



The Benefits of Material Testing with Cyclonaire

Cyclonaire's testing facility provides full-scale system simulations of dry bulk materials

Pneumatic Conveying System Considerations

There are many factors to consider when you need a pneumatic conveying system to move your dry bulk goods. You have to consider your material's characteristics, including particle size, moisture content, abrasiveness, friability, cohesiveness, toxicity, and static charge—to name just a few.

You also have to consider your plant's location and the environment. How will the system fit within those constraints? Do you need to work it around existing equipment in tight spaces or do you have more room to expand? Then, you must determine the best transfer rate. Is vacuum, pressure, or a combined vacuum-pressure mode best for your product?

Trial & Error: Failure Gives You an Advantage

With all of these considerations and more as you design, develop, and test your system, you need to be prepared for a process of trial and error. On site, failures can be expensive and even disastrous, but in a controlled environment, failures actually give you an advantage. This is because they help you learn from issues in advance so you can improve your system until it is exactly what you need before you build and invest significant time and capital.





CycloTech: Cyclonaire's Technology Demonstration and System Proving Facility

With four decades of bulk material handling experience, Cyclonaire's engineering division is the intelligent choice for guidance with pneumatic conveying systems. We also provide the perfect location for research and development: our Technology Demonstration and System Proving Facility in York, Nebraska. This specially engineered location allows for full-scale testing of dry bulk materials in semi-dense, dense and dilute phases in vacuum, pressure, and combined vacuum-pressure modes.

Customized Consultation

Our experts at Cyclonaire's full-scale test facility begin work with each client by conducting computerized material analyses, which include automatic sieve analysis, bulk density, moisture content, and particle surface characterization. This helps Cyclonaire assess several important factors regarding conveying, including whether vacuum, pressure, or a combined vacuum-pressure mode is best for your product. From there, we work with you to design a custom convey setup that simulates your field conditions as closely as possible. This includes the routing, length, number of bends, and other ambient factors.



Full Scale Simulation

Our 5,000 square ft., indoor, full-scale testing facility is uniquely capable of sizing a conveying system that simulates what you have and/or need in your facility. We have the capacity for extensive closed loop convey line configurations up to 1,137 ft. with multiple conveyors and supporting equipment.

Materials can be tested for characteristics that affect the process, including flowability, conveyability, and degradation. Cyclonaire is also able to ensure the equipment will handle the target rate, air usage, convey pressure, degradation requirements, and other important parameters without risking capacity or other resources.

Our experts can assist you in simulating transfer to and/or from rail cars, silos, and bulk bags. Likewise, there are options for simulation of in-plant processing, bulk storage, or transport in addition to weighing, batching, and blending processes. Multiple sources and destinations are also possible. We will work with you to configure a system that meets your unique needs and test it to be sure it not only performs as expected, but that it is also able to withstand common manufacturing challenges.

Again, encountering failures and issues in a controlled testing environment actually provides you with an advantage. You will know what can and probably will happen before it does so you can be prepared and take preventative measures. This will set you apart from the competition and save you money over the long run.

Industry Leading Equipment

In addition to providing long convey line lengths of up to 1,137 ft., Cyclonaire's test facility has convey-line diameters in various sizes ranging from 2 to 8 inches and conveyor units ranging from 1 to 75 cubic ft. We also have a hardware lineup that includes a bulk bag unloader, multiple low pressure blowers, a high volume 100 PSIG compressor, hoppers, filter receivers, air management system, and dust collectors. Cyclonaire also has an infrared moisture analyzer, recording microscope, and analytic lab scales.

Our process controls allow for measurement of instantaneous and average airflows, cycle times, conveyed weights, and pressure. Additionally, Cyclonaire's air management system ensures stable and reliable transfer while allowing automatic switching between multiple sources and destinations as is typical with scale, batch, and blend conveying.

We provide a bi-level observation promenade where your team can observe the test system in action from a multitude of angles, as well as a conference room where your team can meet with our engineers to discuss and further develop your system. We provide everything that you need to create a pneumatic conveyor system that will successfully move your dry bulk material for years to come.

