

VAX™ Vibratory Ash Extractor
For Dry Bottom Ash Handling



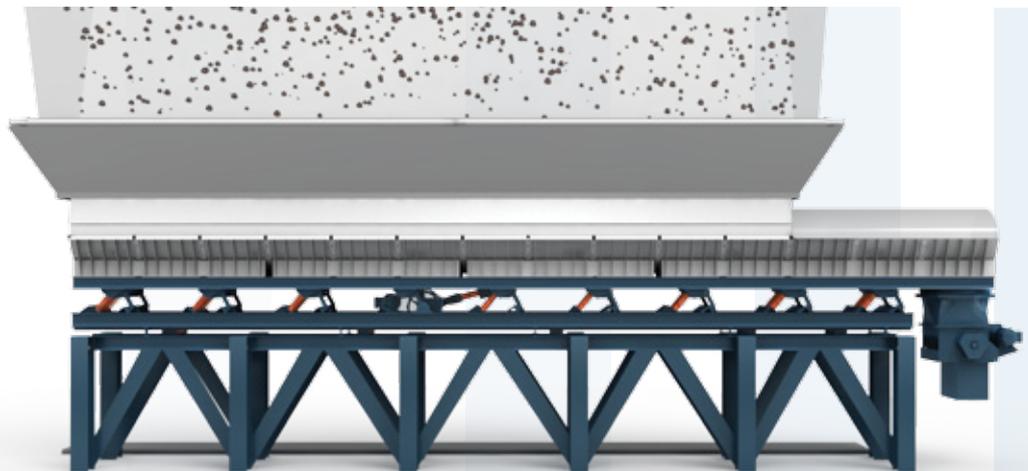
Dry

VAX Vibratory Ash Extractor

Our industry is moving toward technologies that increase plant efficiency while minimizing impact on the environment. The VAX Vibratory Ash Extractor from United Conveyor Corporation delivers on both fronts.

The VAX system is the latest evolution in dry bottom ash technology that surpasses conventional moving belt and dry scraper designs by providing greater heat recovery, lower installed cost, higher reliability, and less maintenance. The VAX system is simply the most cost-effective and rugged dry bottom ash handling system available.

The patented VAX dry bottom ash system is the latest example of how United Conveyor Corporation (UCC) leads the way in providing innovative solutions meeting customer requirements and market demands.



The VAX Advantage

Vibratory conveying technology has proven itself in extreme temperature, severe impact and abrasive applications for over 50 years. To date, there are more than 1,000 installations in over 35 countries. Now this proven and reliable technology is available for dry bottom ash handling.

- **Zero Water Usage**

Effectively moves dry bottom ash through innovative, vibratory technology.

- **Reduced Environmental Impact**

Efficiently conveys dry bottom ash and reduces negative impact on the environment by eliminating sluice systems and ash ponds.

- **Greater Boiler & Plant Efficiency**

Increases boiler efficiency through maximum heat capture while minimizing operation costs.

Vibratory Technology

Vibratory conveying produces an oscillatory toss-and-catch motion, transporting bottom ash in a series of successive throws. With each throw, the ash moves up and forward on the conveyor deck. This technology coupled with our innovative design, produces benefits unlike any other dry bottom ash solution.

Design Flexibility

The VAX system is available in horizontal or incline configurations to meet the unique requirements of each plant. These configurations provide design flexibility to address structural layout or headroom requirements for a retrofit installation or new plant construction.



- PROVEN TECHNOLOGY
- SUPERIOR DURABILITY
- GREATER HEAT RECOVERY
- NO MOVING PARTS EXPOSED TO THE BOILER



[NEXT GENERATION]
FOR DRY BOTTOM ASH HANDLING

VAX

Next Generation Technology for Dry

Dependable Performance

Unlike alternative mechanical bottom ash conveyor systems, there are no moving belts or hinged joints exposed to the boiler that can become damaged from large slag falls or soot blower lances. The result is system reliability and reduced risk of an unplanned outage.

- **Reduced Risk of Sudden Failure**

Heavy-duty, semi-circular deck is designed to absorb disruptive impacts caused by large slag falls. The VAX system is engineered to withstand any ash clinker that can pass through the boiler throat.

