BENETECH®

SAFE MATERIAL HANDLING SOLUTIONS

Cement

Dust and spillage mitigation solutions for your industry.

CONTENT

BENETECH®

Essential Solutions for the Cement Industry

When construction activity picks up, the cement industry peaks, optimal service, and efficiency depend on your plant's ability to supply products without delays or complications.

During production, your cement conveying system moves abrasive material to create dust and wear out belts and other system components. Benetech solutions for material handling at cement plants help prevent problems before they occur to ensure maximum output, reduced maintenance, and a safer, cleaner operation.

The Main Things That Matter to You

Sustaining high performance in the cement industry requires you to keep material moving throughout production, including crushers, preheaters, clinker coolers, kilns, and storage silos. Whether spillage, carryback, or belt mistracking, just one snag can bring business to a halt.

As a cement plant operator, you're primarily on alert for spillage and fugitive dust, which shorten the lives of your conveyor belts. Dust can both interfere with production and create hazards. They also prevent the belt from achieving its design capabilities. Similarly, failing belt cleaners threaten the belt, idlers, trackers, and ploughs.

More-Productive and Profitable Cement Conveying Systems

You succeed with Benetech because our engineers know your challenges and create exact solutions for them. Whether getting the most from your conveyor belt or enhancing your cement plant dust control, with Benetech you:

- better manage your material flow
- ensure top performance at high temperatures
- significantly reduce fugitive dust
- increase belt, chute, and wearliner life
- prevent belts alignment issues
- decrease spillage and carryback
- improve operational safety
- cut maintenance time and costs

Belt Support & Alignment

Simple Slide Idlers

Benetech's Simple Slide Return Rollers allow for safe and simple installation and maintenance while providing optimal belt support between the discharge point and the tail pulley. In addition, the compact size of the frames allows for placement even in confined spaces.

Drop & Slide Idlers

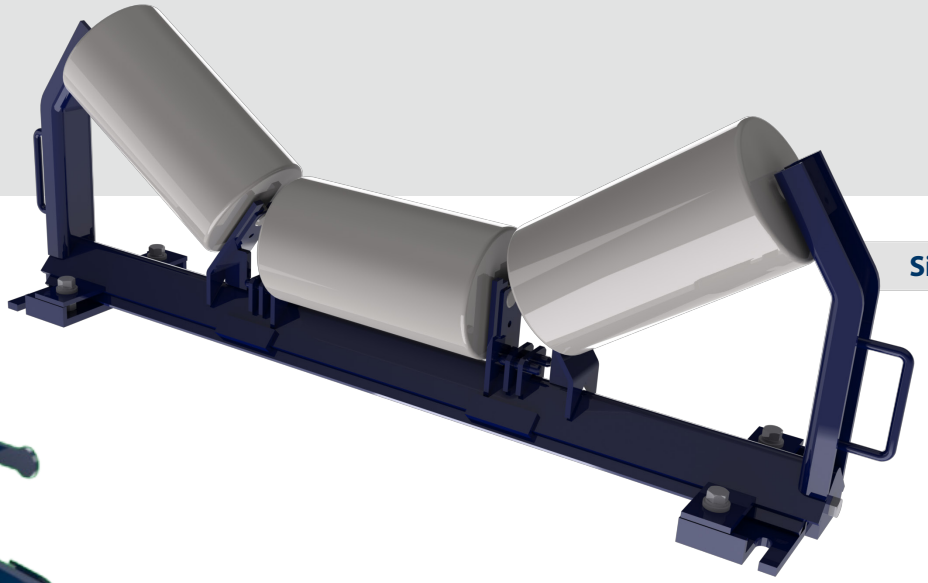
The Benetech Drop & Slide Idler can be completely dismantled, inspected, and serviced by one person from one side of the conveyor. When in the retracted position, the roller unit simply slides out from underneath the existing conveyor belt allowing for easy roller inspection or replacement.

Trackers

Benetech Training Idler responds instantly to the misalignment of the belt and does so without special modifications to the structure. Frame and guide rollers are often the cause of belt damage, which reduces the lifetime of the belt. The Benetech Training Idler requires no maintenance and fits into a standard drop bracket. The Benetech Training Idler can be manufactured to suit all belt sizes in operation in any country. Special design requirements, such as specific shaft dimensions and lengths, are possible at little or no additional charge.

Impact Beds

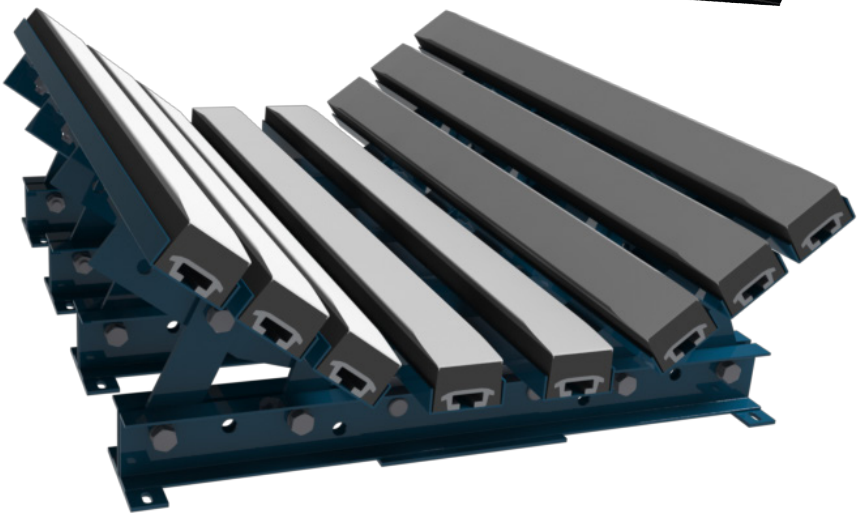
The Warrior Impact Bed stabilizes and supports the conveyor belt during loading, defending it from damage. The stiff, rigid frame and soft rubber bars of the Warrior cushion the belt and absorb impact. The result is longer belt life, eliminated spillage, and decreased O&M costs.



