



### HEAT EXCHANGER ( Shell & Tube Type)

It is the most common type of heat exchanger in oil refineries and other large chemical processes, and is suited for higher-pressure applications. As its name implies, this type of heat exchanger consists of a shell with a bundle of tubes inside it. One fluid runs through the tubes, and another fluid flows over the tubes (through the shell) to transfer heat between the two fluids. The set of tubes is called a tube bundle, and may be composed of several types of tubes: plain, longitudinally finned, etc.

We manufacture Heat Exchangers as per ASME Sec. VII, Div. I latest and TEMA B & C. Different MOC options are available to suite process requirements.

Capacity Ranging from 1 M2 to 125 M2



### STORAGE & MIXING VESSEL

DHARMA manufacture vertical as well as horizontal storage vessel in Stainless / mild Steel construction. Our storage vessels are robust in construction and manufactured using latest production techniques. We use high quality stainless steel materials. DHARMA storage vessels are widely used in Pharmaceuticals, Cosmetics, Food & Beverages and Chemical Processing industries ranging from 50 Ltrs. to 50 000 Ltrs.



### MACHINERIES & EQUIPMENTS FOR

- Pharmaceutical Industries
- Cosmetics & personal Care industries
- Food & Beverages Industries
- Bulk Drugs and Drug intermediate Industries

**SPECIALIST IN:** Specialist In Mixers, Blenders & Dryers For Pharmaceuticals & Bulk Drugs Industries



AN ISO 9001 : 2008 Certified Co.

## DHARMA ENGINEERING

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# DHARMA ENGINEERING

WE BELIEVE IN QUALITY AND SERVICE

## INTRODUCTION

DHARMA ENGINEERING is an India based plant & machinery manufacturing company caters its services to the different industries like Pharmaceuticals, Chemicals, Bulk Drugs, Cosmetics & Food Industries. Our firm is located at Ankleshwar, an industrial zone of Gujarat, In India. Gujarat region has developed at phenomenal rate due to its geographical advantages & best infrastructure which required for business Development.

DHARMA ENGINEERING is a Pharmaceutical Machinery Manufacturing Company with wide experience Which started from small unit and now it is spread its wings to big unit and manufacturing world class machinery like Mixers, Blenders & Dryers, Heat Enchanters, Receivers, vessels etc... Within the few years that we have been known to the industries, we have successfully installed nos. of equipments with fair success and full satisfaction to our customers.

Dharma Engineering, is a group of young, dedicated, qualified & experienced peoples who are committed to their work until grand success. Since commencement of our operation, DHARMA INDUSTRIES, has introduced a wide range of machineries and has been served in to a large segment of industries having fair success and full satisfaction to the industries, we shall of course be continuing on the fast track of growth and will provide many more innovative products in the time to come. Development of our product line has been an end result of the interaction with industry people based on their requirements, experience and expectations. This is a constant process, which we carry out regularly. We take pride that our designers are based in the actual field and industry.

At DHARMA, we are driven by a single dream, a common vision for the future: we must emerge as the largest producer of processing equipments in the world, with a strong focus on services, and a leader in the field of Pharma Machinery with export operations.

## QUALITY ASSURANCE

Committed to total customer satisfaction, we conduct business with high ethical standards and fair judgements. Our strict adherence to the Quality Management System has enabled us to meet the stringent requirements laid down by international authorities. Quality control forms an integral part of our process right from procurement of raw material till final dispatch. Every batch of products are tested on different parameters to ensure durability, reliability and long life performance.

## RESEARCH & DEVELOPMENT

The research and development department has worked as an engine of growth for our company. Our R & D wing is manned by a team of research associates & specialists, who conduct rigorous market research and survey. Their extensive industry in-sight and meticulous endeavors have enabled us to offer innovative technology to meet the changing demands of the global clients.



## OINTMENT MFG. PLANT

Available from 50 Kgs. to 2500 Kgs. batch capacity.

The ointment Manufacturing Plants are ideal tools for the pharmaceutical & cosmetic industries for the production of Ointment, Cream, Lotion, Tooth Paste & other emulsions & homogenizations. It is specially designed to take care of two critical factors which directly affect the quality of the Ointment / Creams.

- (a) Minimum man handling of Ointment.
- (b) Negligible vacuum drop during mixing & blending.

Needless to say, it also provides the benefits of the effective manpower utilization.

