

Bella™

MIXER, COOLER AND DRYER



Mixing energy and product in a new, revolutionary way!

Bella™ dryers and coolers are unique and offer a new method of drying or cooling powders, granulates and filter cakes. The super fast mixing capability of the Bella mixer makes it an ideal heater or cooler, since the process of drying or cooling is simply the mixing of air and product.

The Bella mixer is effective at mixing air and material because the air is exposed to product in the weightless zone of the mixer for optimum contact. Also, because all material in the mixer is constantly moving, the heated or cooled air must take a longer path through the material itself, thus increasing its total exposure time to the material and improving its performance and efficiency. In addition, the low shear and constant agitation in the mixer produce a material uniform in particle size, moisture and temperature.

This operation is extremely efficient because the air flows around the material while it is suspended.

This maximizes the total surface which is exposed to the air, increasing the desired effect. The drying process will go through an adiabatic evaporation with thermal efficiency as much as 80 percent. Only small air volumes are required compared to other fluidizing dryers.

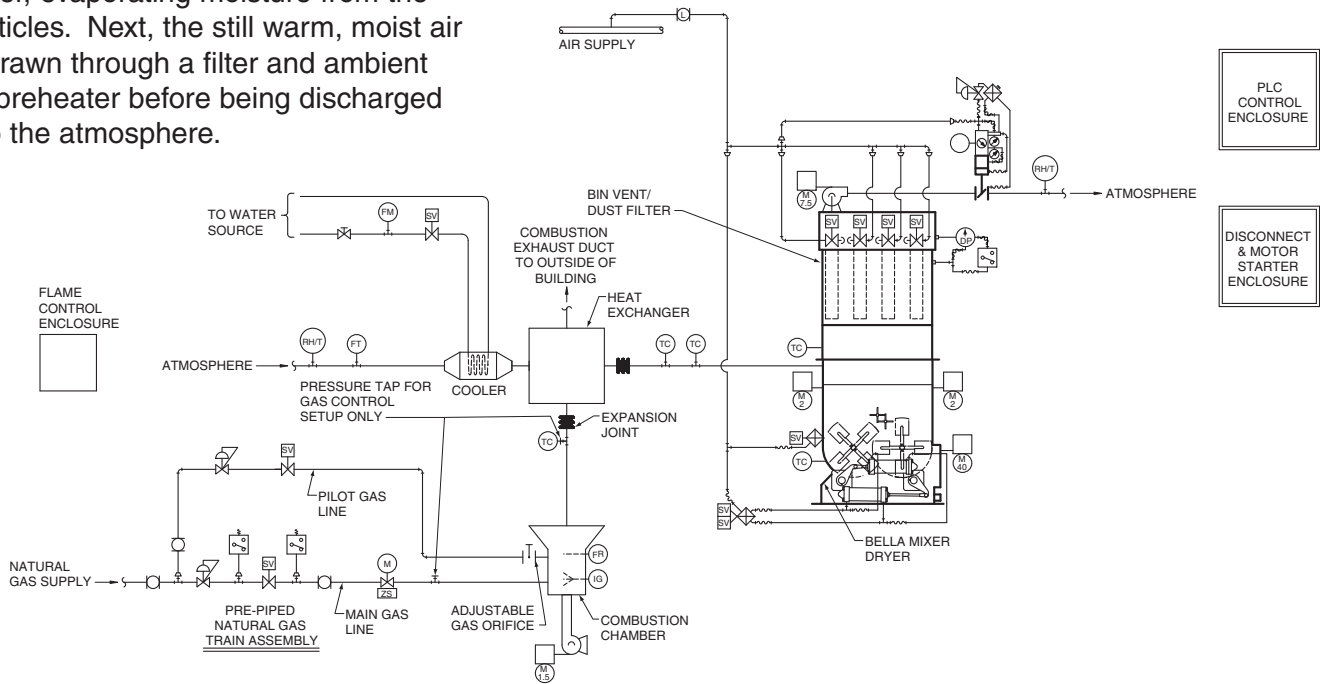
The dryer can be used for drying, mixing, spraying, agglomerating and cooling in the same unit without additional equipment or costs.

Benefits

- Homogeneous drying of batch caused by rotating paddles.
- Channels will not be formed as in other fluidizing dryers.
- Good energy economy due to high thermal efficiency.
- Operating temperatures from -150°F to +900°F.
- Customized control system.
- Continuous monitoring of process.