Simple Slide Idler

Drop & Slide Idler

Tracker



Impact Bed

Load Zone and Containment

Inspection Doors

Benetech conveyor chute inspection doors let you achieve both necessary steps safely and efficiently. The doors' distinctive design and proven technology provide you with complete and easy access for service and maintenance, as well as a tight seal against airborne dust.

Product Offerings

- An innovative door-deflector panel for less material build-up on the door seal
- Grease fitting on pinned hinges for no play or locking up
- Resilient door seals are hidden in the groove for long-lasting service
- Ergonomic cam-action and never-seize closing latches with adjustable tension for suite operation requirements
- Heavy-duty handles that won't bend
- Easy installation with a simple cut-and-weld or bolt-on process

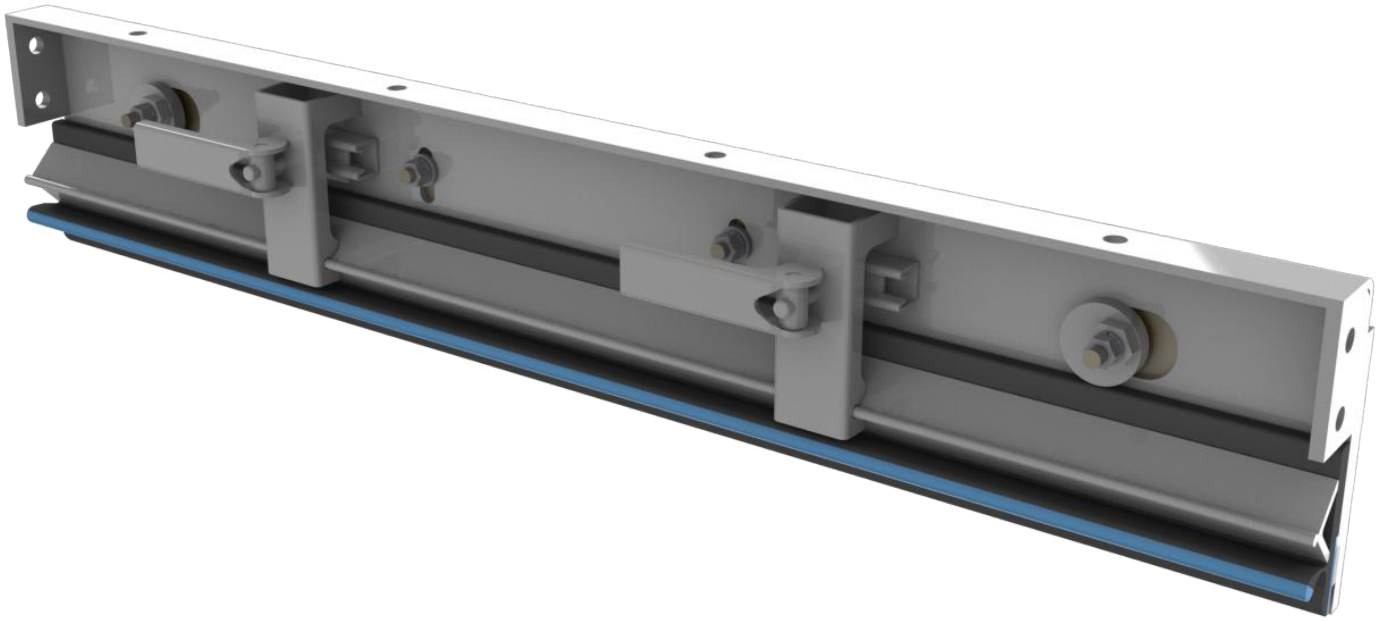
The standard Benetech conveyor chute inspection door is available in mild steel (safety yellow) with an unlined deflector panel.

XN Liners

The XN Externally Adjusted Internal Wear liner is placed in the conventional position inside the skirtboard while the adjusting mechanism can be accessed from the outside. As a result, you never need to enter the chute to remove the liner or make adjustments.

This patented technology gives you instant advantages, including quick, simple wear liner replacements; no confined entry requirements; easily visible adjustment with immediate performance results; reduced early wear and erosion of skirt rubber; extended life of usable steel/chrome; and no more cutting/welding of wear liners.

Inspection Doors



XN Liner

Load Zone Containment

Inspection Doors

Before

After

XN Liners

Before

After

Load Zone Containment

MaxZone®

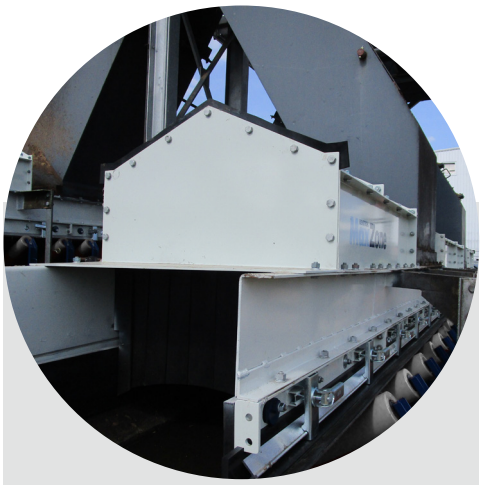
Benetech's patented MaxZone® Modular Skirtboard and Belt Support System seals your load zone to reduce airborne and fugitive dust, preventing product loss and spillage while improving material flow. This system also can be retrofitted to accommodate and enhance an existing system as an economical solution to sealing and protecting your load zone.

