

TORNESH AND FLASH DRYERS

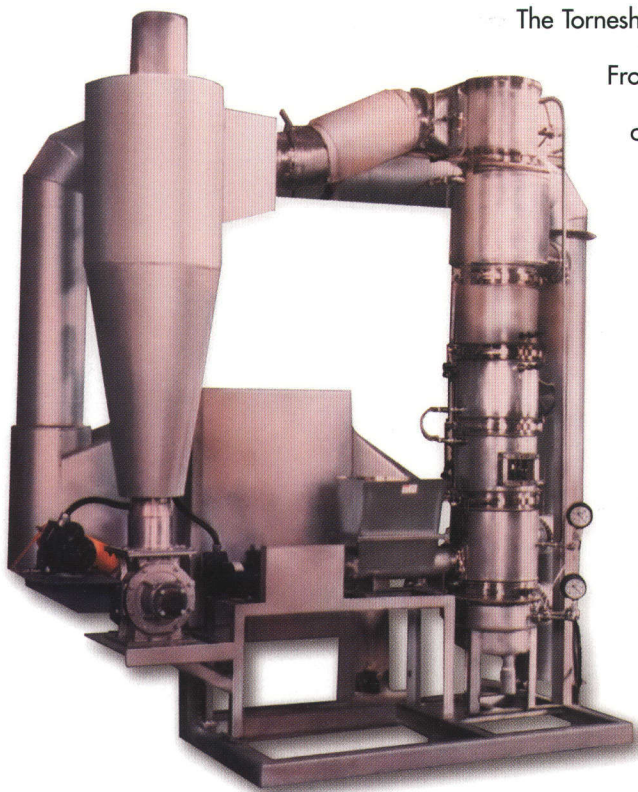
We Make Your Work Flow

Carrier[®]

Vibrating Equipment, Inc.



TORNESH DRYER *



The Tornesh Dryer is an innovative drying device combining many of the benefits of fluid bed and flash drying.

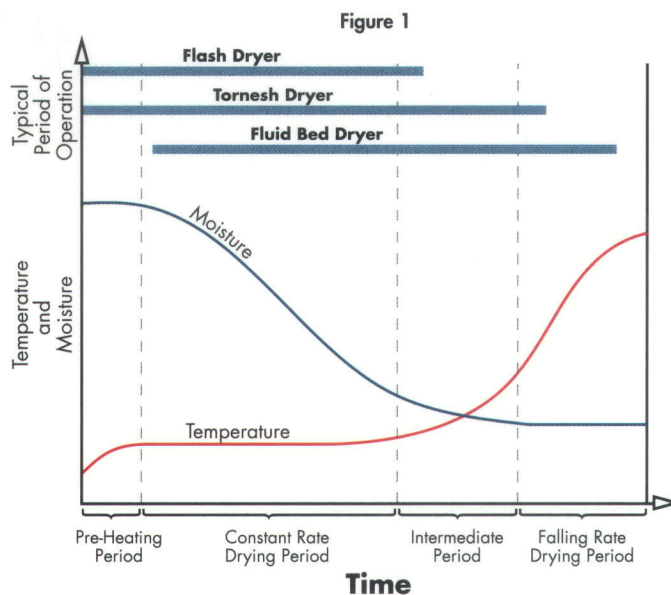
The Tornesh Dryer is a direct-type dryer capable of handling a wide range of products.

From one micron powder up to pellets, the Tornesh Dryer will dry plastics, resins, chemicals, grains, food and dairy products, minerals, ores, and many other materials. The unique feature of this dryer is its feeding-dispersing chamber, which creates a multi-phase flow of gas and powder. The specially designed perforated plate at the side and bottom has directional holes to create a swirling air flow. The two-way hot air supply can be adjusted for retention time control and to encourage the cracking and dispersing of wet raw material. The tubular main body has a simple, easy-to-clean construction with no protruding parts. It requires little floor space and is easy to install.