- **Extended Service Life**

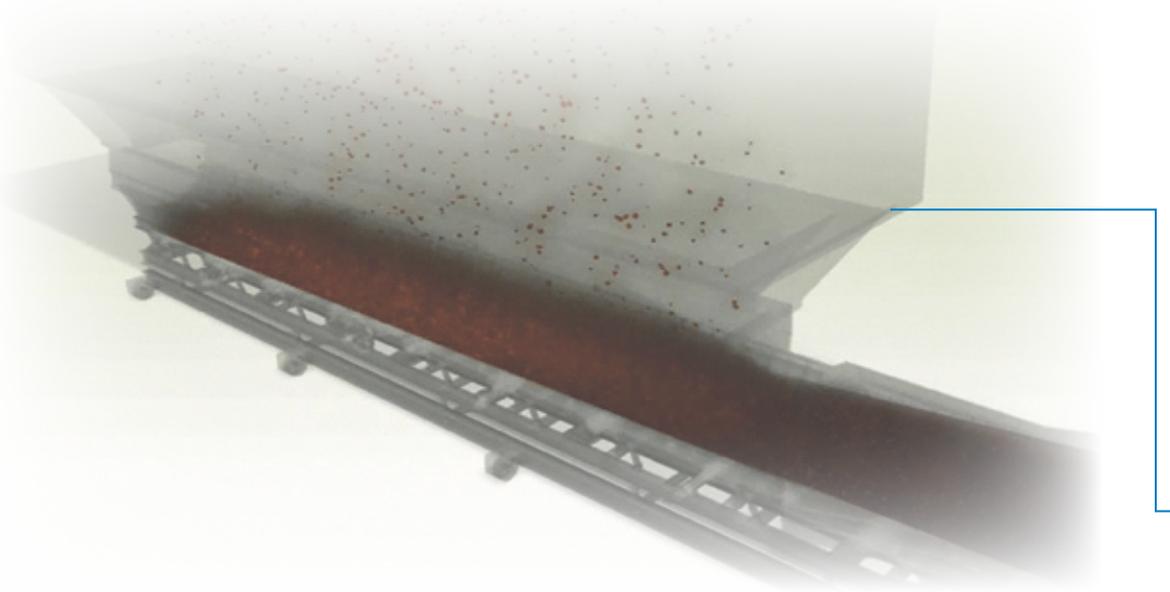
The VAX vibratory conveyor deck is constructed with thick, reinforced abrasion-resistant steel. Vibratory technology forces ash particles to continuously change their point of contact on the conveyor deck. This minimizes heat transfer to the conveyor which allows the use of non-stainless steel material to reduce system cost.

- **Reliable Dry Seal**

A multi-layered composite made of high temperature, flexible sealing and insulating fabrics accommodates thermal boiler expansion. This industry proven material is used in severe temperature and power plant applications.

- **Isolated Shock and Vibration**

An integrated counterbalance system is designed to provide complete damping of all vibration with no energy transmitted to the foundation. High impact absorbers and vibratory springs are structurally designed to dissipate impact energy from large clinkers.



Bottom Ash Handling

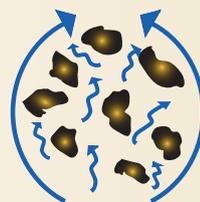
Greater Heat Recovery & Efficiency

The VAX dry bottom ash system incorporates patented fluidized bed vibratory technology that delivers enhanced heat recovery and boiler efficiency over alternative systems.

- **Increased Heat Recovery**

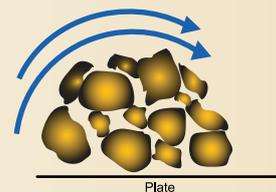
The VAX fluidized ash bed increases combustion and heat recovery compared to a moving belt design. Up to 90% of all heat contained in the bottom ash is recovered and delivered to the boiler.

Air Flow Surrounds Each Particle



VIBRATING FLUIDIZED CONVEYOR
Forced air over entire surface of ash particle
= **INTENSIVE COOLING & OXIDATION**

Air Flow Over Ash Pile



MOVING BELT
Air over pile takes path of least resistance
= **SUPERFICIAL COOLING & OXIDATION**



- **Smart Cooling**

A controlled positive pressure flow of air is blown through openings in the conveyor deck. This forced draft air creates a fluidized bed of ash that surrounds the entire ash surface. The result is increased cooling and combustion. This air flow is accurately regulated to 1.0% or less of total combustion air with no adverse effect on the boiler operation.

- **Improved Boiler Efficiency & Increased Heat Recovery**

Residual pieces of unburnt carbon are allowed to continue the combustion process on the conveyor deck, thus recovering heat that would normally be lost in a wet system.

- **Optimized Performance**

The VAX system includes fully automated controls integrated with the DCS to optimize conveying and combustion air flow capacities. The result is controlled accumulation of ash on the VAX conveyor deck, maximum heat recovery and efficient ash transfer to downstream equipment.

[100% DRY]

VAX

Next Generation Technology for Dry

Lower Operating and Maintenance Costs

Designed for simplicity and safety with no internal moving parts, this system requires very little maintenance and overall performance is unmatched in the industry.

- **Low Maintenance Cost**

The VAX is designed around springs and an eccentric drive. There are no rollers, idlers, metal belts, hinged joints, or chains exposed to the corrosive boiler environment which are potential failure points. Regular maintenance can be performed with the boiler on-line.

- **Low Energy Consumption**

The VAX operates with a low horsepower drive and positive pressure cooling fan.

- **Safe and Quiet Operation**

All moving parts of the conveyor are located outside of the corrosive boiler environment, allowing maintenance to be carried out in a safe environment. Typical noise level is less than 85db at 1m distance.

