



**Genesis Process Technologies**

Committed To Excellence



**GENESIS (GPT) is proven expert for equipment processing Active Pharmaceutical Ingredients into secondary pharmaceuticals using technologies such as granulation, drying, blending. A step ahead of generic industry standards and keeping up with latest industry trends, GENESIS offers AI Processor. It is All in One processor offering mixing, wet granulation, drying, milling in Single Pot a. In addition to conventional wet granulation processes, GENESIS's AI Processor also supports vacuum drying and r ecovery of expensive solvents. AI Processor also offers unique desirable features such containment solution, through the wall design, explosion protection option for special applications which makes critical formulation production process cost efficient.**



## Easy tech transfer:

For dense granules with optimal characteristics suitable for tablet compression, High Shear Mixer Granulators are used. Product development for majority is based on bottom driven impeller profile. While others offer top driven Single Pot Processor, it becomes tech-transfer hurdle in adaptation of simple and efficient Single Pot Processing instead of tradition granulation line consisting of HSMG, FBD and Mill separately. Not to mention resources required for material transfer process and yield loss at each step.

GENESIS AI Processor resolves all these challenges with single equipment. AI Processor comes with Bottom Driven Technology making scale up and tech-transfer effortless even for formulations developed with HSMG. Same time, single unit does dry mixing, solution addition, wet mixing, wet granulation, DE -lumping, drying (if required, vacuum drying supported with solvent recovery), dry milling and screening supported with 21 CFR compliant automation software.

## Containment Solution with Single Pot Processor

Because of its very nature, a Single Pot process is a contained process. No transfers are required between process steps, except for loading the raw materials and unloading the dry granules. This is not only beneficial for protecting the operators from potent products, but also for protecting the products from external influences such as heat, light or moisture. Specific solutions are available for product loading and discharging to achieve the desired level of containment for the whole process.



### Sampling System

A sampling valve that allows the operator to take samples during the process without having to stop the machine, open the bowl, or even open a port in the lid, can be integrated into the processing vessel and adapted to different containment levels. The sample container is completely contained allowing the sample to be transported to the QC lab without exposure to the atmosphere.

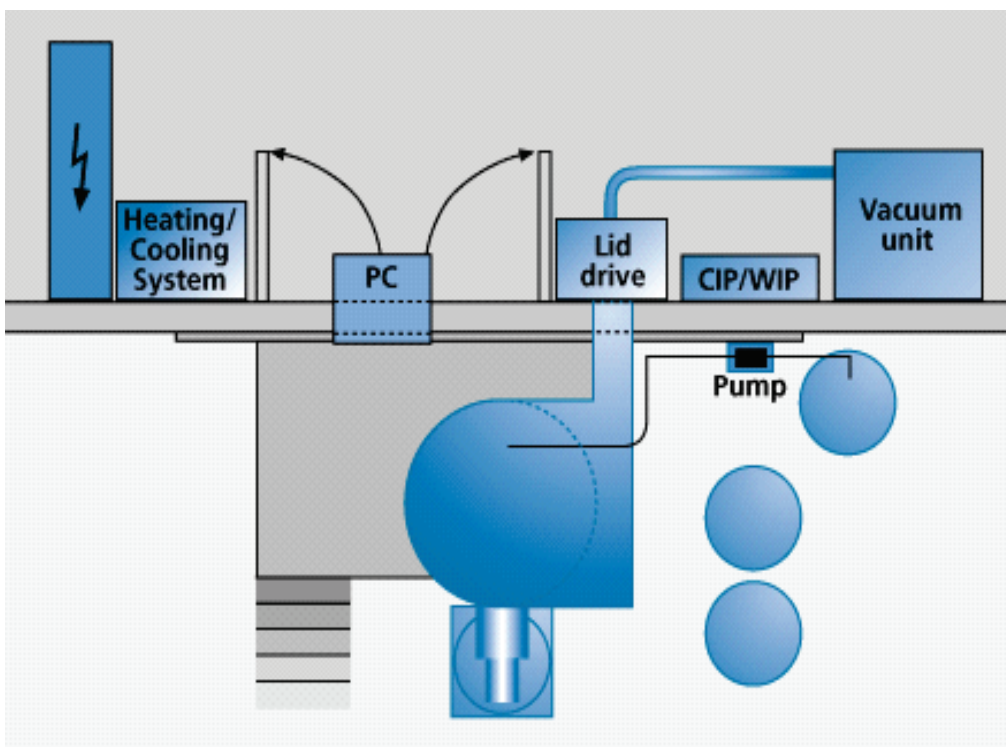
## Versatility of Applications

Single Pot processing is an extremely flexible technology. Whether for standard Wet granulation using organic solvents, melt granulation, crystallization onto substrates, contained production of highly active or toxic products, pelletizing or effervescent production, combined with drying, a Single Pot Process can achieve the required result. With easy and efficient cleaning, using a CIP system, quick product changeover is achievable