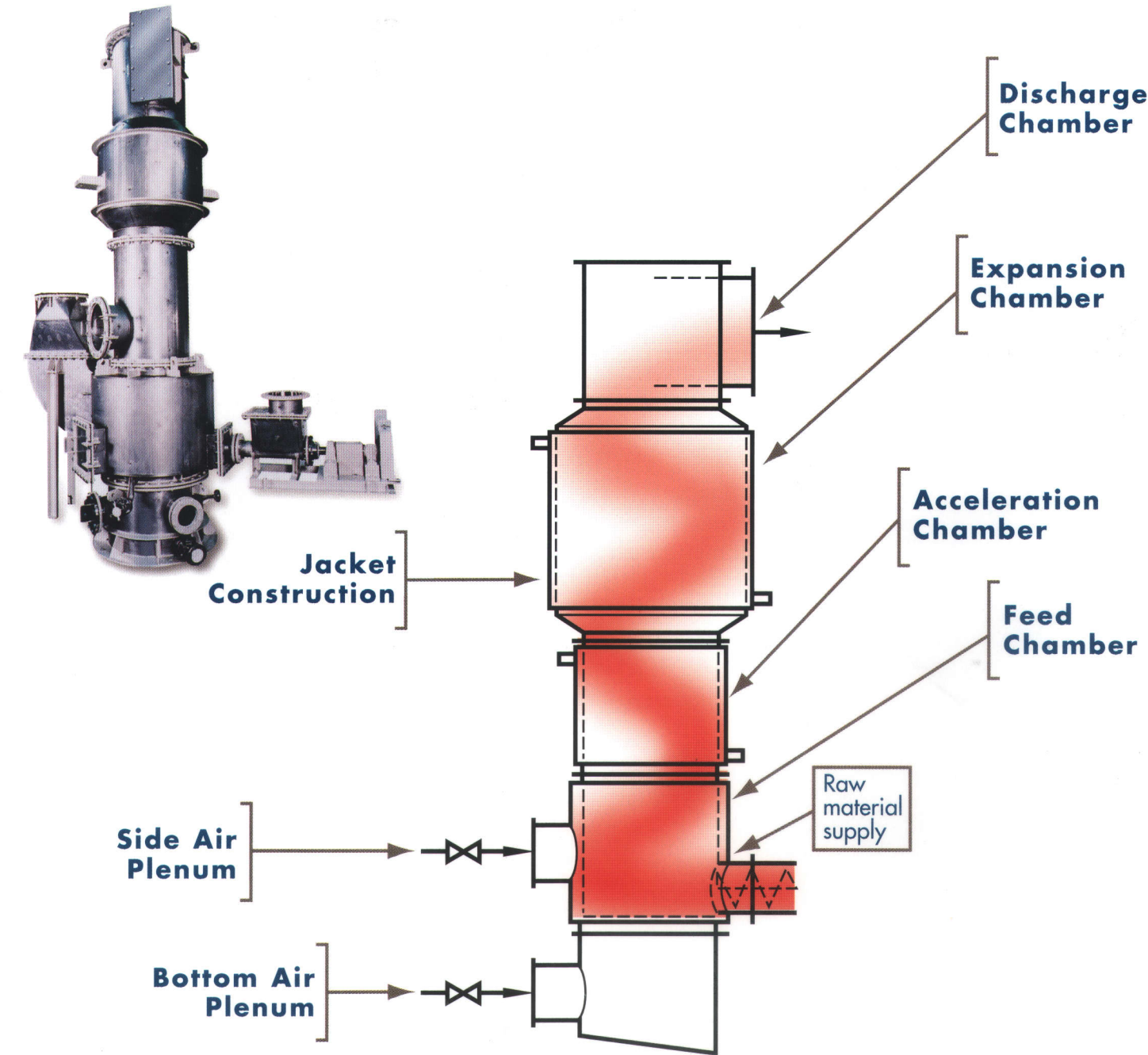
Drying Principles

Figure 1 illustrates a drying curve for a typical wet solid. Usually, materials are dried until they reach the end of the intermediate period. At this point, most materials are surface dry, retaining only a small amount of internal

