HIGH SHEAR MIXER GRANULATOR



ROTO MIX is a high shear mixer granulator designed for dry mixing of powders and wet granulation. Mixing and agglomeration of powder particles are achieved by the combined action of the impeller the chopper and the liquid-binder distribution system. It is supplied in a through-the-wall version and, by locating all the auxiliary equipment in a technical area, optimis es the room layout according to GMPs and safety regulations.





Product discharge B



IMPELLER

The ROTO MIX has a unique impeller design created for the manufacture of pharmaceutical granules.

The impeller has three blades with a little wing on each tip and is driven to obtain the optimum shear for granulation at every speed. It provides the appropriate movement to achieve the highest mixing and agglomeration efficiency.

The impeller has scrapers on the bottom of each blade to ensure minimum tolerance from the bottom of the bowl to prevent product sticking and maximise product yield.



CHOPPER

The chopper is located on the side wall of the bowl and has a horizontal shaft. It runs at variable speed, counter-directional to the impeller to prevent lumps forming.

The chopper can also control granule growth to achieve regular particle size distribution.



Binder solution



PRODUCT BOWL AND DISCHARGE VALVE

The product bowl is designed with no dead zones for mixing and cleaning. It has a wide curvature radius on the bottom that prevents product sticking.

The discharge valve is located on the side wall of the bottom of the bowl and has a GMP design to facilitate discharge operation.

It is also easy to wash in place and has full access for inspection due to the valve housing that can be fully opened.



TECHNICAL AREA

IN-LINE MILLING AND GRANULE TRANSFER TO A FLUID BED DRYER

The ROTO MIX can be integrated with the IMILL, for wet granule sizing and direct transfer, in a closed system, to a fluid bed dryer.

- 1. LOADING OF RAW MATERIAL BY VACUUM OR GRAVITY
- 2. IMPELLER
- 3. Chopper
- 4. BINDER SPRAY SYSTEM
- 5. Peristaltic pump
- 6. IMILL: IN-LINE MILLING
- 7. DISCHARGE VALVE
- 8. SIGHT GLASS AND LIGHT

PROCESSING AREA



WIP - WASH IN PLACE

The washing cycle is basically carried out by introducing the washing fluid from the impeller and chopper seals into the ROTO MIX bowl, then running both impeller and chopper at high speed for a given time. This operation can be repeated with different washing fluids until the final rinsing. Other washing heads are strategically located to wash large bowls when the advanced washing kit is provided.



SAFETY FEATURES

The ROTO MIX is manufactured in conformity with EC Council Directive 99/92/CE ATEX 137 to operate with organic solvents or potentially explosive powders.

The pneumatic circuit is suitable for use with nitrogen to inertize the system, thus preventing dangerous conditions and adding a further level of safety for the operator.



TECHNICAL DATA

INTEGRATED DESIGN.

IMA PROVIDES CUSTOMISED SOLUTIONS TO COMBINE PRODUCTION EFFICIENCY AND CURRENT HEALTH, ENVIRONMENTAL AND SAFETY REGULATIONS TO PROTECT OPERATORS, THE PLANT AND TO PRESERVE THE PRODUCTS.



CONTROL SYSTEM

MAX, the latest generation of IMA HMI, has been created paying maximum attention to User Experience and based on Visual Design to enhance User Interaction. MAX ensures prompt responsiveness, enhanced predictability and easy learning.

MAX HMI is based on iFix SCADA, IoT ready, to make easier connection with the fluid bed or other ancillary equipment in a granulation suite. Communication can be extended to a plant-wide supervision system and also to IMA remote service assistance.

Automatic recipes, reports and audit trails reports for processing or cleaning can be edited and managed to ensure maximum efficiency and consistent results in compliance with current directives and guidelines (ANSI/ISA-88, FDA CFR21 part 11, GAMP*, MHRA GMP Data Integrity).

MAX allows to easily achieve granulation end-point by means of impellee power consumption. In addition, it can work with control instruments required for PAT approach, such as torquemeter, NIR and acoustic detectors, to detect moisture content, content uniformity or to monitor granule growth.







MODEL	30	60	120	300	600	900	1200	1500	2500
A (mm)	1,250	1,400	1,650	2,100	2,300	2,550	2,700	2,850	3,500
B (mm)	1,260	1,250	1,550	1,900	2,300	2,550	2,700	2,830	3,020
C (mm)	800	680	770	950	1,240	1,270	1,300	1,350	1,350
D (mm)	600	850	1,050	1,300	1,500	1,700	1,800	1,900	2,350
E (mm)	800	1,700	1,980	2,300	2,900	3,250	3,250	3,400	3,700
Bowl capacity (litres)	30	60	120	300	600	900	1,200	1,500	2,500
Working capacity (litres)	minimum 25% - maximum 70%								
Impeller power (kW)	3	4	11	18.5	30	45	55	75	115
Impeller speed (rpm)	20 - 345	15-275	15-220	10-165	10-130	10-115	10-100	10-97	6-82
Chopper speed (rpm)	700-1,450 (up to 2,000 with frequency converter)								
Weight (kg)	200	500	1,100	1,700	2,200	2,800	3,100	3,800	5,500



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IMA S.p.A. - ACTIVE division marketing.active.it@ima.it • ima.it/pharma/brands/ima-active FOLLOW IMA **f** in **D O**

