



CONTAINERISED BULK HANDLING

The next generation in clean bulk ports

Case Studies of bulk handling systems to stop dust pollution

Who we are?



A leading manufacture and supplier of container handling equipment for ports and terminals....

who this year celebrate 50 years of success



Who we are?

We entered the bulk handling market in 2011 with **'Revolver'** rotating spreader...



WorldCargo news

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RAM launches "Revolver" bulk handling spreader

News 04 May 2011

RAM Spreaders has come up with a new tipping spreader for lifting and tipping the contents of bulk containers



Three units of the patented Revolver spreader have been delivered to DP World Adelaide for handling containerised iron ore shipments from the Australian mining company IMX.

The units will be deployed over the lifetime of contract loading around 70,000t of iron ore onto the vessel each voyage. The units at DPW allow containers filled with iron ore to be lifted and tipped into the hold of a vessel. The containers are handled within the port, by rail and at the mine with standard container handling equipment such as straddles and reach stackers.

The project has allowed IMX to export its product quickly with low capital investment whilst meeting all the strict environmental requirements and has allowed DP World to develop new business.

Who we are?

Selling close to 100 units of 'Revolver' for various types of crane application from MHC, STS, Ship, Reach Stacker & Bridge Crane



COUNTRY	REGION	MODEL	QTY	YEAR
Australia	Australasia	4110	1	2011
Australia	Australasia	4110	2	2011
South Africa	Africa	4100	2	2012
Australia	Australasia	4120	2	2012
Congo	Africa	4100	2	2013
Australia	Australasia	4131	2	2013
Mozambique	South Africa	4110	2	2013
Borwa	South Africa	4111	2	2013
Borwa	South Africa	4111	1	2013
Mauritania	Africa	4131	2	2014
Argentina	South America	4121	1	2014
Chile	South America	4121	2	2014
Argentina	South America	4131	1	2014
Chile	South America	4121	2	2015
Chile	South America	4121	1	2015
Mexico	South America	4141	1	2015
Peru	South America	4151	4	2015
Saudi Arabia	UAE	4131	1	2015
Latvia	Europe	4121	1	2016
Oman	UAE	4121	2	2016
Oman	UAE	4131	1	2016
China	Asia	4151	1	2017
Mexico	South America	4121	2	2017
Bolivia	South America	4141	1	2017
Mexico	South America	4141	1	2017
China	Asia	4151	1	2018
USA	Central America	4121	1	2018
Georgia	Eurasia	4121	2	2018
Africa	South Africa	4111	4	2018
Chile	South America	4151	2	2018
China	Asia	4151	2	2019
Bulgaria	Europe	4121	1	2019
Russia	Europe	4121	1	2019
Bahrain	Middle East	4131	2	2019
Mexico	South America	4121	2	2019
Chile	South America	4121	2	2019
Chile	South America	4131	1	2019
Indonesia	Asia	4111	2	2022
China	Asia	4141	1	2021
Canada	North America	4111	1	2021
Peru	South America	4121	1	2021
Dubai	UAE	4121	1	2021
USA	Central America	4141	1	2022
Poland	Europe	4121	1	2022
Bahrain	Middle East	4131	1	2022
Canada	North America	4111	2	2022
Chile	South America	4121	1	2022
Chile	South America	4121	2	2022
Chile	South America	4141	1	2022
Mexico	South America	4141	1	2022
Chile	South America	4151	3	2022

Who we are?

...and are **one of the only suppliers** of containerised bulk handling solution in the Americas



Current Bulk Handling Logistics

The commodity is handled **multiple times** during the logistics cycle



TRANSFER POINTS



OPEN WAGONS



STOCKPILES



SHIP LOADING

Current Bulk Handling Logistics

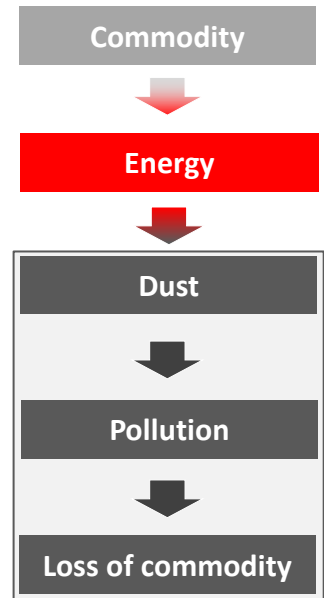


But can it be sustained over time?