When budget and time constraints rule out a total system replacement, the MaxZone Modular Skirtboard and Belt Support System is your answer for an economic transfer point and load zone. With the system's modular design, you can replace components without special permits or extended shutdowns. In addition, installation is simple and affordable, and no welding is required.

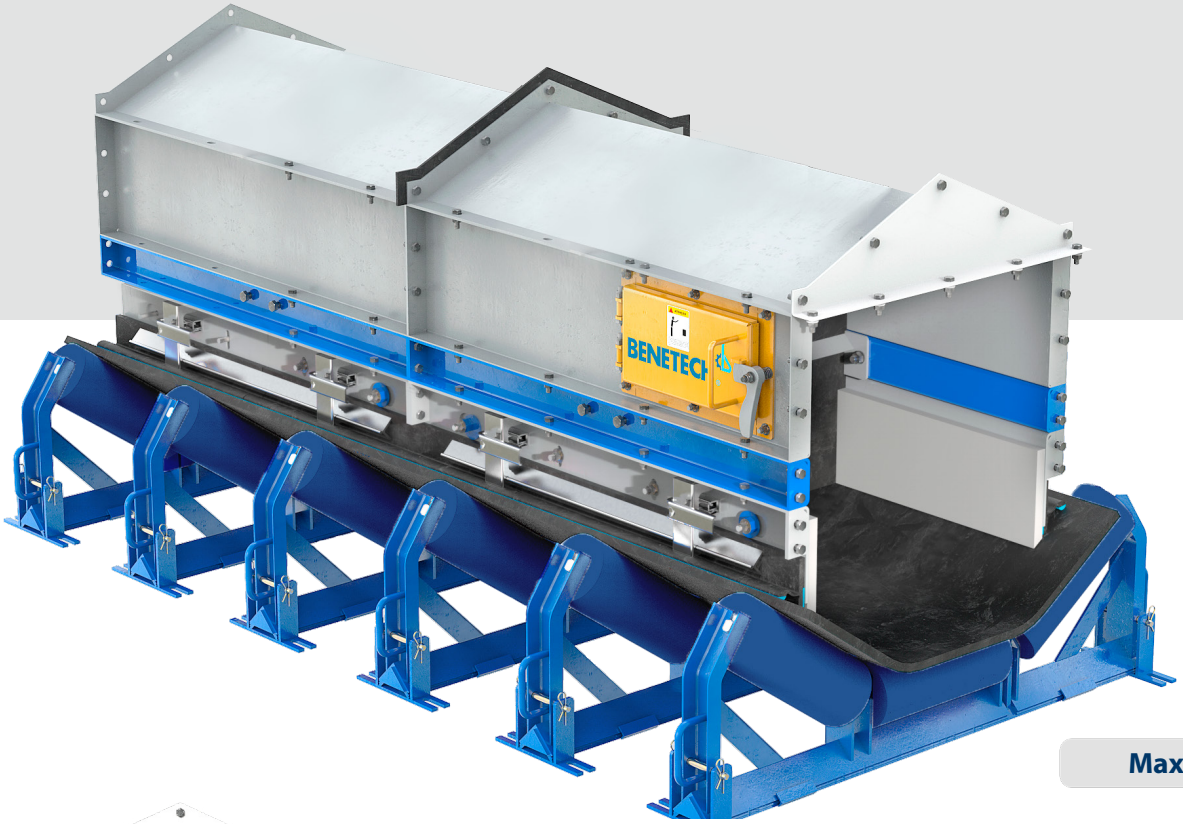
MaxZone® Bundled Kit

- 2' or 4' Tailbox
- 4ft Loading Section
- 4ft Full Height Sections
- Peaked or Flat Hoods
- Dust Curtains
- XN Wearliner
- Skirting Seal
- Dust Tight Inspection Door
- Warrior Impact Bed
- Simple Slide Idlers

