



PNEUMATIC CONVEYING SYSTEMS

## CASE STUDY: R-Con Ready Mix

# Cyclonaire Speeds Cement Unloading at R-Con

### R-Con Operations

R-Con is a large Midwestern ready-mix concrete producer with four plants in Wichita, Kansas, and two in surrounding areas; the company supplies concrete for a wide range of federal, state, local, and private-sector projects in Central Kansas.

### The Problem

In 2001, R-Con Production Manager, Rick Heise, decided he needed a more efficient and reliable way to unload cement at Plant No. 6, located on Zoo Boulevard in Wichita. The plant still had a conventional pit and pneumatic screw pump setup for gravity-unload hopper-bottom railcars.

Spotting the cars slowed the unloading process, and cleaning the pit was dirty, labor-intensive work.

“We had computers running the plant, but we were still mucking out the pit with a shovel,” Heise recalls. Two blowers and a screw pump unit conveyed the cement. “Our screw pump

conveyor could handle the volume, but it went down periodically for repairs as the internal screw eroded from contact with the cement,”

Heise explains. “We couldn’t tolerate that downtime, and the repairs plus the need for separate blower motors for aeration and conveying kept energy costs high. So I started looking for an alternative.”

The Zoo Boulevard facility was erected in 1996 and is built around a Con-E-Co Lo-Pro® Model 12CM in stationary configuration with a 12-yard drum. The Lo-Pro Batch Plant is totally enclosed within a metal-sided building, and the facility has won an environmental award from the Ready Mix Concrete Association. Cement is delivered by railcar and conveyed first to the Lo-Pro unit and then to twin 150-ton storage silos located adjacent to the rail siding. A belt conveyor transfers aggregate fed by a 5.5-yard front-end loader from the storage yard. The plant’s operation is highly automated. The main computer uses a PSI Eagle

operating system to control ingredient mixing for over 200 concrete blends. Another runs the Davis Color System

to control additives for colored architectural concrete. R-Con is one of only a few plants in the Midwest region with such sophisticated



**Cyclonaire Conveyor and hopper-bottom railcars team up for fast, clean unloading at R-Con.**

color control. A third computer uses a Command Data Dispatcher System for order entry, tracking, accounting, and invoice preparation. A satellite global positioning system is tied into the dispatcher system to monitor truck movement and deliveries.

### The Solution

The solution to the railcar unloading problem came from a long-time supplier, Jim Ayers. An executive of the Kansas & Oklahoma Railroad that delivers cement to

**“We couldn’t tolerate that downtime, and the repairs...”**

—Rick Heise

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Plant 6, Ayers had faced a similar problem a year earlier. He wanted to convert a nearby Wichita concrete plant into a dry bulk terminal to serve Kansas customers. For his idea to work, Jim had to find a high-volume system for unloading railcars to fill the terminal and for loading cars as orders came in. He found part of what he needed in the Cyclonaire booth at the Powder and Bulk Solids Show in Chicago. The other parts were already at hand – his own fluidized hopper railcars.

To unload those fluidized cars, the Cyclonaire sales engineer Ayers contacted put together a



**Frame-mounted blower package includes inlet filter with service indicator, premium inlet and exhaust silencers, safety relief valve, and TEFC 3-phase motor.**



**The Cyclonaire Conveyor cycles between vacuum railcar unloading and pressurized conveying to move cement to storage silos or plant. Cyclonaire HC Series Conveyors come in a range of sizes with conveying capacities up to 100 tons per hour and more, depending on model and materials.**

package that included a Cyclonaire high-capacity semi-dense phase conveyor with 8" lines in and out. He matched the conveyor with a Cyclonaire 125-hp blower package to supply the air necessary to fluidize and convey cement into 85-foot high silos. Ayers notes, "The system was a perfect fit for me, so I brought Rick Heise and others from R-Con to see the conveyor and what it could do unloading my fluidized cars. I was sure when Rick saw how slick it all worked we could do some additional business."

"Jim's demonstration convinced me. I was confident I'd found what I wanted," Heise says. "In short order, we had Cyclonaire evaluating our needs at Plant 6 and had signed a long-term contract with

Jim to dedicate 26 fluidized cars to our operation. We got a 100-hp Cyclonaire Blower because we don't have to move the cement as high as Jim does. But our Cyclonaire Conveyor is the same model with a 75-cubic-foot transfer vessel and 6" hoses. I couldn't be more pleased with the system or with the service. We've had two small glitches, and the factory support has been fantastic."

### **The Advantages**

"Our crew saw the pluses right away," Heise reports. "You just take off the hopper cap, hook up the hoses, start the blower, turn on the Cyclonaire, and out it flows. Unloading is fast and easy. We even worked with the railroad to

rig an adapter that links the two railcar hoppers to one vacuum line. There's no spotting, no need to get down into the pit, no dust, nothing to clean up. There's one blower, the controls are simple, and the conveyor all but runs itself. Our railcars hold 80 to 84 tons each, and we unload them in about two hours. When you time everything out, we're getting the job done much faster. I can't quantify the savings in labor and energy, but there's no question the unloading is much more efficient. We plan to include Cyclonaire systems in future upgrades of our other rail and storage facilities."

## The Equipment

The proprietary Cyclonaire HC Series Conveyors are high-capacity semi-dense phase pneumatic units specifically designed to move fluidizable, abrasive materials. They come in several sizes with conveying rates of 100 tons per hour and higher, depending on model and application. The system operates only on positive air flow, so there is no need for high-maintenance filtration.