To schedule a material testing and analysis meeting, please contact our Sales team at sales@cyclonaire.com, call (800) 445-0730 or [click here to fill out our online request form.](#)

Specifications and Capabilities

Overview

5000 Square Feet, Indoor, Full Scale Test Facility; Extensive Closed Loop Convey Line Configurations; Advanced Material Analyses Capabilities; Advanced Data Acquisition and Air Management Monitoring; Wide Spectrum Conveying Technology; Multiple Conveyors and Supporting Equipment

Material Analyses Capabilities

Automatic Sieve Analysis; Particle Size Distribution Graphing; Bulk Density Determination; Particle Characterization; Moisture Content Determination Aeration/Flowability Determination; Special Characteristics Analyses; Hazardous Materials Protocols; Material Database Resource

Facility Equipment: Material Analysis, Conveying and Evaluation

U.S. Standard Sieve Set; Infrared Moisture Analyzer; Recording Microscope; Analytic Lab Scales; Air Management System; Data Acquisition and Capture; Video Camera and Modem; Sight Glass Stations; Bi-Level Observation Promenade; Lab Conference Room; Semi-Dense Phase Conveyors; Dense Phase Conveyors; Dilute Phase Rotary Air Locks; High Pressure Air Compressors; Multi-Pressure Blowers; Bulk Bag Unloading Station; Bag Dump Station; Filter Receiver; Dust Collectors; Bin Vents

Data Acquisition and Air Management

Real Time Data Acquisition; Real Time Report Generation; Remote Video and Data Transmission; Multiple System Operation Evaluation; Filtration Optimization Calculations; Instantaneous and Average Air Flows; Instantaneous and Average Cycle Times; Instantaneous and Average Conveyed Weights; Instantaneous and Average Pressure; Multi Sources, Destinations and Switching

Conveying Capabilities

Semi-Dense Phase; Dense Phase; Dilute Phase; Vacuum (Venturi) or Gravity Load; Pressure and/or Vacuum; Conveying Weigh / Batch Conveying; Multiple Sources and Destinations; Bag Dump Station Discharging; Bulk Bag Station Discharging; Hopper / Silo Bulk Discharging; Simulated Rail Car Discharging; Hopper Destination; Bulk Container Destination; Relay Controls or PLC Systems Automation

| Line Dia. | Configuration 1 | | | | Configuration 2 | | | | Configuration 3 | | | |
|-----------|-----------------|--------------|--------------|------------------|-----------------|--------------|--------------|------------------|-----------------|--------------|--------------|------------------|
| | Actual Length | # 90° Elbows | # 45° Elbows | Effective Length | Actual Length | # 90° Elbows | # 45° Elbows | Effective Length | Actual Length | # 90° Elbows | # 45° Elbows | Effective Length |
| 2.5" | 138 | 5 | 1 | 176 | 288 | 5 | 1 | 326 | - | - | - | - |
| 3.0" | 138 | 5 | 1 | 184 | 288 | 5 | 1 | 333 | 424 | 9 | 1 | 503 |
| 4.0" | 138 | 5 | 1 | 198 | 288 | 5 | 1 | 348 | 424 | 9 | 1 | 528 |
| 5.0" | 138 | 5 | 1 | 214 | 288 | 5 | 1 | 364 | 424 | 9 | 1 | 556 |
| 6.0" | 138 | 5 | 1 | 226 | 288 | 5 | 1 | 376 | 424 | 9 | 1 | 576 |
| 8.0" | 138 | 5 | 1 | 258 | 288 | 5 | 1 | 408 | 424 | 9 | 1 | 632 |

| Line Dia. | Configuration 4 | | | | Configuration 5 | | | |
|-----------|-----------------|--------------|--------------|------------------|-----------------|--------------|--------------|------------------|
| | Actual Length | # 90° Elbows | # 45° Elbows | Effective Length | Actual Length | # 90° Elbows | # 45° Elbows | Effective Length |
| 2.5" | - | - | - | - | - | - | - | - |
| 3.0" | 569 | 9 | 1 | 648 | 841 | 13 | 1 | 964 |
| 4.0" | 569 | 9 | 1 | 673 | 841 | 13 | 1 | 1035 |
| 5.0" | 569 | 9 | 1 | 701 | 841 | 13 | 1 | 1057 |
| 6.0" | 569 | 9 | 1 | 721 | 841 | 13 | 1 | 1137 |
| 8.0" | 569 | 9 | 1 | 777 | - | - | - | - |