

DRY BULK®

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Guillaume Coupez, Standard Industrie International, France, outlines cleaning solutions for reducing dust and improving safety in tanks, silos and hoppers at cement facilities.

CLEAN AS A WHISTLE

The cement industry has often been considered an environmentally unfriendly industry renowned for its pollution; indeed, cement plants consistently emit dust into the atmosphere. Modern anti-pollution control standards have however been institutionalised and the industry is required to implement these standardised emission protocols. These measures are enlisted in the ISO 14 000 protocols relating to environmental management.

The objective of these environmental protection protocols and standards go beyond the packing and shipping areas. This is where the partnership between Standard Industrie International and LafargeHolcim comes in: to develop innovative cleaning solutions for tankers before they get on the road.

Standard Industrie offers a range of solutions that enable the cleaning of tankers from the top by suction and vacuum process. The PAD1350ETHF (Figure 1) eliminates any excess material and is equipped with a 10 m long flexible hose. This 11 kW high filtration equipment has a capacity of 450 litres. The power and tank capacity is able to clean several tankers per day (Figure 2). The PAD1350ETHF is the solution for trucks that

pollute the atmosphere; it replaces the method of cleaning with water and disposes of polluted liquids. It is an economic and ecological solution that is simple to install and easy to use.

Already popular in the cement industry with its AIRCHOC® wireless air canon (Figure 3) and its LIFTUBE® (Figure 5), Standard Industrie offers cleaning and pumping solutions covering standard operational needs as well as repairs and preventive maintenance solutions. In the cement industry, suppliers have to supply an extensive variety of products to meet its needs. The company's diesel, electric as well as pneumatic driven vacuum cleaners include capacities that range from 80 litres to 12 m³.

The following are a few typical operations carried out in cement plants along with the generally recommended solutions.

Bucket elevator clean-up

An incident on a bucket elevator can occur and subsequently create flooding at the base of the lift. In this situation, it is imperative to quickly react to the flooding so the maintenance team can move in for repairs. Standard Industrie offers powerful,



Figure 1. View of vacuuming installation for trailer cleaning.



Figure 2. Vacuum cleaning of trailers.



Figure 3. AIRCHOC® wireless on cement silo.

medium or open top suction trucks, with great storage capacities that are ideal for helping clean up such accidents.

Silos

The fluidisation canvases of a silo after some time wear out, puncture and therefore must be replaced. In order to perform such replacement, residual materials must be removed by suction around the air circulation box located under the canvas, which, filled with material, is punctured. The company offers a fast and mobile solution with its medium-high vacuum suction trucks, MOBNET and VALNET, which are two flexible and economical trucks that can be driven by anyone with a light vehicle driving licence.

Sometimes an intervention is needed on silo and hopper drainage systems due to a malfunction within these systems, caused by drainage with electrostatic filters, oil mills, poor quality products, or a jammed silo or hopper.

Modern cement plants are equipped with automatic palletisers with devices such as limit switch contacts, cells, and sensors. These devices must be cleaned on a regular basis, thus there is a need for a mobile or permanently bolted machine. Sometimes, during operation, an accident can occur due to a malfunction of the system, causing a bag – or even a full pallet of bags – to fall. Standard Industrie may recommend the use of the GAD50 on silos and hoppers as the ideal solution for the clean-up.

General cleaning

Given the extensive processing stages in a cement plant, general cleaning is required for floors, framing, machines, etc. In this scenario, the GAD or mobile UMA, which operate at 50 – 150 hp, are recommended.

Some cement plants use charcoal as a source of energy for the oven. A plant using coal base grinder and additional machinery requires cleaning interventions with hardware protected and safely removed from the building. The GAD is a flexible high-performance solution.

There should also be a plan to have fire prevention equipment or ATEX machine (explosive atmosphere) at the plant.

Sometimes storage silos need to be emptied as cement build-ups can occur and prevent the flow of material. Standard Industrie's equipment is essential to break any obstruction by residues vacuumed inward or outward of a silo into another storage silo.

Considering dust and safety

Dust discharge – even at the originating site – is increasingly becoming prohibited. Special organisations require plants to recycle their waste or to incinerate it in suitable plants (for example, animal meal is incinerated in cement). Therefore, it is important to discharge materials in big bags and also to be able to suppress them pneumatically. The company's UMA and CAM machines can take care of this issue; they are equipped with devices (explosion discs, anti-static components, grounding) that limit the risk of explosion. Depending on the site and the type of build-up material, particles removed can either be reclaimed in the storage silo or missile silo (also referred to as 'purge'), in the supply duct of the kiln or in a bucket elevator.

In a cement plant, the coal mill prepares the coal to be burnt in the kiln to make the clinker. This coal is crushed and then transported by conveyor belts.

The main goal of this application is the vacuuming of explosive products and the overflow along the conveyors.

The UMA3000DMX is a vacuum machine on a big trailer that can be moved wherever in the plant. It is coupled to a fixed network in the coal mill building, which stands on four floors.

Not only is cleaning in this area necessary for environmental reasons but also to avoid the risk of auto-combustion.

The UMA3000DMX (Figure 4), equipped with explosion vents, offers the opportunity to vacuum explosives, and is also used,



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The UMA3000DMX (Figure 4), equipped with explosion vents, offers the opportunity to vacuum explosives, and is also used,

once the cleaning is finished, for cleaning the cooler area and the overflow along the conveyors.

The choice of this solution was made for two main reasons:

- A huge collection capacity (4 m³) without the disadvantages of a truck requiring an experienced driver.
- Daily use due to a plant's cleaning needs, and also a 100% full compliance with the safety policy of the staff.

Another solution is the LIFTUBE® (Figure 5), which decreases risks of mistracking, reduces noise, has pinch point protection, limits material spillages, and consequently, reduces downtime and operating losses. Moreover productivity and safety are optimised between loading and unloading sectors with the help of this equipment.

The installation of self-extinguishing and high temperature resistant LIFTUBE has benefitted one Europe-based plant producing manganese. Before this, the manufacture of this abrasive and dense product meant the plant faced daily issues with their belts, thus making maintenance harder and increasing cleaning operations. The material losses due to leakages present in the foot pulley caused many stops. Access to this area had become difficult, increasing the operators' risk of danger.

Standard Industrie has been able to adapt to the characteristics of manganese dust, and, since the installation of the LIFTUBE in 2016, problems of dust removal have been eliminated, and the system is now perfectly sealed so additional cleaning is unnecessary. Moreover, due to the sealing, noise has been reduced by approximately 15 – 20% thus offering a more comfortable working environment for the operators. **DB**



Figure 4. UMA3000DMX before tank emptying.



Figure 5. LIFTUBE® installation avoiding dust emissions.