# The Ensat® self-tapping threaded insert ...

Ensat is a self-tapping threaded insert with external and internal thread, 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.

**Ensat®-S 302**
(with cutting slot) is recommended for most application cases. In certain materials, this Ensat demonstrates a minimal inward springing action, so creating a certain screw locking effect. If this effect is not required, we recommend using Ensat-SB 307/308.

**Ensat®-SB 307/308**
(with cutting bores) was developed for materials with difficult cutting properties. This insert has a thick wall and the cutting force is distributed over three cutting edges.
The short version Ensat 307 is particularly suitable where minimal material thicknesses are involved.

**Thin-walled Ensat®-SD/SBD**
for applications involving special space conditions (residual wall thicknesses), and also suitable for driving using a thread tapping machine (same internal and external thread pitch).
Slot version: Works Standard 303
Three-hole version: Works Standard 347/348

**Ensat®-SBS 337/338**
with three chip reservoirs. Used primarily wherever only a small amount of chips may be permitted to occur during the tapping process

**Ensat®-SBT 357/358**
with closed floor for additional sealing from below.

## Fields of application

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

**Automotive industry, passenger and commercial vehicles**
Engines, transmissions, wide range of supply parts such as wing mirrors, radiators, bumpers etc.

**Plant and equipment construction**
Flange joints, construction equipment, oil burners etc.

**Household appliance and office machinery production**
Vacuum cleaners, cameras, sun lamps, drills etc.

**Electrical and laboratory supplies**
Capacitors, heavy current, radio and telecommunication systems, dental technology equipment.

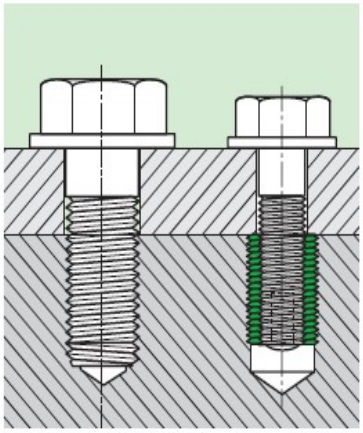
**Military applications**
Tanks, aircraft etc.

## Product features

- The Ensat has a large effective shearing surface (E π B), so ensuring a higher degree of pull-out strength, i.e. an Ensat M4 is often sufficient instead of a cut M5 thread (see page 5).
- The Ensat is driven subsequently into the finished workpiece. This means a higher casting machine output, no rejects due to incorrectly cast-in insert components, no moulding sand trapped in the thread.
- A pre-cast or pre-drilled retaining hole with normal tolerance requirements is sufficient for driving in the Ensat. The thread is always precisely positioned.
- The work steps required with wire inserts – thread tapping, breaking off trunnions etc. as well as costly wearing tools (special thread drills, limit plug gauges etc.) are not needed with the Ensat-system.
- The Ensat is insensitive to small areas of shrinkage. The Ensat-system prevents damage caused by torn threads.

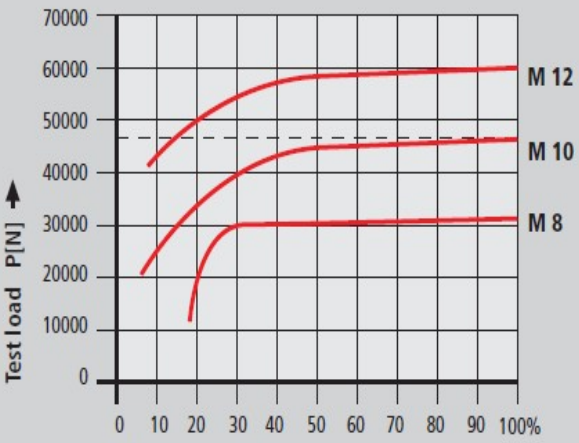
Connections using Ensat threaded inserts permit substantially smaller overall dimensions and thus pave the way for material-saving and weight-saving designs.

