Vacuum Clamping Systems

Solutions for Metal and Plastics Processing

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Schmalz: Vacuum Technology for Intelligent Automation and Ergonomic Handling

1800
employees
working hard for our customers.

29
locations
for outstanding customer service worldwide.

9
percent
of our revenue is invested in innovative ideas and new products.

590
copyrights
are proof of our groundbreaking innovations.

Schmalz is one of the Market Leaders in Vacuum Automation and Ergonomic Handling Systems.

The wide range of products in the Vacuum Automation unit includes individual components such as suction cups and vacuum generators, as well as complete gripping systems and clamping solutions for holding workpieces, for example in CNC machining centers. The Handling Systems unit offers innovative handling solutions with vacuum lifters and crane systems for industrial and handicraft applications.

Our products are used in different applications for example in the logistics industry, the automotive industry, the electronics sector and in furniture production.

With comprehensive consulting, a focus on innovation and first-class quality, Schmalz offers its customers long-lasting benefits.
Schmalz's intelligent solutions make production and logistics processes more flexible and efficient, while also preparing them for the increasing trend toward digitalization.

Vacuum Automation

Components

Systems

Handling Systems

Clamping solutions

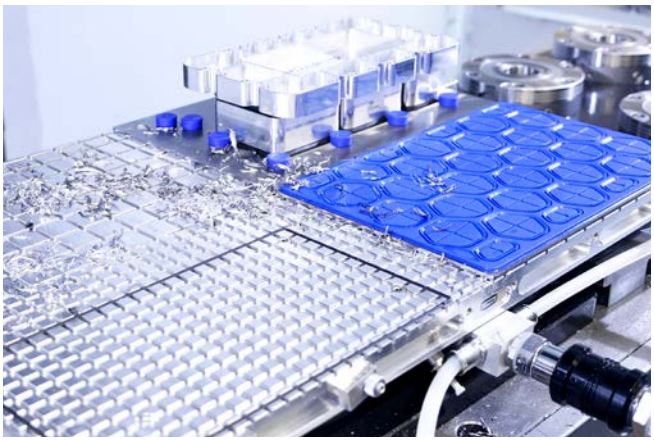
Vacuum lifters and crane systems

Solutions for Metal and Plastics Processing

Advantages of the vacuum clamping technology

The modular vacuum clamping systems from Schmalz facilitate the machining of metals and plastics and can be used universally on all CNC machining centers. They are compatible with each other and can thus be easily combined to obtain the optimum setup for challenging applications.

As an alternative to mechanical clamping devices, they are ideal for fast and gentle fixing of thin and delicate workpieces in particular. Thanks to good accessibility from five sides, you can produce complex parts with fewer setups. Increase the productivity of your machining center by using vacuum clamping systems.



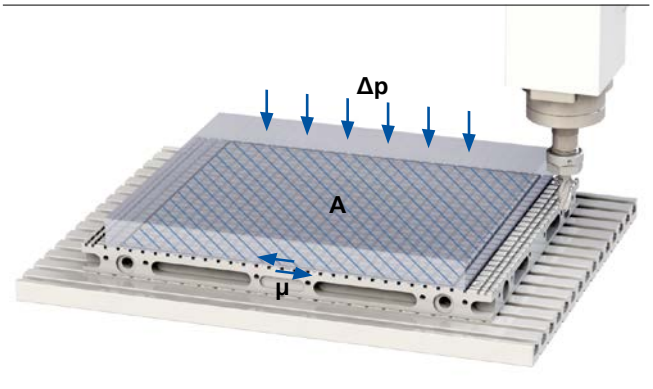
Shorter processing times
Reduction of the number of process steps through extended processing options

Lower setup costs
More flexibility through fast and efficient setup – less need for individual clamping devices

Gentle clamping with vacuum
Deformation and damage to the workpiece due to clamping forces are avoided

Vibration free machining
Particularly suitable for thin, non-magnetic workpieces made of aluminum or plastic

FUNCTIONAL PRINCIPLE OF THE VACUUM CLAMPING SYSTEM



The clamping area is usually limited by the workpiece. The greatest levers for maximizing the effective horizontal clamping force are provided by the vacuum level and the coefficient of friction. Schmalz therefore offers powerful vacuum generators and special friction linings.

The horizontal clamping force (**Fh = A x Δp x μ**) of the clamping system depends linearly on the following factors:

Clamping area **A**	evacuated area inside the seal
Vacuum level **Δp**	Pressure difference between clamping area and environment (according to manometer)
Friction coefficient **μ**	Material-dependent friction between clamping device and workpiece

Application example
An aluminum cuboid (AlMg4SiMn) with a clamping area of 300 x 200 mm is clamped onto a Matrix-Plate with friction pads (μ = 0.25) at a vacuum level Δp of 800 mbar.

Vacuum force: 100 mbar ≙ 1 N/cm²
Clamping force horiz. F_h: 600 cm² x 8 N/cm² x 0.25 = 1,200 N

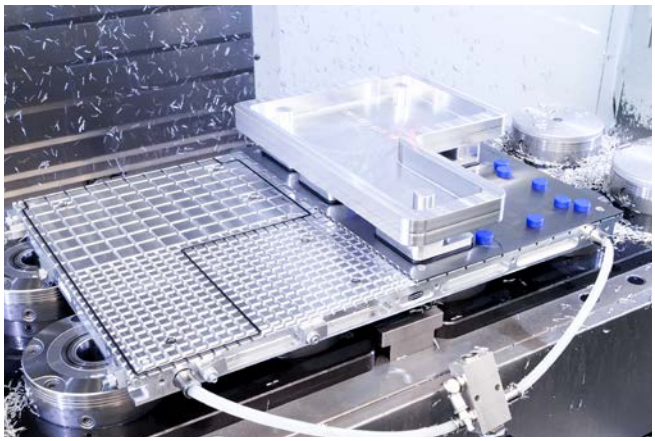
This allows a metal removal rate of approx. 400 cm³/min during roughing (assumption: end mill Ø20 mm with 3 teeth, a_e = 14 mm, a_p = 10 mm, f_z = 0.15 mm, v_c = 400 m/min).

