VERO-S NSE-HT mini

The proven quick-change pallet system for extremely high temperatures

Hand in hand for tomorrow

Resistant to temperatures up to +200 °C – precise clamping technology optimized for heighest temperatures

Short set-up times and high productivity, especially for high-temperature applications – this is what NSE-HT mini 88-20 stands for. The original idea was to transfer the proven idea of setting up in seconds to machines for selective laser melting (SLM). However, this module can also be used in other fields of application such as injection molding with a maximum operating temperature of 200 °C. The compact dimensions ensure optimal heat flow to the workpiece, the device or the substrate plate, allowing the required target temperature to be reached quickly and production to be started immediately. The modules can be completely integrated in the machine table, and are also suitable for working under an inert gas atmosphere, and can be operated in such an atmosphere too.

Advantages – Your benefits

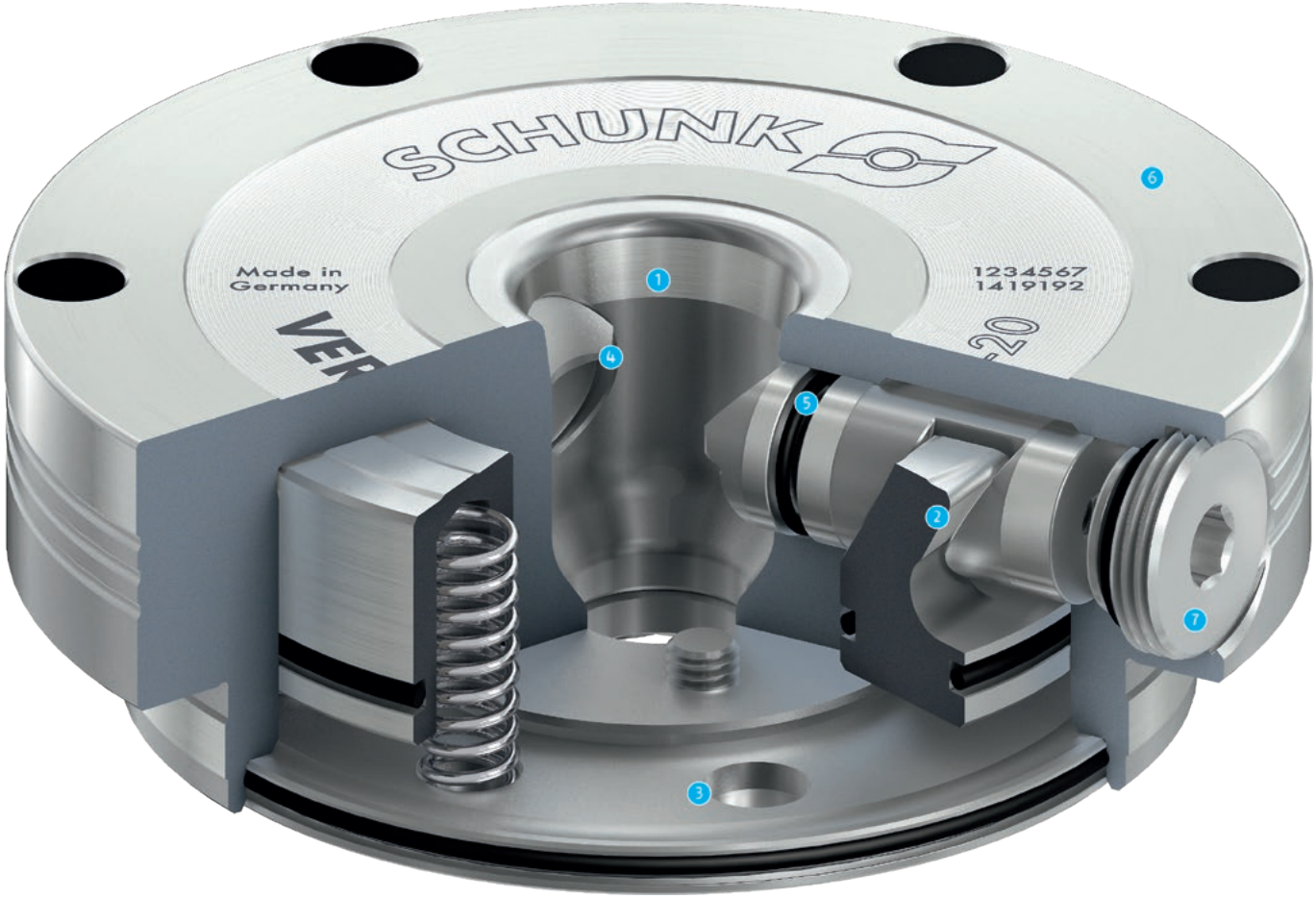
- **Suitable for high temperatures**
  For use in additive production or for the injection molding industry
- **Excellent thermal conductivity**
  Low loss in temperature from the heater plate to the workpiece, to the device or to the substrate plate
- **No cooling necessary for unlocking**
  No downtime until the operating temperature falls below a certain value
- **Positioning via short taper**
  Very easy joining process at a repeat accuracy of < 0.005 mm
- **Turbo integrated by default**
  Increase of the pull-down force of up to 500%
- **Low height design**
  Expands your machine's workspace
- **Form-fit, self-retained locking**
  Full pull-down force is maintained even in the event of a pressure drop
- **The modules are corrosion-free and completely sealed**
  Long life time and maximum process reliability
- **One consistent clamping pin size for all NSE mini-modules**
  Downstream production steps can be performed with the same interface
- **All modules can be operated with a system pressure of 6 bar**
  Additional pressure intensifiers are not required
- **Suitable for operation with inert gas**
  Inert gas supply of AM machines can be used

