

A belt cleaned by scraper, which stays clean for a long time, it is possible?

« Easy Clean[®] » belt or the answer to the "scraper" problem!

Belt cleaning is a recurring problem for conveyor operators. Since the end of the 1980s, this operation has become crucial to guarantee the reliability, cleanliness and safety of bulk handling by conveyors. Many scraper models have developed and these materials have reached a high level of technicality. On the other hand, the belt, a major element of the "cleanliness" problem, has not benefited from any significant progress on this point.

Integrating a mechanical subassembly into a machine requires ensuring the good mechanical compatibility of the various elements present. Integrating a scraper into a conveyor is no exception. In our history, we had to consider the technical criteria of the belt and its environment.

Principle and constraint

The scraper blade is pressed against the surface of the belt; precisely against its top coating soiled by the product handled. It is this pressure of the blade, at a minimum value necessary and very comparable from one model to other scrapers on the market, which quickly generates a loss of performance (quality of cleaning, longevity of the blades).

A microscopic observation, at the interface of the **rubber coating and the scraper blade**, made it possible to demonstrate the formation of a consecutive rubber fold:

- at the pressure of the scraper blade
- at movement of the belt

It is this deformation (rubber fold), however minimal, that is at the root of poor performance or rapid loss of belt cleaning and blade wear performance.

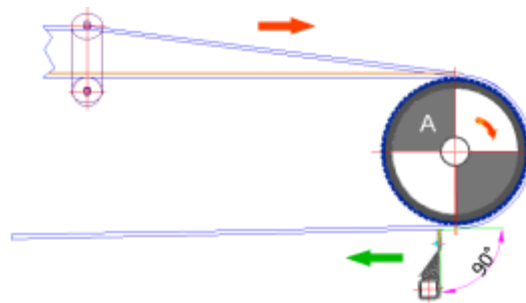


Figure 1 : Underlying scraper
Adequate belt tension, return side, and the distance of blade with belt/pulley line tangency are important factors.

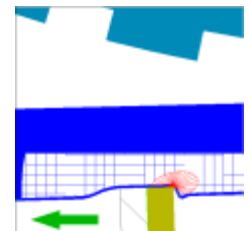


Fig.1.1 / detail : the rubber is pushed back by the scraper blade.

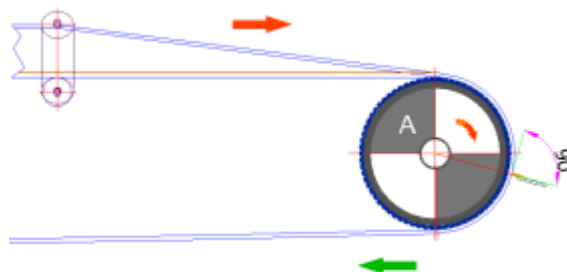


Figure 2 : tangential scraper
The homogeneity of belt, the position and the pressure of the scraper are determining factors.

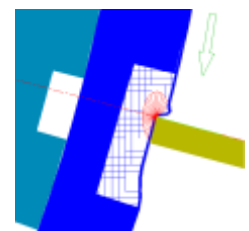


Fig.2.1 / detail : the rubber is pushed back by the scraper blade.

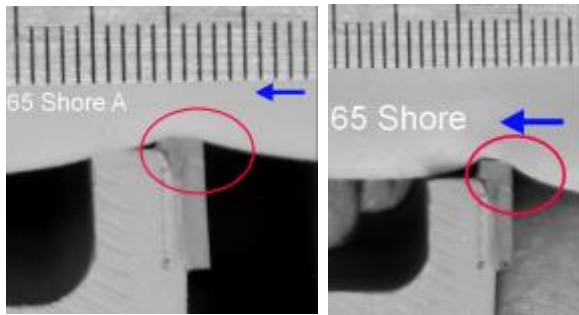


Figure 3.1 : Belt with standard coating
The pressure of the blade forms a swelling of rubber in front of the scraper. QED !

Other **macroscopic factors** intervene; these are more or less influenced by the model of the scraper, the blade holder and the blade on the one hand and, on the other hand, by the tension of the belt, as well as the position and adjustment of the scraper on the conveyor

By responding to the constraints of microscopic observation, the Delta Easy Clean® belt responds, in fact, to macroscopic observations.

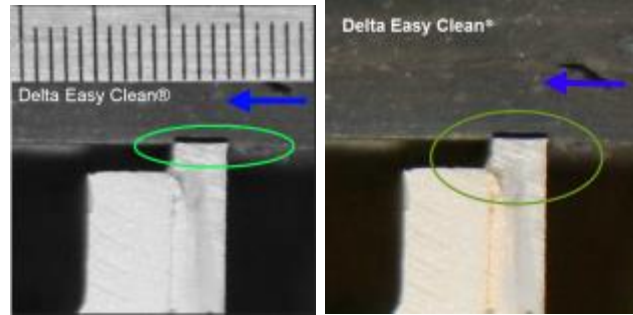


Figure 3.2 : Belt with coating rubber Easy Clean® »
The blade pressure does not deform the flat and constant profile of the Easy Clean coating on the belt.



Figure 4 : household cullet handling

Development and tests

In collaboration with a recognized expert in the field of belt conveyors, specifications have been drawn up to define the architecture of the belt and the qualities of a rubber perfectly adapted to the constraints of modern scrapers, especially with thin blades (thickness 2 to 5 mm) in tungsten. The tests have been successfully conducted on the handling of household cullet. This product is characterized by a large amount of extremely abrasive and sticky "fines", which are particularly damaging to the scraper blades and contain fatty substances, damaging to the belt coating.

This cullet accumulates two antagonistic constraints:

- **Abrasiveness** requires a high-performance anti-abrasive coating rubber that is incompatible with fats;
- **Fat** requires an anti-fat rubber coating, but it is of low abrasion resistance.

For those who like the numbers, the period for 1 revolution of belt on the test conveyor is 28

seconds and the life time has been more than doubled for a 12 hour operation a day, 5 days a week.

Induced advantage in terms of security

The cleaning performance achieved with the **Delta Easy Clean®** belt has a significant impact on the path stability of the belt, return side, and on the cleanliness of the floors and the conveyor's immediate environment. These qualities are to be taken into account from the point of view of the safety obligations since the risks related to the adjustment operations and the risks of falls, slips, risks related to the cleaning are significantly reduced.

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