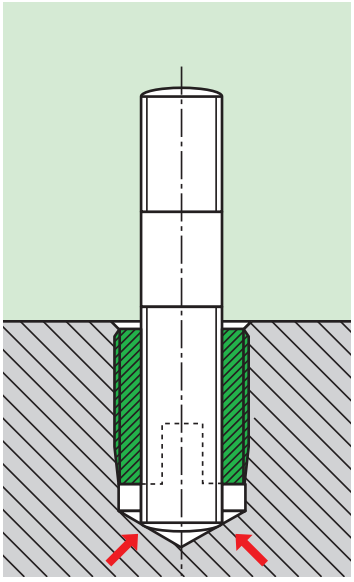
# The Ensat®
# in the workpiece ...



## Installation recommendation

Avoid any tilting between the Ensat and the screw – under the head or in the thread. For this reason, in the case of adjusting screws the Ensat is driven in to a depth of >=1 mm. Studs are countersunk to the floor surface of the blind hole (see illustration).

| Borehole diameter [mm] | | | Standard values for ENSAT 302 | | | | Standard values for ENSAT 307/308 ... 337/338 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Workpiece material | Light alloys Rm=tensile strenght [N/mm²] | | $R_m$ < 250 | $R_m$ < 300 | $R_m$ < 350 | $R_m$ >350 | $R_m$ < 300 | $R_m$ < 350 | | $R_m$ >350 |
| | Ms, bronze, NF-metall | | | | | | | | | |
| | Cast iron HB = brinell hardness [N/mm²] | | < 150 HB | | < 200 HB | >200 HB | < 150 HB | < 200 HB | | >200 HB |
| ENSAT internal thread | M2/M2,5<br>M3 | Zoll<br>N° 4 | | 4,1<br>4,6 | 4,2<br>4,7 | 4,3<br>4,8 | -<br>4,6 | - | 4,7 | -<br>4,8 |
| | M3,5<br>M4 | N° 6<br>N° 8 | 5,4<br>5,9 | 5,5<br>6,0 | 5,6<br>6,1 | 5,7<br>6,2 | 5,5<br>6,0 | 5,6<br>6,1 | | 5,7<br>6,2 |
| | M5<br>M6(a) | N° 10<br>- | 7,2<br>8,2 | 7,3<br>8,3 | 7,5<br>8,5 | 7,6<br>8,6 | 7,4<br>- | 7,5<br>- | 7,6<br>- | 7,7<br>- |
| | M6<br>M8 | 1/4 "<br>5/16" | 8,8<br>10,8 | 9,0<br>11,0 | 9,2<br>11,2 | 9,4<br>11,4 | 9,3<br>11,1 | 9,4<br>11,2 | 9,5<br>11,3 | 9,6<br>11,5 |
| | M10<br>M12 | 3/8 "<br>7/16" | 12,8<br>14,8 | 13,0<br>15,0 | 13,2<br>15,2 | 13,4<br>15,4 | 13,1<br>15,0 | 13,2<br>15,1 | 13,3<br>15,2 | 13,5<br>15,4 |
| | M14<br>M16 | 1/2 "<br>5/8" | 16,8<br>18,8 | 17,0<br>19,0 | 17,2<br>19,2 | 17,4<br>19,4 | 17,0<br>19,0 | 17,1<br>19,1 | 17,2<br>19,2 | 17,4<br>19,4 |
| | M18<br>M20/22 | -<br>3/4" | 20,8<br>24,8 | 21,0<br>25,0 | 21,2<br>25,2 | 21,4<br>25,4 | | | | |
| | M24<br>M27<br>M30 | | 28,8<br>32,8<br>34,8 | 29,0<br>33,0<br>35,0 | 29,2<br>33,2<br>35,2 | 29,4<br>33,4<br>35,4 | | | | |
| Flange cover approx. | | | 60% | 50% | 40% | 30% | 80% | 70% | 60% | 50% |

Recommended borehole diameter for easy assembly.
Other diameters may require lubrication.

The adjacent table is used to determine the recommended bore hole diameter depending on the material of the workpiece and the Ensat type/dimension.

**Example**:
Light alloy workpiece
(Rm=280 N/mm2),
Internal thread M8,
recommended bore hole diameter for
**Ensat-S 302:** 11.2 to 11.4 mm
**Ensat-S 307/308:**11.2 to 11.5 mm

In case of processing problems (e.g. markedly increased screw-in torque levels) there is generally no harm in selecting diameter data in the next highest column. In case of doubt, we advise carrying out a test.

## Retaining hole

The retaining hole can be simply drilled or already provided for in the casting.

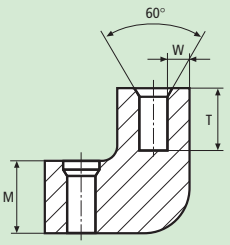
It is generally not necessary to countersink the hole. However, we do recommend that you take care not to warp the workpiece surface when screwing in the Ensat.

**Material thickness:**
Length of the Ensat = smallest admissible material thickness M.

**Depth of the blind hole:**
Minimum depth -T see Works Standard sheets, page 7 to 20.

**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 depends on the planned stress level and the elasticity of the material into which the Ensat is screwed.




**Guideline values for light alloys:**
W ≥ 0.2 to ≥ 0.6 E

**Guideline values for cast iron:**
W ≥ 0.3 to ≥ 0.5 E
E = Outside diameter of the Ensat [mm]-