

Bigging up boxed bulk



containerized bulk handling systems more popular than ever

Louise Dodds-Ely

RAM Spreaders' Revolver® proves its worth

Containerized bulk handling (CBH) is increasing in popularity. Traditional bulk loading requires large amount of investment in engineering, design and construction, implementation and maintenance. Some bulk terminals cost more than \$100 million to set up.

RAM Spreaders is continuing to develop its popular Revolver® system, which makes it possible to transport bulk product easily using containers. The system works by loading bulk directly to a hopper by grab, and loading the cargo to a container, which is then sealed. (Another method of loading

the container is to use a digger.) The container can then be transported and stored, with no need for undercover storage facilities. The Revolver® spreader is used to discharge the container — whether into a hopper, or vessel hold, or other.

The RAM Revolver® picks up and rotates the commodity through 360° using open-top containers with sealed lids as a form of loading, transportation, storage and unloading.

The Revolver® has been designed for flexibility to interchange with either a

Reachstacker or a bridge crane, with other Revolver® models available for mobile harbour cranes, ship-to-shore cranes and ship crane use.

The CBH process is simple and effective, efficient and most of all, clean and friendly to the environment at a very low cost. The Revolver® CBH can handle all dry bulk commodities such as grains, mineral sands, soya, wood chip, copper concentrate, iron ore, coal and scrap metal.

RAM Revolver® has a SWL of between 35t for ship, bridge and reachstack application. 38t SWL for ship-to-shore

Innovative revolving container technology now in use at DP World Fraser Surrey, Canada

In May last year, DP World and New Gold Inc. announced the signing of a long-term agreement to facilitate the export of copper concentrate through DP World Fraser Surrey using rotating containers

This long-term agreement with mining company New Gold Inc. facilitates the export of copper concentrate through DP World Fraser Surrey using rotating containers — a specialized revolving head technology — with the rotating equipment coming from RAM Spreaders.

New Gold is excited to be partnering with DP World Fraser Surrey, a world class marine terminal and Intermodal Solutions Group (ISG). New Gold is the first mining company in North America to use the ISG rotating containers system, from mine to vessel. New Gold recognizes that keeping bulk products contained, from mine to ship, benefits the environment and significantly reduces or eliminates the risk of dust loss that comes with bulk handling.

DPWorld Fraser Surrey is the first marine terminal in Western Canada to begin exporting dry bulk cargo by using rotating containers. This revolutionary new export method begins an era of exporting dry bulk commodities in a more environmentally responsible manner. This method allows fully sealed containers to be rotated 180° within the hold of the vessel to unload the contents rather than using the traditional bulk shiploader. A mobile dust-suppression unit is fitted around the rim of each vessel hatch, emitting water mist to mitigate dust levels.

As a result, there is no product damage or loss and the risk of environmental contamination during transport and loading is dramatically reduced.

In addition to concentrates, the ‘rotainer’ technology can be used with sulphur, wood pellets, fertilizer and grains.

DPWorld (Canada) Inc. CEO & GM, Maksim Mihic, noted: “I am delighted to partner with New Gold Inc. to enable trade in a more efficient way, and with significant environmental benefits. The rotating container is an innovative solution that will improve the competitiveness of Canadian exports in the global markets.”

DPWorld’s continued investment into Fraser Surrey has created a world class marine terminal. The agreement with New Gold and the early-2022 start-up of this model for exporting cargo forms a new standard in marine shipping, enabling smarter trade and creating a better future for all.



The RAM Spreader seen operating at DP World Fraser Surrey in April 2022.

cranes and 45t for mobile harbour crane application. All equipment except the ship crane revolver, which has an on-board power unit, takes power from the crane supply.

Over the years, RAM has shown how the Revolver® can smoothly integrate into any port or logistics type at low costs — that being pit to ship, shed to ship, ship to hopper, etc.

