BRUKS Siwertell

BULK HANDLING & WOOD PROCESSING

HANDLING THE FUTURE

Our commitment to sustainability

CAPEX AND OPEX CONSIDERATIONS IN EQUIPMENT PURCHASES

BULK TERMINALS 2026 A CORUNA



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AGENDA

1 **Who is Bruks Siwertell**

2 **Green field vs. Brown field investments**

3 **Capex and Opex considerations for dry bulk unloading operations**

4 **Introduction of Siwertell EDGE for Spanish grain terminals**

Contacts

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WHO IS BRUKS SIWERTELL?

Products



Ship-to-shore Unloader



Shore-to-ship Loader



Ship-to-shore Mobile Unloader



Terminal equipment



Conveying

Accessories



Digital solutions



Modular add-ons

Services

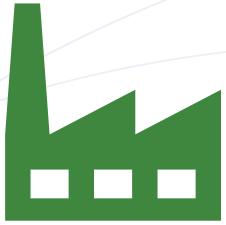


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OUR FOOTPRINT



Siwertell equipment operate >300 sites worldwide



Installed base globally >400 loaders/unloaders



19, and counting, of the worlds first IIoT solution for Ship Unloaders

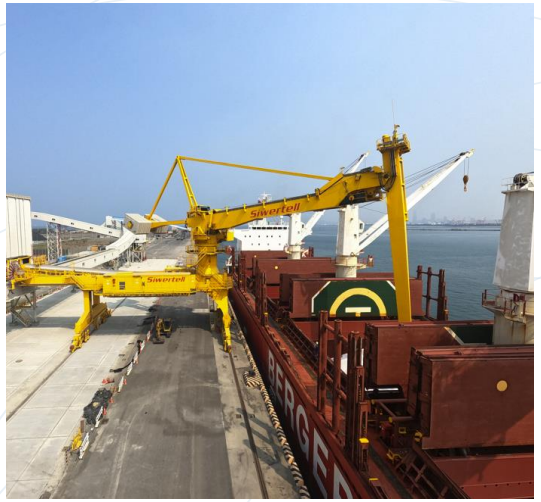
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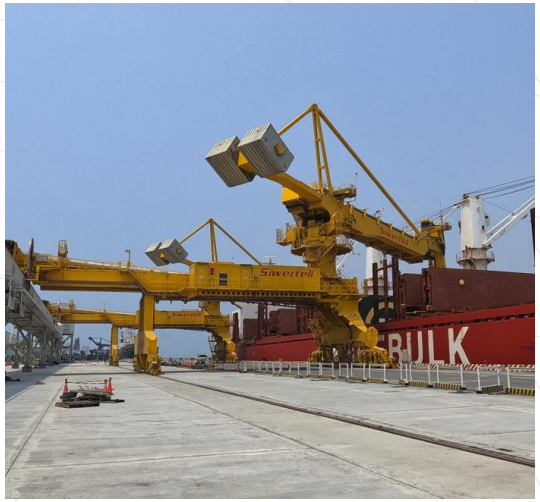
WHAT DOES CONTINOUS SHIP UNLOADER (CSU) MEAN?











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GREEN FIELD VS. BROWN FIELD INVESTMENTS

- Green field dry bulk port projects:
  - Establishing a new industrial facility on land previously not developed for such purpose
    - Freedom of design of infrastructure
    - No consideration of legacy support systems
    - Capex for preparation of land and infrastructure
- Impact on establishment of bulk handling equipment:
  - Adapt piling of quay to position, weight and dynamic moves of equipment
  - Adapt width of quay to position and rail span of equipment
  - Adapt length of quay to type of operations and to length of vessels
  - Adapt level and position of supply voltage to equipment

- Brown field dry bulk port projects:
  - Upgrading or expanding an existing facility
    - Starts from existing infrastructure
    - Considers legacy support systems
    - Capex for complex tie-ins
- Impact on establishment of bulk handling equipment:
  - Less possible to affect the local conditions to the left
    - Focus on capex AND opex related to the bulk handling equipment itself

