Barge-Mounted, Mobile Rotary Dryer Used to Process Bauxite

The suitability of a material to a particular dryer design can be fully tested in our research laboratory. Capacities may vary depending upon the material being processed. Heating mediums include electricity, fuel oils and natural gas. Indirect-heat rotary dryers are available in steam tube designs and standard rotary models. When the standard rotary design is used, convection heat transfer is utilized. 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.

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. 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 a 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.

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.

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Fluid Bed Dryers

**FLUID BED**

**Fluid Bed Dryers and Coolers**

Technology which delivers effective, energy-efficient processing. A very high rate of thermal transfer and product movement. It is a drying process in which solid particles are uniformly distributed as a fluid. The gas stream is also the medium for heat and mass exchange. In a fluid bed, the material being processed is completely suspended and surrounded by a fluid gas stream, causing the material to act like a fluid. The gas flow can be both uniform and turbulent. 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 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 fixed-inlet-outlet “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 load 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 calciners. 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 results in a very low maintenance design.
- Pilot plant testing available.
- Relatively small equipment footprint.
- Low initial capital cost.
- Completely pre- and pre-tested NPSH-approved burner vapor trains.
- 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.

**FLUID BED COOLERS**

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

**Specifications**

- Cylindrical design for bulk-flow or rectangular design for plug flow applications.
- Fluidized-media design for sticky, lumpy or otherwise hard-to-handle materials.
- Units up to 18 feet in diameter.
- Inlet gas temperature up to 2200°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 ADVANTAGES**

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**Agglomerators/Granulators**

Heyl & Patterson designs both rotary and fluid bed agglomerators/ 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, reactor processes, and controlled particle size through rotation-speed and inclination. Fluid bed units typically couple 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.

**FLUID BED DRYERS & COOLERS**

Heyl & Patterson fluid bed dryers are among the most efficient and cost-effective on the market. We have conventional designs for powder and granular materials, as well as unique designs for materials which exhibit characteristics that normally conduct to fluid bed processing, such as slurries, filter cakes, agglomerates, etc. Factors such as particle size distribution and density, starting and final moisture content, product temperature, material characteristics, and other factors influencing drying characteristics are considered in the selection of the dryer. Various combinations of designs, applications, and process materials can be fully tested in our research laboratory.

Rennburg fluid bed dryers are continuous flow processes which treat materials suspended in a rising film of gas. 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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**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.

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Fluid Bed Dryer

**About Fluid Bed Dryers**

Fluid bed dryers are continuous flow processors which treat a large amount of material in the dryer at a high rate of heat transfer and product movement. As a result of this gas-to-solid contact, very high rates of heat transfer are accomplished while gently handling the solids. The dryer’s beatplate uniformly distributes the gas steam 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 feeding 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 fluid 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 calciners. They can also be installed in combinations and in pairs to enhance processing efficiency and productivity.

**FLUID BED FEATURES**

- High thermal efficiency – maximum heat utilization of drying gas stream
- Completely pneumatically fluidized – no moving parts to result in very low maintenance design
- Pilot plant testing available
- Relatively small equipment footprint
- Low initial capital cost
- Completely pre- and pre-approved NFPA-approved burner systems
- Uniform product quality

**FLUID BED OPTIONS**

- Combined drying/cooking 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.

**FLUID BED COOLERS**

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

**Specifications**

- Cylindrical design for back-mix-flow, or rectangular design for plug flow
- Fluidized media design for sticky, lumpy or otherwise hard-to-handle materials
- Units up to 18 feet in diameter
- Intal gas temperature up to 2200°F (1200°C)
- Stainless steel or high-temperature alloy beatplate, or refractory brick dome designs
- Variety of control systems, from burner management only to complete PC-based process control.

**FLUIDIZATION PRODUCTS**

- A high product to surface area ratio, efficient processing at low temperatures and minimal off gaseous emissions.

**MultiDisc® Thermal Processors**

The Heyl & Patterson MultiDisc® Thermal Processor is a cost effective and innovative method for indirectly drying and cooking bulk solids, using conduction-convection heat transfer principles. Indirect processing produces a high product to surface area ratio, efficient processing at low temperatures and minimal off gaseous emissions.

The MultiDisc® Thermal Processor is recommended for countless drying and cooking applications. Its innovative design reduces surface fouling, pluggage or chemical degradation.

**Features**

- Low initial capital cost
- Completely pre- and pre-approved NFPA-approved burner systems
- Uniform product quality
- Combined drying/cooking 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.

**Applicators/Translators**

Heyl & Patterson designs both rotary and fluid bed agglomerators/ 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-drum can provide short- or long retention times, reactions processes, and controlled particle size through rotation-speed and inclination. Fluid bed units typically dry 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.

**Flash Dryers & Coolers**

Heyl & Patterson flash, or instantaneous, dryers differ from conventional flash dryers because they employ the principle of instantaneous processing. This ensures that every particle’s residence time is proportional to its size and weight. The result of instantaneous processing is a homogeneous final moisture content and a high quality commercial product without 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 product with our standard flash dryer designs.

Reneburg flash dryers are currently used to process a variety of materials, including chemicals, minerals, sludge, food stuffs and plastics.

**Liquid Bed Dryers**

Heyl & Patterson 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 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 final product characteristics and innovative method for indirectly drying and cooling bulk solids, using conduction-convection heat transfer principles. Indirect processing produces a high product to surface area ratio, efficient processing at low temperatures and minimal off gaseous emissions.

