

**Compact continuous processing for pharmaceutical research, development and production. Thermo Scientific PHARMA TSG is a twin screw continuous granulator with PLC control, data logging and recipe storage ensuring reliable and repeatable results.**

## Thermo Scientific Pharma TSG

### Twin Screw Granulator



#### Features

- Small footprint
- Continuous operation
- High free volume
- Small process inventory
- Segmented screws and barrel
- Removable screws and liners

#### Benefits

- Reduced clean room area
- Consistent, controllable processing
- Suitable for PAT
- Reduced ATEX risk
- On-demand production
- Minimize scale-up risk
- Reliable cleaning

#### Comprehensive Range of Capabilities

Available in 16 mm and 24 mm sizes, PHARMA TSG can be used for research, development or production of pharmaceutical granulations. Special feeders have been developed to optimize dosing of low bulk density and difficult-to-feed API materials.

#### Designed for Pharmaceutical Needs

The horizontally split barrels (up to 40:1 L/D) have a crevice-free, GMP design. Quick release clamps give easy access to screws and process contact surfaces for cleaning or configuration changes. The barrel is modular, with segments available for feeding solids and liquids, or for venting. Both the barrel liners and screws can be completely removed from the granulator for thorough cleaning.

The touch-screen display is easy to use and easy to clean. The PLC incorporates data acquisition with an option to download to a remote computer for archiving and analysis.

The controls include recipe storage of preset extruder parameters for repeatable process conditions. PAT can be applied for in-process monitoring.

#### Supporting Our Customers

Our facility in Stone, UK has a fully equipped technology center for customer trials on Thermo Scientific compounding, extrusion and granulation equipment. This service ensures you will get the performance you need before you make an investment. With a worldwide services network supporting the pharmaceutical industry, your investment will be protected.

## Thermo Scientific Pharma TSG

Specifications	Pharma 16 TSG		Pharma 24 TSG	
Barrel Length (L/D)	25:1	40:1	30:1	40:1
Barrel Bore Diameter	16 mm	16 mm	24 mm	24 mm
Screw Diameter D	15.6 mm	15.6 mm	23.6 mm	23.6 mm
Channel Depth	3.3 mm	3.3 mm	5.15 mm	5.15 mm
Root Diameter	9.0 mm	9.0 mm	13.3 mm	13.3 mm
Diameter Ratio (D/d)	1.73	1.73	1.77	1.77
Center-line Spacing	12.5 mm	12.5 mm	18.75 mm	18.75 mm
Center-line to Radius Ratio	1.56	1.56	1.56	1.56
Maximum Motor Power	2.5 kW	2.5 kW	7.5 kW	7.5 kW
Maximum Screw Speed	1000 rpm	1000 rpm	750 rpm	750 rpm
<b>Extruder Dimensions</b>				
L x W x H	1.5 x 0.7 x 1.5 m	1.5 x 0.7 x 1.5 m	2.0 x 0.7 x 1.5 m	2.0 x 0.7 x 1.5 m
<b>Scale-up Data</b>				
Internal Free Volume	68 cm <sup>3</sup>	109 cm <sup>3</sup>	274 cm <sup>3</sup>	365 cm <sup>3</sup>
Peripheral Surface Area	316 cm <sup>2</sup>	505 cm <sup>2</sup>	854 cm <sup>2</sup>	1138 cm <sup>2</sup>
<b>Services</b>				
Electric Power (Volt/ph/Amp)	400V/3ph+N/20A	400V/3ph+N/20A	400V/3ph+N/40A	400V/3ph+N/40A
Cooling Water 20°C	5 liters per minute	5 liters per minute	20 liters per minute	20 liters per minute
<b>Performance</b>				
Throughput (formulation dependent)	1-10 kg/h	1-10 kg/h	5-50 kg/h	5-50 kg/h

### Continuous Granulation Process

Representative process allows granulation to be matched to API availability without scale-up issues. Suitable for short runs at development and DFM scale or longer-term production.

### Reduce Time and Costs in R&D.

Continuous granulation delivers multiple samples from a single batch of API. Minimum sample sizes 250 g on 16 mm or 1 kg on 24 mm twin screw granulators.

Reduce scale-up risks by running production on same equipment as development. 16 mm TSG can replace 3 to 60 litre batch granulators, while 24 mm TSG will match performance of 300 to 600 litre batch processors.

Reduce in-process inventory to minimize risks to expensive ingredients and from ATEX hazards. Maximum volume of ingredients in the process is approximately 100 ml for 16 mm and 360 ml for 24 mm twin screw granulators.



Removable contact parts for quick product changes.



Segmented screws, and barrels for flexibility in R&D with high free volume geometry to maximize intake of low density materials.



Adjustable screw length and flexible configurations to change residence time and processing conditions.

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