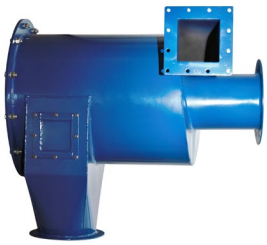
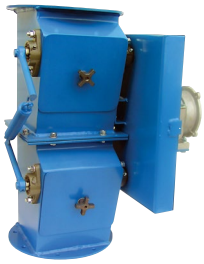
Aerodyne®
ENVIRONMENTAL

Solutions Sourcebook

Application notes for implementing
dust collection systems and material handling
valves for industrial dust solutions





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Vacu-Valve Solves Limestone Quarry's Issues

A state-of-the-art limestone mining facility in Ohio was experiencing very costly problems with its rotary airlock valves. Due to the abrasive nature of limestone dust, the rotary airlock valve's performance was short lived. In addition, the difficult access to the drive assemblies made repairs a challenge.

The company decided to replace their expensive rotary airlocks with the much more cost-effective Vacu-Valve from Aerodyne. This trickle valve system improved overall process efficiency and saved an estimated $8,000 to $10,000 a year or more.

Aerodyne's Vacu-Valve Airlock Valve System is the most cost-effective way to manage dust discharged from bag filters or cyclones under negative pressure. The Vacu-Valve consists of an automatic non-powered valve and has a duckbill rubber sleeve which is held closed by the negative pressure. As material builds up, the sleeve is forced open and the material discharges from the hopper. The system's negative pressure then closes the sleeve automatically.

Abrasive Dust Causes Rough Issues

A national supplier of sand and aggregate, after using Aerodyne's Vacu-Valve to great effect on its baghouses, sought a larger Vacu-Valve that could handle the large amount of build-up in its dust collector during peak intensity and prevent the backup of particulate. Simultaneously, their sister company required a new method of handling the particulate in quarry dust collector. The collection system dealt with large influxes of abrasive material, wearing out their rotary valves quickly. Not only did the rotary valves have short operational lives and often need replacement, but the baghouses had to be shut down during the period of assessment and replacement, halting operations. These issues were hurting these sister companies, so they looked to Aerodyne to provide a simple solution.

The Vacu-Valve is an easy replacement for a rotary valve in many applications. The lack of moving and internal metal parts reduces the long-term damage caused by abrasives compared to rotary valves. In addition, replacing the duckbill sleeves takes no more than 5 minutes. Different sizes of the Vacu-Valves create greater flexibility in terms or capacity, fitting different input and output requirements.

Ultimately, the national supplier bought a 10" Platypus Vacu-Valve, ending their issues with dust backup during peak hours, solving the overflow that would occur during peak hours. The sister quarry tested an Armadillo Vacu-Valve on their dust collector. Immediately, the ease of maintenance and the greater durability against abrasives reduced the man-hours and costs associated with replacement parts and halting operations. The quarry was so pleased with these changes that additional Armadillo units were purchased for other dust collectors.

Salt Mine Operation Sees Improvement with Rotary Valve Replacement

A salt mine in the state of New York was finding issues in its dust collection system. The main particulate being filtered out, salt dust, was corroding the rotary valve meant to transport it to the dust collector. These problems required constant maintenance, necessitating a shut-down of the system and leading to losses in man-hours. While expanding their cyclone dust collector, the company decided to try Aerodyne's Vacu-Valve as a replacement.

The Vacu-Valve's neoprene sleeve reduces the impact of corrosive while improving ease of maintenance and part replacement. The Armadillo Vacu-Valve in particular fits the situation well, as the solid flange on the bottom of the device creates greater stability and the solid steel cage gives the valve better protection against the environmental factors associated with a salt mine. Easy replacement of Vacu-Valve sleeves reduced the amount of downtime and man-hours needed for regular maintenance. The mine ultimately decided on installing an Armadillo Vacu-Valve on its dust collector after a few months of testing. Two more Armadillo Vacu-Valves were purchased for their other collectors.

Two Valves Solves Sandy Problem

Abrasive materials can often wreak havoc on dust and particulate equipment, as a foundry on the shore of Lake Michigan can attest. Their dust collection system often experienced downtime due to the sand and metal dusts present in the shop. These dusts were extremely abrasive and led to a need for constant maintenance on their rotary valves. The maintenance would require the shutdown of their baghouses to remove and repair the valves, leading to a loss of operational time. The need for the replacement of bearings and rotor, as well as the replacement of the valve, led to further drags on productivity and production. Frustrated, the company sought Aerodyne for a solution.

Aerodyne recommended the Vacu-Valve. Abrasives can be easily handled by the Vacu-Valve. While rotary valves often suffer damage to the rotor and bearings from abrasive materials, the Vacu-Valve's more streamlined design reduces damage to parts. The simplicity of design also reduces the amount of time and effort needed for maintenance on a Vacu-Valve. The solid construction of the Armadillo Vacu-Valve allows the valve to be placed securely into collection systems while preserving ease of maintenance. With these points in mind, the foundry purchased an Armadillo Vacu-Valve for trial.

The foundry, by adding the Vacu-Valve and a Knife Gate for quick isolation of the Vacu-Valve, was able to decrease maintenance time from hours to approximately five minutes, eliminating the need for stopping production. The savings in time, money, and effort let the foundry to purchase additional Vacu-Valves for their system.

Spray Drying Specialists Choose Low-Cost Alternative to Rotary Valve

Spray drying is a method used to dry materials from a free-flowing fluid to a powder having specific requirements of shape and size. Heated air is used to vaporize the liquid from a slurry which has been atomized inside a drying chamber. Solids suspended in the slurry are rapidly dried then drawn out of the drawing chamber. The process results in the production of a powder which is collected for use in industries such as food, dairy, chemical, ceramics, and pharmaceuticals.