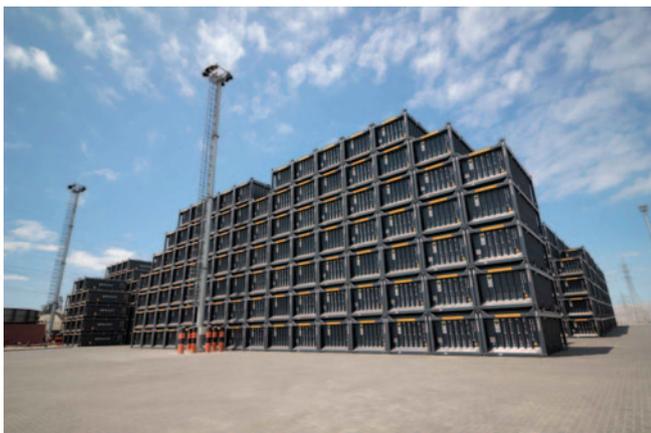
There are a couple of challenges that must be overcome when handling bulk in containers. The first is the issue of working with ships’ gear. Many of RAM Spreaders’ customers want to use ships’ gear, but the tare weight of equipment makes this difficult. Another challenge is that the cost of fully containerizing cargo can be expensive.





However, these challenges are offset by the significant advantages of moving bulk in containers. These include:

- ❖ **Clean & green:** no dust is generated or exposed to the environment as containers are sealed shut. When unloading, the rotating spreader removes the lid semi-autonomously and then gently rotates at the bottom of the hatch.
- ❖ **Multiple types of commodities can be stored** in close proximity without the risk of cross-contamination or environmental impact.
- ❖ **Product protection:** as containers are sealed shut until unloading, the system prevents loss of commodity or product quality being degraded.
- ❖ **Flexibility:** over the years, RAM has shown how the Revolver® can smoothly integrate into any port or logistics type at low costs — that being pit to ship, shed to ship, ship to hopper, etc.
- ❖ **Fast contingency:** the bulk handling system has the ability to stockpile the commodity for the arrival of the ship.



Containerised Bulk Handling with RAM Revolver



Containerising bulk in sealed containers

No contamination, no loss of commodity

360 degree rotation

Decants all commodity efficiently

Heavy duty construction & components

A robust single unit design

For all types of crane & commodity

MHC | STS | Ship Crane | Bridge Crane | Reach Stacker

RAM
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❖ **Boxing clever:** the traditional method of stockpiling bulk demands more consideration when planning — from storage facilities, environmental concerns to cross contamination. Containerizing bulk means using existing infrastructures. A containerized system uses up the storage capacity per square metre, as the commodity is stored in a cuboid formation rather than a conical or cone formation.

DUST CONTROL VITAL

As mentioned above, containerization of commodities, containerization of commodities results in a dust free environment as the commodity is transported in sealed containers and only sees the light of day immediately before being tipped into the ships hold (or hopper if it is bridge crane/reach stacker for handling facilities or exporting from shed to ship). To ensure maximum dust suppression, a dry fog system is placed around the ship's hold to suppress the dust plume when unloading the commodity into the ship's hold.

CUSTOMER BASE

Customers for the RAM Revolver® range from mining companies, bulk handling facilities, ports and terminals and inland terminals. The original concept for RAM CBH was aimed at the export market, but in recent years, the RAM CBH has

increased in popularity with inland terminals and bulk handling facilities. These customers require bulk to be moved between locations without the need for multiple handling and without environmental impact and loss of commodity from multiple handling points.

