

AGGLOMASTER FLUID BED TECHNOLOGY



HOSOKAWA MICRON B.V.

Process Technologies for TomorrowSM

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AGGLOMASTER AGM

Technique and Process

Since more than 80 years Hosokawa is focused in providing optimum process and technical solutions to meet the ever increasing requirements in the powder processing industry, supplying from simple single units to complex, turnkey plants.

One result of the extensive experience and know how in the field of powder processing technology is the typical batch fluidized bed process for fine powders and slurries: the AGGLOMASTER.

The AGGLOMASTER is based on the extensive experience within the Hosokawa Group, where the knowledge and the know how of various powder processing disciplines are combined: agglomeration-technology, thermal processing, fluidized bed technology, jet-mill technology as well as design and construction of complete systems.

Hosokawa Micron has fully equipped pilot plants, where tests can be carried out with products of the client to comply with the specific requirements of the client.

The extensive know how in the field of agglomeration, drying, process technology, design and construction of turn-key systems for various industries will be provided in Europe exclusively by Hosokawa Micron b.v. and its representatives.

Process and Features

The AGGLOMASTER is a multi-functional fluidized bed processor. Thanks to the combination of the fluidized bed with the various blades and rotating disks, diversified types of applications and processes can be realised using the same equipment. The rotating slit disk rotors allow a controlled distribution of air in the lower layers of the fluidized bed. The fluidisation and the air flow to the particles can be adjusted within a certain range.



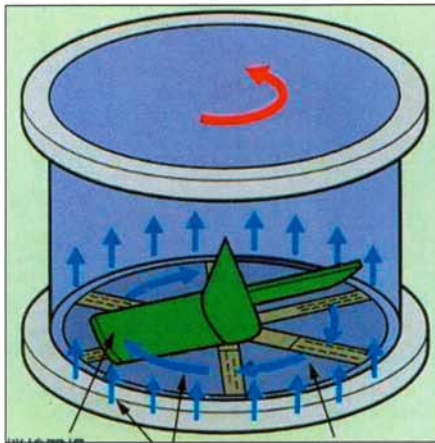
The pulse jet technology enables the granulation and coating of very fine particles of about 10 µm. Agglomeration using air fluidisation and fluidisation by rotating disks is combined with jet-mill principles.

- For agglomeration processes, an upper limit of the particle size can be set/achieved, which for the specific application should not be surpassed. The oversize will be crushed using the pulse-jet principles. Smaller agglomerates and primary particles will continue to agglomerate. With the combination of fluidized bed and pulse jet, dust free microgranules with a very steep particle size distribution can be produced.

- For coating purposes, agglomeration of the particles can be avoided due to the dispersion-effect of the pulse jet, such that coating of only the primary particles can be realised.
- For spray drying processes, it is possible to produce agglomerates from a solution or slurry in one step by using specially developed air atomisers. In this case, bottom injection of the liquid will be applied.

AGGLOMASTER AGM-PJ

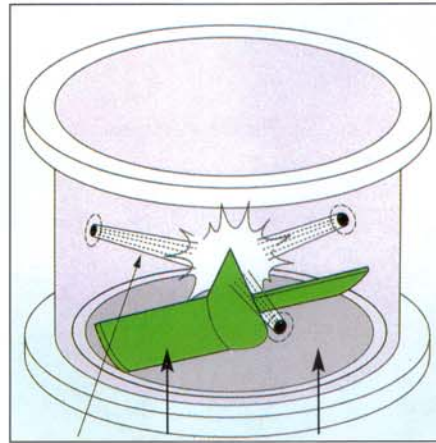
Agglomeration of difficult to fluidise powders to specific particle size



Blade Air Slit disk rotor

The AGGLOMASTER AGM-PJ with blades and slit disk rotor is capable of producing agglomerates from powders which are usually difficult to agglomerate.

