foreign patents.

The Ensats® is screwed into a pre-formed or pre-drilled receiving hole and so automatically taps its own thread into the hole wall.

This ensures a backlashfree fit with extreme loading capacity.

Ensats®-3F 305

is a thread forming insert with 3 longitudinal grooves around its periphery

Fields of application

The Ensats® is used throughout the whole of the metal and plastics processing industry.

- Automotive
- Household appliance and office machinery production
- Electrical and laboratory supplies
- Plant and equipment construction
- Sports and lifestyle equipment
- Railed vehicles industry

Product features

- Universal application for all types of plastic, thermoset plastics, thermoset plastics, PU/PUR foam, Fibre-reinforced plastic (FRP), for hardwood and plywood, hard paper and metal.
- Maximum strength values in comparison to other systems. The diagram illustrates the withdrawing force in thermoplastic materials: In thermoset plastics and FRP, the values tend to be higher.
- Thin-walled Ensats® for restricted space conditions (residual wall thicknesses), and also suitable for screwing in using a thread tapping machine (same inside and outside pitch).

Slot version: WN 303,
Three-hole version: WN 347/348
page 16 and 17.

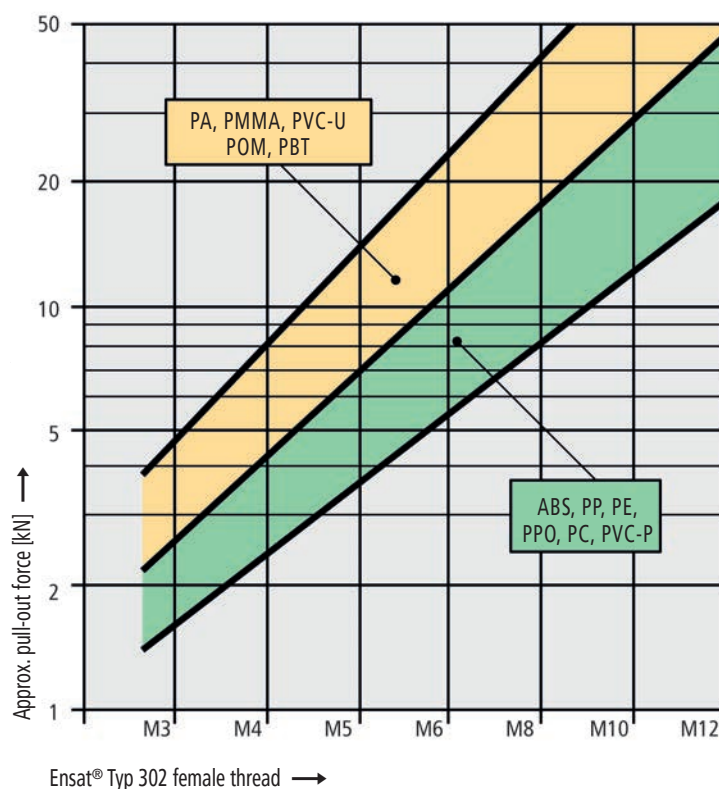


Fig. 2

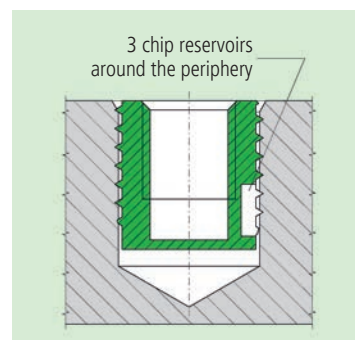


Fig. 3

Ensats®-SBS 337/338

These cutting bores are shaped to serve as chip reservoirs. The chips created during the driving process stored here and cannot drop into sensitive equipment parts.

For additional sealing from below:
Ensats® with closed floor
Works standard 357/358.
See publication no. 20, page 21.

The Ensat® in the workpiece ...

Installation recommendation

The Ensat® should be processed appr. 0,1 – 0,2 mm recessed (fig. 4). After processing, the Ensat® can be immediately subjected to load. If the component material permits subsidence of the Ensat® under load, the Ensat® can only execute an axial movement of 0,1 to 0,2 mm. In other words, the pretension of the screw union is largely retained, loosening of the screw connection under dynamic load is impeded.

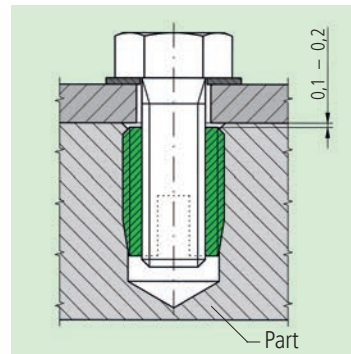


Fig. 4

Example:

Female thread M8, recommended borehole diameter for

Ensats®-S 302:

10,9 to 11,2 mm

Ensats®-SB 307/308:

11,1 to 11,3 mm

(see Works Standard sheets)

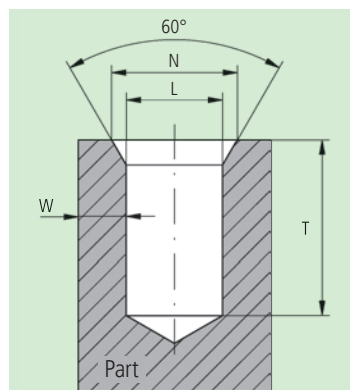
In case of processing problems (e.g. extreme screw-in torque levels), it is generally of no consequence. In case of doubt, it is worth testing this.

Retaining hole

The receiving hole (L, fig. 5) can be simply drilled or already provided for in the casting.

Countersinking (N) the borehole (fig. 5) is recommended in order to:

- Prevent the workpiece surface from being raised
- Permit screwing in to a greater depth
- Ensure improved initial cutting characteristics



Guideline values for countersink:

$N = 0,06 \text{ to } 0,08 \times E + E$

Material thickness:

Smallest admissible material thickness $\geq$ length of the Ensat®

Depth of the blind hole T:

see Works Standard sheets, page 11 to 20

E = Outside diameter of the Ensat® [mm]

Borehole diameter

Brittle, tough and hard materials call for a larger borehole than soft or elastic materials. For guideline values, see the table above.

Edge distance

The smallest still admissible edge distance W (fig. 5) depends on the planned stress level and the elasticity of the material into which the Ensat® is screwed.

Guideline values for plastic:

$W \geq 0,25 \text{ to } 0,9 E$

For moulding parts made of additionell plastic, the Ensat® achieved, due to the greater effective shearing area, a higher pullout strength as a direct screw coupling in the same application.

Fig. 5

Ensats[®] – driving tools...

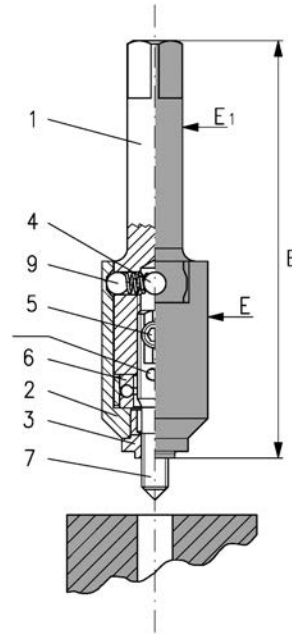
On this page, you can configure the optimum tool for your application. A configuration is provided in the following as an illustrative example.

The article number is composed of two sequences of numbers and starts with the tool shank (fig. 8) which should be selected in accordance with your output.

Also encrypted in this number are the special versions for thin-walled Ensats[®] (620 1 and 621 1) and for very high driving torques (622 0 and 623 0) which are available as standard only as a square shank. Other non-standard geometries can be evaluated as standard besides the tools illustrated. The second sequence of numbers in the table (fig. 9) indicates the thread code of the female thread. The tightened dimensions of the tools are shown on the next page.

Tool for accessible retaining boreholes (short)

- 1 Shank
- 4 Stop pin
- 9 Ball
- 5 Fixing screw
- 6 Ball bearing
- 2 Shell
- 3 Guide bush
- 7 Stud



Tool for deep located retaining boreholes (long)

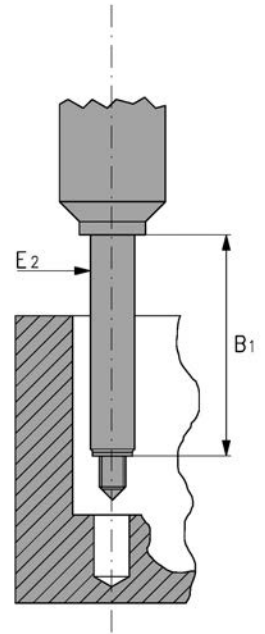


Fig. 6

The right length of the threaded pin for the Ensats[®] with cutting slot or with cutting bore is calculated from the pitch of the female thread (see also Fig. below; P = pitch of the female thread).

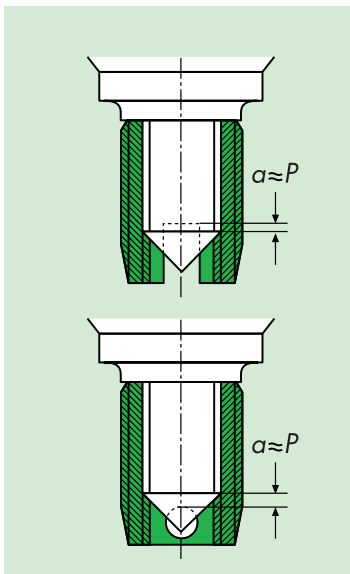


Fig. 7

Setting or exchanging the stud

- Pull the shell (2) downwards off the shank (1).
- Release the locking screws (5).
- Screw the stud (7) in or out. Yellow colour marking indicates flattened surfaces for the locking screws.
- When assembling, tighten both screws (5) evenly.
- Insert the ball bearing (6).
- Push on the shell (2) until the ball stop locks into place. For the tool to function perfectly, the shell must be very easy to rotate. Shorten the thread of tool 610 accordingly for short Ensats[®].
- Unscrew the guide bush (3) at the front if the Ensats[®] is to be installed deeper than 0.2 mm under the surface of the workpiece. Diameter: 0.1 to 0.2 mm smaller than Ensats[®] retaining hole.

For mounting thin-walled Ensats[®] (page 17), special guide bushes must be used (tools 620 1 and 621 1).

Conditions for flawless tool function

- Locking and unlocking the tool on the Ensats[®] surface is guaranteed by a thrust bearing (6).
- The stop pins (4) execute the impact at the shell (2) which unlocks the tool.
- Wear at the stud (7) can result in unlocking problems.

The components are also offered as single parts to allow you to carry out your own repairs to the tool.

Simply give us a call.

Ensat® – driving tools...



Example:

You wish to insert an Ensat® 308 000 050. 110. For the installation process, you have selected a driving tool with spindle hexagon socket to DIN ISO 1173 and have to mount the insert into a deep positioned borehole.

Shank:

636 0...

(long for deep positioned borehole)

Thread code:

...00 050...

