Bulk materials handling
Technology at work for you
Bulk materials handling
Introduction
Bulk materials handling

Introduction

Metso equipment simplifies and speeds the receiving, unloading, transfer and material handling process.

Our solid foundation is built on:

• Globally recognized machinery
• Advanced controls technology
• Increased availability and optimization
• Dependable equipment and parts
• Exceptional service response
• Environmental responsibility
• Personnel safety
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Global locations

- Pittsburgh, Pennsylvania, USA
- Sorocaba, Brazil
- Mumbai, India
- Johannesburg, South Africa
- Perth, Australia
Bulk materials handling

Range of equipment and capabilities
# Bulk materials handling products

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- [Image of Metso logo]
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Apron feeders

• Feeds large lumps of hard and abrasive ores under severe impact conditions
  - Lump sizes of 60" (1,500 mm) not unusual
• Handles wet, sticky/clayish or lumpy material
  - Cannot be handled by other equipment or feeders
• Used when present material handling operations utilize apron feeders as secondary and tertiary feeders
  - Ensures reliable operation with very low maintenance and downtime
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Apron feeders

• Used to extract or feed materials at:
  - Short distances
  - A controlled rate of speed
  - An extremely slow speed

• The purpose of a slow controlled rate of speed (feed) is:
  - To prevent choking of material feeding crushers and other equipment
  - To reclaim material at a uniform rate from hoppers, bins and stockpiles
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Wobblener feeders

• Feeds and separates (scalps) a variety of feed material
• Designed primarily to handle wet, sticky materials where a separation is required
• Generally used ahead of primary crushers
• Used where material is too sticky for other types of feeders/scalpers
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Wobbler feeders

• As elliptical bars turn, fines and smaller particles drop through the openings

• Opening between bars remain constant as the bars rotate
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Rotary railcar dumpers and positioners – features

**Improved end ring design**
- Rolled “T” end rings
- Pin jointed end rings (optional)

**Choice of clamp mechanism**
- Gravity actuated
- Hydraulically actuated
- Breakaway car clamps with spring relief feature

**Optional platen features**
- Integral platen weigh scale
- Shiftable platen

**Train holding devices**
- Wheel grippers
- Wheel locks
- Holding arm

**Blocking/side pad options**
- Fixed for single width wagons
- Moving (hydraulically actuated) for variable width wagons and loco clearance

**Dumper drive (not shown)**
- Heavy-duty rack and pinion drive system at both ends

**Train positioning options**
- Rack and pinion
- Wire rope
- Chain haul
- SCAMP®
- Nolan Hydraulic Car Movers™
- Gemini® car positioner

**Blocking/side pad options**
- Rollers (double/quad)
- External pivot bearing
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Rotary railcar dumpers and positioners

• Simplifies and speeds the unloading of bulk materials received by rail
• Handles random cars and unit train operations in varying railcar sizes
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Rotary railcar dumpers and positioners – unit train

Basic
Metso’s basic rotary car dumper makes handling a wide variety of materials a rapid, automatic process.

Tandem
Tandem barrel configurations dump two railcars simultaneously to double traditional unloading capacity.

Triple and Quadruple
Triple and quadruple configurations available for even higher capacity.
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Rotary railcar dumpers and positioners – random train

Rotaside
Rotaside dumpers lift the car during dumping, therefore reducing the depth of the receiving hopper and foundation

C-frame
The C-frame (crescent) design allows the positioner to move through the barrel, promoting efficient handling of random cars

Highlift Rotaside
Highlift Rotaside dumpers reduce the depth of the receiving hopper and foundations even further
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Rack and pinion positioner

• Cartridge drives come with pinions mounted on the positioner frame
• Machine racks mounted on the land between the positioner rails
• Powered arms to interact with the wagon couplers/drawbars mounted on the positioner frame
• Maximum train weights up to 30,000 tons (27,215 tonnes)
• Pulling forces up to 175 tons (159 tonnes)
• Hauling speed up to 2.5 ft/s (0.75 m/s)
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Gemini® car positioner

• Two over-the-coupler positioners index cars at high rates through the dumper
  - One positioner moves the train into the dumper
  - The second positioner simultaneously returns to the starting position in preparation for the next index

• Significantly reduces overall train dumping time
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SCAMP® reversible hydraulic indexers

- Used in two-directional applications
  - Up to 22.5 tons (20.4 tonnes) pull
  - Applications requiring a spotting accuracy of ±0.9" (±25 mm)
- Arranged to index a string of cars, one car length at a time
- Units can be arranged to traverse scale platforms or to be integrated into rotary dumper platforms
- Recommended for dumping 5–15 cars per hour
- Pushes on the wagon axle
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Nolan Hydraulic Car Movers™