CAPEX AND OPEX CONSIDERATIONS UPON INVESTMENTS

- Considerations to make upon investment in dry bulk handling equipment:
  - **Type, quality and number of dry bulk materials affecting**
    - Choice of technique (capex)
      - Cost of manpower (opex)
      - Cost of electrical consumption (opex)
      - Material losses (opex)

Soya beans

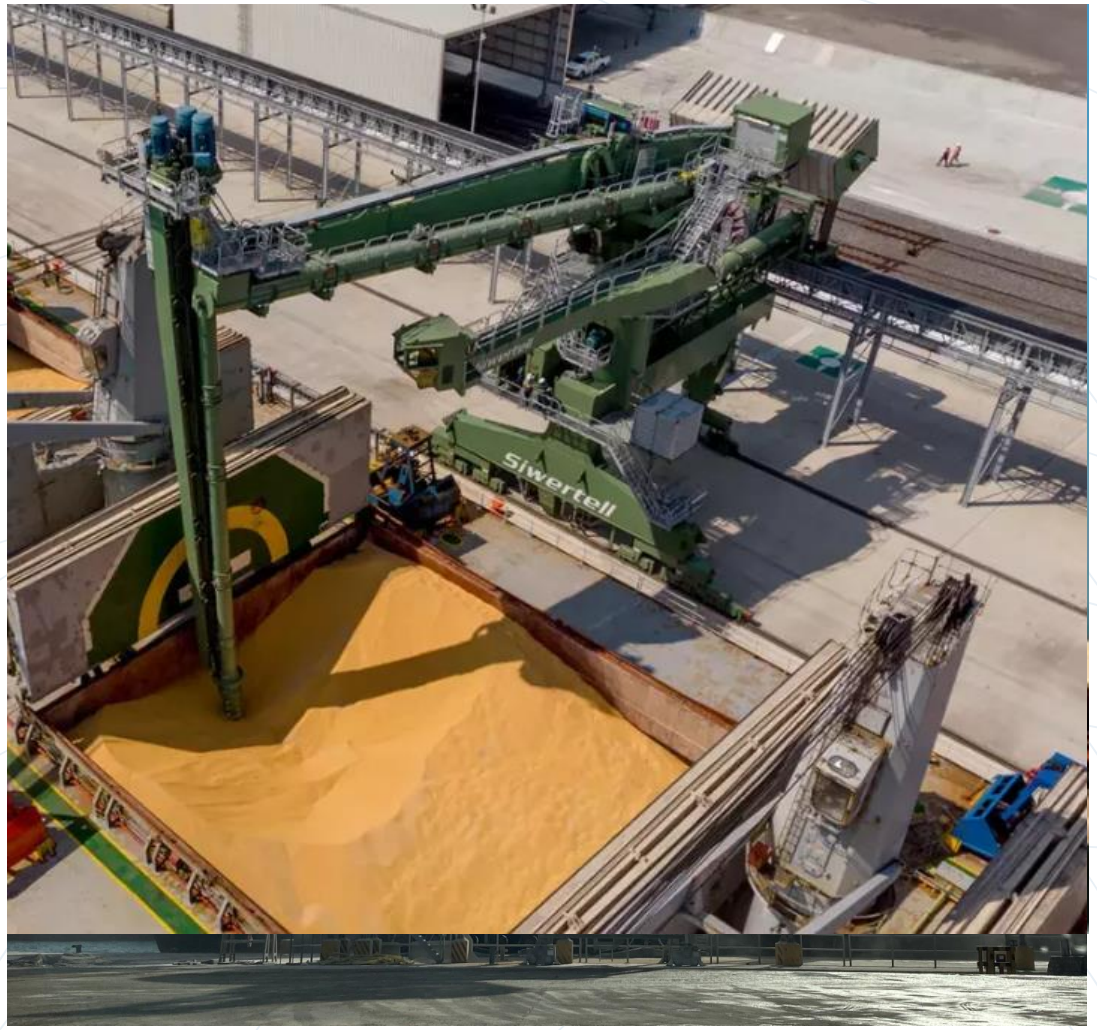


Fertilizer



Meals





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CAPEX AND OPEX CONSIDERATIONS UPON INVESTMENTS

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      - Material losses (opex)
  - **Time window of dry bulk operations (given annual volumes and size of vessels) affecting**
    - Size of mobile/rail mounted equipment (capex AND opex)