Solutions for Metal and Plastics Processing

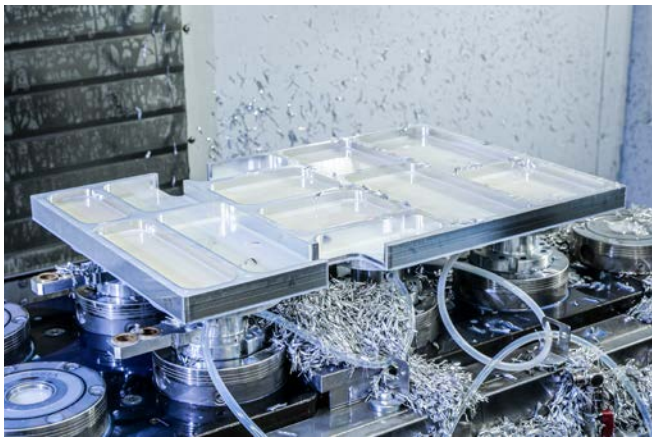
Applications

Side machining and production of apertures and pockets with vacuum blocks ISBL-HD on Matrix-Plate

Vacuum blocks CMB-HD for use in plastics machining



Modular design of the Matrix-Plate clamping system allows multiple setups on one fixture without retooling



Machining of aluminum with high chip volume on vacuum blocks CMB-HD

Portfolio for Metal and Plastics Processing

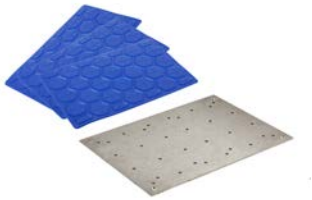
Modular Clamping System MPL-ISST-SFM

Matrix-Plate MPL

- Basis of the modular system for metal and plastics processing
- Low-distortion clamping of flat workpieces
- Adaptable to all common machine tables

Innospann Steel-Plate ISST-MPL and Vacuum Blocks ISBL

- Steel-Plate ISST with vacuum blocks ISBL for metal and plastic processing
- Extension for the clamping system Matrix-Plate MPL
- For 5-axis machining and the production of cutouts



Innospann Steel-Plate ISST-MPL and FlexMat SFM

- Steel-Plate ISST and elastomer mat with honeycomb suction points
- Extension for the clamping system Matrix-Plate MPL
- For the production of cutouts

Vacuum Blocks

Vacuum Blocks CMB-HD

- Main body made of aluminum with elastomer friction pad
- Use on T-slot tables and zero point clamping systems

Vacuum Generation and Monitoring

Oil-Lubricated Vacuum Pumps EVE-OG

- Low-maintenance, oil-lubricated vacuum pump with oil separator
- Suction rate up to 255 m^3/h

Vakuum Units VAGG

- Mobile vacuum generation and monitoring
- Suction capacities of 6, 18, 40 and 63 m^3/h

Vacuum Operation Center VOC

- Central vacuum generation and monitoring
- Suction capacities of 40, 63, 100 m^3/h

Liquid Separators NLS

- For vacuum pumps with suction rate up to 100 m^3/h
- Separation capacity: 60 l/h
- Integration into the control of the machining center

Further Information

Spare parts and accessories

Technical data

Design and CAD data

Documentation

Multimedia

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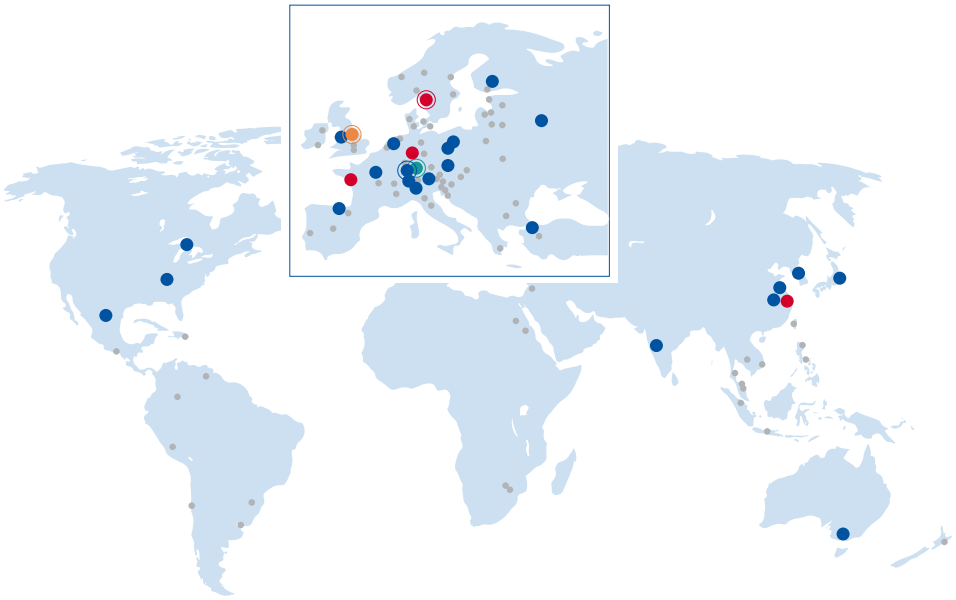
The Schmalz Group – Worldwide On Site



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