

SODA ASH DELIVERY AND UNLOADING OPTIONS

The choice of a delivery and unloading method for soda ash depends on the size of the requirement, transportation costs, rail service, and storage tank location. This bulletin provides a brief description of the most commonly used delivery vehicles.

Railcar Delivery

Soda ash is typically delivered in 100 ton capacity covered hopper cars and gravity discharged through rack and pinion slide gates. FMC maintains the soda ash industry's largest private rail fleet with leased cars of this type. In addition, soda ash can be delivered using covered hopper cars equipped with connections for vacuum pneumatic unloading or pressure differential (PD) covered hopper cars which use a positive pressure pneumatic system to airvey product to bulk storage. Availability of both of these car types is limited and may require special arrangements.

Mechanical Unloading

Mechanical systems to unload soda ash should be evaluated when large unloading rates (>25 tons per hour) and minimal product degradation are advantageous. Such systems are not normally used in applications where soda ash is used in solution form because of high capital costs, restrictive design parameters and operating conditions. If mechanical unloading is desired, gravity discharge cars must be used. Various mechanical systems exist to unload soda ash from these cars, including belt conveyors, screw conveyors, drag conveyors, bucket elevators, and combinations thereof.

Pneumatic Unloading

Pneumatic systems to unload soda ash from railcars are used in a wide variety of applications. In general, pneumatic unloading and transfer offers the following advantages:

- Low capital cost vs. mechanical systems
- Flexible design and operating parameters
- Less prone to water incursion and eliminates spurious dusting

Pneumatic systems are best used for unloading rates below 25 tons per hour and when the storage tank can be located in close proximity to the rail unloading point.

There are two basic types of pneumatic unloading packages, vacuum-positive pressure or positive pressure. The vacuum-positive pressure method, which uses a vacuum to puff soda ash from the car unit (which in turn uses positive pressure to blow product to storage) can be used with both the standard gravity discharge railcars and with railcars equipped for pneumatic unloading. The positive pressure method can be used with standard gravity discharge railcars and with pressure differential (PD) pneumatic railcars. These systems require readily available pneumatic transfer packages. FMC can assist in the selection of a vendor of such equipment.

Pneumatic trailer delivery

In many cases, pneumatic trailers offer the best delivery alternative for soda ash, especially for annual requirements below 10,000 tons. These trailers are self contained, non-coded, pressure units designed to convey product via a four inch line to the storage container. Trailer capacities up to 1600 cubic feet are available, but a delivery is typically controlled by highway weight limits to 45,000 pounds. These units use a positive displacement rotary blower driven by the power take-off from the tractor to pneumatically convey the soda ash to storage. A typical delivery of 45,000 pounds takes 1.5 to 2 hours to unload. While there are usually additional transportation costs for truck vs. rail direct shipments, pneumatic trailer delivery provides advantages including:

- Trailers are self-contained units, making the purchase of a pneumatic unloading package unnecessary, therefore resulting in equipment cost savings.
- The unloading operation is normally handled completely by the truck driver, eliminating the need for the user to provide an operator.
- Lead-time from order placement to delivery is minimal so plant inventories can be reduced or changes in production schedules can be more readily accommodated.
- Pneumatic trailer deliveries usually permit a great deal of design flexibility of the storage bin location.
- The closed positive pressure airveying operation exclude water incursion and eliminates spurious dusting.