

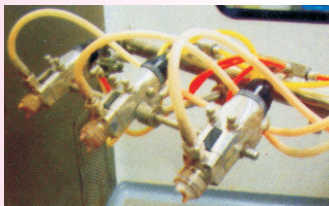
GEM TABLET COATER

PANS

Fully perforated coating pans for aqueous, solvent and sugar film coating of tablets, confectioneries and a variety of other products :

Gem's Autocoaters are recognized industry wide as the most efficient and highest quality side-vented pan coating systems available. All professional disciplines are provided to design, test, manufacture, and install systems that meet the customer's precise requirements. Gem's process engineers and processing program specialists work in union with your development team to optimize all aspects of the coating systems. Craftsmanship, reliability, flexibility, state-of-the-art and often breakthrough technology integrated into a total operating package that meets the exacting standards of a wide range of users indicative of the quality Gem puts into every Tablet Coating System.

All of the Gem Laboratory and pilot size Autocoaters are designed to operate fully perforated style of coating drums and also feature interchangeable drums with different capacities to provide maximum processing flexibility for our customers. The production Autocoaters feature a dedicated style and size of drum.



Spraying of Coating Solution Systems

Automatic air less Spray Guns of Reputed makes such as Walther Pilot/De VILBISS AGG. Controlled and uniform flow rates are achieved with the help of Single / Multi-head Peristaltic Pump.

Telescopic Spray Nozzle Arm is entirely withdrawn from the pan by pneumatic actuation and then located safely away from the Main Access Door. Spray Guns can be adjusted individually or collectively for an optimum pattern onto the product bed.

For Sugar Coating, the nozzles on the Spray Arm are replaced by a Distribution Rake connected to a high pressure Reciprocating Pump.

AHU - Supply & Exhaust

Controlling the Temperature, Humidity, Volume and Classification of the air within the tablet coater have become crucial for the coating process. Air Handling Systems are designed to meet the customers' individual needs including Room Layout, Climatic Conditions and Coating Formulations.

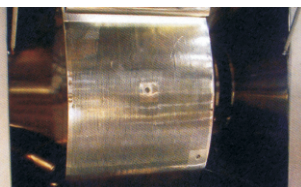
Supply Air Handling Unit

Modular design, Thermally Insulated Customised layout consists of

- Air Filters including HEPA
- Dehumidification chilling coil
- Centrifugal fan type Blower
- Humidification by means indirect / direct steam injection
- Heating Battery using Steam, Electric or superheated water

Exhaust with Filter Assembly

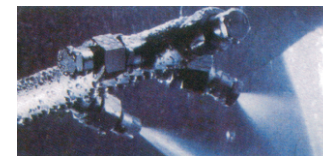
- Centrifugal Fan Type Blower
- Dry Filter Units connected to the blower
- Wet Scrubber Units



Baffles

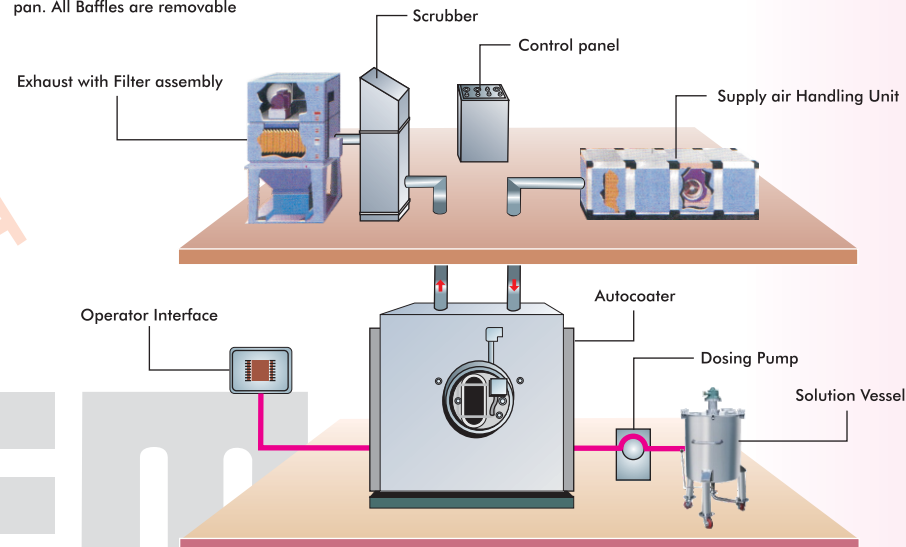
Becoaters are available with different types of Baffles to achieve optimum and efficient turbulence in the tablet bed. The selection of Baffle is decided in conjunction with tablet shape, coating process and customer's need.