### SALIENT FEATURES

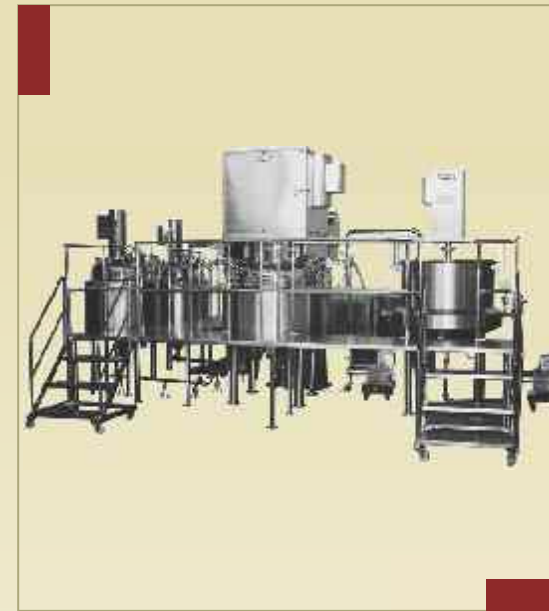
The Plant is designed to be operated only by one operator and one helper. All material transfers are done by vacuum or by transfer pumps.

All the vessels are CGMP (paint free construction)

The gaskets used are of silicon (Food Grade).

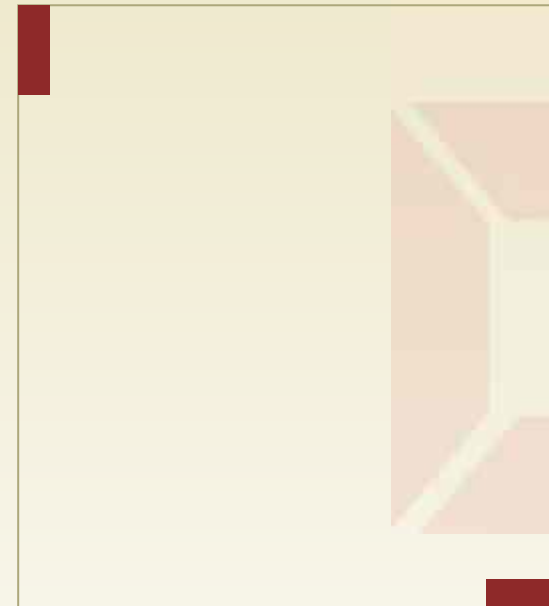
All contact parts are of SS 316 quality material & finished to class 4B (Mirror) finish and are crevice free.

The entry of all agitator are from top & high speed Emulsifier from bottom or in-line Emulsifier (as per customer choice)



## LIQUID ORAL MANUFACTURING PLANT

1. Fully automatic untouched process for liquid oral manufacturing.
2. cGMP compliance with CIP / SIP facility.
3. Capacities available from 100 ltrs. to 20000 ltrs. batch capacity
4. Fully automatic plant consisting of Sugar syrup vessel, syrup manufacturing vessel and storage vessel with interconnecting pipe lines, transfer pumps and integrated control panel.
5. Working platform for 1000 ltrs. and above capacity plants.
6. Entire plant can be operated through integrated control panel, by 01 skilled & 01 semi skilled operator.
7. Sugar charging by means of vacuum transfer or mechanical charging can be provided optionally.
8. All vessels are equipped with bottom entry agitator, which leads to less maintenance, lower energy consumption and better mixing of products.



## MATERIAL HANDLING DEVICES

( IPC LIFTER, FBD BOWL LIFTING TILTING DEVICE & IPC BINS)

Dharma Material handling Equipments are useful for

- Faster material movement with dust free operation
- IPC Lifter and FBD Bowl lifter tippler are available in mobile as well as fixed design
- Different capacity BINS to suit customers' requirement.
- Options to suit different lift height with safe working load.
- SS 316 product contact parts