System Options

Various system options are available to meet customer preferences or specific plant conditions.

- **Hydraulic Doors**

Isolates transition hopper and boiler throat from equipment below. These doors are designed to withstand slag falls when closed.

- **Clinker Isolation Gate**

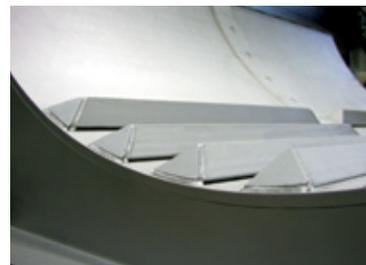
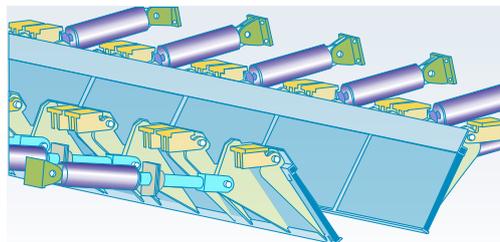
Designed to isolate the boiler from downstream crusher and conveying equipment while continuing to collect ash on the conveyor deck.

- **Roll-out Wheels**

Allows VAX unit to slide out from beneath the boiler, providing improved access during outages.

- **Bottom Ash Size Reduction**

Additional crushing/pulverizing equipment can be supplied to reduce bottom ash size distributions to meet resale requirements.



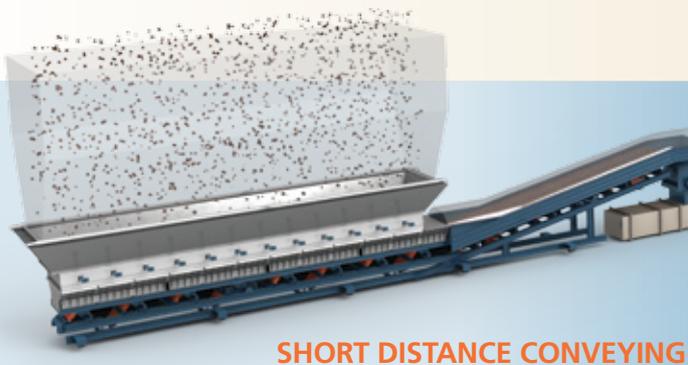
Bottom Ash Handling

Downstream System Configurations

The location of the loading facility and disposal point will influence the type of downstream conveying system. Various types of mechanical or pneumatic systems are available to accommodate the plant layout.

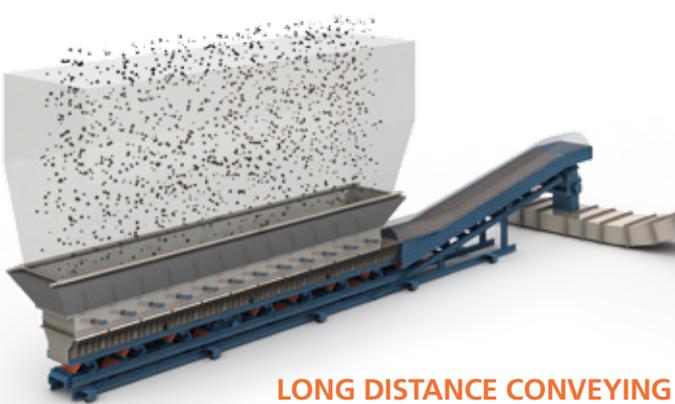
- **Mechanical**

Pan or dry flight conveyors provide continuous ash removal leading to a nearby silo or disposal point.



- **Pneumatic**

Positive or negative pressure systems convey ash longer distances from transfer vessel to storage silo.





The UCC Commitment

As an industry innovator, we have long been at the forefront of ash handling technology. We recognize the importance of providing customers with the best equipment and latest technology that meet their demanding requirements and plant needs.

With our own advanced testing and technology lab, we are able to maintain control over the quality and delivery of our systems and equipment. The result is superior and predictable performance for our customers.

Our dedicated team of engineers, sales, service and in-house designers span the globe covering six continents, assuring you that we can provide exceptional service whenever needed. This is our commitment to you.

UCC Material Handling Solutions

Fly Ash (Dilute, Medium and Dense Phase)

- Vacuum Systems
- Pressure Systems

Bottom Ash (Wet and Dry)

- Hydraulic Systems
- Pneumatic Systems
- Mechanical Systems
- Vibratory Systems

Mill Rejects

- Hydraulic System
- Pneumatic Systems

Dry Sorbent Injection

- Predictive (CFD) Modeling
- On-Site Testing and Demonstration
- Pneumatic Systems
- Installation

Reagent Handling

- Truck and Rail Unloading
- Pneumatic Systems

System Components

- Crushers
- Tanks/Vessels
- Filter/Separators
- Gates/Valves
- Mixer/Unloaders
- Pipe/Fittings

Global Operations in:
United States • Europe • China • India
Systems in over 60 Countries



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