PHARMX®
HIGH-SHEAR GRANULATING
MIXER SYSTEMS

Efficient Mixing and Granulation
Optimized to Your Process
Maximize Your Batch

Design flexibility ensures peak performance for high-shear granulating mixers.

Whether you need solid dosage technology for R&D, pilot, or production applications, Fluid Air can help. Our PHARMX® high-shear granulating mixers can be quickly and cost-effectively customized to meet your unique processing challenges. Processing ingredients with special handling requirements? One pot processing? Let us help you optimize your process.

Benefits
• Simplify your scale-up
• Minimize process downtime
• Optimize production
• Reduce maintenance
• Improve product quality

Efficient Granulating at up to 90% Bowl Capacity

The PHARMX high-shear granulator has a mixing bowl with a bottom-driven mixing impeller and side mounted chopper. The bowl geometry is optimized to permit working volumes from 30-90% of full capacity.

Efficient, Homogeneous Mixing Even at Larger Capacities

The dome shaped lid permits product to perform a complete roll over as it moves up the side of the vessel wall. This ensures efficient mixing even when running at larger operating capacities.

Reduce Downtime Between Batches

PHARMX mixers are equipped with auto-cleaning and liftable tool systems for simplified system cleaning and reduced setup time. Designed to comply with stringent industry regulations, the auto-cleaning system cleans the bowl, tools and discharge valve as well as flushes and drains the seal purge system. After the cleaning phase is complete, the liftable tool system raises the impeller 4-8” to permit inspection or swabbing of the impeller, seal and bowl bottom, reducing downtime between batches. No removal of mixing impeller required.
PHARMX® System Advantages

• Optimized bowl geometry and mixing efficiency permit operation up to 90% capacity for larger batches

• Equipped with auto-cleaning and liftable tool systems for easy clean-up and inspection

• Robust variable speed chopper and impeller drive systems for maximum energy transfer

• Consistent impeller tip speed for all models ensures scale-up

• Flexible bowl configurations available to match all your processing needs

• Elliptical vessel lids promote homogeneous mixing action

• Ensure process validation with Spraying Systems Co. liquid dispersion nozzles for precise and repeatable liquid addition

Easy-to-use Batch Architect™ Process Control Software Maximizes Operating Flexibility

• Simple enough for R&D scale machines; sophisticated enough for applications requiring 21 CFR Part 11 FDA compliance

• Configure for manual control or optional phase or recipe-based control

• Runs on Allen-Bradley® Logix processors, RsLogix™ 5000 Software, PanelView Plus™ or FactoryTalk® SE Platform

Definitions

What is High-Shear Granulation?

High-shear granulation is an effective way to turn powders into dense granules for tableting or coating. To create the granules, powders are added to the mixing bowl and the bowl is sealed. A large impeller rotates at slow speeds, spinning the powders into a vortex. After the powders are blended together, liquid is added to the product using a pump or pressurized container. A high-speed chopper tool located in the bowl shears the granules and removes air. The mixing continues until the desired granule size and density are achieved.

When granulation is complete, the product can be dried in the bowl using vacuum drying with gas assist (if so equipped) or the product can be discharged and dried in a MAGNAFLO® fluid bed dryer. For many products, wet milling of the product with a GRANUMILL® and vacuum conveying into the fluid bed dryer provides several advantages including automated material transfer, uniform sizing of product prior to drying to reduce drying time and a more spherical particle shape for improved material flow.
### PHARMX® High-Shear Granulating Mixer Systems: Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>PX1*</th>
<th>PX25</th>
<th>PX50</th>
<th>PX100</th>
<th>PX150</th>
<th>PX250</th>
<th>PX400</th>
<th>PX600</th>
<th>PX800</th>
<th>PX1000</th>
<th>PX1250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total bowl volume (L)</td>
<td>1, 2, 4, 6, 8, 4</td>
<td>31</td>
<td>58</td>
<td>119</td>
<td>167</td>
<td>274</td>
<td>432</td>
<td>633</td>
<td>864</td>
<td>1050</td>
<td>1286</td>
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<tr>
<td>Charge- max. liters @ light bulk, 0.3 - 0.5</td>
<td>0.9 - 7.5</td>
<td>28</td>
<td>58</td>
<td>107</td>
<td>150</td>
<td>246</td>
<td>389</td>
<td>569</td>
<td>778</td>
<td>945</td>
<td>1157</td>
</tr>
<tr>
<td>Charge- min. liters</td>
<td>0.3 - 2.5</td>
<td>8</td>
<td>15</td>
<td>30</td>
<td>42</td>
<td>69</td>
<td>109</td>
<td>159</td>
<td>218</td>
<td>265</td>
<td>324</td>
</tr>
<tr>
<td>Impeller speed range (RPM)</td>
<td>5 - 1107</td>
<td>37 - 318</td>
<td>29 - 260</td>
<td>14 - 205</td>
<td>12 - 185</td>
<td>10 - 172</td>
<td>1 - 148</td>
<td>1 - 127</td>
<td>1 - 118</td>
<td>1 - 110</td>
<td>1 - 103</td>
</tr>
<tr>
<td>Impeller power (HP)</td>
<td>0.5 - 1</td>
<td>3</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>40</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td>150</td>
</tr>
<tr>
<td>Chopper speed range (RPM)</td>
<td>1500 - 9750</td>
<td>500 - 3600</td>
<td>500 - 3600</td>
<td>500 - 3600</td>
<td>500 - 3600</td>
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<td>500 - 3600</td>
<td></td>
</tr>
<tr>
<td>Impeller power (HP)</td>
<td>.25</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>7.5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>

* Specifications vary depending on bowl size

### Additional Resources

**A Guide to Spray Technology for Pharmaceutical and Biopharmaceutical Processing, Bulletin 599**
Addresses tablet coating nozzles and manifolds, SprayDry® nozzles, vessel cleaning nozzles and more.

**MAGNAFLO®/MAGNACOATER® Fluid Bed Systems, Bulletin FA100**
Describes how these systems optimize drying, granulating and coating.

**GRANUMILL® Size Reduction Systems, Bulletin FA102**
Details how these systems provide high-speed impact milling and low-speed screening of agglomerates.

**Retrofit Batch Equipment and Controls, Bulletin FA103**
Explains how to update and expand the capabilities of current equipment through software upgrades and/or machine conversions.

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Experts in Solid Dosage Technology
A Division of Spraying Systems Co.

For more information on AutoJet solutions, visit [www.spray.com](http://www.spray.com).

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