

Vibrating Fluid Bed Processors

For Heating, Cooling, Drying or Moisturizing
Your Processed Material.



Bulletin No. 1200

carman[®]
Industries, Inc.

Vibrating Fluid Bed Processors:

A Carman Vibrating Fluid Bed Processor is the perfect way to heat, cool, dry, or moisturize your bulk solid material. By passing controlled process air up through the material bed of the Vibrating Fluid Bed Processor, the material is percolated like a gently boiling fluid. (See photo). The solid particles undergo intensive intermixing, as process air surrounds each particle, permitting direct heat and/or moisture transfer between the air and the particles.

It is this intimate contact between air and material particles which makes a fluidized bed the most efficient convection heat and moisture transfer process.

The Carman Vibrating Fluid Bed Processor offers you:

- Process flexibility
- Lower operating costs
- Lower initial capital expenditure
- More reliability, less downtime
- Lower maintenance costs



The Most Cost Effective Heat Transfer Process

Vibration Adds Several Benefits

- Vibration provides the necessary agitation to assist fluidization of some materials which might not otherwise fluidize.
- Vibration provides uniform forward movement of the material bed, so the material is processed on a first-in/first-out basis. Variances in particle residence time are thereby reduced, ensuring uniform processing of the material.
- The positive forward movement of the product through the heat transfer area eliminates deck pluggage and allows the unit to be self-cleaning at the end of each run.
- Startup and shutdown are simplified.

Individually Designed Based On Testing

Your Carman Vibrating Fluid Bed Processor will be designed specifically for your application. With complete laboratory testing facilities, Carman can determine the exact size of equipment required to achieve your desired results.



Carman Testing Laboratory

Each Carman Processor sold with laboratory testing includes a process warranty, insuring the unit will perform to your requirements.

We will also work with the Cost Conscious Manager to improve operating efficiencies by suggesting appropriate design scenarios for your process, such as exhaust air recycling, air-to-air heat exchangers, heating/cooling coils submerged in fluidized bed for additional direct heat transfer.

Total Systems Capability

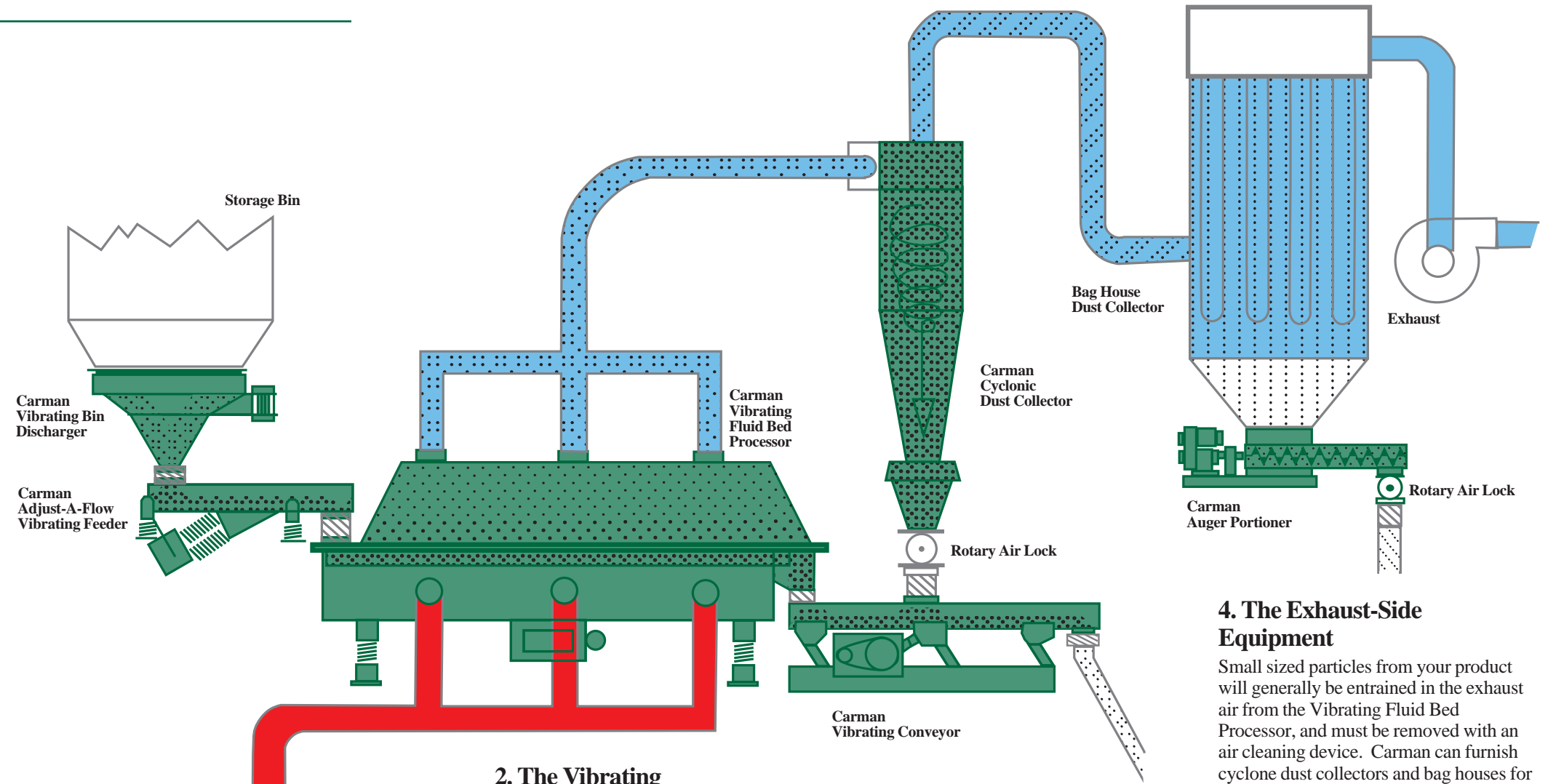
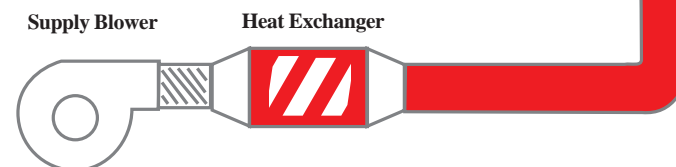
A typical heat transfer processing system (see diagram) consists of four major sub-systems:

1. The Supply-Side Equipment
2. The Vibrating Fluid Bed Processor
3. The Process Control System
4. The Exhaust-Side Equipment

Carman can provide the entire system or any portion of it. And Carman will provide the interface engineering between components for quick installation and trouble-free operation.

1. The Supply-Side Equipment

The equipment required for this portion of the system depends upon the process air requirements and the available in-plant resources. Carman can furnish components such as centrifugal fans, air filters, gas or oil burners, steam coils with control valves, water chiller packages, humidifiers, dampers, air flow measurement and system ductwork.



2. The Vibrating Fluid Bed Processor

The Carman Vibrating Fluid Bed Processor is designed to adapt easily to any type air handling equipment involved in the system. The adjustable features of the Carman design allows the Vibrating Fluid Bed Processor to be altered in the field, should application requirements change.

3. Process Control System

Carman has developed several precise and economical control methods. Carman can provide the complete control package or engineering only for interfacing with plant computer control systems.

4. The Exhaust-Side Equipment

Small sized particles from your product will generally be entrained in the exhaust air from the Vibrating Fluid Bed Processor, and must be removed with an air cleaning device. Carman can furnish cyclone dust collectors and bag houses for this purpose. Or, if you prefer to provide these items, Carman can recommend the equipment necessary for the anticipated dust loading.

The Carman Vibrating Fluid Bed Processor

Individually designed to install quickly and stay on-line.

Exhaust Hood

Process air passing through the material is collected in the exhaust hood and removed. The extra large Carman hood, available with single or multiple outlets, minimizes undesirable entrainment of fine particles. Available features include sampling ports, high temperature glass inspection windows, and access doors.