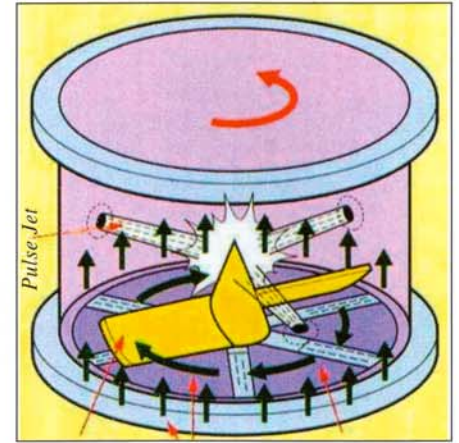
- The particle size and bulk density can be adjusted within a certain range.
- Using a "tumbling" effect, products with a certain particle size could be achieved.
- The shape of the granules can also be influenced.



Pulsejet Blade Distributor plate

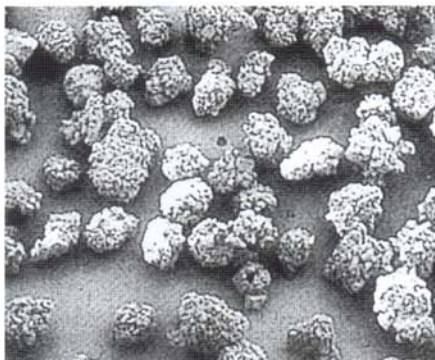
The AGGLOMASTER AGM-PJ with the pulse jet technology is used to produce small particles by using dispersion or pulverisation effect.

This is achieved by means of strong, pulsating air stream, which is jetted during agglomeration- or coating process using a number of jet nozzles, mounted on the AGGLOMASTER-body just above the air distribution plate.

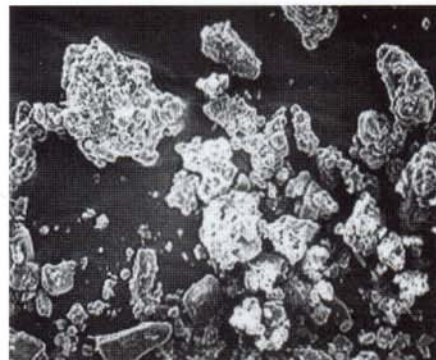


Blade Air Slit disk rotor

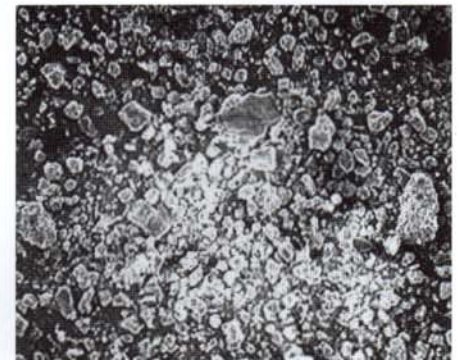
- Using the pulse jet, difficult agglomeration applications as well as the production of fine agglomerates can be achieved.
- Powders can be coated without significant changes of the particle size.
- Dust free granules with a steep particle size distribution can be formed.



Granules for tablet pressing
(Lactose/Corn starch, Binder)



