

## Fluidized bed technology at its best

High-performance fluidized bed dryers with integrated heating surfaces



## Optimized efficiency due to integrated heating surfaces

The fluidized bed technology is a frequently employed process for the drying and cooling of bulk materials due to optimal conditions for heat and mass transfer.

However, the drying performance cannot be further enhanced with a higher drying air temperature in case of heating agents with a fixed temperature level are available, such as saturated steam or thermal oil. Thermally sensitive products also prohibit an increase in the drying air temperature.

The key here is a continuous supply of heat energy within the fluidized bed by means of integrated tubular heat exchangers.

### Reduced energy consumption

The fluidizing gas is thus not the sole heat-transfer medium as up to 80% of the necessary thermal energy is provided indirectly via the heating coils.

The necessary hot air is reduced significantly and the thermal demand and electrical energy consumption and the exhaust air heat losses can be sharply reduced. The resulting high exhaust air moisture load optimizes the drying process.

### High performance in a minimum of space

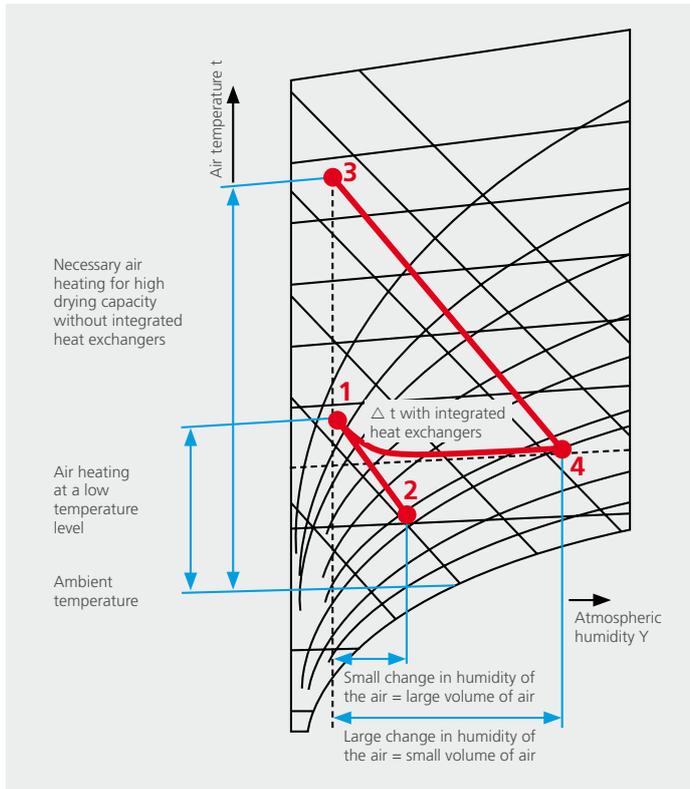
The excellent heat transfer and water evaporation rates reduce the dryer size to a minimum. Furthermore, the air inlet and exhaust air components can be built very compactly.

### High bed – high performance

In order to integrate as much heat transfer area into the bed as possible, fluidized bed heights of up to two meters are common.



# Process technology which needs far less drying air



The convective drying process is illustrated in the Mollier diagram with a low temperature level of the drying air by the change of state from 1 -> 2. The only slight change in the humidity of the air necessitates very large volumes of air to evaporate a given volume of water.