Plenum Chamber

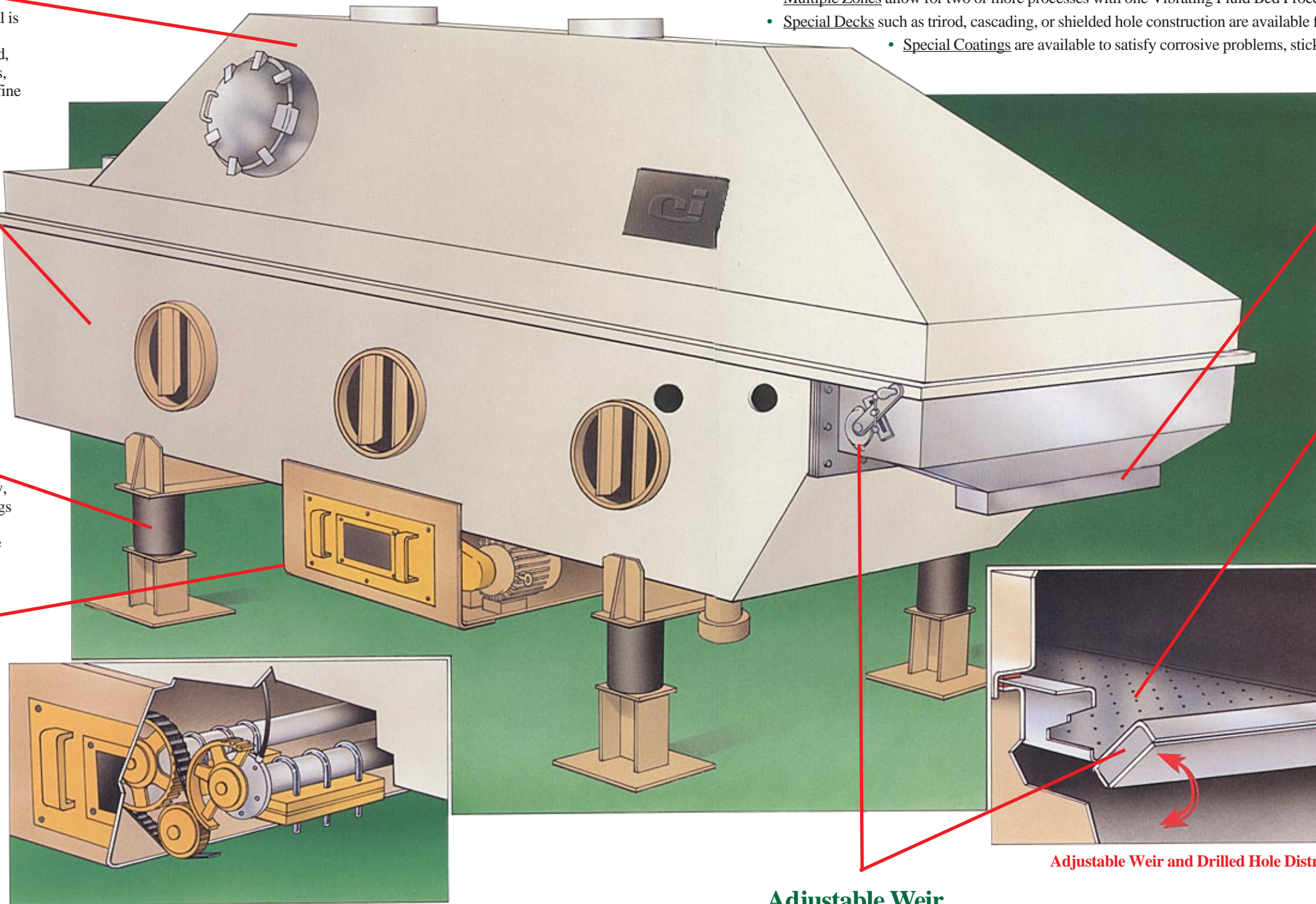
Air enters the plenum chamber through air intake nozzles on either side of the unit. Intake nozzles are furnished complete with flexible rubber socks for easy installation and alignment. Air is evenly distributed through the deck and material to provide uniform fluidization and heat transfer. Clean out door and drain are included at the discharge end.

Isolation System

The Carman design features heavy duty, solid rubber or steel coil isolation springs designed to minimize transmitted vibrations. Structural steel supports are included for secure floor mounting.

Force Vector Drive

Counter-rotating shafts with eccentric weights provide the harmonic driving force for the Carman Vibrating Fluid Bed Processor. Adjustable attack angle, frequency and stroke provide maximum conveying speed flexibility. Vibrating service bearings are conservatively sized for reliable, low maintenance operation.



Force Vector Drive

Optional Features

- Insulation is available for high temperature applications.
- Sanitary Construction may be specified to meet FDA approval.
- Multiple Zones allow for two or more processes with one Vibrating Fluid Bed Processor.
- Special Decks such as trirod, cascading, or shielded hole construction are available for applications where required.
- Special Coatings are available to satisfy corrosive problems, sticky products and other special needs.

Material Infeed & Discharge Spouts

Spouts are designed to accommodate your adjacent material handling equipment. Flexible rubber socks are included with stainless steel band clamps.

Drilled Hole Distributor Plate

Solid steel construction of the Carman distributor plate ensures ruggedness and durability. One-piece design has no joints to hamper material flow. Individual design of drilled hole pattern allows for the most efficient combination of pressure drop and hole velocity. Produces uniform fluidization with no channeling or product weepage through deck.

Adjustable Weir and Drilled Hole Distributor Plate

Adjustable Weir

Allows precise control of material depth; lowers for complete cleanout.