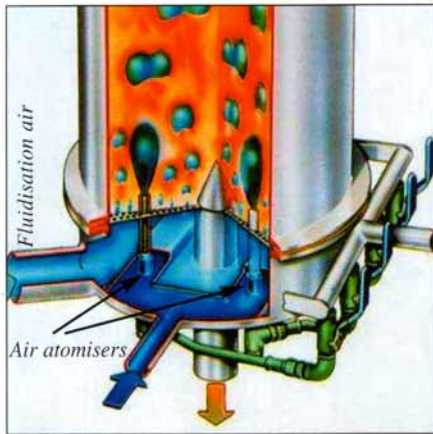
Product without pulse jet
Agglomeration



Product with pulse jet
Coating of primary particle

AGGLOMASTER AGM-SD

The production of agglomerates from suspensions in one step



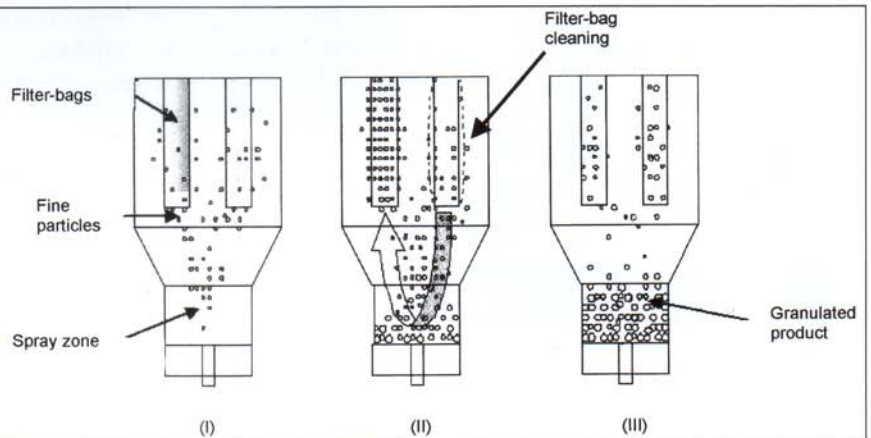
Atomising air Product outlet

The AGGLOMASTER AGM-SD can be used to produce agglomerates from a solution or suspension.

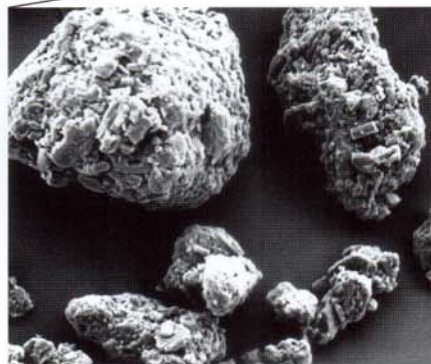
- Products which in conventional spray dryers are difficult to agglomerate, can be agglomerated in a batch-process.
- The filter is integrated in the unit.
- A separate agglomeration-step is not necessary. This reduces the production costs.

- Relatively coarse agglomerates can be made, which in a conventional spray dryer is generally not possible.
- The fluidized bed technology in combination with the very fine droplet size of the sprayed liquid allows very intensive mixing as well as high heat- and mass-transfer.
- Spray drying and agglomeration can be combined in one apparatus.

- I At the start of the process the suspension is injected and atomised.
- II After fine solids particles have formed, part of the suspension will deposit on the particles, which therefore will grow into small agglomerates.
- III Further injection of the suspension will cause further build up of the product layers on the agglomerates, resulting in coarser, compact agglomerates.



Particle size at I: 25µm



Particle size at II: 100µm



Particle size at III: 250µm

AGGLOMASTER AGM

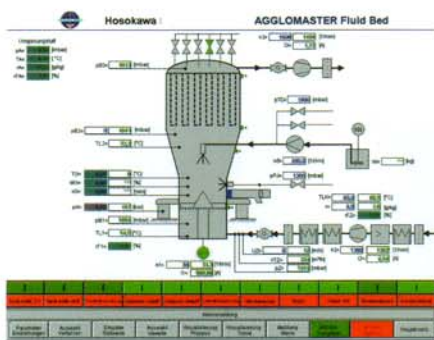
Possibilities and applications

State of the art process control

The process control in all its aspects takes an increasingly important position in an industrial plant.

The customer could take the responsibility for the process control, which however would mean that in such a case he would not have the advantage of the integrated project management, of which Hosokawa has accumulated extensive experience.

The synergy-effect of the project management including the process control by Hosokawa has proved to deliver substantial advantages for the customer.



State of the art SCADA / Process Visualisation for easy operation and continuous control of the process

Applications

The AGGLOMASTER, type AGM-PJ and/or AGM-SD is especially suitable for:

- Agglomeration
- Coating
- Tumbling Agglomeration
- Micro-coating
- Micro-Agglomeration
- Spray drying
- Spray agglomeration
- Drying of (fine) granules
- Cooling of (fine) granules

Examples of the various products which can be processed using the AGGLOMASTER:

Food products like instant soups and drinks, starch and starch based products, Nutrifoods, chemical products like phosphates, fragrances, metal-powders, pharmaceutical-related products such as lactose, dextrine, vitamins, Nutraceuticals.

The AGGLOMASTER is available with batch-sizes of 0.2 to 1,000 litres.