Dust is generated at any point in the logistics cycle

When energy is added to the material

Resulting in pollution and loss of valuable commodity



Current Bulk Handling Logistics

What can we do?

In order to meet current environmental guidelines, many companies are now looking at systems not only to reduce levels of contamination, **but** also cost-effective systems.



Current Bulk Handling Logistics

A competitive edge for container ports & terminals?

Many standard container terminals **are also** looking at ways to handle bulk commodities to remain competitive, **but a number of factors can restrict their progress:**

- **Lack of space**
to expand into bulk handling operations
- **Limited funds**
to develop the port to accommodate stockpiling
- **Infrastructure**
to cope with demand
- **Environmental impact**
with many ports close to residential or coastline attractions



Current Bulk Handling Logistics

Is there a solution?



Containerised Bulk Handling



**Containerised
Bulk
Handling**

FILL | TRANSPORT | STORE | LOAD



So what is the CBH System?

CBH uses sealed open-top containers for the:

Storage

Transport

Unloading

of bulk commodities



So what is the CBH System?

Transport of commodity is done by:



ROAD



RAIL



OR BOTH
(BI-MODAL)

Containerised Bulk Handling

How does it work?

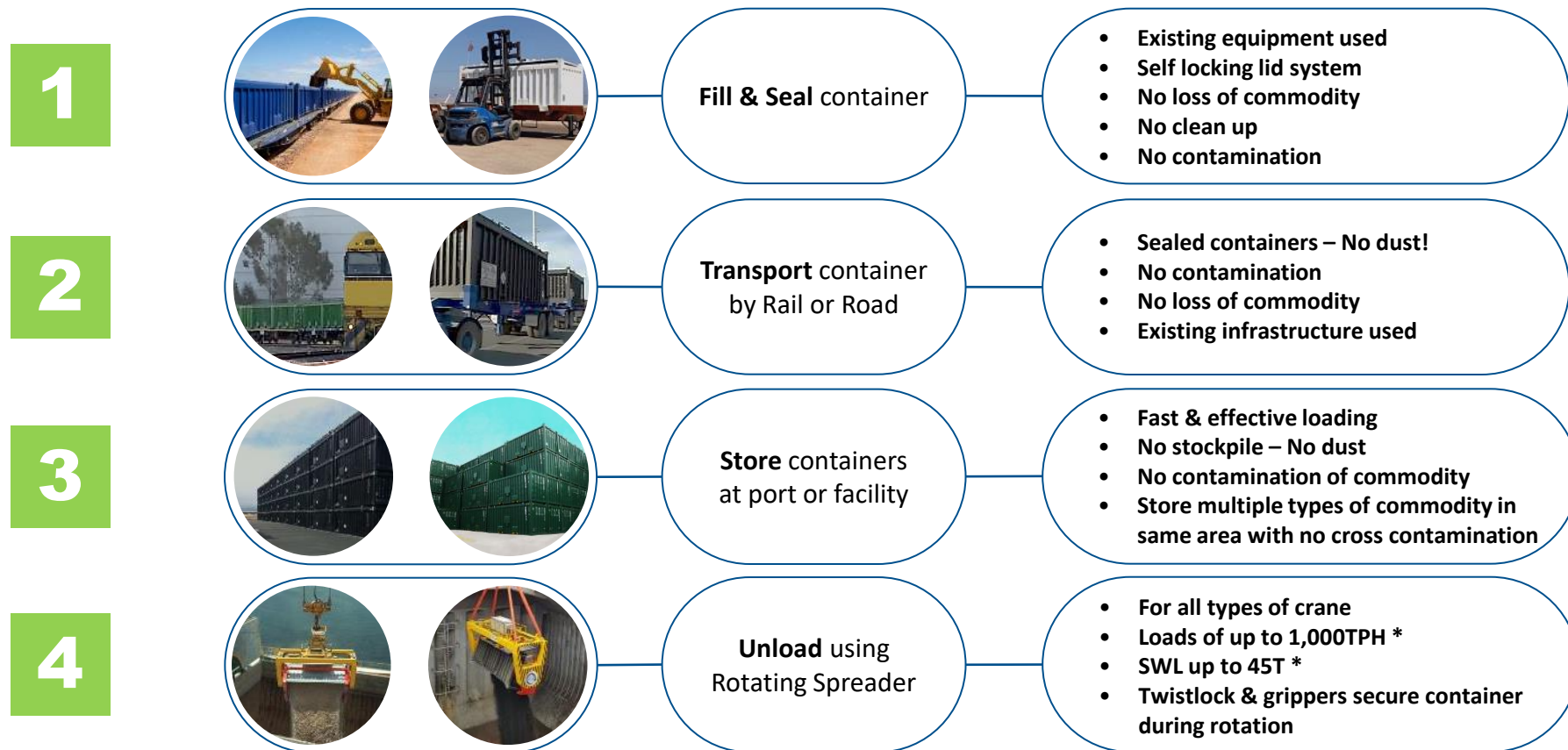
Using a 4 stage process, bulk is handled with minimal transfer points...