Rail travelling ship unloader for 600 tph grain in Philippines

Port mobile ship unloader for 500 tph cement in Australia

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EXEMPLYFING DEVELOPMENT IN MOBILITY AND SIZE

2019 YARA NORGE AS, GLOMFJORD: IMPORT OF ROCK PHOSPHATE ETC.

- Production of NPK
- Inputs for NPK production include:
  - Liquid ammonia
  - **Rock phosphate, Calcium phosphate, Ammonium sulphate etc.**
- Solution for import until 2019:
  - **400 tph Stationary** Siwertell ST 440-C from 1980
    - Average through ship capacity about **200 tph or 50 % efficiency**
- Solution for future import:
  - **600 tph Rail mounted** Siwertell ST 490-M
    - Average through ship capacity about **400 tph or 67 % efficiency**

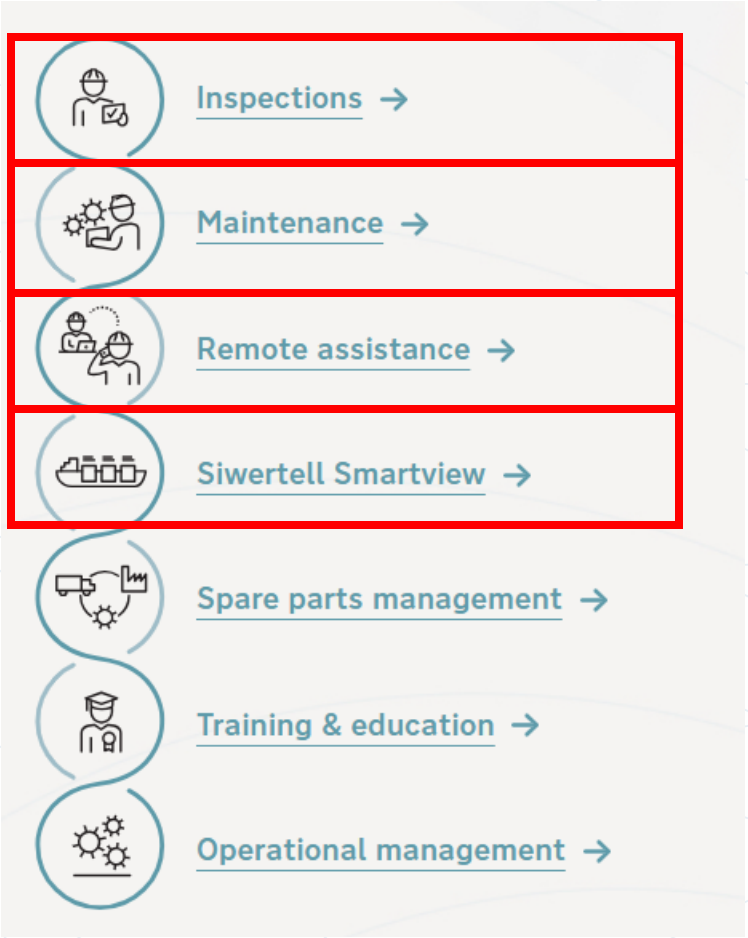


2019 delivery: 600 tph rail mounted ship unloader

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CAPEX AND OPEX CONSIDERATIONS UPON INVESTMENTS

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  - **Time window of dry bulk operations (given annual volumes and size of vessels) affecting**
    - Size of mobile/rail mounted equipment (capex AND opex)
    - AVAILABILITY demands
    - - Proactive measures against stand still (and lifetime)
      - Inspections, Monitoring and Maintenance (opex)



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EXEMPLYFING - PROACTIVE MAINTENANCE

2006 PEEL PORTS, ROYAL SEAFORTH GRAIN TERMINAL, LIVERPOOL, UK: IMPORT GRAIN

- The terminal efficiently manages the import, export, and distribution of a variety of grains such as grain, maize and soybeans
  - Servs as a vital link in the UK's food supply chain
  - Fully automated conveyor and weighing systems
- Solution for import from 2006:
  - **1800 tph Rail mounted** Siwertell ST 790-D adapted to capacity of conveyor systems of ca 1200 tph
  - Average through ship capacity about **800 tph (1250 tph possible)**
- Solution for future import:
  - Following the inspection and maintenance schedules plus a bigger overhaul 2026 and 2027, the lifetime of the ship unloader is expected to be prolonged +20 years.