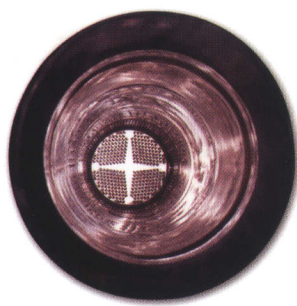
moisture, and capable of being packaged, handled, or further processed. Occasionally, further drying is required to remove small amounts of internal moisture. Drying in this portion of the curve, the falling rate period, causes material temperatures to rise rapidly and drying efficiency to drop. The Tornesh dryer is ideal for drying materials in the constant rate and intermediate drying periods and into the falling rate period. Because it allows a longer retention time than a flash dryer, it can dry materials to lower moisture levels. It also can process fine powders and granular products that, when wet, are too sluggish for a fluid bed.



Tornesh Dryer* Construction

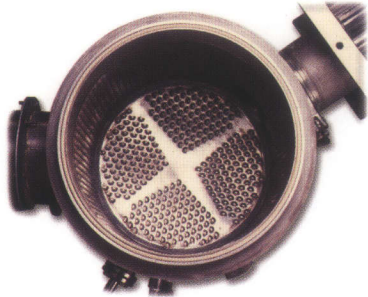


Internal Construction

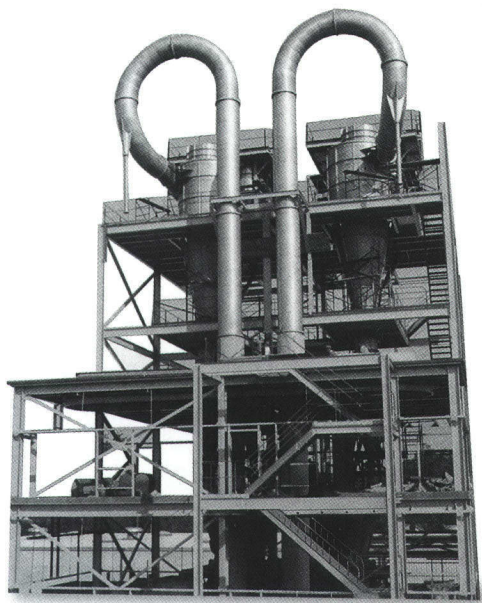


The dryer main body has a simple tubular construction with no protruding part(s).

Feed Chamber



FLASH DRYER



The Carrier Flash dryer provides an inexpensive solution to drying problems in a wide variety of applications. For quick drying of powders or granular materials, the Carrier Flash dryer offers many benefits:

- Capable of processing large capacities
- High thermal efficiency
- Crushing of lumps is possible with addition of a Carrier Cage Mill
- Pneumatic conveying while drying eliminates additional equipment
- High process gas temperatures possible for reduced size and cost
- Minimal floor space requirements
- Ease of installation

For agglomerated materials, a cage mill is added to reduce the lumps and expose internal moisture. Much of the drying is performed in the cage mill, increasing the thermal efficiency of the flash dryer. If size reduction is not desired, a mechanical slinger is available for dispersing sticky materials in the flash dryer.

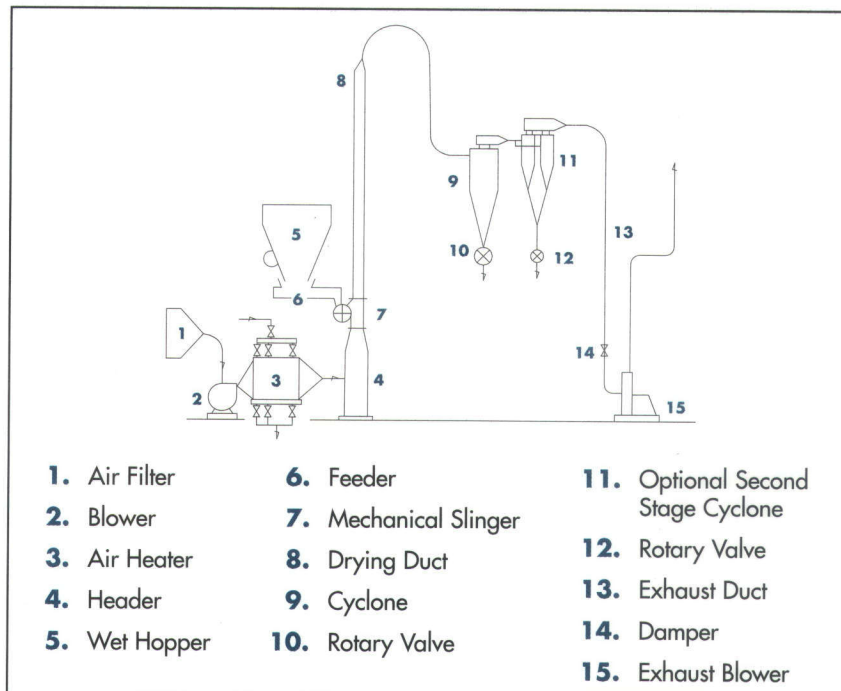
*The Flash Dryer is capable
of drying powder or
granular material instantly.*