- Rabbit Ear
- Tubular
- Plate Type Bolted on inside wall of the pan. All Baffles are removable



Wash In Place

Built in WIP System consisting of High Pressure Pump, Rotary wash nozzle on the Spray Arm and solid cone spray nozzles outside the pan. Automated predefined wash cycles controlled by PLC is also available. A sink is provided to collect the wash water and drain the same.



Operator Interface & Equipment Management

- User Friendly Operator interface and specially designed Process Control Systems, managed by PLC provides full details of coating process both real time and historical.
- Comprehensive online Status Reports, Result Summaries and Regime of Alarms / Controls ensures validated coating process has been followed.
- Ability to interface with higher management interface systems including SCADA with PC based software meets certain regulatory guidelines.
- Choice of operation modes 'Manual, Automatic, Maintenance and Recipe Management with three level password security system provides flexibility and ensures tamper proof controls.
- Control Systems uses Mitsubishi, Allen Bradley or Schneider PLC with Membrane Key Pad or Torch Screen displaying both Graphics and Numeric.



Product Discharge

The easy to use discharge device is connected to the pan by quick fitting system and discharge is achieved by rotating the pan.



Coating Solution Preparation Unit

A Cylindrical vessel with solid pneumatic Agitator with speed control to prepare and mix coating solution, fixed on wheels for easy transportation. The discharge of solution by means of valve which is connected to peristaltic pump that transfers the material from the tank to spraying gun.



GEM PHARMA MACHINERIES

Machineries & Equipments for Pharmaceuticals, Chemicals, Cosmetics, Beverages & Food Industries

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GEM FLUID BED DRYER

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HORIZONTAL PROCESS LAYOUT ON ONE LEVEL

Solid dosage form lay-out may have different philosophy and / or configuration on how the link between the main process steps and product handling operations. Manual or gravity system can be used for product flow.

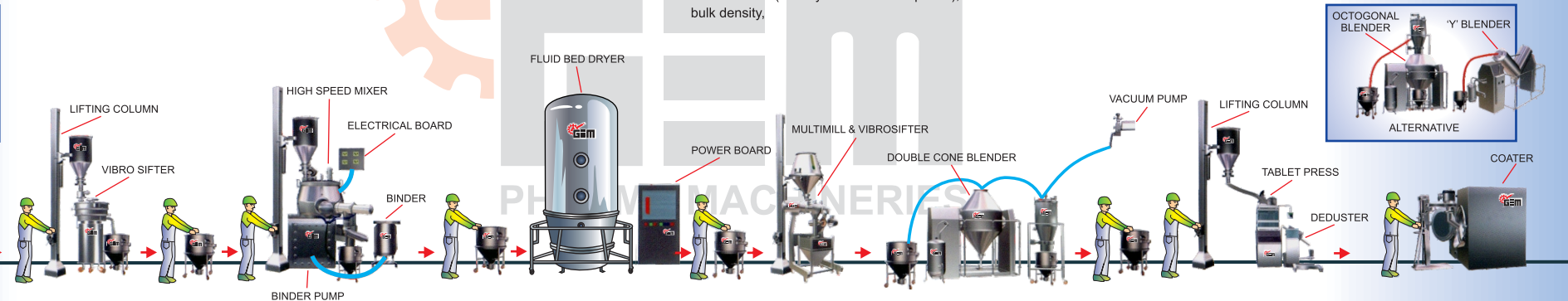
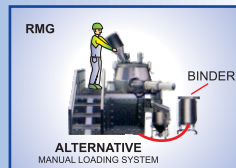
GEM's entire range of process equipment is designed with system integration in mind. A modular approach allows customers to select standard process modules to suit project need. Fluid bed dryers and coaters can be combined with high shear mixer- granulators, wet and dry milling facilities, product handling systems, binder and coating preparation units, filtration units, all designed for fully integrated systems. Safety, containment, product flow and building requirements are in-built for full integration for optimum process efficiency.