Technical data

Description	Turbo function	Excellent thermal conductivity	Anti-rotation protection	Pull-down force [kN]	Pull-down force with turbo [kN]	Max. actuation temperature [°C]
NSE-HT mini 88-20	●	●		0.5	2.5	200
NSE-HT mini 88-20-V1	●	●	●	0.5	2.5	200

Function NSE-HT mini 88-20

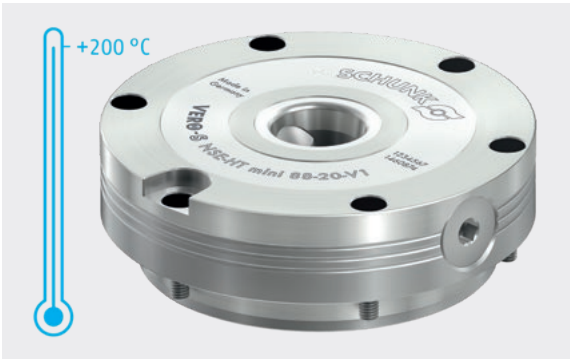
The clamping procedure of the module is carried out by an integrated spring package. An axial piston and a wedge hook drive convert the spring force into a maximum pull-down force on the clamping pin. Clamping is carried out by two clamping slides and is self-locking. In addition, the pull-down force can be increased by means of an integrated turbo function. The module is opened pneumatically with a system pressure of 6 bar.



1. **High-precision short taper centering**
   Ensures µ-precise connection
2. **Wedge hook drive**
   High pull-down forces are ensured between the piston and the clamping slide
3. **Turbo function**
   For amplification of the pull-down force
4. **Large contact surfaces**
   For transmitting the pull-down and holding forces
5. **Completely sealed system**
   For adequate protection of the clamping module against extremely fine metal powders with SLM applications
6. **Large flat surface**
   For best support and highest rigidity
7. **Closing screw**
   Is used for complete closure of the clamping slide bore hole

High-temperature resistant

The NSE-HT mini quick-change pallet system was developed especially for applications with high temperatures. All components are designed to ensure smooth actuation of the module up to an operating temperature of 200 °C.
Benefit: Due to the cooling process, the module can be actuated directly without any loss of time.

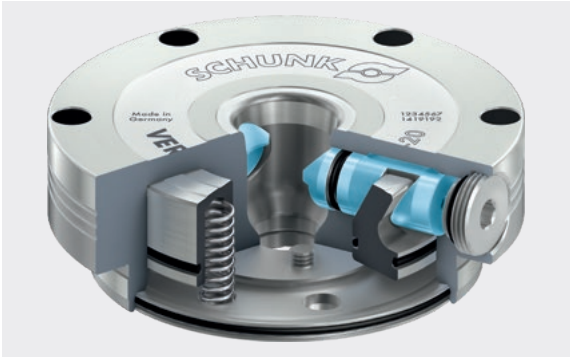


Centering via short taper

The precise short taper centering combined with the form-fit and self-retaining locking characterizes the SCHUNK quick-change pallet system.