Carman Vibrating Fluid Bed Processors On-The-Job In These Industries



Testing/Pilot Plants

Accurate drying, heating, cooling, dedusting, crystallizing and moisturizing tests can be performed in our lab or at your own facility. Bulletin #2012 details this system which is available on a rental basis.



Chemical Industry

This Model FBP-202 2-Zone Vibrating Fluid Bed Processor is fed by a Model BF36HD6 Feeder with triangular slotted bar dewatering deck. This system, specially designed for handling a heat sensitive product, dries from 35% to 0.5% moisture using 150° F air and cools to 80° F using chilled air.



This custom designed 5'-9" wide by 24' long high pressure Vibrating Fluid Bed Processor includes 304 stainless steel construction, bolt-on high temperature drive, underflow weir, instrumentation nozzles, expanded hood, continuous plenum discharge, and skinned thermal insulation.

Foundry Industry

This 5' wide by 18' long dynamically counterbalanced and isolated Vibrating Fluid Bed Processor includes natural frequency spring system and positive arm eccentric shaft piston drive. Cooling of hot shakeout sand is enhanced by evaporation of moisture in the sand. Cool, dry sand is screened at the discharge end to remove tramp iron and core butts.



Mineral Industry

Solar salt is dried from 3% to .1% moisture and cooled to 100° F with this 2-Zone Model FBP-1594 Vibrating Fluid Bed Processor. To optimize thermal efficiency, hot air from the cooling zone is cleaned and recycled for drying. Corrosion resistant features include 316L stainless steel construction, rubber spring isolation system and totally enclosed Force Vector Drive.



Food Industry

To assure product purity, this 6' wide by 40' long Vibrating Fluid Bed Processor removes 40% moisture using indirectly heated drying air. Product contact surfaces are fabricated of 304 stainless steel to meet FDA standards. Exterior surfaces are insulated to increase energy efficiency.



Various grades of bread crumbs are dried and toasted at capacities up to 10,000 PPH on this Model FBP-1322 Vibrating Fluid Bed Processor. Independently controlled heat zones optimize throughput and thermal efficiency. Cooling zone eliminates condensation problems during storage and packaging.



Plastic & Tile Industries

Recycled PET is dried, preheated and crystallized on this Model FBP-562 Vibrating Fluid Bed Processor. Standard construction includes access doors, sample ports, internal lump breakers, thermal insulation, rubber spring isolation system and Force Vector Drive. Similar systems preheat limestone and recycled floor tile prior to extrusion.



Other Carman Vibratory Equipment

Carman manufactures the most complete line of vibratory material processing equipment in the industry. For more information, call and ask for the bulletin listed under the product you're interested in.

Adjust-A-Flow Vibrating Feeder



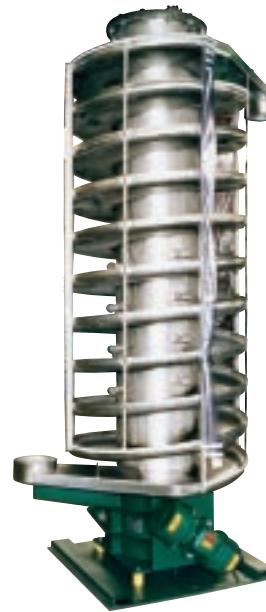
Feed, Meter, Scalp, Charge or Distribute.

- Rugged design well suited for impact loading and handling sticky materials.
- Non-resonant drive.
- Designed and constructed to suit application.
- Isolation system reduces force transmissions.
- Variable capacity control.

Ask for Bulletin No. 610



Vibrating Spiral Elevator



Heat, Cool, Dry, Cure, Dewater, or Quench While Elevating.

- Long retention with minimal floorspace requirements.
- Direct or indirect processing capability.
- Integral isolation system minimizes force transmission.
- Non-resonant drive with long-life vibrating service motors.
- Process Guarantee.

Ask for Bulletin No. 910



Vibrating Conveyor



Convey, Inspect, Orient, Pick, Screen, Clean, Cool, Dry, Feed, Fluidize, Freeze, Heat, Mix, Quench, Size or Sort.

- "Natural frequency" spring system.
- "Positive arm" drive.
- Standard-duty, fiberglass leaf spring or heavy-duty coil spring designs available.

Ask for Bulletin No. 700



Vibrating Bin Discharger



Eliminate Bridging, Ratholing and Segregation. Maximize Hopper Volume.

- Custom applied hanger arms and internal pressure cone.
- Double clamps eliminate leakage of fine product.
- Long-life vibrating service motor.
- Guaranteed performance.

Ask for Bulletin No. 365



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