DYNAMIC AIR®
Conveying Systems

Vacuum Conveying Systems

Four Types of Vacuum Conveying Systems for Different Applications

When headroom is a major concern or at a premium, such as rail car and hopper bottom truck unloading, the Dynamic Air Vacuum Conveying System is the material handling system of choice.

If you are considering a vacuum system, you may be pleased to know that Dynamic Air offers you four different types of vacuum systems to suit your specific application:

- The ***HDV™ 8000*** Series High Density Vacuum System
- The ***HDV™ 6000*** Series High Density Vacuum System
- The ***LDV™ 4000*** Series Low Density Vacuum System
- The ***LDV™ 2000*** Series Low Density Vacuum System

Each system has its own set of operating characteristics, capabilities and limitations.

Each system also has its distinct advantages, depending upon the type of material to be conveyed and your specific requirements.

Our strong commitment to research and development has now made it possible to vacuum convey some materials once thought impossible to convey!

Comprehensive and Versatile Systems Provide High Performance, Reliability and Efficiency

Dynamic Air has sold over 9,000 pneumatic conveying systems worldwide. We have many years of experience in designing and building different types of pneumatic conveying systems for a wide variety of applications. This broad range of technology helps assure you that Dynamic Air can meet your special requirements by providing a custom-designed system, using standard components, with a high degree of performance and reliability.

Our systems are very comprehensive and versatile for handling many types of dry bulk granular materials such as sand, salt, sugar, dolomite, coffee, detergent, carbon black and cement, just to name a few. With our highly technical and very thorough testing facility, we can fully test and analyze your material to determine exact handling characteristics. These include conveyability, conveying rates, optimum air-to-material ratios, degradation, segregation, air consumption, air pressures, buildup tendencies, flowability and other special attributes that may concern you.

In addition, our strong commitment to research and development to provide better and newer products has now made it possible to vacuum convey some materials once thought impossible to convey. Also, our philosophy is to develop products that easily retrofit to existing Dynamic Air systems, so you can update your system whenever new products become available. Our ultimate goal is to make our customers more competitive, and designing and building better and more efficient systems is our way of making this happen.

Four types of vacuum conveying systems

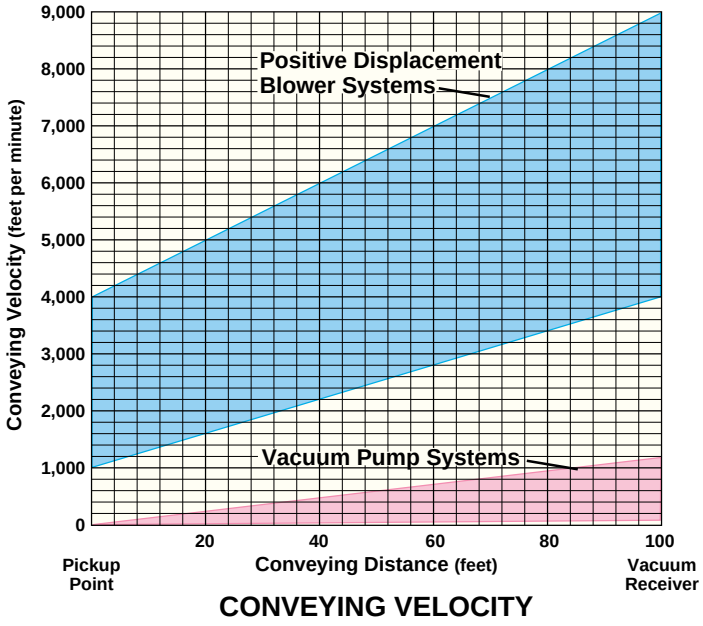
The Basics of Vacuum Conveying Systems

The basic components of any vacuum conveying system are the pickup nozzle, conveying line, vacuum filter/receiver and the vacuum generator. The heart of the system is the vacuum generator, which is the power source. The vacuum generator creates the required negative pressure in the conveying line and vacuum filter/receiver.

