



Marumerizer™

Spheronization Technology

Would Your Product Perform Better



Controlled release pharmaceutical



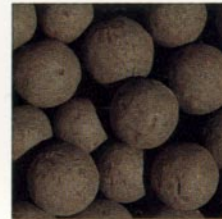
Detergent enzyme



Specialty food additive



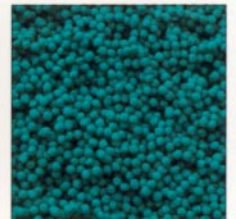
Ceramic substrate



Reaction catalyst



Specialty fertilizer



Water dispersible pesticide

Spheronization can improve your product's performance by:

- Producing a smooth particle surface suitable for thin layer coating.
- Conditioning particles to prevent generation of dust and fines from usage or shipping.
- Forming granules with a specific bio-consumable shape.
- Increasing flowability by elimination of sticking or bridging points.
- Increasing the apparent bulk density up to 25% compared to extruded material.

The Marumerizer™ from LCI is being used to produce smooth, uniform spheres in a wide range of applications.

Features

- Design and operational simplicity. Allows easy, reliable production of particles with desired shape, batchwise or continuously.
- Process controllability. Final granule shape is determined by formulation, rotational speed and spheronizing time.
- Easy maintenance. Engineered for quick and simple disassembly for maintenance and cleaning.
- Adaptability. The Marumerizer can be incorporated into most granulation systems.
- 316 stainless steel construction for components in contact with process materials.

Options

- Single cabinet design for continuous or multiple batch operation
- GMP construction
- Electricals suitable for flammable solvents and combustible powders
- Integrated weigh cell charge system for precise charging
- Process control sequencing
- Multiple friction plate designs to optimize yield and shape
- Special construction materials
- Air assisted spheronization
- Automatic discharge
- Jacketed bowl for temperature control
- Custom process design