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CAPEX AND OPEX CONSIDERATIONS UPON INVESTMENTS

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  - **Time window of dry bulk operations (given annual volumes and size of vessels) affecting**
    - Size of mobile/rail mounted equipment (capex AND opex)
    - AVAILABILITY demands
    - - Proactive measures against stand still (and lifetime)
      - Inspections, Monitoring and Maintenance (opex)
    - - Redundancy (capex AND opex)



Travelling ship unloaders á 600 tph grain in Casablanca

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REDUNDANCY CONSIDERING FEATURE EDGE ACTIVE

EDGE ACTIVE – Full Capacity. Always.

With **EDGE Active and capacity optimization**, the terminal operator gains more than just redundancy - they gain **continuous performance optimization across the entire system**.

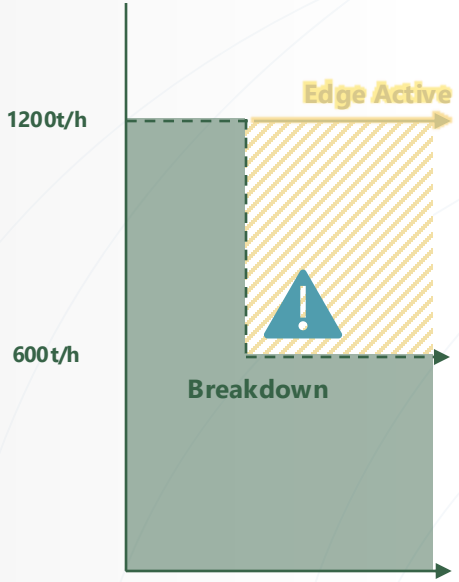
Unlike traditional setups, where a failure immediately results in lost capacity, EDGE ensures **no drop in throughput**.

If one unloader stops or is taken out of operation, the second unit will automatically ramp up from **600 to 1200 t/h**, maintaining full terminal performance and eliminating productivity losses.
This is the essence of the **EDGE Active system**.

Scenario A
Normal operation

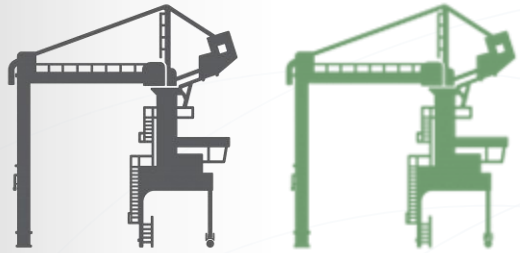


600t/h CSU1 | 600t/h CSU2



Other unloading alternatives

Edge Active
Normal operation



Offline CSU1 | 1200t/h CSU2

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CAPACITY BALANCING CONSIDERING EDGE ACTIVE

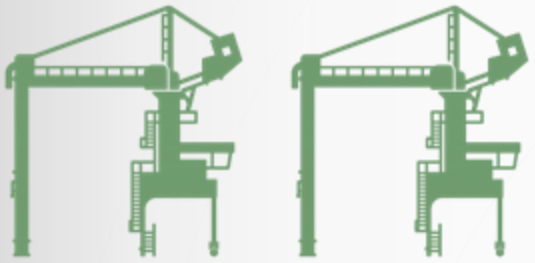
INTELLIGENT LOAD BALANCING IN REAL TIME

EDGE Active is not only a backup function — it operates continuously.

When both unloaders are running, the system actively balances capacity. During operations such as **hold cleanup**, where one machine naturally operates at reduced capacity, the second machine will automatically compensate by increasing output.

The system continuously targets a **combined throughput of 1200 t/h**, ensuring stable and predictable operations at all times.

