

# 300XP MULTIFUNCTIONAL FILTER/FLUID BED DRYER SYSTEM



Product Bowl in Filter Apparatus



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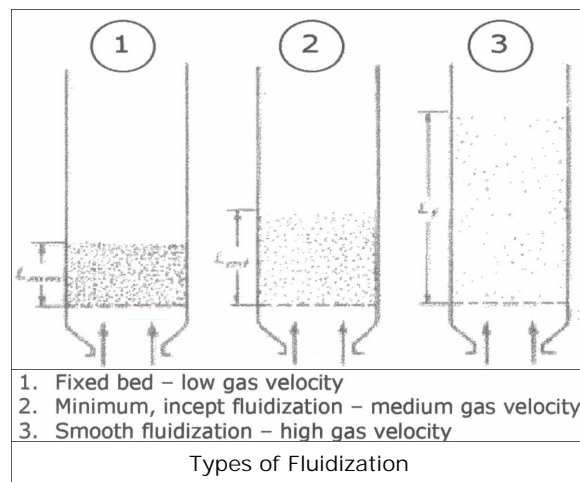
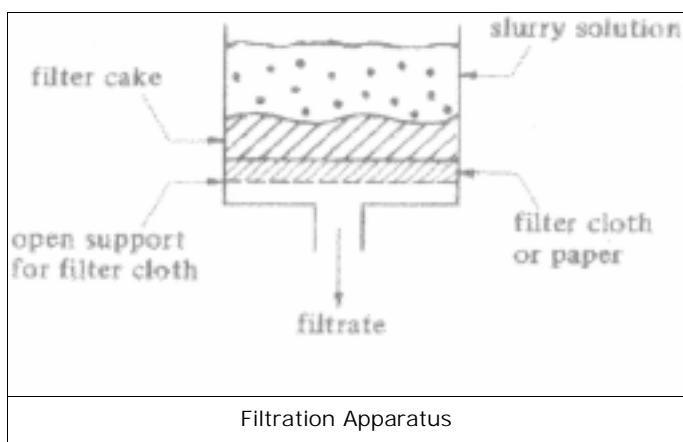
# The 300XP Filter/Dryer Fluid Bed System

The 300XP model fluid bed is not a conventional fluid bed dryer. The 300XP model incorporates a filtration step to remove a solvent from a slurry.

In filtration, a pressure difference is set up and causes the fluid to flow through a screen or cloth. The screen or cloth blocks the passage of the large solid particles, which build up on the cloth as a cake. Once the solvent is physically removed from the slurry, the wet cake is transported in the product bowl to a fluid bed dryer.

The fluid bed dryer accepts the product bowl and removes the remaining solvent with a warm gas stream. In a fluid bed, gas enters a bed of powder until the powder fluidizes. Fluidization occurs when the particles become suspended in the gas stream, and the bed of powder behaves as a boiling liquid. Depending on the gas velocity, the bed of powder behaves differently.

The type of fluidized bed shown below is dependent on the gas velocity and the physical properties of the powder. Since the gas stream mixes and suspends the bed of material, fluid beds provide gentle and rapid drying applications.



