DYNAMIC AIR INCORPORATED

DENSE PHASE PNEUMATIC CONVEYING SYSTEMS
Dynamic Air Inc. Corporate Headquarters, St. Paul, Minnesota, USA
Let's Dispel Some Myths, Right Away

Everybody Claims That His System Is The Best For Every Application

Fact: Dynamic Air is world renowned for its pneumatic conveying systems.

1. Each Dynamic Air system is custom-designed, with over 10,000 systems worldwide.

2. Our systems utilize the best available technology to achieve the optimum performance characteristics at the highest efficiencies.

3. Our systems provide the ultimate in reliability with capacities as low as a few hundred pounds per hour to over 400 tons per hour and distances exceeding 5000 feet in length.

4. Dynamic Air has developed 16 different pneumatic conveying concepts, utilizing both pressure and vacuum for handling a wide variety of dry bulk solids and process applications.

5. Our systems and services are comprehensive. (Complete systems can include weighing, batching, blending, mixing, lump breaking, storage, complete electronic control equipment and more.) And we offer complete engineering and design, a state-of-the-art full scale test facility and the highest caliber of technical and engineering expertise in the business.

This brochure explains how our systems can improve efficiency, reliability and overall quality of your material-conveying process. But keep in mind that manufacturing the highest quality systems in the world is only part of our success story. Dynamic Air has built its reputation on listening to our customers, designing custom systems to fit specific and unique needs and providing outstanding field support services on a worldwide basis.
When it comes to conveying bulk granular materials regardless of how abrasive, fragile or difficult to handle, Dynamic Air Dense Phase Pneumatic Conveying Systems are State-of-the-Art.

There's no longer any question that dense phase pneumatic conveying can be the most reliable, efficient method for handling a remarkably wide range of dry bulk solids.

By definition, dense phase pneumatic conveying simply means using a small amount of air to move a large amount of bulk solid material in closely-associated slugs through a conveying line. The process is similar to extruding.

Unlike "dilute phase" pneumatic systems that typically use larger amounts of air (either positive pressure or vacuum) to move relatively small amounts of material at high velocities in suspension, dense phase offers the enormous advantage of efficiently "pushing" a much denser concentration of bulk solids at relatively low velocities (300 to 2000 feet per minute) through a conveying line.

The result: gentle handling of heavy abrasive materials and non-abrasive solids that cannot tolerate degradation. For many fragile crystalline and granular materials there is no finer process. And Dynamic Air's dense phase systems offer more gentle treatment of system components as well: because of the lower velocities, system wear and related breakdowns are minimized.
Dynamic Air’s dense phase pneumatic conveying is:

- Energy and labor efficient.
- Reliable, because of fewer moving parts and less system wear.
- Flexible, allowing installations of entire conveying systems in spaces too small or crowded for mechanical systems with minimum disruption to your production schedules.
- Totally contained, minimizing particulate control problems.

Typical materials conveyed are:
alumina, aluminum oxide, baby formula, ball clay, barite, bauxite, bentonite, borax, calcium carbonate, calcium chloride, carbon black (pelletized), cement, coffee beans (roasted), cullet, detergent (agglomerated), feldspar, fine coal, flour, fluorspar, fly ash, foundry molding sand, glass batch, glass beads, ground meal, gypsum, iron oxide, kaolin clay, kyanite, lime, litharge, magnesium, milk powder, peanuts, PVC resin, quartz, roofing granules, salt, silica sand, soda ash, sodium sulfate, steel chips, sulfur, sugar (crystal), talc, titanium dioxide and more.
Dynamic Air's Exclusive Dyna-Chek® 4 Booster Fitting is the Key to Complete Control of Your Material Through the Entire Conveying Line.

The earliest dense phase conveying systems were nothing more than a blow tank and a pipeline. Some systems still are. In these systems, all the air required to convey the material out of the transport vessel and to overcome friction in the conveying line is added at the blow tank.

But these more primitive systems have major drawbacks. Paramount among them: reduced efficiency, because they require larger volumes of air and are limited to conveying smaller batches of material.

Further, the larger amounts of air that must be added to these systems to prevent plugging leads to increased conveying velocity. This velocity creates some of the very problems that dense phase systems were developed to avoid - greater abrasion and/or product degradation.

The Dyna-Chek 4 booster fitting provides a precise, gentle push exactly where it is needed.

Dynamic Air systems do not add all the air at the transporting vessel. Instead, we add only the volume required to move the material into the line at maximum density. After the material begins to convey down the line, we add only the necessary air to overcome conveying line friction, as it occurs and not before.

Friction can increase in a system for various reasons, such as a bend in the conveying line or a change in material characteristics. Dyna-Chek 4 booster fittings allow us to maintain your material at a maximum density and minimum conveying velocity, overcoming friction as it occurs.

The Dyna-Chek 4 booster fitting is so reliable that most materials can be stopped or restarted anywhere along the conveying line regardless of length!
**The Dynamic Air precision-control concept is unsurpassed for system reliability, efficiency, flexibility and performance.**

Because we add air all along the line, we improve the material-to-air ratio throughout the system without causing plugging problems. Thus, we can convey large batches of materials, providing the highest obtainable efficiencies with the added plus of the highest degree of reliability.

