

Industrial Solutions

Rail car unloaders

Complete rail car unloading
stations from single to qua-
druple car dumpers with
fully automated side arm
chargers



thyssenkrupp



We realize your design specifications

As one of the world's leading manufacturers of rail car dumpers and car positioners, our references can be found on all five continents.

Rail car dumpers are used to unload bulk cargo from rail cars. Single, tandem, triple and quadruple dumpers are available depending on the applications. Each system is tailored to our customer's exact needs. The steel structures are designed using FEM software, allowing highly stressed areas to be identified and appropriate design measures taken to make the dumpers more durable. A seamless quality control and production monitoring system ensures that design specifications are met precisely during manufacture.



thyssenkrupp Industrial Solutions offers to our clients over 100 years of experience and a unique know-how in the field of bulk materials handling. We offer complete rail car unloading stations from single to quadruple car dumpers with fully automated side arm chargers.

O-type rotary dumper

Available in single, tandem, triple and quadruple dumper configurations

O-type rotary dumpers are used to unload unit trains, where all cars are of uniform design and equipped with rotating couplings, allowing them to be unloaded without the need for uncoupling each car. During rotation of the dumper, the cars are each held in place by four clamps. The holding devices can be activated by a counterweight or hydraulically. With hydraulic activation, the car springs are relaxed during unloading to reduce the stress on the dumper structure and the cars.

The dumper is powered by variable-frequency motors, allowing acceleration and rotational speeds to be controlled individually. To avoid twisting the dumper barrel, the two end rings are driven by synchronized motors. O-type rotary dumpers can be used to unload one, two, three or four cars at the same time.



