

# STATIC FLUIDIZED BED



## PRINCIPLE

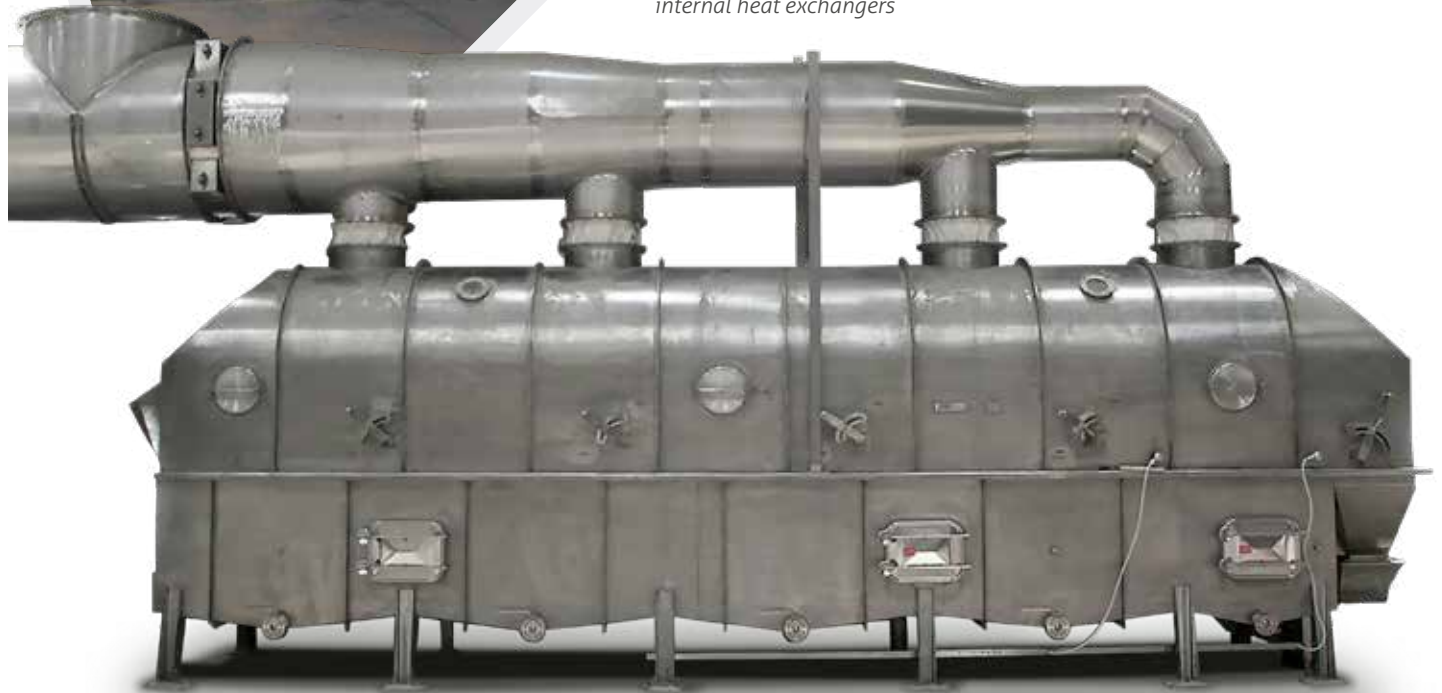
The fluidization is a state of dynamic balance of a divided solid in an ascending moving gas. It confers hydraulic properties to solids (angle of repose equal to zero, easy spreading, total filling of a receiver in which the product is fluidized). Such method of bringing in contact a solid with a gas, allows high mass and heat transfers. Mechanical energy transferred by gas to the particles is low enough to prevent attrition. Crystals for instance will remain bright and will keep sharp edges.