## Through-the-wall

configuration Through the wall offers the best option in terms of cleanliness, maintenance and explosion protection. The Through-the-wall configuration provides a sealed separation between technical and GMP space by the machine itself. This offers a clear containment concept including explosion area separation that fulfills the latest requirements like ATEX. By keeping technical components out of the process room, the equipment is much easier to clean. Maintenance is carried out from the technical area, reducing the need for the maintenance engineer to work in a GMP area. This reduces downtime and the risk of contamination. For ATEX, the design allows the technical area to be classified as safe.



### Maximum efficiency: Impeller with stripper

Blades with elevated tips, tangentially attached to the center cone

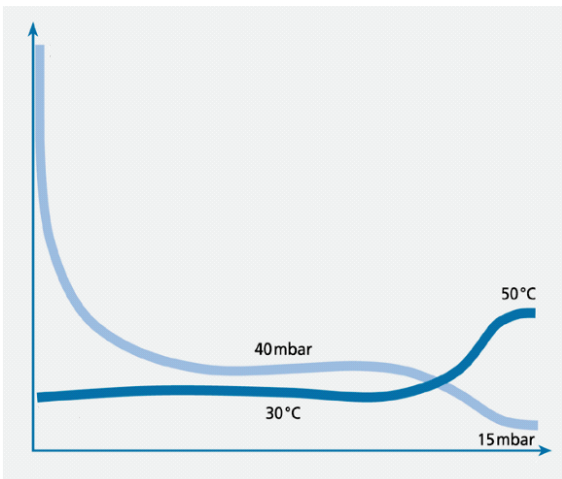
- Efficient removal of wall deposits by the scraper (without touching the wall)
- Easy drying of sticky recipes, even with high jacket temperatures
- Very short drying times due to high heat transfer rate



## Drying options

The Single Pot Processor range has been designed to yield optimal drying efficiency. By incorporating condenser systems and selecting the right pumps, excellent solvent recovery and a competitive drying rate can be achieved. Different configurations are available to suit any process requirements.

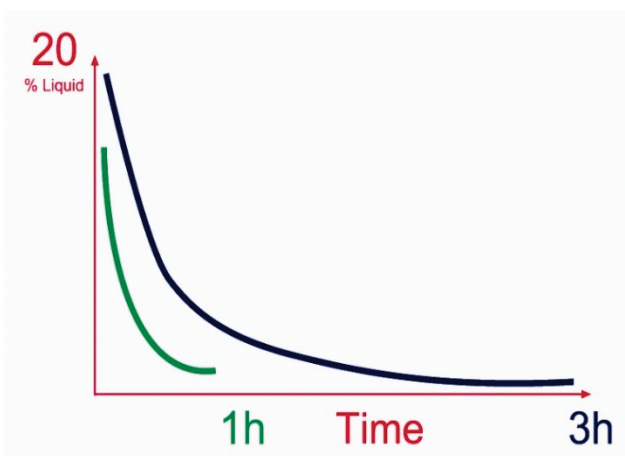
The Single Pot Process is gas-assisted vacuum drying has been designed for optimal distribution of the stripping gas through the product, without compromising on inspection, validation or cleanability.



## Drying End Point

The Introduced energy Heats up the Granules instead of being converted into evaporation-energy

**The Vacuum pump just have to pump out a very small amount of Vapor the final pressure is reached.**







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### Heating & Cooling System

Genesis Process Technology have very unique feature for Heating & Cooling System for Single Pot Jacket

The two-circuit heating/cooling system ensures quick and precise regulation of the water temperature

### From R&D to large scale production

Genesis Process Technologies is your partner for your granulation process from process development up to full-scale production.

