

Pneumatic Ship and Barge Unloaders

State-of-the-art design
and technology



Smart unloading systems that won't let you down

Downtime on your ship and barge unloaders causes process bottlenecks and significant expense. Yet so many pneumatic vacuum arms are simply not cut out for the job, succumbing to high loads and forces that lead to cracks and failures. We don't believe it should be this way. So not only do we find and strengthen stress points to ensure our unloading arms won't let you down, we also back every DOCKSIDER™ and KOVAKO® ship unloader with a performance guarantee.

Key benefits

- Stronger unloading arms
- Dust-free system
- Automatic unloading controls
- Performance guarantee
- Bespoke engineering

Pneumatic ship and barge unloaders designed for real world applications

Vacuum arms you can trust

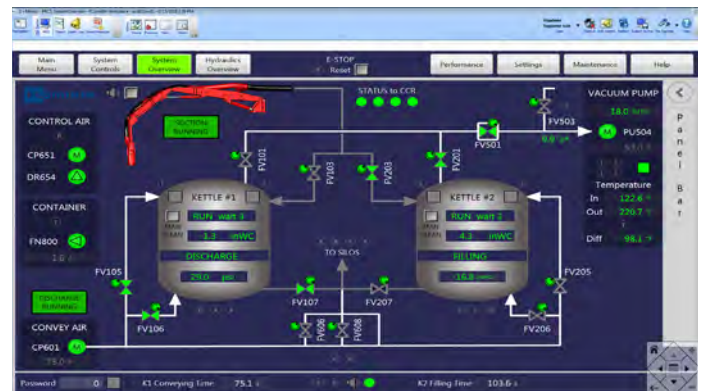
Two things you don't want to lose: valuable bulk materials and time. But when a vacuum arm fails, both are at risk. Unfortunately, most pneumatic vacuum unloading arms simply aren't up to the job. They have evolved from cranes originally designed for vertical lifting and are fabricated from high-tensile steel. As the arms are maneuvered through deep piles of bulk materials, they are subjected to high loading conditions and forces which could lead to rapid fatigue, cracking and failure.

We use Finite Element Analysis (FEA) and perform full kinematic studies to identify and strengthen stress points on the DOCK-SIDER and KOVAKO ship unloader arms during the design phase. This gives you a more reliable vacuum arm that won't fail during operation.



Intuitive control systems

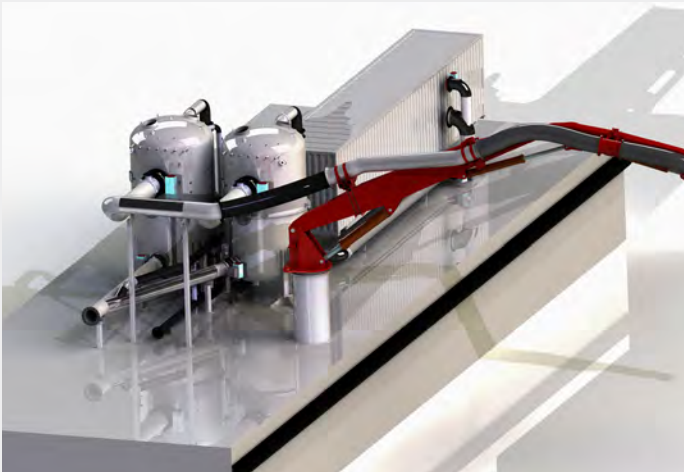
Automation makes unloading operations safer, more efficient and more accurate. All DOCKSIDER and KOVAKO ship unloaders have modern PLC control systems that control all of the unloading functions automatically using easy-to-navigate touchscreens. The control systems have built-in features to monitor operational status, process settings, historical production data, alarms and maintenance requirements. It can even simulate operating conditions and test the components and sub systems, ensuring that your unloader is ready to work when you are.



Caring for the environment

Unloading operations can be very dusty, presenting a health and safety risk for your operators and a threat to the local environment. Not our systems. From the time the material enters the vacuum nozzle to the time it reaches its storage destination, it is fully encapsulated in a system of piping, hoses and vessels – making DOCKSIDER and KOVAKO ship unloaders among the most environmentally-friendly transfer systems in the industry.

The filtration system is either integral to the transfer kettles or installed as a separate filter receiver (for dual-pipeline or extra-high capacity applications). Pleated cartridges provide optimal cloth area in a compact design, and jet-pulse cleaning and a PTFE media coating offer maximum durability and efficiency.



No ifs, no buts. Performance, guaranteed.

All of our ship unloaders are designed for optimal performance, according to the characteristics of the materials being transported, the capacity, any space constraints, etc. Our engineers are supported by our Pneumatic Conveying R&D facility, which is capable of analyzing and testing hundreds of materials to see how they move through a pneumatic conveying pipeline, their fluidization, response to different pressures, and so much more. We're so confident that we can build the right solution for your specific application that every DOCKSIDER and KOVAKO ship unloader is backed with a performance guarantee.

