

Continuous Granulation System

DOME-EX COMBI

The Singular Solution for Continuous Blending,
Granulation, and Drying For Tableting



DALTON

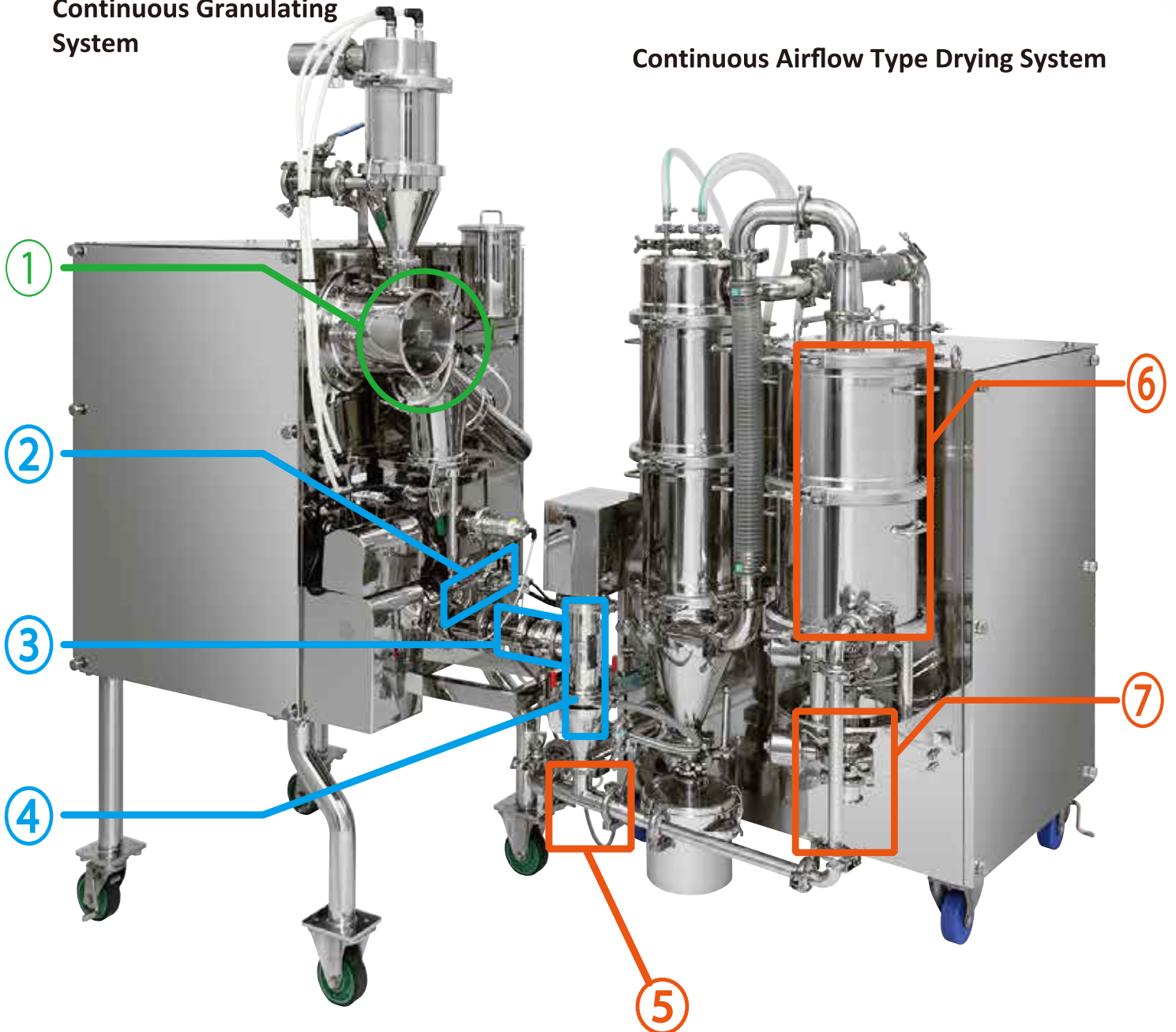
Continuous Blending, Granulating, and Drying for Tableting

Based on an abundance of experience over many years, Dalton has developed a system that enables continuous processing of individual operations, i.e. precision mixing, granulating and drying. The innovative design and configuration allows for the manufacturing of granules before tableting through a streamlined process. The cutting-edge system enables flexible production, a simplification of equipment, and a space-saving design.

