

# BULK UNLOADING: DELIVERING THE BEST

## NEW TECHNOLOGY IN SHIP UNLOADING HOPPERS

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The trend in recent years has seen a significant increase in the use of hoppers for unloading at ports, due to both increased regulation and desire for higher efficiency and throughput. This does mean that port operators are looking for a variety of solutions, as different materials require different levels of dust suppression, and port managers need to balance requirements where the highest performance is necessary, offering max dust suppression and throughput, with solutions which can quickly, easily and efficiently be moved from one task to another and do not require high performance dust suppression.

The onus is then on equipment suppliers to address these varying needs. In balancing technology, usability and cost, it quickly becomes evident that no single solution can address all needs. As a result, a broad portfolio of solutions is required, ranging from top of the line models which offer maximum dust suppression and performance, all the way to robust simple units that can move from task-to-task with the minimum of cost and work.

DOCKSOLID Bulk Port Equipment is a range of mechanical handling solutions for port terminals handling grains, coal, minerals, cement, fertilisers, powders or other dry bulk commodities. The brand includes extremely robust and reliable ship unloading systems, with a focus on flexibility of use and highly manoeuvrable mobile equipment. DOCKSOLID port equipment is designed and fabricated by Buttimer Engineering for bulk ports, logistics hubs and industrial facilities to handle dry bulk commodities ranging from grains and foodstuffs to minerals, coal, ores, biomass, woodchip, oilseeds and much more.

### A CHANGING LANDSCAPE IN BULK HANDLING

What is noticeable in the last two to three years is the increase in requirements for

dust suppression. Increasing regulation in environmental issues with regards to bulk handling at ports and other facilities means port owners and operators are being forced to either upgrade existing unloading equipment, or in many cases turn to solutions like unloading hoppers for the first time to meet new legislation.

The issue is complicated by a lack of uniformity among regulations, with wide variation from country to country. Additionally, much of the dust suppression performance is dependent on both the other equipment in the unloading chain and the correct operation by the persons operating the equipment, most significantly the crane operator in charge of the grab, who has to ensure he follows correct procedures in transferring the material. If these are followed, then ship unloading hoppers have been shown to remove over 90% of expelled dust.

### MINIMISING DUST

When unloading a bulk cargo vessel with a grab, the commodity is disturbed, handled and can be exposed to through winds. In these conditions it is probable that smaller particles will become airborne and create environmental dust. While developing our range of DOCKSOLID environmental hoppers, we have given careful consideration to the process of unloading bulk commodities from ships using a crane and grab. We wanted to both optimise the performance and efficiency of the receiving hopper, while minimising the amount of dust created and suppressing the dust that is. The DOCKSOLID range has come about as a result of a long time and plenty of design energy invested into getting efficient, robust and reliable hopper performance; the Environmental hopper adds our experience in environmental dust control to this expertise, creating – we believe – the most effective, as well as

reliable and efficient, dust controlling ship unloading hopper on the market.

Environmental hoppers are fitted with a steel ‘thimble’ or skirting around the hopper’s opening, providing an enclosed space in which the grab can open, protected from through winds or the external climate; limiting the exposure of the product to airflows prevents small particles being separated and lifted as airborne dust. As the grab opens, it prevents the flow of air into the hopper’s thimble, while extraction filters create negative pressure inside the hopper, pulling the product into the hopper and minimising dust creation. After the grab opens, the bulk commodity passes through the hopper’s grid and flex-flap system; the grid is to stop oversized items from entering the hopper and blocking the discharge, the flex-flap system is constructed from heavy-duty rubber flaps with steel girders – it allows the product to pass into the hopper, while preventing any product or dust from rising back above the grid upon impact. Dust above the hopper grid, and below the hopper – where trucks, or wagons, are loaded – is suppressed using an air extraction and filtration system. The air extraction system removes a specified volume of air at a low velocity from above the hopper’s grid, and around the end of the discharge chute, maintaining a negative air pressure and pulling practically all emitted dust particles through a special fabric ‘sock’ filtration system. A compressed air reverse-jet pulse then periodically cleans the filtration fabric, and returns the collected dry particles to the bulk commodity, for discharge to trucks, rail-wagons or conveyors.

