Siwertell

The ultimate solution for unloading sulphur

Bulk handling - Sulphur

Siwertell unloaders provide a safe bulk handling operation

Everyone in the business knows that there are three main issues when unloading sulphur: the high explosion risk; extreme corrosion; and stringent requirements for environmental protection. These difficulties were the trigger for our solution: a full range of Siwertell unloaders that offer economical, clean and safe sulphur-unloading/loading operations.

Sulphur is considered to be a hazardous commodity in many places, not only because it is prone to explode and cause fires, but moreover because of its negative impact on the environment from dust emissions and spillage through careless handling. Being a hazardous commodity, its handling comes with ever stricter requirements for minimising pollution and calls for operators to secure ship loading and unloading operations by eliminating spillage and minimising dust emissions.

Siwertell loaders and unloaders are among the highest performing environment-friendly systems available for sulphur handling that the market can offer. Their conveying line is based on totally-enclosed screw conveyors configured in such a way that negative pressure is created in the conveying line and all connection and transfer points are totally enclosed and sealed. For unloading operations, cargo pick-up is carried out below the cargo surface in the ship's holds. With its unique inlet feeder mechanically forcing the cargo into the screw conveyor, Siwertell unloaders are designed for a layer-by-layer unloading method, which minimises dust creation from cargo avalanches inside the hold. Siwertell loaders are also equipped with specially designed loading chutes that reduce any dust creation at the loading point.

A Siwertell unloader can be configured to discharge sulphur either to a jetty conveyor, for further transportation to storage areas, or directly into trucks or rail cars. The most common and efficient way, especially for travelling rail gantry-based unloaders, is to integrate the unloader in a complete conveying and storage system. In such cases, the transfer point from the Siwertell unloader to the jetty conveyor is rendered dust-proof through a specially-designed transfer trolley with integrated dust suppression system. Direct discharge from the Siwertell unit to trucks – which is the most common application for the road-mobile unloader range – or rail cars is carried out through specially-designed loading bellows also fitted with an integrated dust suppression system.

Siwertell unloaders are available in both electric and diesel-driven versions and to comply with the latest exhaust and noise emission regulations, the diesel engines are continuously upgraded to fulfill the latest emissions regulations. Therefore the unloader can without doubt be used close to populated areas.

Siwertell ship unloaders in Hsinta, Taiwan

Reducing risks for explosions and fires to a minimum

Cargotec has developed its own safety system to carefully handle the risks involved in sulphur handling.

4S – Siwertell Sulphur Safety System

- Water spray nozzles at the inlet feeder
- Nozzles that spray water in vertical-horizontal conveyor transfer box
- Automatic lubrication system
- Temperature guards on the intermediate bearings
- Spark and fire detectors in the conveying line
- Fire extinguishing system in the conveying line
- Reinforced conveying system
- Explosion venting devices along the conveyors and dust collector

Safe operation

Handling sulphur involves many risks. Apart from environmental risks, the largest hazard, also involving the most serious consequences, is the risk of explosions and fires. To handle this, Cargotec has developed its own safety system, called the 4S – Siwertell Sulphur Safety System, which is designed to minimise the risk of explosions and detect fires.

To prevent explosions and fires, the Siwertell unit is equipped with nozzles that spray water at the inlet feeder and in the conveyor transfer points. An automatic lubrication system is installed to lubricate and cool down end bearings and intermediate bearings. Even though precautions are taken, a fire or explosion may occur, but the system takes care of the explosion and extinguishes the fire in the unloader/loader conveying line.

There are fire detectors along the conveying line, which when activated, automatically start the fire extinguishing system to spray water and stop the conveyors from moving. This safety aspect importantly prevents fires entering the storage building.

To manage any explosion, the conveyor's steel casings are reinforced with extra thick steel and explosion-venting valves are fitted along the conveyors and dust collectors to relieve pressure.

By operating with minimal dust creation, in combination with the 4S – Siwertell Sulphur Safety System, the health hazards associated with sulphur handling are minimised.

Fire alarm system

Water spray nozzles

Explosion venting device

Siwertell guarantees cost efficient operation

With a flexible unloading arm that reaches in all directions to provide high unloading/loading efficiency, along with minimum energy consumption and practically maintenance free components, the Siwertell unloader is the number one solution for a cost efficient bulk handling operation.

Various dry bulk commodities

A large advantage of Siwertell unloaders is their ability to unload not only sulphur, but virtually any dry bulk material. This offers the operator valuable flexibility, as they can combine the unloading of sulphur with other bulk cargoes, such as fertiliser, phosphate, cement, grain or biomass.

Power sources

Depending on the size of unloader and the ports' power grid, Siwertell unloaders can be powered from a diesel driven engine or directly from the power grid. Road mobile units are normally powered from a diesel driven engine onboard the trailer, while the larger gantry rail-based units are powered via a main high voltage cable on a reel attached to the gantry.