CIP

More efficient cleaning is one of the key advantages of system integration. We provide validated cleaning with minimal downtime. GEM offers CIP-by-design (patented) features into all of its process. Every aspect of the integrated plant, from inlet to discharge, has been value-engineered for optimum cleanability. Spray system, tanks cleaners, nozzles and seals are an integral part of our equipment design. Starting from Sieving operations to the coating operations



GEM provides the sequence of machine which are shown in the layout below



RAPID MIXER GRANULATOR (RMG)

Homogenous mixing of dry & wet powders, deagglomeration of wet mass and fast dispersion of binding agent. Dust free, high free flowing dosing particles, high uniformity of granule size. AC frequency control for bottom driven Impeller Mixer with 3 or 4 blades with exclusive scrape side design and Chopper positioned to make granules. Default Pneumatic discharge assembly and pneumatic bowl lifting makes ease the operation. GEM supplies RMG of capacities 5 Ltrs. To 1200 Ltrs.

Jacketed Bowl, WIP CIP system, Telescopic arrangement for main impeller, Binder spray arrangement with holding tank and peristaltic pump, Direct coupled gearbox and motor, EX rated FLP construction etc.



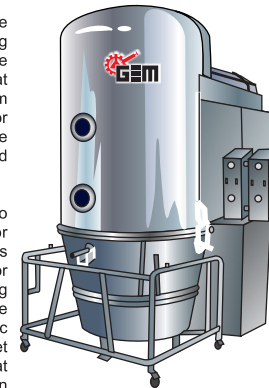
GEM provides several options that can be supplied with RMG if opted such as Steam

FLUID BED DRYER (FBD)

Dust free, fast, gentle, uniform, effective drying. A special effective air flow during fluidizations allows to a pass through the entire surface of every single particle. Great drying efficiency for a perfect and uniform granule. GEM's FBD is manufactured for over pressure integrity using a unique sealing system for operator safety and product containment.

GEM's Fluid bed dryer is a process unit for preparation of granulated materials for solid dosage forms in batch and continuous batch operations. The system is applied for drying, agglomerations and top spraying upon fluidised bed. Fluid Bed Dryers are manufactured in various capacities & batch sizes. Batch size means the weight of wet product i.e. Including moisture / solvent that can be charged in the dryer at a time. In case of very granular or crystalline material the capacity may be increased by about 15 to 20 %.

The capacity depends upon the material characteristic (i.e. Crystalline or amorphous), bulk density,



Moisture content, hygroscopic nature etc. GEM supplies FBD of capacities 5 Kgs to 300 Kgs. Fluid Bed Dryer consists of :

- ★ Bottom chamber
- ★ Product container
- ★ Expansion chamber
- ★ Retarding and Filter Bag Chamber with lateral Support.
- ★ Air Supply Unit - Inlet Air plenum & its interconnecting duct
- ★ Exhaust blower with its interconnecting duct.
- ★ Relief / Return duct
- ★ Control system (Electrical and Pneumatic)

GEM provides several options that can be supplied with FBD if opted such as Inflatable tubes, PLC automation control, AC Variator for blower, WIP CIP system, pneumatic damper on ducts, police filter, Scrubber on discharge, steam fittings if steam heater, electrical heater, chilling coil, solid flow monitors, Top spray arrangement with holding tank and peristaltic pump, EX rated FLP construction etc.

BLENDERS

Dust free, dry blending and lubrication of powder and granules. It uses the principle of tumbling of powder in a partial void to cause mixing. Motion is achieved by means of a motor coupled to a gearbox and final speed reduction through belt or chain driven assembly. Safety barrier with limit switches are provided for safety operation of the blender. GEM supplies various types of blenders of required capacities such as Octagonal blender, 'Y'- Blender, Bin blender, Double Cone blender, Bin blender, contra rotary blenders etc. The principle and operation of all these blenders remains the same but the shape of the blender varies with respect to the Capacities ranging from 5 Ltrs to 3000 Ltrs.

