

The Significance of Railroad Sanding



Railroad sanding is a critical practice for increasing adhesion between the wheel and the rail to facilitate the initial motion and smooth acceleration of locomotives and other self-propelled train or tram engines. Sanding while the rolling stock is in transit improves traction on slippery rails covered with lubricants, water, ice, wet leaves or other trackside vegetation. As a train slows down on steep grades and tight curves, or approaches a signal light or stopping destination, sanding assists in preventing the wheels from sliding as the braking systems are applied.

The Evolution Of Sand Replenishment Systems

Sanding has been used to increase friction and improve traction since the very inception of railroad transport. At one point in time, large, elevated tanks filled with sand were a dominant feature at numerous railroad yards. These gravity-style sanding towers occupied a large footprint in the rail yard and were expensive to construct.



Railroad personnel would maneuver the sand hoses that dangled from the bottom of the tower over to the locomotive sand boxes' fill point. Since the hoses typically only extended a short distance from the silo, the locomotive had to be moved a couple of times in order to load each locomotive sand box. Safety was a big issue as operators maneuvered the unwieldy hoses over to the sand boxes, while working at elevated heights on top of the locomotives.

Over the years, sand-filling technology evolved into the use of gantry-type systems. Sand transferred from the sand-storage silo was loaded into a hopper, which was moved along the length of the track by a gantry crane. This allowed for a safer mode of sand box filling, as it eliminated the need to climb on top of the locomotive itself. However, this method only allowed for the filling of one locomotive sand box at a time. Furthermore, gantry systems also required a steep capital investment, not to mention the additional expense of maintenance and repair.

Today, technology has evolved from cumbersome, safety-challenged, and one-size-fits-all sand replenishment strategies to a variety of sanding equipment solutions that vary in range of applications and purpose. While gravity sanding towers are still widely used, there are cleaner and more efficient systems for replenishing sand that promote a much safer working environment. Newer, higher performance systems deliver sand on demand, are more efficient and convenient to use, and are designed with operator safety in mind.

The American Rail Network

Since before the Civil War, the railroad industry has played a major role in shaping the American economy. Growth provided millions of Americans with a steady job, opened up new domestic markets for commodities and commercial goods, and was an economical means of passenger transportation. Although flourishing in the latter half of the nineteenth century, since then, the U.S. rail industry has had to re-invent itself to compete with new modes of transportation in the form of cars, trucks, and airplanes.

After a difficult period during the last economic downturn, the railroad industry has emerged with a brand new vigor. Thanks to major improvements in technology that have reduced fuel usage and improved speeds, the amount of rail traffic over the past several years has grown substantially.

Freight rails are playing a more vital role than ever in the nation's logistics system and are a key participant in America's "energy boom." In addition to transporting natural resources across areas where there are no pipelines, freight rails deliver massive amounts of sand to fracking wells as well as tons of crushed rock and concrete to out-of-the-way drilling rigs. Favorable economic conditions have spurred a dramatic climb in intermodal traffic as demand for everything from commodities to consumer goods increases.

Passenger trains are also experiencing a boom of their own. Clogged highways and urban traffic congestion are compelling more cities to adopt the use of light rail to accommodate the growing need for inter-city transportation. Annual ridership on Amtrak continues to break records, and in municipalities around the country, passenger trips on light and commuter rail lines are steadily increasing.

"Today's railroad sanding equipment ensures cleaner and more efficient methods for replenishing sand, and also promote a much safer working environment."



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Railroad Yard Operations

To accommodate the boom in railroad transportation, modern rail companies must operate strategically. U.S. freight rail is a highly competitive marketplace, and rail transportation providers must offer high-quality services at competitive rates in order to succeed in the marketplace. Although there is great demand for freight rail transport, carriers must work hard to keep their competitive advantage over air freight and trucking companies. On the passenger rail front, organizations are under close scrutiny in terms of reliability and consumer satisfaction while being forced to accommodate increased passenger loads under tight budgetary constraints.



Pneumatic sand-filling systems, like Cyclonaire's SandMaster, deliver traction sand directly to the locomotive sandbox.

Train operating companies are continuously challenged to improve rail yard efficiency in order to use their rolling assets at maximum capacity. Modern-day railroad maintenance facilities are a busy hub where activities must take place in a safe, efficient, and controlled manner. When tasks like routine maintenance, fueling, and sanding occur simultaneously, equipment is ready for its next roll out as quickly as possible. However, it is imperative to situate equipment to avoid interference between systems that could compromise worker safety.

