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RegalRexnord
Creating A Better Tomorrow

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The importance of skirtboard sealing systems

Martin Engineering designs products to promote a clean working environment. Dave Mueller, the company's product manager, explains how proper skirting can help.

WHEN TONNES OF TRANSFERRED bulk material hits a moving belt, three things happen. Fines scatter, cargo shifts, and dust becomes airborne.

The impact can create turbulent air that seeks the easiest escape from any gap it can find, carrying dust and fines with it. These gaps generally appear on the sides of the enclosure between the chute wall and the belt. Skirting systems address the challenge of containing fugitive dust and spillage.

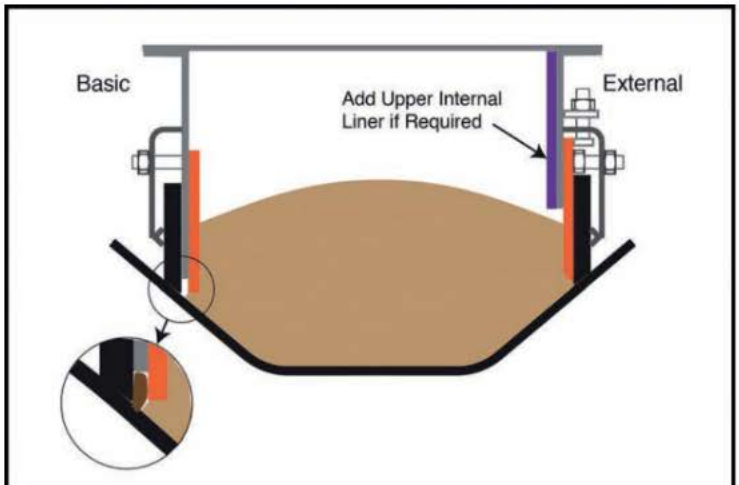
What is a skirtboard sealing system

Usually made from natural or SBR rubber (or specialty formulations for specific applications such as underground mining or food), the skirting extends down the entire length of the transition enclosure and is generally tapered at the bottom to match the trough angle of the belt. It is intended to maintain a seal on the enclosure and help trap any fine particles and dust that is not contained by the wear liners and chute wall.

As the skirt edge loses its seal, gaps are created, which allow material to become entrapped in a 'pinch point'. This causes abrasion that gouges or chafes the surface of the belt down its entire length. Some of the major issues from entrapment include scalloping, when wedged material causes excessive wear, and grooves, when debris collects under the skirt causing friction damage.

Regardless of the belt tension, belt sag will create a space for fugitive dust to escape or for material to become entrapped.

This is avoided by retrofitting a skirt sealing system with impact cradles or edge support rather than rollers in the loading zone.



External Wear Liner & Skirting

Proper enclosure

Wear liners are typically welded to the inside of the chute wall with the skirtboard attached on the outside using an adjustable clamp system. However, the internal design can allow some material buildup in the gap between the wear liner and the skirtboard, depending on the size of the aggregate.

External wear liner and skirting configurations place both pieces of equipment outside the chute wall. Placing the skirt seal and wear liner outside of the chute makes it easier for workers to perform adjustments safely. The result is a better seal on the belt and less material entrapment.

Self-adjusting skirting maintains a seal automatically as belt path fluctuates due to its design, without the need for adjustment and only periodic inspection. A low-profile skirting assembly should need only 152mm of clearance for installation and maintenance in small spaces.

Skirting best practice

Since skirts are wear parts, it is important that they are easily installed, adjusted, maintained, and replaced to avoid dust and spillage, mitigate downtime, improve workplace safety and reduce the cost of operation. Managers contemplating a capital investment in a skirting and wear liner system should consider:

- Hiring an outside engineer to design the best system for the application.
- Installing equipment that features external maintenance.
- Utilising a skirting strip that extends the entire length of the chute to avoid seams.

- Choosing skirting material that is free of fabrics, with a lower abrasion resistance than the belt.
- Installing a self-adjusting system.
- Choosing the option with the least worker exposure to equipment hazards.

Case study

The Port of Santos in São Paulo is the busiest in Latin America. Operating at Terminal 26, T-Grão manages the import and export of over 3.6 million mt/y of malt, wheat, soy, and maize. Transfer points at T-Grão range between 10-15m in height. The fugitive emissions affected air quality and visibility in the immediate work areas, forcing personnel to wear protective masks when working the conveyor. The dust often travelled beyond the site line, sparking complaints. Before the chute upgrade, a cleaning crew of 45 workers spent around 24 hours per month on dust and spillage cleanup.

Martin Engineering technicians constructed a longer sealed enclosure with the ability to control airflow and give dust extra space to settle. They added several other critical components including external dual seal skirtboard and wear liner system. Impact cradles and slider cradles replaced the idlers to seal gaps in the chute.

Operators immediately observed results. As material moved through the system, particulates remained within the enclosure and either collected in the dust bags or settled back into the cargo flow. After a lengthy observation period, operators report there has been less downtime for cleanup and maintenance, and improved safety.

Conclusion

By installing modern skirtboards that prevent fugitive material from leaving the loading chute, operators can reduce worker exposure to hazards, minimise labour for maintenance and cleanup, improve equipment and belt life and achieve better compliance. The savings on labour and operating costs alone provide a sound return on investment, but the improvement to workplace safety should be the only motivation needed. B

Dust and spillage clogs idlers, requiring them to be replaced and raising the cost of operation.