..resulting in a reducing loss of commodity and contamination than conventional bulk handling processes

1. **Fill** container at facility or mine
2. **Transport** container by road or rail
3. **Store** containers ready for unloading
4. **Unload** with rotating spreader



Containerised Bulk Handling



*Loads & SWL typical with using RAM's Rotating Spreader 'Revolver'

Containerised Bulk Handling

Can CBH be used on all types of crane?

Bulk rotating spreaders, such as 'Revolver' are available for all types of crane, from MHC's to Reach Stacker's

MHC**STS CRANE****SHIP CRANE****BRIDGE CRANE****REACH STACKER**

Containerised Bulk Handling

What equipment do I need for CBH?

Rotating Spreader



Misting system (optional)



Containerised Bulk Handling

What equipment do I need for CBH?

CONTAINERS



**EQUIPMENT NEEDED
AT THE MINE/BULK PRODUCER**

Containerised Bulk Handling

A large orange RAM spreader is shown in operation at a port. The spreader is lifting a container, and its boom is extended upwards. The background shows a large ship and other port infrastructure. The text "HOW FLEXIBLE IS IT?" is overlaid in the center of the image.

HOW FLEXIBLE IS IT?

Containerised Bulk Handling

EXPORT

Pit to Ship



Fill at mine

| Transport



Stack containers at port



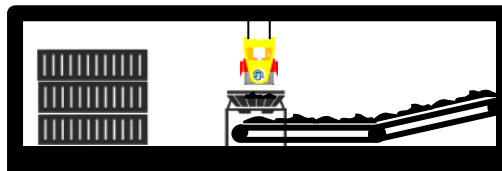
| Lift & unload directly into ships hold

Pit to Ship Loader



Fill at mine

| Transport



| Store containers in port's shed | Lift & unload onto conveyor ship loader

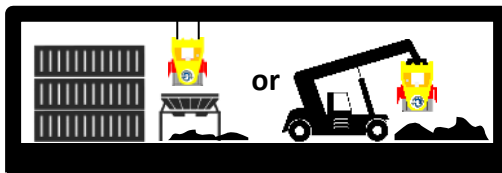


Pit to Shed



Fill at mine

| Transport



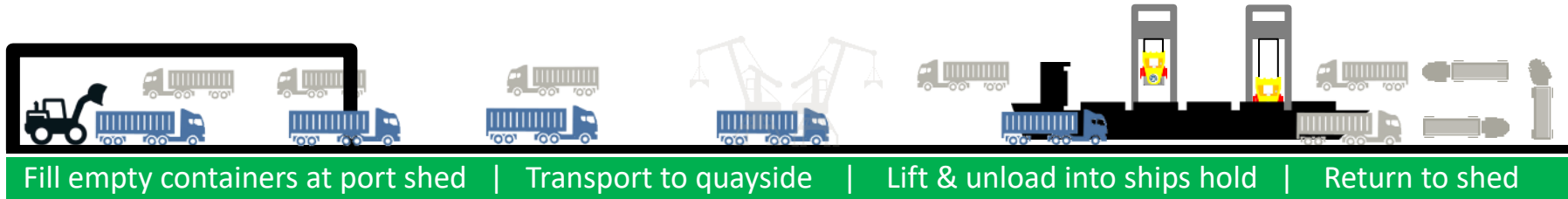
| Lift & unload into shed at port of facility



Containerised Bulk Handling

EXPORT

Shed to Ship (Internal Truck Loop Operations)



