PROCELL LABSYSTEM

SPRAY GRANULATION
AGGLOMERATION
COATING
ENCAPSULATION
POWDER LAYERING
DIRECT PELLETIZATION
Rotor and shovel rotor technologies

In this process inlet air chamber and process chamber are separated by a moving rotor plate. The particles in the process are spheronized by the rotating movement. Simultaneously liquid and powder can be introduced by means of a tangential spray nozzle to coat particles with powder. Static shovels on the wall of the shovel rotor support the rolling movement of the particles. With this insert pellets can be generated from powder without starting core.

Maximum process flexibility

By means of the side discharge and the zig-zag sifter all processes can be run continuously. All particles below the desired particle size are returned to the process chamber. Alternatively the discharge can be closed and all processes can be run in batch mode. In all process chambers liquid can be sprayed either from top or from bottom. The capacities depend on the size of the process chambers, the inlet air volume and inlet air temperature.
**TECHNICAL DATA**

**spraying rate**
- 0.2 – 18 l/h (depending on product)

**performance**
- max. 250 m³/h air flow at max. 200 °C inlet air temperature
- max. 300 °C inlet air temperature (option)
- max. 500 m³/h air flow (optional with external fan)

**utility requirements**
- compressed air: 6 bar (g)
- power: 31 kW
- weight: 1,300 kg
- main measurements refer to drawing
FLEXIBLE UNIT: PROCELL – VARIO – GF – AGT – ROTOR

ProCell System
- continuous spouted bed:
  spray granulation and encapsulation
- batch spouted bed:
  agglomeration and coating

Vario System
- continuous fluid bed:
  spray granulation and encapsulation
- batch fluid bed:
  agglomeration, coating and Wurster coating

GF System
- continuous fluid bed:
  spray granulation, encapsulation, agglomeration, coating and drying

AGT System
- continuous fluid bed:
  spray granulation and encapsulation

Rotor System
- batch fluid bed:
  powder layering, spheronization and direct pelletization

Glatt. Integrated Process Solutions.
PRODUCT FLOW IN THE PROCELL LABSYSTEM

- **Internal filter**
- **Return of undersized particles**
- **Discharge of solids**
- **Compressed air**
- **Product discharge**

**Components:**
- Cartridge filter
- Bag filter
Maximum operator flexibility
The ProCell LabSystem made by Glatt is the most flexible laboratory fluid bed unit on the market. Integrated in a mobile base unit, this modular lab all-rounder allows the use of all process options for batch and continuous fluid bed, spouted bed or rotor processes for a great variety of material systems.

Closed loop process
In addition to the exhaust gas treatment by internal or external filter or by cyclone and external filter a full closed loop is available. The process gas is dried with a condenser or a desiccant wheel before returning to the process. The desiccant wheel may also be used alone in order to control the inlet gas moisture.

Internal bag filter
You want to work with small product volumes? Use the internal bag filter! The smaller surface of the filter means that less product is collected in the filter. Easy cleanability of the bags in the laundry machine is an additional advantage.

WIP-filter
For improved cleaning the ProCell LabSystem can be equipped with a WIP-filter. WIP nozzles are integrated in the filter plate and clean the filter housing and the filter cartridges or filter bags automatically.

Threelfold nozzle
You have a special application and want to spray two liquids in parallel? The ProCell LabSystem can be equipped with a threelfold nozzle. Two liquids are pumped separately to the tip of the nozzle and atomized by compressed air.

Spraying of melts
Heated hoses, atomization air heater and insulated nozzles allow spraying of melts which have a melting point of up to 100°C. This process is used for example to coat particles with fat to protect them against moisture.

Solid dosing
When continuous dosing of solid raw material is desired, this can be done by means of a screw feeder.

Continuous discharge
The zig-zag-sifter is not only discharging product from the process. The compressed air, which enters at the bottom of the sifter is also returning all undersized material back to the process. If no sifting is desired, the discharge is accomplished by a twin valve.