DOME-EX COMBI

Continuous Granulating System

Continuous Airflow Type Drying System



Continuous Blending, Granulating, and Drying for Tableting

① Material mixing

Spartan Mixer

With a large chopper at the center of the mixing container, the mixer can complete precision mixing in an extremely short time. The high rotation speed ensures intimate mixing.

② Feeder

The screw supplies mixed powder at a uniform rate to the kneading unit

③ Continuous kneading

Water is added to dry material and continuously kneaded. The kneading speed can be adjusted by the number of kneading blades and rotation speed.

④ Granulation

Granules are produced through the front dome die. Granule diameter can be adjusted by the hole diameter of the dome die, which can be changed quickly with swing clamps.

⑤ Surface drying

Granule surfaces are instantaneously dried by hot compressed air. By drying granule surfaces, secondary agglomeration can be avoided.

⑥ Final drying (Airflow type drying)

Granules are dried while being transferred by warm airflow through a spiral dryer. Exhaust air is recycled to maximize efficiency.

⑦ Collection

Granules are collected with the cyclone that is integrated with the drying unit. Integration of the drying unit and collection unit results in a compact design.

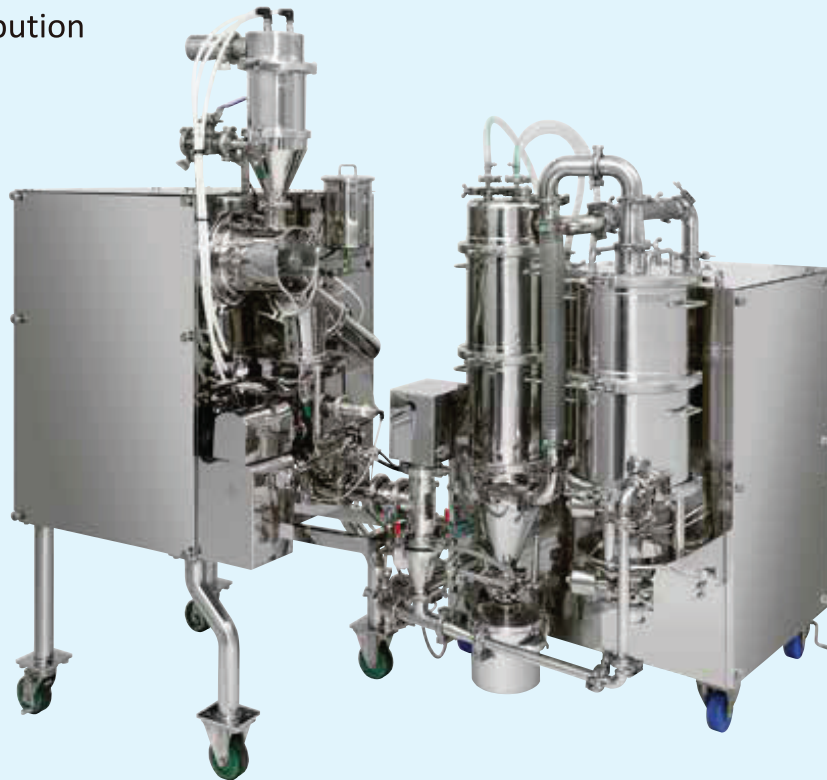


Next-Generation Granulation System

Shift from batch granulation to continuous granulation

Precompaction of powder before tableting

Narrow particle size distribution



Manufacturing Granules with the Continuous Granulating & DG-Dryer Drying System

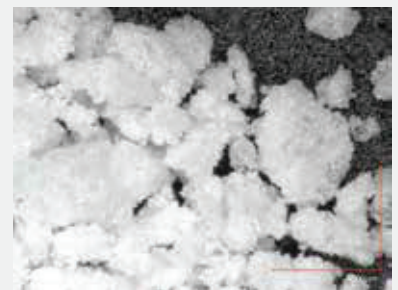
This system can control the granule hardness by changing operating conditions.