Locking via clamping slides

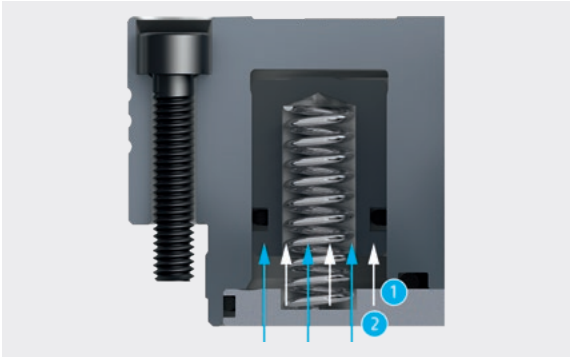
Large contact surfaces between clamping slides and clamping pin ensure a low surface pressure, resulting in a long service life.



Integrated turbo function

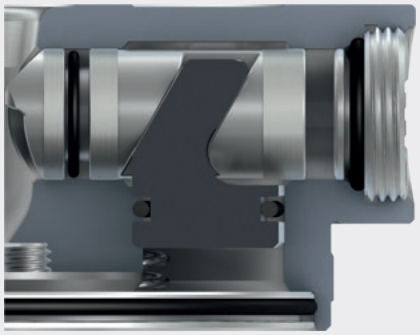
In order to raise the pull-down force, the quick-change pallet module is additionally pressurized with compressed air during clamping. Due to the turbo function the pull-down force increases by the factor of 5 (max. 2,500 N) compared to clamping merely based on spring force. With the active turbo function, even higher lateral forces can be achieved.

1. **Spring force**
   Stainless, fatigue-resistant pressure springs.
2. **Additional force**
   Resulting from the turbo function.



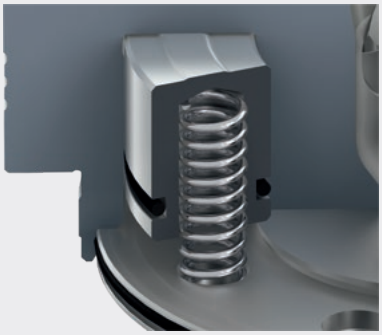
Wedge hook drive

Provides a maximum force in any position.
Benefit: Even if fine metal powder gets into the cutting area, the clamping slides do not block. The module clamps reliably.



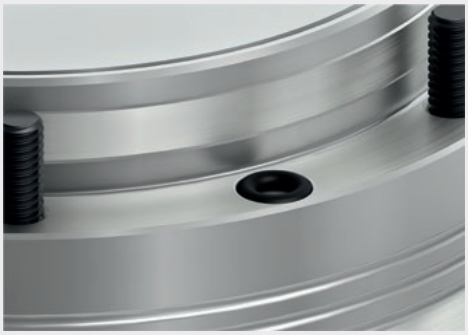
Corrosion and high-temperature resistant pressure springs

For a maximum life span, all the actuating springs are made of fatigue-free stainless steel. Special high-temperature resistant springs have been selected, which operate witjhout loss of performance even under continuous temperature load.



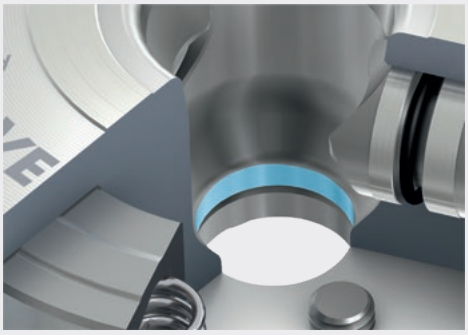
Control of the quick-change pallet system

The modules are actuated via bottom air connections. It can be operated with inert gas, so that no separate compressed air supply is required in the area of the additive machines.



Alignment fit in the body

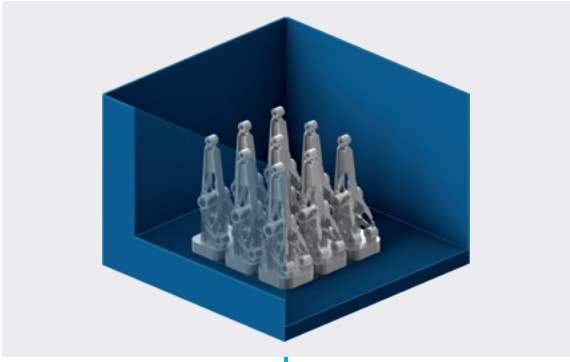
A Ø 12H7 fit in the center allows the alignment of a clamping station by means of positioning elements directly on the clamping module. Depending on the workpiece, clamping stations can be designed flatter. This is particularly beneficial for additive machines, where a short heating time and the greatest possible installation space are important.



