

# Screw in thin plate jointing

The most common fasteners for shaped plate are screws. Screws for plate joints can be divided into three groups:

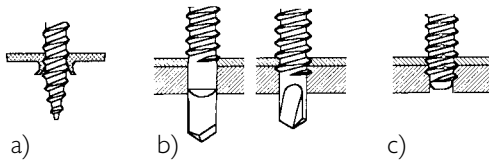
- Penetrating screw.
- Drilling screw.
- Thread pressing screw.

## Penetrating screw

The penetrating screw is provided with an elongated crest of thread, sometimes with double thread starts and with a relatively high pitch (see figure a).

The penetrating screw is aimed at a plate thickness of 1,0 mm maximum and is mainly used for indoor fixing of sheet material.

When using penetrating screw it has sometimes occurred cracking in the plate material. At dynamic loading penetrating screw also has a tendency of unscrewing itself out of the bedding. The drilling screw is therefore preferred for these kinds of constructions. When tightened into thin plate the screw should have a reduced bit point of drill and a low pitch.



Points for a) penetrating, b) drilling and c) thread pressing screw.

## Drilling screw

For tightening into thicker materials a drilling screw is used. This type of screw is provided with a bit point of drill that entails that the drilling, forming of the thread and tightening is carried out in one stage (see figure b).

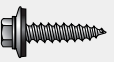


For tightening and joining of plate products there are a great number of variants for more or less all existing applications. These screws have a drill capacity between 1,0 mm and 12 mm.

## Thread pressing screw

The thread pressing screw is the oldest type of structural steel sheet screw and requires preboring or prepunching of the material. The screw shape flows an inner thread by the screw threads pushing aside the material at the edge of the hole (see figure c).

Thread pressing screws can be found in three different performances according to table 207.

**Table 207 Screw points for thread pressing screws**

Screw point	Type	Fields of application
	A	wood bedding
	B	steel bedding > 3,0 mm
	C (AB)	steel bedding < 3,0 mm

When using thread pressing screw the bore diameter must be adjusted to the bedding's thickness for the thread shape flow to be optimal. The table below shows examples of recommendations.

**Table 208 Examples of recommended bore diameter  $d_h$  for different material thickness  $t_l$  for 6,3 mm screw**

Screw points	Thickness $t_l$	Bore diameter $d_h$
Type C, $\phi$ 6,3	1,0 - 2,0	5,05
	2,0 - 3,0	5,35
Type B, $\phi$ 6,3	4,0 - 6,0	5,65
	6,0 - 10	5,80
	>10	5,85
Type A, $\phi$ 6,4 (wood)		4,1

## Assemblage of joint with penetrating-, drilling- or thread pressing screw

In joints with thin plate it is easy to tighten the screw too much, i.e. to screw the threads broken in the plate. To avoid this one should work with machines equipped with depth stop bolt or torque controlling.

## Tightening of screw with sealing plates

Screws with sealing plates are not to be tightened so hard that the plates are damaged and so that the sealing function is not fulfilled. Both these demands are automatically fulfilled when assembling with a machine with depth stop bolt and manual tightening, which is stopped when the sealing has got the right compression. For torque controlled assembly on the other hand, the bore diameter needs to be selected so that the torque of the forming of the thread is not going to be larger than the torque of tightening, which is required to give the sealing plate the right compression. For thread pressing screws a screwdriver with depth stop bolt is the principal recommendation.

## Screwdrivers

For thread pressing screw a low rotation screw driver (300-600 effective rotations per minute) with depth stop bolt is recommended. For drilling screw a screwdriver with 1500 to 2000 rotations per minute and depth stop bolt is recommended. For screws with release an infinitely variable drilling machine without depth stop bolt could be used.

Source: SBI.