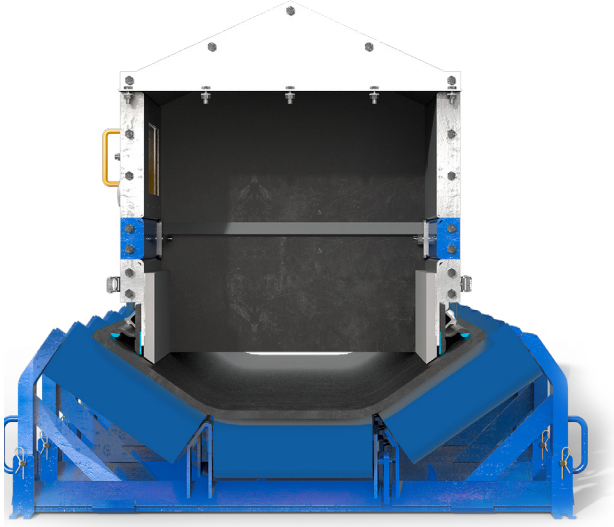
MaxZone®

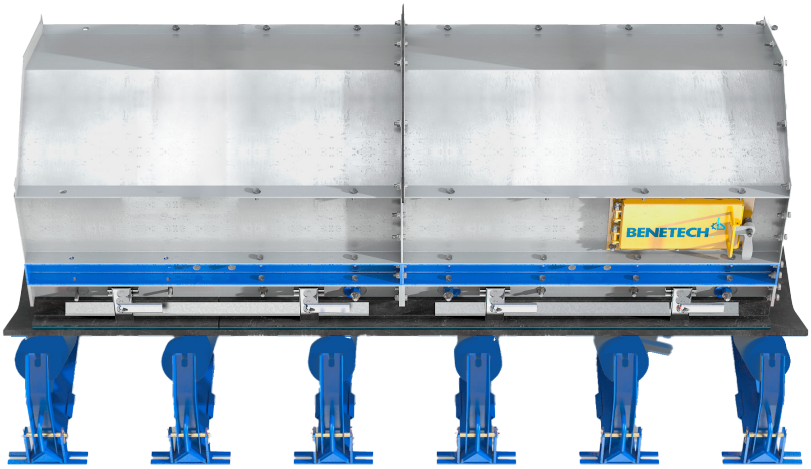


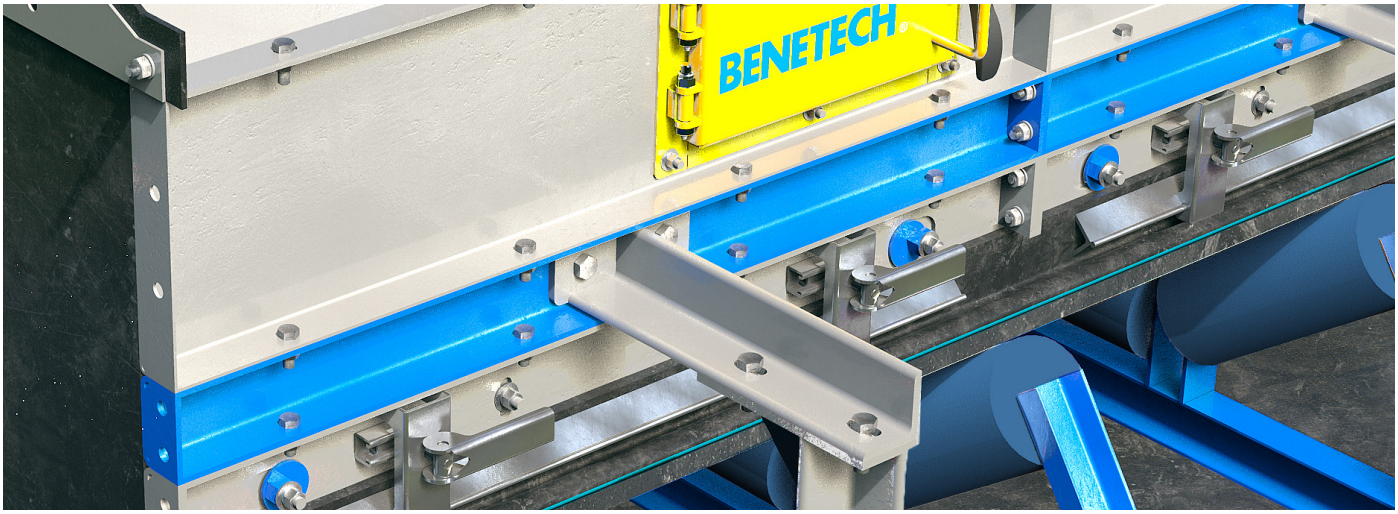
MaxZone® with a peaked hood



MaxZone®







Load Zone and Containment

MaxZone® Plus

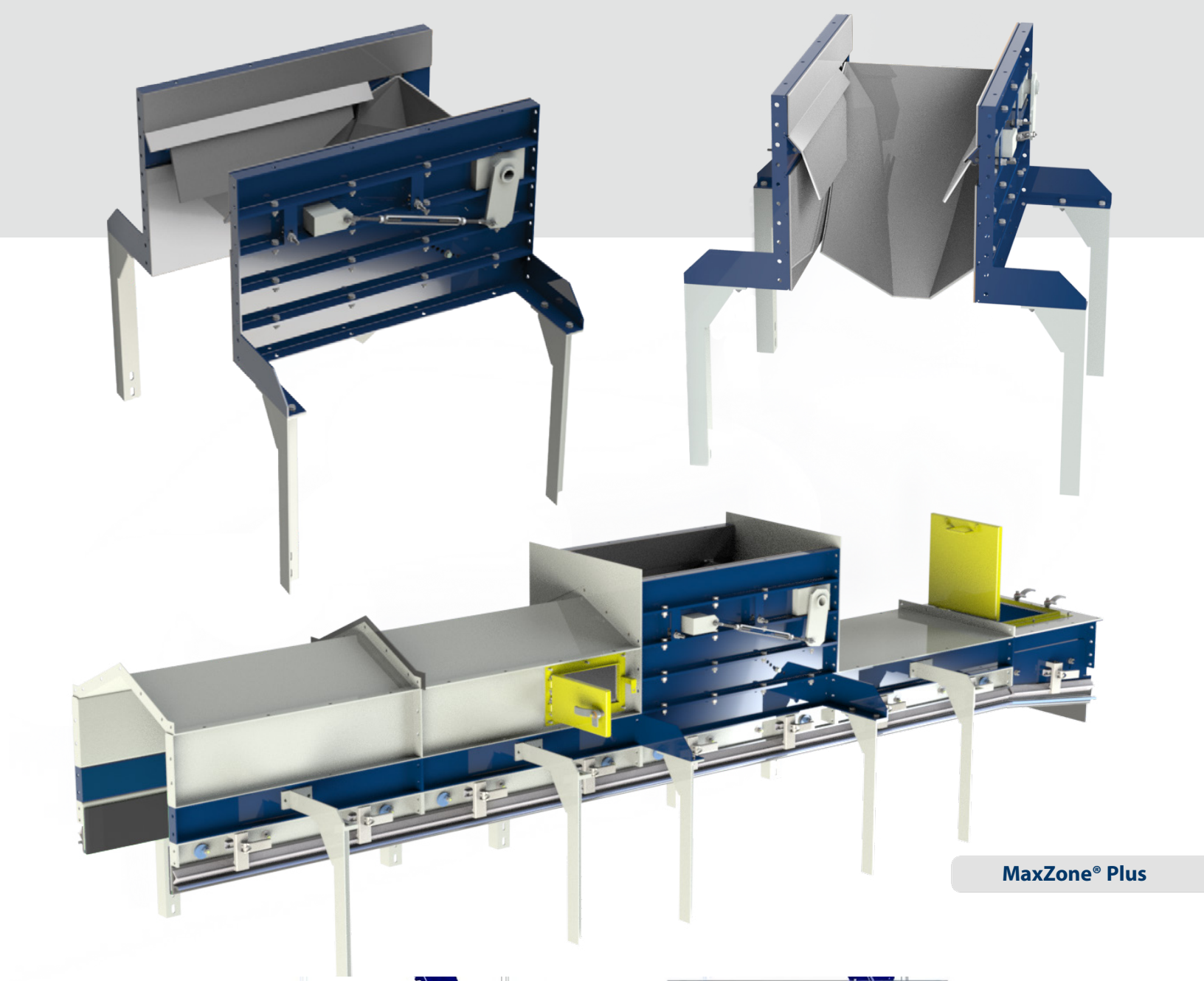
A low-cost solution to combat off-center conveyor loading without costly chute redesign.