(for thread M5)

Suffix numbers:

.... 000

(with always the same tools)

Order no: **636 000 050.000**

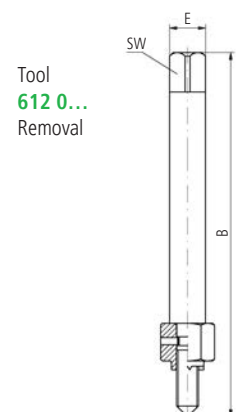
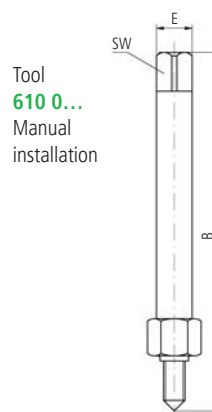
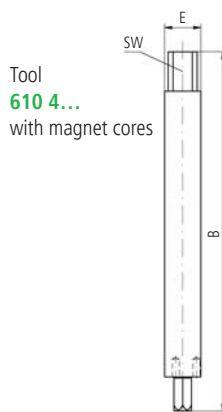
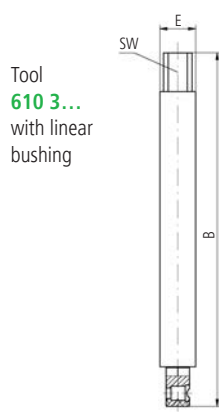
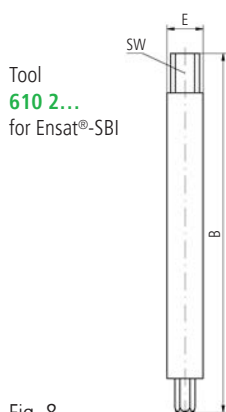
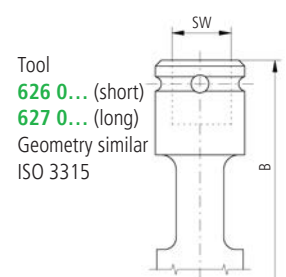
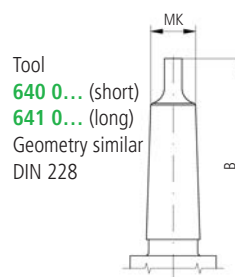
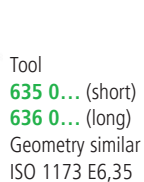
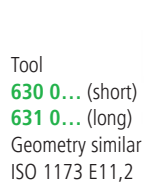
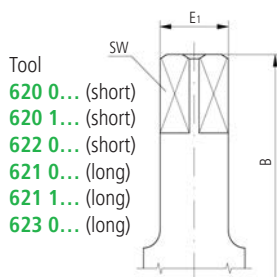


Fig. 8

Artikel-No.	For Ensaf®	M 2	M 2,5	M 3	M 3,5	M 4	M 5	M 6	M 8	M 10	M 12	M 14	M 16	M 18	M 20	M 22	M 24	M 27	M 30
		—	—	No. 4	No. 6	No. 8	No. 10	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	—	—	—	—	—	—
	Metrich	...00 020.000	...00 025.000	...00 030.000	...00 035.000	...00 040.000	...00 050.000	...00 060.000	...00 080.000	...00 100.000	...00 120.000	...00 140.000	...00 160.000	...00 180.000	...00 200.000	...00 220.000	...00 240.000	...00 270.000	...00 300.000
	Whitworth	—	—	—	—	—	—	...00 525.000	...00 531.000	...00 537.000	...00 544.000	...00 550.000	...00 562.000	—	—	—	—	—	—
	UNC	—	—	...00 604.000	...00 606.000	...00 608.000	...00 610.000	...00 625.000	...00 631.000	...00 637.000	...00 644.000	...00 650.000	...00 662.000	—	—	—	—	—	—
	UNF	—	—	...00 704.000	...00 706.000	...00 708.000	...00 710.000	...00 725.000	...00 731.000	...00 737.000	...00 744.000	...00 750.000	...00 762.000	—	—	—	—	—	—

Measurement table

Tool type 620 0... (short version), 620 1... (variant for thin-walled-ENSAT®) and 621 0... (variant for thin-walled-ENSAT®)																			
E ₁	8	8	8	8	8	8	12,5	12,5	12,5	16	16	25	25	25	25	25	30	30	30
SW	6,3	6,3	6,3	6,3	6,3	6,3	10	10	10	12,5	12,5	20	20	20	20	20	25	25	25
B	78	78	78	78	78	78	95	95	95	118	118	145	145	145	169	169	198	198	198
B ₁	40	40	40	40	40	40	50	50	50	60	60	60	60	60	60	60	60	60	60
E	18	18	18	18	18	18	24	24	24	32	32	50	50	50	58	58	70	70	70
E ₂	7	7	7	7	7	7	9	10	12	15	18	20	22	24	26	28	32	35	38
Tool type 622 0... (short version, reinforced version for high installation torques) and 623 0... (long version, reinforced version for high installation torques)																			
E	○	○	○	○	○	○	36	36	36	43	43	○	○	○	○	○	○	○	○
Tool type 630 0... (short version, hexagonal shaft) and 631 0... (long version hexagonal shaft)																			
SW	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	11,11	—	—	—	—	—
B	71	71	71	71	71	71	83	83	83	98	98	118	118	118	—	—	—	—	—
Tool type 635 0... (short version, hexagonal shaft) and 636 0... (long version, hexagonal shaft)																			
SW	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	—	—	—	—	—	—	—	—
B	66	66	66	66	66	66	78	78	78	93	93	—	—	—	—	—	—	—	—
Tool type 640 0... (short version, morse taper shaft) and 641 0... (long version, morse taper shaft)																			
MK	MK0	MK0	MK0	MK0	MK0	MK0	MK2	MK2	MK2	MK3	MK3	MK4	MK4	MK4	MK4	MK4	MK4	MK4	MK4
B	○	○	○	○	○	○	○	○	○	○	176,5	○	222,5	○	○	○	○	○	○
Tool type 626 0... (short version, square socket shank) and 627 0... (long version, square socket shank)																			
SW	—	—	—	—	—	—	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
B	—	—	—	—	—	—	94,5	94,5	94,5	117,5	117,5	140,5	140,5	140,5	168,5	168,5	197,5	197,5	197,5
Tool type 610 2..., 610 3... (from M 8), 610 4... (from M 6) – (for ENSAT® with hexagon socket)																			
E	—	—	—	—	—	6	8	10	10	12	14	16	18	—	—	—	—	—	—
B	—	—	—	—	—	80	90	100	100	110	125	125	125	—	—	—	—	—	—
SW	—	—	—	—	—	4,9	6,2	8	8	9	11	12	15	—	—	—	—	—	—
Tool type 610 0..., 612 0... (manual driving tools)																			
E	—	—	6	6	6	6	10	10	10	16	16	16	—	—	—	—	—	—	—
B	—	—	55	55	60	60	75	75	75	95	95	95	—	—	—	—	—	—	—
SW	—	—	5	5	5	5	8	8	8	12,5	12,5	12,5	—	—	—	—	—	—	—

In order to obtain the length dimension of the extended tool versions, the specified dimensions B must be added in each case to the dimension B1.

○ = available on request

Fig. 9

Manual Ensats® - installation ...

Manual installation with driving tool and tap wrench:

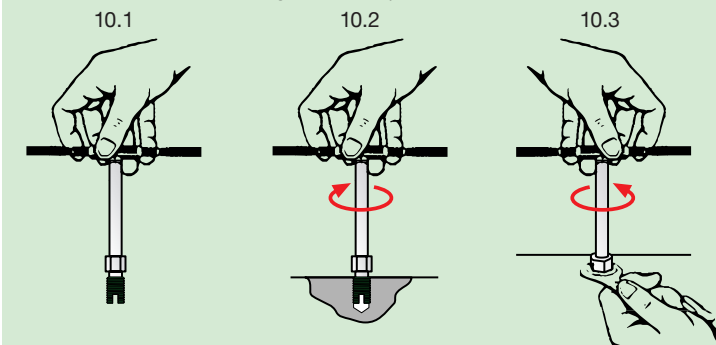


Fig. 10

Emergency installation using screw and nut:

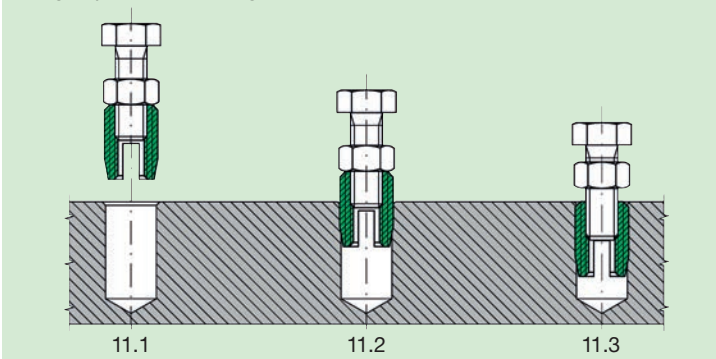


Fig. 11

Manual Insertion Process

The manual insertion is usually carried out using the manual tool 610 0 ... via the female thread or in the case of the tools 610 2... using the hexagon socket. You can of course also use power tools for the manual assembly. If doing so, it needs to be ensured that the rotatable sleeve (2, see fig. 6) is in the corresponding correct position (see fig. 15 procedure description).

Image 10.1/11.1

Thread the Ensats®, cutting geometry (slit or bore) has to be pointing downward. Attention needs to be paid while doing so that the screw with nut does not face in the direction of the cutting geometry after locking with a counter nut, as the shavings are otherwise not discharged.

Image 10.2/11.2

Screw in the Ensats® until approx. 0.1-0.2 mm underneath the surface of the work piece like in image 4 (during temporary assembly using screw and nut, the Ensats® should be processed until flat). Vertical assembly must be ensured.

Image 10.3/11.3

Loosen the counter nut, otherwise the Ensats® could possibly become unscrewed. Subsequently screw out the screw/screw-in tool.



Fig. 12

Machine Ensatz® - installation...

Machine driving process

1. Precisely position the workpiece so that the bore and machine spindle are at right angles to each other (do not tilt).
Set the machine to the precise installation depth (appr. 0.1 to 0.2 mm below the surface of the workpiece see page 5).
2. Actuate the operating lever of the machine.
The rotatable outer shell of the tool must be resting against the outer visible stop pins at the beginning of the turning process so that it is driven by the pins in the clockwise direction.
3. Feed the Ensatz® towards the tool (slot or cutting hole facing downwards) and grip for the duration of 2 to 4 revolutions.
4. Continue to actuate the operating lever of the machine and to guide the tool to the hole until the Ensatz® cuts into the borehole. The remainder of the driving process takes place without actuating the feed.
5. Switch on the reversing function (depending on the type and structure of the device, this takes place automatically by means of a limit switch / depth sensor). Avoid setting the tool down hard on the workpiece as this can lead to breakage of both the tool and the Ensatz®. It can also damage the play-free fit of the Ensatz® and so reduce the pull-out strength. If necessary, adapt the driving speed in line with the necessary reversal time.

Machine installation takes place using the driving tools illustrated on page 7, mounted in:

1. Thread tapping machine

2. Drill press

with reversing system by means of depth stop or thread cutting head. Without guide cartridge, without feed.
Important: Do not exceed tightening torques.

3. Manual machine

With depth sensor and reversing system. See fig. 12.

4. Single or multiple installation machines

With pneumatic or electric drive; semi or fully automatic, computer controlled (CNC).
Note different pitches.