Monolithic manufacturing process

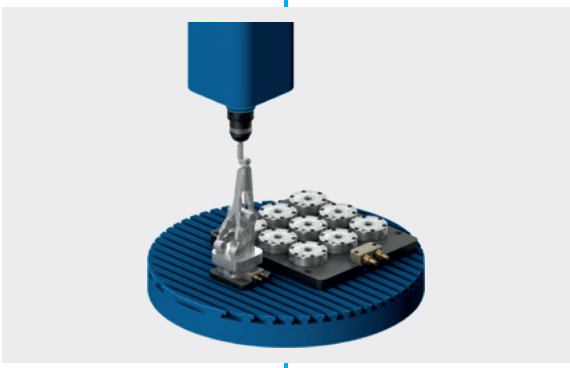
1. Additive manufacturing

The workpieces are "printed" directly onto the substrate plate. Clamping modules with anti-rotation protection enable the use of island substrate plates, which allow 5-sided reworking.



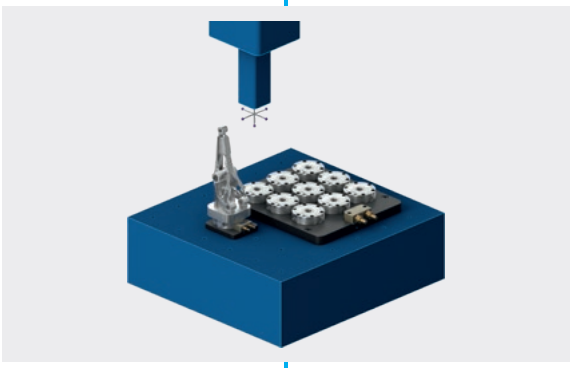
2. Metal-cutting

Production of functional surfaces and fittings on a milling machine. The standard single clamping station NSL mini 100-25-V1 can be used for clamping island substrates.



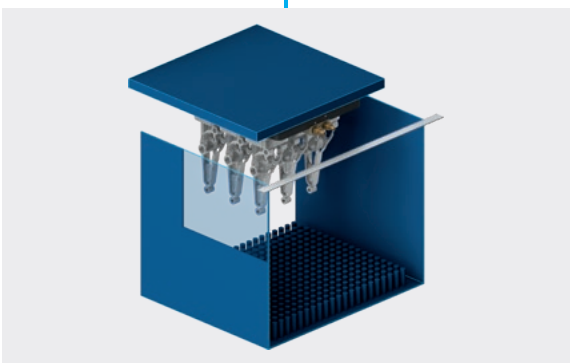
3. Measuring

Check the dimensional accuracy of the workpiece. The standard single clamping station NSL mini 100-25-V1 can be used for clamping island substrate plates.



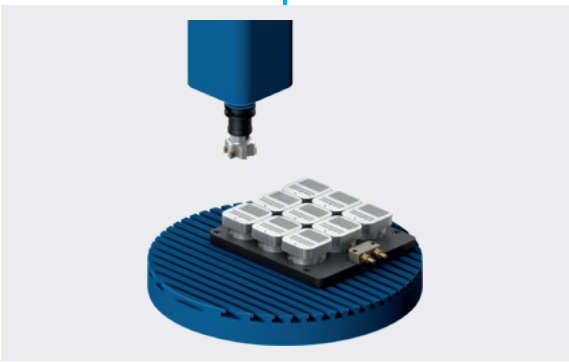
4. Separating

Separation of the workpieces from the substrate plates on a band saw. With a special clamping station with 9-way NSE mini 90-25-V1 all workpieces can be separated from the substrate plates at once.



