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RAIL WAGON UNLOADING SYSTEMS

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SCHADE Rail Wagon Unloading Systems offer an efficient and safe solution for unloading large quantities and varieties of bulk materials. When paired with a bespoke SCHADE Charger or Indexer, an automated wagon unloading system can empty between 24 and 110 wagons per hour depending on Tippler design. SCHADE Tipplers are designed to operate in extreme temperatures from -45°C to +50°C. To date, more than 20 SCHADE Wagon Tipplers have been successfully installed worldwide.

Rail Wagon Unloading Systems

Wagon Tippler Systems are generally used in the following markets:

- **Ports and Terminals** – mainly large volume export where the raw material is delivered by rail.
- **Cement plants** – material intake (generally additives, fuels, calcining clay, etc.)
- **Other process plants** where raw materials are delivered in large quantities by rail (e.g. metallurgical and power plants)

Main materials handled are coal, fertilisers, iron ore and mineral concentrates, with emerging opportunities developing within Lithium mining and extraction.

The Unit Train Wagon Tippler

The Unit Train Wagon Tippler, with a capacity of more than 10,000 tph, is designed for industries where rapid unloading of bulk materials is critical for continuous plant operation, such as in power, cement, steel plants and ports.

It can accommodate wagons weighing up to 150 tons and is capable of handling up to 170 wagons per rake. This system is also capable of unloading up to 110 wagons per hour without the need to uncouple them.

Key advantages of the Unit Train Wagon Tippler include:

- Fully automatic operation with SCHADE Rail Wagon Indexer. Wagons remain coupled together for faster performance.
- High unloading rates and a consistent flow of materials without wagon uncoupling.
- Ideal for both new plants and retrofitting existing operations, integrating seamlessly into current infrastructure.
- The unloading process can be complemented with conveying systems from the AUMUND Group to transport materials to storage facilities.

The robust SCHADE frame designs ensure flexibility and compatibility for bespoke unloading requirements.

O FRAME WAGON TIPPLER

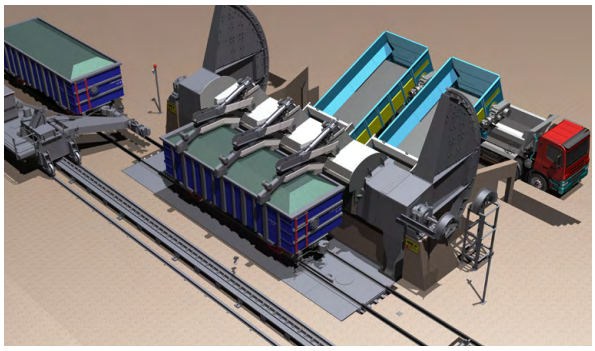
The O Frame Wagon Tippler is designed for unloading open random wagons and requires wagon uncoupling in its operation. While it uses less modern technology, it remains highly effective in operation. The wagon is rotated up to 180° within the fixed, closed installation of the Tippler frame for unloading. The single O frame design typically handles up to 25 wagons per hour.

The O Frame Tippler is designed to be a replacement machine for older tipplers, typically installed in Russia, CIS and Mongolia. The SCHADE O Frame design is a direct retrofit for existing O frames, offering both hydraulic and mechanical clamping options. As a result, installation costs for the SCHADE O Frame are reduced.

C FRAME WAGON TIPPLER

The C Frame Wagon Tippler design is the most versatile option in the SCHADE range. Its unique design allows the charger arm to move through the frame, enabling faster and more efficient wagon positioning compared to traditional O frame designs. The C Frame is available in single, tandem, and triple cell configurations, capable of unloading up to 30, 54, and 66 wagons per hour respectively.

The C Frame also features a movable side panel which adjusts to seat against the wagon side before clamping and tipping, ensuring smoother operation with less strain on the overall structure. Like all SCHADE designs, the C Frame incorporates built-in redundancies in critical components, ensuring that even if a component fails, the Tippler can continue to operate effectively, guaranteeing uninterrupted unloading.



PIVOT FRAME WAGON TIPPLER

The Pivot Frame Tippler is the only SCHADE design which lifts the wagon and offloads it to the "side," allowing for much shallower foundations and resulting in cost savings. This design is highly versatile, making it ideal for a range of applications, including recycling. The wagons need to be uncoupled, but a Charger can still be used to improve unloading efficiency.

The Pivot Frame is available in three height options: 2.4 m standard, 3.1 m, and 4.2 m, with the latter two offering even shallower foundations. This design is particularly beneficial in areas with high water tables, and where deep foundations would be too costly for project feasibility. The unloaded material can be removed using a front-end loader, or SCHADE can incorporate feeders into the discharge area for added convenience.