The discharge of these powders from the dryer chamber into the dust collection system is the final step in most spray drying processes. In order for the entire process to move smoothly, a reliable material handling valve is necessary.

A global manufacturer of spray drying equipment has long depended on a unique material handling valve for the reliable discharge of powders from the drying chambers and cyclone dust collectors on a number of its spray drying systems. For more than 30 years this spray drying facility has relied on non-powered automatic valves made by Aerodyne.

The process engineer in charge of industrial sales for this facility has been specifying the Aerodyne Vacu-Valve on "ceramics" spray drying systems since he joined the company 29 years ago. When asked why he prefers the Vacu-Valve to a more commonly used rotary valve, the answer was "simplicity", noting "the Vacu-Valve is a simple power release valve that prevents ingress of air into the system, which is just what we needed."

This company is known in the spray drying industry for its use of energy-efficient components, plus the ease of operation and process automation that its equipment provides. The Vacu-Valve uses no electricity or controls

and is a fraction of the cost of the rotary valve it typically replaces. The valve's unique duck-bill rubber sleeve utilizes the negative pressure within the dust collection system to maintain a proper airlock seal. As collected material builds up above the valve, the sleeve is forced open to allow product to discharge from the hopper. The Vacu-Valve is available with a variety of sleeve materials to suit various application requirements.

The process engineer specifies the Vacu-Valve on specific spray-drying applications in the ceramics industry. He says there are particular applications the valve is well suited to, namely those with "dense, free-flowing powders". "The free-flowing nature of materials like ceramics makes this valve suitable for use." He also notes that he continues to choose Aerodyne's Vacu-Valve for his company because of the "reduced maintenance and high reliability" it offers. With no controls or moving parts like the rotary valve, he said, it just works.

Clogged Up Rotary Valves Halt Fertilizer Production

Rotary valves can become a large issue if improperly maintained. A fertilizer company experienced this problem firsthand. Their product would often clog up their rotary valves, causing the valves to fail and creating major problems for the dust collector farther down the system. In addition, the valves were not maintained regularly, leading to greater problems over time. The company turned to Aerodyne for a solution.

Aerodyne's Vacu-Valve is suited to long-term use with little maintenance. The streamlined design of the Vacu-Valve often requires less maintenance than a rotary valve while delivering the same results. The duck-bill design also has no need for electricity or electronic controls, making the product easier to maintain and replace, as well as more flexible in placement. Replacement of the duck-bill is as simple as removing the old bill and fitting on the new one, making maintenance of the Vacu-Valve quick and easy. Based on these factors, the company purchased an 8" Platypus Vacu-Valve with a neoprene sleeve.

The Vacu-Valve cleared up the issues within the system quickly. Over the course of the next month, the company monitored the performance of the valve and found the consistent flow resolved almost all of the issues their previous rotary valve faced. Having seen the results, the company placed orders for four more Vacu-Valves, phasing out the rotary valves that caused so many headaches.

Double Dump Valve Endures Years of Wear and Tear

A producer of chemicals in Ohio used the GatorGate Double Dump Valve from Aerodyne for over 10 years, but had begun to see some wear within the last year. The valve feeds an auger from their cyclone dust collector, helping maintain the pressure gradient while constantly removing particulate from the system while preventing the bridging that can occur with the discharged particulate. The producer had requested another Double Dump Valve.

The long life of the GatorGate valve can be attributed to its design. The heavy duty carbon steel or stainless steel construction prevents damage from abrasive materials that other valves may not be able to withstand. The strength of the heavy duty gear reducers and cams also ensures that a motor will stay connected to the GatorGate for a long time. Finally, the low maintenance nature of the GatorGate makes upkeep rare and easy.

Double Dump Valves for Coffee Production

Double Dump Valves are excellent work horses in coffee production applications. They offer long-lasting dry material handling with minimal wear and air seepage. Once the coffee bean has been harvested, it must be dried and husked. For the wet method, manufacturers use pulping machines to extract the majority of the husk from the coffee bean. If the bean or husk becomes airborne during the pulping or hulling process, the dust collection system captures the material and discharges it using the double dump valve.

This type of valve has tandem gates that work together to collect and dispense coffee bean fragments without compromising the positive or negative pressure in the system. A double dump valve is engineered to handle a variety of dense, abrasive particles without wearing out or becoming jammed like other valves might if used in this type of application. Due to its cost-effective, low-maintenance design, it can save your facility valuable resources over years of operation.

Double Dump Valve Solves Major Problems for Midwest Tire Recycler

Aerodyne's GatorGate Double Dump Valve helped resolve an issue a Midwest tire recycler was having at their facility. The company was using a bag house system which was collecting airborne dust from the tire shredding operation. Small pieces of rubber, nylon, and steel were collected and discharged from the collector by a rotary airlock, which kept wearing out prematurely. In addition, the fibers from the tires would wrap around the rotors which caused further problems. Replacement and maintenance of these rotary valves was costly and time consuming.

The decision was made to purchase the GatorGate Double Dump Valve. This valve is the most efficient and reliable double dump valve available for the discharge of chunky, fibrous, and abrasive materials from dust collection systems. The unique cam operated drive mechanism provides reliable service without the use of expensive and problematic pneumatic controls. As the motor driven cam rotates, it actuates the upper and lower flap gates in sequence, allowing material to discharge while ensuring minimal leakage. Quick removing inspection doors provide easy access

to internal components for regular maintenance. The GatorGate Double Dump Valve is available in a variety of sizes and is a great alternative for applications not suited for rotary air lock valves. The tire recycling company was so pleased with the outcome that they decided to replace other rotary valves in the facility with the GatorGate Double Dump Valve.