GEM provides several options that can be supplied with blenders if opted such as Vacuum transfer system, pneumatic actuator valve at discharge, Drum lifting system, PLC automation

control, AC Variator for motor, WIP CIP system, EX rated FLP construction etc.



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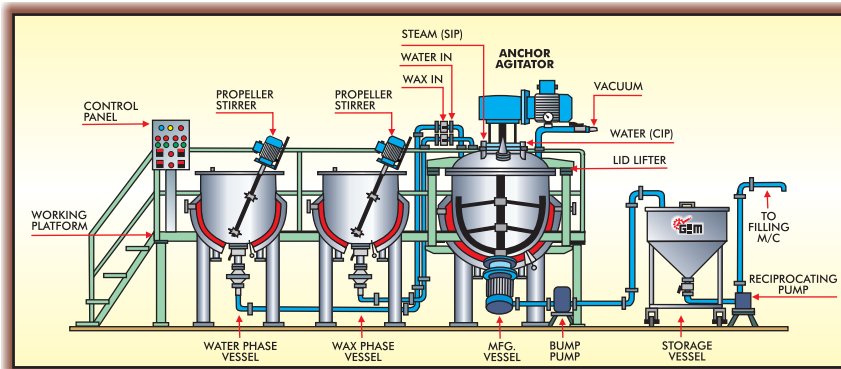
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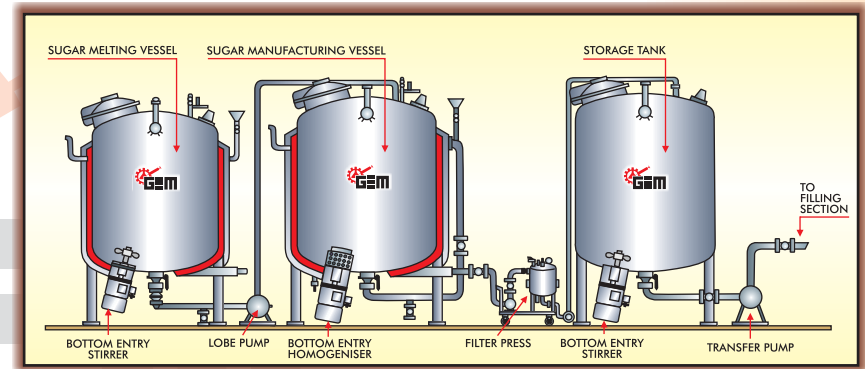
OINTMENT/ CREAM MFG. PLANT



OPERATION SEQUENCE FOR OINTMENT/CREAM MFG.

- Ensuring body internals of the works are cleaned thoroughly
- Charging of pre-determined water quantity to water phase vessel
- Supply of steam and heat the water
- Addition of additives manually and mix at preset temperature
- Charging of oil / petroleum jelly / wax to oil phase vessel
- Supply of steam and heat them
- Addition of additives manually and mix at preset temperature
- Vacuum transfer the heated oil and heated water to Ointment / Cream
- Addition of additives manually and mix at preset temperature
- Starting Homogenizer for emulsification and dispersion
- After confirmation of cream / ointment discharge the product to storage Tank using lobe pump
- Keeping the product under slow speed agitation in storage vessel
- Transferring the product to filling through metering pump

SUGAR SYRUP MFG. PLANT



OPERATION SEQUENCE FOR SUGAR SYRUP MFG.

- Ensuring body internals of the works are cleaned thoroughly
- Charging of pre-determined Sugar & water quantity to Sugar melting vessel
- Supply of steam and melting down the Sugar
- Addition of additives manually and mix at preset temperature
- Transferring the melt down Sugar to the manufacturing vessel after filtration through lobe pump
- Supply of steam & heat them in manufacturing vessel
- Addition of additives manually and mix at preset temperature
- Starting Homogeniser for emulsification and dispersion
- After confirmation of Sugar syrup discharge the product to filterpress for filtration which then transferred by lobe pump to storage vessel
- Keeping the product under agitation
- Transferring the product to the filling line through transfer pump



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