Safety
Test your products - even if you don’t know the exact explosion characteristics.
The basis of the safety concept is avoiding ignition sources. As an option the unit can be delivered pressure shock resistant – ProCell LabSystem™. Explosions, e.g. of hybrid mixtures formed by explosive dusts and solvents, are kept inside the equipment. Alternatively you can use nitrogen as process gas in closed loop - inertization. This means not only highest safety but also allows to recover the solvent.
**Spray granulation**
Liquids (solutions, suspensions, melts) are sprayed into the fluid bed. The solvent evaporates and the solids form small particles or the liquid droplets spread on existing particles and let this particles grow layer by layer.
Typical grain sizes: 50 µm - 4 mm.

**Encapsulation**
Applying spray granulation for emulsions, e.g. of oxygen sensitive oil in a solution of maltodextrin, granules are generated which encapsulate the oil droplet in maltodextrin.

**Agglomeration**
Very small particles are fed to the fluid bed. Binder liquid is sprayed and wets the surface of the particles. The moist particles stick to each other, forming agglomerates - granules with coarse structure and large surface. Agglomerates are very good wettable soluble. Typical grain sizes: 200 µm - 3 mm, raw material may be as small as 5 µm.

**Coating**
Particles of different shape and size are moved in the fluid bed. Liquid is sprayed onto the surface of the particles, the solvent evaporates and the solid forms the coating layer. Typical functions of the coating are: taste masking, protection against moisture or oxygen, controlled release. Typical grain sizes: 100 µm - 3 mm.

**Powder layering**
If thick coating layers on small core particles are desired, the coating material may be delivered as powder. Liquid is only needed as binder.

**Direct pelletization**
It is also possible to generate pellets directly from powder – without starter core. Supported by a liquid binder the powder rolls up to spherical particles.
Rent or buy
It's your choice. Configure your ProCell LabSystem according to your product requirements. We will support you with installation, commissioning and training of your personnel.

Scale-up
Develop your customized processes together with us for tailor-made products. A safe scale-up from laboratory to production scale with guaranteed product characteristics requires reliable studies on high-performance pilot systems. Here, technical configurations are tested, stability tests performed, and all relevant parameters for the design of the production processes are determined.

Process development is always a close cooperation with you. Your product know-how and our specific technology and process know-how are the perfect combination for the best results.

Production
Product samples for your customers may already be produced in laboratory scale. The large process inserts of the ProCell LabSystem also allow to use the unit in production scale – up to 20 kg/h may be produced. Modular pilot systems and large-scale plants are available for initial production campaigns as well as for long-term contract manufacturing.

Testing and analyzing
Several laboratory units are available for trials in our technology center, giving you the flexibility to find the ideal process for your product.
The characteristics of your products e.g. particle size, particle size distribution, particle shape, residual moisture, bulk density, angle of repose, attrition, steam sorption etc. can be tested and evaluated in detail in our modern analytical laboratory.

Scale-up

Testing and analyzing

Rent or buy

Process development is always a close cooperation with you. Your product know-how and our specific technology and process know-how are the perfect combination for the best results.

Production
Product samples for your customers may already be produced in laboratory scale. The large process inserts of the ProCell LabSystem also allow to use the unit in production scale – up to 20 kg/h may be produced. Modular pilot systems and large-scale plants are available for initial production campaigns as well as for long-term contract manufacturing.

Rent or buy
It's your choice. Configure your ProCell LabSystem according to your product requirements. We will support you with installation, commissioning and training of your personnel.
Overview of operator advantages

» feasibility tests 500 g/batch - 4 kg/batch (batch mode) and 200 g/h - 4 kg/h (continuous mode)
» production of samples 1 kg/batch - 30 kg/batch (batch mode) and 1 kg/h - 15 kg/h (continuous mode)
» maximum flexibility for all processes and operating modes
» maximum flexibility for all material systems and future products
» high operator protection
» high environment protection
» simplified safety reviews prior trials and production
» reduction of cost for solvents