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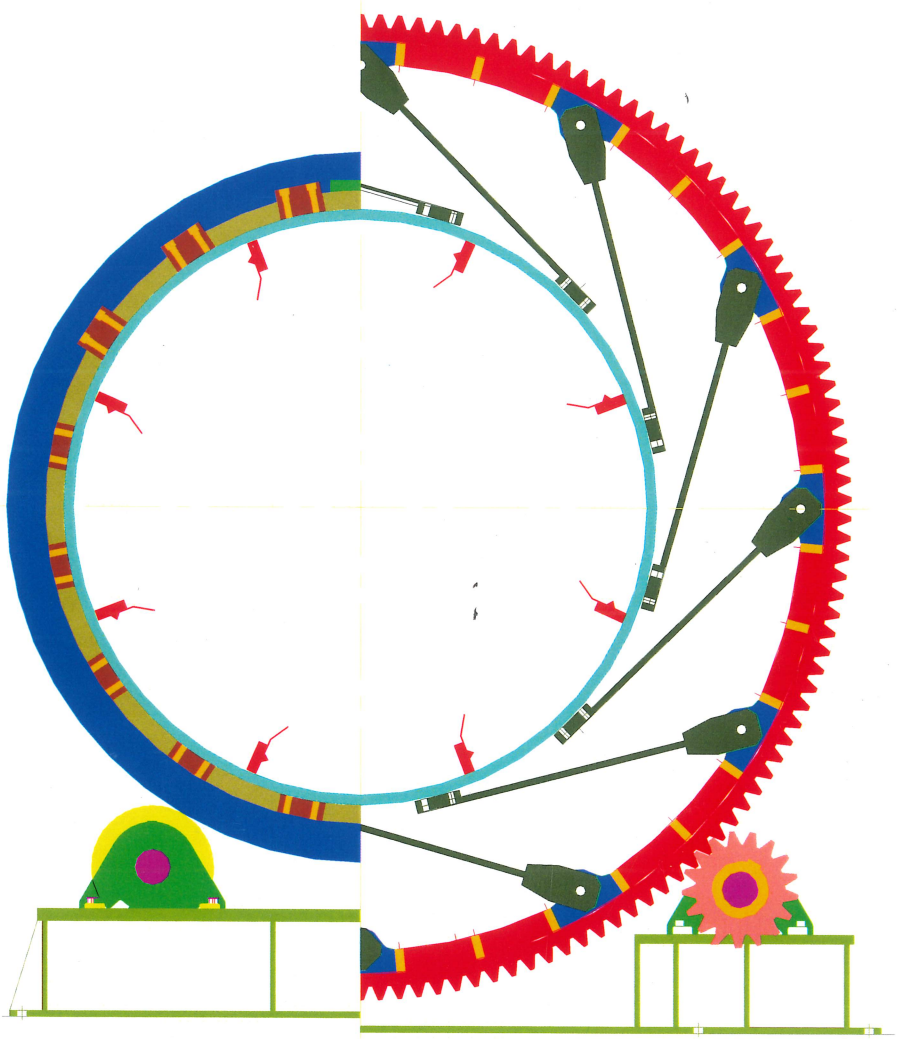
# Rotary Drum Dryer / Cooler / Kiln



SINCE 1985

CHEMFILT

# Solution for Process Drying, Roasting, Heat Treatment and also Cooling.

**Rotary Drum Dryer /Cooler**
CHEMFILT's Rotary Drum Dryer offers a simple solution for continuous drying, cooing, roasting and heat treatment of particulate/bulk solids.

CHEMFILT's Rotary Drum Dryers are capable of handling large tonnage throughputs and are built to withstand rough, rigorous, continuous 24 x 365 hours of operation with minimal down time. Our engineering expertise in producing rugged, high quality, co-current and counter current units is in use by industries around the world.

