

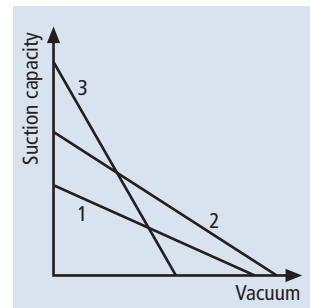
Vacuum generation

The necessary vacuum can be generated with vacuum generators of various types.

The following three basic types are available:

- 1) Ejector
- 2) Vacuum pump
- 3) Vacuum blower

Each type has its own specific advantages, but they have one thing in common: a high suction capacity at a high vacuum always means high power consumption and high operating costs.



Ejector

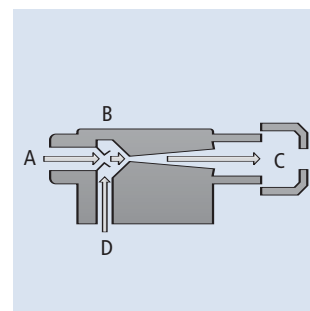
Ejectors are purely pneumatic vacuum generators which operate on the Venturi principle. Compressed air enters the ejector at A and flows through the nozzle B. This results in a low pressure (vacuum) immediately behind the nozzle outlet, and air is drawn in through the vacuum inlet D. This air, and the driving air, leaves the ejector via the silencer C.

Advantages of ejectors

- No moving parts, which means little maintenance and wear
- Compact construction
- No heat
- Low weight
- Fast generation of a vacuum
- Suitable for installation in any orientation

Typical application areas

- Industrial-robot applications in all sectors of industry
- Feeder for presses in the automobile industry



A distinction is made between three basic types of ejectors:

Basic ejectors



Vacuum generator without control valves or system monitoring, with a high maximum vacuum value (85%). Used primarily for handling air-tight workpieces.

Multi-stage ejectors



Vacuum generator with several nozzle chambers in series and with a very high suction capacity. Used primarily for handling porous workpieces such as cardboard boxes and sheets of OSB or MDF.

Compact ejectors



Vacuum generator with integrated control valves and system monitoring functions. Gripping and blowing-off can be controlled without the need for external valves. Used in fully automated handling systems (such as machining of sheet metal, automobile construction, robot applications).

Vacuum pump

Vacuum pumps are electrical vacuum generators which can generate high vacuum values at volume flow rates of 4 to 250 m³/h.

Advantages of vacuum pumps

- High vacuum values can be achieved in large-volume systems
- Suitable for use as a central vacuum generator
- Little maintenance required

Typical applications areas

- As a central vacuum generator in portal transfer systems
- In manual vacuum handling devices
- In packing machines

A distinction is made between three types of vacuum pumps:

Dry-running pump



Universal vacuum pump requiring little maintenance.
Used primarily as a central vacuum generator in large gripper systems for the handling of air-tight workpieces.

Oil-lubricated pump



Special vacuum pump for very high vacuum values (up to - 0.98 bar) for handling of air-tight workpieces.
Used in handling systems where quiet operation, minimum maintenance and high vacuum values are required.

Water-ring pump



Vacuum pump requiring little maintenance and with internal water-cooling for the handling of air-tight workpieces.
Used, in particular, in applications where the quality of the ambient air is important (such as packing applications in the food-stuffs sector).

Vacuum blower

Vacuum blowers generate a very high suction capacity at low vacuum values. They are used wherever porous workpieces have to be picked up and handled.

Advantages of vacuum blowers

- Enormous suction capacity
- Very good compensation for leaks
- Permit handling of porous workpieces

Typical application areas

- Evacuating large volumes in a very short time
- Handling of porous workpieces such as cardboard boxes, thermal insulation material, chipboards or sacks