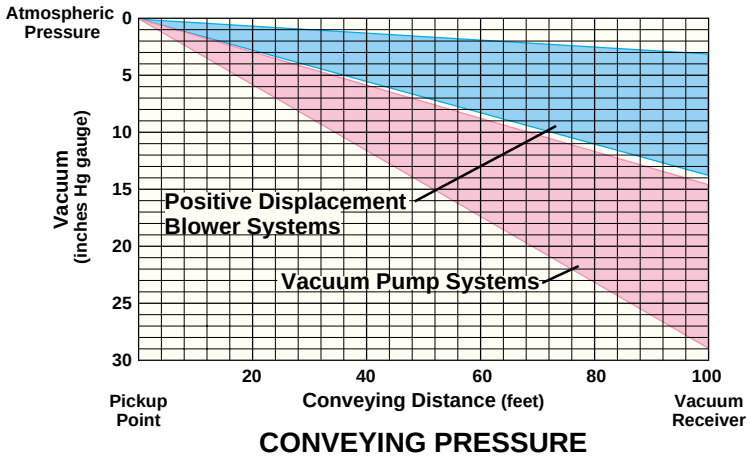
The type of vacuum generator chosen, which can be a fan, positive displacement blower or vacuum pump, will determine the maximum negative pressure that can be generated and the overall capability of the system. It will also determine the system's efficiency and general operating characteristics.

During operation, the material to be conveyed is pulled through the conveying line and into the vacuum filter/receiver by the air flow created by the vacuum generator. When the material reaches the vacuum filter/receiver, the conveyed material drops by gravity into the hopper of the vacuum filter/receiver. The conveying air is then separated from the conveyed material by passing through the filter media in the vacuum filter/receiver.

When continuously discharging material from the vacuum filter/receiver, a rotary airlock or gatelock is utilized to maintain the proper vacuum required for conveying. For batch discharging, only a simple outlet valve is required. During the conveying process, the conveying velocity is always lowest at the beginning of the system, which is the pickup point. The conveying velocity then gradually increases and is highest at the end of the conveying line.



CONVEYING VELOCITY



CONVEYING PRESSURE

Conversely, the air pressure is highest at the pickup point and gradually decreases with distance, and is lowest at the end of the conveying line.

It is important to understand that the overall performance of a vacuum conveying system and the general conveyability of any given material will vary depending upon its physical characteristics, such as particle size, moisture content, bulk density, etc.

to choose from . . .

