Drying Technologies Reinvented

TECHNODRY

SYSTEM ENGINEERING PVT. LTD.

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Technodry System Engineering Pvt. Ltd. is a company engaged in serving the process industry to cater to all the requirements related to drying and evaporation. The company is managed by highly experienced industry professionals having rich experience in the field since 1995. Mr. Mohan Chaudhari, the promoter of the company has a vast experience of designing and executing over 300 small and large industrial drying and evaporation installations worldwide.We are based in the engineering hub of India, Pune. We believe in providing value to the money invested by the customer. Every requirement is unique and needs to be handled with complete understanding after detailed analysis.

We cater to the various industries like food, chemicals, biochemical, mining, detergent, dairy, pharmaceuticals and ceramics. Bring to us any requirement related to drying and evaporation and we shall provide you with technically superior and economically best solution. Technology keeps updating in every field and we ensure that we keep abreast of the latest trends so that we are able to provide our customers the products with current technology.

Our Mission

To be amongst the leading companies, providing technologically superior products, in the field of dehydration and evaporation, while maintaining our responsibility towards environment and society.

Our Strategy

To keep updating ourselves with the latest technologies in our field of operation and endeavour to provide the best to our customers always.Focussing on the core competencies and core technologies.

Our Capabilities

Technodry has complete in-house manufacturing set-up spread over 800 sq. mtr. The facilities include EOT crane, TIG welding machines, Plasma cutting machine, Plate bending machine, Radial drilling machine, Polishing machines, Grinders etc. The manufacturing area has epoxy coated flooring and the handling of the raw material is done by using rubber mats to avoid damage and scratch marks.

Some of our esteemed clients

We are serving many global brands from various industrial sectors such as below

- Dyes and Chemical Industries
- Ceramic industries
- Mining industries
- Biochemical industries
- Pharmaceutical industries
- Food Industries
- Agro based industries
- Nutraceutical Industries

Technodry Product Range

DRYERS

Spray dryers and coolers
Flash dryers and coolers
Agitated / Cage Mill flash dryers
Rotary dryers and coolers
Continuous fluid bed dryers and coolers
Paddle dryers
Agitated thin film dryers

EVAPORATORS

Falling film evaporators
Forced circulation evaporators
Agitated thin film evaporators

ALLIED EQUIPMENT & SYSTEMS

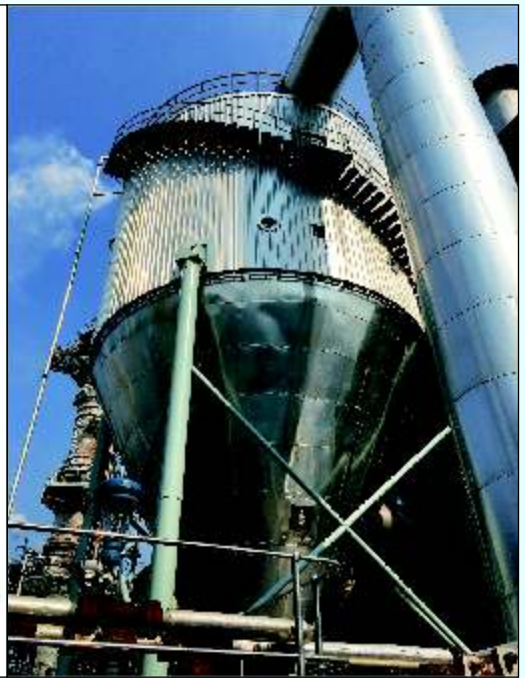
Hot Air Generators
Air Pollution Control Systems

Salient features of Technodry Spray Dryers

- Manufacturing quality as per current industry standards.
- Operator friendly and safe system.
- Lowest operation and maintenance costs.
- Minimum lead time to set up.
- Complete automation using PLC/ DCS based system as per customer demand.
- Certifications like CE/ATEX/GOST-R as per customer requirement provided.
- High thermal efficiency leading to low fuel cost.
- Low footprint with layouts as per factory requirements.
- Robust construction.
- GMP standards for food and pharmaceutical industries.

