Barge-Mounted, Mobile Rotary Dryer Used to Process Bauxite

Capacities may vary depending upon the material being processed. The suitability of a material to a particular dryer design can be fully tested in our research laboratory.

Direct-heat rotary dryers can operate on fuel oils, natural gas, propane or coal. In addition, steam-heated clean air and flue gases may be used as a heating medium. Indirect-heat rotary dryers are available in steam tube designs and standard rotary dryers utilize both direct and indirect heat sources and are available in either parallel flow or counter flow configurations.

Heyl & Patterson rotary dryers are among the most versatile dryers available, capable of handling almost any bulk solid material regardless of its conveyance and handling characteristics. Our rotary dryers can be configured to meet wide range of needs and applications. Factors such as starting and final moisture content, product temperature, drying air temperature, air velocity and retention time of the material in the dryer are considered in the selection of the dryer. Applications and designs can be investigated in our testing facility. Whichever the properties of the material you need to dry, Heyl & Patterson will design and manufacture a rotary dryer that will meet all your application objectives.

Renneburg rotary dryers are available in several sizes and types. Standard designs utilize both direct and indirect heat sources and are available in either parallel-flow or counter-flow configurations. Direct-heat rotary dryers can operate on fuel oils, natural gas, propane or coal. In addition, steam-heated clean air and flue gases may be used as a heating medium. Indirect-heat rotary dryers are available in steam tube designs and standard rotary dryers. When the standard rotary design is used, conventional heat transfer is employed. Heating mediums include electricity, fuel oils and natural gas. Capacities may vary depending upon the material being processed. The suitability of a material to a particular dryer design can be fully tested in our research laboratory.

Rotary Dryers and Coolers

The purpose of a dryer is to remove moisture and harden the soft, mud-like granules of a wet substance. Among the items to be considered in drying are the proper diameter-to-length ratio, flighting design, material of construction, energy consumption, retention time of the material in the dryer, etc. The safety precautions built into our equipment collectively work against overall component failures, while shielding workers and equipment at optimum levels.

At Heyl & Patterson, we’ve pioneered solutions for the chemical processing industry since 1887—the let our experience work for you. For further information, visit www.heylpatterson.com or call today.

Safe and Secure

Minimizing Risks, Protecting Workers and Equipment

We work diligently to ensure the utmost protection measures are incorporated into everything we do, and take advantage of a facility’s available energy options for the utmost efficiency. The safety precautions built into our equipment collectively work against overall component failures, while shielding workers and equipment at optimum levels.

Since 1887, Heyl & Patterson has provided custom-engineered thermal processing and bulk transfer equipment solutions to industries worldwide. Combining cutting edge technology with superior serviceability, as well as a commitment to meet and exceed our client’s needs, Heyl & Patterson is well positioned to provide new product solutions for many years to come.

Heyl & Patterson’s Renneburg Division offers a wide range of drying and cooling equipment. Fluid Bed Dryers & Coolers, Rotary Dryers & Coolers, Flash Dryers & Coolers, Agglomerator/Granulators and the MultiDisc Thermal Processor can be customized to dry or cool any product.

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Fluid Bed Dryer

**About Fluid Bed Dryers**

In a fluid bed, the material being processed is completely suspended and surrounded by a rising gas stream, causing the material to act like a fluid. The gas stream is also the medium for heat and mass exchange. As a result of this gas-to-material contact, very high rates of heat transfer are accomplished while gently handling the solids. The dryer’s design usually distributes the gas stream during operation and supports the bed of material during shutdown. The final product moisture is a function of retention time and product temperature. Five types of Fluid Bed Dryers & Coolers are available:

- **Trough-Type** employs a thin-inlet-seal "plug flow" method of product handling to ensure an average residence time for each particle product. This produces precise control of temperature levels and product final moisture. Trough designs are also readily adaptable to in-bed indirect heat transfer techniques.

- **Circular-Type** has the additional advantage of back-mixing processed material with wet or sticky solids. This achieves uniform flow. Circular designs can be fitted into compact installations due to their small footprint.

- **Trough-Style** can be designed as an in-bed indirect heat transfer technique. The design ensures product quality and process efficiency.

**Specifications**

- Cylindrical design for back-mix flow, or rectangular design for plug flow.
- Fluidization media for sticky, lumpy or otherwise hard-to-handle materials.
- Units up to 18 feet in diameter.
- Intake gas temperature up to 2280°F (1200°C).
- Stainless steel or high-temperature alloy bedplate, or refractory brick dome designs.
- Variety of control systems, from burner management only to complete PLC-based process control.

**FLUID BED FEATURES**

- High thermal efficiency – minimum heat utilization of drying gas steam.
- Completely pneumatic fluidization – no moving parts results in a very low maintenance design.
- Pilot plant testing available.
- Relatively small equipment footprint.
- Low initial capital cost.
- Completely pre- and pre-tested NPSA-approved burner/vent trains.
- Uniform product quality.

