

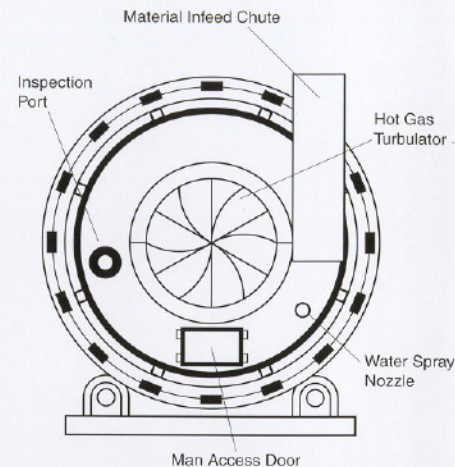
**QUADPASS**<sup>TM</sup>  
Four-Zone Rotary Drum Dryer

**DUPPS**

# Revolutionary QuadPass™ Four-Zone Rotary Drum Dryer

## A Superior Solution For...

- Agribusiness Industries
- Forest Products Industry
- Municipal & Industrial Wastes
- Animal Protein Recycling Industry



## Get lower VOC emissions, better product color, and more uniform drying than single- or triple-pass rotary drum dryers

### Reduces VOC's

Wet feed is exposed to the hot furnace gases in a controlled "lift and fall" manner. The particles are exposed to the hot gas as they fall, but not while they are resting in the flighting. This exposure to high heat, followed by a brief rest, prevents the gases from heating the solids too long, greatly reducing the amount of VOCs generated.

### Better product color

A QuadPass Dryer gives you better color in your finished product because the solids are less likely to be charred or over-dried. This is due to the unique way the QuadPass design presents the wet feed to the drum, as well as the controlled manner in which the feed is exposed to the hot gas.

### Solids dried uniformly

The Hot Gas Turbulator swirls the gas as it enters the feed zone. This turbulent air helps

the feed solids to spread out, allowing the hot gas to contact nearly all particle surfaces. Good heat distribution prevents clumping and generates a more uniformly dried product.

### Reduces fire danger

A unique feed arrangement all but eliminates operating dryer drum fires. Because the wet feed enters the drum off-center, away from the "blowtorch" of hot gases, it is much less likely to catch fire.

### No insulation to break down

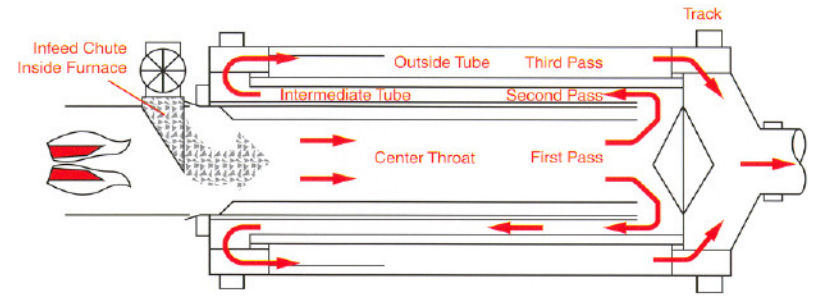
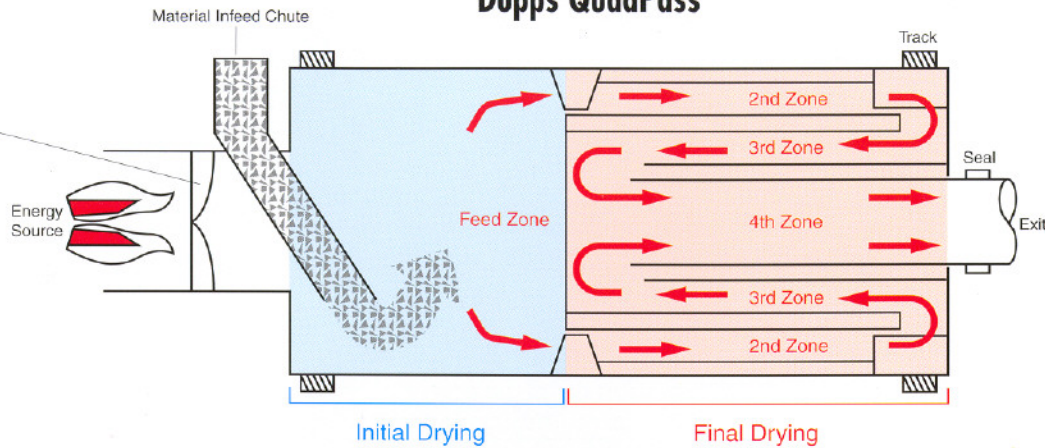
The QuadPass drum has NO insulation, only air sandwiched between the drum's outer shell and its stainless steel cladding. This annular air gap keeps the drum's outer

surface at a modest temperature. And since there's no foam or fiber, there's no insulation breakdown—a common problem with other drum dryers.

### Flexible fuel choices

To heat the air flowing through the dryer, Dupps offers burners that operate on natural gas and fuel oil as well as a solid fuel VDC (vertical dry cell) burner. The VDC can operate using wood, coal, or other forms of biomass fuel.