Large Capacities

The flash dryer can use higher process gas temperatures than most other dryers type because the material retention time is very short. The result is a dryer that can process very high capacities in a relatively small amount of space. Because it requires so little space, it is often used as a pre-dryer to expand production capacity on existing lines.

Process Guarantee

Carrier will test each application and provide a **complete process warranty**. If required, Carrier will also provide construction and installation services.



Features

1. *Energy efficient*
2. *Requires little floor space*
3. *Easy to clean and maintain*
4. *Completely discharges all material*
5. *No internal moving components*
6. *Processes a wide range of materials*
7. *Retention time control for process changes*
8. *Minimal construction and installation costs*

Design Flexibility

The walls of the acceleration chamber and expansion chamber can be jacketed for hot water, steam, or hot oil to add further drying capability. The material residence time can be increased to provide additional drying by adjusting the two-way hot air supply to the feed chamber. The residence time can also be increased by adding an expansion chamber. Three interchangeable expansion chambers are available.

This dryer is especially well suited for food and chemical applications or other applications where frequent cleanings or grade changes are the norm. The main body can be clamped or bolted together or a uni-body design can be supplied. A simple CIP system can be easily installed.

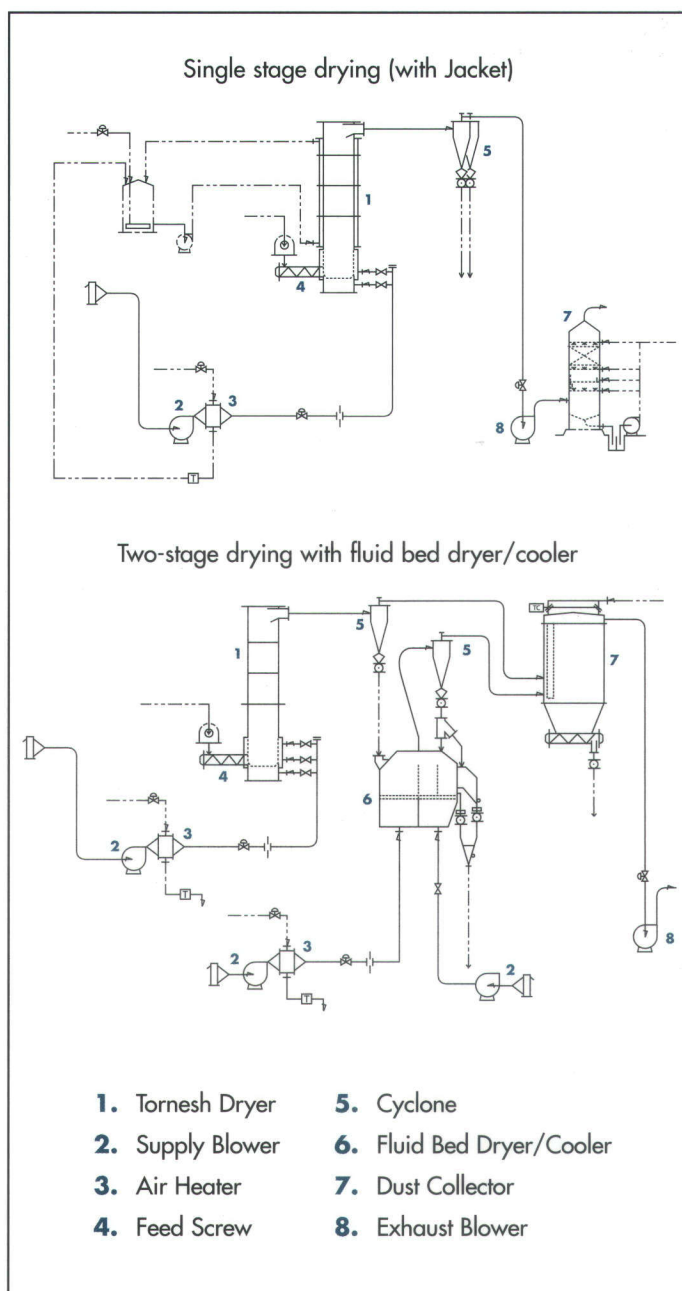
Process Guarantee

In addition to the Tornesh Dryer, Carrier offers vibrating and conventional fluid beds, flash dryers, slurry dryers, and indirect dryers. Carrier tests each application in its state-of-the-art laboratory or at your facility and provides a **written mechanical and process guarantee.**

Process Flexibility

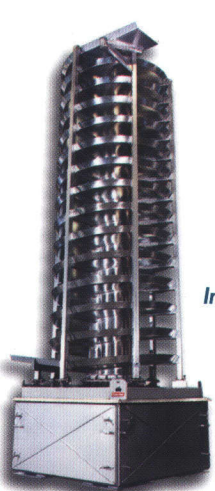
Many materials require further heat treating or cooling after drying. The Tornesh dryer is easily packaged with a fluid bed for final processing in a multi-stage system.