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*Drying, roasting, heat treatment and cooing is achieved by passing the material being processed through a rotating horizontally inclined cylindrical drum. The stream of hot gas / air for drying and cold air for cooling, also, passes through the drum. As the drum rotates, the internals, Pusher Flights and "Lifters", fitted into the drum tumble, slide, lift and shower and cascades the material into the air stream. In co-current dryers, the hot gas / air stream flows in the same direction as that of the product being dried, and in counter current models the drying gas / air stream travels against the flow of the product being dried. In these dryers the product is directly exposed to i.e. in contact of the stream hot gas / air produced by the heat source.*

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## Constructional Features:

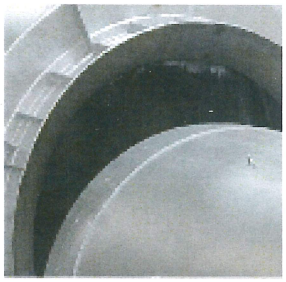
**"Exacting to the Standards -To Exceed Customer Expectations".**

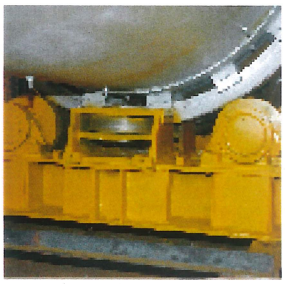
**•The Rotary dryer/Cooler consists of following main components:**

- Hot Gas / Air System
- Feed System
- Main Dryer
- Discharge System
- Exhaust Gas Cleaning System
- Exhauster
- Electrical and Control Panel

**Hot Gas / Air System:**
Depending upon the application i.e. the duty, material to be processed and configuration i.e. Co-current or Counter current the choice of Hot Gas or Air is made. The choice of fuel could also be accepted depending upon availability and application.

**Feed System:**
The feed to the dryer is through a feed chute. The sealing is provided by a rotary Air Lock valve or Screw type Feeder. The feeder is driven by an electrical drive and is regulated by a panel mounted variable frequency drive (VFD). The regulation / control is automated by sensing the temperature of hot gas / air leaving the dryer by Temperature Indicator (TI), PT100, and feed back to VFD through a PID controller. Thus ensuring feed to the dryer matching heat input and proper thermal efficiency.





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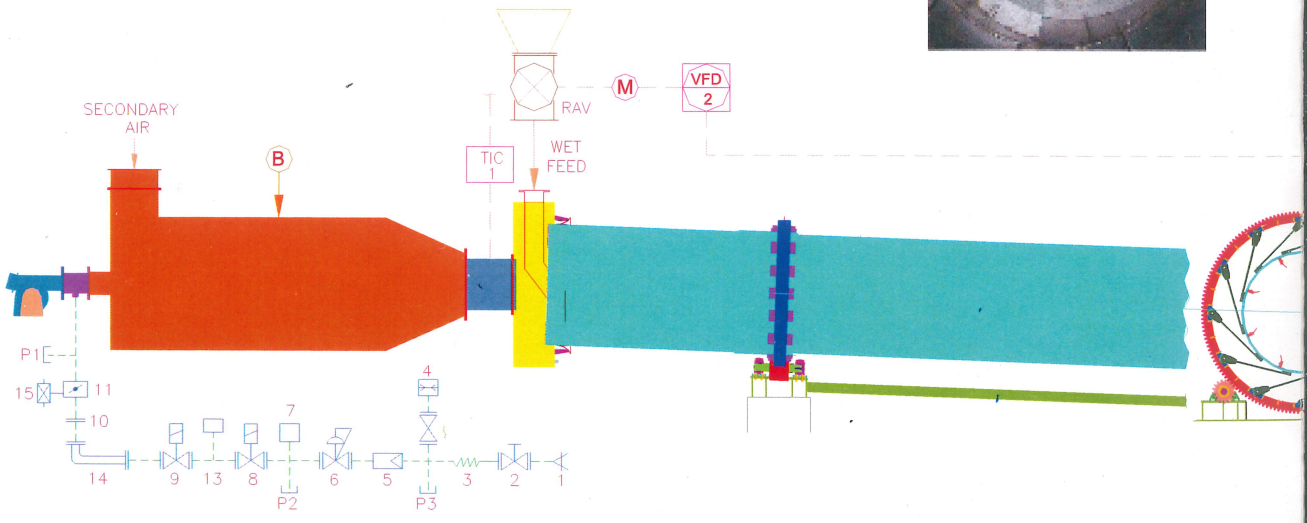
|---|---|---|---|---|---|---|---|
| A | BURNER | 1 | GAS INPUT PIPEWORK | 8 | VS SAFETY SOLENOID (VERTICAL) | 15 | MAXIMUM GAS PRESSURE SWITCH |
| B | COMBUSTION CHAMBER | 2 | MANUAL VALVE | 9 | VR REGULATION SOLENOID (VERTICAL) | P1 | COMBUSTION HEAD PRESSURE |
| C | ROTARY DRYER | 3 | ANTI-VIBRATION JOINT | 10 | GASKET AND FLANGE SUPPLIED WITH THE BURNER | P2 | PRESSURE DOWN STREAM FROM REGULATOR |
| D | ROTARY AIR LOCK VALVE | 4 | PRESSURE GAUGE WITH PUSH BUTTON COCK | 11 | GAS ADJUSTMENT BUTTERFLY VALVE | P3 | PRESSURE DOWN STREAM FROM THE REGULATOR |
| E | DUST COLLECTOR | 5 | FILTER | 12 | BURNER | TIC | TEMP. INDICATOR CONTROLLER |
| F | ROTARY AIR LOCK VALVE | 6 | PRESSURE REGULATOR (VERTICAL) | 13 | SEAL CONTROL MECHANISM FOR VALVE 8-9 | VFD | VARIABLE FREQUENCY DRIVE |
| G | EXHAUSTER | 7 | MINIMUM GAS PRESSURE SWITCH | 14 | GAS TRAIN-BURNER ADAPTER | ΔP | DIFF. PRESSURE (DROP) |