5. Metal-cutting

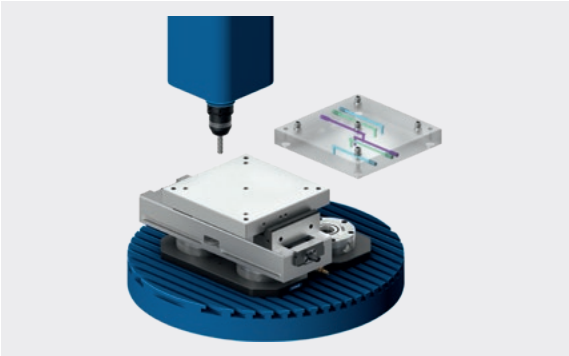
Joint surface milling of the island substrate plates on a 9-way special clamping station for the next application. Optimal results in height uniformity are achieved through joint surface milling – the ideal preparation for the next construction process.



Hybrid production process

1. Metal cutting & monitoring

The hybrid blank is manufactured conventionally, then the clamping pins are mounted directly on the hybrid blank. With an A-bolt in the center, the thermal zero point can be placed in the center.

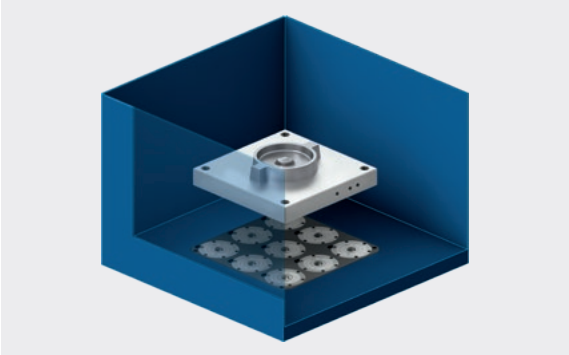


2. Measuring

Peak production time concurrent offset measurements can be carried out process-reliably by using a measuring machine. The offset values can be adopted in the AM machine. Time-consuming measuring processes, which are linked to the AM machine, are no longer necessary.

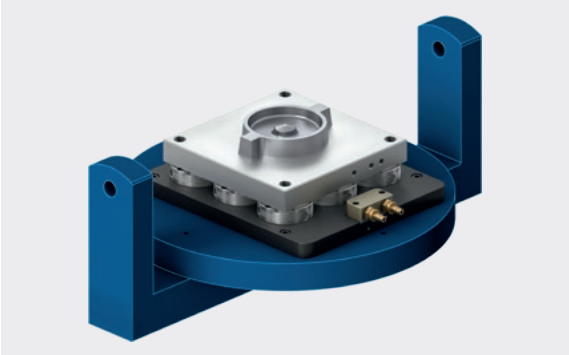
3. Additive manufacturing

The complex part of the workpiece is "printed" onto the hybrid blank using an additive process.



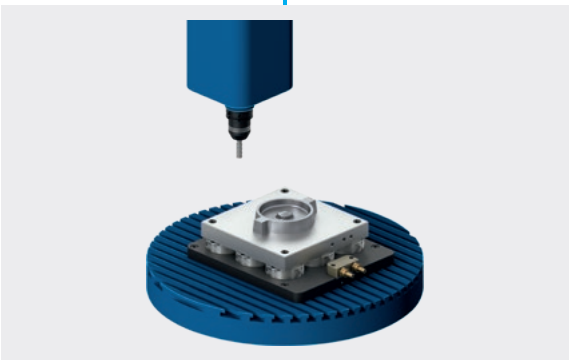
4. De-powdering

Cooling channels and undercuts are de-powdered on a de-powdering machine.



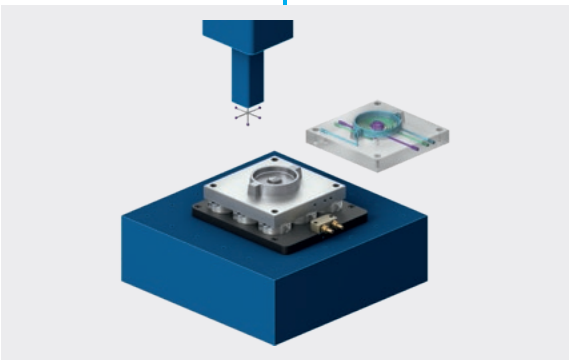
5. Metal-cutting

Finishing of the surface and production of functional surfaces.



6. Measuring

Final measurement of the workpiece. The clamping pins can then be disassembled. The workpiece is ready.