Guideline speed values for light alloy:

Ensatz® female thread	Speed rpm [min ⁻¹]
M 2,5 / M 3	650 – 900
M 4 / M 5	400 – 600
M 6 / M 8	280 – 400
M 10 / M 12	200 – 300
M 14 / M 16	150 – 200
M 18 / M 20	120 – 200
M 22 / M 24	100 – 160
M 27 / M 30	80 – 140

Fig. 13

Guideline values for driving torques:

Ensatz®	M 2,5	1,5 Nm
Ensatz®	M 3	2,5 Nm
Ensatz®	M 4	5,5 Nm
Ensatz®	M 5	10 Nm
Ensatz®	M 6	15 Nm
Ensatz®	M 8	28 Nm
Ensatz®	M 10	40 Nm
Ensatz®	M 12	60 Nm
Ensatz®	M 14	100 Nm
Ensatz®	M 16	160 Nm
Ensatz®	M 18	220 Nm
Ensatz®	M 20	310 Nm
Ensatz®	M 22	420 Nm
Ensatz®	M 24	530 Nm
Ensatz®	M 27	770 Nm
Ensatz®	M 30	1050 Nm

Fig. 14

Torque M_D

The maximum admissible torque is dependent on:

1. The axial load capacity of the tool stud
2. The pressure resistance capacity of the Ensatz® in the axial direction

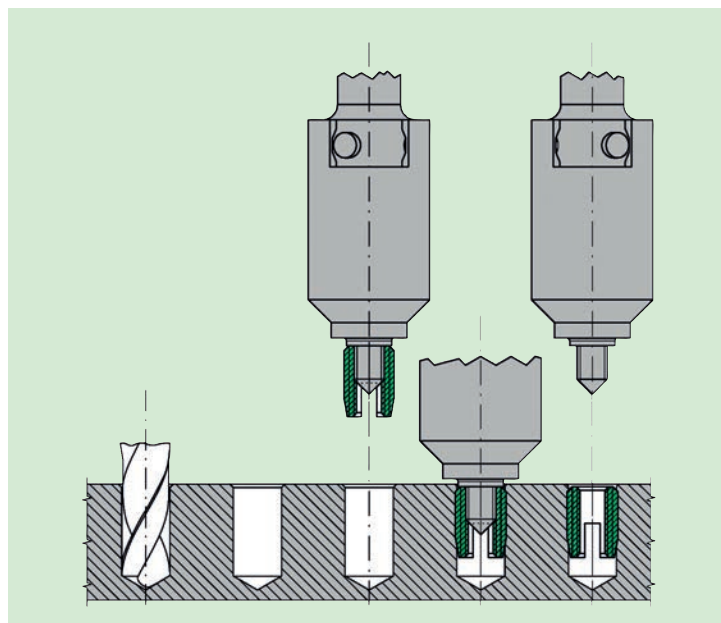


Fig. 15

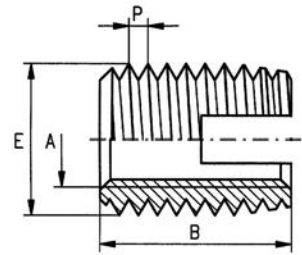


Threaded insert self-tapping metric inner thread

Ensats®-S
Works Standard
302 0

Application

The threaded insert Ensats®-S with cutting slot is a self-tapping fastener for the creation of wear-free, vibration resistant screw joints with high loading capacity in materials with low shearing strength.



Dimensions in mm

Article number	Internal thread	External thread		Length	Guideline values for receiving hole diameter		Minimum borehole depth for blind holes
	A	E	P	B	L		T
302 000 020 ...	M 2	4,5	0,5	6	4,1	to 4,2	8
302 000 025 ...	M 2,5	4,5	0,5	6	4,1	to 4,2	8
302 000 030 ...	M 3	5	0,5	6	4,6	to 4,7	8
302 000 035 ...	M 3,5	6	0,75	8	5,5	to 5,6	10
302 000 040 ...	M 4	6,5	0,75	8	6,0	to 6,1	10
302 000 050 ...	M 5	8	1	10	7,3	to 7,5	13
302 000 061 ...	M 6 (a)	9	1	12	8,3	to 8,5	15
302 000 060 ...	M 6	10	1,5	14	8,9	to 9,2	17
302 000 080 ...	M 8	12	1,5	15	10,9	to 11,2	18
302 000 100 ...	M 10	14	1,5	18	12,9	to 13,2	22
302 000 120 ...	M 12	16	1,5	22	14,9	to 15,2	26
302 000 140 ...	M 14	18	1,5	24	16,9	to 17,2	28
302 000 160 ...	M 16	20	1,5	22	18,9	to 19,2	26
302 000 180 ...	M 18	22	1,5	24	20,9	to 21,2	29
302 000 200 ...	M 20	26	1,5	27	24,9	to 25,2	32
302 000 220 ...	M 22	26	1,5	30	24,9	to 25,2	36
302 000 240 ...	M 24	30	1,5	30	28,9	to 29,2	36
302 000 270 ...	M 27	34	1,5	30	32,9	to 33,2	36
302 000 300 ...	M 30	36	1,5	40	34,9	to 35,2	46

Example for finding the article number

Self-tapping threaded insert Ensats®-S to Works Standard 302 0 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensats®-S 302 000 050.110

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 143
Article-No. (fourth group of digits) ... 500
Article-No. (fourth group of digits) ... 800

Other materials, designs (e. g. fine thread) and finishes on request.

Tolerance

ISO 2768-m

Thread

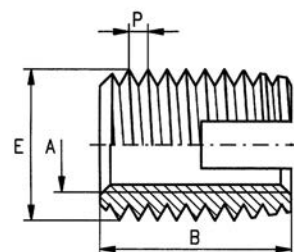
Internal thread A: as per ISO 6H
External thread E: as per KKV standard
Internal thread UNC, UNF, Whitworth see page 12

Animation



Application

Threaded insert with cutting
slot and internal thread.
Whitworth, UNC or UNF



Dimensions in mm

	Article number	Internal thread inch	External thread mm		Length mm	Guideline values for receiving hole diameter	Minimum borehole depth for blind holes
		A	E	P	B	L	T
Whitworth B.S.84 Internal thread Tolerance: medium	302 000 525 ...	1/4	10	1,5	14	8,9 to 9,2	17
	302 000 531 ...	5/16	12	1,5	15	10,9 to 11,2	18
	302 000 537 ...	3/8	14	1,5	18	12,9 to 13,2	22
	302 000 544 ...	7/16	16	1,5	22	14,9 to 15,2	26
	302 000 550 ...	1/2	18	1,5	22	16,9 to 17,2	26
	302 000 562 ...	5/8	20	1,5	22	18,9 to 19,2	26
UNC Unified Coarse Thread ANSI B1.1/BS 1580 Internal thread Tolerance 2B	302 000 604 ...	4 – 40	5	0,5	6	4,6 to 4,7	8
	302 000 606 ...	6 – 32	6	0,75	8	5,5 to 5,6	10
	302 000 608 ...	8 – 32	6,5	0,75	8	6,0 to 6,1	10
	302 000 610 ...	10 – 24	8	1	10	7,3 to 7,5	13
	302 000 625 ...	1/4 – 20	10	1,5	14	8,9 to 9,2	17
	302 000 631 ...	5/16 – 18	12	1,5	15	10,9 to 11,2	18
	302 000 637 ...	3/8 – 16	14	1,5	18	12,9 to 13,2	22
	302 000 644 ...	7/16 – 14	16	1,5	22	14,9 to 15,2	26
	302 000 650 ...	1/2 – 13	18	1,5	22	16,9 to 17,2	26
	302 000 662 ...	5/8 – 11	20	1,5	22	18,9 to 19,2	26
UNF Unified Fine Thread ANSI B1.1/BS 1580 Internal thread Tolerance 2B	302 000 704 ...	4 – 48	5	0,5	6	4,6 to 4,7	8
	302 000 706 ...	6 – 40	6	0,75	8	5,5 to 5,6	10
	302 000 708 ...	8 – 36	6,5	0,75	8	6,0 to 6,1	10
	302 000 710 ...	10 – 32	8	1	10	7,3 to 7,5	13
	302 000 725 ...	1/4 – 28	10	1,5	14	8,9 to 9,2	17
	302 000 731 ...	5/16 – 24	12	1,5	15	10,9 to 11,2	18
	302 000 737 ...	3/8 – 24	14	1,5	18	12,9 to 13,2	22
	302 000 744 ...	7/16 – 20	16	1,5	22	14,9 to 15,2	26
	302 000 750 ...	1/2 – 20	18	1,5	22	16,9 to 17,2	26
	302 000 762 ...	5/8 – 18	20	1,5	22	18,9 to 19,2	26

Example for finding the article number

Self-tapping threaded insert Ensat®-S to Works Standard 302 0 with internal thread A = UNF 1/4-28 made of case-hardened, zinc plated and blue passivated steel: Ensat®-S 302 000 725.110

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 143
Article-No. (fourth group of digits) ... 500
Article-No. (fourth group of digits) ... 800

Other materials, designs (e. g. fine thread) and finishes on request.

Tolerance

ISO 2768-m

Thread

External thread E: as per KKV standard

Remark:

Female threads in imperial measurements are also available for other Ensat® types.
Example: Self-tapping thread insert Ensat®-SB (see page 14, female thread M6) with female thread A = 1/4-20 UNC in steel, case hardened, zinc plated, blue passivated and a length of B = 12 mm: 308 000 625.110



Threaded insert

self-tapping / with hexagonal socket

Ensatz®-SI
Works Standard
302 2

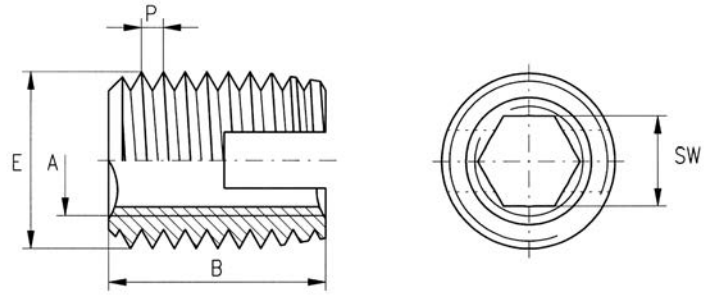
Application

The threaded insert Ensatz®-SI with cutting slot is a self-tapping fastener for the creation of wear-free, vibration resistant screw joints with high loading capacity in materials with low shearing strength.

Hexagonal socket

The Ensatz® is inserted via the hexagonal socket, permitting the achievement of short installation time.
Other benefits: More simple driving tools and machines which require only clockwise rotation.

The Ensatz® can be extracted without problems before the recycling process.



Dimensions in mm

Article number	Internal thread	External thread		Length	Hexagonal socket	Guideline values for receiving hole diameter		Minimum borehole depth for blind holes
	A	E	P		SW +0,1			
302 200 040 ...	M 4	6,5	0,75	8	3,2	6,0 to 6,1		10
302 200 050 ...	M 5	8	1	10	4,1	7,3 to 7,5		13
302 200 060 ...	M 6	10	1,5	14	4,9	8,9 to 9,2		17
302 200 080 ...	M 8	12	1,5	15	6,6	10,9 to 11,2		18
302 200 100 ...	M 10	14	1,5	18	8,3	12,9 to 13,2		22
302 200 120 ...	M 12	16	1,5	22	10,1	14,9 to 15,2		26

Example for finding the article number

Self-tapping threaded insert with hexagonal socket Ensatz®-SI to Works Standard 302 2 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensatz®-SI 302 200 050.110

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305 (M4 to M8)
Brass

Article-No. (**fourth** group of digits) ... 110
Article-No. (**fourth** group of digits) ... 143
Article-No. (**fourth** group of digits) ... 500
Article-No. (**fourth** group of digits) ... 800

Other materials, designs and finishes on request.