For high-capacity applications, a separate vacuum filter receiver allows for continuous airflow and faster material transfer. Multiple discharge options, including pressure tanks, feeders and rotary valves enable you to convey a wide range of dry-bulk materials – including abrasive products such as alumina and coarse limestone. The system can even discharge through a Fuller-Kinyon® pump – allowing for simple, low-pressure pneumatic conveying, or to provide a durable vacuum seal for material transfer to a dock belt conveyor.



Versatile, advanced, and designed just for you: the DOCKSIDER™

Because every terminal is different, all our DOCKSIDER ship unloaders are custom-designed for your specific application. Delivering proven performance, reliability and durability, these state-of-the-art ship unloaders have gained a reputation as the best ship unloaders in the world.

Starting with a range of four basic sizes, FLSmidth can supply the right DOCKSIDER ship unloader for any terminal – whether you're unloading river barges or Handymax bulk vessels, and whether you're conveying to an adjacent belt conveyor or through a 1200 m (4000 ft) pipeline.

DOCKSIDER™ PNEUMATIC UNLOADERS

Model	DS1	DS2	DS3	DS4
Maximum peak/ design capacity	400 MTPH ¹	550 MTPH ¹	725 MTPH ¹	1200 MTPH ¹
Maximum vessel size	8000 DWT	45000 DWT	55000 DWT	65000 DWT
Available vacuum arm length	18 m (60') (3-section)	37 m (123') (3-section) 41 m (135') (3-section)	42 m (138') (3-section)	45 m (148') (3-section) 47 m (154') (3-section)
Available configurations	Stationary Dock mobile Gantry mobile	Stationary Dock mobile Gantry mobile	Stationary Dock mobile Gantry mobile	Stationary Dock mobile Gantry mobile

¹ Based on Type I/II Portland Cement with the shortest available vacuum arm. Convey capacity is sized for site requirement.



KOVAKO® – the original pneumatic ship and barge unloader

The KOVAKO name is recognized around the world as a symbol of quality and performance for vacuum/pressure transfer of cement from ships and barges to land-side storage. Since becoming part of FLSmidth in 1992, the industry has benefitted greatly from the combination of the KOVAKO ship unloader innovative design and FLSmidth's global reputation for superior technology and customer service.

Today's KOVAKO ship unloaders are built to comply with CE and US design and performance requirements. Utilizing the resources available at FLSmidth's Pneumatic Conveying R&D Facility, these

systems can be accurately and confidently applied for use with various other dry-bulk materials such as fly ash and ground blast furnace slag.

KOVAKO ship unloaders are offered in three standard models that match optimal unloading capacity with typical vessel sizes – eliminating added costs associated with custom design. They are available as electric powered and in multiple configurations – making it easy to match a KOVAKO ship unloader model to any terminal application.



KOVAKO® PNEUMATIC UNLOADERS

Model	K01	K02	K03
Maximum normal capacity	200 MTPH ¹	200 MTPH ¹	320 MTPH ¹
Maximum vessel size	8000 DWT	20000 DWT	45000 DWT
Available vacuum arm length	20 m (66') (4 section) 23 m (76') (4 section)	24 m (79') (3 section) 26 m (85') (3 section) 28 m (92') (3 section) 31 m (102') (3 section)	32 m (105') (3 section) 34 m (112') (3 section) 36 m (118') (3 section)
Available configurations	Stationary Road towable ²	Stationary Dock mobile Gantry mobile	Stationary Dock mobile Gantry mobile

¹ Based on Type I/II Portland Cement with the shortest available vacuum arm and a maximum overall convey distance of 100 meters horizontal and 25 meters vertical, including (6) 90-degree equivalent bends.

² Permit may be required for movement over public roads, per local law.

Continuous service and support

Field Service and Emergency Repairs

Getting help when you need it ensures optimum performance and maximum uptime. Our factory-trained service engineers provide on-site assistance to help you repair or troubleshoot your DOCK-SIDER or KOVAKO ship unloader during an emergency or regularly scheduled maintenance. Trouble-shooting may be available remotely through the PLC if your system has online capabilities.

Technical Support and Training

Whether you need to onboard new staff, supplement your skillset, or if you just need more knowhow in the mix, our engineering staff are always available to assist in any problem solving or training required to meet the needs of your operation.





Spare Parts Handling

We offer speedy spare parts support for all types of DOCKSIDER or KOVAKO ship unloaders. Many of the spare parts are in stock in our warehouses and can be provided immediately to any location worldwide.

Upgrades and Optimization

Do you have an older or under-performing unloader that you would like to upgrade? Our design and field service engineers can evaluate your existing system and offer solutions that will keep your system operating at its optimal performance level.

FLSMIDTH

Mission Zero

TOWARDS ZERO EMISSIONS IN MINING AND CEMENT



Zero emissions



100% fuel substitution



Zero water waste



Zero waste



Zero energy waste

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