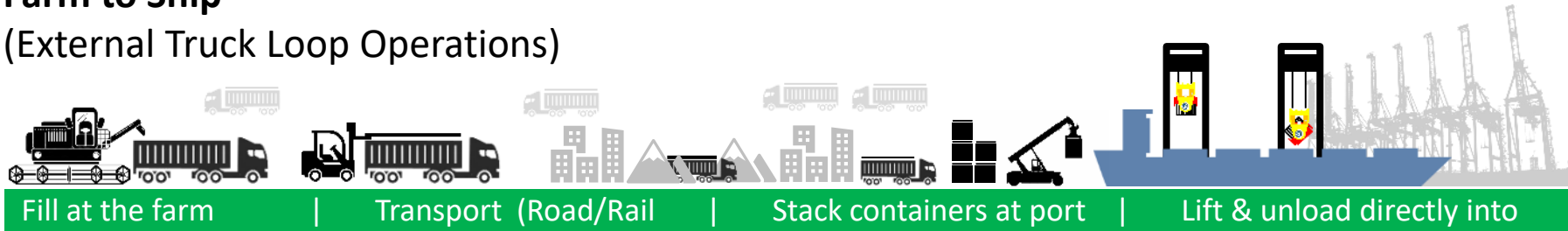
Shed to Ship (External Truck Loop Operations)



Containerised Bulk Handling

EXPORT – GRAINS

Farm to Ship (External Truck Loop Operations)



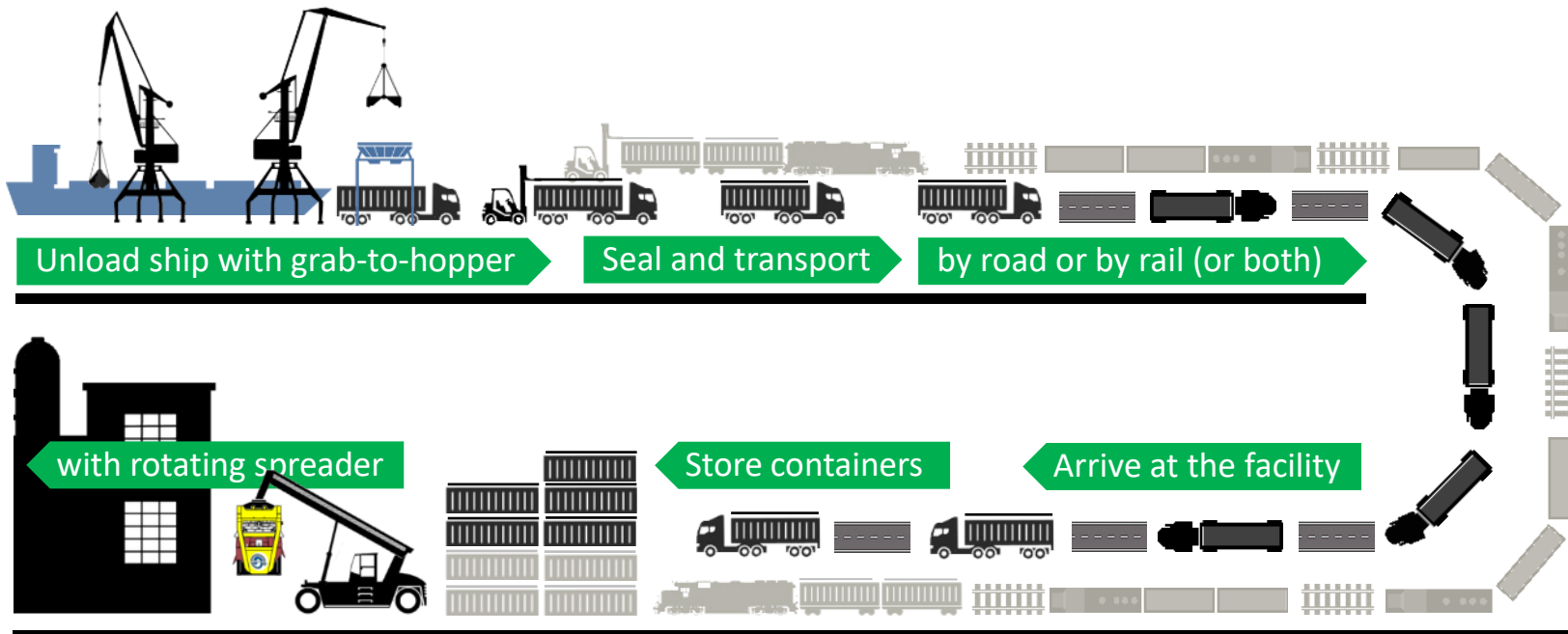
Farm to Shed (Internal Truck Loop Operations)