VALVES Knife Gate

CHEMICAL

Knife Gate Valve Provides Flow Control for Automotive Maker

A Northeast Ohio company that manufactures specialty chemicals for the automotive industry needed a way to control the flow of the carbon black dust leaving its cartridge collector hopper. The dust is collected in a plastic bag inside a box located under the hopper. The company wanted to continue operating the cartridge collector while changing bags. The company had previously used, and seen firsthand the effectiveness of Aerodyne's dust collection products, and decided to go back to Aerodyne to solve this problem.

After reviewing the application, Aerodyne suggested that they use a 12" pneumatic Knife Gate valve with a position switch. The Knife Gate is an ideal solution to the company's problems since this product provides an effect way to control the flow of a variety of materials in differing operating condition either at the line of flow or the point of discharge. The customer would keep the knife gate open during normal operation and close it, thereby isolating the collection container from the cartridge collector. Furthermore, the Knife Gate sits tightly on a material handling systems which prevents significant loss of positive or negative pressure in the system, making it an ideal way to control discharge.

VALVES Knife Gate

FOOD

Customized Knife Gate Allows for the Dough to Rise

A US company that specializes in producing dough in the food industry contacted Aerodyne for a custom order. The company mixes all of its ingredients in a massive tank. They were looking for a valve that would allow them to have control of the flow of ingredients into the tank, but the valve needed to be made up stainless and aluminum construction. Looking for suggestions, the company contacted Aerodyne.

Aerodyne suggested the facility use the StopTight Knife Gate Valve. This material handling valve is used as a flow control valve. It can be used either in the line of flow or at the point of discharge. Using a linear motion, a blade advances until the passage is closed or it withdraws until the passage is open. In the closed position, the knife gate valve is designed to seal tightly. Aerodyne has a large selection of knife gate valves which can be used to handle a variety of materials and operating conditions.

Aerodyne was able to fabricate a knife gate valve made of aluminum, stainless steel, and nylon to effectively control the introduction of contents into the mixing tanks as well as stay within the regulations.

Airlock Valves to Go Nuts About

An engineering company working with a peanut supplier on how to control the pneumatic peanut shell waste contacted Aerodyne in hopes to find a dust collector for the application. The peanut company was using six cyclones in various sizes to dispose of the waste. However, the company did not have any airlock valves under the cyclone, and dust was being carried to the clean outlet. The company, looking to fix this problem, turned to Aerodyne.

After considering the system, Aerodyne suggested that the company use an 8" Rotary "R" Valve as an airlock valve and install a fabric filter to increase dust removal. The R-Valve's design for continuous discharge of free-flowing, low-abrasive dry solid in gravity flow or low pressure systems makes this product a perfect fit for the company's current system. In addition, this rotary valve's steel plate construction gives it an advantage over other valves in quality, flexibility and durability. By using the R-Valve the company gained

an airlock under the cyclones that was efficient and durable. Furthermore, by using the fabric filter the plant operators were able to increase the dust removal, solving the company's problems with its current system.

Rotary Valve Plays Pivotal Role in Food Starch Production

Rotary valve technology is an integral part of the food production industry, especially when processing lightweight, free-flowing material that is in the form of a fine powder or grain. A prime example of this would be food starch, a carbohydrate derived from a variety of grains including corn, wheat, tapioca, rice and potatoes. Among its many applications, food starch is often used by food and beverage manufacturers to improve texture, act as a binding agent, improve stability during processing or extend a product's shelf life.

Plant managers should select a reliable rotary valve for the conveyance or transportation of food starch during manufacturing. A rotary valve is specially designed to effectively dispense collected material without disturbing the vacuum environment of your dust collection system. Its motorized vanes allow food starch to pass through without creating a direct opening between the inlet and outlet sides of the valve. Among the variety of rotary valve options available, the Rhino Rotary R Valve offers exceptional durability, quality and flexibility at a great value.

GPC Helps Keep Pharmaceutical Company's Process in Check with FDA

A prominent US pharmaceutical company was creating a dust collection system for the facility where a variety of drugs are manufactured. The company plans on using a cartridge collector as part of the tablet manufacturing process. Because this company is regulated by the FDA, every gram of product must be accounted for, even the dust. The tablet dust created is extremely fine and flows like water. The cartridge collector would collect the particulate in the process, but most of it would get stuck in the filters and the dust would be difficult to account for. Additionally, the facility uses a bag-in/bag-out process with its cartridge collectors. This means that when they change out the cartridges or collection tanks that are filled with dust, they use bags so that no dust is released. Again, because every gram of dust produced during operation must be accounted for, using the bag-in/bag-out method will help ensure that none of the particulate gets lost.

The company was still looking for a way to collect most of the particulate before going through the cartridge collectors and reached out to Aerodyne for assistance. After going over the proposed dust collection set up the facility had in place, Aerodyne suggested the company use the GPC dust collector (Ground Plate Collector) to collect the fine dust. The GPC dust collector is a compact high efficiency cyclone dust collector. It has several distinct advantages over common high-efficiency cyclone dust collectors. The spiral inlet of the GPC directs the dirty gas stream toward the ground plate and hopper of the collector. Coupled with the compact size of the collectors, this gives the GPC the ability to be installed horizontally with virtually no effect on the collection efficiency.

The company purchased 15 vertical Carbon steel GPC-20s for its plant. The GPCs are in rows of 5 and each row is located in its own "clean room". Each clean room serves a different purpose, such as capsule coating, encapsulation, etc. The GPCs are fitted with a special bag for the bag-in/bag-out process to further prevent dust loss. The rows of cyclones then feed a cartridge collector for final dust collection. After roughly

16 hours of operation, almost zero dust reached the cartridge collector.