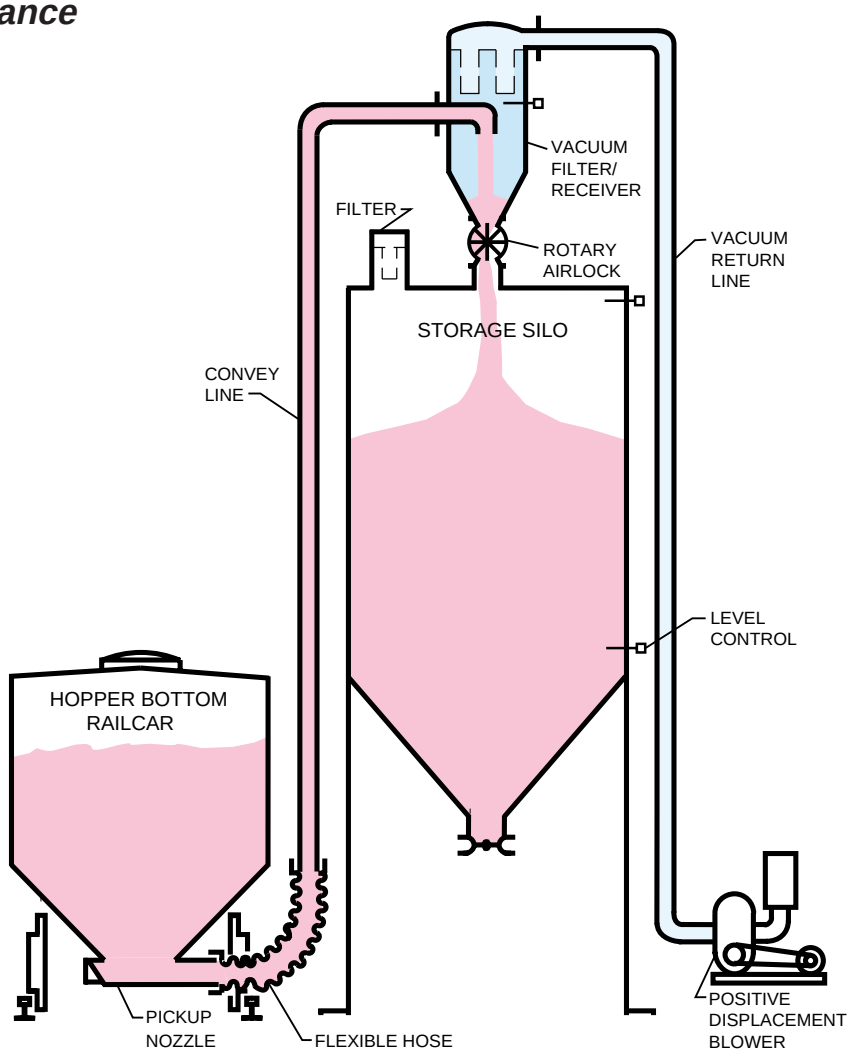
The LDV™ 2000 Vacuum System

low density, lower performance

The LDV 2000 vacuum conveying system is the most basic and lowest priced vacuum system offered by Dynamic Air. It is best suited for vacuum conveying of materials where degradation or wear is not of a particular concern, but low initial cost is.

The LDV 2000 system is normally designed to vacuum convey at a higher air-to-solids ratio and a higher conveying line velocity than any of the other Dynamic Air vacuum systems. Its simple design has less moving parts, resulting in a lower investment cost. Most non-abrasive, fine, granular, low bulk density, fibrous and/or large light particle materials can be easily handled in the LDV 2000 system.

The LDV 2000 vacuum conveying system requires a minimum starting, or pickup, velocity of about 2,000 to 4,000 feet per minute. The conveying velocity then increases to a higher terminal velocity at the end of the system from about 6,000 to 9,000 feet per minute. Due to air pressure limitations, practical conveying distances should generally be limited to about 500 lineal feet.



How the LDV 2000 System Works

Primary components in the system include a pickup nozzle at the beginning of the system; a method to control material flow; a vacuum conveying line with couplings and tubing bends; a vacuum filter/receiver; a secondary filter and a positive displacement blower. The positive displacement blower, which is used as the power source, produces vacuum levels to about 14 inches of mercury. For continuous conveying applications, a rotary airlock or optional gatelock hopper is installed at the end of the system.

All the air needed to convey the material is added at or near the vacuum pickup nozzle. The material is usually metered into the pickup nozzle by a volumetric feeder, such as a rotary airlock, and/or by controlling the air volume and pressure. The material is then mixed with conveying air and moves through the conveying line to the vacuum filter/receiver.