**FLUID BED OPTIONS**

- Combined drying/greening configurations.
- In-bed heating or cooling for additional heat transfer capability.
- Special abrasion- and corrosion-resistant designs.
- Dust collection and emissions control equipment, including cyclones, baghouses, scrubbers, etc.

**FLUID BED COOLERS**

- Designed as standalone units or in combination with dryers.
- Trough air sweep design.
- In-bedplate or pipe coils.
- Exhauster water spray design.

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**Flash Dryers & Coolers**

Heyl & Patterson flash dryers are among the most efficient and cost-effective on the market. We have conventional designs available for powders and granular materials, as well as unique designs for materials which exhibit characteristics not normally conducive to fluid bed processing, such as sludges, filter cakes, agglomerates, etc. Factors such as particle size distribution and density, starting and final moisture content, product temperature, and the homogeneity of the material in the dryer are considered in the selection of the dryer. Various combinations of designs, applications and process materials can be fully tested in our research laboratory.

Renzburg fluid bed dryers are continuous flow processes which treat materials suspended in a rising gas stream. The flow of gas makes the solids being processed behave like a fluid. The fluidizing action exposes each particle fully and continuously to the drying gas stream, achieving a very high rate of thermal transfer and product movement. It is a technology which delivers effective, energy-efficient processing.

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**Agglomerators/Granulators**

Heyl & Patterson designs both rotary and fluid bed agglomerators/ granulators to process powder and bulk back to hard products into spherical pellets. Rotary units utilize the rotational element of a horizontal drum mounted at a slight incline to create agglomerates. Custom-designed rotary driers can provide short or long retention times, reaction processes, and controlled particle size through rotation speed and inclination. Fluid bed units typically combine drying with particle agglomeration or granulation by spraying the wet feed material onto a bed of used material. The fluidizing action then provides the means for efficient and thorough processing. The result of selective processing is a homogenous final moisture content and a high-quality commercial product with physical or chemical degradation. Special back-mixing equipment can also be installed for effectively feeding pasty or sticky products.

Several sizes of standard designs are available to handle feed rates ranging from 100 pounds per hour to 50 tons per hour. Complete testing in our research laboratory ensures the suitability of your actual processes with our various flash dryer designs.

Renzburg flash dryers are currently used to process a variety of materials, including chemicals, minerals, sludges, food stuffs and plastics.
Fluid Bed Dryers for Waste Biomass Product

Fluid Bed Dryers and Coolers technology which delivers effective, energy-efficient processing.

In a fluid bed, the material being processed is completely suspended and surrounded by a rising flow of gas, causing the material to act like a fluid. The gas stream is also the medium for heat and mass exchange. As a result of this gas-solid contact, very high rates of heat transfer are accomplished while gently handling the solids. The dryer’s bedplate uniformly distributes the gas stream during operation and supports the bed of material during shutdown. The final product moisture is a function of retention time and product temperature.

Two types of Fluid Bed Dryers & Coolers are available:

- **Trough-Type** employs a first-in/first-out “plug flow” method of product handling to ensure an average residence time for each product particle. This produces precise control of temperature levels and final product moisture. Trough designs are also readily adapted to in-bed indirect heat transfer techniques.
- **Circular-Type** has the additional advantage of back-mixing processed material with wet or sticky feeds to achieve uniform flow. Circular designs can be fitted into compact installations due to their small footprint.

Our fluid bed dryers can be refractory-lined for operation as culminators. They can also be installed in combinations and in pairs to enhance processing efficiency and productivity.

**FLUID BED FEATURES**

- Completely pneumatic fluidization – no moving parts to result in a very low-maintenance design.
- Pilot plant testing available.
- Relatively small equipment footprint.
- Low initial capital cost.
- Completely pre- and pre-approved NFPA-approved burner valve trains.
- Uniform product quality.

**FLUID BED COOLERS**

- Designed as standalone units or in combination with dryers.
- Trough air sweep design.
- In-bedplat pipe coils.
- Evaporative water spray design.

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- Combined drying/cooling configurations.
- In-bed heating or cooling coils for additional heat transfer capability.
- Special abrasion- and corrosion-resistant designs.
- Dual collection and emissions control equipment, including cyclones, baghouses, scrubbers, etc.

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Fluid Bed Dryers

Fluid Bed Dryers and Coolers

Fluid Bed Dryers are among the most efficient and cost-effective on the market. We have conventional designs available for powders and granular materials, as well as unique designs for materials which exhibit characteristics not normally available for powders and granular materials, as well as unique designs for materials which exhibit characteristics not normally available.

Our fluid bed dryers can be refractory-lined for operation as calciners. They can also be installed in combinations and in pairs to enhance processing efficiency and productivity.