Placing the GPCs in front of the cartridge collectors has provided numerous benefits to this process. Filters need to be replaced frequently because they fill up with product in a short amount of time. Because the dust passes through the GPCs before the cartridge collectors, the filter life gets extended. However, by placing a cyclone before the cartridge collector in the process, less product reaches the filter which means they don't have to be replaced as often. This also helps with overall recovery of the product, which is crucial in an application such as this where there are FDA regulations and all of the dust must be accounted for. Additionally, the GPC requires less maintenance than cartridge collectors. By sending the airflow into the Aerodyne dust collector before the cartridge filter, the bulk of the dust is collected, thereby drastically reducing maintenance time and costs.

Coffee Roaster's Process Improves with Dust Collector

A prominent coffee bean roaster was planning on building a new roasting facility in New Jersey. The head engineer contacted Aerodyne about trying to find equipment that could tackle the typical problems that occur during the roasting process and utilize as little space as possible.

When roasting coffee beans, smoke and particulates are released from the roaster during the process. The chaff (bean skins) will escape in to the exhaust air so it is imperative to capture the particulate before being vented outside. In addition, organic liquids (volatile organic compounds/VOCs) are released and can cause a burning toast scent. Specialized dust collection systems are required in order to tackle all of these problems that occur.

After sending over the specs of the application, Aerodyne concluded that the roasting facility could easily house the GPC coffee roasting system. The Aerodyne GPC Dust Collector operates differently than other dust collectors. A sloped spiral inlet directs the dirty gas stream toward a fixed ground plate and hopper of the dust collector. The ground plate forces vortex reversal to occur in a much shorter space, eliminating the need for a long, tapered body. As the dirty gas stream strikes the convex ground plate, fine particulate that has not completely made it to the dust collector walls is deflected into the hopper. The ground plate also shields collected particulate from the forces of the vortex reversal, acting as a barrier between the separation chamber and the collection hopper. This innovative design enables a compact dust collector to operate at high efficiency, even when installed horizontally.

The GPC coffee system comes complete with the cyclone, an electrostatic precipitator (ESP) to remove the VOCs, a support stand, and a chaff collection bin. Due to the compact design of the GPC, this complete coffee roasting system takes up very little space, has low electrical costs, helps clean your exhaust gas, and makes chaff disposal clean and simple.

With the GPC's compact yet powerful design, the coffee roaster was able to achieve the necessary layout at the facility and still obtain the results they were looking for. They were most concerned about finding a system that would fit within the proposed layout. They were pleasantly surprised to find a system that not only worked in the size allotted, but one that also contained all the necessary components for the roasting process and required less power than other systems they had used in the past.

Aerodyne's GPC Dust Collector Helps to Keep Brazilian Oil Supplier in Check with IBAMA Regulations

A major oil supplier operating in Brazil was required by the Brazilian Institute of Environment and Renewable Natural Resources, or IBAMA, to install dust collectors on its oil rig supply ships. The supply ships provide concrete to the oil rigs and use compressed air to pneumatically transfer the concrete from the ship up to the storage vessel on the oil rig. When the air from the transfer is released into the atmosphere, some particulate is left in the air. While a dust collector would solve this, the main issue the facility was facing was that there was a limited amount of room on the supply vessels that would accommodate most dust collectors. The only solution would be a system with a compact footprint that would not require too much head room.

The oil supplier turned to Aerodyne Environmental, the industry's leading manufacturer of industrial cyclonic dust collectors and dust collection valves and its Ground Plate Cyclonic Dust Collector (GPC). The compact, horizontal design was ideal for the space limitations on the operator's deck. The GPC dust collector is a high-efficiency cyclone dust collector. It has several distinct advantages over common high-efficiency cyclone dust collectors. The spiral inlet of the GPC directs the dirty gas stream toward the ground plate and hopper of the collector. Coupled with the compact size of the collectors, this gives the GPC the ability to be installed horizontally with virtually no negative impact on collection efficiency.

After working with Aerodyne on the layout for the dust collectors on the rigs, plant operators initially purchased two GPC-18s with the durable stainless steel construction option as a trial. The company was so pleased with the performance of the Aerodyne GPCs, it purchased 20 more for its other oil rig supply ships.

Abrasive Metal Chips Wear Out Dust Collector

A manufacturing facility in OH that specializes in aluminum processing equipment was utilizing a small cyclone in its application. The cyclone was used to remove aluminum chips from the exhaust air that leaves the dryer. The company was using a competitor's cyclone and was facing issues with the abrasiveness of the application affecting the efficiency of the cyclone. After contacting Aerodyne Environmental about the problem and inquiring about a dust collector, it was

determined that the GPC industrial dust collector would be an ideal replacement for this particular operation.

During the facility's process the aluminum chips were washed and then dried before being melted for casting. The chips were fed into the dryer on a conveyor system. Hot air was then passed over the chips, drying them as they passed through. Most of the chips fell out and moved on further down the processing line. However, some of the chips were transported by the air and exhausted out of the dryer. It is at this point that the company's dust collector would remove the aluminum chips from the exhausted air, however due to the abrasive nature of the aluminum the dust collector was wearing down and malfunctioning. By replacing the old dust collector with a GPC, the company was able to use its existing system and did not need to use up any additional plant space. The GPC can handle tough dusts, like aluminum, when other collectors can't. The Aerodyne GPC Dust Collector operates differently than other dust collectors. A sloped spiral inlet directs the dirty gas stream toward a fixed ground plate and hopper of the dust collector. The ground plate forces vortex reversal to occur in a much shorter space, eliminating the need for a long, tapered body. As the dirty gas stream strikes the convex ground plate, fine particulate that has not completely made it to the dust collector walls is deflected into the hopper. The ground plate also shields collected particulate from the forces of the vortex reversal, acting as a barrier between the separation chamber and the collection hopper. This innovative design enables a compact dust collector to operate at high efficiency, even when installed horizontally.