Low density vacuum and high density vacu

The LDV™ 4000 Vacuum System

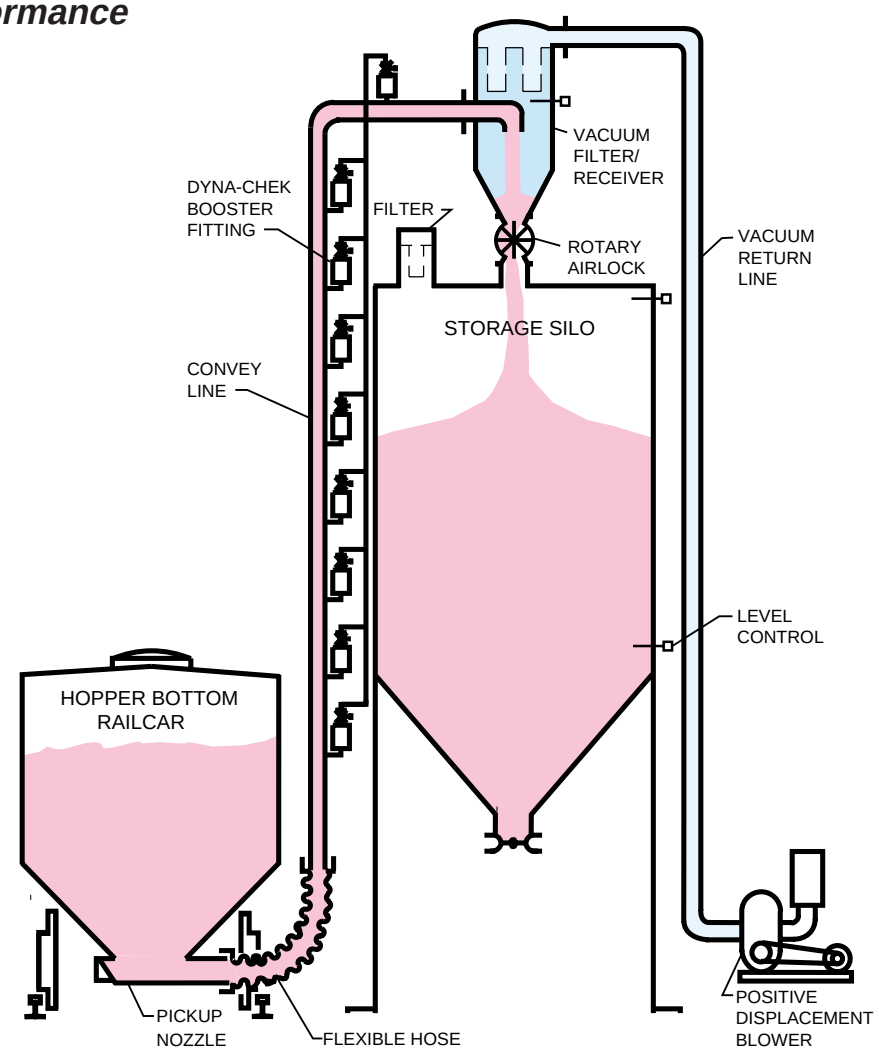
low density, medium performance

The LDV 4000 vacuum conveying system is similar to the LDV 2000 system with additional performance features to provide more reliability and capability. It has the ability to convey higher bulk density materials at a lower air-to-solids ratio with better efficiency and a lower conveying line velocity than the LDV 2000 system.

The low cost LDV 4000 system can also easily handle most lightweight, non-abrasive, fine, granular, low or high bulk density, fibrous and/or large light particle materials where degradation is not a concern.

The primary feature of the LDV 4000 system over the LDV 2000 system is that it uses Dynamic Air's exclusive Dyna-Chek® 4 booster fittings spaced along the conveying line, which optimizes the air introduced. Also, the minimum pickup velocity is reduced to about 1,000 to 3,000 feet per minute and the terminal velocity is reduced to about 4,000 to 7,000 feet per minute. Due to air pressure limitations, practical conveying distances should generally be limited to about 500 lineal feet.

Primary components of the LDV 4000 system include a pickup nozzle at the beginning of the system; a method to control material flow; a vacuum conveying line with couplings and tubing bends; Dyna-Chek 4 booster fittings; a vacuum filter/receiver; a secondary filter and a positive displacement blower. The positive displacement blower, which is used as the power source,



How the LDV 4000 System Works

produces vacuum levels to about 14 inches of mercury. For continuous conveying applications, a rotary airlock or optional gatelock hopper is installed at the end of the system.

Unlike the LDV 2000 system, where all the air needed to convey is added at or near the vacuum pickup nozzle, the LDV 4000 system generally requires the displacement air to be added at the beginning. The balance of the air needed to convey is then introduced through the Dyna-Chek 4 booster fittings.