Research and Development

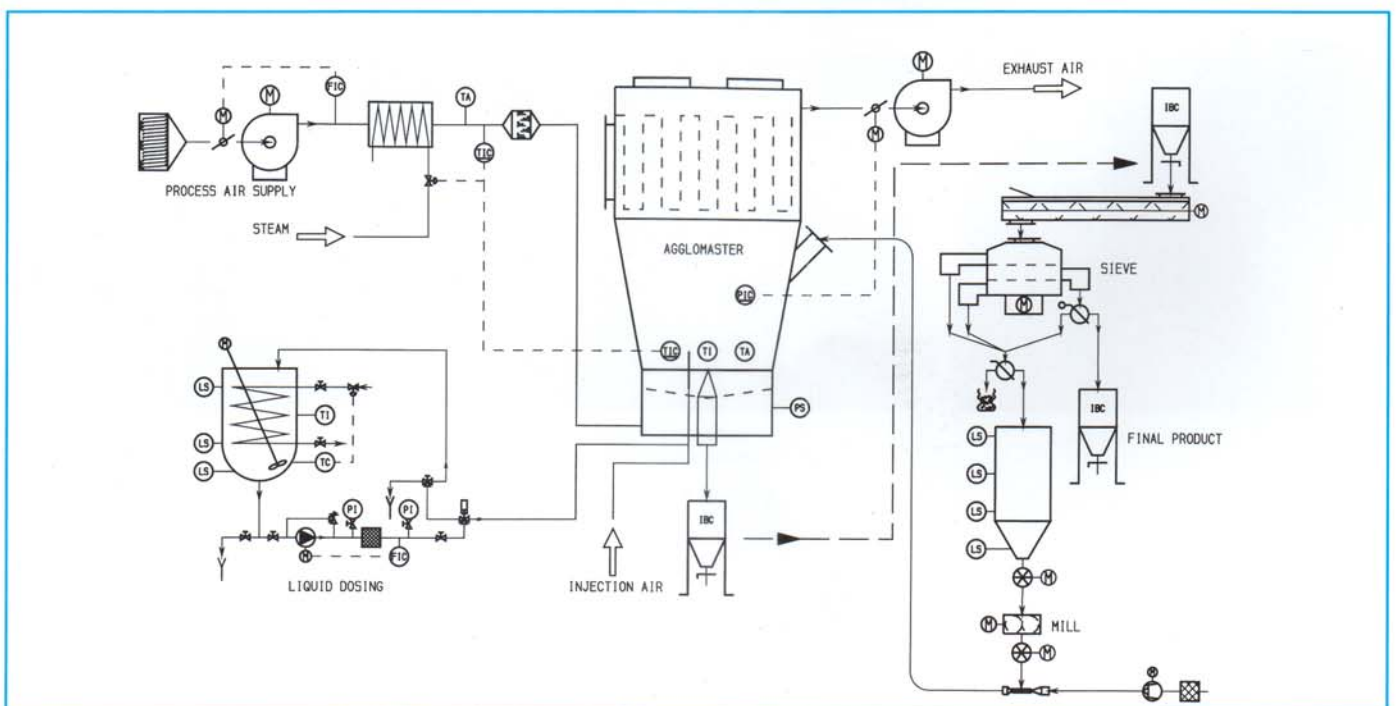
Hosokawa Micron b.v. has a fully equipped test- and development centre, in which practically all equipment in its delivery programme are available for testing purposes.

Trials with products of the client enable the determination of the most suitable process/equipment and optimum process conditions for the specific application.

The test results and the field-data are systematically evaluated and form an important basis for the specific process application.



AGGLOMASTER AGM-2PJ&SD Specially developed for R & D



Flow diagram with an AGGLOMASTER, in this example a continuous spray agglomeration system

Supplier of global solutions for mixing, drying, agglomeration, containment, milling, classifying and compacting

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HOSOKAWA MICRON B.V.

Hosokawa Micron B.V. is a member of the Hosokawa Micron Group, responding to global needs through an emphasis on materials science and engineering. The Group is an international provider of equipment and technology for powder and particle processing, plastics processing and confectionery products. The Group maintains facilities for research, engineering, manufacturing and service in each of the world's major industrial markets.