

FORM TAP INFORMATION

Fluteless taps are used to form the internal threads without chip removal. In contrast to conventional tapping where material is cut from the work piece, thread forming is a pressure deformation process without chip removal for the production of internal threads. During the process the material is cold formed without interrupting the grain flow.

Thread forming is described as *"pressing the thread into the work piece with a tool possessing a spiral working area"*. The spiral threaded, polygonal portion of the fluteless tap is "screwed" into the pre-drilled work piece with an appropriate constant feed rate equal to the thread pitch. The thread profile is pressed gradually via the forming lead into the material of the work piece. Subsequently, the pressure in the deformation zone exceeds the compression limit; the work piece becomes ductile and is deformed. The material alters drastically, "flows" along the thread profile in the unoccupied base of the tool and forms the minor diameter of the nut thread. This flow process creates specific fluteless tap form pockets (claws).

The tapping size hole diameter is heavily dependent on the formability of the material, the work piece geometry and the required effective depth of the thread. In comparison to conventional tapping, a larger diameter tapping size hole should be selected. The partially formed crests of the thread with decreasing effective thread depth are a typical characteristic of threads produced by the thread forming process. With the flanks of the thread fully formed, they have no influence on the tensile strength of the thread.

Lubrication is of significant importance. The lubrication prevents material from building up on the thread flanks and ensures that the necessary torque for the forming process is not too high. Therefore, you should always have lubrication in the thread forming envelop.

Advantages of Thread Forming:

- No chip formation.
- One tool for the production of threads in through and blind holes.
- Application in wide range of materials.
- No cutting errors.
- Pitch and angle of thread errors that can occur with thread cutting are eliminated.
- Internal threads produced by thread forming possess a higher tensile strength.
- The surface of the thread is improved.
- Fluteless taps can be applied at higher speeds.
- Reduced danger of breakage through rigid design

Process

The production of internal threads without chip removal (thread forming) in comparison to conventional tapping.

Flow characteristics of the material during thread forming and the deformation process