## Operating Parameters:

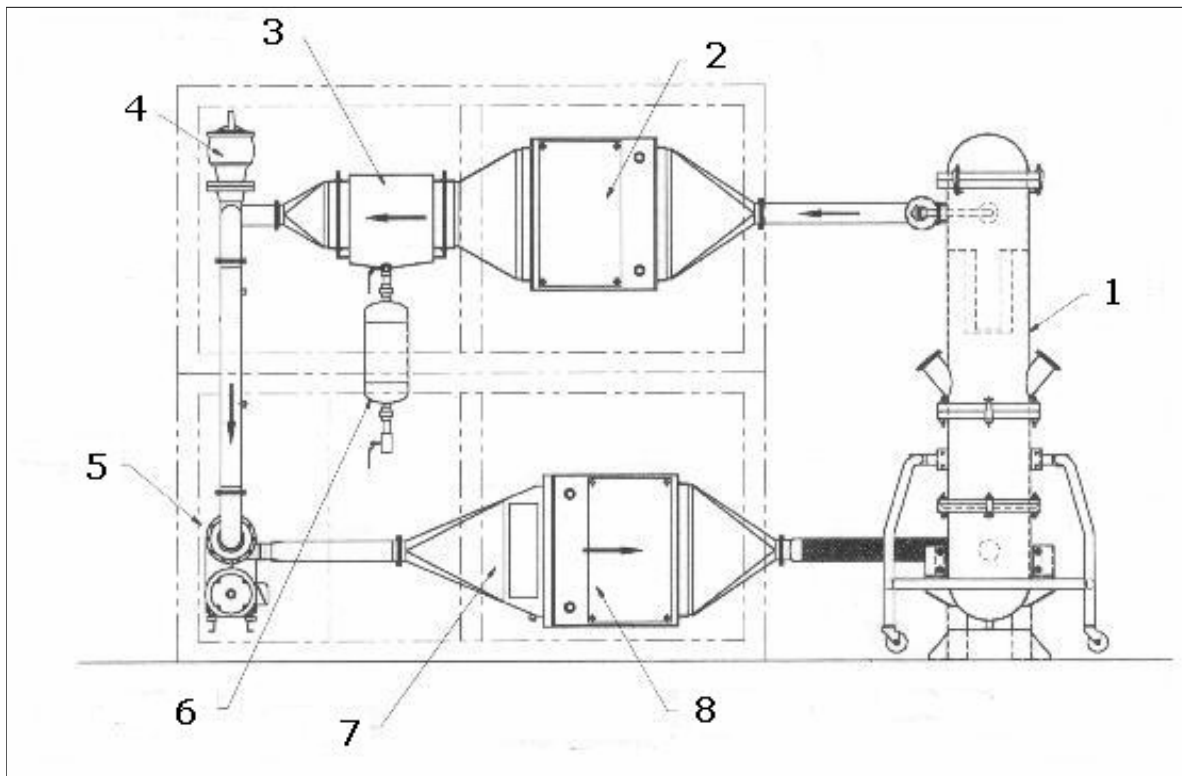
- Fluidization velocity: 45 to 500 ft/min
- Inlet gas temperature: Ambient to 250° F (120°C)
- Condenser temperature: 32°F (0°C) to Ambient
- Fluid bed area: 1.35 ft<sup>3</sup> (0.125 m<sup>2</sup>)
- Product bowl volume: 50L
- Material of construction: 316 SS

## System Requirements:

- Dimensions: 9' 6" H x 18' L x 12' W
- Overall weight: 4,000 lb
- Electrical: 240 V, 3 phase, 60 Hz, 30 amp
- Compressed air: 3 cfm @ 90 psi
- Inert gas (Nitrogen)\*: 7.5 lb
- Heat transfer fluid\*: 4 gpm @ 90°F
- Chiller\*: 4 gmp @ -15°F

\*May vary based on specific requirements of the process.

# Solvent Recovery System



1. Fluid Bed
2. Pre-filter
3. Condenser Coil
4. Pressure Relief Valve

5. Blower
6. Solvent Recovery Tank
7. Heating Coil
8. HEPA Filter

The purpose of the solvent recovery system is to remove the solvent in the inert gas stream supplied to the fluid bed dryer.

In the dryer, the solvent of the material evaporates into the gas stream. An internal fluid bed filter (1) and a pre-filter (2) remove particulates in the gas stream. A condenser coil (3) lowers the temperature of the gas stream, which condenses some of the solvent onto the coils. The condensed solvent is collected in a solvent recovery tank (6).

A pressure relief valve (4) downstream from the condenser coil protects the ductwork from overpressure scenario.

The blower (5) recirculates the gas stream to the fluid bed. Prior to the fluid bed, the temperature of the gas stream is increased by the heating coil (7). A HEPA filter (8) cleans the gas stream upstream from the fluid bed. The oxygen concentration of the system is monitored and controlled by the control system using a dilution purge.

# Control System

## Standard Features:

- Allen Bradley PLC and touch screen panel
- Temperature controller for heat exchanger, and condenser
- Blower controller for adjusting gas flow
- Product bowl position controller
- Product temperature display
- Exiting air temperature display
- Backpulse filter timer
- Pressure drop indicators
- Gas flow indicators
- Isolation valves
- Inerting system with oxygen concentration controller and alarm



## Optional Features:

- Batch report system
  - Inlet gas temperature
  - Product temperature
  - Gas flow rate
  - Spray rate
  - Batch time
- Humidity indicators
- Total remote operation
- Vacuum purge system



## Information

To discuss your project with an engineer or for more information about ACT services, including complete catalogs of ACT fluid beds and other process equipment, you may contact us by phone, fax, or email.

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