## Dupps QuadPass™



### Ordinary three pass drums can over-dry.

Material starts drying at high air velocity then drops at each stage, so particles can accumulate, overheat and clog.

### How it works

Wet solids enter at the largest diameter of the drum, away from hot gases. Hot air enters the feed zone at the centerline while the wet solids enter away from the center, landing directly on the flighting. As the drum rotates, the flights lift the wet feed upward. With further rotation, the particles are gradually released to fall downward through the hot gases in a thin curtain.

The repeating cycle of “lift and fall” through the hot gas occurs in an environment of low air velocity, which assures enough residence time in the Feed Zone. Most of the evaporation takes place in this zone, quickly reducing gas temperatures.

Zones 2 through 4 comprise the final drying section of the QuadPass drum. This section consists of two annular passageways and one final pass through the drum’s center tube. Each successive zone has a smaller cross sectional area, so the gas velocities increase as the product travels through the drum.

In Zones 2 through 4, the fines tend to separate from the larger particles and exit the drum quickly. This prevents overdrying and charring and reduces VOC emissions. The smaller, faster-drying particles are picked up and carried away. Larger, wetter particles stay in the drum longer and continue to give up moisture as they are pushed along by the airstream. Each particle exits the dryer system at the desired moisture content.

### Advantages of QuadPass

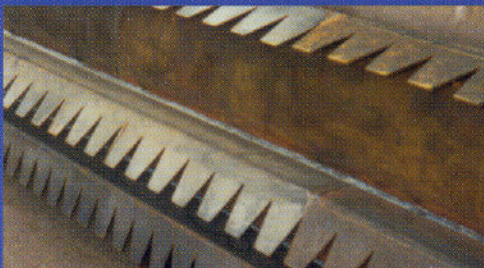
- An off-center feed chute allows wet feed to enter the drum away from the “blowtorch” of hot gases.
- Wet solids are exposed to the high heat in a controlled way, through a sequence of “lift and fall.” The solids fall through the hot gas, then get a brief “break” from the heat as they lie in the drum’s flighting.
- The feed zone is the entire drum diameter. Feeding into such a large volume allows the particles to spread out and travel individually rather than in clumps. Falling through a much larger vertical distance ensures that the hot gas reaches all particle surfaces.
- Drying gas velocity is slowest in the feed zone, then gets progressively faster in each successive zone. This increasing velocity helps material conveying and decreases any chance of drum plugging.

### Problems with 3 Pass Dryers

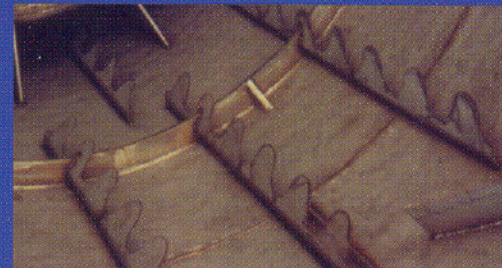
- Wet feed is introduced in the dryer’s center throat, directly into a “blowtorch” of hot gases.
- Wet solids are constantly exposed to unrelenting heat as they travel the entire drum length. This leads to charring, over-drying, and even fires.
- By feeding into the center throat, the wet solids are forced into a tight space. Even though flighting lifts and stirs, feed has less distance to fall and tends to form clumps.
- Drying gas in the center throat is at a high velocity, but the velocity drops as it travels through the annular passageways. This drop in velocity reduces conveying force and makes drum plugging more common.

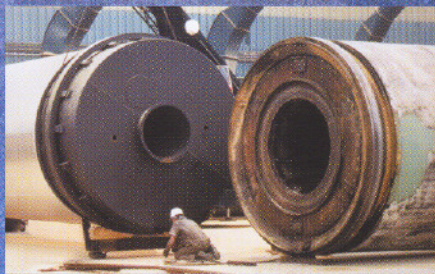
### Flighting to meet your application

For small, granular particles, the QuadPass offers saw-tooth flighting.



For elongated products (e.g. strands, hay, grass, bagasse) curved, smooth-edged flighting keeps products from hanging up in the flights.





### **Drum replacement**

The QuadPass dryer is your fastest and most economical way to improve product quality, color, and reduce VOC emissions.

If your drums are broken, burned up, worn out, or don't meet production quality, we can replace any size, make or model with a new state-of-the-art drum using the same footprint.

# **QUADPASS™**

## **Four-Zone Rotary Drum Dryer**

### **Complete turnkey systems**

Everything you need — including biomass/wood burners, material feeding and conveying equipment, recycle air systems, high-efficiency particulate collectors, and state-of-the-art PLC controls — available now.

### **More Free Facts**

See how to boost product quality, lower energy costs and easily meet emissions requirements. Contact us today for a free heat and materials balance using your application specs.

U.S. Patent Numbers 4,729,176 and 4,802,288.  
Other U.S. and foreign patents pending.



## **The Dupps Company** Thermal Technology Division

P.O. Box 189  
Germantown, Ohio 45327  
Phone 937-855-6555  
Fax 937-855-6554  
[www.dupps.com](http://www.dupps.com)  
E-mail: [info@dupps.com](mailto:info@dupps.com)

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