Tolerance

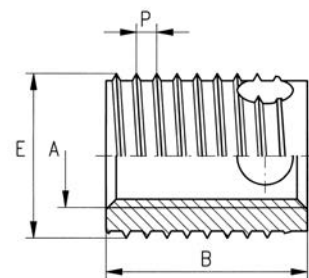
ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: as per KKV standard

Application

Threaded insert Ensatz®-SB with cutting bores is a self-tapping fastener for the creation of wear-free, vibration resistant screw joints with high loading capacity in materials with higher shearing strength.



Dimensions in mm

Article number	Internal thread	External thread Special thread		Length B	Guideline values for receiving hole diameter		Minimum borehole depth for blind holes
	A	E	P		L		T
307 000 030 ...	M 3	5	0,6	4	4,6	to 4,7	6
308 000 030 ...	M 3	5	0,6	6	4,6	to 4,7	8
307 000 035 ...	M 3,5	6	0,8	5	5,5	to 5,6	7
308 000 035 ...	M 3,5	6	0,8	8	5,5	to 5,6	10
307 000 040 ...	M 4	6,5	0,8	6	6,0	to 6,1	8
308 000 040 ...	M 4	6,5	0,8	8	6,0	to 6,1	10
307 000 050 ...	M 5	8	1	7	7,4	to 7,6	9
308 000 050 ...	M 5	8	1	10	7,4	to 7,6	13
307 000 060 ...	M 6	10	1,25	8	9,3	to 9,5	10
308 000 060 ...	M 6	10	1,25	12	9,3	to 9,5	15
307 000 080 ...	M 8	12	1,5	9	11,1	to 11,3	11
308 000 080 ...	M 8	12	1,5	14	11,1	to 11,3	17
307 000 100 ...	M 10	14	1,5	10	13,1	to 13,3	13
308 000 100 ...	M 10	14	1,5	18	13,1	to 13,3	22
307 000 120 ...	M 12	16	1,75	12	15,0	to 15,2	15
308 000 120 ...	M 12	16	1,75	22	15,0	to 15,2	26
307 000 140 ...	M 14	18	2	14	17,0	to 17,2	17
308 000 140 ...	M 14	18	2	24	17,0	to 17,2	28
307 000 160 ...	M 16	20	2	14	19,0	to 19,2	17
308 000 160 ...	M 16	20	2	24	19,0	to 19,2	28
307 000 180 ...	M 18	22	2	18	21,0	to 21,2	21
308 000 180 ...	M 18	22	2	24	21,0	to 21,2	28
308 000 200 ...	M 20	26	2	27	25,0	to 25,2	31
308 000 220 ...	M 22	26	2	30	25,0	to 25,2	34
308 000 240 ...	M 24	30	2	30	29,0	to 29,2	34

Example for finding the article number

Self-tapping threaded insert Ensatz®-SB to Works Standard 307 0 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensatz®-SB 307 000 050.110

Short design Long design

Works Standard 307
Works Standard 308

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 143
Article-No. (fourth group of digits) ... 500
Article-No. (fourth group of digits) ... 800

Other materials, designs (e. g. fine thread) and finishes on request.

Tolerance

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: Special thread with flattened thread root, as per KKV specification
Internal thread UNC, UNF, Whitworth on request

Animation





Threaded insert

self-tapping / with hexagonal socket

Ensatz®-SBI
Works Standard
307 2 and 308 2

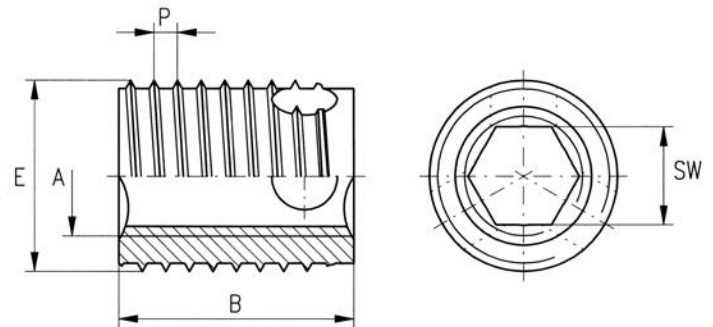
Application

Threaded insert Ensatz®-SBI with cutting bores is a self-tapping fastener for the creation of wear-free, vibration resistant screw joints with high loading capacity in materials with higher shearing strength.

Hexagonal socket

The Ensatz® is inserted via the hexagonal socket, permitting the achievement of short installation time.
Other benefits: More simple driving tools and machines which require only clockwise rotation.

The Ensatz® can be extracted without problems before the recycling process.



Dimensions in mm

Article number	Internal thread	External thread Special thread		Length	Hexagonal socket	Guideline values for receiving hole diameter		Minimum borehole depth for blind holes
	A	E	P		SW +0,1	L		T
307 200 040 ...	M 4	6,5	0,8	6	3,2	6,0	to 6,1	8
308 200 040 ...	M 4	6,5	0,8	8	3,2	6,0	to 6,1	10
307 200 050 ...	M 5	8	1	7	4,1	7,4	to 7,6	9
308 200 050 ...	M 5	8	1	10	4,1	7,4	to 7,6	13
307 200 060 ...	M 6	10	1,25	8	4,9	9,3	to 9,5	10
308 200 060 ...	M 6	10	1,25	12	4,9	9,3	to 9,5	15
307 200 080 ...	M 8	12	1,5	9	6,6	11,1	to 11,3	11
308 200 080 ...	M 8	12	1,5	14	6,6	11,1	to 11,3	17
307 200 100 ...	M 10	14	1,5	10	8,3	13,1	to 13,3	13
308 200 100 ...	M 10	14	1,5	18	8,3	13,1	to 13,3	22
307 200 120 ...	M 12	16	1,75	12	10,1	15,0	to 15,2	15
308 200 120 ...	M 12	16	1,75	22	10,1	15,0	to 15,2	26

Example for finding the article number

Self-tapping threaded insert with hexagonal socket Ensatz®-SBI to Works Standard 307 2 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensatz®-SBI 307 200 050.110

Short design Long design

Works Standard 307
Works Standard 308

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305 (M4 to M8)
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 143
Article-No. (fourth group of digits) ... 500
Article-No. (fourth group of digits) ... 800

Other materials, designs and finishes on request.

Tolerance

ISO 2768-m

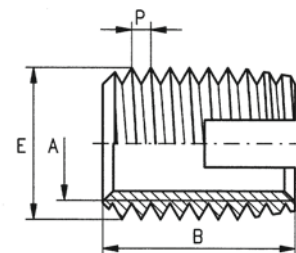
Thread

Internal thread A: as per ISO 6H
External thread E: Special thread with flattened thread root, as per KKV standard

Application

Threaded insert Ensatz® with cutting slot in a special thin-walled and shortened version. Particularly suitable for plastic with thin residual walls and for light-weight constructions.

These versions are designed primarily for processing on thread tapping machines, as the pitch of the outside and internal thread is identical.



Dimensions in mm

Article number	Internal thread	External thread Special thread		Length	Guideline values for receiving hole diameter		Minimum borehole depth for blind holes
		E	P		soft plastics hardwood L	hard, brittle plastics L	
303 000 030 ...	M 3	4,5	0,5	6	4,0 to 4,1	4,1 to 4,2	8
303 000 035 ...	M 3,5	5	0,6	6	4,5 to 4,6	4,6 to 4,7	8
303 000 040 ...	M 4	6	0,7	6	5,3 to 5,4	5,5 to 5,6	8
303 000 050 ...	M 5	7	0,8	8	6,3 to 6,4	6,5 to 6,6	10
303 000 060 ...	M 6	8	1,0	10	7,1 to 7,2	7,3 to 7,5	13
303 000 080 ...	M 8	10	1,25	12	8,6 to 8,8	8,9 to 9,2	15
303 000 100 ...	M 10	12	1,5	15	10,6 to 10,8	10,9 to 11,2	18

Example for finding the article number

Self-tapping thin-walled insert Ensatz®-SD slot to Works Standard 303 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensatz®-SD 303 000 050.110

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305 (M4 to M8)
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 143
Article-No. (fourth group of digits) ... 500
Article-No. (fourth group of digits) ... 800

Other materials, designs and finishes on request.

Tolerance

ISO 2768-m

Thread

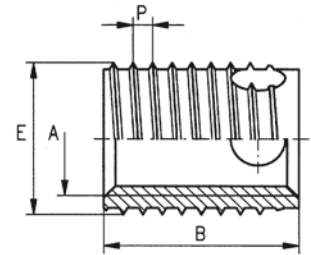
Internal thread A: as per ISO 6H
External thread E: as per KKV standard

Application

Threaded insert Ensats®-SBD with three cutting bores in a special thinwalled version developed primarily for applications with thin residual walls and for light-weight constructions.

These version are designed primarily for processing on thread tapping machines, as the pitch of the outside and inside thread is identical. For processing thinwalled inserts in metal, the tensile

strength / hardness of the base material is always the determining factor. In critical cases, we recommend lubricating with suitable media in order to prevent fracture of the thinwalled inserts.



Dimensions in mm

Article number	Internal thread	External thread Special thread		Length	Borehole diameter	Minimum borehole depth for blind holes
	A	E	P	B		
347 000 035 ...	M 3,5	5	0,6	5	4,6 to 4,7	7
348 000 035 ...	M 3,5	5	0,6	8	4,6 to 4,7	10
347 000 040 ...	M 4	6	0,7	6	5,4 to 5,6	8
348 000 040 ...	M 4	6	0,7	8	5,4 to 5,6	10
347 000 050 ...	M 5	6,5	0,8	7	6,0 to 6,1	9
348 000 050 ...	M 5	6,5	0,8	10	6,0 to 6,1	13
347 000 060 ...	M 6	8	1	8	7,4 to 7,6	10
348 000 060 ...	M 6	8	1	12	7,4 to 7,6	15
347 000 080 ...	M 8	10	1,25	9	9,3 to 9,5	11
348 000 080 ...	M 8	10	1,25	14	9,3 to 9,5	17
347 000 100 ...	M 10	12	1,5	10	11,1 to 11,3	13
348 000 100 ...	M 10	12	1,5	18	11,1 to 11,3	22
347 000 120 ...	M 12	14	1,75	12	13,1 to 13,3	15
348 000 120 ...	M 12	14	1,75	22	13,1 to 13,3	26

Example for finding the article number

Self-tapping thin-walled threaded insert Ensats®-SBD to Works Standard 347 0 with internal thread A = M5 made of case-hardened, zinc plated and blue passivated steel: Ensats®-SBD 347 000 050.110

**Short design
Long design**

Works Standard 347
Works Standard 348

Materials

Case-hardened steel, zinc plated, blue passivated
Case-hardened steel, zinc-nickel plated, transparent passivated
Stainless steel 1.4305 (M3,5 to M8)
Brass

Article-No. (**fourth** group of digits) 110
Article-No. (**fourth** group of digits) 143
Article-No. (**fourth** group of digits) 500
Article-No. (**fourth** group of digits) 800

Other materials, designs and finishes on request.