Material is usually metered into the pickup nozzle by a volumetric feeder, such as a rotary airlock, and/or by controlling the air volume and pressure. The material is then mixed with the conveying air and moves through the conveying line to the vacuum filter/receiver.

um conveying systems . . .

The HDV™ 6000 Vacuum System
high density, high performance

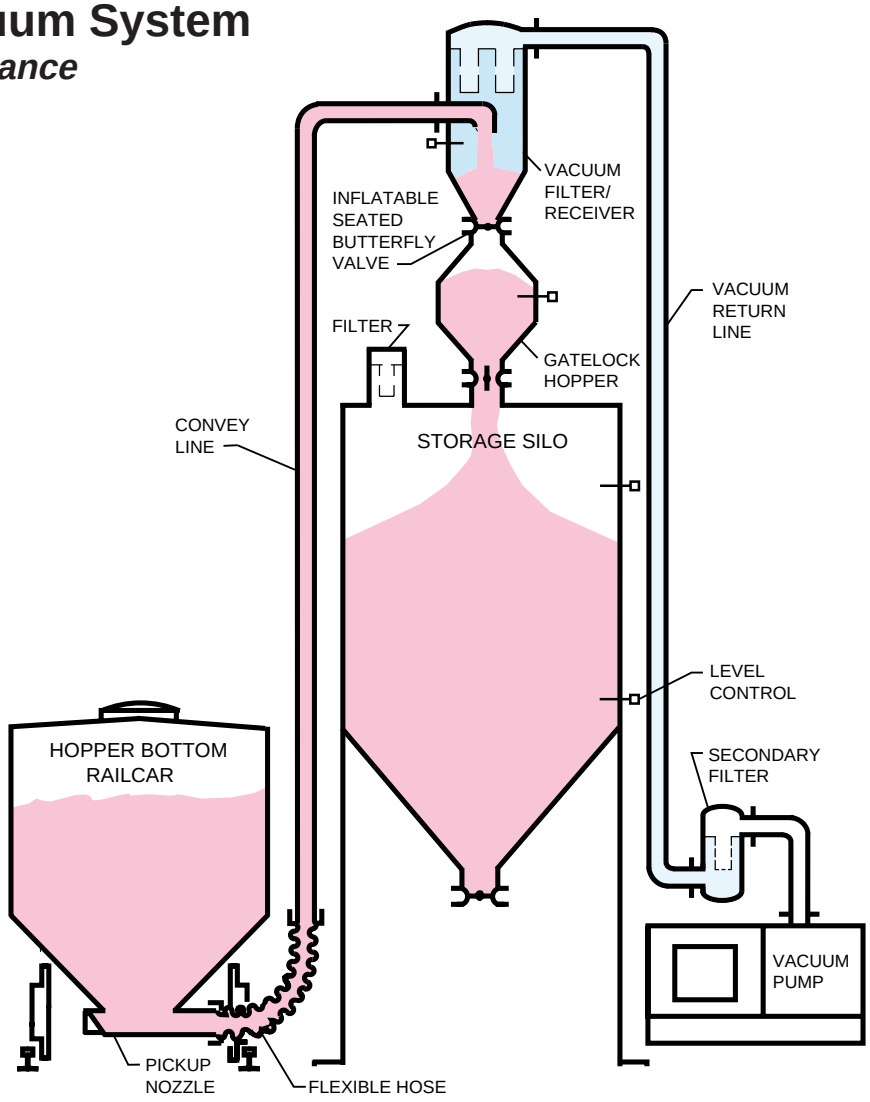
The HDV 6000 vacuum conveying system is a high performance energy saving system. It is well suited for conveying materials that are fragile, abrasive, heavy, light, fine, coarse or difficult-to-handle. This system can convey the materials at a high solids-to-air ratio and low conveying line velocity, with little degradation or system wear. And, the HDV 6000 system requires few moving parts, keeping the cost moderate.

The primary power source of the HDV 6000 system is the vacuum pump that can produce up to 29 inches of mercury. The system can be operated in Full Line Concept® mode under certain conditions and many materials can be conveyed with greater control.