Granulating Conditions

Screen	1.5 ϕ
Mixing time	60 sec
Continuous kneading rotation speed	160 rpm
Granulating rotation speed	200 rpm
Water content	13%



×30



×200

Granulating Conditions

Screen	1.5 ϕ
Mixing time	60 sec
Continuous kneading rotation speed	160 rpm
Granulating rotation speed	120 rpm
Water content	15%



×30

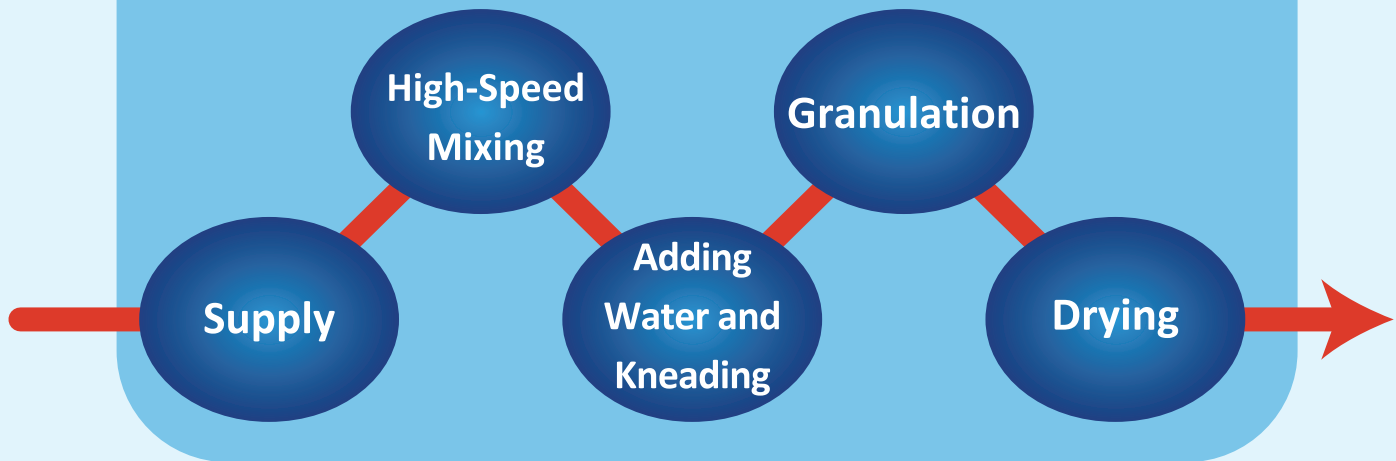


×200

Continuous Granulating & Drying System

The DOME-EX and DG-Dryer produce granules through a streamlined process

Individual Unit Operations Are Executed In A Sequential Process



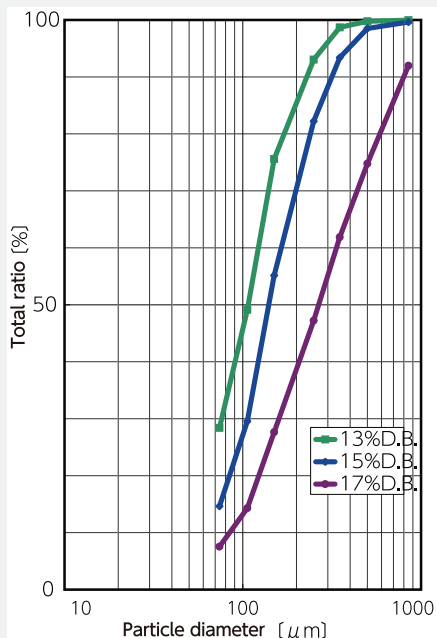
Once material is prepared, this system can manufacture granule products through a process comprised of individual unit operations. Operating conditions can be set to ensure constant and stable manufacturing of products.