Benetech understands the difficulties of fugitive dust and spillage from poorly designed transfer points and load zones. The underlying issue is often a misaligned transfer point chute creating a flawed material transition onto the receiving belt.

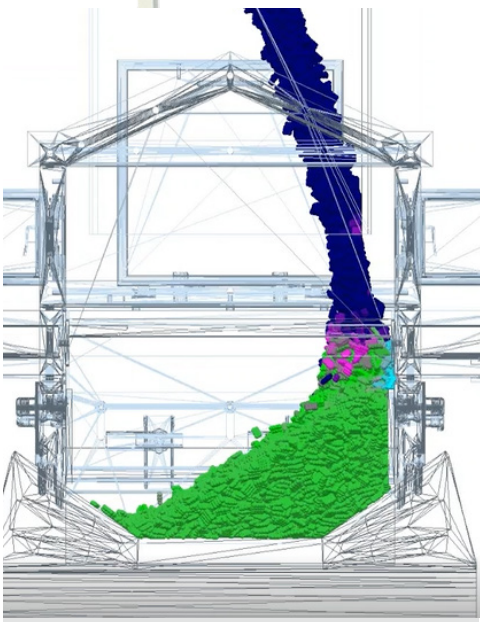
Improper or off-center loading can lead to several problems. First, when the material is loaded to either side of the belt, it creates excessive spillage and dust and threatens to mistrack it fully. Mistracking can then damage the conveyor; cause uneven wear; make the motor work harder, and even create safety issues. These potential downsides frequently result in costly maintenance, housekeeping, and material loss.

Although these problems should be addressed, time and budget constraints do not always allow for engineered load zone chute replacement, which is the best option to solve most conveyor material-flow issues. To overcome this, Benetech has developed a new low-cost solution to combat off-center conveyor loading without costly chute redesign: the MaxZone® Plus system.

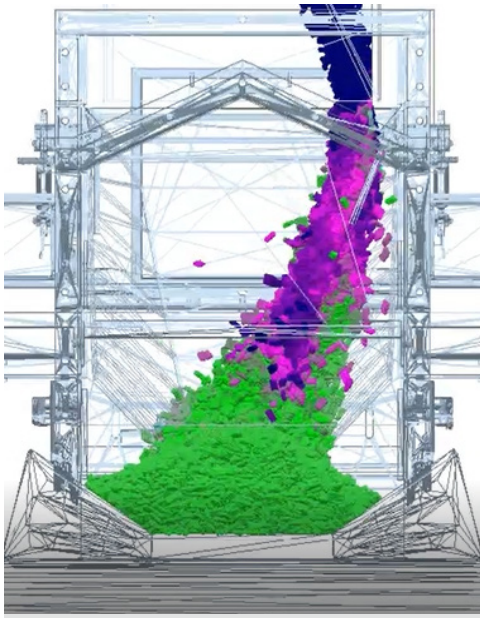
The adjustable side kicker plates and deflector moves material forward onto the conveyor belt to correctly center load the material for a smoother transition onto the moving belt. With 6" removable side panels to accommodate chute configuration, the MaxZone® Plus can be installed easily into an existing Benetech MaxZone® and retrofitted to other containment systems.



MaxZone® Plus



Before
DEM Off-Center Loading



After
MaxZone® Plus DEM Center Loading

Material Flow

Clean Sweep AC

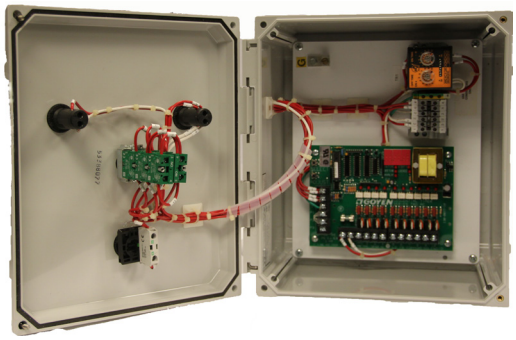
Distinctly designed for bulk materials, the radial Clean Sweep AC automatic cleaning system uses standard plant compressed air at 80–100 PSIG to prevent pluggage and eliminate build-up in transfer chutes, bins, hoppers, silos, and bunkers.