Scenario B
Normal operation



600t/h CSU1 | 600t/h CSU2



Other unloading alternatives

Edge Active
Normal operation



X t/h CSU1 | 1200 – X t/h CSU2

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FEATURES OF SHIP UNLOADER EDGE

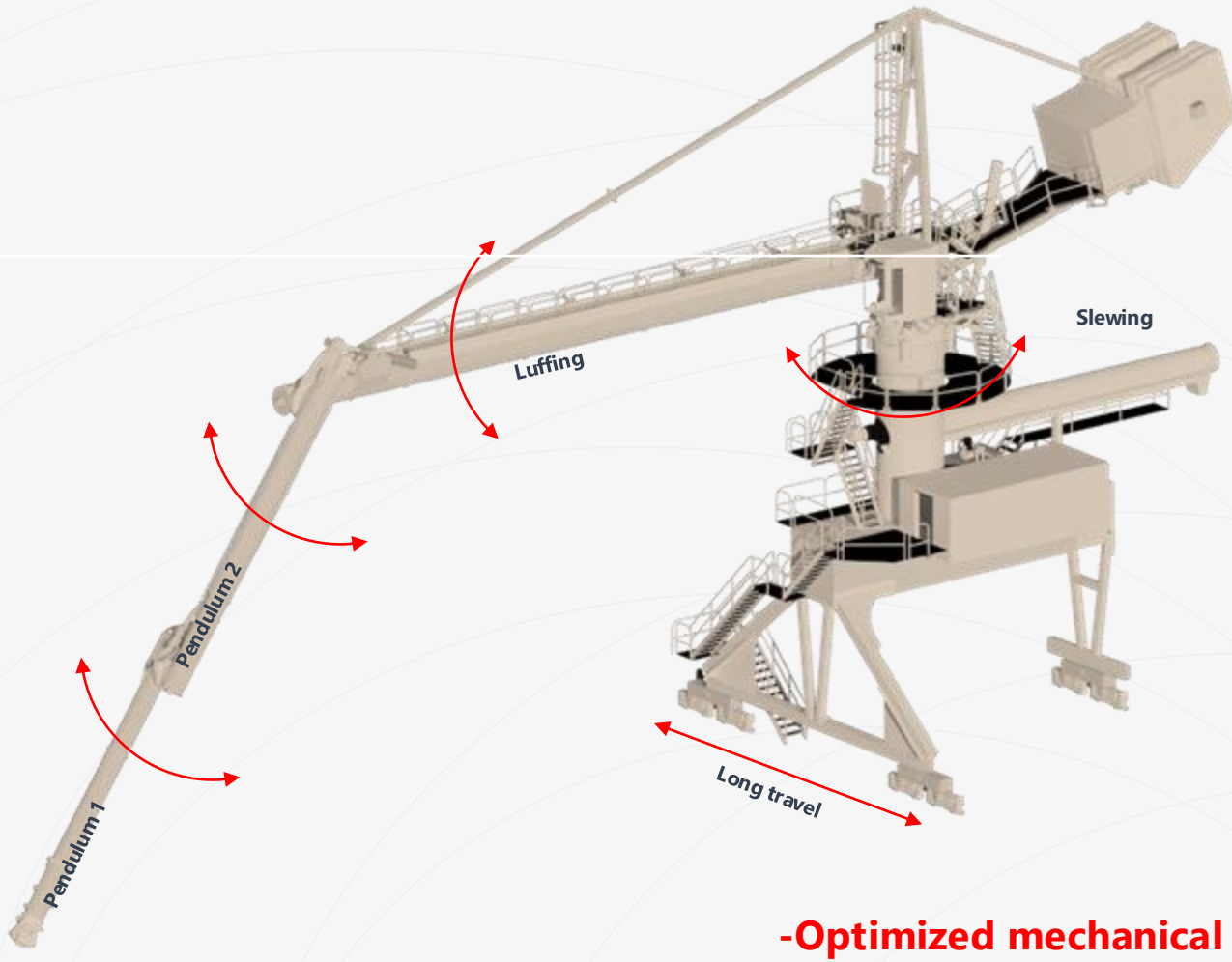
CAPACITY & PERFORMANCE

Nominal capacities at max ambient temp +40C

Material	Kg/dm3	Rated Cap. (tph)
Grain	0,75	1200
Soya beans	0,75	900
Oat	0,45	800
Soya meal	0,55	800

