

Flash Dryers and Coolers

Dryers

The pneumatic or 'flash' dryer is used with products that dry rapidly owing to the easy removal of free moisture or where any required diffusion to the surface occurs readily. Drying takes place in a matter of seconds. Wet material is mixed with a stream of heated air (or other gas) which conveys it through a drying duct where high heat and mass transfer rates rapidly dry the product.

Many of the largest dryers in the world are flash dryers - some exceeding 20 tonnes of water evaporation per hour in a single system. Inlet air temperatures range from 100°C to 650°C while airflow can exceed 200,000 m³/hr.

Elevated drying temperatures can be used with many products since flashing-off of surface moisture instantly cools the drying gas without appreciably increasing the product temperature.



Two flash dryers rated for 15 t/h evaporation

Applications include the drying of filter cakes, crystals, granules, pastes, sludges and slurries; in fact almost any material where a powdered product is required. Proper feed conditioning is the key to drying materials with high initial moisture contents, and these systems include:

- Single and twin shaft paddle mixers
- Cascading screens
- Disintegrators
- Kicker mills
- Rotary slings

As the drying air also conveys the product, this system can be used to discharge at elevation. Product is separated from the drying gas in either single or multi cyclones, and/or bag filters. Sometimes cyclones are followed by scrubbers for final cleaning of the exhaust gases.

For even greater thermal efficiency and where inertisation is required we use *Exhaust Gas Recycle*, a special drying technique that can be applied to all our airstream drying systems. Inertisation is achieved by the reduction of the oxygen content in the drying gas. Here a major proportion of the exhaust gases are recycled back into the direct fired air heater. Automated control is incorporated to vary the quantity of recycle gas (via actuated dampers) depending on dryer load.

Coolers

Pneumatic coolers are a simple and reliable method of cooling and conveying dried product. In many instances ambient air will achieve the desired cooling effect. Where required, greater cooling capacity and a finer degree of control can be achieved with conditioned air at controlled humidity and temperature.