Spray Dryers

Conversion of liquids containing dissolved or suspended solids into powder form of required specifications, by evaporation of liquids, takes place in a spray dryer. Spray drying is a highly efficient drying method with possibility to have close control over the particle size, bulk density



and moisture content of the dried powder. The spray drying process consists of atomisation of the liquid feed into fine droplets with the help of spray nozzle/s or rotating disc. These fine droplets are brought in contact with hot air in a suitably designed drying chamber. The liquid gets vaporised and the solid particles in dry form are collected at the bottom of the chamber. The fine particles which are carried by the air are separated either in cyclone separator or bag filter or wet scrubber.

Types of Spray Dryers

Spray dryers are broadly classified into two types based on the method of atomisation. These are;

- **Nozzle Spray Dryers**
- **Rotary Atomiser Spray Dryers**

Sub types of Spray Dryers

There are various arrangements of the spray dryers depending upon the pattern of air flow, type of pollution control equipment used, type of air heating method used. Following are the sub types of spray dryers depending upon the air flow pattern.

- **Co-current Spray Dryer**
- **Counter-current Spray Dryer**
- **Mixed flow Spray Dryer**

Special Types of Spray Dryers

- **Fluidised Spray Dryer**
- **Closed Loop Spray Dryer**

Spray Coolers

Spray coolers are used for obtaining powders from molten products like oils, fats, glycerine etc. In the process of spray cooling the products in molten form are sprayed through nozzle or rotating disc atomiser in a cooling chamber. This sprayed material is brought in contact with either ambient air or cooled air depending upon the melting point of the product. As the cooling takes place the cooled product in powder form is discharged from the bottom of the cooling chamber. Particle sizes up to 500 microns are possible by spray cooling.

Flash Dryers

Flash dryers are also known as pneumatic dryers. Flash dryers are used for drying free flowing powders or cakes containing moisture. Flash dryers are suitable for heat sensitive products. Even the heat sensitive products can be dried at high inlet air temperatures due to very low residence time of the product in the flash duct.

Flash Coolers

Flash coolers are also known as conveying coolers. The principle of operation of flash coolers is similar to flash dryers except that the product comes in contact with ambient or cool air instead of hot air. Flash coolers are mostly used as ancillary systems to drying systems to cool the product while conveying it for storage.

Agitated Flash Dryers

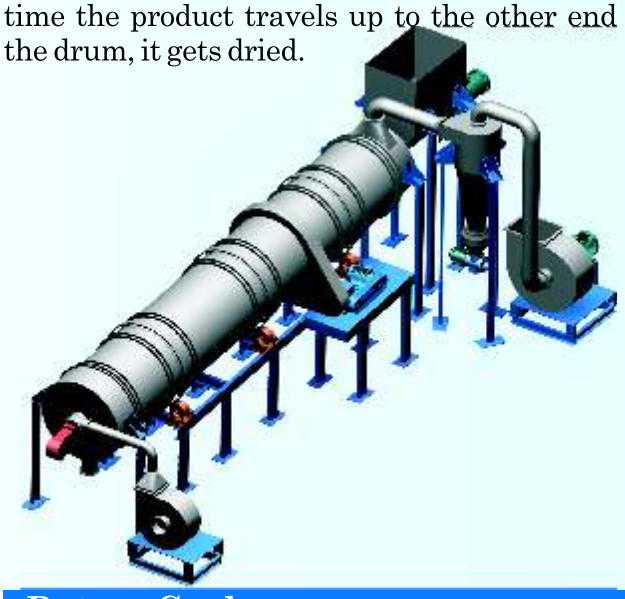
Agitated flash dryers are used for drying of wet powders, cakes or even pastes and convert into fine powder. The difference between flash dryer and agitated flash dryer is that in an agitated flash dryer there is a pulverising effect that gives the final dried product as fine powder having particle size smaller than the feed.

Cage Mill Flash Dryers

Cage mill flash dryers operate on the same basis as that of the agitated flash dryers. The difference is that the cage mill flash dryers consist of vertical pin mill type agitators in which the wet product is fed.

Rotary Dryers

Rotary dryers are used for drying wet powders or wet cakes which require long time to dry. Rotary dryer consists of a hollow drum fitted with staggered louvres internally. The wet product is fed at one end of the rotating drum. The hot air comes in contact with the product and by the time the product travels up to the other end of the drum, it gets dried.



Rotary Coolers

Rotary coolers operate on the same principle as rotary dryers except that these handle either ambient or cold airs in order to cool the products.