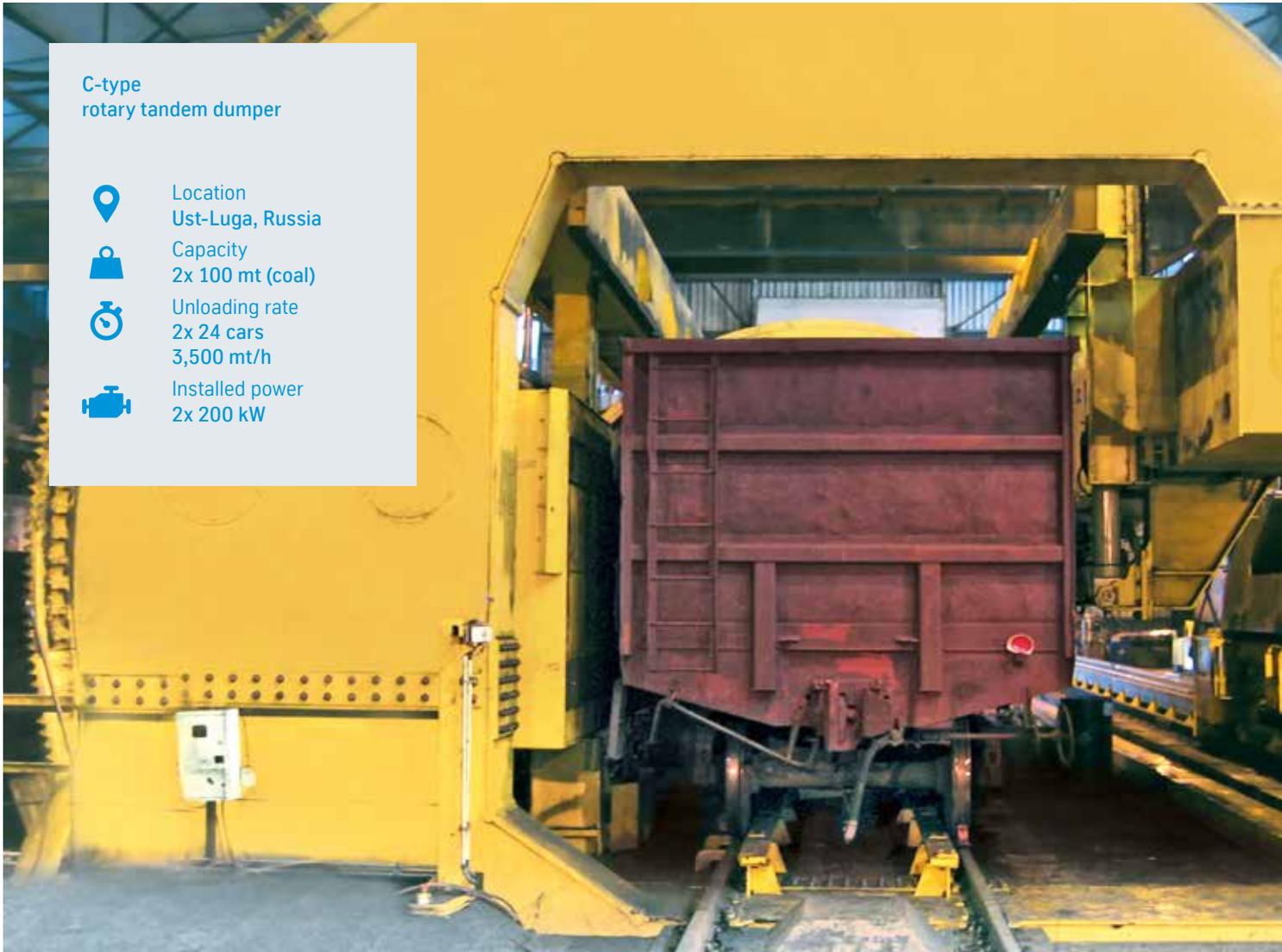
O-type rotary tandem dumper

-  Location
Tubarao, Brazil
-  Capacity
2x 120 mt (iron ore)
-  Unloading rate
2x 45 cars
9,000 mt/h
-  Installed power
2x 260 kW



Installation

After delivery of the dumpers, an experienced team of installation advisors and engineers can be provided for installation and commissioning. Customers can choose to have installation work carried out by thyssenkrupp Industrial Solutions or to do it themselves with expert advice of thyssenkrupp.



C-type rotary tandem dumper



Location
Ust-Luga, Russia



Capacity
2x 100 mt (coal)



Unloading rate
2x 24 cars
3,500 mt/h



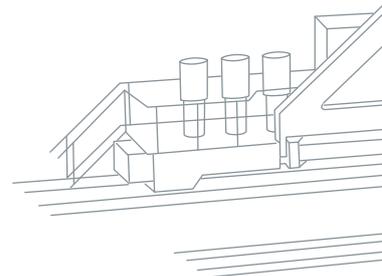
Installed power
2x 200 kW

C-type rotary dumper

Available in single or tandem dumper configurations

C-type rotary dumpers are used to unload uncoupled cars and can be designed for use with unit trains. The C-shape allows the positioner to position the cars with a lowered side arm either individually or in pairs which are removed after unloading. Hydraulic clamps can be used as vertical holding devices. When unloading uncoupled cars, the rotational axis of the dumper is independent of the coupling axis of the car, so the dumper's center of gravity can be optimized.

This permits a reduction in the required power, and the diameter of the dumper can be designed smaller than that of an O-type model. This dumper type can be used to unload one or two cars at the same time.





Design details

- 1 Vertical holding devices on an O-type dumper swing back automatically upon opening to allow passage of a locomotive.
- 2 The barrel bearings can be readily adapted to the rail type and the capacity of the dumper by varying the number and diameter of the support rollers.
- 3 One of two drives of a tandem dumper.



