

Freeze clamping technology

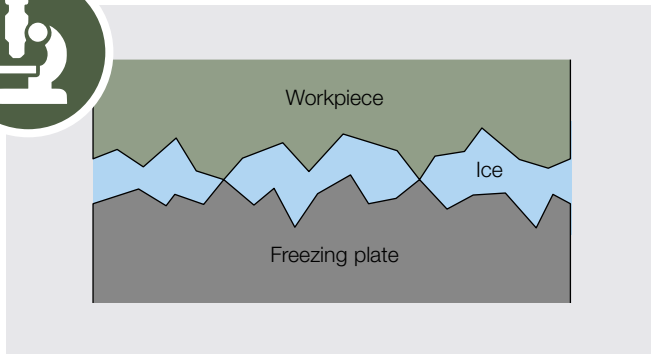
Clamping without deformation.

Clamping of smallest workpieces.



Freezing generated by compressed air. Quick and easy.

Clamping with ice – is this reliable?



Functional principle

Ice offers excellent adhesion. Just think of the hoarfrost on windshields, or the tray of ice stuck in your fridge freezer. Freeze clamping technology makes use of this property.

Workpieces are placed on the moistened freezing plate, which is cooled down using a compressed air heat exchanger. Ice forms after a few seconds, and its natural properties hold the workpieces in place.

Freeze clamping technology is used for complicated applications with filigree or fragile workpiece in a wide variety of manufacturing areas.

Advantages

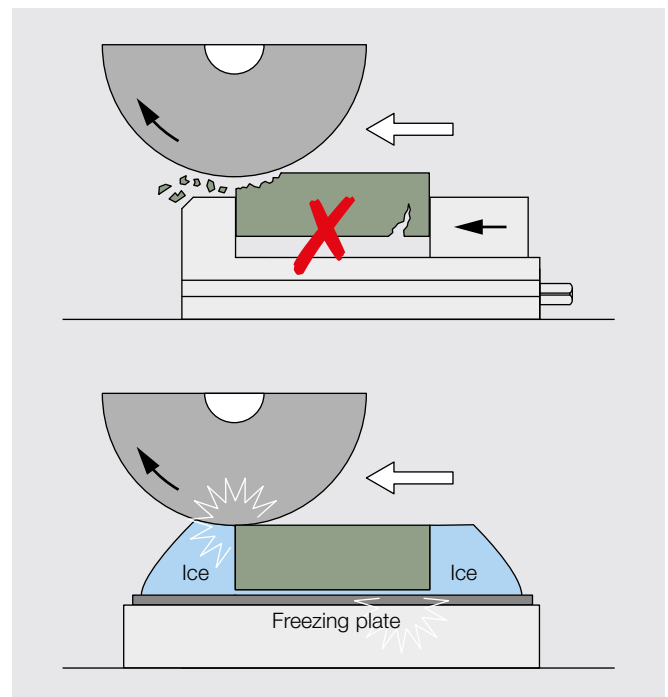
The sensitive workpieces are clamped stress free. Deformations and damage caused by mechanical clamping of workpieces are avoided. Without special pre-machining of the underside of the workpiece and regardless of the workpiece shape, parts can be reliably held over just one side. It is possible to machine five sides in each operation. Various hard and soft materials can be “clamped” such as metal, plastics, ceramics, graphite, glass, rubber, neoprene, textiles, etc.

In the case of a metal workpiece, the nominal holding force of the freeze clamping plate is 150 N/cm². For comparison, the nominal holding force of magnetic chucks is 100-150N/cm² and that of vacuum chucks is 10 N/cm².

After release/unfreeze the workpieces, the ice offers the advantage that no residues remain on the workpiece.

Industry sectors

- Aerospace technology
- Medical engineering
- Electronics / semiconductors
- Watch and jewelry industry
- Precision mechanics



Example of machining a graphite workpiece on a grinding machine.



Freeze clamping technology at a glance

- + Sensitive parts are clamped without mechanical force
- + High holding force of up to 150 N/cm²
- + No residues on the workpiece
- + Deformations and damages are avoided
- + No pre-machining of the workpiece required
- + Freezing plate / clamping surface exchangeable

Freeze clamping plates SPGF

Application example,
mounted on palletizing
system



Exchangeable freezing
plate, workpiece-
specifically reworked

Air connections
W = warm / C = cold

Procedure in practice

The compact and monoblock freeze clamping plates can be used very quickly and easily:

1. Connect the freeze plate to the air supply (pure, dry air)
2. Spray water on the freezing plate
3. Place the workpiece
4. Freeze
5. Machining the workpiece
6. Unfreeze



Watch and jewelry industry

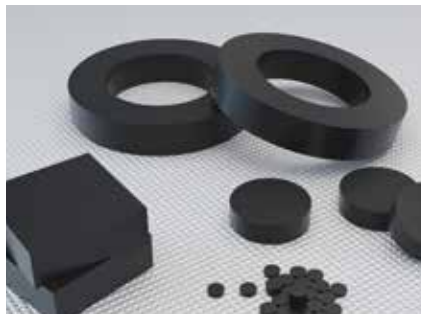


Medical engineering / Precision mechanics



Practical tip

- The reaction times of the freeze clamping plates are dependent with the supplied air volume flow.
- The cold increases the strength of many materials (plastics, raw ceramics, ferrite, neoprene, etc.) and improves machinability. Conventional lubrication is also no longer necessary.



Electronics / semiconductors



Aerospace technology

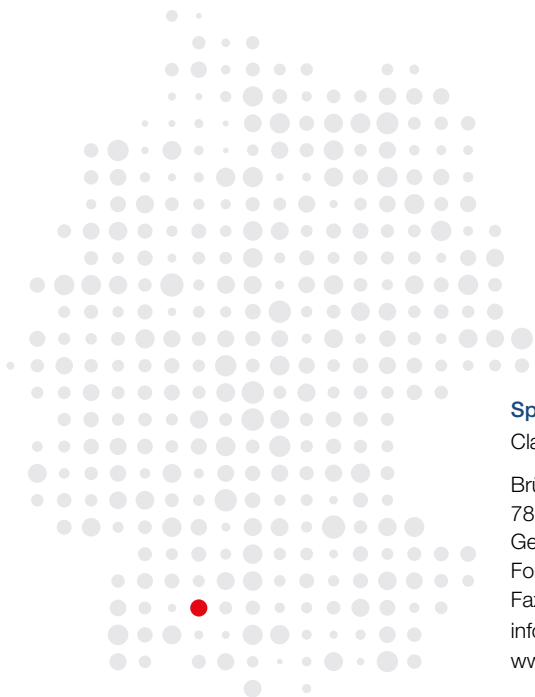
Type	Clamping surface [mm]	L x B x H [mm]	Holding force [N/cm²]	Order No.
SPGF 150-100	150 x 100	250 x 120 x 73	max. 150	B110500003
SPGF 150-150	150 x 150	270 x 170 x 73	max. 150	B110500002
SPGF 250-150	250 x 150	270 x 250 x 73	max. 150	B110500001

Scope of delivery

- 1 Freeze clamping plate
- 1 Connection set with hand lever valve
- 1 Spray bottle



Freeze clamping plate SPGF



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