Quick-change pallet module

For high temperature applications up to 200 °C

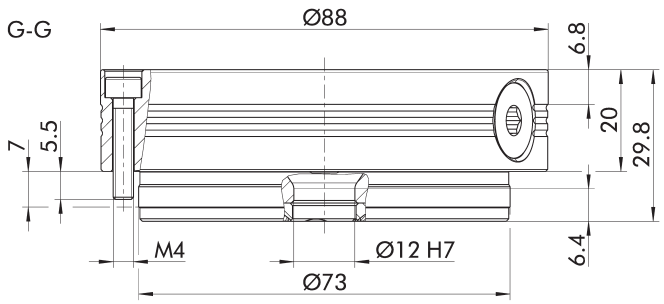
Scope of delivery

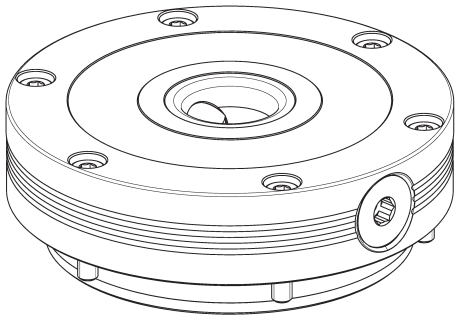
Clamping module, mounting screws, O-rings, cover caps, operating manual; without clamping pins

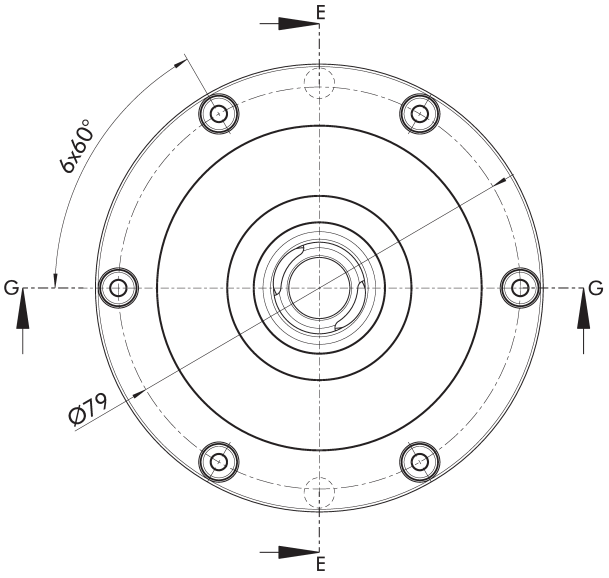
Technical data

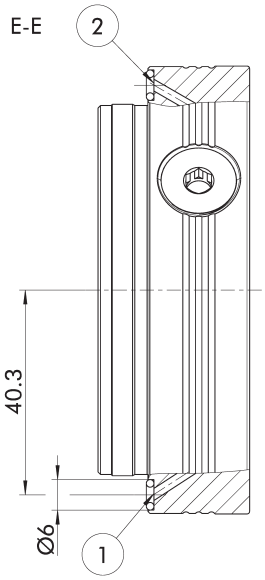
Description	ID	Pull-down force [kN]	Pull-down force with turbo [kN]	Unlocking pressure [bar]	Max. actuation temperature [°C]	Repeat accuracy [mm]	Weight [kg]
NSE-HT mini 88-20	*1419192*	0.5	2.5	6	200	< 0.005	1

The repeat accuracy only applies to partial installations and partially recessed installations.
The values for a full installation may differ.









Subject to technical changes.

(1) Hose-free direct connection module open

(2) Hose-free direct connection turbo function

Accessories

Clamping pins SPx mini

Clamping pin for positive connection with NSE mini clamping modules.

Suitable for	Description	ID
NSE-HT mini 88-20	SPA mini 20	0435610
NSE-HT mini 88-20	SPB mini 20	0435620
NSE-HT mini 88-20	SPC mini 20	0435630

High-temperature clamping pins

Clamping pins for additive production for form-fit connection of the substrate plate with the clamping modules. Recommended for application temperatures from 200 to 520 °C.

Suitable for	Description	ID
NSE-HT mini 88-20	SPA-HT mini 20	1393004
NSE-HT mini 88-20	SPB-HT mini 20	1393005
NSE-HT mini 88-20	SPC-HT mini 20	1393006

Sealing plug

Center plug for closing the alignment fit in the lower area of the NSE-HT mini modules.

Suitable for	Description	ID
NSE-HT mini 88-20	STO-HT mini Ø14.5	1571475

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