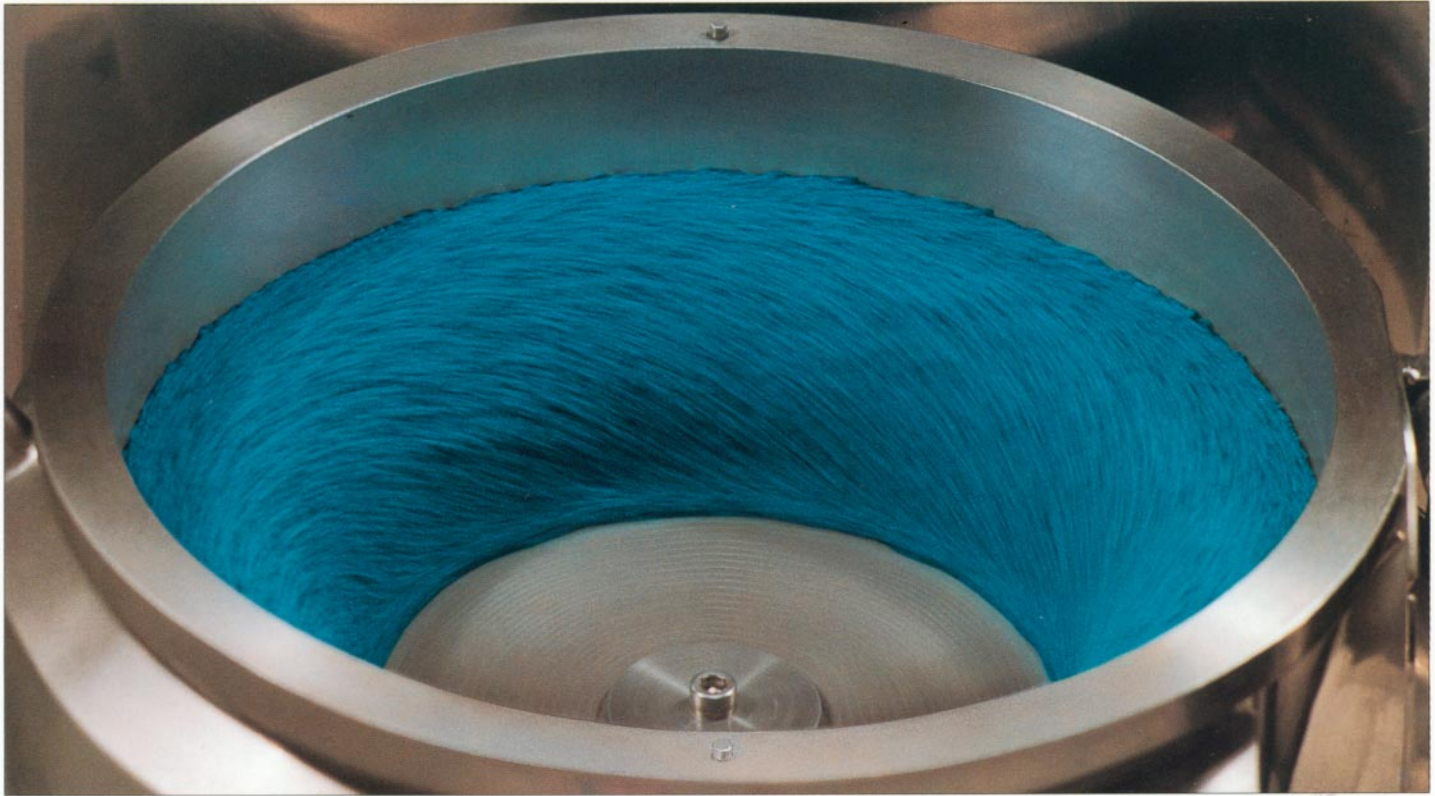


Two stage cascade continuous Marumerizer

Model	Operation	Typical Operating Capacity*
QJ-230	Batch	0.1–1.5 kg
	Continuous	5–30 kg/hr
QJ-400	Batch	0.2–3.0 kg
	Continuous	20–120 kg/hr
QJ-700	Batch	1.0–15 kg
	Continuous	100–600 kg/hr
QJ-1000	Batch	2.5–35 kg
	Continuous	250–2000 kg/hr

*Continuous rates are for a single stage cascade system. Rates are dependent on material characteristics, operating parameters and end use.

As A Sphere?



How It Works

The Marumerizer comprises three principal, precision made components: a vertical cylinder with discharge port, a circular “friction” plate and a variable speed drive train which turns the plate.

The feed material can be extruded particles or moist granules from a mixer/granulator. Since an extruded particle has two dimensions already defined, a narrow final particle size distribution is expected.

Particles are fed onto the spinning friction plate, which hurls them against the inside wall of the cylinder.

If the particles are extruded, they quickly break into segments approximately one diameter long. Centrifugal and gravitational forces create a mechanically fluidized ring of particles. Collisions with the wall, friction plate and other particles result in the plastic deformation (see below) of each granule, quickly creating a spherical shape. The desired shape for a specific application is time and formulation dependent and is achieved, predictably and repeatedly, in a brief period called the “spheronization time”.



Sphere magnified 100x.

Extrudate as it enters the Marumerizer

After 5 seconds

After 15 seconds

After 45 seconds

After 180 seconds



Example showing deformation of extruded pellets to produce spheres

Spheronization Systems

Spheronization is just one step in the process of producing spherical granules. LCI can engineer and provide complete granulation systems which take your product from powder to sphere, ready for packaging or further processing.

These systems are based on the broadest range of extrusion methods available. This flexibility of choice allows our clients to more closely produce the exact granule properties they require.

Our technical services include preliminary evaluation studies, pilot or full-scale demonstrations in our