Siwertell 15 000 S road-mobile unloader transported on a trailer

Cost efficiency with a Siwertell unloader

To achieve an economical unloading operation, all cost factors have to be minimised. The most important factor is related to the real through-ship capacity. This depends on the rated capacity, but equally, or even more importantly, on the efficiency of the unit during clean-up, where an arm system plays a significant role in providing adequate reach to all corners of the ship's holds. With a flexible and strong unloading arm, the Siwertell unloader offers a high through-ship capacity with minimal unloading time, substantially reducing ship and crew costs.

Energy prices continue to rise, but a Siwertell ship unloader reduces them to a minimum, for example, only 0.2 litres fuel/tonne is required with a Siwertell 5 000 S unloading prilled sulphur, or about 0.7 kWh/tonne with a larger 1,600 tph unloader.

Operating a Siwertell unit on a dedicated sulphur mission is extremely cost efficient. The specially designed conveying line with stainless steel components is practically maintenance free. There are few moving parts in a screw conveyor and with its well-proven unique design, wear is considered minimal, therefore running costs of a Siwertell sulphur unloader are limited to consumables.

The clean, dust free unloading operation is an advantage from an environmental perspective, as well as from an economic one. With an uncontaminated operation, there is no need to spend time and money on cleaning the port, ship or neighbourhood. Loss of material, and its value, is consigned to history.

For all ship sizes

For barges and smaller ships, up to about 15,000 dwt, Cargotec offers its Siwertell range of road mobile unloaders. Mounted on a semi-trailer, they are all fully road mobile for transportation between different ports or between berths in the same port. The transition from transport mode to unloading mode is easily carried out and takes only 30-45 minutes. This unique design offers customers enormous flexibility to use their unloader in more than one port and on different berths.

Maintenance and spare part costs are kept to a minimum, as mobile unloaders largely incorporate only standard components that are available worldwide on a year-round basis. Also, staffing costs are low as only one person is required to operate and perform the folding and unfolding procedure of the Siwertell road-mobile unloader.

For larger ships, Siwertell unloaders are normally installed on travelling rail gantries. This type of installation is the most efficient set-up from an operational perspective and also provides the best opportunity to adopt a truly environmentally-friendly sulphur handling system.

In ports where there are no rails, or where the unloader needs to be moved away from the jetty, installation on a rubber-tyred gantry is possible. As an alternative solution, Siwertell unloaders can also be mounted in stationary positions.

Siwertell unloader handling sulphur for Fremantle Port Authority in Australia

Siwertell 15 000 S road-mobile unloader conveying directly to truck for Skorpion Zinc in Namibia

Siwertell stationary unloader operating in the heart of Westhafen, Germany

Siwertell unloader with rubber- tyred gantry delivered to Cia Canaria, Tenerife, Spain

Model range

Model	Installation	Max ship	Capacity sulphur
Siwertell 5 000 S	Road mobile trailer	5,000 dwt	250 tph
Siwertell 10 000 S	Road mobile trailer	12,000 dwt	250 tph
Siwertell 10 000 S	Gantry	20,000 dwt	250 tph
Siwertell 15 000 S	Road mobile trailer	15,000 dwt	350 tph
Siwertell 15 000 S	Gantry	25,000 dwt	350 tph
Siwertell ST 490-F	Gantry	35,000 dwt	600 tph
Siwertell ST 490-M	Gantry	65,000 dwt Panamax	800 tph
Siwertell ST 640-M	Gantry	65,000 dwt Panamax	1,400 tph
Siwertell ST 640-D	Gantry	Cape size	1,600 tph
Siwertell ST 790-D	Gantry	Cape size	2,300 tph
Siwertell ST 940-D	Gantry	Cape size	3,000 tph

Siwertell unloader handling sulphur for Paradeep Phosphates Ltd. in India

Siwertell system features

- environmentally friendly
- safe operation
- minimal dust and spillage
- long service life
- low maintenance costs
- multi-cargo unloading
- various installation options
- high capacities
- low energy consumption

Bulk handling

Cargotec's bulk handling business is a world leading supplier of dry bulk handling systems in ports and for offshore applications. Its scope of services and supply includes:

- plant and terminal systems
- ship unloaders
- ship loaders
- mechanical and pneumatic conveying systems
- transfer terminal solutions
- storage systems

Siwertell unloaders and loaders have been delivered for decades and around 350 units have been sold to customers throughout the world. Siwertell products are designed, marketed and supplied from Cargotec's offices in Bjuv, Sweden, with support from local representatives in other countries.

Siwertell unloader operating in a populated area in Westhafen, Germany

Cargotec is present throughout the world.

Cargotec *improves the efficiency of cargo flows by offering solutions for loading and unloading goods on land and at sea – wherever cargo is on the move. For handling dry bulk materials, Cargotec provides engineering solutions through its Siwertell brand. Designed to ensure environmentally-friendly and efficient cargo operations, Siwertell ship unloaders and loaders are based on unique screw conveyor technology, in combination with belt conveyors and aeroslides and can handle virtually any dry bulk cargo.*

CARGOTEC
SIWERTELL IS A CARGOTEC BRAND

Cargotec Sweden AB
Bulk Handling
P.O. Box 566 Gunnarstorp
SE-267 25 Bjuv, Sweden
Tel +46 (0) 42 858 00
Fax +46 (0) 42 858 99
blksales@cargotec.com
www.cargotec.com