Containerised Bulk Handling

IMPORT

Ship to Shed/Processing Facility



LOADING PROCESS

CBH
4 stage
process

Fill container at the mine or facility
Seal with lid
Transport
Load at final destination

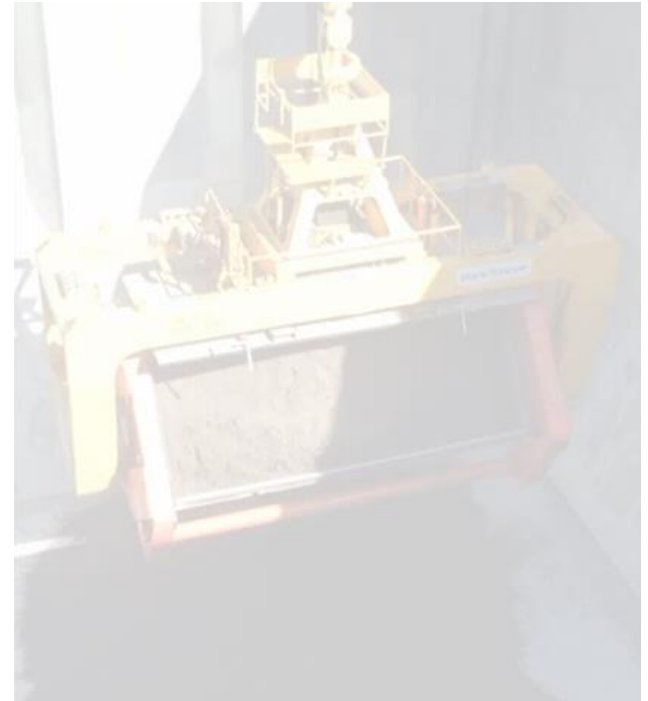


RAM
SPREADERS

Containerised Bulk Handling

Benefits for Terminals

- ✓ **Gain new customers** Use existing equipment
- ✓ **Flexible berths** No fixed bulk berth
- ✓ **No dust** No local complaints
- ✓ **Low cost** No expensive infrastructures
- ✓ **Proven** High productivity



CASE STUDIES

Case Study



COMPANY: Transnet Port Elizabeth

COMMODITY: Manganese

CRANE: Ship to Shore



Case Study



Case Study



CONTAINER & CBH BULK HANDLING TERMINAL



Case Study



CONTAINER & CBH BULK HANDLING TERMINAL

VEHICLE EXPORT TERMINAL



Case Study



CBH has been in operation since 2014 at Port Elizabeth Container Terminal

Handling an increasing large volume of bulk, in 2019 Transnet Port Terminals (TPT) placed a repeat order for a further 4 units of RAM CBH




Dust Free Loading in Port Elizabeth


Delivery of 4 Revolver® spreaders helps Transnet Port Terminals commit to its sustainability agenda and reduce dust. April 2019

Summary

Following the introduction of Containerised Bulk Handling at Port Elizabeth Container Terminal (CBCT) in South Africa, Transnet Port Terminals (TPT) placed a repeat order with RAM spreaders to enable its four Revolver® bulk handling spreaders.



TPT handles large volumes of bulk exports annually at the Port Elizabeth Container Terminal and recently expanded maritime and bulk handling. TPT's investment in 4 units of RAM Revolver® to help TPT serve their base of customers better.



Flexible Approach & Clever Use of Capital


Containerised Bulk Handling (C-BH) allows for easy handling of bulk materials with a simple, smaller change on the cranes. The cost of the CBH system is a fraction of the cost of new bulk loaders.

Speaking of the handling cost, secretary of the Revolver®, RAM Spreaders Canada, Ray Ackermann, "Since the first order of Revolvers in 2014, more than 2 years ago, the CBH system has grown significantly. These new revolvers will allow TPT to ensure environmental compliance."

www.ramspreaders.com

A Route to Market for Miners

Mining companies are now able to find an new route to market using CBH for exporting bulk through standard container terminals, which until now has only been possible with heavy infrastructure, such as expensive infrastructure.



Clean & Green!

CBCT is located next to the main town of Port Elizabeth and like all cities that is a sensitive town.