Tolerance

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: Special thread with flattened thread root, as per KKV standard
Internal thread: UNC, UNF, Whitworth on request

Application

Threaded insert Ensats®-SH with cutting slot is a fastener designed to create wear- and vibrationresistant screw connections capable of withstanding high loads in:

- Hardwood
- Softwood
- Soft plastic and
- Composite materials

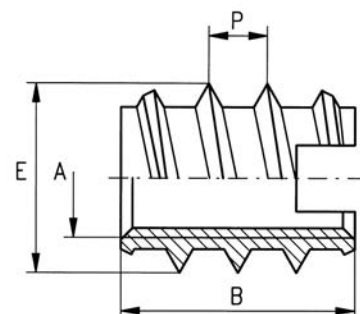
Installation:

1. Self-tapping

Installation with cutting slot facing **down** (normal application)

2. Thread forming:

Installation with cutting slot facing **up** (in very soft materials)



Dimensions in mm

Article number	Internal thread	External thread		Length	Guideline values for receiving hole dia.		Minimum borehole depth for blind holes
		E	P		Softwood ≥ L	Plastic Hardwood L	
A	E	P	B				T
309 000 025 ...	M 2,5	5	1,6	6	3,5	3,6 to 3,8	8
309 000 030 ...	M 3	5,5	1,6	6	4,1	4,2 to 4,3	8
309 000 035 ...	M 3,5	6,5	1,6	8	4,6	4,7 to 4,8	10
309 000 040 ...	M 4	7	2,5	10	5,1	5,2 to 5,3	13
309 000 050 ...	M 5	9	3	12	6,6	6,7 to 6,9	15
309 000 060 ...	M 6	10	4	14	7,6	7,7 to 7,9	17
309 000 080 ...	M 8	13	4	20	9,9	10,1 to 10,3	23
309 000 100 ...	M 10	16	5	23	12,4	12,6 to 12,8	26
309 000 120 ...	M 12	19	5	26	15,4	15,6 to 15,8	30
309 000 140 ...	M 14	22	5	26	18,4	18,6 to 18,8	30
309 000 160 ...	M 16	24	5	26	20,4	20,6 to 20,8	30

Example for finding the article number

Self-tapping threaded insert Ensats®-SH to Works Standard 309 0 with internal thread A = M5 made of brass:
Ensats®-SH 309 000 050.800

Materials

Case-hardened steel, zinc plated, blue passivated
Brass

Article-No. (**fourth** group of digits) ... 110
Article-No. (**fourth** group of digits) ... 800

Other materials, designs (e. g. fine thread) and finishes on request.

Tolerance

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: Special thread, as per KKV specification

Countersink

Guideline values for countersink N (see page 5, fig. 5): **N = 1,0 to 2,0 + E** (E = External dia. of the Ensats®).
because of the larger diameter of the countersink, **the bore hole (L) countersink with 90°**.

Application

Threaded insert Ensatz®-SHI with cutting slot is a fastener designed to create wear- and vibrationresistant screw connections capable of withstanding high loads in:

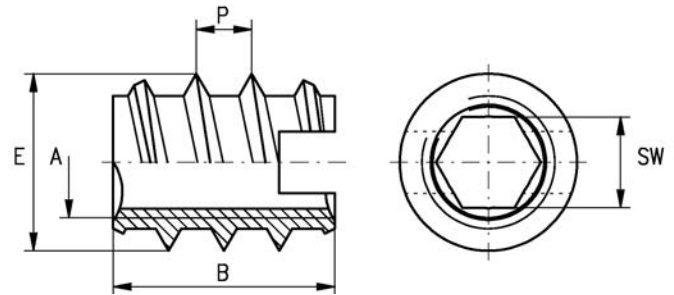
- Hardwood
- Softwood
- Soft plastic and
- Composite materials

Hexagonal socket

The Ensatz® is inserted via the hexagonal socket, permitting the achievement of short installation time.

Other benefits: More simple driving tools and machines which require only clockwise rotation.

The Ensatz® can be extracted without problems before the recycling process.



Dimensions in mm

Article number	Internal thread A	External thread		Length B	Hexagonal socket SW +0,1	Guideline values for receiving hole dia.		Minimum borehole depth for blind holes T
		E	P			Softwood ≥ L	Plastic Hardwood L	
309 200 040 ...	M 4	7	2,5	10	3,2	5,1	5,2 to 5,3	13
309 200 050 ...	M 5	9	3	12	4,1	6,6	6,7 to 6,9	15
309 200 060 ...	M 6	10	4	14	4,9	7,6	7,7 to 7,9	17
309 200 080 ...	M 8	13	4	20	6,6	9,9	10,1 to 10,3	23
309 200 100 ...	M 10	16	5	23	8,3	12,4	12,6 to 12,8	26

Example for finding the article number

Self-tapping threaded insert Ensatz®-SHI to Works Standard 309 2 with internal thread A = M5 made of brass:
Ensatz®-SHI 309 200 050.800

Materials

Case-hardened steel, zinc plated, blue passivated
Brass

Article-No. (fourth group of digits) ... 110
Article-No. (fourth group of digits) ... 800

Other materials, designs (e. g. fine thread) and finishes on request.

Tolerance

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: Special thread, as per KKV specification

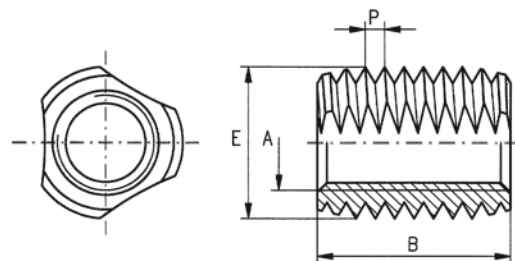
Countersink

Guideline values for countersink N (see page 5, fig. 5): **N = 1,0 to 2,0 + E** (E = External dia. of the Ensatz®).
because of the larger diameter of the countersink, **the bore hole (L) countersink with 90°**.

Application

For the manufacture of wear-resistant screw fastenings capable of withstanding high loads in plastic, preferably thermosetting plastics.

The outside thread is interrupted by three longitudinal grooves which permit the Ensats®-3F to form the thread into the receiving hole.



Dimensions in mm

Article number	Internal thread	External thread		Length	Guideline values for receiving hole dia.			Minimum borehole depth for blind holes
	A	E	P	B	L			T
305 000 030.800	M 3	5	0,5	6	4,6	to	4,7	7
305 000 040.800	M 4	6,5	0,75	8	6,0	to	6,1	9
305 000 050.800	M 5	8	1	10	7,3	to	7,4	11
305 000 060.800	M 6	10	1,5	14	9,0	to	9,2	15

Example for finding the article number

Self-tapping threaded insert Ensats®-3F to Works Standard 305 with internal thread A = M5 made of brass:
Ensats®-3F 305 000 050.800

Materials

Brass

Article-No. (**fourth** group of digits) 800

Other materials, designs and finishes on request.

Tolerance

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
External thread E: as per KKV standard
Internal thread UNC, UNF, Whitworth on request

Mubux®-A pressed-in threaded insert/stud ...



The Mubux®-A is a threaded insert or stud with multiple helically knurled rings, a tapered anchorage profile and a pilot end for easy push in.



Field of application

For all moulded parts made of hard plastic.



Product features

- Fast and easy to install. A special pilot end prevents insertion problems.
- Relatively small diameter and minimal installation length.
- Particularly cost-effective

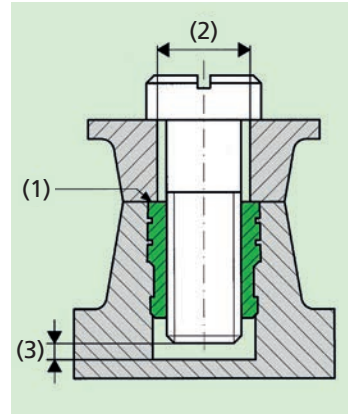


Fig. 16

Design of the shaped component and receiving hole

The part requiring fastening should be flush with the threaded insert, see (1, fig. 16). For this reason the **bore-hole (2) should be closely dimensioned and not countersunk**. The Mubux®-A press in flush into the formed part (1).

Hole diameter and wall thicknesses are dependent on the material used for the formed part. Please enquire or ascertain by testing. For guideline values, see the Works Standard sheets.

Hole depth $\geq$ Length of the Mubux®-A + 1 mm. The screw must not under any circumstances come to rest at the bottom of the hole (3).

Available versions:

- Standard length
- Shortened version
- Contact head for electrical contacts or simultaneous fastening of several parts.
- Stud with and without contact head

Installation

Insert the Mubux®-A with pilot start downwards into the receiving hole and press in with the hand lever or a small press. **Never knock in Mubux®-A with a hammer!**

Mubux®-A achieves outstanding pull-out resistance if inserted into moulded components immediately after removal from the mould, when the component has not yet fully cooled down.

Mubux®-A has also proven successful in some thermo plastic materials if embedded using ultrasound technology.

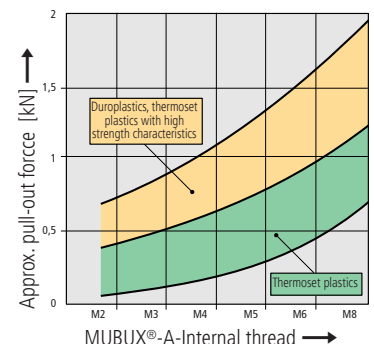


Fig. 17

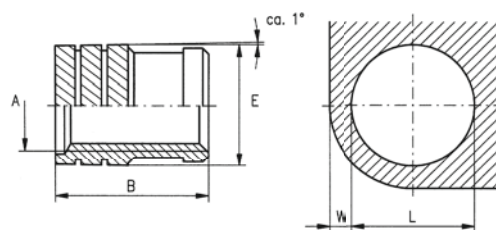
All table values apply only if the screw is inserted to at least 50% of its length in the threaded insert.



Application

For the manufacture of wear-resistant screw fasteners with high loading capacity in hard plastic.