### PLANETARY MIXER

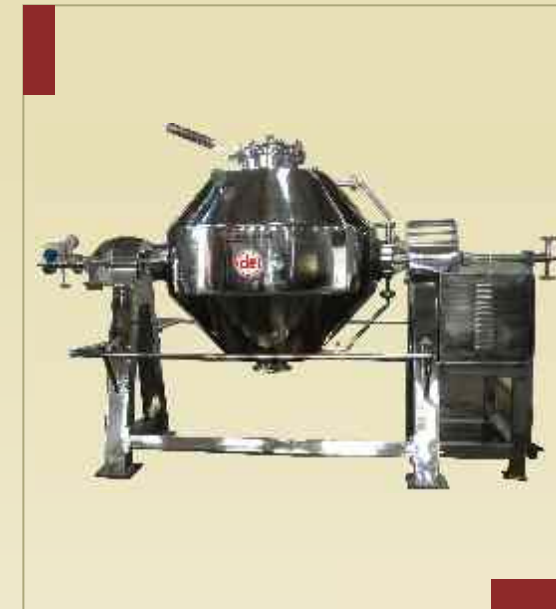
Planetary Mixer is a Multi Purpose Mixer extensively used IN Pharmaceuticals, Food and Cosmetics industries, for wet / dough mixing, cream / Ointment manufacturing. It is available in Pain as well as steam / electrically jacketed container with option for mixing under vacuum.

Models available from 25 Kgs. batch capacity to 500 Kgs. batch capacity.

Planetary Motion of beater ensures efficient mixing with shorter batch time. Mobile product container facilitates ease in cleaning during product change over.

Models up to 100 Ltrs. are available with container lifting mechanism where as higher capacity models are available in top plate lifting mechanism.

Different shape product container with different design of mixing blades to suit process requirement.



### ROTOCONE VACUUM DRYER

The drying in a Rotocone Vacuum Dryer is a batch operation under vacuum. It is possible to dry heat sensitive materials at well below boiling points of water and solvents. Drying time depends on material being dried, amount of solvent or water to be removed, desired final moisture content, permissible jacket temperature etc.

DHARMA Rotocone vacuum Dryer is available in sizes ranging from 100 Ltrs. to 10000 Ltrs. Gross volume. Batch capacity of wet material loaded into the dryer is usually restricted to 45 to 50% of gross volume.

#### SALIENT FEATURES/MOC (GMP MODEL)

- cGMP construction with option for flame proof electrical.
- Reduces drying time and eliminates need of re drying of lumps.
- Shaft sealing by mechanical seal, offers optimum and continuous vacuum during process.
- Provision for nitrogen purging.
- Quick openable discharge valve permits direct packing of dr products into bags or drums.
- Exposure of final product can be avoided.
- Easy to clean internal surfaces thus ensuring purity of product.
- cGMP construction with safety railing to avoid personnel injury.



### CONTRA ROTARY MIXER

Contra Rotary Mixer is an ideal mixer for mixing high viscous and high density products like tooth paste, grease and other similar products. It consists of two different blades rotating in opposite to each other i.e. clock wise and anti clock wise. Homogeneous mixing is achieved due to contra rotary movement of blades. No air contamination because of mixing under vacuum and no product contamination due to sanitary design. Minimum residual product loss because of anchor scraper design & suitable sized bottom outlet.

Capacities available from 100 Ltrs. to 5000 Ltrs. capacity.



### FLUID BED DRYER

FLUID BED DRYER is designed to introduce hot air stream at the base of the product container which is filled with the material to be dried. Induced draught is created by means of high velocity blower, which creates turbulence inside the materials. The phenomenon is called as "FLUIDIZATION" Since each particles gets surrounded by hot air, heat transfer is extremely high and uniform. The product is dried fast without appreciable loss of heat. Fresh air is heated by means of electrical heaters, steam or thermic fluid heaters.

#### SPECIAL FEATURES :

- Uniformity in drying and reduction in drying time.
- Digital temperature indicator cum controller for inlet air & Digital temperature indicator for outlet air, to monitor the temperature of inlet and outlet air.
- Capacities available from 10 kgs. to 500 kgs. batch capacity
- cGMP construction with option for 3 stage filtration.
- PLC based control system with various options can be provided, upon request.
- Options available to install blower & heating system in services area.



### REACTOR VESSELS

DHARMA manufacture SS / MS reactor vessel s, ranging from 100 Ltrs. to 25 KL capacity. Reactor vessels are mainly used in Chemical and Bulk Drug industries.

DHARMA Reactor vessels are

- High operational Efficient
- Superior functionality
- Durability and
- Strong in construction to suit process conditions of pressure and temperature.

We offer reactor vessels with jacket and / or limpet coil for heating & cooling application. We also manufacture cGMP reactor for Pharmaceutical industries.