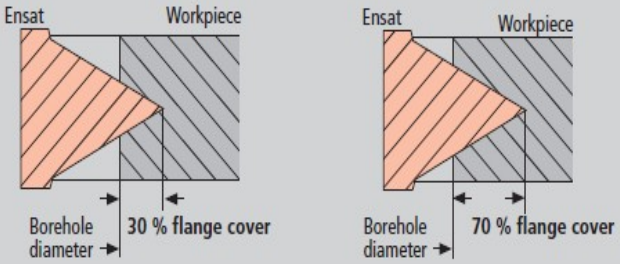
The illustration below shows two screw connections with equal pull-out strength.



## Flange cover

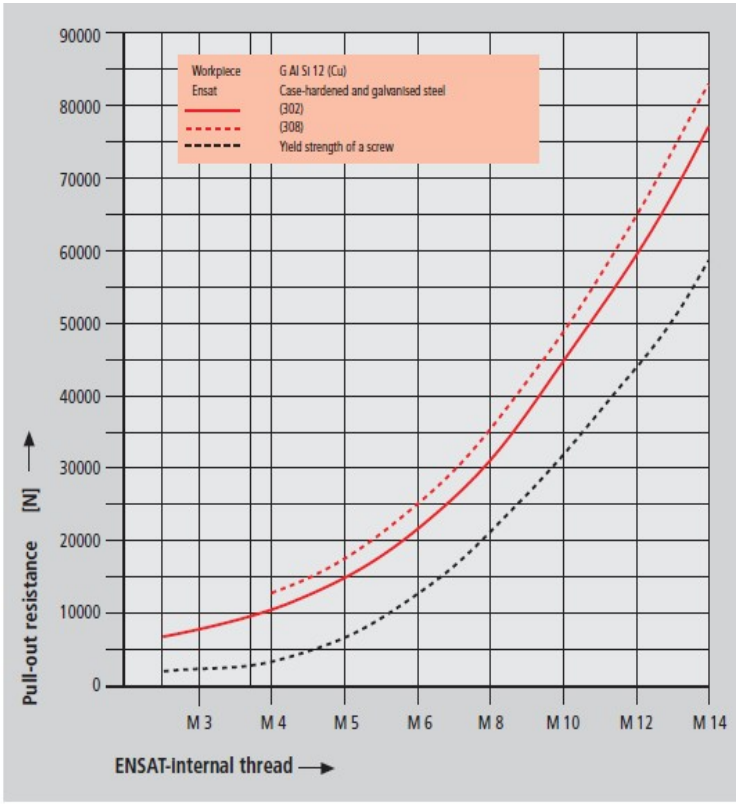
In a workpiece made of a light alloy, the Ensat 302 achieves almost maximum pull-out strength with only 30 % flange cover.

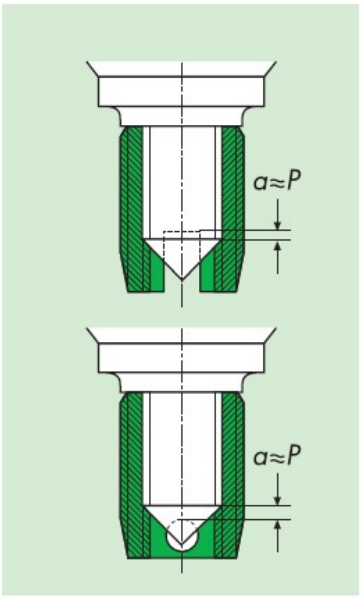



## Pull-out strength

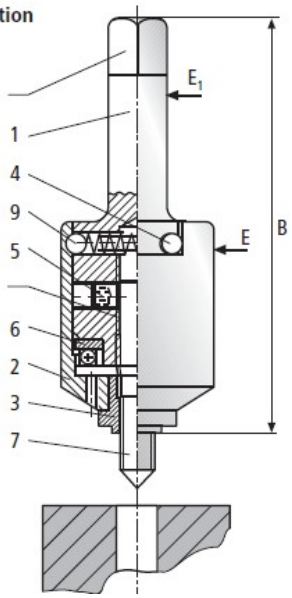
The Ensat is capable of withstanding high loads. When used in light alloys, for example, a degree of pull-out strength is achieved which far exceeds the yield strength of the mating screw 8.8.