Animation

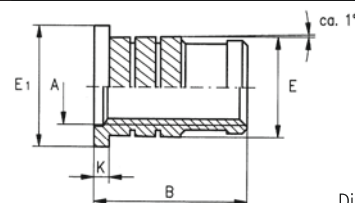


Dimensions in mm

Article number	Internal thread	External diameter	Length	Minimum wall thickness	Hole dia. (guideline values)
	A	E	B	W	L +0,1
850 000 020.800	M 2	3,35	4,0	1,6	3,1
850 000 025.800	M 2,5	4,2	5,3	2,0	3,8
850 000 030.800	M 3	4,2	5,3	2,0	3,8
850 000 035.800	M 3,5	5,0	6,3	2,5	4,6
850 000 040.800	M 4	5,8	7,4	2,5	5,4
850 000 050.800	M 5	6,6	8,3	2,5	6,2
850 000 060.800	M 6	8,2	9,2	2,8	7,8
850 000 080.800	M 8	9,7	9,2	3,8	9,3
850 000 100.800	M 10	12,0	9,2	5,5	11,6

Example for finding the article number

Pressed-in threaded insert Mubux®-A to Works Standard 850 with internal thread A = M 4 made of brass: Mubux®-A 850 000 040.800



Dimensions in mm

Article number	Internal thread	External diameter (excluding head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
852 000 020.800	M 2	3,35	4,8	0,6	4,6
852 000 025.800	M 2,5	4,2	5,6	0,6	5,9
852 000 030.800	M 3	4,2	5,6	0,6	5,9
852 000 035.800	M 3,5	5,0	6,4	0,8	7,1
852 000 040.800	M 4	5,8	7,2	0,8	8,2
852 000 050.800	M 5	6,6	8,0	1,0	9,3
852 000 060.800	M 6	8,2	9,5	1,3	10,5
852 000 080.800	M 8	9,7	11,0	1,3	10,5
852 000 100.800	M 10	12,0	14,0	1,6	10,8

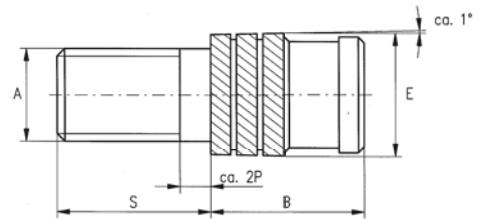
For receiving hole diameter, see Article no. 850

Material Brass

Tolerances ISO 2768-m

Thread Internal thread A: as per ISO 6H

Article-No. (fourth group of digits) 800

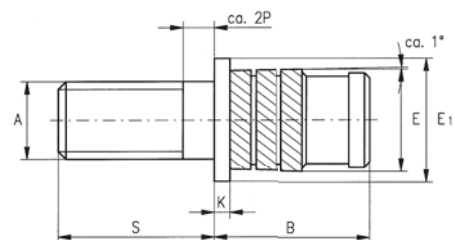

 Available stud lengths
 (other lengths on request)

Dimensions in mm

Article number	Internal thread	External diameter	Insert length	Guideline values for receiving hole diameter L +0,1	Article number <u>eleventh digit</u>	Length
	A	E	B			S
856 000 030. ...	M 3	4,2	5,3	3,8	 820	6
856 000 035. ...	M 3,5	5,0	6,3	4,6	 840	10
856 000 040. ...	M 4	5,8	7,4	5,4	 860	16
856 000 050. ...	M 5	6,6	8,3	6,2	 880	25
856 000 060. ...	M 6	8,2	9,2	7,8		
856 000 080. ...	M 8	9,7	9,2	9,3		

 Thread length = S - 2P
 P = Thread pitch

Example for finding the article number

 Pressed-in threaded insert Mubux®-AS to Works Standard 856, length of the threaded stud **S = 10 mm** made of brass: Mubux®-AS 856 000 040.**840**


Dimensions in mm

Article number	Internal thread	External diameter (excluding head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
857 000 030. ...	M 3	4,2	5,6	0,6	5,9
857 000 035. ...	M 3,5	5,0	6,4	0,8	7,1
857 000 040. ...	M 4	5,8	7,2	0,8	8,2
857 000 050. ...	M 5	6,6	8,0	1,0	9,3
857 000 060. ...	M 6	8,2	9,5	1,3	10,5
857 000 080. ...	M 8	9,7	11,0	1,3	10,5

Available stud lengths: See table Works Standard 856

For the receiving hole diameter, see article no. 856

Material Brass
Tolerances ISO 2768-m
Thread External thread A: as per ISO 6g

B-Lok® self-locking threaded insert

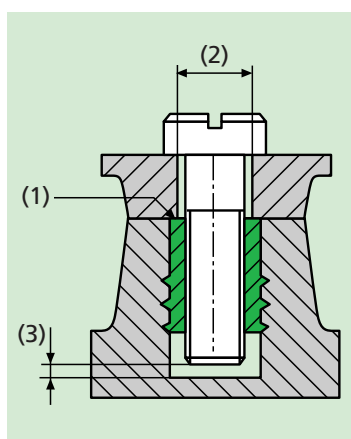


Fig. 18

The B-Lok® is a threaded insert with different external profiles, which guarantee optimum anchorage in all types of moulded plastic components.

Product features

- Unbeatably short installation times
- Screw is secured automatically against loosening.
- Cost savings for locking elements.

Design of the moulded component and receiving hole

The part requiring fastening should be flush with the threaded insert, see (1, fig. 18). For this reason, **the bore-hole (2) should be closely dimensioned and not countersunk.** The B-Lok® press in flush into the formed part (1).

The screw length must be selected so that the B-Lok® is completely expanded

Hole diameter and wall thicknesses are dependent on the material used for the formed part. Please enquire or ascertain by testing. For guideline values, see the Works Standard sheets. Conicity 0,5° to max. 1°.

For B-Lok®, we recommend the smallest possible hole diameter in which it is still possible to reliably insert the screw. Although a larger hole means that the screw is less stiff running, at the same time reduces pull-out resistance and torque safety.

Hole depth. This should be overdimensioned if possible. The screw must not under any circumstances come to rest at the bottom of the hole, see (3).

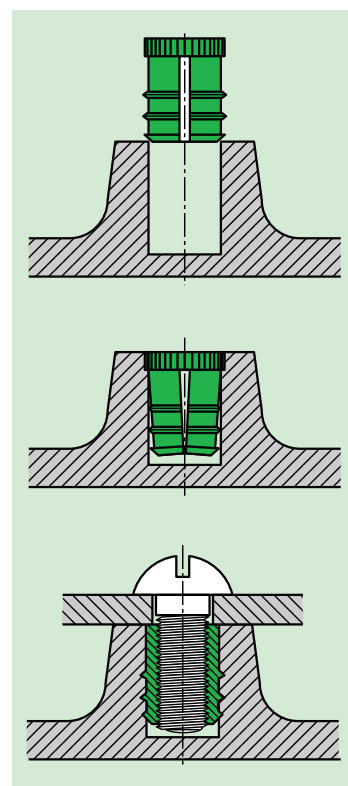


Fig. 19

Installation

1. The B-Lok® is pressed into the receiving hole, during which process the segments bend inwards (fig. 19).
2. When inserting the screw, the segments resume their original shape, in which process the external profile becomes anchored in the hole wall. The residual tension acts to lock the screw in place (fig. 19).

In the case of small-scale series, the B-Lok® is embedded with a simple manual levering device (possibly a small press or drill at a standstill).

For large series: Single or multiple installation machines on request.

We recommend practical testing.

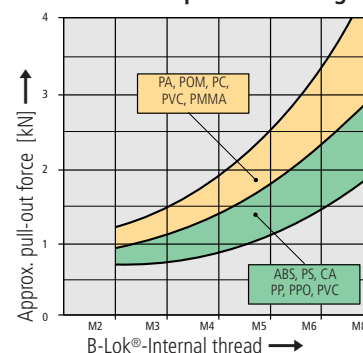


Fig. 21

Selection of the correct B-Lok®-type:

Material	B-Lok®	Works Standard	Page
Thermoset plastic	-MV or -E	812/815, 830/831	25, 26
Duroplastic	-R	841	27
PU/PUR-foam	-R, -MV or -E	841, 812/815 830/831	27, 25, 26
Wood	-F or -E	821/823, 830/831	26
Through holes in laminate materials or side walls	-RK	842	27

Fig. 20



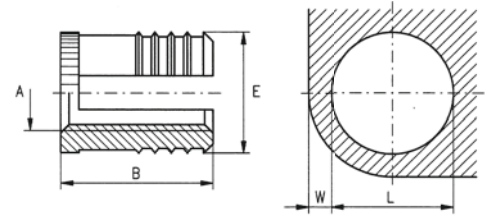
Expansion inserts self-locking

B-Lok®-MV
Works Standard
812 to 815

Application

For creation of wear and vibration-resistant screw fastenings with high load capacity in plastic moulded components, preferably thermoset plastic. The insert is anchored in the moulded compo-

nent by precision anchoring vanes, and torque safety is provided by a gear ring. The screw is rendered resistant to vibration by the clamping action of the two segments.



Dimensions in mm

Article number	Internal thread	External diameter	Length	Number of vanes	Minimum wall thickness	Hole diameter ¹⁾ (guideline values)
	A	E	B		W	L +0,1
812 000 020.800	M 2	3,45	4,0	2	1,6	3,2
813 000 025.800	M 2,5	4,3	4,8	3	2,0	4,0
813 000 030.800	M 3	4,3	4,8	3	2,0	4,0
813 000 035.800	M 3,5	5,1	6,4	3	2,4	4,8
814 000 040.800	M 4	5,9	8,0	4	2,8	5,6
815 000 050.800	M 5	6,7	9,5	5	3,2	6,4
815 000 060.800	M 6	8,3	12,7	5	4,0	8,0
815 000 080.800	M 8	9,9	12,7	5	4,8	9,5

¹⁾ Max. conicity +0,04 mm

Example for finding the article number

Self-locking threaded insert B-Lok®-MV to Works Standard 815 0 with internal thread M5 and 5 vanes made of brass: B-Lok®-MV 815 000 050.800

Materials

Brass

Article no. (**fourth** group of digits) 800

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H
Internal thread UNC, UNF, Whitworth on request

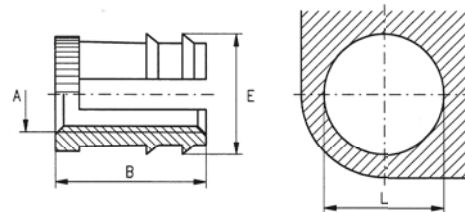
Animation



Application

For creation of wear and vibration-resistant screw fastenings with high load capacity in

- Soft plastic
- Wood / fibreboard
- Composite materials



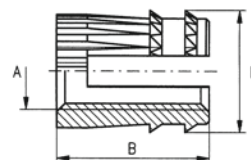
Dimensions in mm

Article number	Internal thread A	Biggest external diameter E	Length B	Number of vanes	Hole diameter (guideline values) L +0,2
821 000 025.800	M 2,5	5,35	4,8	1	4,5
821 000 030.800	M 3	5,35	4,8	1	4,5
821 000 035.800	M 3,5	6,0	4,8	1	5,2
822 000 040.800	M 4	6,65	9,5	2	5,8
822 000 050.800	M 5	7,35	9,5	2	6,5
822 000 060.800	M 6	9,05	9,5	2	8,2
823 000 080.800	M 8	12,45	14,3	3	11,8

Different lengths and numbers of vanes with the same internal thread on request. This changes the guideline values for hole diameters..

Example for finding the article number

Self-locking threaded insert B-Lok®-F to Works Standard 822 0 with internal thread M5 and 2 vanes made of brass: B-Lok®-F 822 000 050.800



Dimensions in mm

Article number	Internal thread A	Biggest external diameter E	Length B	Number of vanes	Hole diameter (guideline values) L +0,1	Article number	Biggest external diameter E	Length B	Number of vanes
830 000 020.800	M 2	3,9	3,5	1	3,4				
830 000 025.800	M 2,5	4,4	4	1	3,9				
830 000 030.800	M 3	5,5	5	1	4,9	831 000 030.800	5,5	8	2
830 000 040.800	M 4	6,5	5	1	5,9	831 000 040.800	6,5	8	2
830 000 050.800	M 5	7,6	6	1	6,9	831 000 050.800	7,6	9	2
830 000 060.800	M 6	8,6	7	1	7,9	831 000 060.800	8,6	9	2

Example for finding the article number

Self-locking threaded insert B-Lok®-E to Works Standard 831 0 with internal thread M5 and 2 vanes made of brass: B-Lok®-E 831 000 050.800

Materials

Brass

Article no. (fourth group of digits) ... 800

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H

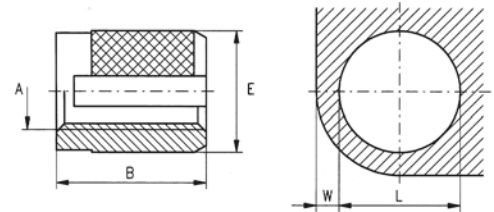


Expansion inserts self-locking

B-Lok®-R
Works Standard
841

Application

For creation of wear and vibration-resistant screw fastenings with high load capacity in plastic, preferably duroplastics.