Vacuum blower



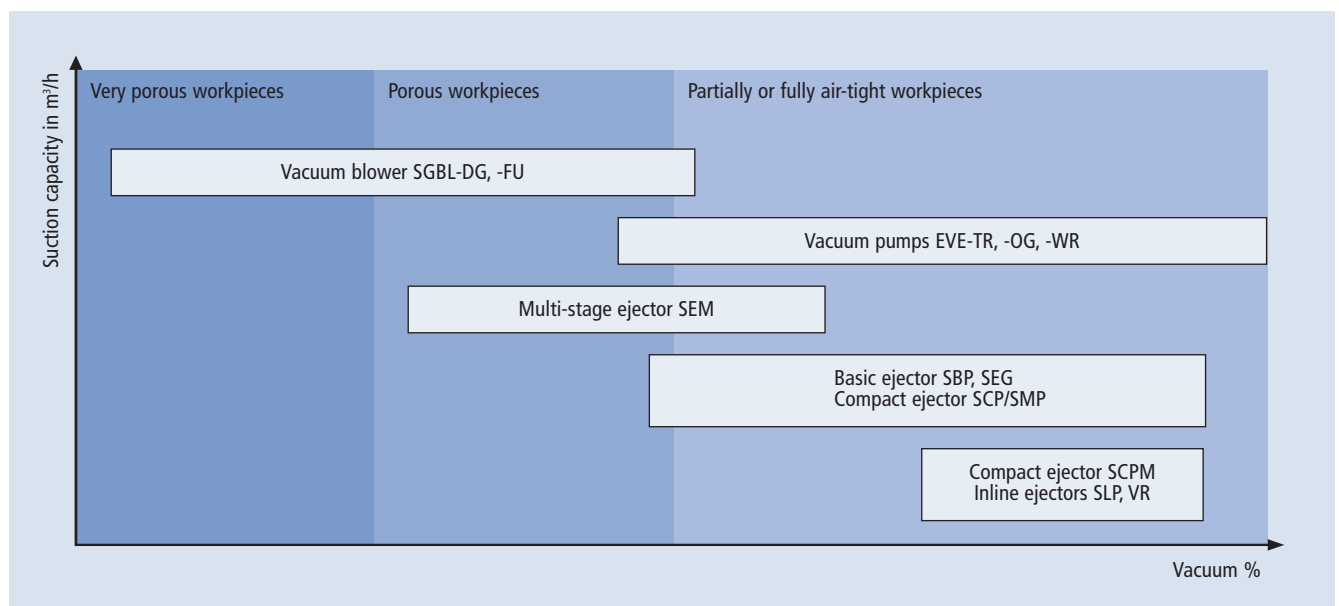
Vacuum blowers, either directly driven (SGBL-DG) or frequency-regulated (SGBL-FU), particularly suitable for handling of porous workpieces (chipboard, sacks, etc.). The motor speed, and thus the suction capacity, of the frequency-regulated blowers can be adjusted to meet customer-specific requirements.

Vacuum blower with reversing function



Vacuum blowers with electro-pneumatic reversing function for switching between evacuation, blowing off and neutral position. Suitable for handling of porous workpieces which have to be gripped and released quickly.

Selection aid for vacuum generators



The planning checklist for selection of a vacuum generator

How is the vacuum generator driven?	Electrically (pump, blower) or pneumatically (ejector).
Is the workpiece air-tight or porous?	Affects the evacuation volume.
How large is the volume to be evacuated?	Details (in m ³ /h or l/min) are shown for each vacuum generator.
How long is the required cycle time?	Affected by: the evacuation volume of the vacuum generator, the volume to be evacuated, the switching times of the valves etc.
Which vacuum value is required?	For practical use, a value of -600 mbar is assumed for calculations with air-tight workpieces.
Where is the vacuum generator located?	Affects the size, weight and additional functions.

Vacuum accessories



Sealing rings (DR)

Robust PA sealing rings with excellent sealing properties. Further information in Section 8.



Vacuum filters (VF/VFT/STF)

Filter the incoming air to protect the vacuum generator against dirt and resulting failure. Depending on the air-flow rate, various vacuum filters are available. Further information in Section 8.



Plug-in screw-unions

For quick, tool-free connection of hoses to vacuum generators. Further information in Section 8.



Vacuum hoses (VSL)

Carry the vacuum to the places where it is needed. Suitable for both compressed-air and vacuum. Further information in Section 8.