



White Paper

## **Conveying & Loading - Dust free! Environmental Protection along the complete Transport Chain**

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Dust is one of the real big problems in bulk handling. It means loss of product, pollution of the environment, and trouble with the neighbours. Solutions for some of this problems are presented hereafter.

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Belt conveyors: rapid and efficient transport of bulk material from the quarry to the destination as well as through rough terrain. (Pictures: © Beumer Group)

Beumer Group is a world-leading systems provider for transporting, loading, filling and packaging bulk material. Their portfolio includes curved belt conveyors for fast and cost-efficient transport of large quantities of bulk material from the quarry or mine to the factory or port. The belt conveyors are able to navigate long distances, high angles of inclination and tight curve radii, and can be adapted individually to the belt or pipe conveyor bulk handling solutions. Depending on

the customer's requirements, Beumer provides either troughed belt or pipe conveyor bulk handling solutions. Open troughed belt conveyors are recommended for larger throughputs, higher mass flows and wider curved radii. Closed Pipe Conveyors protect both transported items from environmental influences and the environment from falling items. Troughed belt conveyors can also be covered or encased to minimise dust formation during transport. This seal guarantees dust-free transport. Beumer's portfolio also includes mechanical vertical conveyors such as belt bucket elevators. They are an essential production link in the cement industry. Beumer reliably seals the shaft casings of these bucket elevators, which stops dust from escaping. Instead, the dust trickles into the bucket elevator boot that is equipped with a dynamic bottom. Wet and sticky material cannot accumulate but is fed back into the transport process.

### **Loading without Spilling**





With the Beumer bulk loading head, bulk transporter vehicles can be loaded quickly and without dust.

The Beumer Group has developed bulk loading heads for the quick and dust-free loading of bulk transporter vehicles. They are designed according to the double-wall system, where the material inlet and the dedusting unit are separated from each other. When the bulk loading head is placed on a filler neck, its sealing cone

is lowered and the outlet spout opens simultaneously. The lowering level of the sealing cone is variable. You can adjust the fill level in the vehicle using the fill level meter. In order to balance out any minor positional deviations of the vehicle, the operator can move the bulk loading head laterally during placement. The bulk loading head is also available with an integrated filter allowing you to operate the centralised dedusting units independently from the dust transporting devices. The dust removed from the bulk transporter vehicle is fed again to the material flow during loading. The filter consists of filter hoses which are positioned between the inner telescopic tube and the outer bellows. The suction is carried out by a fan fastened at the outside. The cleaning is carried out by timed compressed-air shocks.

### **Dust-free Loading of Open Vehicles**

Beumer offers various types of telescopic loading systems for dust-free loading of open vehicles. With these systems, the bulk loading head is lowered to the floor of the vehicle and the material feed is switched on. A fill level switch in the lower dedusting hood is activated by the rising material. This causes the bulk loading head to be raised automatically. The edge of the dedusting hood always rests on the material cone while it rises, so that no dust can escape. The bellows, or the telescopic tubes for the dust extraction, are connected to a central dedusting air system. Corresponding devices or flow control gates transport the material to the system. The bulk loading heads can also be equipped with fill level indicators. Once the vehicle is loaded, they reliably turn off the material feed. Different types of fill level indicators are used depending on the properties of the material.

### **Mobile Loaders for Bulk Transporter Vehicles**

In the cement industry, high loading capacities are required. Stationary bulk loading heads are often not sufficient, especially if the bulk transporter vehicle is standing on a weighbridge and may not be moved during the loading process. It should be possible for the operator to move the bulk loading head to each filler neck of the vehicle. Depending on the properties of the materials to be loaded and the length of the vehicle, different sliding or swivelling loading system options are available. These mobile loading systems can be fitted with either one or two loading heads, depending on the space available.



The twin-belt turning device: Two parallel belt conveyors, driven with different speeds during the turning process, bring the bags gently into the required position.

First, the bulk material needs to be filled in bags so that it can be palletised, packaged and sent to the customer. As a single-source provider, BEUMER Group offers an innovative solution with the BEUMER fillpac filling machine and provides



equipment and systems for packaging lines. The new machine can be flexibly integrated with existing packaging lines and can be optimally adapted to the customer's situation. What makes the BEUMER fillpac unique is a specific weighing electronics which ensures the weight accuracy of the bags. Rejects caused by too high or too low filling weights can nearly be eliminated. The weighing unit communicates permanently with the filler neck via a specific software. The automatic bag weight adjustment determines the exact filling weight of the bags, thus enabling the exact degrees of filling during the filling process. The filling spout is equipped with a special hood that reduces dust emission to a minimum. There are also suction points on both sides in the area of the filling spout. The dust is sucked off directly where it builds up and fed back into the process. This allows for a practically dust-free filling of the bags. The three-position cylinder that regulates the coarse and fine flow is protected from dust, because it is positioned vertically and outside of the dirty area. The cylinder for bag discharging is also located in the dust-free zone above the filling spout. The paper, PE or PP bags are then stacked on pallets of different sizes in a flexible, precise and stable way. For this, Beumer has developed the Beumer paletpac®, a high capacity layer palletiser. If you want to avoid dust formation, the bags have to be handled very carefully. This is why Beumer offers the palletiser with a clamp-type turning device or the newly developed twin-belt turning device. They position the filled bags quickly, ensuring their dimensional stability without any deformations. If required, Beumer Group customer support can simply upgrade existing palletisers with the twin-belt turning device.

#### **A Note from the Editor**

For all statements in this article that refer – directly or indirectly – to the time of publication (for example “new”, “now”, “present”, but also expressions such as “patent pending”), please keep in mind that this article was originally published in 2014.

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