

Dust-free clinker delivery

Minimising the environmental impact when loading and unloading fine, dusty materials such as clinker is vital. Samson Materials Handling Ltd has developed a range of mobile solutions that effectively limit dust generation, combat material degradation and reduce spillage.

■ by **Jon Parker**, Samson Materials Handling Ltd, UK

Due to variations in supply and demand, clinker is increasingly traded internationally. This enables regions with surplus production to benefit from regions that are investing heavily in infrastructure but may not have sufficient clinker production capacity available. A lack of natural resources or unreliable supply networks can also drive trade patterns. Given the cement industry's role as a contributor in the release of greenhouse gases, it also makes environmental sense for the cement sector to ensure that global capacity is fully utilised.

However, fine dusty materials such as clinker need to be transported correctly. In recent years, concern for the environment and public health has led to the adoption of a range of environmental protection measures and the threat of punitive action for non-compliance, and companies within the cement industry have been encouraged to take action.

To meet these requirements, UK-based SAMSON Materials Handling has developed a range of shiploaders and hoppers for the conveying of cement production-related materials which limit their environmental impact during loading and unloading operations. Careful design minimises



Figure 1: SAMSON Materials Handling, part of the Aumund Group, specialises in the design of material-handling solutions across the cement process

dust generation at source and measures have been put in place to combat spillage, thereby increasing the share of deliverable product while also limiting material degradation.

Part of the AUMUND Group, SAMSON specialises in the design of mobile material handling equipment from the point of extraction to final reception at the grinding plant for the environmentally-respectful trade of dry bulk materials (see Figure 1).

Quick, safe and continuous shiploading

One such material handling solution is the SAMSON material feeder. Using a SAMSON material feeder integrated with a

shiploader, trucks arriving at a port laden with clinker can discharge quickly and safely (see Figure 2). The material feeder can either be a single-truck reception unit or, for greater capacity, a double or even quadruple unit. The buffer capacity of the material feeder allows for continuous shiploading during truck manoeuvring with handling rates of 1200tph possible for an integrated material feeder and shiploader set-up.

As the SAMSON Material Feeder is fully integrated with the shiploader, measures to avoid dust creation are already built-in at the most vulnerable point – the transfer point between the material feeder and the main shiploader boom. Their design



Figure 2: a single, inline SAMSON material feeder with integrated shiploader



Figure 3: internal view of a SAMSON material feeder



Figure 4: telescopic cascade trimming chutes are the preferred option when handling clinker

Figure 6: the truck unloaders at a Portuguese plant needed to fit seamlessly with the ongoing conveyor system



Figure 5: material can be placed in the hold by the operator using a remote-control system

minimises the amount of dust created using dust filters and seals to ensure no product or dust escapes into the surrounding environment (see Figure 3).

For very dusty materials, the material feeder can be provided with a profiled steel enclosure and an integrated reverse jet dust filter unit to keep the surrounding area free of contamination. The truck also passes through a rubber curtained area before discharging the product. Depending on the application, SAMSON can also supply enclosures made from flexible PVC covers.

Limiting pollution and cargo loss

As the clinker travels along the shiploader boom, it is protected from crosswinds by a canvas enclosure. When it reaches the ship, it is discharged through a telescopic cascade trimming chute, which controls the material velocity from the outloading boom head to the hold floor by directing the clinker down a series of inclined cones. This prevents excessive particulate

separation and the creation of dust at source. There is also an external flexible cover enclosing the entire chute as a further dust-prevention measure. Telescopic cascade trimming chutes are always preferable when trimming vessels with light dusty materials such as clinker as they eliminate the effect of crosswinds and the resulting cargo losses and risk of pollution (see Figure 4). Designed specifically for clinker,

they limit the amount of dust that escapes and material can be directed to the chosen area of the hold by the operator using radio or infrared remote control systems, allowing for better use of space in the hold (see Figure 5).

The SAMSON material feeder and shiploader, whether integrated or free-standing, can be easily moved along the quay for use at different berths and stowed away when not in use. Self-powered machines allow for speedier repositioning for trimming and therefore a higher average loading rate. The configuration and alignment of the wheel bogies can provide inline, parallel or radial travel functions to suit the layout of the port and the vessels to be loaded.

Case study: overcoming space limitations

A Portuguese cement producer required a reliable input method for clinker being

delivered by truck to a new cement plant. The city location of the plant meant that dust reduction was vital. To keep the plant operational, a quick turnaround of trucks was required, but the configuration of the plant and the available space meant that traditional truck unloaders would not provide the best use of space. The chosen truck unloaders also needed to fit seamlessly into the ongoing conveying system to limit any civil works.

The solution came in the form of a SAMSON standard reception unit and two side-tip feeders (see Figure 6). The two 10m, 450 Super Series side-tip feeders were supplied with an extended horizontal loading sector allowing trucks to discharge over the side of the SAMSON entry at 90° to the axis. The feeders discharge directly to two bucket elevators which, in turn, feed to a dome storage system.

A third, single, inline 450 Super with an 8m body was also supplied. This unit was designed to receive clinker directly from the tipping trucks, providing a buffer holding capacity and controlled discharge rate to an ongoing conveyor system. With a flared and reinforced truck entry, the SAMSON unit benefits from a maximised holding capacity and improved flexibility with vehicle alignments.

All three feeders provide an output rate of 250tph to ongoing conveyors and are fitted with profiled steel enclosures, complete with flexible entry curtains and a high-performance dust filtration system, to eliminate any concerns of dust generation. The SAMSON feeders are also designed to limit any civil work requirements and provide ease of operation and maintenance. ■