An advantage of this system is that it does not require a pickup velocity at the beginning of the system. This keeps typical terminal conveying line velocities from a low of about 300 feet per minute up to about 1,000 feet per minute. For optimum performance, the conveying distance should be limited to 100 feet.

Primary components of the HDV 6000 system include a pickup nozzle at the beginning of the system; a vacuum conveying line with couplings and tubing bends; a vacuum filter/receiver; a secondary filter and a vacuum pump.

For continuous conveying applications, a gatelock hopper with an inlet and outlet valve is installed at the end of the system. All the air



How the HDV 6000 System Works

needed to convey the material is added at the beginning of the conveying line.

At the start of the system, or at the pick-up point, material is usually flood fed to the pickup nozzle by controlling the air volume and pressure. The material and air move through the conveying line to the vacuum filter/receiver. As material enters the vacuum filter/receiver, the conveying air is separated from the material and the air passes up through the filter media and then through a secondary filter before entering the vacuum pump.

Vacuum systems for conveying dry granular

The HDV™ 8000 Vacuum System

high density, highest performance

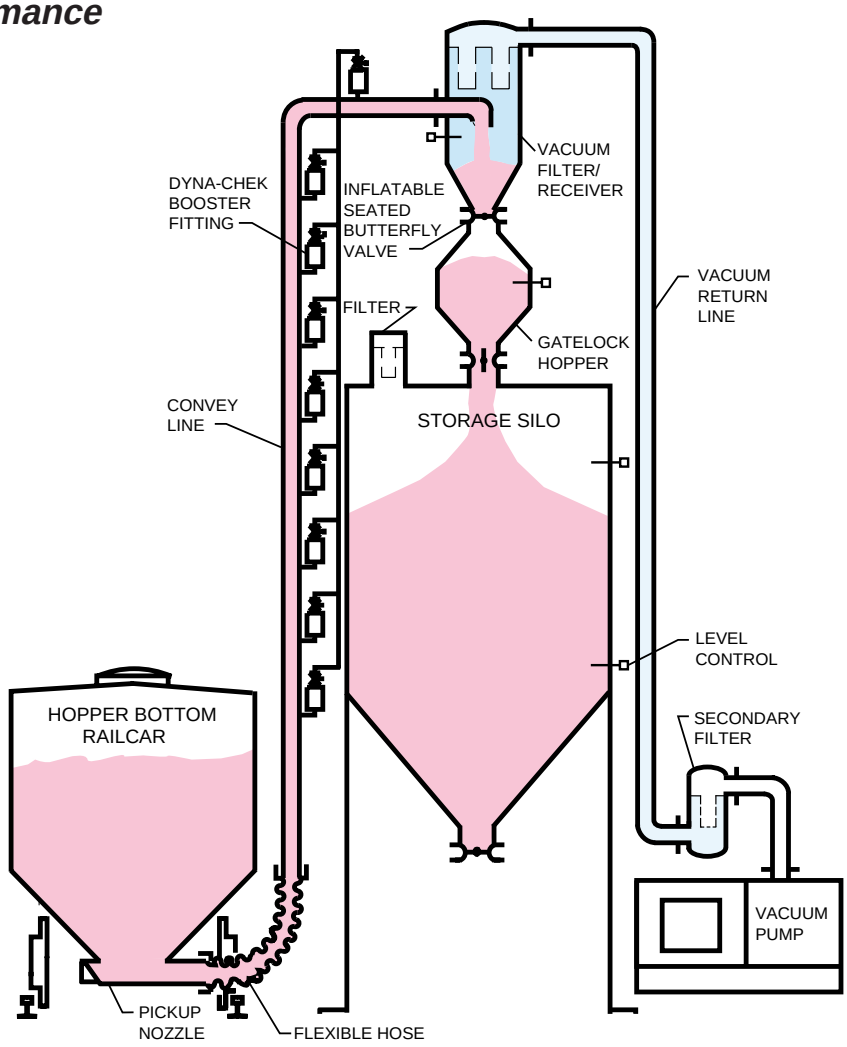
The HDV 8000 vacuum conveying system has the highest performance and is the most energy efficient vacuum conveying system offered by Dynamic Air. It is our best vacuum system for conveying materials that are very fragile, abrasive, heavy, light, fine, coarse or difficult-to-handle.