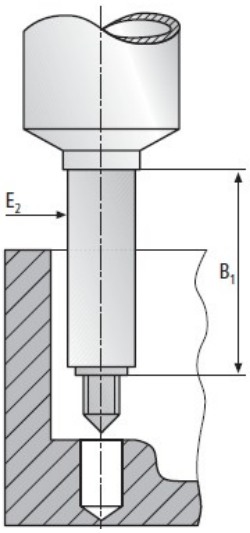



**Tool 620**
**for flush installation**

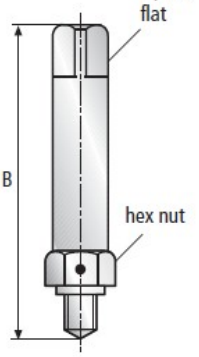
Square flat
1 Shaft
4 Pin
9 Ball
5 Locking screw, colour marking
6 Ball bearing
2 Shell
3 Guide bush
7 Stud



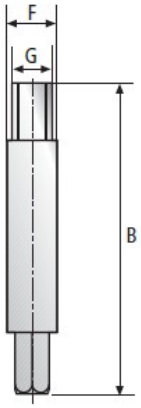

**Tool 621**
**For deep retaining holes**




**Tool 610**
**for manual installation**

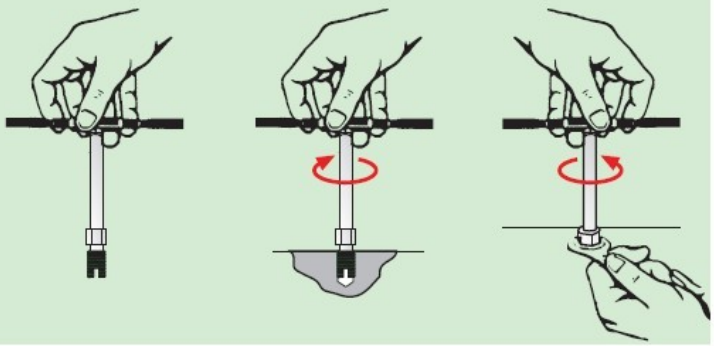



**Tool 6102**
**for Ensat-SBI**

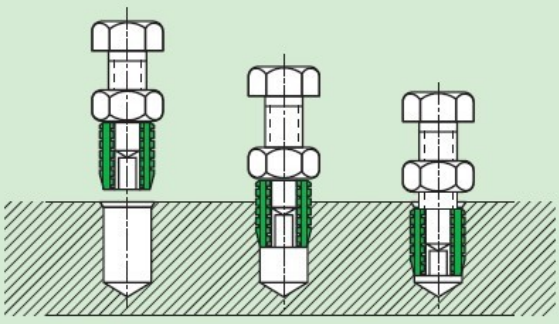



# Manual Ensat® Installation ...

Manual installation with driving tool and tap wrench:



Emergency installation using screw and nut:



## Manual installation

Manual driving takes place using the driving tools 620, 621 or 610 and a tap wrench:

1. Drill the hole: see page 6 for the correct diameter, countersink if necessary.
2. Screw the Ensat onto the driving tool with the cutting slot or cutting bore pointing downwards.
3. Drive in the Ensat until appr. 0,1 - 0,2 mm below the surface of the workpiece. Ensure that it does not tilt! When using tool 620 and 621, the rotatable shell must rest against the externally visible stop pins in such a way that it is driven round clockwise by the pins.
4. Back out the driver tool. During this process, tool 620 or 621 is automatically released from the Ensat.
   Tool 610: Hold the hex nut using a spanner until the lock breaks.

## Driving into steel

**With Ensat®-S 302:**
Pre-cut the thread using the drill (max. centre cutter), set the threaded stud of the tool to the full Ensat length (tool 610 cannot be adjusted).

**With Ensat®-SB 307 / 308:**
In steel up to medium strength, pre-cutting is not required.

Up to M12, we recommend for high-strength steel the use of **Mubux®-M**.

## Mubux®-M installation

Pre-cut the retaining thread with customary thread tapping tool, then drive in as for the Ensat.