Treacherous Insulation Application Shows Baghouses No Mercy

A US insulation manufacturer was experiencing major issues with its application. Insulation in general can be a tricky material to handle. Its fibrous nature can wreck havoc on a dust collection system. To make matters more difficult, this particular insulation had a metal-backing which required high heat during the process. The baghouses that were being used in the operation just could not keep up with the treacherous conditions. The company sought t to find way of preventing damage to the existing dust collection system.

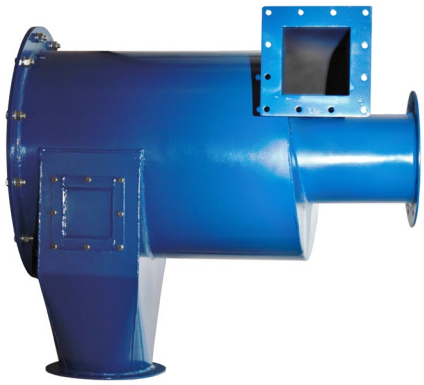
Aerodyne's GPC dust collector proved to be the right solution for difficult job. The GPC worked as a pre-filter for the existing baghouse collectors in the process. This compact dust collector was able to handle the rigorous part of the process while leaving the final and less intense filtration stage to the baghouses. Due to the GPC's ability to operate both horizontally or vertically, the company had no trouble finding a model that would fit the current system in place. The rugged construction of the GPC allowed for greater durability for the demanding insulation that was being processed. The fibrous dust was no issues for the GPC. It did not clog nor was there any air stream reduction.

After installing the GPC-36 as a pre-filter for its baghouses, the plant operators noticed a dramatic difference in the operation. The baghouses were less strained during operation and the fibrous insulation no longer clogged up the process. Production times were higher than they were previously and maintenance was not needed as often.

Compact Collector Keeps Work Space Safe and Eliminates Clogged Dust Collector Cartridges

A US facility that manufactures PVC piping was having issues with its dust collector cartridges. For the final finish on the PVC piping, the facility grinds the surface down for a smooth exterior. This process creates a lot of dust and particulate. They use 13500 SCFM (standard cubic feet per minute) of airflow from the grinding apparatus to collect the dust from the system. The dirty air gets vented to the dust collector cartridges which get clogged up within 3 to 4 days. In order to remedy this situation, the plant operators have to turn the entire system off and operate without ventilation until new dust collector cartridges are put in or until the old cartridges are cleaned. Not only is this counterproductive, it poses an extreme threat to the workers' health. Looking for a solution to the clogged dust collector cartridges and hoping to find a way to keep the work environment safe, the company reached out to Aerodyne Environmental. After analyzing the manufacturing process and the space allotted at the facility, Aerodyne suggested the company use a GPC-66 in front of the dust collector cartridge filter at the plant as a pre-filter.

The GPC is a compact, high-efficiency cyclonic dust collector. The unique "ground plate" design eliminates the need for a long, tapered cone as required by conventional cyclonic dust collectors. The compact size of this collector allows for installation in locations with



low overhead clearances and reduces the need for tall maintenance scaffolding. The GPC Dust Collector is ideal for use as a pre-cleaner for baghouses and other filter-type dust collection equipment. Because the GPC has no moving parts or filters, it is easy to maintain and is well-suited to product recovery applications. The GPC will remove 99% of the particulate 20 micron or larger before it reaches the filter, extending the filter life. With modern controls the cyclone can also decrease the usage of compressed air.

After installing the GPC, the facility has been able to increase product production and decrease time and money spent on fixing clogged dust collector cartridges.

Unique Process Reflects Well on Dust Collector

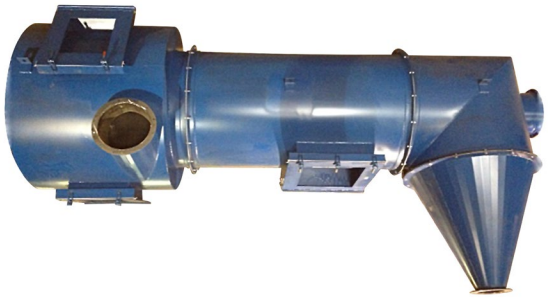
Reflective pavement markings are an important element for safe night driving and they are even more critical on rainy nights when wet roads can cause lane lines virtually to disappear. Traditionally, pavement markings are made reflective through the use of tiny glass beads dropped onto the surface of a liquid paint binding agent. Although these pavement markings provide acceptable dry-weather reflectivity, their performance in wet conditions can be extremely poor. The traditional glass bead material used is also prone to wear, which further decreases its effectiveness. The need for a better all-weather pavement marking was apparent and the innovators at a well-known technology company went to work engineering a better solution.

Special materials and processes were implemented to create better reflective pavement markings. The solution to durable, high-performing dry and wet reflective

pavement markings came in the form of extremely fine microcrystalline glass and ceramic beads applied over a liquid binding agent. These specially engineered beads resist chipping and scarring and have excellent retro-reflective properties, which means they reflect light back to its source. This property makes the pavement markings highly visible when a driver's headlights shine on them at night in both wet and dry conditions. The development of these new glass and ceramic beads was the key component in making an improved pavement stripe. However, it was also the beads that posed one of the biggest obstacles during manufacturing and production.