With more rolling stock moving in and out of the yard, space is a premium commodity. Large scale maintenance equipment, like massive gantry and gravity-style silo sanding systems, become an impediment to productivity. Using these systems also forces crew members to climb onto the top of the train car or locomotive, putting their safety at risk. Alternatively, newer pneumatic sand filling systems, with low-profile, self-contained designs that bring the sand to the equipment instead of the equipment to the sand, allow companies to provide a high level of worker protection while improving efficiency and maximizing fleet availability.

Safe, Efficient, And Reliable Sand Filling Systems

From an operational standpoint, Cyclonaire's pneumatic railroad sanding systems are specially engineered to improve both safety and efficiency in the rail yard. Our pneumatic systems create a cleaner, safer working environment while simplifying sand delivery, making filling easier and more convenient, and minimizing equipment movement around the yard.

Our systems are operator-friendly and include numerous features that promote safety in a busy service yard. For example, our ergonomically designed wands are light in weight and incorporate automatic sand shutoff and purge to prevent overfilling. This allows railroad personnel to safely replenish the sand supply and minimize spillage. Wands can also come equipped with dust collection features to eliminate risk of harmful dust contaminating the surrounding areas. Even our traditional gravity sand towers are equipped with filters that clean the dusty air circulated when the silos are filled and during the filling of the locomotive sandboxes through the use of de-dusting features. Sanding nozzles that shut off when sandboxes are full are also valuable tools.

Our company utilizes compact, dense phase conveyors to distribute sand efficiently. Dense phase pneumatic conveying requires only a small amount of air for low velocity, gentle transfer that minimizes abrasive wear on internal components. This makes them last longer, lowers maintenance costs, and avoids downtime. Distribution conveyors deliver sand on demand at ground-level, allowing workers to easily fill sandboxes from ground-level. This eliminates the need for fall-protection gear or climbing to fill from gravity-fed systems and risking operational safety.



Cyclonaire's Mainliner System simultaneously services the fore and aft sandboxes of up to five locomotives on one track, or five locomotives on a parallel track.

A big advantage of pneumatic sand filling systems is that we can size them according to your capacity needs. Compact dispensers that fit in close quarters can be outfitted with up to four wands to service equipment on both sides of a platform simultaneously. Scaled-up systems incorporate large storage tanks and high performance conveyors to distribute sand to multiple on-platform sanding stations, enabling railroad personnel to service long trains, no locomotive respotting required.

In addition to operational safety and efficiency, our pneumatic sand filling systems are noted for their extreme reliability. With state-of-the-art controls and fault monitors as standard features, valves open only when a cycle is initialized and close when hoppers and bins are full. Air supply lines deliver controlled pressures to conveying lines and distribution tanks to ensure smooth flow of material. Filters and specialized nozzles eliminate fugitive dust emissions from escaping and allow for fast, safe, and clean sand dispensing.

Cyclonaire has made developing safe, easy to operate rail sanding systems a top priority. From sanding towers to distributed sanding systems, we provide equipment for any type of rail class. We design our systems with strong emphasis on workplace safety and rail yard efficiency. Highly developed pneumatic sand transfer with integrated filtration and dust collection ensures that all dust from the filling process is captured and workers are not inhaling harmful contaminants. Our systems are ergonomic and provide a safe and easy means for operators to fill sandboxes. These systems keep rail yards free of unnecessary congestion and maximize rolling stock availability, allowing you to successfully manage the growth and profitability of your rail operations.



Cyclonaire's Sand-A-Long is an innovative sanding conveyor stationed on a trailer which allows a single operator to fill a locomotive's sanding box anywhere at any time.

About Cyclonaire

Cyclonaire is committed to designing and manufacturing the finest pneumatic conveyor systems—from the simplest to the highly complex—and has done so since 1973. Our commitment to your project begins with a careful analysis of your needs, followed by full-scale testing in our state-of-the-art Technology Demonstration and System Proving facility. This facility allows us to simulate your conditions to ensure your company's equipment will handle the target rate, air usage, convey pressure, degradation requirements and other important parameters without risking capacity or extra capital investment.

Learn more about Cyclonaire and its products at www.cyclonaire.com.