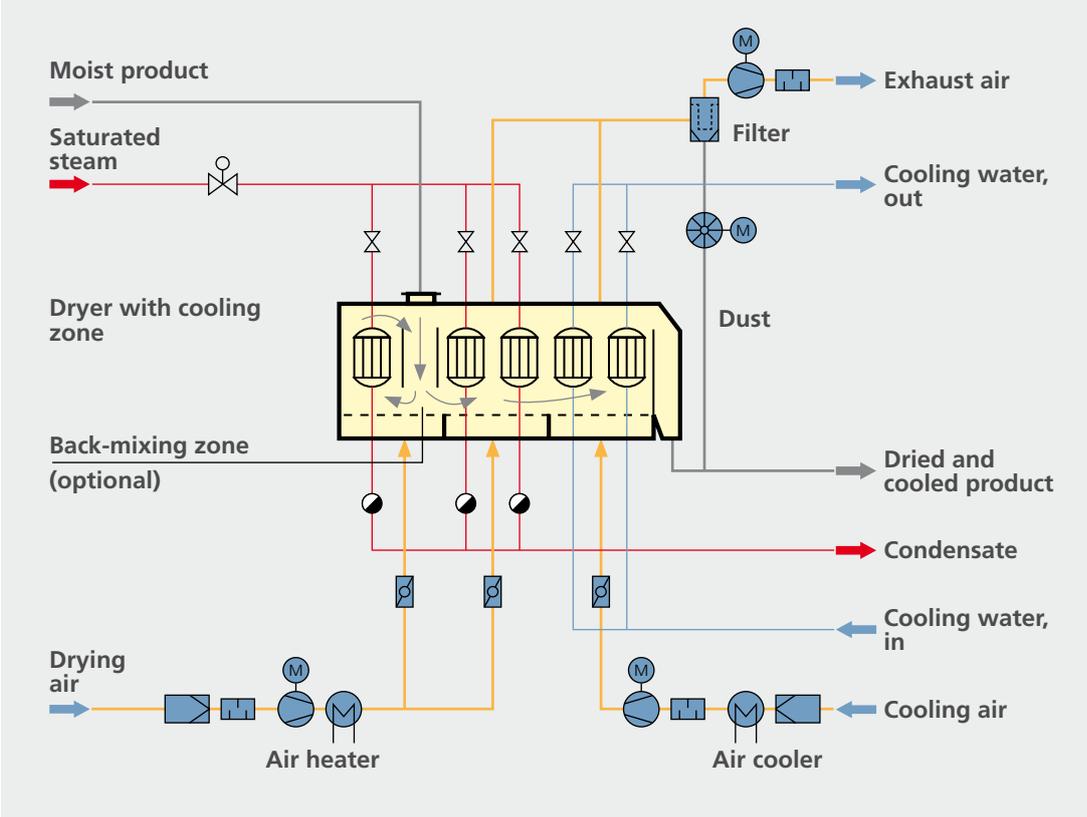
Thanks to the additional installation of heater surfaces, heat is continuously supplied to the bed so that a change of state from 1 -> 4 is possible with a far higher exhaust air enthalpy. The significantly higher water load of the exhaust air requires smaller volumes of air.

In order to achieve a change in water load from 1 to 4 by using only hot air, a significantly higher air inlet temperature level starting from point 3 would be necessary. However, this is process-related not always possible.



Tubular heat exchanger installed in fluidized bed dryer

# Drying and cooling of bulk materials in the fluid bed dryer with immersed tube bundle heat exchangers



The integration of the heating or cooling surfaces into the fluidized bed optimizes the heat input or heat discharge. Heat transfer sources are steam, hot water or thermal oil. Cooling is effected with

cold water or brine. Allgaier supplies customized solutions tailored to the demands of the particular application, including complete engineering.



# The strengths at a glance

## Wide choice of materials

Fluid bed dryer with heating surfaces are constructed in the necessary materials, depending on the corrosive, thermal or mechanical demands of the application.