The process in which the tiny reflective beads are created is a highly guarded proprietary secret. At some point during this process, some of these highly valuable beads become airborne and need to be collected for reuse. Any sort of filter-media dust collector was out of the question because too much of the product would be lost in the fibers or become contaminated. A cyclone dust collector was deemed to be the obvious answer. Unfortunately, after several trials with conventional cyclones, a rather unique and unexpected problem was discovered. The spherical shape and high density of the glass and ceramic beads caused them simply to bounce off of the cyclone walls, escape from the cyclonic vortex, and be exhausted from the collector with very low collection efficiencies.

Searching for a better solution to this problem, the world-famous technology company found Aerodyne. The decision was made to give Aerodyne's high efficiency SplitStream Cyclone Dust Collector a try and a 1000 CFM test unit was sent to the company's lab for experimentation. It wasn't long before technicians realized that the SplitStream was exactly what they were looking for. The unique dual-air stream "counter-cyclonic" design of the SplitStream Collector provided the best collection efficiency of any dust collection technology tested, collecting nearly 100 percent of the airborne glass beads. An extremely high-efficiency cyclonic dust collector, the SplitStream's unique counter-cyclonic design prevents collected particulate from



making contact with the interior walls, thereby reducing abrasion wear and, in this case, preventing collected material from deflecting out of the cyclonic vortex. Another benefit of the SplitStream Collector's unique design is the ability to be installed either vertically or horizontally, which is a major space-saving advantage.

Since its initial tests, this company has purchased more than 30 dust collectors from Aerodyne, ranging in size from 200 CFM to 18000 CFM for its various operations and test labs around the United States and in Asia. Aerodyne is pleased to play such a vital role in helping to keep roads safe and customers satisfied.

SplitStream Dust Collectors See a Variety of Wood Processing Applications

Aerodyne industrial dust collectors are widely used in the wood industry for hardboard plants, particle board plants, saws, and various other wood processing applications. The high volume of dust particulate generated in the processing of wood products creates a major safety and health issue. Aerodyne dust collectors have been a key component in solving this problem for more than 30 years.

North Carolina: A particulate board plant has been equipped with 15 dust collectors to handle the effluent

products in its dryer setup, with the majority of the dust collectors being S15000 units handling 15,000 CFM. The

flash dryers operate under moist conditions and deal with sticky products. The Aerodyne SplitStream Dust Collector handles these circumstances with ease.

Tennessee: Two S12500 units have been installed at a saw-cutting operation. The dust collectors are connected to the ventilation system and draw hazardous hardboard dust from the mill

The Aerodyne SplitStream Collector's ability to handle granular, stick, fibrous, or hygroscopic particulate lends itself well to the wood industry. Because the dust collector uses no bags or filter, wood dust reclamation is not a problem. As more and more uses are being found for the former waste product, the ability to capture wood dust and fibers is becoming extremely important.

Wet Scrubbers Get a Break at Metal Recovery Plant

The economical Splitstream Dust collectors have successfully relieved overload on wet scrubbers installed at a Midwest secondary metal recovery plant, enabling the plant to continue meeting state and federal emission requirements,

The plant, which primarily reclaims aluminum, produces clean metal chips, briquettes, and powder. The Aerodyne cyclone dust collectors are installed in lines involved in the conveying and shredding of metal and the thermal recovery contaminated metals. Another collector eliminates dust from a screening and bagging operation.

An S12500 Splitstream Dust Collector precedes a wet scrubber on the thermal reclaim system and a S6000 SplitStream precedes another wet scrubber on the shredding operation. In each case, the cyclone dust collectors facilitate the recovery of dry materials from the plant air before the final collection by wet scrubbers. By using the industrial dust control systems as a pre-filter before the wet scrubbers are used, maintenance and cleaning of the wet scrubbers has been dramatically

reduced. An added bonus to installing the Aerodyne SplitStream Dust Collectors was the ease of recovery of the collected material. Because the SplitStream dust collector uses no bags or filter cartridges, collected product is easily returned to the process for reuse or sent out for disposal.

High Temperatures Are No Problem for Cyclonic Dust Collector

A manufacturer of grinding wheels in Niagara Falls, N.Y., needed to replace an existing dust collector used to collect dust coming off a rotary kiln. Initially, a bag house collector was considered to be the obvious solution. However, because the problem involved high temperatures – 700° F and above – specific efficiency requirements, moisture content problems, and future maintenance issues, the purchase of an Aerodyne SplitStream grinding dust collector was justified.

The volume of gases being handled was estimated at 4,000 CFM at 700°F, according to the specifications of their previous cyclone. Using this information, a S4500 SplitStream grinding dust collector was selected and installed. When the collector was started and the flows were checked, the company discovered that only 2,500 CFM at 500°F was needed to ventilate the kiln. Even at this lower-than-expected inlet flow rate, the results were excellent. No visible carry-over was detected, and the SplitStream dust collector captured materials much finer than previously collected. The plant was satisfied it had made the correct decision and avoided the headaches and maintenance issues of a bag house. After several months in operation, abrasion wear was not evident on the collector. Consequently, the company ordered two more Model 4500 SplitStream grinding dust collectors.

The lack of a filter media and Aerodyne's unique design make the SplitStream collector perfect for applications involving high temperatures and abrasive materials.

The Aerodyne SplitStream dust collector achieves high efficiency by forcing dirty gases into a powerful centrifugal motion. The centrifugal action throws dust particulate out of the gas stream. A secondary air stream carries the dust particulate to the hopper, keeping dust away from the collector walls and reducing sticking and abrasion. As a result, the SplitStream dust collector virtually eliminates maintenance problems common to other types of cyclones. The prevention of particulate contact with external walls is a major factor in the unit's ability to achieve high efficiency ratings.