With capacities from 10-L to 2000-L, the Single Pot Processor range can cover all requirements starting with the process development stage and clinical batch production to scale-up trials and large-scale production for marketed products





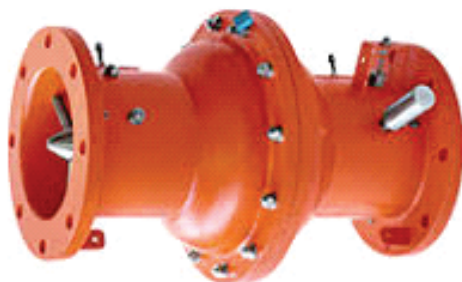
### Process monitoring

A video camera installed in the head of the machine provides a complete view into the process vessel. This is the ideal tool for state-of-the-art processing and gives the operator a clear indication of the product behavior and flow while the vessel is closed. Not only for product development but also for production this feature provides a huge advantage for modern integrated and contained processing.



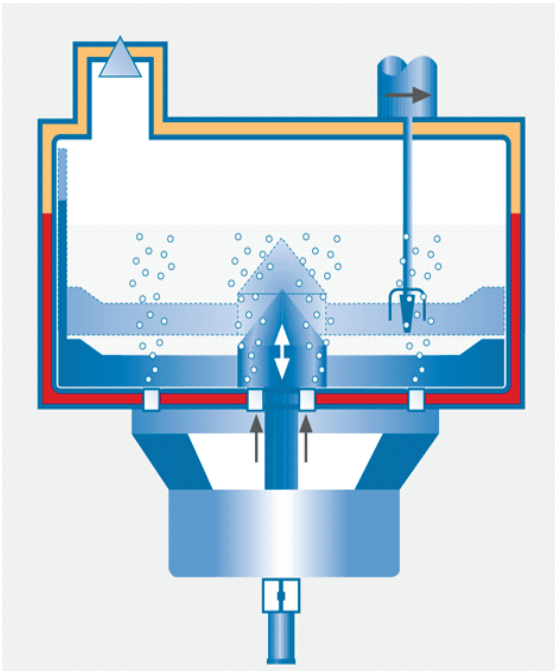
### PAT integration

As well as the classical tools for monitoring and controlling process like torque measurement for granulation control, or temperature, pressure and energy input for the drying process. Genesis Process Technologies has developed innovative solutions for the integration of NIR (near infrared) and FBRM (focused beam reflectance measurement) sensors into its processes and the controls. These advanced measurement tools are used for the direct measurement of product quality parameters such as moisture content, homogeneity of the mix, and particle size distribution, providing control parameters for direct release of the product.



### Explosion safety

When using solvents during granulation or certain dry products with a low MIE, there is a risk of explosion. By eliminating one of the sources necessary to create an explosion, this risk can be effectively mitigated. The Single Pot system by Genesis Process Technologies relies on an inertization procedure for this end. The oxygen in the bowl is replaced by nitrogen in a automatic cycle. Oxygen sensors can be provided to ensure the level is below the explosion limits. VENTEX REMBE Make.



**Cylindrical Container with Two Heating Zone & Insulation**

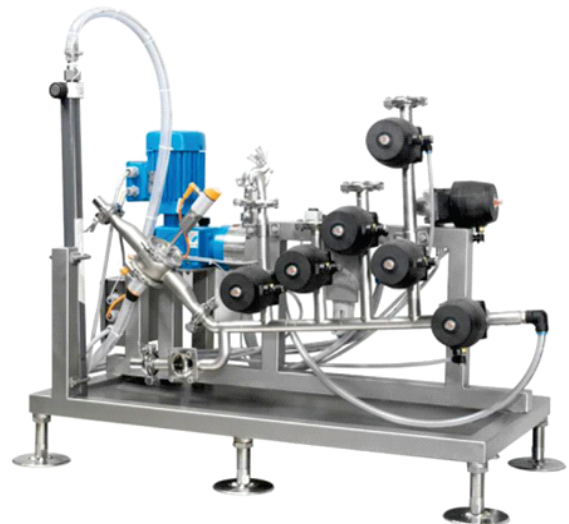
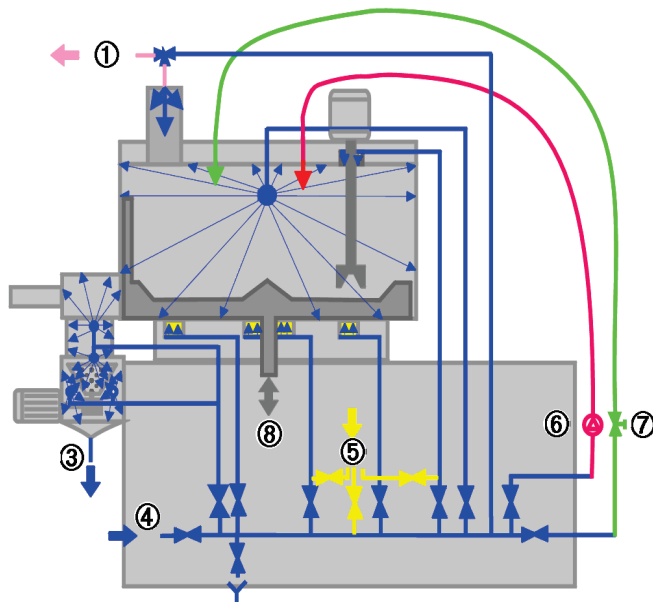
Mixing Impeller with Stripper

