Processing Solutions for Mined Minerals

Carrier specializes in the design and manufacture of custom heavy-duty equipment for processing and handling a wide variety of minerals mined from the ground. Whether mined minerals need to be dried, moved, screened or reclaimed, our processing equipment has proven reliable, durable and efficient for mining operators around the world.

We understand the unique issues of processing mined materials, and our team of engineers has the experience to solve them. From lightweight aggregates to heavy ores, mining operations trust our expertise and reliable equipment. Carrier offers a variety of mining and mineral processing equipment including fluid bed dryers and coolers, flash dryers, tornesh dryers, feeders, screeners, conveyors, and bin and pile dischargers.

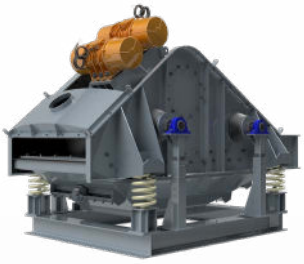
Heavy-Duty Equipment for Processing Minerals:

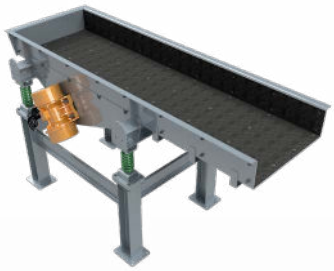
- Vibrating Feeders
- Vibrating Screeners
- Vibrating Fluid Bed Dryers & Coolers
- Tornesh & Flash Dryers
- Vibrating Conveyors
- Vibrating Bin & Storage Pile Dischargers

Carrier®
Vibrating Equipment, Inc.

Vibrating Feeders

Heavy-duty vibrating feeders are suitable for unloading hoppers and piles and transferring minerals and ores. Available in economical and efficient direct drive units, natural frequency feeders for higher capacities, and Grizzly feeders to scalp large, heavy rocks and ores without becoming clogged.





Features & Benefits

- Heavy-duty designs to handle headloads and large capacities
- Fixed or adjustable feed rates provide versatility for different process requirements
- Natural frequency drive units maintain stroke under headload for reliable operation

Options

- Heavy-duty grizzly deck
- Scalping or screening decks
- Removable dust-tight covers
- Overhead drives
- Feed Hoppers
- Supported from below or suspended from above

Grizzly Feeders

Grizzly feeders feature bars made from heavy steel and load plates lined with rubber to absorb impact of large material.

Vibrating Screeners

Vibratory screeners are designed to screen, scalp, feed, dewater, or separate materials. Multiple decks can be incorporated into the unit to efficiently separate materials of varying size.

Features & Benefits

- Robust designs for reliable operation and maximum screening efficiency
- Custom screening deck designs
- Elliptical or circular motion designs for increased efficiency
- Tuned, two-mass, natural frequency and brute force designs to handle a variety of materials

Isolation Arrangements

Supported from below or suspended from above with steel coil or soft rubber isolation springs to isolate vibration from the structure.

Options

- Custom screening media
- High-temperature designs
- Removable dust-tight covers
- Variety of discharge designs
- Multiple decks and/or ball decks

Vibrating Fluid Bed Dryers & Coolers

Vibrating fluid bed dryers are specially designed to provide dry products at specifically required moisture levels. Vibration aids in the fluidization of sticky and wet minerals. Carrier offers custom vibrating fluid bed units to accommodate your process thermal load requirements.

Features & Benefits

- Optimized fluidizing velocity and vibration provides maximum energy efficiency
- Plug flow delivers consistent first-in, first-out output of materials
- High temperature designs provide minimal footprint and maximum efficiency
- Zoning allows multiple functions such as simultaneous drying, classification, and cooling to be performed

Patented Delta-Phase® Drive

Make on-line changes to the angle of vibration for precise control of retention time.

Options

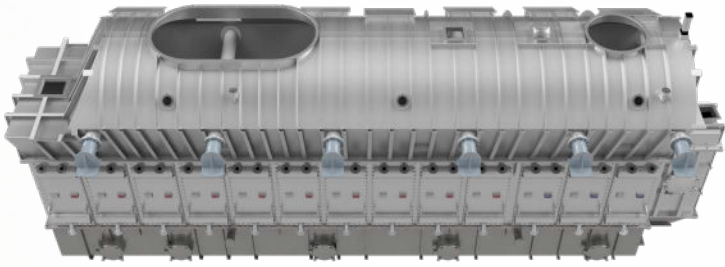
- Patented Delta-Phase® drive
- Variety of fluidizing deck designs
- Re-circulated gas and closed-loop systems
- Access manways/doors
- Custom controls

Static Fluid Bed Dryers

Static fluid bed dryers are ideally suited for minerals with a smaller size fraction, such as washed crushed coals or fines. Lower rank coals such as sub-bituminous, PRB, or lignite coals that tend to thermally breakdown while being dried are efficiently processed with static fluid bed dryers.