Dynamic Air systems are designed to conserve valuable compressed air. Since your material is maintained at the lowest possible velocity throughout the entire system, there is less abrasion. The conveying line life is extended and degradation of fragile materials more effectively minimized than with any system that adds all the energy (almost always too much energy) only at the blow tank.

Because of its unique check valve action, the booster fitting is highly responsive to back feeding of the conveyed material, and it can be throttled to obtain optimum efficiency at virtually any point in the conveying line. Furthermore, our booster fittings make our systems highly flexible - we can handle many materials previously thought impossible for pneumatic conveying, and by adding new booster fittings, a Dynamic Air system can even be easily expanded, modified or upgraded for most processes, materials or design changes.
We are the world's dense phase pneumatic conveying specialists.

We are a manufacturer.
Our systems are recognized as second to none for their reliability and performance. And they go beyond pneumatic conveying to include a full range of components for a complete material handling system: air-activated gravity conveyors, switches, bag breakers, batch weighing systems, diverter valves, mixers and blenders, dust control equipment, automatic bag openers, lump breakers, aerators, bin discharge systems, silo blenders, feeders, rotary spouts, powder pumps, storage bins and hoppers, and much more, any of which can be designed into a Dynamic Air system.

We provide completely engineered systems.
Any truly high performance system is more than hardware. Dynamic Air is a world leader in dense phase pneumatic conveying because of our people and the expertise they can bring to your material handling design problem.

We are listeners first and foremost. We never walk into a client's plant with standardized plans in our back pockets and off-the-shelf "compromise" solutions. Instead, we merge our bulk handling expertise with your unique process knowledge to design a custom system for your application.

We have a fully equipped testing laboratory.
If you have a new material that must be tested or if our knowledge of your material is limited, we will test your special material in our full-scale test facility.

In our testing lab, we determine conveyability, material-to-air ratios, material velocities, hygroscopic effects, build-up tendencies, dust collector requirements, degradation, segregation, filling times, conveying times, optimum conveying pressures, air volumes, aerated bulk densities and any other test data that might be required. Little is left in doubt.
Dense phase pneumatic conveying system

Mobile Truck Lance™ filling a truck

Full Line Concept® pneumatic conveying system conveying corn

High density vacuum system conveying carbon black

Dense phase transporter with a Vibra-Jet™ bin discharger conveying detergent

Multiple dense phase conveying lines
System Applications

Bag delivery to a mixer surge bin and a mixer delivery system
Manual bag breaker with Powder Pusher delivery to a mixer surge bin and dense phase delivery from a mixer to three use bins.

Rail unloading with weighing and in-plant delivery system
Dense phase batch delivery to two storage silos, from silos via Dyna-Slide conveyors to weigh hopper with air blending and transporter delivery to two in-plant use bins.
Dust removal system utilizing an existing screw conveyor system
Dense phase batch delivery system from a central dust collector via a screw conveyor to one storage silo.

Unloading of storage silos to in-plant use bin systems
Dense phase batch delivery system from four storage silos, via a Dyna-Slide conveyor, to four in-plant use bins.
Rail unloading and in-plant delivery system
Dense phase batch delivery system from a rail car, via a Dyna-Slide conveyor, to two storage silos and from silos to two in-plant use bins using a common conveying line.

Dust removal system without a screw conveyor
Dense phase batch delivery system from a central dust collector to one storage silo.
**Rail unloading and in-plant delivery system**

Dense phase batch delivery system from a rail car, via a Dyna-Slide conveyor, to two storage silos and from silos to two in-plant use bins using a common conveying line.

**Vacuum-pressure rail unloading utilizing both dilute and dense phase systems**

Combination of a dilute phase vacuum system and a dense phase batch pressure system to two storage silos; dense phase batch delivery from silos to two use bins.
Weighing and batching system
Variable rate screw feeder batching with dense phase delivery to an in-plant surge bin.

Weighing and batching system
Dyna-Slide conveyors to a weigh hopper and air blender; dense phase transporter to two in-plant use bins.
System Applications

In-plant delivery system
Dense phase batch delivery system using Full Line Concept from one batch hopper to three in-plant use bins.

In-Plant delivery to pressurized reactor system
Dense phase batch delivery from a storage silo to a high pressure reactor.
Silo blending and in-plant delivery system
Silo blending with dense phase batch delivery to a truck loading spout or an in-plant bagging machine.

Continuous in-plant delivery system
Dense phase continuous delivery from a storage silo to an in-plant use bin.
Pneumatic Conveying System Components

Forberg Fluidized Zone Batch Mixer
Forberg Continuous Mixer
Forberg Batch Cooler/Dryer

Blendcon® Silo Blending Head, 10-port
Blendcon® Silo Blending Head, 16-port
Tuffer™ Aerator/Lump Breaker
NETX® Vibratory Screener
Quiet-Pac™ Vacuum Blower Package

Posi-flate® Inflatable Seated Butterfly Valve
Vibra-Jet™ Bin Aerator, Model D and Model K
Vibra-Jet™ Bin Discharger
Accu-Flo™ Screw Feeder
NETX® Vibratory Feeder

Dyna-Slide™ Air Activated Gravity Conveyors and Feeders
BagBuster® Bag Breaker/Cruncher™ Bag Compactor
BulkBuster™ Bulk Bag Unloader
BulkBuster™ Bulk Bag Unloader with BagBuster® Bag Breaker
Bulk Bag Slitter