Rack and pinion positioner

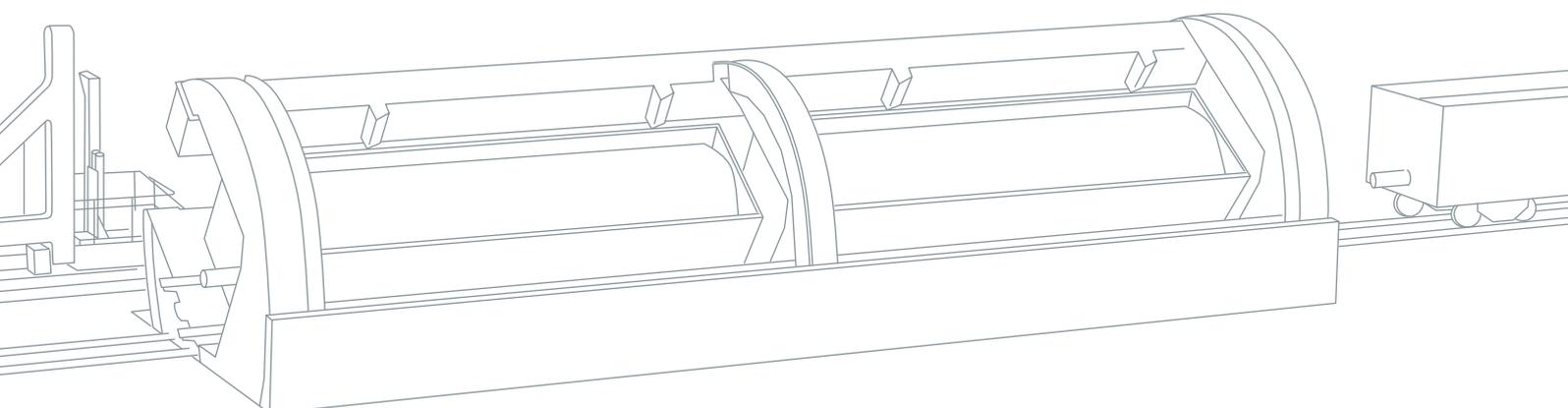


Rope driven positioner

Positioner

The cars are positioned in the dumper using special positioners with pulling forces of 100 to 1,350 kN. Depending on dumper type, pullers with one or two arms are used. On O-type dumpers, the second arm is used to insert and position the last car or pair of cars in the dumper.

A simulation program is available to determine the required pulling forces, taking account of upward and downward rail gradients, curves and friction coefficients to calculate the train dynamic factors.



Side discharge dumper

This type of dumper is used where a maximum of 20 cars are to be unloaded per hour.

Thanks to its design, this dumper requires much shallower foundations than O-type or C-type dumpers because the car is raised from track level during rotation. However, the installed per ton rating is higher, and the unloading rate per hour lower than with the two other dumper types.

The clamping device for the cars is mechanical, so no hydraulic equipment is required for this type of dumper. As a result of this method of operation and the significantly shallower foundations, this is a considerably less expensive solution than its two alternatives. However, as a rule only single cars can be unloaded.