Specifications

- Cylindrical design for back-mix flow, or rectangular design for plug flow.
- Fluidized-media design for sticky, lump or otherwise hard-to-handle materials.
- Units up to 18 feet in diameter.
- Intial gas temperature up to 220°F (100°C).
- Stainless steel or high-temperature alloy bedplate, or refractory brick dome design.
- Variety of control systems, from burner management only to complete PLC-based process control.

FLUID BED FEATURES

- Completely pneumatic fluidization – no moving parts to result in a very low-maintenance design.
- Pilot plant testing available.
- Relatively small equipment footprint.
- Low initial capital cost.
- Completely pre- and pre-tested to meet NFPA-approved burner water fame.
- Uniform product quality.

FLUID BED OPTIONS

- Combined drying/cooling configurations.
- In-bed heating or cooling coils for additional heat transfer capability.
- Special abrasion- and corrosion-resistant designs.
- Dust collection and emissions control equipment, including cyclones, baghouses, scrubbers, etc.

FLASH DRYERS & COOLERS

Flash Dryers & Coolers

Heyl & Patterson flash dryers are among the easiest to use and most efficient dryers available for processing many liquid and semi-liquid products. Flash drying is an extremely efficient way of removing moisture and/or volatiles from materials.

Specifications

- Completely pneumatic fluidization – no moving parts to result in a very low-maintenance design.
- Pilot plant testing available.
- Relatively small equipment footprint.
- Low initial capital cost.
- Completely pre- and pre-tested to meet NFPA-approved burner water fame.
- Uniform product quality.

FLUID BED COOLERS

- Designed as stand-alone units or in combination with dryers.
- Trough air-sweep design.
- In-bed plate heat exchangers.
- Evaporative water spray design.

About Fluid Bed Dryers

In a fluid bed, the material being processed is completely suspended and surrounded by a high velocity gas stream, causing the material to act like a fluid. The gas stream is also the medium for heat and mass exchange. As a result of this gas-solid contact, very high rates of heat transfer are accomplished while gently handling the solids. The dryer’s bedplate uniquely distributes the gas stream during operation and supports the bed of material during shutdown. The final product moisture is a function of retention time and product temperature.

Two types of Fluid Bed Dryers & Coolers are available:

- Trough-Type employs a film-in-flight or “plug flow” method of product handling to ensure an average residence time for each particle product. This produces precise control of temperature levels and final product moisture. Through designs are also readily adapted to in-bed indirect heat transfer techniques.
- Circular-Type has the additional advantage of back-mixing processed material with wet or sticky solids to achieve uniform flow. Circular designs can be fitted into compact installations due to their small footprint.

Our fluid bed dryers can be rainwater-resistant for operation as calciners. They can also be installed in combinations and in pairs to enhance processing efficiency and productivity.

FLUID BED OPTIONS

- Combined drying/cooling configurations.
- In-bed heating or cooling coils for additional heat transfer capability.
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- Special abrasion- and corrosion-resistant designs.
- Dust collection and emissions control equipment, including cyclones, baghouses, scrubbers, etc.

Special Abrasion- and Corrosion-Resistant Designs

- Special abrasion- and corrosion-resistant designs can be incorporated into our fluid bed dryers and coolers to perform high-temperature processing.
- Our fluid bed dryers and coolers are designed with select materials of construction to withstand high-temperature processing.
- We offer special abrasion- and corrosion-resistant designs to our fluid bed dryers and coolers to meet the needs of high-temperature processing.

Agglomerator/Granulators

Heyl & Patterson designs both rotary and fluid bed agglomerator/ granulators to process powder and bulk hand to handle products into spherical particles. Rotary units utilize the rotational element of a horizontal drum mounted at a slight incline to create agglomerates. Custom-designed rotary drums can provide short or long retention times, reaction processes, and controlled particle size through rotation-speed and inclination. Fluid bed units typically combine drying with particle agglomeration or granulation by spraying the wet feed material onto a bed of used material. The fluidizing action then provides the means for efficient and thorough processing.

The result of selecting Heyl & Patterson equipment is a homogeneous final moisture content and a high-quality, economically-processable product. Special back-mixing equipment can also be installed for effectively handling powdery or sticky products.

Several sizes of standard designs are available to handle feed rates ranging from 100 pounds per hour to 50 tons per hour. Complete laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process and our research laboratory ensures the suitability of your actual process.
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Minimizing Risks, Protecting Workers and Equipment

We work diligently to ensure the utmost protection measures are incorporated into everything we do, and take advantage of a facility’s available energy options for the utmost efficiency. The safety precautions built into our equipment collectively works against overall component failures, while shielding workers and equipment at optimum levels.

Heyl & Patterson, Inc. 400 Lydia St., Carnegie, PA 15106 PHONE 412-788-1900 | FAX 412-788-9822

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