LID LIFTING SYSTEM

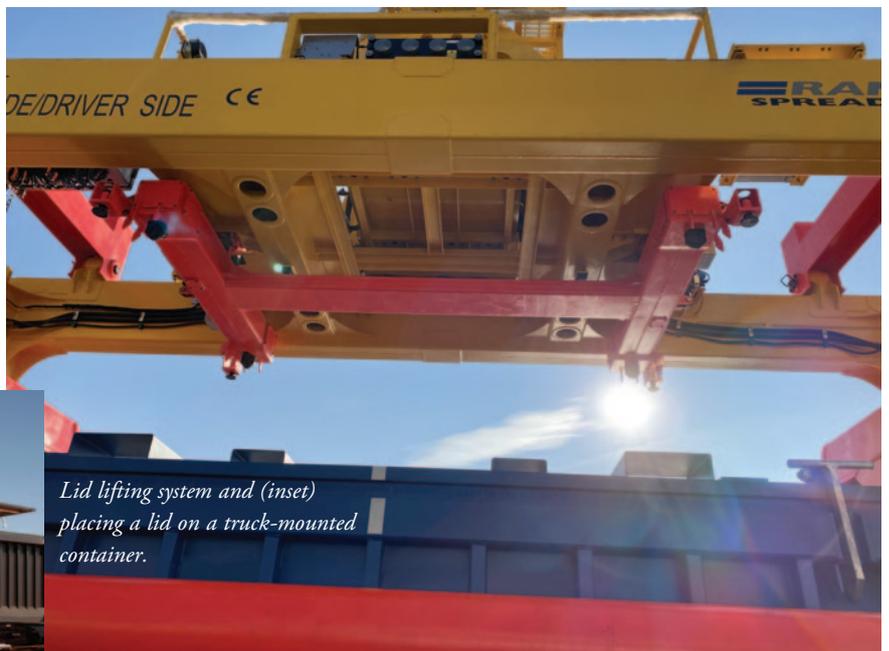
This is the mechanism on Revolver® that lifts the lid from the container immediately prior to Revolver® rotating the container through 360°, tipping the commodity.

LOW-DENSITY BULK SOLUTION

RAM Spreaders has also developed a high-volume Revolver® for low-density bulk, to add to its extensive range of container handling solutions. With a growth in

biomass and other low density dry bulk materials, RAM has been investigating ways to maximize the efficiency of loading with its customers. Essential to the investigation process and the feedback it received, was the need and ability to load large volumes (>100m³) per cycle. After consulting with customers RAM developed a solution with the 'Revolver® – Container' combination being able to handle this level of load rate, by introducing a high volume container capable of achieving a higher volume load capacity.

This new innovation allows the Revolver® to handle large volumes and enable customers to get the very best load rates available. With a maximum volume of standard open top containers being limited, it ultimately restricts its efficiency. So you



Lid lifting system and (inset) placing a lid on a truck-mounted container.



would think to increase the volume, you would have to introduce an out-of-gauge container, which would be expensive to build and to ship.

To solve this problem, RAM developed a two-tier container, which is an 'in-gauge' design solution for shipping but out-of-gauge for operations. So for the customer it will increase efficiency but still remain cost effective.

The design and construction of the high volume 'in-gauge' container is innovative and very easy to introduce into the containerized bulk handling process.

CASE STUDIES

RAM Revolvers® are in use at a wide range of facilities. Notable contracts for the system include:

- ❖ **CODELCO:** the largest copper producing company in the world. The copper concentrate is loaded and sealed into special ISO twenty foot containers at the mine; it is then transported to the port's yard, stored like any other container and then loaded right into the vessel's hatch with existing terminal equipment. The only new equipment is the purpose-designed revolver from RAM Spreaders. The CBH process is simple and effective, efficient and most of all, clean and friendly to the environment at a very low cost. The copper is not exposed to the environment, even when it is released at the bottom of the vessel's hatch by the revolver spreader.

- ❖ **Riga Universal Terminal Ltd (RUT):** as part of its ongoing development of the terminal, and in order to increase the

effectiveness of cargo handling, RUT introduced the use of the RAM Revolver® for handling wood pellets on large dry bulk ships. The Port of Riga was the first port in Europe to use the system. Pellets are delivered from warehouse to pier in special-purpose open-top 20-foot containers. Using a portal-frame container lift equipped with a Revolver®, the entire contents of a container are delivered onto the ship by turning the container over into the holds.

Said Atis Šulte, RUT Trade and Business Development Director: "The main benefit from introducing the new technology is significant optimization of terminal expenses and increase in performance. Now, we can perform dry bulk handling operations involving



a significantly smaller number of machinery and human resources. Savings on resources amount to almost 50%. By introducing containerized cargo handling, we have become more competitive and can better adjust to customer requirements. Following the general tendency in cargo carriage, dry bulk ships handled at our terminal are becoming even larger. By means of the new technology, we are able to ensure fast and effective loading of large ships. By applying the new technology, we are able to load dry bulk and containers at the same pier, using one portal-frame lift. It allows us to quickly organize our work in the terminal and quickly handle any type of ship."