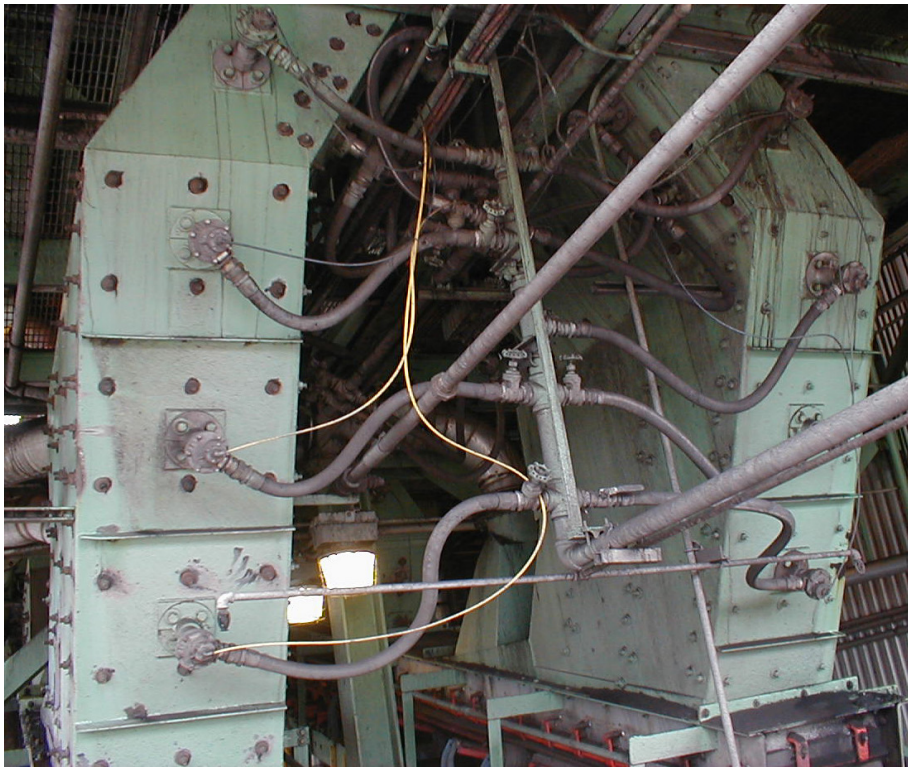
Easy to install and maintain, Clean Sweep AC is your trouble-free answer to ensuring uninterrupted material flow, especially for wet and sticky substances such as sand and cement. Clean Sweep AC is the only radial, pneumatic cleaning system created for bulk material handling and designed not to damage ceramic-lined chutes.

The system's automatic electronic controls trigger wear-resistant nozzles that sequentially fire precise bursts of plant air supplied through a quick-open/close solenoid valve to achieve less waste and maintenance. Each nozzle directs the air 360°, approximately two feet for 0.1 seconds along the surface of the chute work. In doing so, Clean Sweep AC impedes material from crusting or layering – rather, it dislodges and breaks up any potential accumulations for easy flushing by gravity and flowing material. Clean Sweep AC includes a remote air tank and control station for convenient ground-level access. As a result, there is no need to worry about installing large compressed air tanks on chutes, silos, or bunkers.

In addition, the Clean Sweep AC control panel and sequence timers can be located in an area convenient to operations, allowing personnel to make any adjustments needed for changing air pressure and rate of sequencing. Timing sequence and firing rates can be expanded (supporting up to 45 different nozzles) to accommodate a range of chute configuration changes.

Plus, unlike air lancing, which can result in injury and insufficient cleaning, Clean Sweep AC cleans automatically and does not require confined-space permits.





Dust Suppression

Chemical

At Benetech, we know dust control goes beyond using a chemical. It also calls for your program that applies methods based on premium support and technology.

Our engineers specialize in designing, fabricating, and installing custom dust suppression systems. That includes managing hydrophobic materials (those that try to repel water from the surface). Benetech dust suppression lowers the water's surface tension to a value closer to the material being treated, letting the water droplets capture more dust particles.

Benetech's chemical agents also are non-flammable, non-toxic, non-explosive, and biodegradable.

Benetech dust suppression allows you to reduce and control fugitive dust throughout your facility:

- Stockpiles
- Transloading hoppers
- Haul roads
- Stackouts
- Transfer points
- Rail and truck dumps
- Pugmills
- Ship-loaders

Our chemicals and applications solve challenges for diverse businesses, including:

- Aggregate operations
- Cement plants
- Ports and terminals
- Refineries
- Biomass power plants
- Mines/Quarries
- Pulp and paper mills
- Steel mills and coking facilities
- Coal-fired power plants
- Pet coke power plants
- Recycling facilities
- Waste transfer facilities

Application Systems

Benetech designs, engineers, and installs complete dust suppression systems. Our dust suppression methods produce powerful dust control for millions of tons of material each year. With custom systems in force worldwide, we provide the technologies that solve even the toughest material handling challenges.

Our systems serve a wide range of dust control applications:

- Anti-oxidizers
- Rail car unloading
- Conveying systems
- Slope encrusting
- Haul road
- Stackout suppression
- Pile sealant
- Transfer points suppression
- Rail car topper
- Truck top sealants
- We offer several state-of-the-art design options for superior results.

Before

After

Engineered Transfer Chutes

With over 500+ engineered chute designs worldwide, Benetech, Inc. applies advanced engineering technologies and years of experience to design material handling systems that upgrade your efficiency and improve safety.

By adeptly improving material flow issues, Benetech engineered transfer chutes to minimize production problems. This includes pluggage or choked flow; help eliminate spillage and airborne dust; and reduce high-impact areas, optimize belt life, and create longer intervals between service and maintenance.