Dimensions in mm

Article number	Internal thread	External diameter	Length	Minimum wall thickness	Hole diameter (guideline values)
	A	E	B	W	L +0,1
841 000 020.800	M 2	3,55	4,0	2,4	3,2
841 000 025.800	M 2,5	4,3	4,8	3,2	4,0
841 000 030.800	M 3	4,3	4,8	3,2	4,0
841 000 035.800	M 3,5	5,1	6,4	3,6	4,7
841 000 040.800	M 4	6,0	8,0	4,0	5,5
841 000 050.800	M 5	6,8	9,5	4,8	6,3
841 000 060.800	M 6	8,4	12,7	6,0	7,9
841 000 080.800	M 8	9,9	12,7	7,0	9,5

Example for finding the article number

Self-locking threaded insert B-Lok®-R to Works Standard 841 0 with internal thread M5 and made of brass: B-Lok®-R 841 000 050.800

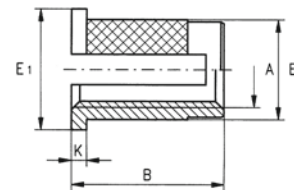


Expansion inserts self-locking

B-Lok®-RK
Works Standard
842

Application

With additional countering head, used in through holes in laminates and housing walls.



Dimensions in mm

Article number	Internal thread	External diameter	Length	Head dia.	Head height	Minimum wall thickness	Hole diameter (guideline values)
	A	E	B	E ₁	K	W	L +0,1
842 000 020.800	M 2	3,55	4,0	4,8	0,6	2,4	3,2
842 000 025.800	M 2,5	4,3	4,8	5,6	0,6	2,8	4,0
842 000 030.800	M 3	4,3	4,8	5,6	0,6	3,2	4,0
842 000 035.800	M 3,5	5,1	6,4	6,4	0,8	3,6	4,7
842 000 040.800	M 4	6,0	8,0	7,2	0,8	4,0	5,5
842 000 050.800	M 5	6,8	9,5	8,0	1,0	4,8	6,3
842 000 060.800	M 6	8,4	12,7	9,5	1,3	6,0	7,9
842 000 080.800	M 8	9,9	12,7	11,0	1,3	6,0	9,5

Example for finding the article number

Self-locking threaded insert B-Lok®-RK to Works Standard 842 0 with internal thread M5 and made of brass: B-Lok®-RK 842 000 050.800

Materials

Brass

Article no. (fourth group of digits) ... 800

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H

S-Lok® – threaded insert and stud ...

The S-Lok® is a threaded insert / stud with a graduated opposing herringbone knurl on the outside and a pilot end for problem-free insertion.

Its unique shape has been tailored to the requirements of the material and was developed especially for insertion into plastic components by means of ultrasonic vibration or heat transfer.

Well-known manufacturers of ultrasonic welding machines recommend S-Lok® due to the low energy requirement, the short insertion time and the problem-free production.

Field of application

For all moulded parts made of thermoset plastics.

Product features

- Also suitable for thin-wall thicknesses, elimination of material tension.
- The firm seating is largely insensitive to borehole tolerances and material shrinkage.

Available versions:

- Standard length
- Shortened version
- Contact head for electrical contacts or simultaneous fastening of several parts.
- Stud with and without contact head



S-Lok® – Construction and installation ...

Design of the moulded component and receiving hole

Hole diameter (L, fig. 24) and wall thicknesses (W) are dependent on the material used for the formed part, the insertion method and the requirements imposed on pull-out resistance / torque safety. Please inquire or ascertain by testing. For guideline values, see the Works Standard sheets.

Countersinking (N) is recommended if the insert would not moulded in.

Countersinking diameter (N) = S-Lok®-outside diameter E.

Countersinking depth t:

M 2	~ 0,4 mm
M 2,5 / M 3,5	~ 0,5 mm
M 4 / M 5	~ 0,7 mm
M 6 / M 8 / M 10	~ 1,1 mm

Hole depth:

(T) ≥ length of the S-Lok® + 1 mm.
(fig. 24).

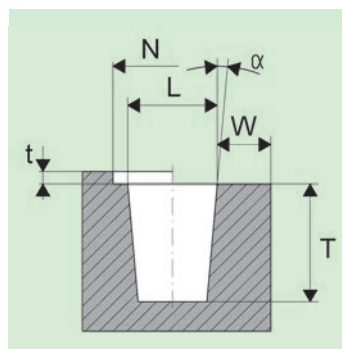


Fig. 24

Installation

Inserts are installed by means of ultrasonic or heat transfer. This causes the plastic to soften so that it flows into the knurl profile of the S-Lok®. On subsequent cooling, a firm seat is obtained which is capable of withstanding high loads.

The pull-out resistance is generally higher than is the case with moulded-in components, and depends on the plastic, the size of the receiving hole, the wall thickness, the edge distance and the correct setting of the installation equipment.

Installation machine

(fig. 22 and 23) on request.



Fig. 22

30.1218

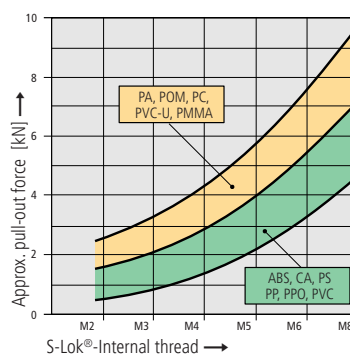


Fig. 25



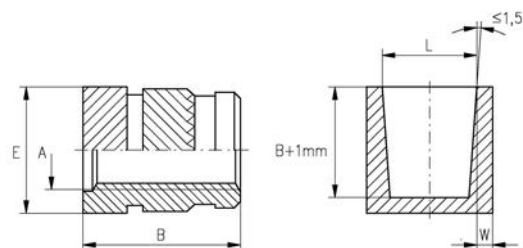
Fig. 23

Application

For the manufacture of wear and vibration-resistant screw fasteners with high loading capacity in plastic, preferably thermoset plastics.

The inserts are pressed into pre-formed receiving holes while the hole wall is softened using heat or ultrasound.

Animation

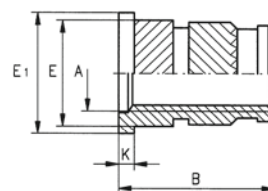


Dimensions in mm

Article number	Internal thread	External diameter	Length	Hole diameter (guideline values)	Minimum wall thickness	Article number short version	Length
	A	E	B	L +0,1	W		B
860 000 020.800	M 2	3,6	4,0	3,2	2,0		
860 000 025.800	M 2,5	4,6	5,8	4,0	2,3	861 000 025.800	4,0
860 000 030.800	M 3	4,6	5,8	4,0	2,3	861 000 030.800	4,0
860 000 035.800	M 3,5	5,4	7,2	4,8	2,5	861 000 035.800	5,8
860 000 040.800	M 4	6,3	8,2	5,6	2,5	861 000 040.800	7,2
860 000 050.800	M 5	7,0	9,5	6,4	2,7	861 000 050.800	8,2
860 000 060.800	M 6	8,6	12,7	8,0	3,0	861 000 060.800	9,5
860 000 080.800	M 8	10,2	12,7	9,6	3,5	861 000 080.800	9,5
860 000 100.800	M10	12,3	12,7	11,7	4,0	861 000 100.800	9,5

Example for finding the article number

Threaded insert S-Lok® to Works Standard 860 0 without head and internal thread M4 made of brass: S-Lok® 860 000 040.800



Dimensions in mm

Article number	Internal thread	External diameter (excluding head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
862 000 020.800	M 2	3,6	4,8	0,6	4,6
862 000 025.800	M 2,5	4,6	5,6	0,6	6,4
862 000 030.800	M 3	4,6	5,6	0,6	6,4
862 000 035.800	M 3,5	5,4	6,4	0,8	8,0
862 000 040.800	M 4	6,3	7,2	0,8	9,0
862 000 050.800	M 5	7,0	8,0	1,0	10,5
862 000 060.800	M 6	8,6	9,5	1,3	14,0
862 000 080.800	M 8	10,2	11,0	1,3	14,0
862 000 100.800	M 10	12,3	14,0	1,3	14,0

For receiving hole diameter, see article no. 860

Materials

Brass

Article no. (fourth group of digits) 800

Other materials on request.

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H



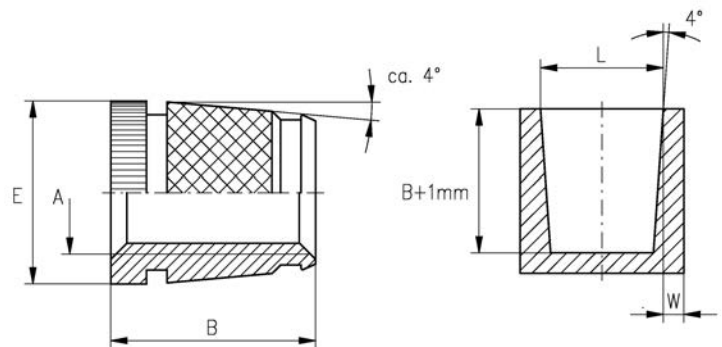
Threaded inserts for heat or ultrasonic embedding

S-Lok®-KOH
Works Standard
853 2 / 854 2

Application

For the manufacture of wear and vibration-resistant screw fasteners with high loading capacity in plastic, preferably thermoset plastics. The inserts are pressed into pre-formed receiving holes with 4° demoulding incline during softening of the hole wall by means of heating or ultrasonic technology.

Animation



Dimensions in mm

Article number	Internal thread	External diameter	Length	Hole diameter (guideline values)	Minimum wall thickness	Article number short version	Length
	A	E	B	L +0,1	W		B
853 200 030.800	M 3	4,7	5,5	4,4	1,8	854 200 030. 800	5,0
853 200 035.800	M 3,5	5,5	6,0	5,2	1,8	854 200 035. 800	5,5
853 200 040.800	M 4	6,1	7,5	5,8	2,0	854 200 040. 800	6,0
853 200 050.800	M 5	7,3	9,0	6,9	2,5	854 200 050. 800	7,0
853 200 060.800	M 6	8,9	10,0	8,5	2,5	854 200 060. 800	9,0
853 200 080.800	M 8	11,3	12,0	10,9	3,0		

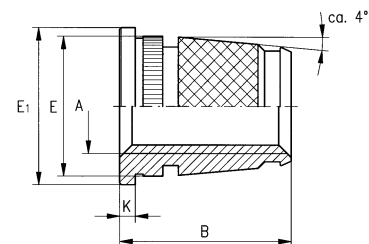
Example for finding the article number

Threaded insert S-Lok®-KOH to Works Standard 853 2 with demoulding incline 4°, internal thread M4, length 7,5 mm made of brass: S-Lok®-KOH 853 200 040.800



Threaded inserts for heat or ultrasonic embedding

S-Lok®-KOHK
Works Standard
855 2



Dimensions in mm

Article number	Internal thread	External diameter (without head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
855 200 030.800	M 3	4,7	6,4	0,6	6,1
855 200 035.800	M 3,5	5,5	7,0	0,8	6,8
855 200 040.800	M 4	6,1	8,0	0,8	8,3
855 200 050.800	M 5	7,3	8,5	1,0	10,0
855 200 060.800	M 6	8,9	10,0	1,0	11,0
855 200 080.800	M 8	11,3	12,5	1,3	13,3

For receiving hole diameter, see article no. 853 2.. ...