The Containerised Bulk Handling system, using a batch mixing system is the present loading system in the world with zero fugitive dust emissions. It achieves this through a 2 stage method:

- The Revolver® adds only 1% of energy to the bulk material at the very bottom of the hatch.
- A batch based dust suppression system mounted on the hatch, which strips any wind blown dust from the roof-top.

Local Community-Supporting Local School

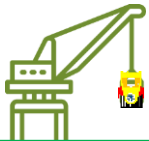
RAM Spreaders & Transnet Port Terminals are both socially aware companies, so as a result of the Bulk Handling project, are helping to support the local community by employing a number of local technical staff and provide training programs to help further their skills in this new technology.

The local Green Apple Education close to the Port Elizabeth Container Terminal is also benefiting from the new project with RAM & TPT helping to subsidise teachers and provide funding to help the school add three new classrooms. This will allow more children in the area to receive a decent foundation education and further help the local area continue to prosper.



Case Study

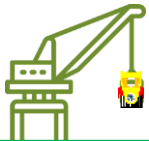
COMPANY: RUT
COMMODITY: Biomass
CRANE: MHC



Case Study

Riga Universal Terminal (RUT) became **the first** terminal in Europe to introduce the **Containerised Bulk Handling** system.

Since its introduction RUT have **doubled** their biomass export to cope with the increased demand and bring in new levels of revenue.



Case Study

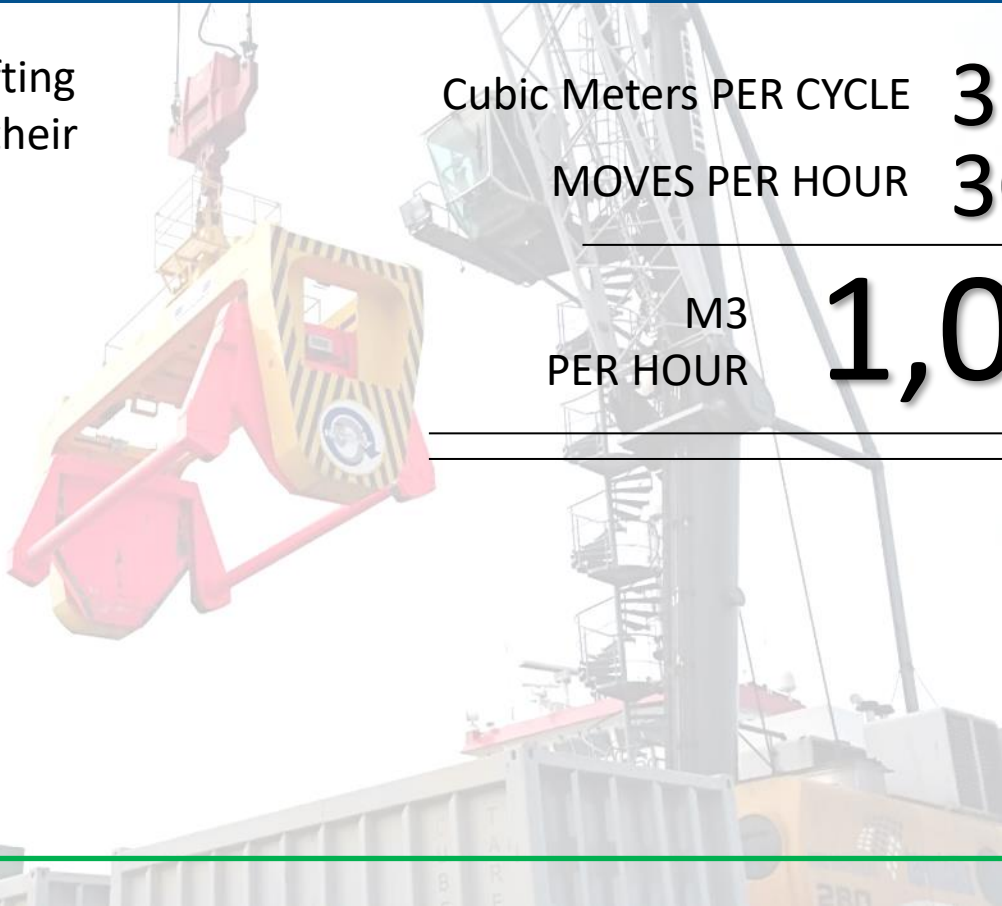
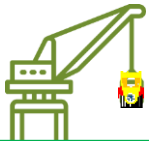
With the system capable of lifting 35m³ per cycle, RUT utilized their existing MHC

...and projected a **30 lifts per hour** capacity

allowing them to handle large volumes of biomass per hour

Cubic Meters PER CYCLE **35.00**
 MOVES PER HOUR **30.00**

M3 PER HOUR **1,050**



Case Study



The main benefit from introducing the new technology is a significant optimization of terminal expenses and an increase in performance.