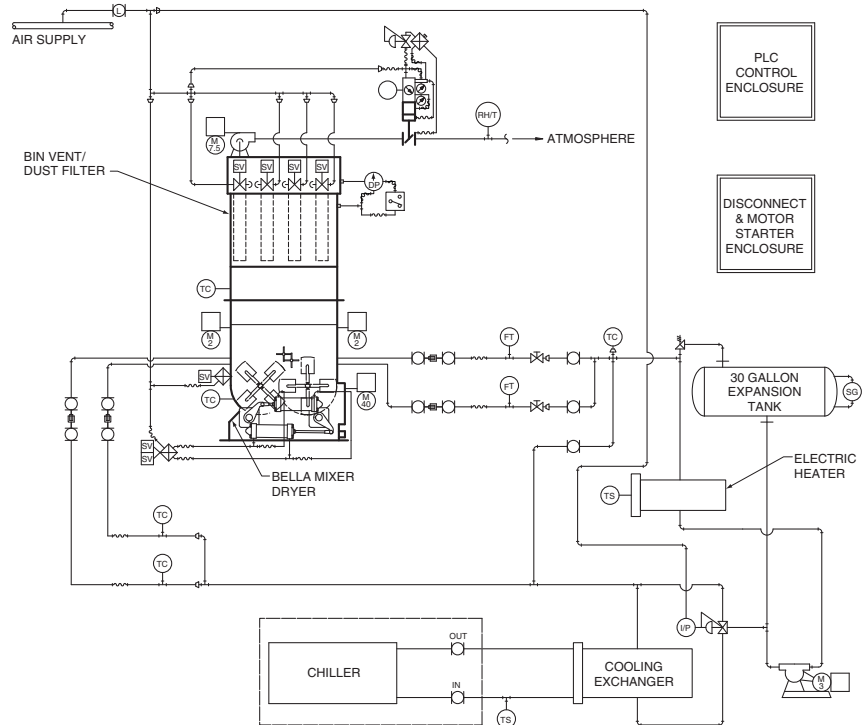
Two systems available

The “**Open Loop**” system begins with ambient air passing through the heater. This hot air then passes through the mixer, evaporating moisture from the particles. Next, the still warm, moist air is drawn through a filter and ambient air preheater before being discharged into the atmosphere.



The “**Closed Loop**” system operates on the same principles except the ambient air preheater is replaced with a condenser to remove the moisture from the air or gas before it re-enters the drying cycle. Closed Loop drying is required when drying toxic materials because the fumes or airborne particles do not leave the system. Also, because the warmed air is re-used, this system is even more efficient.

Bella dryers may also be used for drying slurries if a de-watering device is installed before the mixing cycle.



Drying procedure

The supply air inlet temperature is as high as the product will allow to reduce drying time to a minimum. Once the drying process has begun, the product temperature immediately rises to a predetermined maximum allowable reading. A percentage of moisture must be left in the product to act as a coolant and to maintain a steady material temperature.

The exhaust air temperature will be slightly higher than the product temperature and is a measure of the dryer's efficiency. The closer the relationship between the exhaust air and the product temperature, the higher the thermal efficiency of the process.

Drying is dependent on three parameters:

- Air/Gas Flow
- Temperature
- Relative Humidity

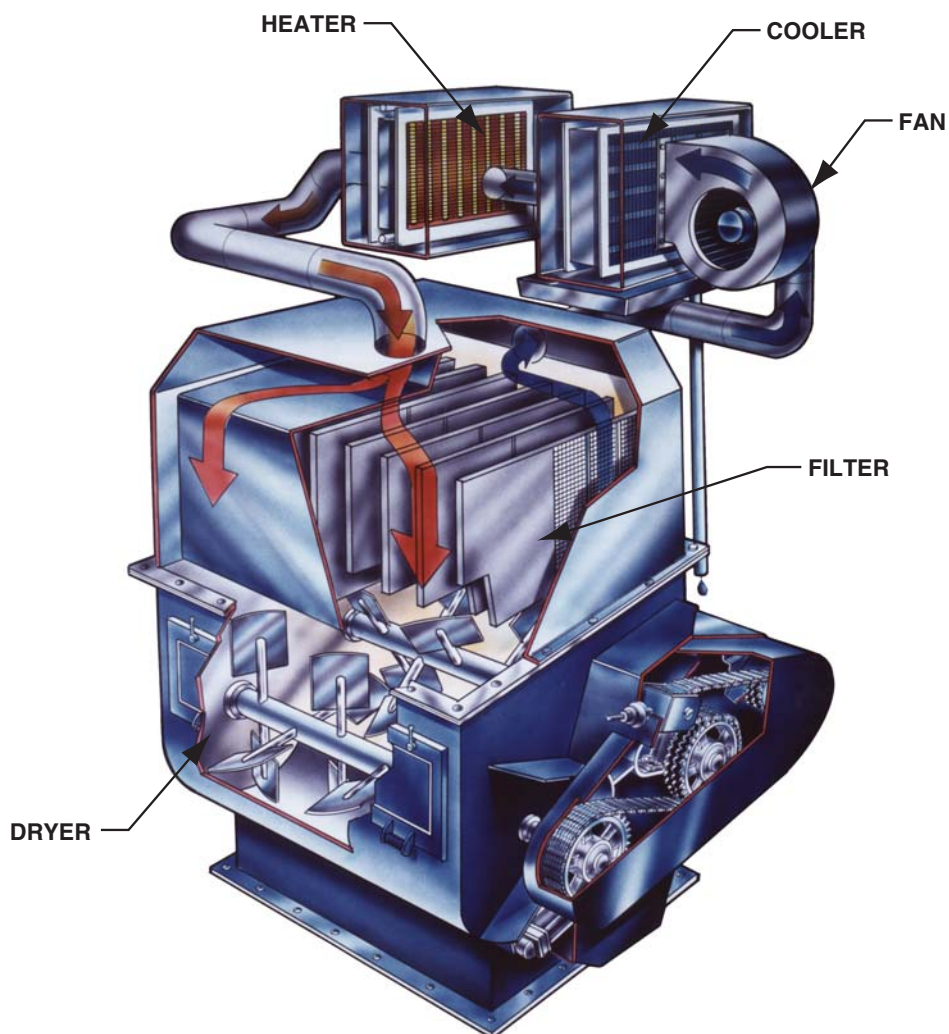
The Bella dryer optimizes these parameters and product moisture quickly reaches the desired level.

Inert gas drying for explosive materials

If the materials being dried are explosive or otherwise dangerous, inert gases such as nitrogen, argon, etc., may be used as a safety consideration. Usage of an inert gas instead of air also eliminates the potential for oxidization of the product during the drying process.

Dryer sizes

The Bella cooler/dryer is available in any size to suit the application and in both batch and continuous operation. All are customized for the particular process design. Batch sizes may vary from a few pounds to tons of dried product per hour.



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