TYPICAL WAGON TIPPLER PERFORMANCE*

Unit Train Tipplers can handle:

SINGLE	40 – 50 wagons per hour
DOUBLE	50 – 75 wagons per hour
TRIPLE	75 – 110 wagons per hour

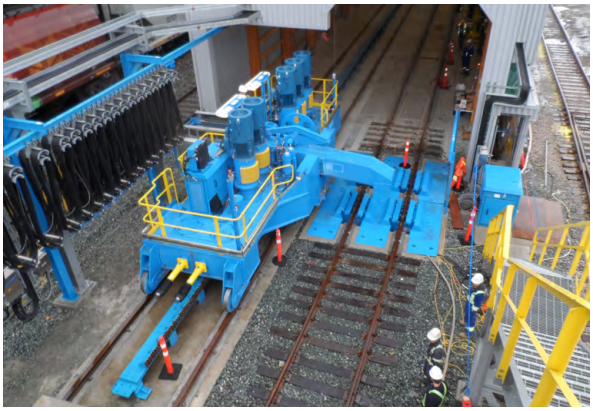
Tippler Design	Side Arm Charger
O Frame (single)	max 25
C Frame (single)	max 30
C Frame (tandem)	max 54
C Frame (triple)	max 66
Pivot Frame	max 24
High-lift Pivot Frame	max 24

* Actual handling rates will depend on wagon weights and lengths, train length, material, etc. SCHADE runs every enquiry through a complex in-house simulation programme. The system loading, drive pinions, and cycle times are assessed to determine the most efficient scenario for each application.

Additional SCHADE components for package solutions

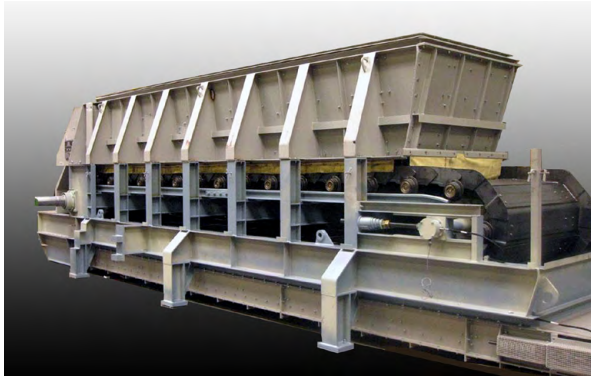
WAGON CHARGER (INDEXER)

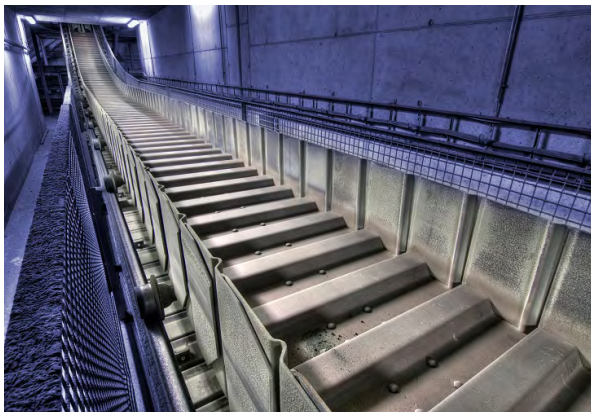
The SCHADE Wagon Charger is a crucial part of the wagon unloading system. It efficiently and precisely positions the wagons, enabling unloading speeds which align to customer requirements. The charger can be equipped with either a luffing or linear arm, along with a last car arm, to optimize performance and maximize unloading rates. Optional wagon charger drive types available are electromechanical, hydraulic or rope haul.



TRAVERSER (TRANSBORDER) WITH EJECTOR

The traverser with ejector is a space-saving innovation which enables unloaded wagons to be returned to the system without the need for traditional rail loops, reducing land requirements and lowering rail line and installation costs as well as addressing potential environmental concerns.





AUMUND GROUP TURNKEY OPTIONS

The AUMUND Group also provides conveying equipment designed to optimize Wagon Tippler operations. Conveyor types suitable for these applications include Armoured Plate Conveyors, Drag Chain Conveyors, Arched Plate Conveyors, Apron Weigh Feeders, and Pan Conveyors. The portfolio is completed with Discharge Systems for hoppers and silos.

For efficient stacking and reclaiming of materials, Portal and Semi-Portal Reclaimers, along with Bridge-Type Reclaimers, ensure reliable operations in both longitudinal and circular storage.

SCHADE AFTER MARKET SOLUTIONS

In addition to new Tippler design and installations, SCHADE also offers the following services:

- Increased tippler performance
- Retrofit tippler replacement opportunities
- Upgrades and repairs to existing tipplers
- Dust control canopies
- High pressure water misting systems for dust suppression

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