For solvent recovery or energy savings, the process gas stream can be recirculated in a closed loop system.

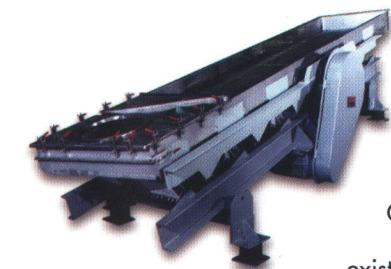




Vibrating Fluid Bed Dryer



Vibrating Spiral Elevator



Inclined Vibrating Conveyor

Corporate Profile

Established in 1950, Carrier is internationally known for its pioneering work in the field of bulk material handling and processing. Carrier specializes in the manufacture of fluid bed processors, pneumatic dryers, vibrating conveyors, feeders, screeners, and spiral elevators.

Through the years, Carrier has developed processing equipment to meet the needs of a broad range of industries, including chemicals, synthetics, foundry, glass, food, explosives, wood, coal, metals, scrap, and recycling.

Carrier continues to bring new technology to the market, as well as new value to existing technology through its Research and Development Lab. The lab serves as a technology base in which to confidently test the feasibility of new products and processes, simulating actual operating conditions.

With a technology profile of over 150 patents, each application is custom tailored. Computer-assisted design and manufacturing procedures provide the background for the innovative engineering required to achieve unmatched production efficiencies.

With an extensive line of processing machines and vibrating equipment, we are your ONE-STEP SOLUTION to:

- Accumulate
- Agitate
- Blanch
- Blend
- Calcine
- Classify
- Cool
- Convey
- De-Oil
- Dewater
- Distribute
- Divide
- Dry
- Dry/Cool
- Elevate
- Feed
- Flatten
- Heat
- Meter
- Moisten
- Orient
- Proportion
- Quench
- Recycle
- Scalp
- Screen
- Separate
- Shakeout
- Singulate
- Solidify
- Sort
- Tumble
- Wash
- Withdraw

Representatives

Carrier is represented by more than 75 manufacturer's representative organizations throughout the U.S., Canada, Mexico, Korea, Peoples Republic of China, Taiwan, Chile, Argentina, Columbia, Brazil, Australia, Peru, Eastern Europe, and Western Europe. Licensees: India, Japan, and Sweden. Contact our United States office for the nearest representative in your area.

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