## Main dryer

***Shell:*** The dryer Shell / Drum is fabricated in Carbon Steel, Stainless Steel, Alloy Steel plates, depending upon the application. The shell is provided with external reinforcing bands/chairs for mounting of the tyres and ring gear / sprocket and suitable insulation retainers.

***Tyres:*** Generously/sufficiently sized for the duty and life, Seamless, Free Floating, fully machined tyres in material of construction of carbon Steel Casting, in adequate numbers (normally two), are provided to support the drum / shell.

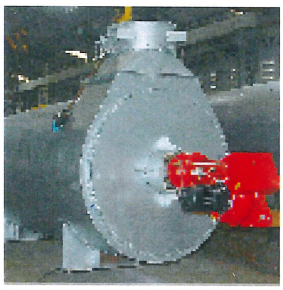
***Support Rollers:*** Support Rollers of Matching duty and size, in material of construction of carbon Steel Casting, fully machined, mounted on heavy duty shaft, supported in taper roller bearing and dust tight bearing housing with grease lubricating arrangement, are provided to support level and align the drum / shell on the tyres.

***Guide/Thrust Rollers:*** Guide/Thrust Rollers are provided at drive end tyre support to curb the longitudinal expansion at drive end and divert the same at free tyre end. Breaching Seals Breaching Seals for Feed End and Discharge End Hoods are designed for providing adequate sealing and dust tightness between rotary drum and stationery parts of dryer. The spring steel leaves and wearing liner on the drum

## Internals

***Screw Flights:*** The initial section of the dryer is provided with helical / screw type pusher flights to ensure feed material pushed into cascading section is regulated and well distributed.

***Lifters:*** Lifting flights are carefully designed to accommodate and cascade the material being dried and ensure the product is uniformly exposed. This action / agitation ultimately leads to higher efficiencies and reduced processing times compared to stationary units.



## Drive:

***Motor:*** A totally Enclosed, Fan cooled Induction motor, of adequate HP rating and number of poles (RPM), 440 V, 50/60 Hz of reputed make is provided. Optional feature like Variable Frequency Drive (VFD) to control final RPM of Drum is available on request.

***Gear Box:*** Depending upon the size of dryer and its power requirement, Worm or helical gear box of reputed make is provided, which is generously sized with adequate safety factor as per OEM's recommendations.

***Coupling:*** Rigid Gear type coupling of reputed make with adequate safety factor as per OEM's recommendations is provided

***Pinion and Pinion Assembly:*** Spur pinion, generously sized with adequate safety factor and wear life i.e. Module, Face Width, and MOC (normally EN 19C), with machine cut teeth is provided, duly mounted in two out board reputed make of bearings sized for long uninterrupted duty conditions, housed in grease lubricated in-house fabricated bearing housings. The pinion shaft assembly is coupled to gearbox output shat through the rigid gear type coupling and is mounted on a common, sturdy, fabricated and machined base frame along with the motor and gearbox or Geared Motor.

***Ring Gear, its mounting and supports:*** Ring Gear generously sized with adequate safety factor and wear life i.e. Module, Face Width, and MOC, normally Steel Casting confirming to IS2707, with machine cut teeth is provided. The Ring Gear is mounted on to the shell using locating pins and Spring Plates, to take care of thermal and mechanical misalignment. The spring plates are locked by a shear pin on chairs mounted on the shell and bolted by cap plate

## Discharge System:

The dried product is discharged through the rotary Air Lock Valve Type Discharger, mounted below the discharge end hood.