FLASH DRYERS & COOLERS

Continuous Fluid Bed Dryers

Continuous fluid bed dryers are used for drying of free flowing wet products which require longer drying time. Continuous fluid bed dryer consists of horizontal chambers partitioned by a custom built perforated sheets. The product to be dried is fed on top of this perforated sheet and the hot air enters from the bottom of the perforated sheet. The hot air causes the fluidisation of the product causing mild agitation. During this time the product gets dried. To assist fluidisation or movement of difficult to handle products the fluid bed chambers are mounted on springs and fitted with vibratory motors and these are called vibratory fluid bed dryers. The ancillaries like air heating system, fans, cyclone separators, bag filters and scrubbers are the same as are used in other type of dryers.

Continuous Fluid Bed Coolers

Continuous fluid bed coolers have the same principle of operation as that of the dryers except that these are used for cooling of products and are mostly used as additions to systems like dryers or any other process where the product comes out hot and needs to be cooled before packing or further processing.

Paddle Dryers

Paddle dryers are conduction dryers used for drying of sludge, paste or wet powder. Paddle dryer consists of horizontal container with single or double shafts mounted with hollow paddles. The paddles are specially designed to make them self-cleaning. The container is provided with jacket. Steam or hot oil is passed through the container jacket as well as the paddles so that all the internal surfaces are heated up. The wet product is fed to the dryer at one end and travels to the other end while it comes in contact with hot surface of paddles and container and gets dried. The dry product is discharged at the bottom from the paddle dryer. For heat sensitive products or for products having solvent in them the paddle dryer is operated under vacuum.

Agitated Thin Film Dryers

Agitated thin film dryers are used to dry liquid solutions or slurries into flakes or powder. Agitated thin film dryer consists of a jacketed vertical shell having an agitator shaft mounted with multiple blades on it. The clearance between the shell and blades are very low. Either steam or hot oil is passed through the jacket of the shell thereby heating the internal surface of the shell to required temperature. The liquid feed is introduced at the top and spread across the shell internal by the rotating distributor. The agitator blades while rotating spread the liquid on the heated shell surface causing the evaporation of the solvent or water and the dry product is discharged at the bottom. If the feed contains solvent the dryer is operated under vacuum and the vaporised solvent is passed through a condenser to recover the solvent.

Evaporators are used to increase the solid content in the liquids containing low solids, by evaporating water or solvent from the liquid so that it can be further processed or can be transported as final product economically. Evaporators basically consist of shell and tube heat exchanger columns called as calandrias. The product to be concentrated is passed through the tubes and the heating media, usually steam, is passed through the shell. The calandria tube side is under vacuum causing the liquid boiling at lower temperature, thus making the operation economical and safe for heat sensitive products. Generally, evaporators consist of multiple calandrias and the steam is introduced only in first calandria. The following calandria uses the liquid vapours from the first calandria as the heat source for evaporation and so on. These are called as multiple effect evaporators (MEE). Following are the types of evaporators depending upon the feed circulation configuration.

- **Falling Film Evaporators**
- **Forced Circulation Evaporators**
- **Agitated Thin Film Evaporators**
- **Wiped Film Evaporators**

ALLIED EQUIPMENT AND SYSTEMS

Hot Air Generators (HAG)

Direct fired

Direct fired hot air generators are used to heat the air for processes which can allow mixing of products of combustion with the products which come in contact with hot air.

Indirect fired

Indirect fired hot air generators are used to heat the air for processes where clean air is a necessity and the temperature of air is below 350oC.

Air Pollution Control Systems

Wet Scrubber

Wet scrubber is used for air pollution control. The principle of wet scrubbers is that the dust laden air or gas is brought in contact with fine droplets of scrubbing liquid which is usually water, in a high turbulent zone which is created in a ventury. Due to high velocity and high turbulence the fine dust in the air or gas gets mixed with the scrubber liquid and the air or gas becomes dust free.

Bag Filter

Bag filter is used as an efficient air pollution control system. Bag filter consists of a housing with multiple filter bags or cartridges mounted in it. The filter bags or cartridges are made of material suitable for operating temperatures and products being handled. The dust laden air or gas passes through the filter media and gets filtered. The mechanism to dislodge the dust adhering to the filters is either reverse pulse jet using compressed air/nitrogen or mechanical shaking using pneumatic cylinders. Fine particles having size as low as 0.1 microns can be filtered thus making it possible to achieve emission levels as low as below 10ppm.

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