

Cleveland Cascades – at the forefront of loading chute technology

The development of dry bulk shiploading technology responds to the key requirements and drivers of the industry. Productivity is high on every operators list of priorities, so in order to be profitable, the loading rate as well as overall efficiency and operating costs, are crucial factors. Protection of the material during loading is also an essential part of the process, to ensure



Cascade chute loading grain.

that the material arrives at its destination in the same condition as it left its source and does not degrade during the loading process. Finally, the health, safety and environmental impact of the loading process must be assured. This is not only confined to the developed economies, but is an area ever-increasing focus in developing countries as well.

The development of loading chute technology at Cleveland Cascades has been driven by these factors and addresses all of them directly to ensure the company maintains its position as a leader in the sector.

The Cascade system of inclined cones is renowned worldwide for its ability to control environmental pollution from dust emissions during loading. The cascade limits the material flow velocity to a controlled speed. The shape of the cone holds the material to prevent particulate separation and minimizes material degradation. The significantly reduced product velocity creates a 'mass flow' of material moving as a single mass through the chute, onto the stockpile, practically eliminating dust at source



Cascade technology creates a 'mass flow' of material through the chute.

and at the same time preventing material degradation and material segregation.

Cleveland Cascades specializes in dry bulk loading chute technology, so invariably the chute is part of an integrated port loading system. The company has always recognized this and has developed engineering capabilities and business relationships to ensure the solution for the port operator is seamless. The company has in house bespoke engineering capability to design each chute to interface effectively with upstream feeder systems. Every chute is designed to suit its specific application. The company has developed well established business relationships with most of the world's major conveyor system manufacturers, who recognize the company's specialist chute expertise, enabling co-operation over multiple projects in numerous applications worldwide.

The Cascade system supplied to the Port of Newcastle, Australia, for loading grain has a capacity of 2,800m³ per hour, through a 31-metre-long chute. It has auto raise-lower capability and is fitted with a fixed head chute and upper deflector in order to interface with the on-site shuttle boom conveyor.

To effectively handle grain, the GRP cones are lined with UHMW PE liner and electrical components which come in to contact with the material, are certified to ATEX zone 21 standard. Two interchangeable outlet options include a standard skirted arrangement and a trimmer spout, which extends to 1.5m from the chute and helps ensure maximum utilization of the ships hold space.

Although the company is best known for the Cascade controlled flow technology chute, its experience and expertise in its core product sector has been transferred to conventional free



Free fall cone chute loading fertilizer.

fall chutes. The investment has enabled the launch of both free fall cone and tube chutes. The cone system utilizes a series of vertical cones suspended from chains or strops, allowing the material to fall vertically to the pile. The tube system uses a series of telescoping concentric tubes which remains rigid and is ideally suited to applications which require trimming spouts or jet slinger devices.

The Port of Riga, in Latvia operates a free fall cone chute for loading fertilizers in to bulk vessels. The 8.5-metre-long chute loads up to 500tph (tonnes per hour) through stainless steel cones and is fitted to a Telestack TS542 mobile radial telescopic conveyor. The relatively light weight but robust, high performance chute is ideally suited the conveyor and the application.

In some cases, operators need to handle various materials through the same loading conveyor. Where the material properties vary greatly, particularly moisture content, it is possible that different chute technologies may be required to effectively handle each material. In such cases a Cleveland Cascade can engineer different types of chute to be interchangeable. For example, one project in Canada had a requirement to load up to 1,200tph of titanium slag and metal concentrates through a 20-metre-long chute. But metal concentrates have a relatively high moisture content and can become very sticky.

Consequently, Cleveland Cascades engineered a free fall telescopic tube for metal concentrates and free fall cone arrangement for titanium slag. The interface with the conveyor loading system and the two chute type were designed to be interchangeable to increase flexibility and asset utilization for the



Free fall telescopic tube chute, part of an interchangeable system.

port operator. The system was designed to have relatively quick and easy chute changeover procedure.

Even the most reliable and advanced technology still requires spare parts, service and maintenance to keep the equipment operating efficiently and Cleveland Cascades prides itself on a strong product support package throughout the lifetime of the product, wherever in the world the chute is installed.