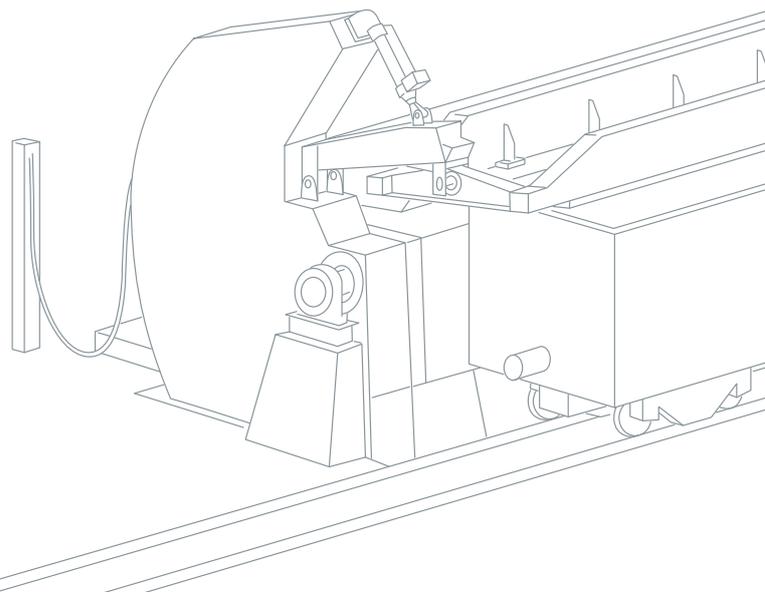


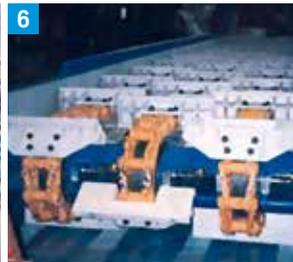
Side discharge dumper

-  Location
Kokkola, Finland
-  Capacity
100 mt
-  Unloading rate
20 cars
1,600 mt/h
-  Installed power
355 kW

New-design side discharge dumper

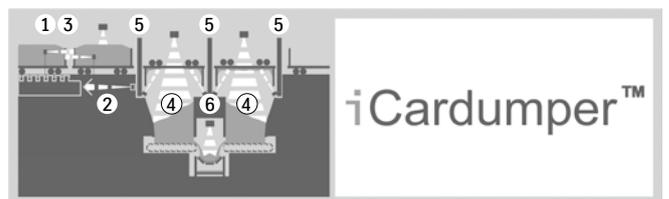
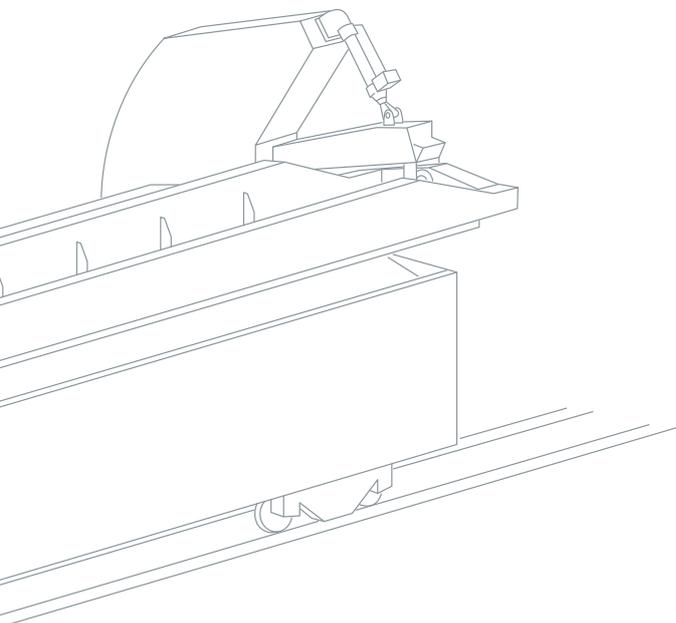
Both dumper rotation and car clamping are carried out using hydraulic motors/cylinders. As a result, the extensive counterweights and locking elements of this all-mechanical solution can be eliminated.





Optional accessories

- 1 Travelling hammer mill to reduce frozen material above the hopper grate.
- 2 Wheel chocks to hold the train while the positioner is being positioned.
- 3 Wheel gripper to hold the wheels of the train using clamps.
- 4 Water spray unit to suppress dust during unloading.
- 5 Apron conveyors that can be used to discharge abrasive materials such as iron ore from the hopper.
- 6 Chain conveyors that are used to discharge coal from hoppers.
- 7 Belt discharge conveyors are used to discharge non-abrasive materials from hoppers.
- 8 Vibrating feeders can be used to discharge materials from hoppers instead of the systems described under points 5-7.
- 9 A transfer platform is used to move empty single or coupled pairs of cars to an empty parallel track if there is no space for a loop.



Our rail car dumper systems can be provided with indurad sensory technology including: 1. Rail car indexer gap detection | 2. Rail car indexer positioning | 3. Wagon classification ILDR & OCR | 4. Car dumper apron feeder control | 5. Car dumper residue detection | 6. Discharge conveyor volume flow control

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