SCREW CONVEYING SYSTEM

Type	Enclosed screw conveyor
Control system	Stepless control or automatic mode (inlet feed)
Edge active	Boost capacity, from 600 to 1200t/h
Others	Overload protection Bearing temp monitoring (optional) Speed guard (Horizontal)



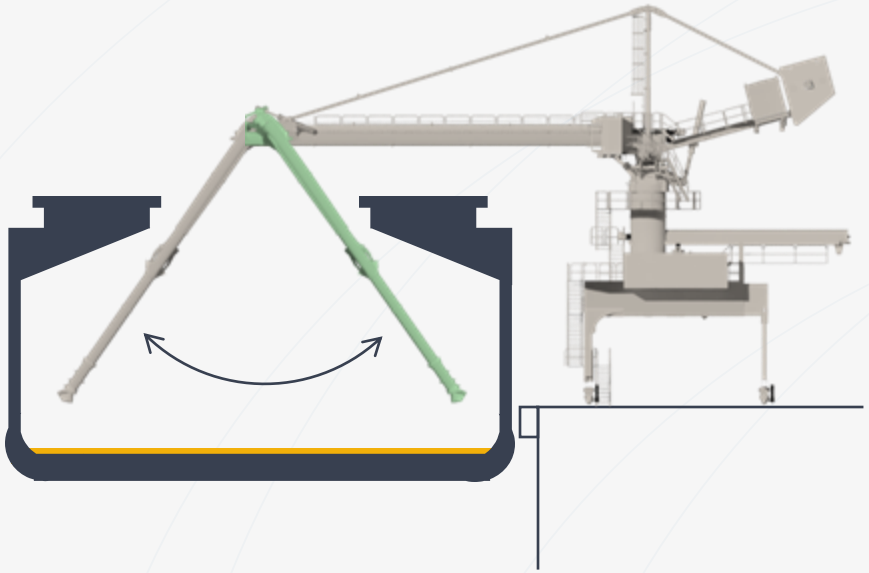
-Optimized mechanical design
-Built-in operational flexibility

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COMPARISON OF REACH BETWEEN EDGE AND GRAB

COMPARISON OF REACH

Edge In-Hold reach



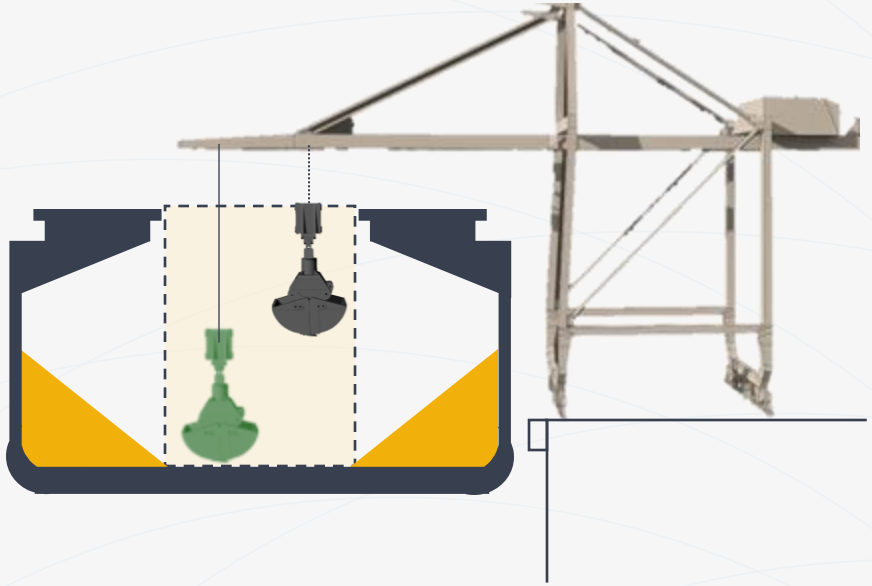
FULL IN-HOLD REACH

- ✓ Reaches deep and wide
- ✓ No dead zones
- ✓ Minimal residual cargo

TONNAGE FOR CLEANUP

280 TON

Grab In-Hold reach



LIMITED REACH

- ✓ Limited reach to center
- ✓ Remaining pockets in corners
- ✓ High residual cargo

TONNAGE FOR CLEANUP

1300 TON

THANK YOU FOR THE ATTENTION

Contacts

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