Materials

Brass

Article no. (fourth group of digits) ... 800

Other dimensions on request.

Tolerances

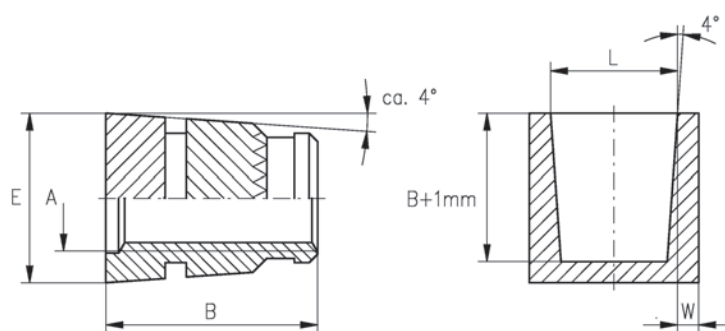
ISO 2768-m

Thread

Internal thread A: as per ISO 6H

Application

For the manufacture of wear and vibration-resistant screw fasteners with high loading capacity in plastic, preferably thermoset plastics. The inserts are pressed into pre-formed receiving holes with 4° demoulding incline during softening of the hole wall by means of heating or ultrasonic technology.

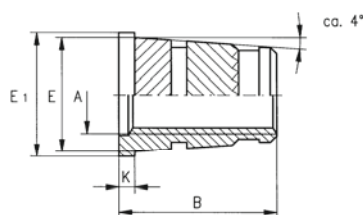


Dimensions in mm

Article number	Internal thread	External diameter	Length	Hole diameter (guideline values)	Minimum wall thickness	Article number short version	Length
	A	E	B	L +0,1	W		B
853 100 030.800	M 3	4,6	5,5	4,4	1,8	854 100 030. 800	5,0
853 100 035.800	M 3,5	5,4	6,0	5,2	1,8	854 100 035. 800	5,5
853 100 040.800	M 4	6,0	7,5	5,8	2,0	854 100 040. 800	6,0
853 100 050.800	M 5	7,2	9,0	6,9	2,5	854 100 050. 800	7,5
853 100 060.800	M 6	8,8	10,0	8,5	2,5	854 100 060. 800	9,0
853 100 080.800	M 8	11,2	12,0	10,9	3,0	854 100 080. 800	10,0

Example for finding the article number

Threaded insert S-Lok®-KO to Works Standard 853 1 with demoulding incline 4°, internal thread M4, length 7,5 mm made of brass: S-Lok®-KO 853 100 040.800



Dimensions in mm

Article number	Internal thread	External diameter (excluding head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
855 100 030.800	M 3	4,6	6,4	0,6	6,1
855 100 035.800	M 3,5	5,4	7,2	0,8	6,8
855 100 040.800	M 4	6,0	8,0	0,8	8,3
855 100 050.800	M 5	7,2	9,0	1,0	10,0
855 100 060.800	M 6	8,8	10,0	1,3	11,3
855 100 080.800	M 8	11,2	12,5	1,3	13,3

For receiving hole diameter, see article no. 853 1.. ...

Materials

Brass

Article no. (fourth group of digits) ... 800

Other dimensions on request.

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H

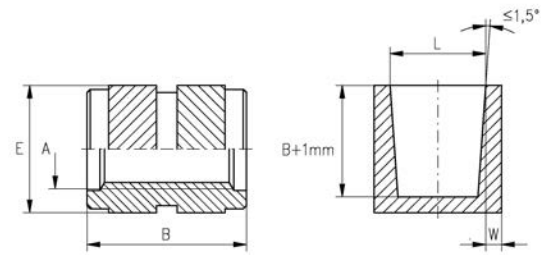


Threaded inserts for heat or ultrasonic embedding

S-Lok®-RB
Works Standard
864

Application

Easily sortable due to their symmetrical shape and usable on both sides, suitable for all applications in thermoset plastics.



Dimensions in mm

Article number	Internal thread	External diameter	Length	Hole diameter (guideline values)	Minimum wall thickness
	A	E	B	L + 0,1	W
864 000 020.800	M 2	3,6	4,0	3,2	1,5
864 000 025.800	M 2,5	4,6	5,8	4,0	1,8
864 000 030.800	M 3	4,6	5,8	4,0	1,8
864 000 035.800	M 3,5	5,4	7,2	4,8	2,2
864 000 040.800	M 4	6,3	8,2	5,6	2,5
864 000 050.800	M 5	7,0	9,5	6,4	3,0
864 000 060.800	M 6	8,6	12,7	8,0	3,5
864 000 080.800	M 8	10,2	12,7	9,6	4,5
864 000 100.800	M10	12,5	12,7	11,9	5,5

Example for finding the article number

Threaded insert S-Lok®-RB to Works Standard 864 0 with internal thread A = M4
made of brass: S-Lok®-RB 864 100 040.800

Material

Brass

Article no. (**fourth** group of digits) 800

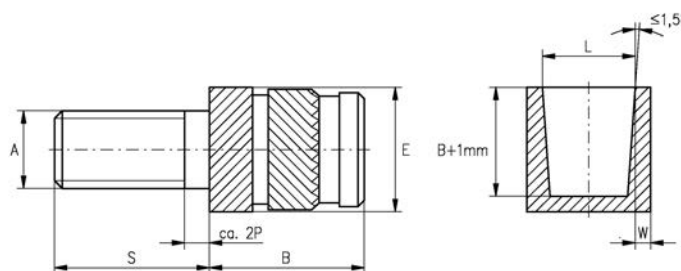
Other dimensions on request.

Tolerances

ISO 2768-m

Thread

Internal thread A: as per ISO 6H



Available stud lengths
(other lengths on request)

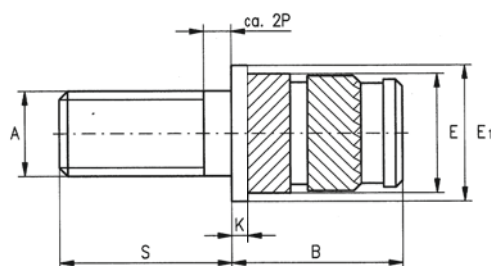
Dimensions in mm

Article number	Thread	External diameter	Inserted length	Hole diameter (guideline values)	Article number eleventh digit	Length
	A	E	B	L +0,1		S
866 000 030. ...	M 3	4,6	5,8	4,0	 820	6
866 000 035. ...	M 3,5	5,4	7,2	4,8	 840	10
866 000 040. ...	M 4	6,3	8,2	5,6	 860	16
866 000 050. ...	M 5	7,0	9,5	6,4	 880	25
866 000 060. ...	M 6	8,6	12,7	8,0		
866 000 080. ...	M 8	10,2	12,7	9,6		

Thread length = S - 2P
P = Threaded pitch

**Example for finding
the article number**

Threaded insert S-Lok®-S Stud M4 to Works Standard 866 0, length of stud **S = 10 mm**
made of brass: S-Lok®-S 866 000 040.**840**



Dimensions in mm

Article number	Thread	External diameter (excluding head)	Head diameter	Head height	Length
	A	E	E ₁	K	B
867 000 030. ...	M 3	4,6	5,6	0,6	6,4
867 000 035. ...	M 3,5	5,4	6,4	0,8	8,0
867 000 040. ...	M 4	6,3	7,2	0,8	9,0
867 000 050. ...	M 5	7,0	8,0	1,0	10,5
867 000 060. ...	M 6	8,6	9,5	1,3	14,0
867 000 080. ...	M 8	10,2	11,0	1,3	14,0

Available stud lengths: See table Works Standard 866

For receiving hole diameter, see article no. 866

Material

Brass

Other dimensions on request.

Tolerances

ISO 2768-m

Thread

External thread A: as per ISO 6g

Fastening elements for special applications ...

Press in bushing
with long hole

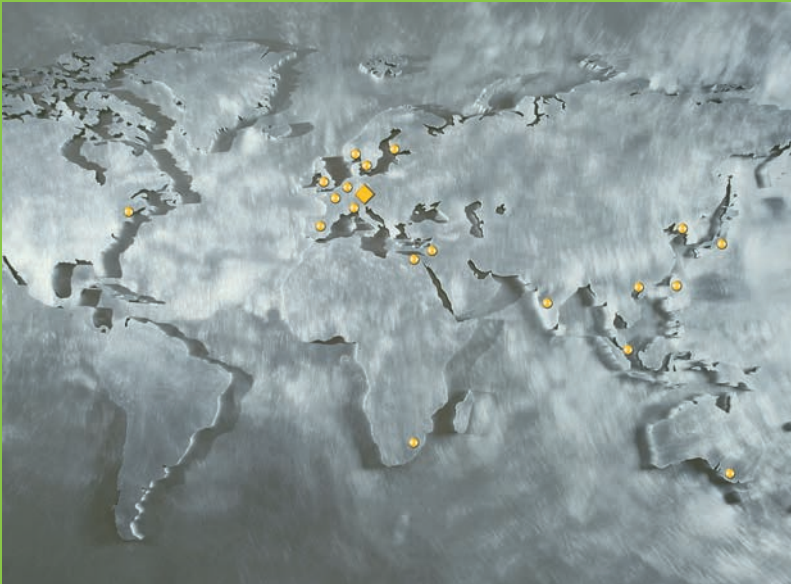


Threaded press in bushing
with O-Ring for applications
with sealing performances



Press in, moulded in and
inlaid elements with
different kind of designs
and outer contours

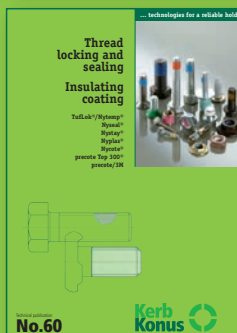
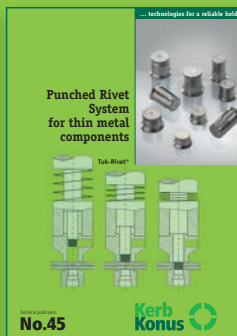
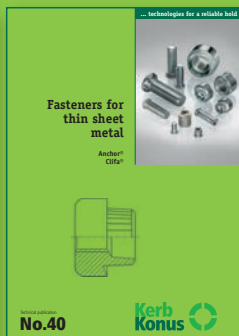




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Kerb-Konus-Vertriebs-GmbH
P.O.Box 1663
92206 Amberg, Germany

Phone +49 9621 679-0
Fax +49 9621 679444
e-mail KKV-Amberg@kerbkonus.de

Internet www.kerbkonus.de

... in Germany

Amberg Headquarters
Production and Sales
Kerb-Konus-Vertriebs-GmbH
Wernher-von-Braun-Straße 7
92224 Amberg

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