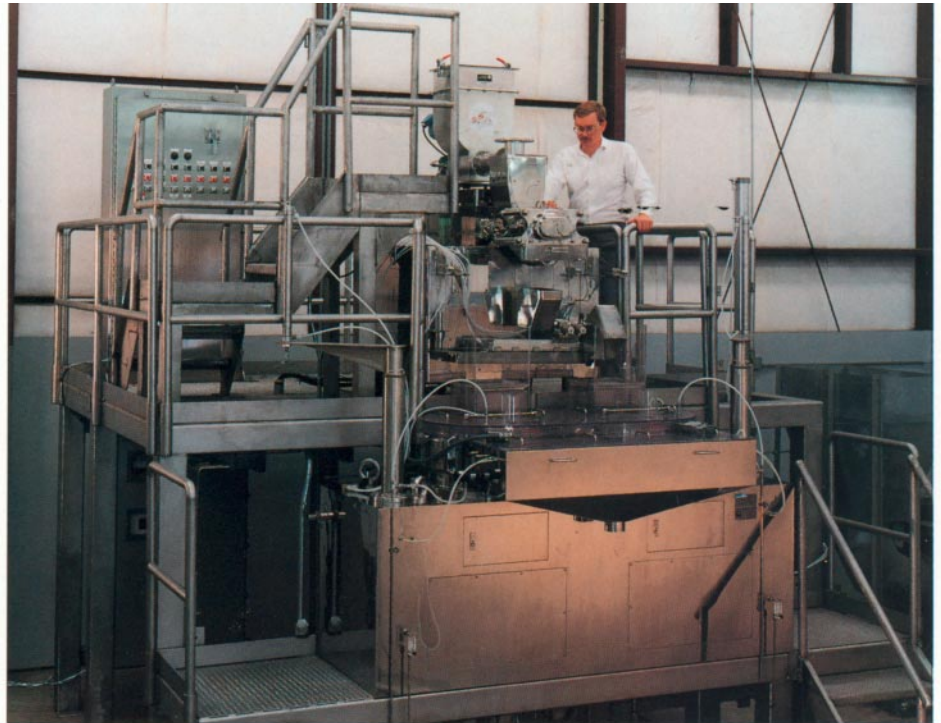
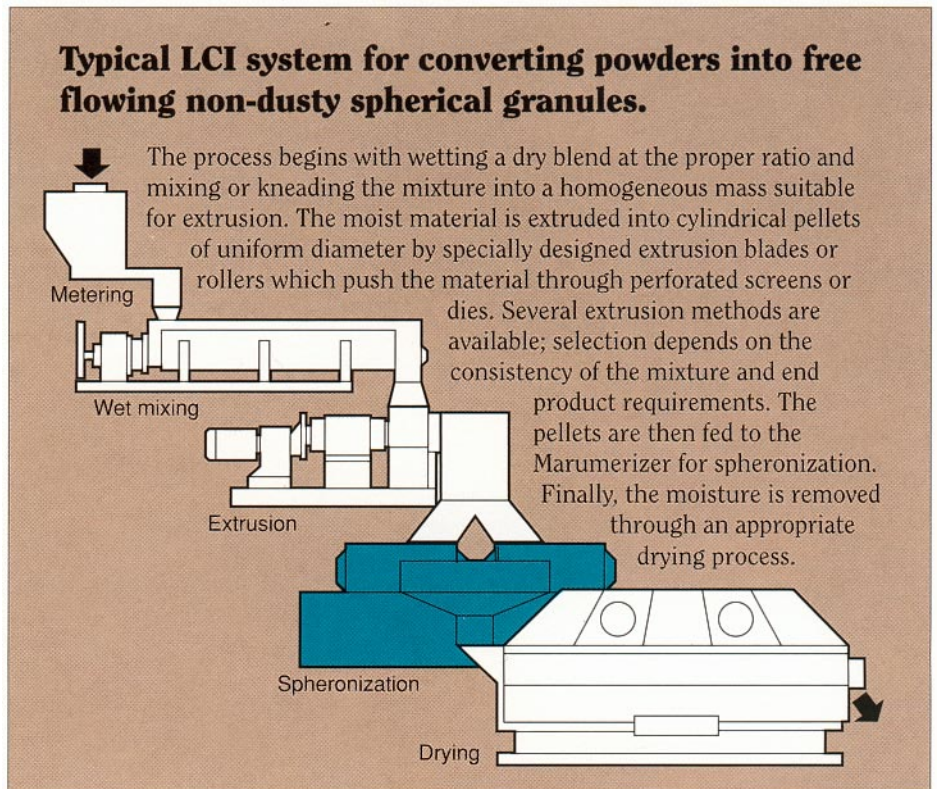


The LCI Test Center can prove feasibility and lay the groundwork for a production system.

test center, applications engineering, systems design, comprehensive equipment and instrumentation supply, on-site consulting and start-up assistance.

The Marumerizer is manufactured by Fuji Paudal Co. Ltd., a world leader in granulation technology based in Osaka, Japan.

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Microprocessor controlled semi-continuous system for producing spherical granules.