Fluidization of bulk materials with SIPERM® aeration components

Storage, mixing and discharge of bulk materials with average particle sizes of less than 0.2 mm frequently causes problems because these bulk materials do not flow freely and therefore are almost impossible to discharge. They tend to agglomerate and form bridges and tunnels, particularly around the silo outlet, thereby obstructing the free flow of the material from the storage vessel.
Such low flowable materials include fine plastic powders, flour, pigments, soot, cement, pesticides etc.

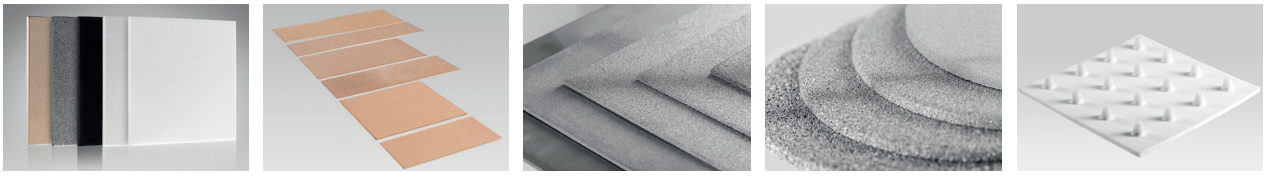
The solution to the problems of discharging bulk materials

A proven solution for the problem-free handling of bulk solids with average grain sizes between 10 and 200 µm is the fluidization of the material using pneumatic aeration units made from highly porous SIPERM® materials.

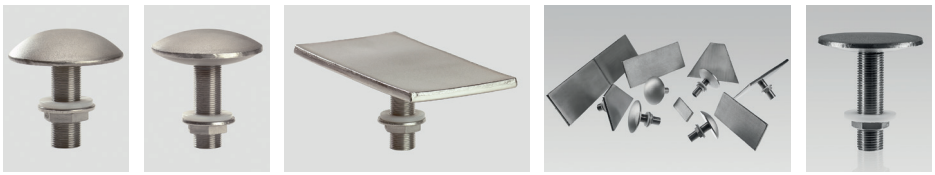
You can choose between:

- **Custom-made aeration bottoms, cones or inserts which we manufacture to your specifications**

- **Plate material for adapting to your own systems**

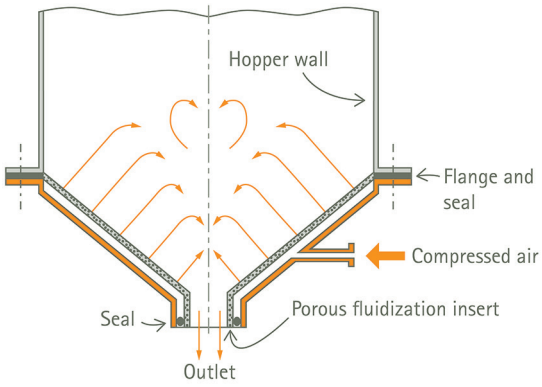


- **Standard aeration pads which can easily be retrofitted into existing systems**



Fluidization inserts made of SIPERM®

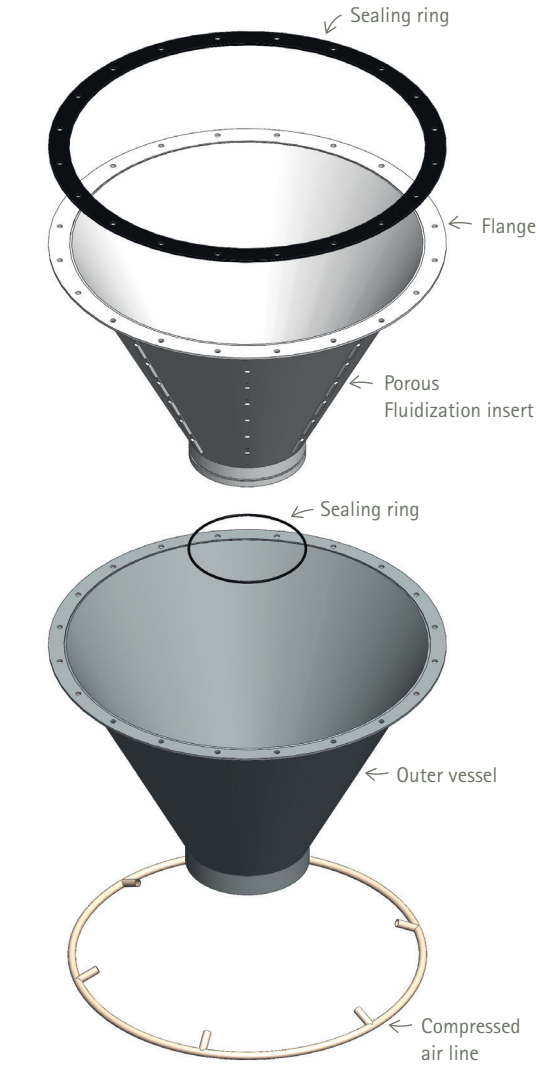
The operating principle of the fluidization inserts made of SIPERM® is shown in the graphic below.



Dry, dust-free air is injected to reduce the friction and cohesive forces of the bulk material, producing a continuous flow of the material from the vessel. Air supply pressure and velocity of air must be set at such a rate that the contents of the silo are evenly loosened.