This system operates with a very high solids-to-air ratio and has the ability for very low conveying line velocities. This enables fragile materials to be conveyed with minimal degradation and abrasive materials to be conveyed with very low wear on the system.

The HDV 8000 system is similar to the HDV 6000 system with the exception that it uses Dynamic Air's exclusive Dyna-Chek 4 booster fittings. The booster fittings provide added performance and much better reliability for most materials being conveyed. The system can be easily operated in the Full Line Concept mode for ultimate control in conveying most materials.

The primary power source is a high pressure vacuum pump that can produce up to 29 inches of mercury. With the HDV 8000 system, you can determine a conveying velocity that suits your material — not the other way around. Typical terminal conveying velocities are from a low of 50 feet per minute up to 800 feet per minute. For optimum performance, the conveying distance should be limited to 100 feet.

Primary components of the HDV 8000 system include a pickup nozzle at the beginning of the system; a vacuum conveying line with couplings and tubing bends; Dyna-Chek 4 booster fittings; a vacuum filter/receiver; a secondary filter; and a high pressure vacuum pump. For continuous conveying applications, a gatelock hopper with an inlet and outlet valve is installed at the end of the system.



How the HDV 8000 System Works

Unlike the HDV 6000 system where all the air needed to convey is added at the start of the conveying line, the HDV 8000 system requires only the displacement air to be added at the beginning. The balance of the air needed to convey is then introduced through the Dyna-Chek 4 booster fittings that are spaced along the conveying line.

At the start of the system, material is flood-fed into the conveying line inlet, eliminating the need for metering of the material. The material and air move through the conveying line to the vacuum filter/receiver. As material enters the vacuum filter/receiver, the conveying air is separated from the material and the air passes up through the filter media and then through a secondary filter before entering the vacuum pump.

products . . .

Vacuum System Installations

Shown above is an HDV 8000 vacuum unloading system utilizing Dyna-Chek 4 booster fittings and a vacuum hose to convey material from a hopper-bottom railcar to four storage silos.

Shown above is a pickup pan and vacuum hose connected to a railcar in combination with an HDV 8000 vacuum unloading system for polyethylene pellets.

Shown above is an HDV 8000 railcar vacuum unloading system utilizing a vacuum conveying line with Dyna-Chek 4 booster fittings and a vacuum filter/receiver mounted above a dense phase pneumatic transporter.

Shown above is an HDV 8000 vacuum unloading system utilizing a vacuum filter/receiver mounted above a dense phase pneumatic transporter.

Vacuum System Installations

Shown above is an HDV 8000 vacuum unloading system utilizing a vacuum filter/receiver and gatelock hopper to convey sand from hopper bottom railcars to a storage silo.

Shown above is an HDV 8000 vacuum system combined with a Dense Phase Full Line system that conveys carbon black to six storage silos.

Shown above are three power boot lifts for truck unloading.

Shown above is a power boot lift in combination with an HDV 8000 vacuum unloading system directly connected to the hopper bottom of a truck.

Shown above is an HDV 8000 vacuum unloading system utilizing a vacuum filter/receiver mounted above a Dense Phase Full Line system to convey carbon black from trucks to three storage silos.

Printed in U.S.A. • Bulletin 9621 (dm) (UK 3/08)

DYNAMIC AIR®
Conveying Systems

Corporate Headquarters
Dynamic Air Inc., 1125 Willow Lake Blvd., St. Paul, MN 55110-5193
Phone (651) 484-2900 • Fax (651) 484-7015

United Kingdom
Dynamic Air Ltd., 26 Peverel Drive, Granby, Milton Keynes, MK1 1QZ
Phone +44 (0)1908 622344 • Fax +44 (0)1908 646633

www.dynamicair.com