

Bulk Flow *Heating / Cooling Exchangers*

Carrier Vibrating Equipment provides highly-efficient indirect bulk flow heating, cooling and conditioning technology for bulk solids. Since no moving parts contact the product during the heat transfer process, and little to no process air is utilized, Carrier's indirect technologies deliver a cost-effective method of heat transfer for a variety of materials.

Each unit is designed and engineered to meet your unique processing challenges and applications. Our Bulk Flow Heating and Cooling Exchangers are ideal for temperature-sensitive materials that require a long residence time. Sweep gas can be used to evacuate any moisture or volatiles which may be released.



Bulk Material Heat Exchanger (BMHX)

Vibro Heat / Cool Exchanger (Vibro-Q)

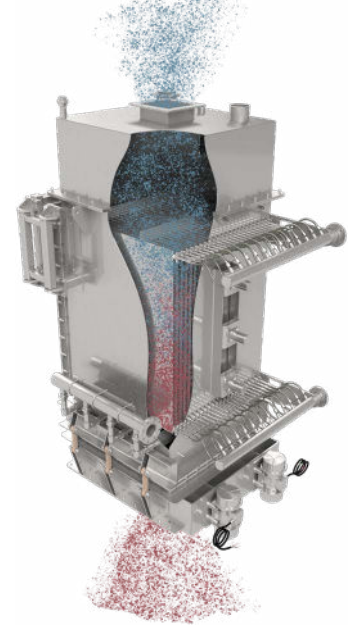
Typical Applications for Bulk Flow Heating and Cooling Exchangers:

- Biosolids
- Salt
- Minerals
- Metal Ore
- Catalysts
- Chemicals
- Fertilizers
- Sand
- Foundry Sand
- Proppants
- Plastic Pellets
- Food Products

Carrier[®]
Vibrating Equipment, Inc.

BMHX Features & Benefits

- Indirect heating/cooling design provides intimate contact between solids and plate coils for maximum efficiency
- Counter-current fluid-to-material flow ensures even heating or cooling of bulk material solids
- Adjustable feeder on the discharge provides precise control of product flow rate and residence time
- Little to no air exhaust eliminates the need for ancillary fans and air filtration systems in most cases
- No moving parts within product contact reduces maintenance costs



Advantages: Bulk Flow Heating / Cooling Exchangers

Energy Efficient

BMHX uses gravity to move the material and does not rely on large amounts of process air minimizing energy use compared to other methods.

High-Quality Product Output

Material moves slowly and efficiently in a plug flow through the unit to prevent product degradation and equipment abrasion. Its design delivers consistent product residence time.

Low Operational Cost

Operating without moving parts and few ancillary components makes the BMHX a low maintenance machine. It's designed for easy cleaning and part replacement, reducing downtime and expenses.

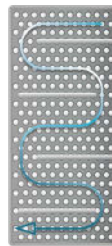
Small Footprint

Designed to move the product vertically, the BMHX has a small footprint compared to other technologies. This allows it to fit into existing plants with minimal retrofitting.

BMHX Key Components

Plate Coil Design

A series of plate coils circulate heat transfer fluid through the unit in a counter-current flow pattern. Intimate contact between the plates and the bulk solids provides highly efficient indirect heating or cooling.



Stainless Steel Fluid Lines

Heat transfer fluid lines are made of flexible stainless steel to accommodate any thermal expansion.



Uniform Mass Flow Feeder

The mass flow discharge feeder delivers a consistent and uniform product by regulating the flow rate and residence time.



Access Doors

Access doors provide quick access for easy cleaning and maintenance.

PLC Control System

Optional PLC control system records and controls temperature levels and discharge rates to ensure material specifications are met.

Optional Aeration or Vibration

Aeration or vibration can be added to the heating/cooling tower to help sluggish materials move more freely.



Vibro-Q Features & Benefits

- Movement of solids between heat transfer pipes provides highly efficient bulk flow heat transfer
- No moving parts in product contact
- Easy to clean and maintain
- Horizontal configuration provides a low profile installation where height constraints are an issue
- Unique and gentle vibration efficiently wipes the sidewalls to minimize buildup
- Versatile design accommodates fine particles (<100 microns)

Advantages: Bulk Flow Heating / Cooling Exchangers

Temperature-Sensitive Product

The Vibro-Q provides heating and cooling of temperature sensitive product with its low temperature and long residence time.

Unique Vibratory Motion

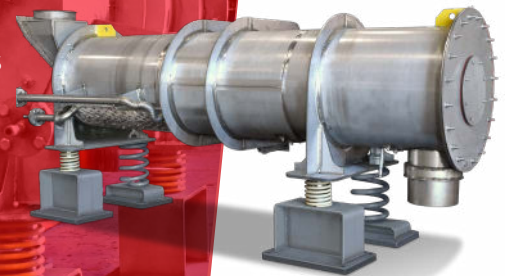
Steel coil isolation springs and a gearbox-driven eccentric weight drive produces a unique vibratory motion ensuring the product moves slowly through the machine in a gentle, well-mixed, sub-fluidized state.

Uniform Mixing

Thorough mixing of product between the tube bundle delivers uniform product temperature and maximizes heat transfer efficiency.

Little To No Emissions

Since moving air is not used in the heating or cooling process, the Vibro-Q is ideal for plants with strict emission regulations.



Vibro-Q Key Components

Heat Transfer Pipes

Pipe bundles are bolted into the vibrating drum assembly and allow intimate contact with flowing bulk solids material.



Materials of Construction

Material contact surfaces can be fabricated from a number of materials such as carbon steel, stainless steel, and other alloys for high temperatures and/or corrosion resistance.



Direct Drive

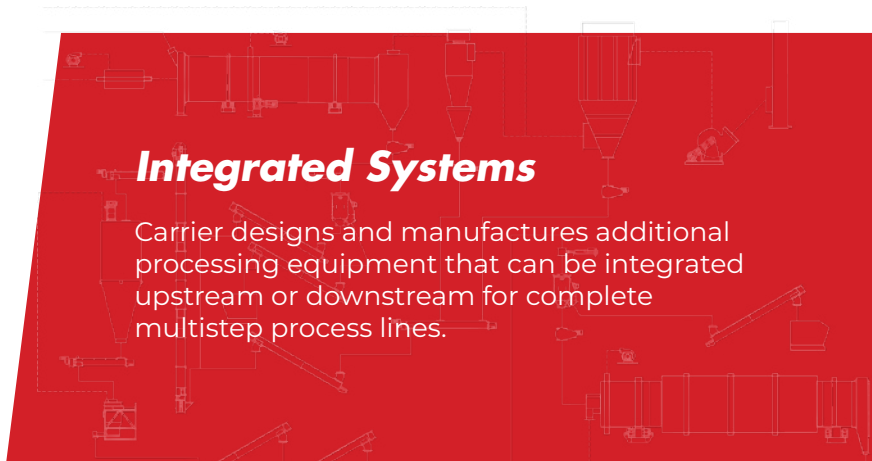
Direct drive with forward conveyance ensures consistent material flow.

Sweep Gas (Optional)

Sweep gas can be used to evacuate moisture or volatiles.

Integrated Systems

Carrier designs and manufactures additional processing equipment that can be integrated upstream or downstream for complete multistep process lines.



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 powder and bulk solids processing is efficient with CPEG's 15,000 ft² 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.

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