When fitting-out large silo areas with aeration units, it is advantageous to divide them into sectors each of which can be interchangeably aerated. The sectors can be arranged in a radial pattern or laid out concentrically starting from an inner ring. In this way it is possible to aerate even large areas with relatively low air quantities. In many cases it is sufficient to compensate the pressures produced by the bulk material during storage by the inflowing air.

The support of the fluidization insert is usually realized with supporting ribs. Depending on the material and system conditions, these are either welded to the side of the fluidization insert away from the product, or attached to the inside of the solid outer vessel.



Installation fluidization insert

Operating notes

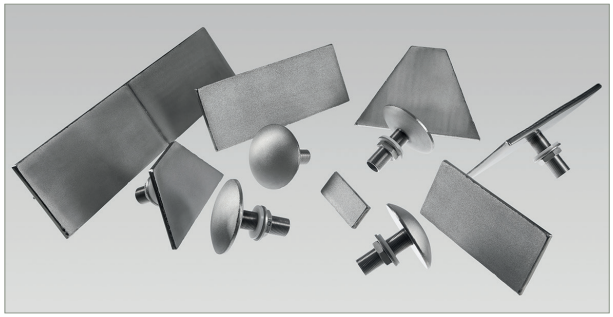
Fluidization cones: The medium (e.g., air, nitrogen, etc.) used for the operation must be dry and free from dirt and grease/oil. The required gas quantities depend on the respective application (ventilation, fluidization, homogenization or drying), the plant dimensions and the bulk material properties. For applications for discharge improvement in fully lined bins, the typical gas amounts needed are 100-300 $m^3/(m^2*h)$.

In the case of partial linings with fluidization pads or applications for drying or homogenization, the gas quantities may be correspondingly higher. The pressure loss is dependent on the porous material used and the material thickness, the size of the surface to be ventilated, the amount of gas supplied and the dimensions of certain components of the compressed air system (pipe diameter, pipeline management, etc.).

Ready-to-install aeration components made of SIPERM®

Ready-to-install aeration components made of SIPERM® can also be retrofitted in hard-to-reach places in silos as well as in other existing systems. They are supplied complete with all the necessary hardware, such as seal, washer and nut.

In addition to our various standard aeration components, we also produce customized components on request.



Standard aeration components

Item number	180082	180047	180131	180125	182525
Dimensions	125 x 250 mm	125 x 500 mm	ø100	ø105	ø80
Connection	G 3/4"	G 3/4"	G 3/4"	G 3/4"	G 1/2"
Porous material	AISI 316L	AISI 316L	AISI 316L	AISI 316L	AISI 316L
Solid material	AISI 304	AISI 304	AISI 304	AISI 304	AISI 304
SIPERM® grade	R	R	R 14	R 14	R
					

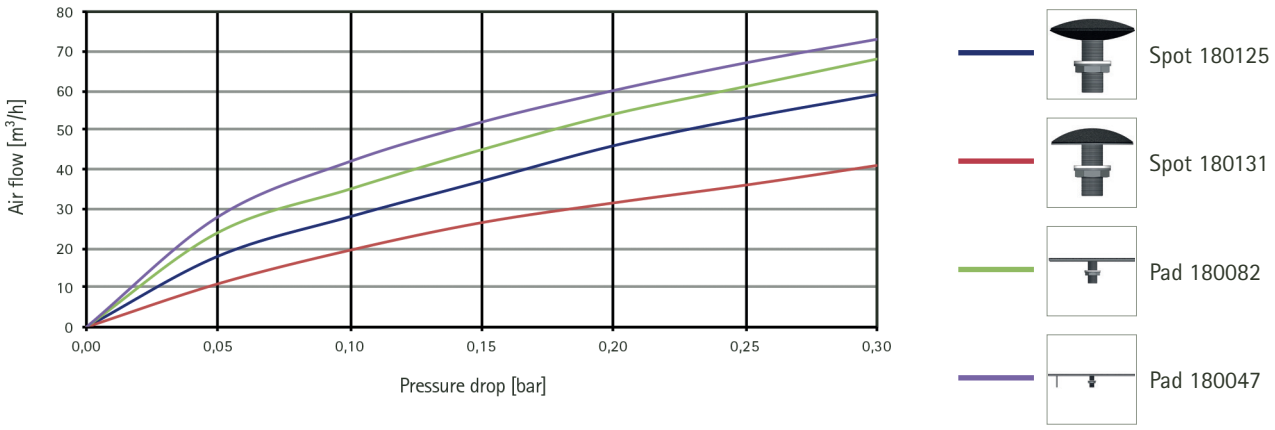
Information on the flow behavior of our ready-to-install aeration components can be found on the back page.

Operating notes

Spots: Air consumption depends on type and overall size. For the round spots for example it is approximately 10 m^3/h at a pressure of 50 mbar.

Regular maintenance of the SIPERM® Ready-to-install aeration components is not necessary. The porous SIPERM® materials can be cleaned dry or wet, depending on the bulk materials used and product changes within the plants. The respective suitable cleaning process depends both on the installation as well as on the bulk materials used and on the porous material used. In any case, complete drying of the porous material should be ensured before re-use.

Permeability measured on R 14



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