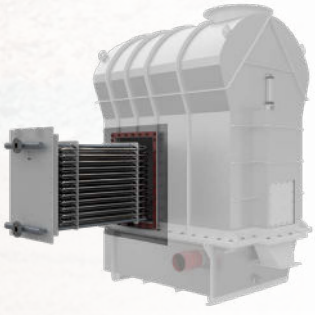
Features & Benefits

- Efficient fluidizing design for optimal heat transfer with low energy consumption
- Zoning allows multiple functions such as simultaneous drying, classification, and cooling to be performed
- Material is continuously mixed while in the bed, creating uniformity in drying and blending



Options

- Immersed heat exchangers
- Variety of fluidizing deck designs
- Custom system arrangements
- Access manways & doors
- Custom controls

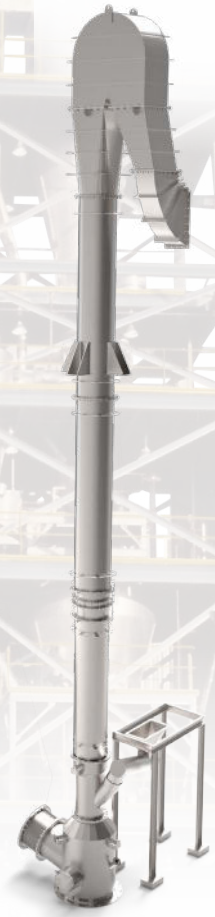


Immersed Heat Exchanger

Immersed heat exchanger tubes can be added to the fluidized bed area for indirect heat transfer for both drying and cooling.

Flash Dryers

Conventional flash dryers offer quick drying and are ideal for drying fine powders. Recirculating the process gas greatly enhances the efficiency and can be beneficial for drying a wide variety of minerals.



Features & Benefits

- High gas temperature and active heat exchange design quickly dries and simultaneously transports materials
- Flash design is capable of processing high capacities of wet materials in a relatively small amount of space
- Pneumatic conveying while flash drying eliminates any additional equipment

Cage Mills & Slingers
Optional cage mills or mechanical slingers provide deagglomeration of lumps.

Options

- Cage mills or mechanical slingers for deagglomeration
- High temperature designs

Tornesh Dryers

Tornesh flash dryers provide longer retention time and higher drying efficiency than conventional flash dryers. Its feeding-dispersing chamber creates a multi-phase, cyclonic flow of gas and powder to help break up agglomerates.

Features & Benefits

- Innovative design provides quick drying of wet minerals
- Feeding-dispersing chamber generates cyclonic flow of gas/solids for increased residence time
- Adjustable retention time provides precise process control
- Process gas can be re-circulated to reduce emissions, save energy or recover vapors

Options

- Custom feed designs
- Expansion chambers
- Single-stage & two-stage dryers

Feed Chamber Basket
The feed chamber basket is customized with specially designed directional holes to generate spin.

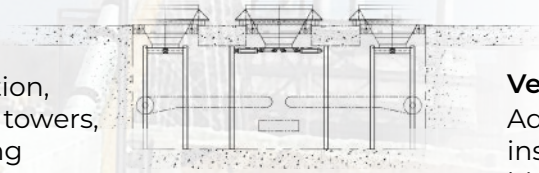
Vibrating Storage Pile Dischargers

Storage pile dischargers are proven to enhance the flow of dry bulk materials from storage. Its sloped, heavy steel drawdown skirt maintains constant vibratory contact with the bulk solids and transmits impulses from bottom to the top. This typically produces a drawdown angle greater than its natural angle of repose to increase the live storage area and eliminate flow stoppages.

Features & Benefits

- Unique design increases “live” storage area of stockpiles reducing the need for reclaiming material from above
- Vibratory design efficiently discharges sluggish materials such as limestone, coal and sulfur from storage piles
- Cycle-basis design cycles a few seconds per minute for efficient, low-energy consumption

Options



- Adaptable to any existing installation, such as flat bottom bins, stacking towers, reclaim piles, and rail car unloading
- Various diameters and capacities available

Versatile Configurations
Adaptable to any existing installation, such as flat bottom bins, stacking towers, reclaim piles, and rail car unloading.

Vibrating Bin Dischargers

Vibratory bin dischargers are proven to enhance the flow of dried minerals from storage silos and bins. Plug flow is achieved without ratholing, segregation or bridging. Available configurations include vibrating bin discharger, vibrating live bins and live bottom hoppers.

Features & Benefits

- Suspension system with heavy-duty hanger arms isolates silos/hoppers from the vibrating forces
- Internal pressure cone provides the energy transmission necessary for positive material flow
- 45° heavy-duty outer cone for structural rigidity
- Simple vibratory drive for quiet, reliable operation

Options

- Molded neoprene Super Seal or Simple Seal inlet sock
- Pressure or vacuum units
- Variety of motor classifications
- Bolted expansion joints

Sealed Inlet Socks
Molded neoprene Super Seal or Simple Seal inlet sock with built-in skirt provides a flexible sealed connection between the bin discharger and hopper.

Complete System Integration for Mining & Mineral Processing

Carrier Vibrating Equipment can help with the design and selection of additional processing equipment for mining process operators.

Engineering & Manufacturing

- Technology profile of over 150 patents
- Equipment designs are verified using Finite Element Analysis (FEA) to ensure trouble-free service and long life
- 3D equipment modeling
- State-of-the-art manufacturing facilities on 3 continents with robotic cutting and welding
- Manufacturing expertise working with mild steel, various grades of stainless steel, duplex steels and other exotic alloys for specialty applications
- Welders certified to ASME & AWS standards
- ISO 9001:2015 certified

Lab Testing

Be confident that your processing is efficient with CPEG's 15,000 ft^2 state-of-the-art test lab. With our lab, you have access to the most extensive testing capabilities in the industry. Multiple pieces of equipment can be combined for multistep and multistage testing to simulate field operation, validate new equipment designs and provide complete process solutions. Combined with our full analysis of material characteristics and measurements of material behavior in specific processing applications, you are assured an efficient, reliable and safe solution, all backed by our process warranty. Field testing with rental equipment is available when lab testing would not effectively simulate process operating environments.

Aftermarket Parts & Services

Carrier offers a full line of aftermarket parts for its equipment. Our Aftermarket Sales Team will assess your parts needs and recommend the best solution. Our engineers are available to assist in any redesign or retrofit your existing equipment for new applications.

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