• Used where cylinders are preferred over wire rope due to site conditions, or for pulls up to 20 tons (18 tonnes)
• Moves strings of railcars for dumping materials with spotting accuracy of ±5.9" (±150 mm)
• Pushes on the bogie transom
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Wire rope car pullers and positioners

• Single drum one-way
  - Six size options available, from 1.7–11.5 tons (1.5–10.4 tonnes) pull
  - Variable rope speeds

• Single drum reversible
  - Used where cars must be moved in both directions along one or two tracks
  - Closed rope circuit

• Double drum reversible
  - Used where two-way movement greater than 590' (180 m) is needed
  - Closed rope circuit (required)

A complete unit train is easily and accurately moved by this automatic wire rope-type sidearm positioner
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Train holding devices

- Prevents transmission of forces from the string of railcars to the dumper cage
- Ensure complete control of the string of railcars at all times
- Ensures accurate positioning of the railcars for optimum time cycle
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Metso equilibrated crane – barge unloading

• Unique counter-balance design principle ensures the weight of machine and a portion of the lifted load are balanced at any point in the duty cycle

• This results in 50% less energy to move the lifted load
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Continuous barge/ship unloaders

- Continuous barge and ship unloaders are economical for high capacity unloading applications
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Bucketwheel stacker reclaimers – stockpiling and reclaiming

• Two basic styles of stacker reclaimers with three different configurations of trailing tripper structures typically meet most storage requirements for:
  - Bulk ports
  - Terminals
  - Electric power stations
  - Other facilities where efficient stockpile management of raw materials is essential
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Linear scraper reclaimers – stockpiling and reclaiming

• Linear scraper reclaimers travel on a horizontal runway to stack and reclaim storage piles
• Booms may be mounted on either or both sides of the machine
• Able to use multiple storage piles for different materials
• Employ the cost-saving advantage of back-stacking (the ability to reverse boom flight direction and push material up the storage pile)
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Radial and portal scraper reclaimers – stockpiling and reclaiming

• Radial scraper reclaimers maintain a smaller footprint where yard length is limited
  - Lower cost compared to bucketwheel machines as they eliminate the separate stacker along with rails and associated yard conveyor

• Portal (bridge type) scraper reclaimers are excellent for blending materials and many times incorporate covered storage to keep material dry
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Barrel reclaimers

• Blending and reclaiming material from a stockpile
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Overland conveyors – cable belt

• Cable belt conveyors are generally suited to long distance conveying over 3.1 miles (5 km)

• At capacities up to 8,818 tph (8,000 mtph), they are a cost-saving and environmentally friendly alternative to trucking

• This rope driven conveyor is capable of negotiating difficult topography and rounding curves
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En masse conveyors

• Metso owns the REDLER conveyor name in the U.S.
• A single machine can replace several conventional units such as feeders, conveyors and bucket elevators
• They can be used for both horizontal and vertical conveying of virtually any free-flowing bulk material
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Metso equilibrated crane - scrap handling

• Metso equilibrated cranes can be easily adapted to the scrap recycling market
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Ship trimmers and throwers

• Thrower-type trimmers transport bulk materials more evenly to occupy the space surrounding the hatch in the ships hold
• Portable throwers are also ideal for stockpiling grains, cottonseed, fertilizers, salt, sands and wood chips
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Bottom ash and fly ash conveyors

- Submerged and totally enclosed mechanical conveyors will dewater and transport bottom ash away from the boiler discharge
- Dry drag chain conveyors are totally enclosed and dust tight systems for transporting fly ash from precipitators, fabric filters, boiler hoppers and cyclones
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Fly ash mixer conditioners

• Fly ash mixer conditioners uniformly wet the fly ash through an exclusive shaft/paddle arrangement
• The consistent moisture content cuts dusty emissions during loading and transporting
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Services and benefits
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Services portfolio

• Annual service contracts
• Breakdown assistance
  - Accelerated manufacture of critical parts
  - Field service engineers on call
• Control upgrades
• Equipment inspections
  - Structural, mechanical, electrical, hydraulic
• Field service engineering services
• Laser alignment services
• Operations and maintenance training
• Remote troubleshooting services
• Replacement parts order agreements
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Conclusion

With over a century of experience and a drive towards the future, Metso is committed to:

• Exceptional technological capability
• Sustainable performance
• Outstanding results
• Maximum return on investment
• Total customer satisfaction
Thank you