Says RAM Spreaders Head of Sales & Marketing Cameron Hay, "Being the first Revolver in Europe, the CBH system is world's best practice for environment; and we can see in Riga that it increases productivity as well".

- ❖ **Port Elizabeth Container Terminal (PECT), South Africa:** following the introduction of containerized bulk handling at PECT, Transnet Port Terminals (TPT) placed a repeat order with RAM Spreaders for four units of the RAM Revolver® bulk handling spreader. TPT handles large volumes of bulk exports annually at PECT, and turned to RAM Spreaders for its CBH needs. The terminal invested in four units of RAM Revolver®, to help it service its base of customers better. Speaking in 2019 at the handing over ceremony of the Revolvers, RAM Spreaders Cameron Hay commented "Since the first order of Revolvers® in Port Elizabeth more than five years ago the CBH system has grown significantly. These new revolvers will allow TPT to ensure environmental compliance."

PECT is located near to the main town of Port Elizabeth and like all cities dust is a sensitive issue. The CBH system, using a hatch misting system is the greenest loading system in the world with zero fugitive dust emissions.

- ❖ **Peru minerals contract:** working with international mining consultants Ausenco, RAM Spreaders designed and supplied its CBH system, which loads bulk ore into containers and uses standard trucks, trains & cranes to

handle the material through the supply chain. The CBH system seals the valuable material in the container at the mine and doesn't see daylight until emptied into the ship's hold. The containers are filled with valuable ore at the mine and then the modular system is transferred simply through the supply chain with no double-handling or material loss. The RAM Revolver® was designed to be flexible in application, so that it could be changed to handle a number of loading or container handling situations. The system can be interchanged between reachstacker, bridge crane in the warehouse, or port crane for direct shiploading. This flexibility allowed the system to work straight away in the 'ramp up' phase of the project before all of the infrastructure was ready.

- ❖ **Port of Poti, Georgia:** at the Port of Poti, to reduce spillage and wastage before being transported to the terminal, copper concentrate is loaded into reinforced open top containers covered by a tarpaulin in a closed warehouse. The use of the RAM Revolver® has improved efficiency and improved the environmental impact of these operations. There is a clear cost

and time saving. At the terminal, the revolving spreader attaches to a mobile harbour crane as a regular spreader does. The suspended spreader turns the container upside down and deposits the contents at the bottom of the vessel's hold. As the product is loaded into the vessel, a hatch-mounted misting system prevents the copper dust from being blown away. The spreader means that the copper concentrate avoids spillage, dusting and water contamination.

STAYING COMPETITIVE

RAM Spreaders retains a highly competitive position in the market by having different designs to suit the application of the customer's equipment

It also works closely with potential clients to show how the CBH system can flexibly integrate into their port infrastructure (in a small-time frame and without unnecessary costs) to boost productivity.

Moreover, to solidify its relationship with customers, RAM Spreaders aims to provide exceptional customer care before and after delivery. Its support services are there to provide help and guidance throughout the service life of the machine.

ABOUT RAM SMAG LIFTING TECHNOLOGIES

RAM SMAG Lifting Technologies has been manufacturing spreaders since 1972 for nearly 50 years. The head office is based in Germany and the company is an integral part of Group SMAG.

RAM & PEINER SMAG provide the full range of crane lifting attachments from, spreaders, tandem headblock, grabs, RAM Revolver, tilting spreaders, pipe handling spreaders.

RAM SMAG Lifting Technologies is a global company with offices in Germany, Singapore, UK, India, China. It benefits from a global network of local sales & service representatives. RAM carries out all design/manufacturing in-house and does not subcontract.

Quality systems in place include: ISO 9001, ISO14001, ISO18001, ISO 3834-2, EN1090-2.

The company is currently celebrating over ten years of RAM CBH success, with the very first commercially available Revolver still in operation today. This is testament to the hard work and determination of not only RAM, but also its customers, who believe in, and rely on, the product gaining great success and reducing their environmental impact using RAM CBH.