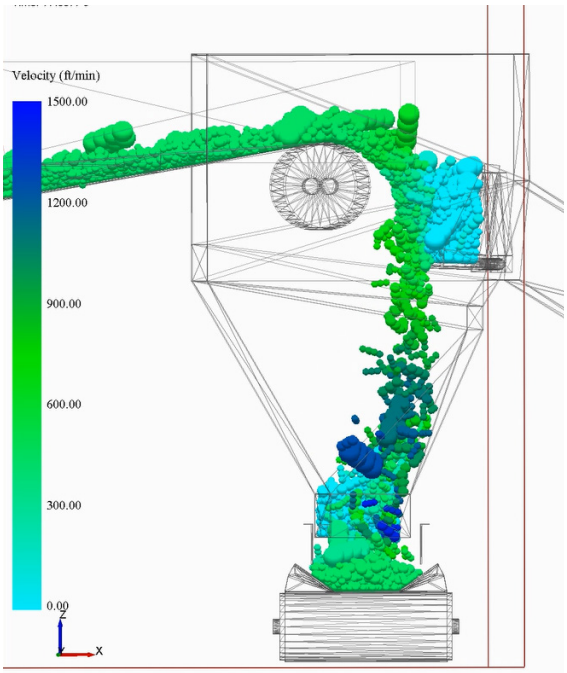
Discrete Element Modeling (DEM) Flow Analysis

Benetech uses state-of-the-art DEM analysis to evaluate and optimize each material handling transfer point design in developing advanced transfer chutes. This pre-installation computer-modeling process anticipates your plant's potential downstream material flow problems and solves them before expensive mistakes interfere.

DEM chute designs are performed in-house by Benetech's highly trained and experienced chute engineers. All computer modeling also includes the latest multi-phase material flow and airflow engineering analysis based on Conveyor Equipment Manufacturers Association (CEMA) criteria. This enables precisely defined and controlled material movement from the head of the belt conveyor through discharge to the receiving conveyors.

Before

After



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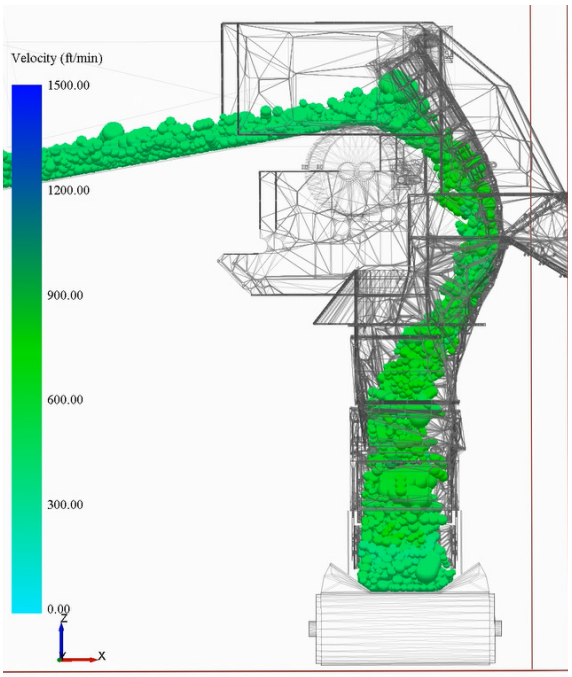

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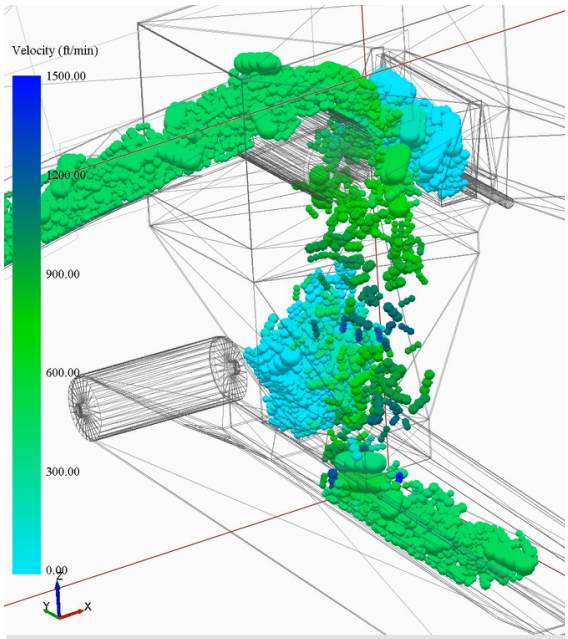

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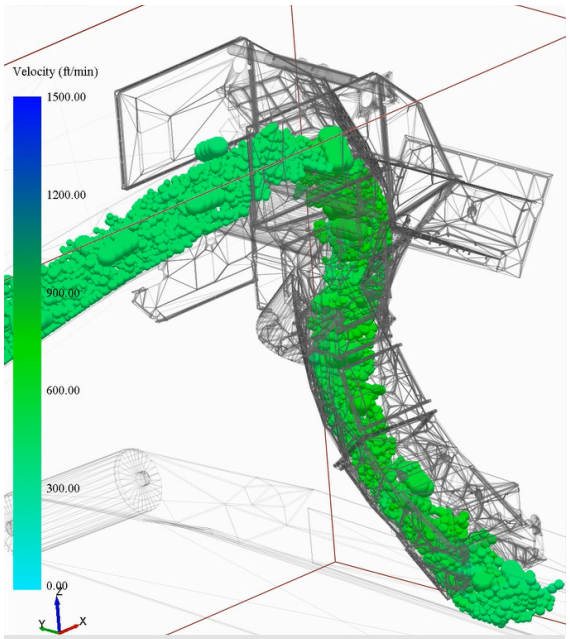

After

Project Profile

Cement Facility: Material Handling Upgrades Reducing Excessive Dust and Spillage

A North American cement facility was experiencing significant dust issues due to spillage and the poor flow of its traditionally designed rock boxes chutes. In addition, because the material was not being controlled, it was causing premature wear on the belt and chute surfaces. Benetech partnered with the plant to assess the situation and provide an engineered solution that would control the material flow to alleviate the spillage and dusting issues, extend belt and chute life and create a safe work environment.

