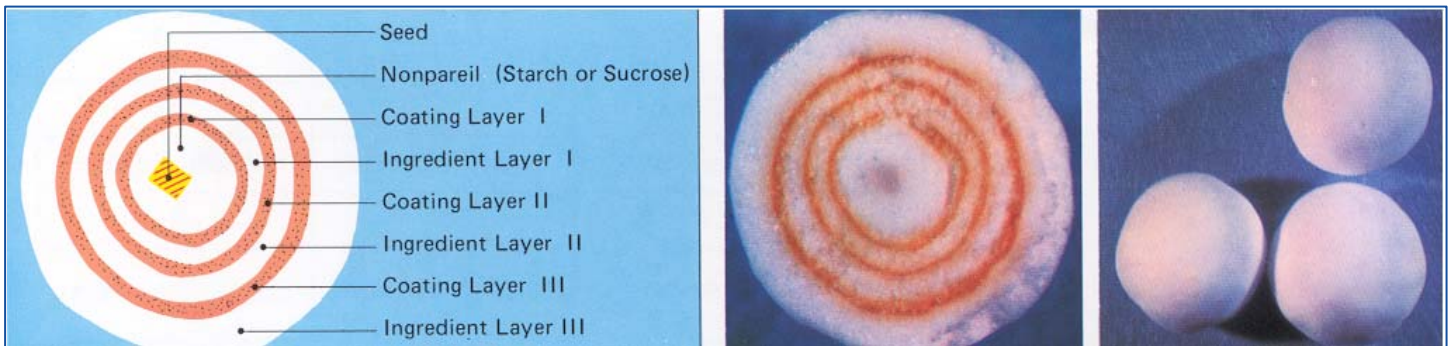


Precision Coating and Powder Layering Processes

The Granurex[®] precisely and consistently performs both coating and powder layering processes. In the pictures below, multiple coating and powder (ingredient) layers demonstrate the accuracy and control of a Granurex[®] rotor processor, including the creation of the nonpareil.



Unique, Efficient Granulation Processes

Granules produced by the Granurex[®] are dense and spherical in shape. The pictures and graphs shown below demonstrate how the Granurex[®] processes Ciprofloxacin from a 7 μ m poorly flowing powder to 200 μ m granules with excellent flow characteristics.

Unprocessed Ciprofloxacin

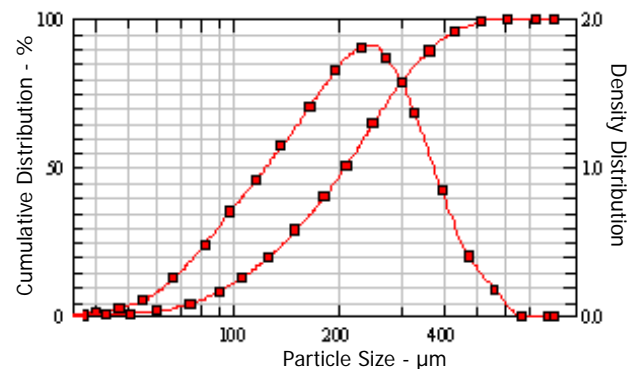
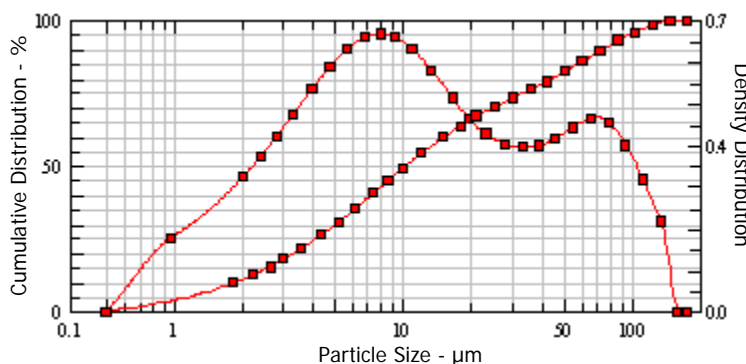


- Bulk Density: 0.358 g/cc
- Poor Flow Characteristics
- X₅₀ Diameter: 7 μ m
- 100% Ciprofloxacin

Granulated Ciprofloxacin Using Granurex[®]



- Bulk Density: 0.468 g/cc
- Excellent Flow Characteristics
- X₅₀ Diameter: 200 μ m
- 92% Ciprofloxacin
- 5% Fine Grade PVP
- 4% Coarse Grade PVP



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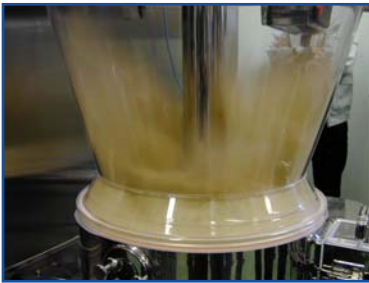
Email: vector.sales@vectorcorporation.com

www.vectorcorporation.com

Granurex® Technology

One-Pot Processing

A patented feature of the Granurex® is its ability to dry product within the same processing chamber. This unique drying method, combined with 12 bar construction, provides a true one-pot system, ideal for manufacturing highly potent and expensive pharmaceutical compounds.



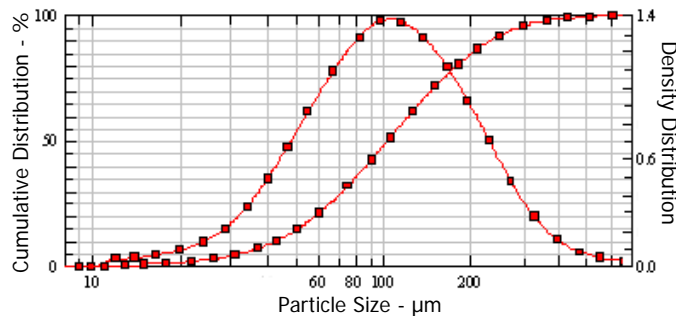
Increased Batch Capacities

The patented conical rotor plate increases batch capacities when compared to traditional rotor processors. The precision machined gap contains the product within the processing area and the peripheral spray guns are embedded into the product, which provides accurate coating with minimal spraying defects.



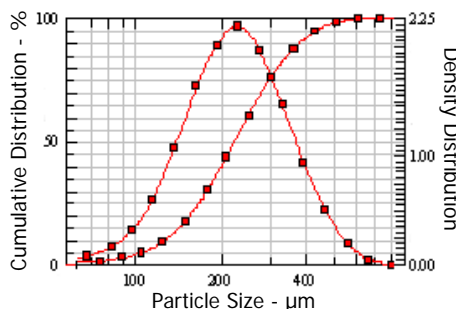
Maximum Processing Flexibility

Using micronized acetaminophen as the base material, the Granurex® produced both a 100 µm granulation and a 200 µm spherical bead. In both of the examples below, the APAP core material had the same initial Mean Particle Size (X_{50}) of 40 µm.



Granulation Process

- X_{50} Diameter: 110 µm
- Yield: 97.2%
- Content Uniformity: 1.12%
- Surface Area: 211.8 cm²/g



Layering Process

- X_{50} Diameter: 225 µm
- Yield: 99.1%
- Content Uniformity: 1.74%
- Surface Area: 92.9 cm²/g

Providing equipment and processing solutions around the world since 1972, Vector is a subsidiary of Freund Corporation located in Tokyo, Japan. Globally, the Freund/Vector team has thousands of system installations in the pharmaceutical, healthcare, chemical, agricultural, and food industries.