Particle size distribution of DOME-EX

Granulating Conditions

Dome Die	Kneading Rotation Speed (rpm)	Granulating Rotation Speed (rpm)
ϕ 1.5	170	200

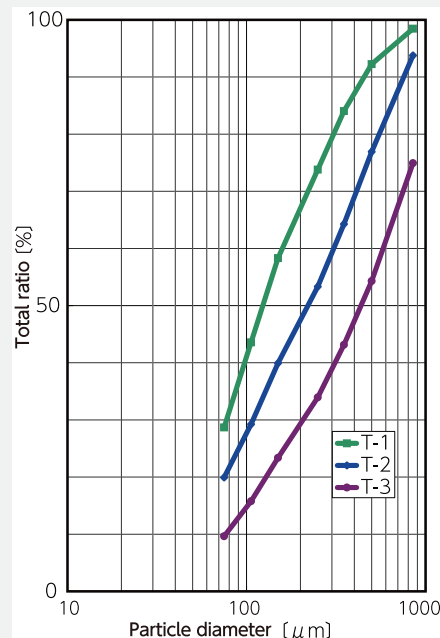
Prescription: Lactose 70%, Cornstarch 30%, HPC-L 3% (D.B.)



Granulating Conditions

Dome Die	Water Content (%D.B.)	Kneading Rotation Speed (rpm)	Granulating Rotation Speed (rpm)
T-1	ϕ 1.5	13	160
T-2	ϕ 1.5	13	120
T-3	ϕ 1.5	15	120

Prescription: Lactose 70%, Cornstarch 30%, HPC-L 3% (D.B.)



Continuous granulating system

DOME-EX20

With a dry powder mixing function, DOME-EX20 executes a series of kneading and granulation steps with a single unit.

Feature

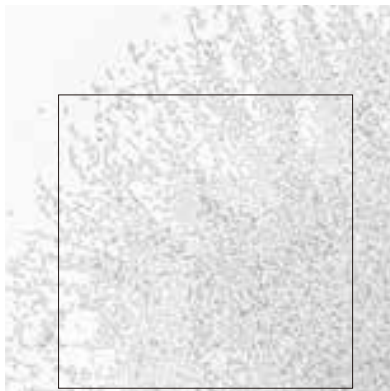
The DOME-EX20 incorporates a Spartan Mixer and integrates the mixing, kneading and extrusion granulation steps. Since the granulation supply unit is equipped with a liquid addition system, DOME-EX20 can always maintain optimum water content and kneading conditions, while monitoring conditions of granule products.

Fine granule diameter of 0.3 mm

The DOME-EX20 enables manufacturing of soft and fine granules of 0.3 mm in diameter. The dome die enables manufacturing of granules with uniform L/D in comparison with conventional extrusion granulating machines.



Granulating unit



Granule product: $\phi 0.3$ mm



Built-in Spartan mixer enables precision mixing



Excellent cleanability can meet requirements of GMP

Easy to disassemble, this system ensures higher cleanliness because the powder contact parts can be cleaned with water. This system can comply with GMP requirements for pharmaceutical and food industries.



Liquid addition and kneading steps are executed in series before granulation.

Continuous Airflow Type Dryer DG-Dryer5

Product granules are continuously dried by airflow

Feature

DG-Dryer5 is an airflow type drier that continuously dries granule products during transport. The continuous drying system can prevent accumulation of wet granules immediately after the granulating step, and can eliminate secondary agglomeration. Thus, the DG-Dryer5 can dry products that cannot be dried with conventional driers.



Instantaneous drying of granule surfaces

Granule surfaces are dried by warm air immediately after product granules are charged, so that adhesion of granules to the piping and the cycle surface can be reduced. When wet granules are supplied into the hopper of DG-Dryer after the granulation step, only the granule surfaces are instantaneously dried. After that, final drying is completed in a spiral dryer.



Integration of the airflow drying unit and cyclone

Integrating the airflow drier and cyclone eliminates heat retention. The combination allows for easier disassembly and cleaning.