Exisiting Problems

- 6-10" of material spillage on both sides of the belt.
- No side walls to stop spilling or dust.
- Material flow was loading at the wrong angle causing material to hit belt instead of flowing onto the belt
- Original conveyor had poor spacing on idlers causing belt sag and a lack of sealing on the belt
- Extended maintenance and clean up time
- Lost material due to excessive spillage

Before

Previous enclosure that did not effectively seal conveying system.

After

New MaxZone was installed to contain material, reduce dust, spillage, make maintenance easier and safer.

The Benetech Solution

Benetech recommended the MaxZone Modular Skirtboard and Belt Support system to control the dust and spillage. The existing skirt system was removed and a 40 foot MaxZone was installed. Included in the MaxZone containment system are: four inspection doors, tracker trainers, a V-Plow, dust curtains, idlers, sealing skirt rubber with quick release clamps and externally adjustable, internal wearliners. Peaked hoods were installed because of the load out belt above and the dusting and spillage issues it had. This allowed the spillage above to shed off the bottom MaxZone and away from the bottom belt, so no more idlers and trackers seizing up resulting in less downtime. An extended tail box was added and the entire loading zone was sealed correcting the take up spillage. This allowed the take up to keep the correct tension on the belt. To address the improper material flow, Benetech modified the existing chute to bring it down closer to the belt. This allows material to be loaded on the belt gently, reducing the amount of dust and spillage caused by the prior harsh impact.

Successful Results

- Dust Level Reduction ≈70%
- Spillage Reduction ≈ 70%
- System no longer needs to be shut down for 8 hours weekly for housekeeping

Before

Excessive spillage from gap between belt and side liner. The plant was experiencing rollers freezing up due to the build-up.

After

Benetech installed SImple Slide Out Idlers to better support the belt an allow for ease of maintenance.

Project Profile

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Exisiting Problems

- High dust emissions from transfers
- Extreme spillage and material carryback
- High level of manpower required to maintain/clean system
- Premature wear of belts and chute surfaces

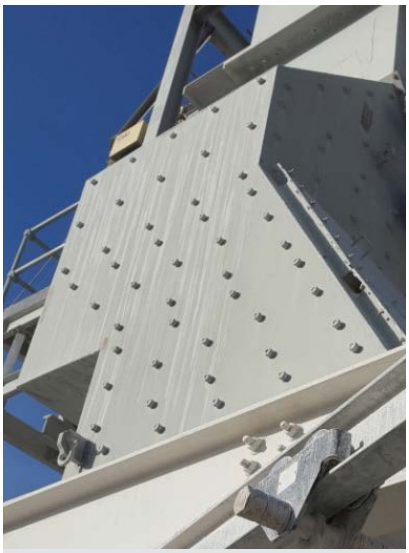
The Benetech Solution

Benetech provided the Engineering and Procurement of leading technology Advanced Transfer Systems to improve material flow and reduce dusting. In addition, best-in-class conveyor components were used to prevent spillage and carryback. To ensure sustainable results, training was provided for proper maintenance and upkeep.

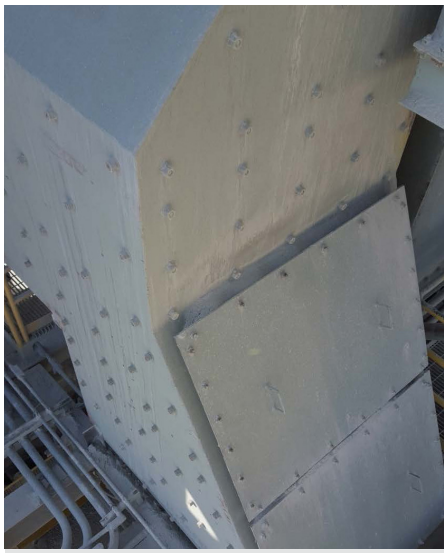
Existing Bucket Elevators to Existing Conveyors were replaced with Engineered Advanced Transfer Systems. Benetech worked alongside facility personnel to introduce all new technologies and trained on proper maintenance techniques to ensure sustainable results. Benetech's Conveyor Components eliminated spillage and carryback by including XN® internal liners, long-lasting belt cleaners and easy access Inspection Doors.

Successful Results

- Material flow is now controlled, drastically reducing dust generation
- Spillage is drastically reduced
- Increase in belt and chute life
- Reduction of plant maintenance expenditures
- Overall Safety of Operation has improved
- Ease of maintenance has improved due to XN® retrofit
- Integration of new technology with existing system minimized project capital



Existing Bucket Elevator Before



Transition Chute Before

Transition Chute After

Smaller Transition Chute with low impact angles and Inspection Doors.

Existing Bucket Elevator After

Replaced with smooth flow, low impact angles to control material and reduce dusting. Large rock box removed.

Load Chute Before

Load Chute After

Concentrated flow to reduce dusting.

Load Zone Before

High maintenance clamps and ineffective sealing.

Load Zone After

Load Zone with XN® external Access, internal liner and B Plus double lip seal for easy maintenance and spillage prevention.

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