DUST SplitStream PETROCHEMICAL

Brr! Baghouse Goes Cold in Oil Drilling Application

A company in the oil drilling industry was looking to find a dust collector that would withstand arctic conditions. The standard bag house is not able to withstand these conditions due to the fact that cold conditions compressed air and bag houses have limited tolerances, making the conventional bag houses an inefficient way of dust collecting for this company. In hopes of finding a solution to its problem the company turned to Aerodyne.

Aerodyne suggested the company use the SplitStream dust collector to replace the baghouse. The SplitStream dust collector achieves high-efficiency by forcing dirty gases into a powerful centrifugal motion. There are no moving parts to bind up in the arctic temperatures and the centrifugal action throws dust particulate out of the gas stream. A secondary air stream carries the dust particulate to the hopper, keeping dust away from the collector walls and reducing sticking and abrasion. As a result, the SplitStream virtually eliminates maintenance problems common to other types of cyclones. The prevention of particulate contact with external walls is a major factor in the unit's ability to achieve high efficiency ratings. Since the SpiltStream does not use bags or filter cartridges, the collected product is easily returned to the process for reuse or sent out for disposal.

Furthermore, this dust collector removes 99% of dust that are 7 microns, making the SplitStream an ideal fit for the client's dust collecting needs. The SplitStream's ability to function in arctic conditions without losing its ability to effectively collect dust made this product perfect for the customer.

DUST SplitStream FOOD

Oatmill Production Line Rolls Along Smoothly With Cyclonic Dust Collectors

A large producer of breakfast food found complications collecting dust particles from its oatmill production line. The dust collection system had issues stemming from wetness and heat, since a significant amount of dust and steam was collected from the oat dryer during the kilning process. The air would be moist and the temperatures above 200°F, leading to issues with traditional baghouses and other types of collectors where moisture would decrease efficiency. In addition, space constraints required a horizontal design. The company came to Aerodyne.

The unique design makes the SplitStream design ideal for removing particulate from hot and moist conditions. The counter-centrifugal forces used as the conceptual basis for the SplitStream prevent the dust and particulate from touching the walls of the collector, avoiding issues of heat and moisture during collection. A lack of collection medium reduces the issues with heat, creates greater efficiency, and reduces the necessary maintenance of the collector. In addition, the dust collectors can be made food grade, preventing issues with the USDA and keeping the process running smoothly.

The producer ultimately purchased two SplitStream collectors for the large groats stream and the small groats stream. Issues with particulate collection stemming from the heat and moisture were eliminated and the producer can prepare oatmill without any delays on the part of the collector.

DUST SplitStream CHEMICAL

Tricky Tough Dust Brings Down Cartridge Collector

A manufacturer of boron nitride had complications stemming from the unique nature of their product. Boron nitride, commonly used in abrasives for machining steel, lubricants, semiconductors, and even nanotechnology, requires boiling out boron oxide at 2000°C. The boron oxide is difficult to dispose of, since its hygroscopic nature leads to rapid expansion and a texture that bears greater resemblance to sticky mud rather than dust. Although the company had a cartridge collector, the cartridges were rapidly filling with this sticky, mud-like substance and required constant replacement, driving up costs and filling inventory space. The replacement also necessitated greater man-hours for those needing to replace the cartridges. The manufacturer asked Aerodyne for a solution.

The SplitStream dust collector was suggested. The design of the SplitStream uses a secondary airflow to strengthen the centrifugal forces that remove the particles from the airstream and prevents the material from touching the side of the collector, avoiding the sticky buildup that plagues cartridge dust collectors and baghouses. This muddy material may be disposed of in a multitude of manners that make economic sense for the manufacturer. The greater airflow can also help cool extremely hot particulate as it moves through the system, prevent

The manufacturer chose to purchase an S4500 SplitStream dust collector with slide gate to reduce the large particulate entering the cartridges, extending the life of each cartridge much farther while helping to cool the boron oxide. The manufacturer saved significant amounts of time and money through the use of the SplitStream.

DUST SplitStream INSULATION

Safety Issues Prompts Insulation Manufacturer to Seek New Dust Collector

A prominent US glass fibers manufacturer was having a difficult time overcoming obstacles with its fibrous dust control application. The facility manufactures glass mat and wet chop. The end product is used to strengthen concrete, vinyl flooring, and is used in specialty papers. The dust collector the company was using was experiencing operational issues. The fibrous dust is extremely fine and bridges once it settles. With the cartridge collector they had in place the material was not entirely getting out of the hopper. This was the first issue the company faced. Additionally, they had to spray the hoppers down with water to get the excess material out and the water would leak out of the units. The collectors are kept in ambient conditions and when the weather gets colder the water that leaked would form ice patches on the ground. Several employees had slipped and injured themselves on the icy patches around the equipment.

Frustrated with these fibrous dust control and safety issues, the company reached out to Aerodyne

Environmental for a solution. After inspection of the facility and the fibrous material involved in the process, Aerodyne suggested the facility install a SplitStream dust collector with a special rotary valve attachment. The Aerodyne SplitStream Dust Collector achieves high efficiency by forcing dirty gases into a powerful centrifugal motion. The centrifugal action throws dust particulate out of the gas stream. A secondary air stream carries the dust particulate to the hopper, keeping dust away from the collector walls and reducing sticking and abrasion. As a result, the SplitStream virtually eliminates maintenance problems common to other types of cyclones. The prevention of particulate contact with external walls is a major factor in the unit's ability to achieve high efficiency ratings. Since the SplitStream does not use bags or filter cartridges, the collected product is easily returned to the process for reuse or sent out for disposal.