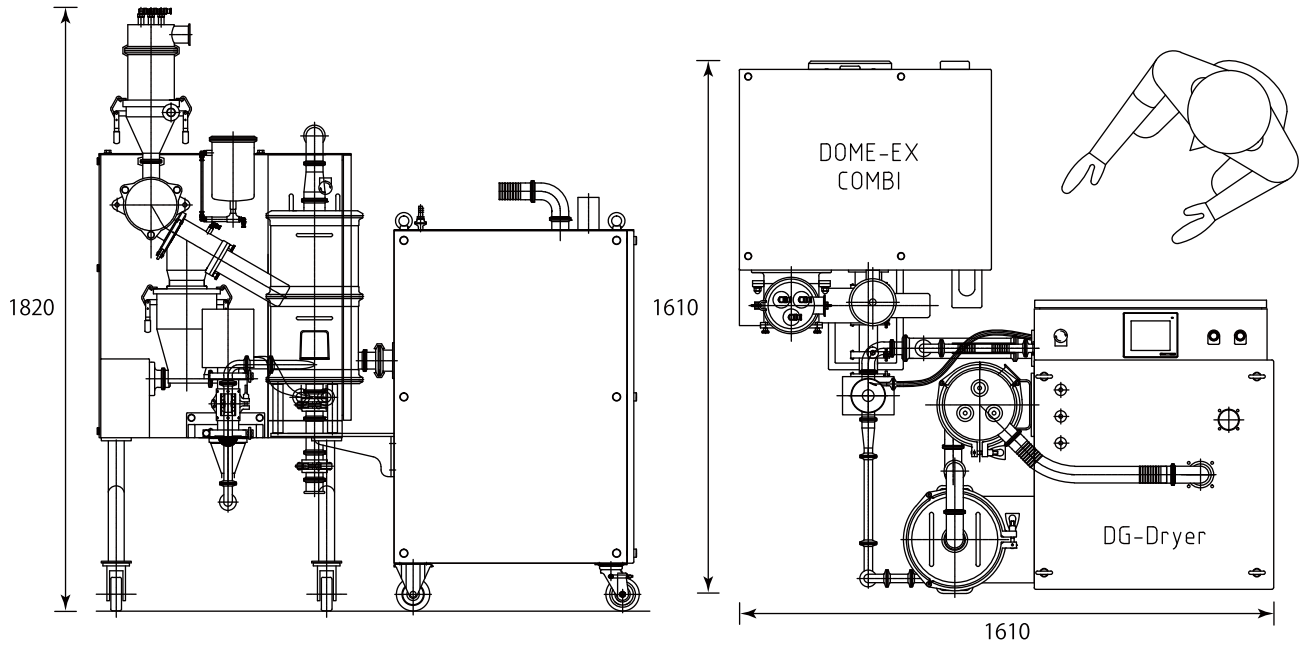


Excellent compatibility with DOME-EX COMBI

The DG-Dryer has been designed for combination with DOME-EX COMBI as a precondition to ensure excellent compatibility.



Combination system diagram



Specifications

DOME-EX COMBI

Dry powder mixing unit

Mixing with high-speed rotation chopper

Total capacity: 1.6 L

Effective capacity: 1.0 L

Mixing: 0.4 kW

Chopper: 0.75 kW

Constant feeding unit

Total capacity: 2.8 L

Constant feeding screw: 0.09 kW

Liquid addition and mixing unit

Mixing with twin screw self-cleaning type screw

Kneading screw: 0.4 kW

Granulating unit

Extrusion granulation using dome die

Extrusion screw: 0.2 kW

DG-Dryer

Collecting method

Combination of cyclone and bag filter

Heater

Main heater: 2 kW

Heater for supply unit: 2 kW

Heater for cold environment: 2 kW

Airflow rate

Main blower: 4.4 m³/min Compressed air:

1000 L/min (max.)

Material and finish

Powder contact part: SUS304

SUS finish condition: Polished with

buffing cloth #400

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※Note: Specifications and shape of this product are subject to change without notice.



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