### FLEXIBLE SOLUTIONS: IT’S NOT ALL ABOUT PERFORMANCE

While many ports are focused on unloading systems offering maximum dust suppression, these often tend to



be dedicated to unloading of a single material. Just as common are requirements for hoppers which offer lower levels of performance but are used in ports which handle a wide variety of products, and the requirement is for a solution which can be moved around the port wall from ship-to-ship quickly and efficiently and handle different materials with no configuration work required.

DOCKSOLID is epitomised by its core values: Clean. Flexible. Robust. To DOCKSOLID this is more than a slogan, it's the key characteristics we deliver in every hopper we deliver to customers. Clean and robust are essentials in the delivery of any port equipment. Flexible can often be a bigger challenge. Unlike some other providers, because DOCKSOLID takes responsibility for the entire process, through design, fabrication and installation, it delivers a level of flexibility not commonplace in the market.

Designing solutions to be as flexible as possible is no easy task, as the range of features must be balanced with overall system cost. In working with customers, a number of key requirements were identified:

- **Simplicity.** The hopper was to be capable of handling a variety of materials without requiring setup when switching to a new material, and be straightforward to operate
- **Manoeuvrability.** Easy moving around the port was necessary. The hopper had to be able to move quickly from position to position as simply as possible.
- **Cost-effective.** The customer already had a number of High end environmental hoppers and a cost-effective solution that offered robust operation while forgoing "nice to haves" was key.

#### MEETING CUSTOMER REQUIREMENTS

These requirements echoed the main benefits the new range of hoppers from DOCKSOLID were developed to deliver. The new range offer fast efficient unloading across a variety of materials while delivering a portability and ease of use not typical of traditional hoppers, benefits which are delivered through several key features:

- **Manoeuvrability:** The hoppers feature a single set of wheels on one side, which hydraulically raise for loading. The other side of the hopper is lifted by readily available port equipment, such as forklifts or tug masters. This allows units to be quickly and efficiently moved from one unloading project to another.
- **Simplicity:** The new range address a range of use cases where the dust suppression features of the other units in the range are not needed. The units can be designed to easily switch from one material to another with no configuration needed, or without the concerns of how different materials will affect installed filters.
- **Cost-effective:** The range focuses on base units, which balance the base features needed for efficient operation with value and cost. It then allows customers to add on the additional features they see as necessary, such as cabins, external lighting and other extras which they see as essential to their specific requirements.

#### PULLING IT ALL TOGETHER

Hopefully, by now it is clear that the market for ship unloading hoppers is neither straight forward or homogenous. Addressing the wide gamut of customer requirements is no straightforward task. As regulations and unloading practises standardise, offering solutions will become straightforward, but offering the best solution at the right cost will remain a

priority for hopper suppliers. To achieve this, equipment manufacturers need to focus on two key areas: close collaboration with customers (in order to ensure that the portfolio of offerings reflects the most important handling requirements), and a broad capability base to meet expanding regulations and customer requests.

#### ABOUT THE AUTHOR

Maurice Moroney is the Marketing and Business Development Manager for DOCKSOLID and Buttimer Engineering, with responsibility for Bulk handling opportunities globally, and is based at the company headquarters located in Cahir, Ireland.

#### ABOUT THE ORGANISATION

DOCKSOLID port equipment is designed and fabricated by Buttimer Engineering for bulk ports, logistics hubs and industrial facilities to handle dry bulk commodities ranging from grains and foodstuffs to minerals, coal, ores, biomass, woodchip, oilseeds and much more be-sides. Clients include: Associated British Ports (ABP), Port of Gdynia, Port of Cork and Dublin Port. The DOCKSOLID brand stands for well-engineered, reliable equipment with three core attributes: State-of-the-art environmental controls, flexibility of use & very effective manoeuvrability, along with well-engineered structural design and high-quality steel for strength and longevity.

#### ENQUIRIES

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