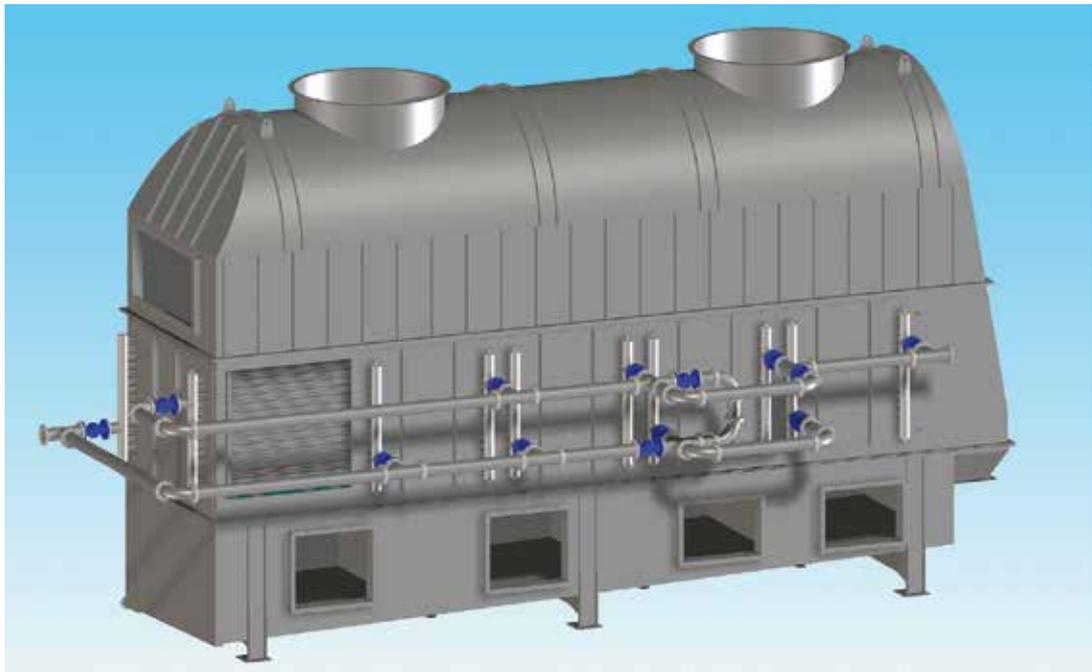
## Design features for cost-effective drying processes

- Suitable for particularly tough environments
- Drying of products even with high surface moisture content
- Coarse material discharge to prevent accumulation of lumps in the dryer
- Dust discharge via filter systems or cyclones and exhaust air scrubbers

## Variable process engineering

Take advantage of Allgair's vast process know-how for customized solutions.

- Pure drying or drying with subsequent cooling zone
- Single or multi-stage plants
- Combination of different dryer types
- Possibility of heat recovery from the exhaust air
- Heating by all commonly available fuels and heat sources
- Pressure relief and explosion protection
- Integration into process control systems



After drying, for example fertilizer granulate have to be cooled sufficiently in order to enable lump-free storage.

Where high cooling capacities are required, the necessary cooling air volume can be significantly reduced by the integration of cooling surfaces into the fluidized bed. The necessary air conditioning is minimized.



# Modern fluidized bed technology safeguards your competitiveness

**Our technology makes your products look good.**

The benefits of the Allgaier fluidized bed technology can be used in all areas for the drying or cooling of crystalline or granulated bulk materials.

## Foodstuffs industry

- Common salt
- Potato granulate
- Sugar
- Conditioning of oilseeds
- Soya

## Chemical industry

- Soda
- Sodium sulphate
- Zeoliths
- Activated charcoal cooling
- Iron sulphate
- Plastic powders
- Potassium chloride
- Borax
- Fertiliser cooling
- Ammonium sulphate
- Monoammonium phosphate

Further fields of application are environmental engineering, agriculture, minerals industry, metallurgy and the animal feeds industry.



## Visit us for a drying trial in our test center

Convince yourself of the quality of the Allgaier fluidized bed dryer with heating surfaces in our test center. This will enable you to not only test the performance of the dryer with your product, we can also assist you in the product development and sample production.

Our product and process know-how are gained from multiple applications – this means we can provide optimum solutions. We look forward to seeing you in our test center.

The laboratory fluid bed dryer with immersed tube coils can be used for both batchwise and continuous tests. During the tests, important process parameters are gained that enable a safe scale-up.



Pilot plant at Allgaier test center

# ALLGAIER

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## Competent customer and spare parts service

Spare parts hotline: +49 7161 301-293  
service-tro@allgaier.de

- Original quality spare and wear parts
- Upgrading, conversion, retrofitting and maintenance of existing drying systems
- Process control advice
- Power and energy advice



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