## ADVANTAGES OF THIS TECHNOLOGY

- Controlled residence time allowing uniform treatment
- Low attrition of particles
- High thermal efficiency
- Preservation of physical and biological properties of fragile products
- Simple and robust equipment (no mechanical device)
- Low maintenance
- Easy cleaning
- Multiple processing in one single equipment
- Possibility to process under controlled atmosphere in a closed loop (i.e. nitrogen, hydrogen, etc.)
- Adjustable fines removal ratio



▀ *Static fluidized bed with internal heat exchangers*



## MAIN APPLICATIONS

All kind of powders, crystals, beads, granules for all industries (chemical, food, mineral, etc).

## MAIN PROCESSES

Drying, cooling, calcining, reaction, roasting, reduction, dehydration, solvent removal, etc.

## PILOT TEST LABORATORY

For determination of fluid bed parameters and possibility to perform semi industrial tests or rental of a complete pilot unit.



# comessa can propose different types of fluidized beds

## STATIC FLUIDIZED BED



The standard static fluidized bed is composed of a plenum for gas injection, a fluidization plate for a homogeneous air distribution and a hood for product conveying and gas exhaust. Fluidization plate may be from different types : perforated sheets, porous metal, oriented air jet, nozzles, or other type depending on processes and applications. The plenum chamber is generally subdivided into several sections to provide the optimum fluidization velocity at each stage of processing.

The temperature of the processing gas can be adapted for each plenum section. Final section can be a cooling zone. The behavior of the fluidized product is similar to a liquid. The processed product is discharged by overflowing an adjustable weir (typically from 0 to 300 mm).

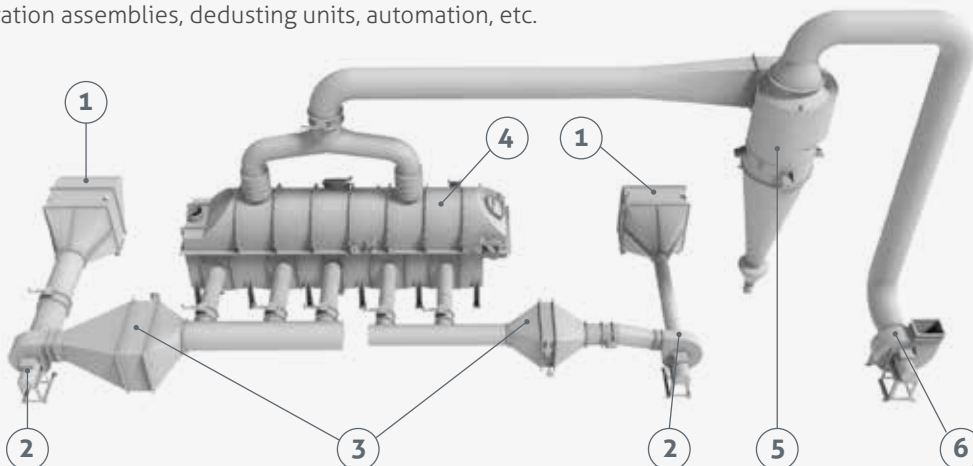
## STATIC FLUIDIZED BED WITH INTERNAL HEAT EXCHANGERS



For fine powders (or heat sensitive products) thermal supply brought by fluidization gas is very low due to low gas velocity (or low gas temperature). Therefore, the fluidized bed area would be quite important. Addition of internal immersed heat exchangers will reduce significantly the size of the equipment as most of the thermal balance will be achieved by conduction through these exchangers. Typical height of product layer will be between 600 to 2000 mm in order to allow integration of the immersed heat exchangers. Depending on application, different types of exchangers are available (bundle of tubes, dimpled plates, etc.).

## COMPLETE PROCESS UNITS

Depending on customer's requirements and applications, COMESSA can provide a complete process unit including ancillaries equipment such as : air preparation assemblies, dedusting units, automation, etc.



- 1 - Air filter(s)
- 2 - Blower(s)
- 3 - Heat exchanger(s)
- 4 - Fluidized bed
- 5 - Dedusting unit
- 6 - Exhauster