Lid & Filter Heated to Avoid condensation

Vertical Chopper

Gas Stripping Bottom nozzles

## WIP Working Principle for Single Pot Processor





## Benefits

The Single Pot Processor is equipped with a very efficient recovery system that can recover up to more than 99% of the used solvent

Requirements for solvent recovery systems are lower for single -pot processors compared with fluid bed dryers.

The concept of containment not only applies to the production area. When working with organic solvents, recovery and containment of these solvents is as important as containment of the product itself. The Single Pot Processor is equipped with a very efficient recovery system that can recover up to more than 99% of the used solvent

## Risk analysis

Genesis is open to assist its customers with extensive in -house experience in establishing a risk -based approach for validation and for HAZOP studies.

## After sales

Regular maintenance is essential to ensure equipment operates to maximum efficiency. Fully trained engineers can carry out on-site servicing and calibration of equipment, either as part of a planned maintenance program or in response to customer need. Replacement parts can be supplied from stock or manufactured to order

## Training

Finally, operators of Genesis Process Technologies equipment can undergo training to help them maximize efficiency, either at the time of installation or periodically as required.

## Technical Data for HSPOT (High Share POT)

| Technical Data   | Bowl Gross Volume in Litre | Impeller HP | Chopper HP | Impeller RPM (0.7 to 7m/s) | Chopper RPM | Compressed Air Consumption @6 Bar | Cleaning Water Consumption 3 @ 3bar |
|------------------|----------------------------|-------------|------------|----------------------------|-------------|-----------------------------------|-------------------------------------|
| GPT-HS-POT-60    | 65                         | 5           | 1.5        | 20-215                     | 280-2880    | 26 Nm <sup>3</sup> /h             | 2 m <sup>3</sup> /h                 |
| GPT-HS-POT-100   | 102                        | 7.5         | 2          | 20-194                     | 280-2880    | 28 Nm <sup>3</sup> /h             | 2 m <sup>3</sup> /h                 |
| GPT- HS-POT-150  | 153                        | 10          | 3          | 15-168                     | 280-2880    | 30 Nm <sup>3</sup> /h             | 2.5 m <sup>3</sup> /h               |
| GPT- HS-POT-250  | 255                        | 30          | 5          | 15-145                     | 280-2880    | 35 Nm <sup>3</sup> /h             | 3 m <sup>3</sup> /h                 |
| GPT- HS-POT--400 | 408                        | 40          | 7.5        | 10-125                     | 280-2880    | 40 Nm <sup>3</sup> /h             | 4 m <sup>3</sup> /h                 |
| GPT- HS-POT--600 | 612                        | 50          | 10         | 10-110                     | 280-2880    | 50 Nm <sup>3</sup> /h             | 5 m <sup>3</sup> /h                 |
| GPT- HS-POT--800 | 816                        | 60          | 15         | 10-100                     | 280-2880    | 60 Nm <sup>3</sup> /h             | 6 m <sup>3</sup> /h                 |
| GPT- HS-POT-1000 | 1020                       | 85          | 20         | 10-93                      | 280-2880    | 70 Nm <sup>3</sup> /h             | 6 m <sup>3</sup> /h                 |
| GPT- HS-POT-1250 | 1275                       | 100         | 20         | 5-87                       | 280-2880    | 80 Nm <sup>3</sup> /h             | 6 m <sup>3</sup> /h                 |
| GPT- HS-POT-1500 | 1530                       | 120         | 30         | 5-82                       | 280-2880    | 90 Nm <sup>3</sup> /h             | 7 m <sup>3</sup> /h                 |
| GPT- HS-POT-2000 | 2040                       | 150         | 40         | 5-74                       | 280-2880    | 100 Nm <sup>3</sup> /h            | 8 m <sup>3</sup> /h                 |