### HOT AIR TRAY DRYER

HOT AIR TRAY DRYER is ideal and conventional machine suitable for pharmaceutical, food, chemical, paint and textile industries. It works on the principal of recirculation of hot air inside the drying chamber. Approx. 25 to 30 % of recirculated air exhausted. Thus removing moisture from the product to dry.

#### SALIENT FEATURES

- Model available from 6 trays to 192 trays.
- Available in Standard mild steel construction as well as cGMP SS construction.
- Available with electrical, steam or thermic fluid heating facility.
- SPLIT model with separate AHU with 3 stage filtration can be provided upon request.
- Offers uniform temperature inside the drying chamber with minimum temperature difference between hot and cold zone temperature.
- PLC based control panel with printing facility can be provided.
- Leak proof door sealing for efficient drying of products.



### VACUUM TRAY DRYER

Vacuum Tray Dryer (VTD) is suitable for drying of thermal sensitive materials easily resolved, polymerized or deteriorated under higher temperature. Hollow shelves are connected to a common header at inlet and outlet. Headers are designed in such a way that the flow of a heating media is equally distributed into the each of the shelves. Zig-Zag movement of heating media ensuring faster heat transfer to the shelves surfaces, which is transferred to the product through conduction.

#### SALIENT FEATURES

- Models available from lab scale to commercial production. i.e. 3 trays to 96 trays.
- cGMP construction with all rounded corners.
- Shelves are hydro tested at 4Kgs/cm<sup>2</sup> with straightness  $\leq(\pm)1$  mm
- Condenser and receiver for efficient solvent recovery.
- Validation port and nitrogen purging facility.
- Digital temperature indicator for HOT WATER and Vacuum line.
- Leak proof door sealing for efficient drying of products.



### BIN BLENDER (CAGE BLENDER)

CAPACITIES : AVAILABLE IN 25KGS TO 300 KGS.

#### SALIENT FEATURES

- Smart stop positioning for easy loading & unloading of the IPC.
- Safety guard with limit switch to prevent the accidental operations of the blender.
- Easy to clean and maintain.
- Excellent mixing of dry powders and granules.
- Single unit, suitable for different capacity BINs.
- cGMP construction with option for variable frequency drive.
- Reduces loading and unloading time.

### DOUBLE CONE BLENDER

CAPACITIES : AVAILABLE IN 5KGS TO 2500 KGS.

#### SALIENT FEATURES

- Easy to clean and maintain
- Excellent mixing of dry powders and granules.
- Cantilever design for blenders up 100 ltrs. capacity
- cGMP construction with option for variable frequency drive.
- R&D Model with detachable container of different capacities.
- Safety guard with limit switch to prevent the accidental operations of the blender.
- Flame proof construction provided on demand.
- Higher capacity model provided with powder charging system.



### OCTAGONAL BLENDER

CAPACITIES : AVAILABLE IN 25KGS TO 4000 KGS.

#### SALIENT FEATURES

- Ideal for dry granules and crystalline materials.
- Cylindrical container with mechanical jacking trolley provided for easy charging and discharging.
- Safety guard with limit switch to prevent the accidental operations of the blender.
- Easy to clean and maintain.
- Excellent mixing of dry powders and granules.
- cGMP construction with option for variable frequency drive.



### RIBBON BLENDER

CAPACITIES : AVAILABLE IN 50KGS TO 5000 KGS. BATCH CAPACITY

#### SALIENT FEATURES

- Efficient & versatile Blending Machine for Blending dry powders and granules.
- cGMP construction with option for variable frequency drive.
- Easy to clean and maintain.
- Different blade design with single / double helical Ribbons, to suit process requirements.
- User friendly operating panel with optional for material charging and discharging.
- Compact and sturdy design with minimum wall clearance. NMT 5 mm
- Flame Proof / Tailor made construction can be provided upon demand.



### RAPID GRANULATOR MIXER

CAPACITIES: AVAILABLE IN 1 KGS TO 400 KGS. BATCH CAPACITY

Integration of dry blending and wet granulation processes in to one-step mixing and granulation.

We offer a range of Rapid Mixer Granulator that is a multipurpose machine used for mixing as well as granulation of ingredients.

It is equipped with a dual speed impeller and a chopper which is fitted close to the base of the mixing bowl. Both chopper as well as the impeller helps in smoothly distributing the granulating solution as it is added and for fluidizing the charge and creating the vortex of the material being mixed by both vertical and horizontal components.