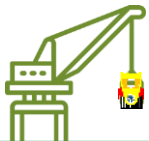
Now we can perform dry bulk handling operations involving a significantly smaller number of machines and human resources.

Saving on resources amount to almost 50%, he added.



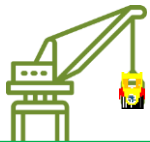
Atis Šulte

Sales & Business
Development Director



Case Study

LOCATION: Poti - Georgia
COMMODITY: Copper Concentrate
CRANE: MHC



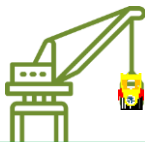
Case Study

Supporting local clients

CBH introduced to support local dry bulk clients

Flexibility at the port

Using existing port equipment with CBH allows the port flexibility in handling all commodities for local companies, especially for those who import, blend and export locally mined copper concentrate



GREENPORT

EFFICIENT SPREADER REDUCES ECO-IMPACT

14 Nov 2018

APM Terminals Poti, Georgia has commissioned a new revolving spreader to load copper concentrate into bulk vessels, improve efficiency and minimise environmental impact during bulk cargo loading operations.

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.

"With this solution we have addressed the needs of our customer, enabling both sides to become more efficient and environmentally friendly," said Klaus Holm Laurson, managing director of APM Terminals Poti. "Furthermore, with the same equipment and infrastructure, we can now expand into a market with the potential for several million tons of bulk cargo."



The spreader means that the copper concentrate avoids spillage and water contamination. Credit: APM Terminals Poti

Regulation compliance

To reduce spillage and wastage before being transported to the terminal, copper concentrate is loaded in reinforced open top containers covered by a tarpaulin in a closed warehouse.

The overall process is compliant with all environmental IMO and REACH regulations as the concentrate never touches the ground, avoids spillage, dusting and water contamination, said APM Terminals Poti. It also improves workers' health & safety and significantly speeds up terminal and port operations and daily vessel loading rate.

There is also a clear cost and time saving. "At the traditional bulk facility, we were happy if they would load 5,000 tons in a day using three cranes. Today we experienced loading of 10,000 tons in a day on a single crane," explained Michael Mogilevsky, founder of Caucasian Metals Terminal, APM Terminals' business partner in this operation.

"We are seeing not only more product actually being loaded with less environmental impact but we are also experiencing a cost advantage on the number of days we need to charter the vessel," added Mr Mogilevsky.

Case Study

A safe and secure way to handle bulk

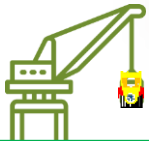
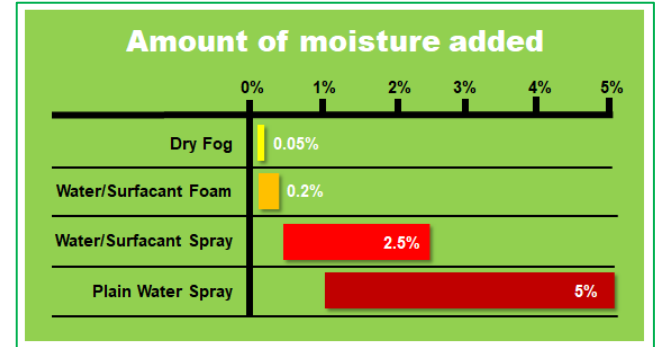
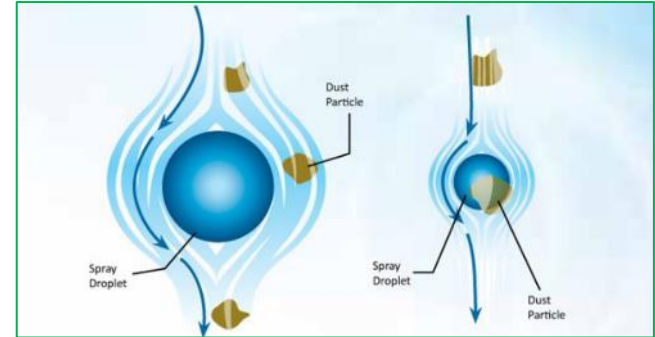
Handling dry bulk from the port using CBH, is *environmental best practice*.

