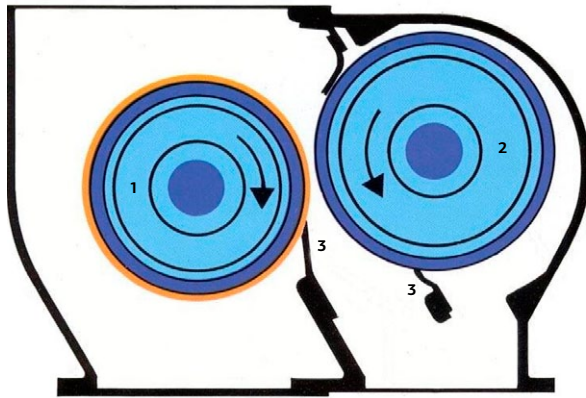


# Mechanical Process



## VACUPRESS

### Function

The VACUPRESS is an apparatus for deairing and compacting / densifying fine-grained, light powders. Deaeration and densification are achieved by a combination of vacuum and mechanical pressure. The effect of the VACUPRESS process is generated by two drums, i.e. the filter drum and the pressure drum (diagram 1,2) which rotate in opposite directions. The product to be treated enters the machine through a feed hopper and attaches to the filter drum (diagram 1). A vacuum is created inside the filter drum. As the drum revolves, the particles are rearranged and precompact under the influence of the air passing through. The material treated in this way is then drawn into the clearance between the filter drum and the pressure drum (diagram 2) and subjected to a preselected rolling pressure. This causes the product particles to form an even denser arrangement and sometimes interlace but they will not agglomerate or be rigidly pressed together. At the end of the process cycle, the densified product is peeled off the filter drum and leaves the machine.

### Design features

All VACUPRESS machines are made of corrosion-resistant silumin cast material. Parts coming into contact with the product are coated with two-component lacquer for additional protection. Special VACUPRESS versions made of stainless steel or featuring other coating systems can also be supplied. The body with top cover and the gear case are dust-tight. The filter drum and pressure drum are mounted in sturdy antifriction bearings. Sealing rings and slide discs at the pressure drum provide for sealing of the shaft. The filter drum (diagram 1) is connected to a vacuum line via a hollow shaft and packing box. The filter drum is covered with either a porous sinter metal or with a cloth, depending on the application of the machine. A flanged bearing housing with quickrelease fasteners on the suction side provide for easy and fast replacement of the filter drum. The pressure drum (diagram 2), which has a smooth surface, is equipped with an adjusting unit for infinitely variable adjustment of the clearance between the drums. A defined pressure is applied via the pressure drum either by means of spring assemblies or a separate hydraulic unit fitted to the adjusting device. Two knives (diagram 3) at the outlet of the machine peel the compacted material off the two drums. The VACUPRESS drums are driven via a variable-speed or frequency-controlled geared motor.

### Advantages

The VACUPRESS can handle product temperatures up to approx. 100°C. Densification of the product is particularly gentle. Compared with conventional compactors or granulators, the pressing forces applied in the VACUPRESS are relatively low and thus only have a minimal impact on the characteristics of the products treated. The product produced can be converted back to their original fine powdered state at any time without having to apply strong shearing forces. Over 800 VACUPRESS machines for a wide range of processes have been supplied since the mid 1950s. In ideal case a triplication of the bulk density together with reduction of the storage costs are possible. Due to their sturdy design and construction, VACUPRESS machines have very long service lives and require only very few spare parts. They can also be used for handling products with an explosion risk.

### Typical Applications

VACUPRESS machines are used for all dry, fine powdered bulk materials for which deairing and densification is necessary or beneficial because of their low bulk weights. VACUPRESS machines serve as densifiers upstream from packaging systems (to reduce the shipping volume and dust formation and to improve the handling characteristics for the end user), as metering systems for better integration of materials into downstream process stages, or as precompactors in combination with granulators. The main range of application today is the processing of silicic acid, carbon black, pigments, aluminium oxide and magnesium oxide.

### Limits of Application

The VACUPRESS is suitable for all fine powdered and dry bulk materials with a maximum particle size of approx. 40 µm. The maximum product feed temperature is 100°C. The machine can usually be used for bulk weights below 750 kg/m<sup>3</sup>. Economic throughput rates range from 30 – 10,000 kg/h.

