Spray drying

Optimised drying with desiccant dehumidifiers from Seibu Giken DST

- Eliminate variable climate impact on drying rate
- Predictable product moisture content
- Reduce drying time
- Improved product wastage
- Reduce production material and energy costs
- Climatic Part load efficiency
- Condensation free and hygienic desiccant

CF-192S installed at yeast factory in Dennmark, for spray drying of yeast extract.

Spray drying integrated with desiccant dehumidification

The use of a desiccant dehumidifier allows the outside air to be conditioned to the driest condition year round ie 2g/kg, which also provides a much increased evaporation potential of the air. A benefit of a desiccant dehumidifier is it follows an adiabatic process and provides heat as a result of moisture absorption (opposed to evaporative cooking/ humidification).

Seibu Giken Technology advantage

As well as producing the most efficient desiccant rotor at low dewpoints, Seibu Giken has the ability to use waste heat alone at part load for more efficient supply of conditions. This capability is unique to Seibu Giken Desiccant rotors and allows for efficient dehumidification at conditions below 6g/kg.

In moderate climates it is effective to use the Recusorb energy purge to eliminate inefficiencies in sectors of the Desiccant wheel.

Ask us to compare this option as this can also reduce the supply air temperature to the system. These Recusorb systems can be retrofitted in existing installations.

With a climate data modelling it is possible to look at the benefits from desiccant dehumidification in your production and to calculate the energy opportunity of Seibu Giken DST Desiccant technology for you to compare with seasonal production outputs. Eg. Spray drying of milk powder is anticipated to be 17% in mild climates and greater in climates with higher humidity's. If monthly production rates are available these can by quantified against the operational expenditure of desiccants. Further increases in existing dryer capacity can also be similarly modelled.

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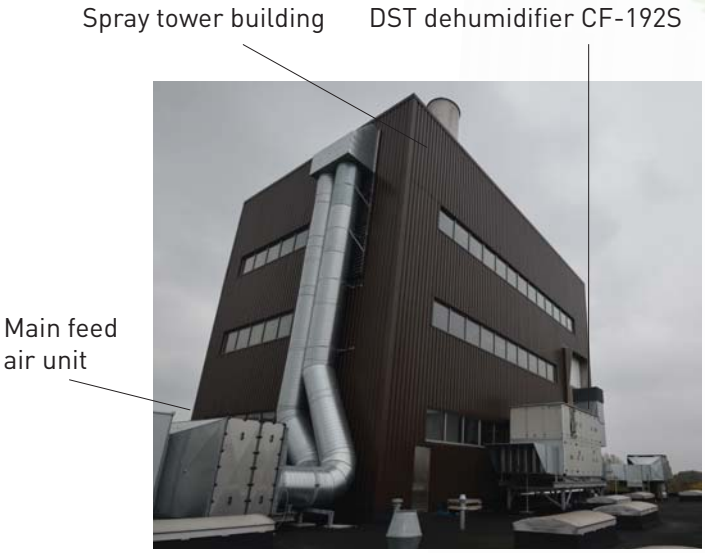
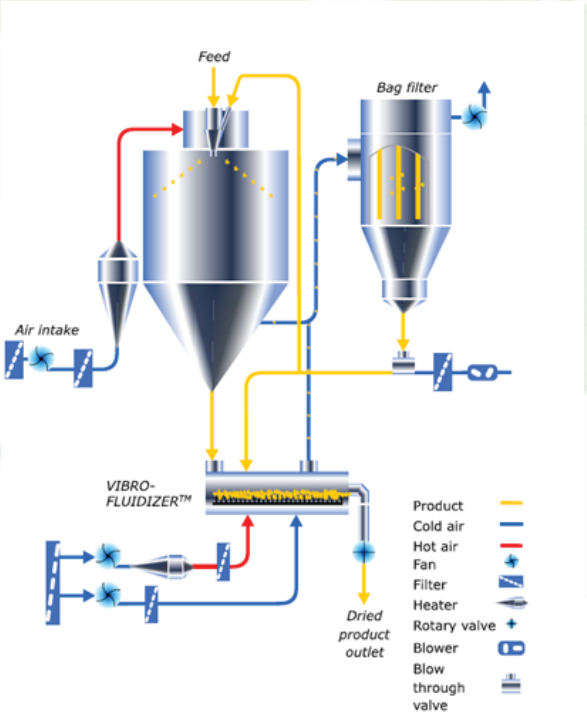
Example of installation



Schematic of the spray drier



In the above example a DST dehumidifier CF-192S was installed at the Danish yeast factory in Grenaa. They produce yeast extract in spray towers with fluidized cooling beds and had problems in production during June to September. The moisture content of the product increased during cooling in the fluidized bed. If the cooling air has higher moisture content then 4.5 g/kg the product stick together
The production also suffered from filter clogging and stop in production.
Benefits after installing the CS-92S unit from DST:
- Constant production conditions all year round
- No moisture regain during cooling of the product
- No sticking
- No filter clogging
- Right product quality
- No need to invest in a chiller
- Easy to check operation thanks to internet connection

The pay-off time for this project is less than 2 years. For details regarding the installation, contact your nearest DST representative.

Applications for spray drying:

- Milk and coffee powder spray dryers
- Refined and Milled Sugar dryers
- Pharmaceutical spray dryers
- Yeast spray dryers
- Paint spray dryers
- Confectionary pan coating

Associated applications

- Fluidised bed supply air
- Conveyor tunnel dehumidification
- Pneumatic conveyor air
- Production rooms
- Storage silos
- Refit to existing systems

Seibu Giken are a world leader in desiccant technology and with the innovation in desiccant wheel technology with the invention of the Silica Gel wheel. With Japanese quality and continuous improvement the SZC rotor was developed specially for high temperature full fresh air drying characteristic of Spray dryers.

References
Nestle, NIRO, De Danske Geerfabrik, MARS, Pfizer, Kemira Kemi

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