## Exhaust Gas Cleaning System:

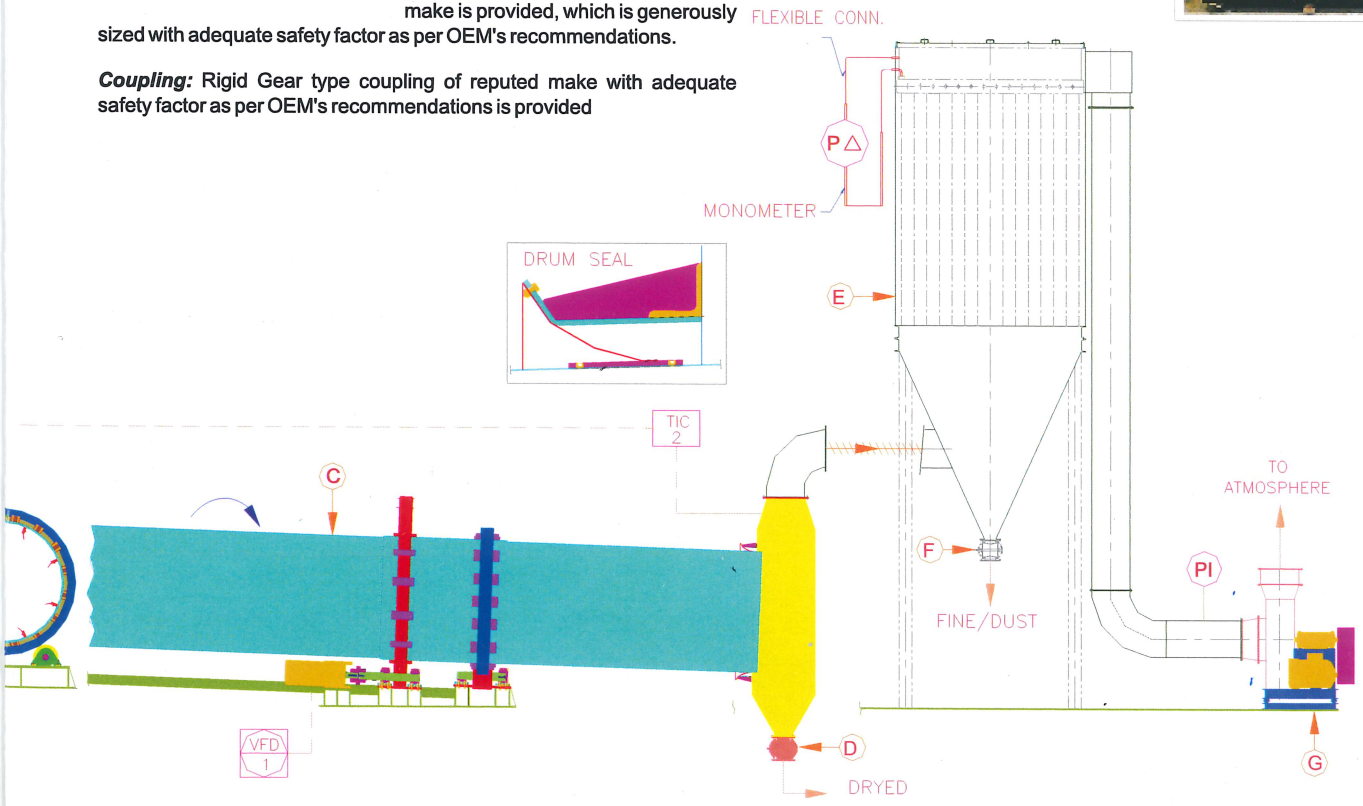
The exhaust gas from dryer are vented through an adequately sized bag filter for avoiding pollution problem and loss of product.