The plant's fibrous material is removed in the SplitStream, falls into the hopper, and then is removed from the hopper with a special rotary valve. The rotary valve for this application has an over-sized rectangular flange which allows the fibrous material to fall easier into the valve and pulled out of the cyclone hopper. With the SplitStream dust collector and rotary valve added to the application, the glass fibers manufacturer's troubles with fibrous dust control were eliminated, and the safety of the shop is back to where it should be.

Company Seeks Out Environmentally Sound Dust Collection System

A UK concrete manufacturer was updating the machinery while retooling its concrete processes away from Portland cement, the most common cement type in the world. Portland cement is very energy intensive and recent home carbon footprint laws in the UK have forced the company to find a more energy efficient process. The company's move towards lower energy use concrete blends directly affects machinery. Seeking a low-energy dust collector that can cool high temperature dust, the company turned to Aerodyne.

Aerodyne's SplitStream Dust Collectors are well-suited towards saving energy. With the only power concern being airflow, the SplitStream collector can reduce the energy costs needed, especially if temperature control is needed. With the unique counter-cyclonic technology used in the collector, hot and cold air is able to be mixed to bring dust to temperatures the rest of the collection system can handle, reducing the strain on later parts of the system.

The company ordered Aerodyne's S400 as a small scale pilot cyclone. The cyclone's main function is to introduce ambient air into a high temperature airstream, while collecting as much dust as possible.

After months of pilot testing, the company ordered an S22000 SplitStream as 1 to 12 pilot unit, cooling 25,000 ACFM of 500°C dirty air with the secondary airflow. The company is considering a "full" scale unit.

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SplitStream Keeps Cereal Flowing

A producer of breakfast cereals approached Aerodyne about augmenting dust collection in one of their production facilities. The producer's dust collection system pulled dust from sugar coating, conveyors, and ovens for cooking the cereal. Although the company used a wet scrubber to remove dust, recovery of dust was difficult due to the nature of wet scrubbers. The company also faced increasing costs stemming from the greater water and power usage needed for the large amounts of dust as well as from the disposal of wastewater. Baghouses were not an option due to the temperature of dust stemming from the oven. The producer sought Aerodyne's S15000 SplitStream collector to ease the strain on the system.

The SplitStream Dust Collector was able to help relieve pressure on multiple systems. The cyclone is a great choice for easy removal and reuse of dust since the dust is never trapped in a solid or liquid medium, which baghouses and wet scrubbers requires. The SplitStream is also able to use a recycle airflow design for its secondary inflow, increasing the efficiency of the cyclone while also allowing collection of dust from multiple sources without extensive modifications to ventilation systems. By forcing the secondary stream into the collector, the dust from the secondary stream is merged with the primary stream while avoiding abrasion or sticky buildup that might result from sugars in the airflow.

The producer installed the SplitStream in front of the wet scrubber, lowering the amount of liquid waste and reducing the strain upon the system. The producer currently has 5 SplitStream collectors operating across the country at the various facilities.

Update In Livestock Feed Process Requires Update in Equipment

A company that produces additives for livestock feed was looking to produce a key ingredient in-house that they previously bought from suppliers. In order to do so they needed to use a spray dryer that would exhaust 26,000 ACFM. The company needed a way to remove the dust, which are about 16 microns and larger, from and cool the exhaust and turned to Aerodyne for a solution.

After looking into the company's dust collection and cooling needs, Aerodyne suggested that the company use a SplitStream Dust Collector for removing dust and cooling the exhaust. The SplitStream would use the 17,500 ACFM of ambient air in the secondary air stream to cool the airstream while removing 99% of dust 7 microns and larger. The secondary air design of the SplitStream will minimize the dust buildup and cool airflow while minimizing the stickiness that comes with the mixture of dust and most air, making it a perfect fit for the company's needs.

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Soy Processing Facility Requires New Dust Collection Technology

A multinational grain processing company was looking to add a few dryers to one of their soy processing facilities. The company uses Aerodyne's SplitStream dust collectors in tandem with the dryers in the operation. Plant operators have been turning to Aerodyne for dust collection needs for years and turned to Aerodyne again for new SplitStream Dust Collectors to work with the new dryers.

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The SplitStream dust collectors have two functions in this operation. First, the SplitStream provides dust removal from the airstream. It pulls and collects the texturized soy dust for disposal. The SplitStream also helps cool the exhaust gas during the operation.

Common Problem in the Food Industry Solved with Unique Dust Collector

One of the largest corn refiners in the United States came to Aerodyne with a problem commonly found in the food manufacturing industry. The inefficiencies of their existing dust collector were causing them to lose approximately 50 pounds per hour of very fine material – a sticky corn feed product. The existing system consisted of a cyclone followed by a wet scrubber. The scrubber collected part of the loss, but was still not very efficient. The total process involved the handling of between 7,000 to 9,000 CFM of gases.

Aerodyne's solution was a single 4500 SplitStream Dust Collector with a Dirty Secondary installation. The results were excellent. The outlet grain loading remained at a constant of 0.06 grains per cubic foot of air. The SplitStream dust collector replaced both the existing cyclone dust collector and the wet scrubber

and produced higher efficiency and lower power consumption. Before learning of Aerodyne, this corn refining company had found no other equipment able to solve this difficult problem. Because of the success of the initial unit, the company has specified three new stainless steel Aerodyne collectors for installation.

The Dirty Secondary installation of the SplitStream Dust Collector used in this application takes the dust-laden gas streams and splits it into two streams. One stream enters the primary air circuit, and the other is used as the secondary air stream. The Aerodyne SplitStream dust collector has no major moving components and can handle a wide range of materials while requiring minimal maintenance. Used as an integrated part of an air cleaning system, this cyclonic dust collector greatly extends the life of other process equipment and, in some cases, replaces them completely. Because the SplitStream dust collector uses no bags or filters, collected particulate can be easily returned to the process or sent out for disposal.