Standard automated controls allow for minimal operator supervision. A variety of control options are available that can be integrated into an existing plant control platform.

Cyclonaire HC Conveyors use only positive air pressure from a single high-efficiency blower for both vacuum loading and pressurized conveying. A proprietary venturi assembly creates the vacuum required for loading. In vacuum mode, the conveyor draws material from the hopper-bottom railcar to fill its transfer vessel. Cycling



***Over-the-rail adapter facilitates hook ups and allows both railcar hoppers to unload into one vacuum line. The Cyclonaire conveyor supplies both aeration air and vacuum.***

between loading and unloading the transfer vessel is automatic. A high-level control senses when the transfer vessel is full and automatically switches to the pressurized discharge mode for conveying material from the vessel to its destination. Conventional conveying systems often have significant problems with particle degradation, abrasion, and system wear when moving materials like cement. But because of their

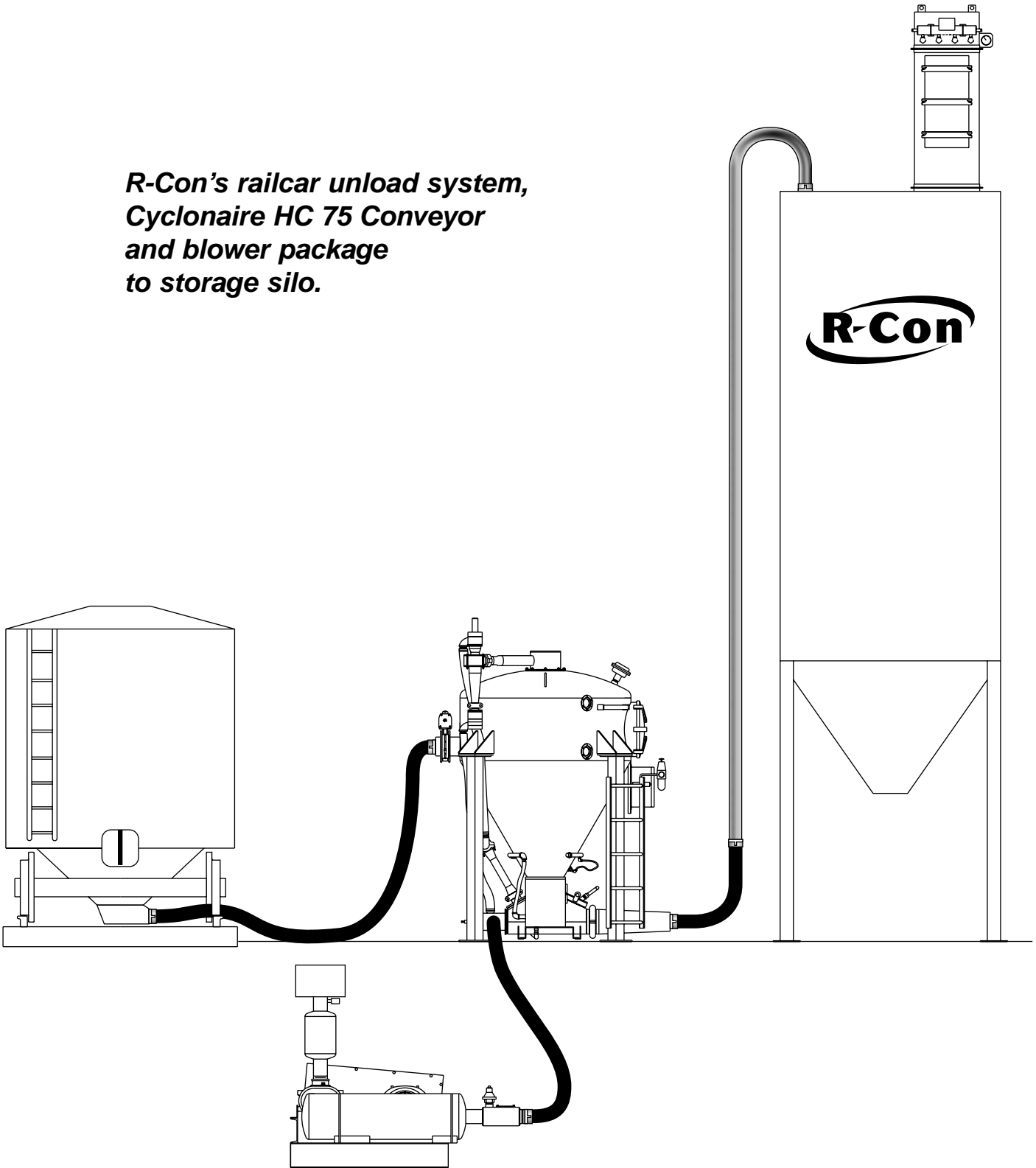
unique design, Cyclonaire HC Conveyors are inherently superior in handling abrasives. They use 15-psig convey air to move materials at the right combination of line velocity and material-to-air ratio to minimize abrasion and maximize efficiency.

Since 1973, Cyclonaire has been manufacturing bulk material handling systems and controls, specializing in pneumatic conveying. The company supplies components as well as complete systems. Its services range from concept engineering and project management through start-up supervision. Industries served include cement, chemical, battery, food, foundry, milling, mineral, railroad, and rubber.

*To see photographs, dimensional drawings, and specifications for Cyclonaire Conveyors and other company products, visit the Cyclonaire Web site at [www.cyclonaire.com](http://www.cyclonaire.com). For more information and free literature, contact:*

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***R-Con's railcar unload system,  
Cyclonaire HC 75 Conveyor  
and blower package  
to storage silo.***



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