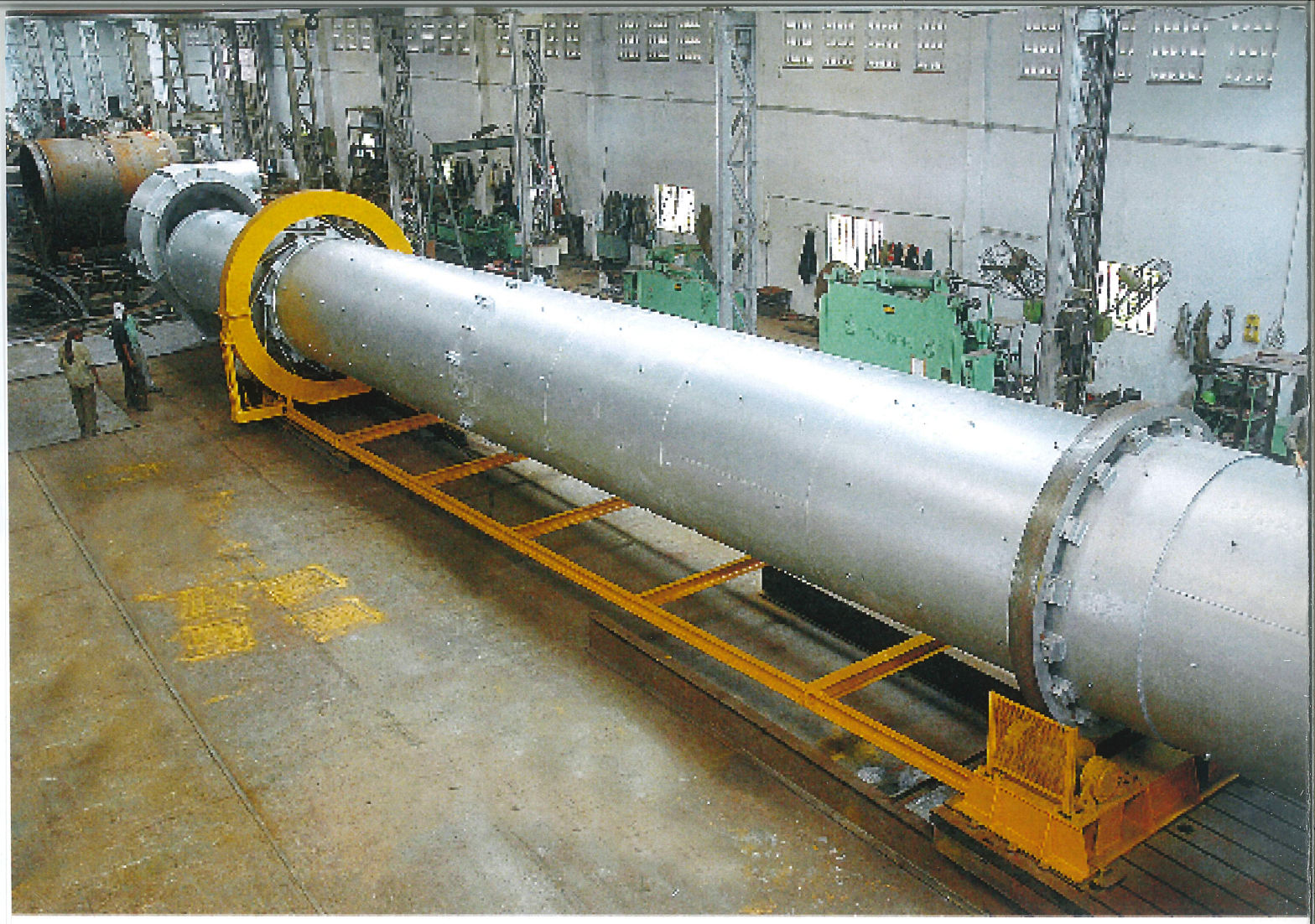
## Exhauster:

A centrifugal Induced draft fan of required rating, flow capacity and head, is provided with discharge end Valve, Duct Silencer and Electrical Motor Drive. A Variable Frequency Drive (VFD) to control the fan with energy efficiency is provided optionally on request.

## Electrical and Control Panel:

A pre-wired, electrically interlocked, panel fabricated out of Sheet metal and powder coated, houses starters for all drives, VFD for main drier motor and Exhauster motor, Sequential Controller (timer) for bag filter with all necessary indications





**Applications:**

- Agricultural Grains & By-Products
- Animal Feeds
- Animal Waste
- Reclaimed Dust
- Biosolids
- Municipal Sludge
- Municipal Waste
- Paper Sludge
- Steel Mill Waste Sludge
- Fertilizers
- Potash
- Urea Perils & Crystals
- Ceramics
- Clay
- Sand
- Gypsum
- Limestone
- Aggregates
- Organic & Inorganic Chemicals
- Salts
- Sugar
- Iron Ore Concentrates
- Mining Ores & Concentrates
- Metal Chips & Shavings
- Plastic Pellets

SINCE 1985

CHEMFILT

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