Ports, such as Poti located close to a residential area, schools and recreational park, can handle dry bulk cleanly and safely with no harm to the environment or commodity.



Case Study

CBH adds very little energy to the bulk material when unloded, and a dust suppression misting system contains the dust plume within the ships hatch



TESTIMONIALS

Case Study Testimonials

Environmental benefits...

*“Turning DP World Adelaide from a standard container terminal into a bulk handling terminal **raised an interesting reaction**”.*

“The sailing squadron next to the terminal came to me one day to protest about the new system of bulk export being introduced at the terminal, and they wouldn’t allow us to operate the system as it would create red dust on their sailing boats”.

*“They had slack jaws when I told them **the system had already been running for six months with zero emissions**”*

DPW Adelaide



Ray Lee

Regional Director
DPW Australia | 2009-2011

Case Study Testimonials

...and terminal growth

“DPW Adelaide was an under utilized terminal with low berth occupancy and little growth prospects”

*“...to grow the terminal **we needed to think outside traditional income sources**”*

DPW Adelaide



Ray Lee

Regional Director
DPW Australia | 2009-2011

Case Study Testimonials

Low capital expenditure

*“Patrick was able to utilize this new revolving spreader technology to export copper concentrate for our client **with very little capital**”*

*“Our Client was **extremely pleased** with the dust free solution”*



Adrian Howard
Commercial Director
Patrick Ports & Stevedoring

Patrick | Asciano

Case Study Testimonials

High loading rates minimize shipping costs

Miners Perspective

*“Environmentally **it is a very clean system** due to containers being emptied directly into the ship’s hold thereby **minimizing a number of dust generating points**”*

*“Loading rates of 15,000 wmt/day being achieved are such that it **helps to minimize shipping costs**”*



Jack Cole
North Park Mines

North Park Mines

Case Study – Further Examples

MOBILE HARBOUR CRANE



RUT Latvia - Grain



South Africa- Coal



Chile – Copper/ Potassium Salt



Maputo - Coal



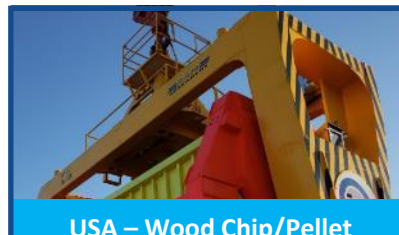
Congo – Iron Ore



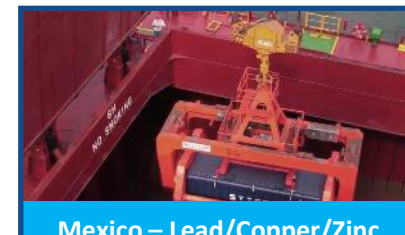
Chile – Copper/Zinc



Cuba - Zinc



USA – Wood Chip/Pellet



Mexico – Lead/Copper/Zinc

Case Study – Further Examples

BRIDGE CRANE & REACH STACKER



Peru - Copper



Mauritania - Magnetite



Bolivia - Urea



Turkey - Copper



Chile - Copper

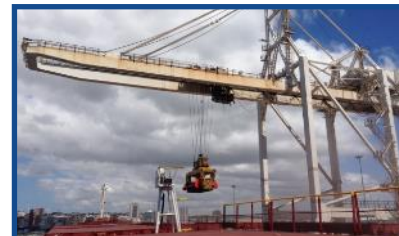


Arizona/Mexico - Copper

Case Study – Further Examples



Argentina – Soya/Rice



South Africa- Manganese



Australia - Copper



Chile - Zinc



Argentina - Grain



Australia – Iron Ore



USA – Wood Chip/Pellet

**SHIP AND
STS CRANE**

The many benefits of Containerised Bulk Handling

Containerises the bulk

Low set up cost

Environmentally friendly

Award winning solution

No contamination

The many benefits of Containerised Bulk Handling

- ✓ Expand market opportunities for terminals
- ✓ Provides cost effective alternative logistics to shippers
- ✓ Innovative turnkey solution to industry
- ✓ Provides shipper and countries a faster route to market
- ✓ Implement “best practices” into the industry to attract business
- ✓ Responsible care for environment – good business ethic

Commodities Handled



Containerised Bulk Handling Operators