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FLUID BED

**FLUID BED DRYERS**

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

**FLUID BED COOLERS**

- Hi-thermal efficiency – maximum heat utilization of drying gas stream
- 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-gridded and pre-1SSP (PNEP)-approved burner water trays
- Uniform product quality

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- Completely pre-gridded and pre-1SSP (PNEP)-approved burner water trays
- 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
- Dual collection and emulsions control equipment, including cyclones, baghouses, scrubbers, etc.

**Specifications**

- Cylindrical design for back-mix flow, or rectangular design for plug flow
- Fluidized media design for sticky, lumpy 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 designs
- Variety of control systems, from burner management only to complete PLC-based process control

**FLUID BED DRYERS**

- High-temperature fluid beds are recommended for materials which exhibit characteristics not normally conducive to fluid bed processing, such as slurries, filter cakes, agglomerates, etc. Factors such as particle size distribution and density, starting and final moisture content, product temperature, product solids content and other in-bed parameters are considered in the selection of the dryer. Various combinations of designs, applications and process materials can be further studied in our research laboratory.

**Reneburg Fluid Bed Dryers**

Reneburg fluid bed dryers are continuous flow processors which treat materials like a fluid. The gas steam is also the medium for heat and mass exchange. As a result of this gas to 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 fill-inflated-sea “plug flow” method of product handling to ensure an even residence time for each product particle. This produces precise control of temperature levels and final product moisture. Though designs are also readily adapted to bed indirect heat transfer techniques.
- **Circular-Type** has the additional advantage of back-mixing processed material which wet or sticky solids need 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 calciners. They can also be installed in combinations and in pairs to enhance processing efficiency and productivity.

**FLUID BED DRYERS**

- Designed for processing all types of materials, including foodstuffs and plastics.
- Chemicals, minerals, sludge, raw product with our various flash dryers.
- A high product to surface area ratio, efficient processing at low temperatures and innovative method for indirectly drying and cooling bulk solids, using spraying the wet feed material onto a bed of seed material. The fluidizing action then provides the means for efficient and thorough processing.

The MultiDisc® Thermal Processor is recommended for countless drying and cooling applications. Its innovative design reduces surface fouling, plugging and power consumption, effectively reducing overall operational costs.

**Combustion/Thermal Processors**

- The MultiDisc® Thermal Processor is a cost effective and innovative method for indirectly drying and cooling bulk solids, using combustion-convection heat transfer principles. Indirect processing produces a high product to surface area ratio, efficient processing at low temperatures and minimal off gas volumes.

**MULTI-DISC® THERMAL PROCESSORS**

The MultiDisc® Thermal Processor is recommended for countless drying and cooling applications. Its innovative design reduces surface fouling, plugging and power consumption, effectively reducing overall operational costs.

- **Combustion/Thermal Processors**

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- **FLUID BED DRYERS**

Heyl & Patterson fluid bed dryers are among the most efficient and cost-effective on the market. We have conventional designs available for processing a wide variety of materials, including sludges, filter cakes, agglomerates, etc. Factors such as particle size distribution and density, starting and final moisture content, product temperature, product solids content and other in-bed parameters are considered in the selection of the dryer. Various combinations of designs, applications and process materials can be further studied in our research laboratory.

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**Two types of Fluid Bed Dryers & Coolers are available:**

- **Trough-Type** employs a fill-inflated-sea “plug flow” method of product handling to ensure an even residence time for each product particle. This produces precise control of temperature levels and final product moisture. Though designs are also readily adapted to bed indirect heat transfer techniques.
- **Circular-Type** has the additional advantage of back-mixing processed material which wet or sticky solids need 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 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, lumpy 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 designs
- Variety of control systems, from burner management only to complete PLC-based process control
Barge-Mounted, Mobile Rotary Dryer Used to Process Bauxite

Laboratory. Of a material to a particular dryer design can be fully tested in our research employed. Heating mediums include electricity, fuel oils and natural gas. Models. When the standard rotary design is used, convection heat transfer is addition, steam-heated clean air and flue gases may be used as a heating medium. Direct-heat rotary dryers can operate on fuel oils, natural gas, propane or coal. In utilization both direct and indirect heat sources and are available in either parallel flow Renneburg rotary dryers are available in several sizes and types. Standard designs manufacture a rotary dryer that will meet all your application objectives. Applications and designs can be investigated in our testing facility. Whatever 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 models. When the standard rotary design is used, convection 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.

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

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Since 1887, Heyl & Patterson has provided custom-engineered thermal processing and bulk transfers 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. 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, lighting design, temperature range, air requirements, furnace design and a number of other factors. A cooler uses chilled air or water as a cooling medium to lower the temperature of a hot substance to a level at which it can be more easily handled. A dryer and cooler can also be combined to deliver extra processing efficiency and productivity.
Barge-Mounted, Mobile Rotary Dryer Used to Process Bauxite

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Indirect-heat rotary dryers are available in steam tube designs and standard rotary models. When the standard rotary design is used, convection heat transfer is utilized. Additions, exhaust or boiler flue gas may be used as a heating medium.

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. Direct-heat rotary dryers are capable of handling almost any bulk solid material regardless of its conveyance properties, 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. Whatever 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.

Heyl & Patterson rotary dryers are among the most versatile dryers available, capable of handling almost any bulk solid material regardless of its conveyor and handling characteristics. Our rotary dryers can be configured to meet a 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. Whatever 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.

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To request further information, visit www.heylpatterson.com or call today.

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