Wear, rip and tear: Caring for conveyors

With some of the world's biggest industrial players now recognising the recycling industry's importance and potential for growth, Netherlands-based Dunlop Conveyor Belting says it too is focusing more and more on the very specific demands of recycling and waste management operators. RWW reports.

THE RECYCLING industry relies on speed, efficiency and capacity to generate profit, says Les Williams, Dunlop's general sales and marketing manager.

"Recycling and waste management companies invest heavily in machinery that has to deal with a wide range of difficult belt destroying materials. Wear, rip, tear, impact and oil are all important factors," adds Williams. The Achilles heel, and therefore an opportunity for Dunlop as he sees it, is that the conveyor belts used are not nearly as good as they could and should be.

Dunlop supply belting to more than 150 countries worldwide and during his travels Williams says he has been shocked by what he has witnessed at some recycling plants.

"It is not uncommon to see belts that have been ripped their entire length and then 'clipped' back together using metal fasteners just to keep them running for a little longer."

Despite the best efforts of the operators to prevent it happening, Williams says damage is caused by metal, ceramics, rock and timber becoming trapped which can destroy conventional and even steel-reinforced belts within a matter of a few belt cycles.

He adds it is a common sight to see belts wearing prematurely with profiles and cleats that are used to pull the materials being badly damaged or ripped off altogether.

"On many applications the belts are simply not lasting long enough or, at the very least, need to be repaired much too frequently," continues the general sales and marketing manager.

Hidden belt killers

To the layperson, general household waste, although unpleasant and smelly, may appear to be relatively harmless, but even this has characteristics that can reduce the toughest looking rubber conveyor belt to something more closely resembling a shredded bed sheet within months or even weeks.

Mineral and vegetable oil is an almost invisible yet deadly killer of rubber belts. Not only does it soften the surface rubber causing it to become less pliable and to crack; it also affects the carcass of the belt.

Consequently, belts start to become increasingly difficult to keep running straight.

Worse still, adhesion is reduced between the various layers of the belt, which causes the belt to break apart sometimes literally at the seams. But the progressive damage caused by oil is only part of the story.

Sharp objects such as glass cut and gouge the surface of the belt. Apart from accelerating surface wear, this also allows oil and other household product chemicals to penetrate into the carcass more rapidly.

Add all these factors together and it is little wonder, especially considering the significant capital cost of conveyor belts as well as lost production time for repairs and replacements, that many operators view conveyor belt life as a serious headache.

Reducing lifetime cost

According to Dunlop, there are three key actions that can be taken to reduce conveyor belt problems and thereby improve efficiency and lower operational costs. Two of these actions, they maintain, are within the direct control of the operators. "Conveyor belts are not cheap purchases and invariably the price reflects the quality," emphasises Williams.

"The first and most important thing to look at is the quality of the rubber covers. International standards such as ISO and DIN are only minimum standards and in far too many cases the belts do not meet even these minimum standards, despite the claims of the manufacturers and traders."

Above: Sharp objects cut and gouge the surface of the belt, which causes the belt to break apart; sometimes literally at the seams. Below: Even general household waste can be a 'belt killer'.

In the case of resistance against oil and fat penetration there is not even a recognised EN/ISO test standard to seek reassurance from.

This in itself can pose a big question mark against the oil resistance claims made by some manufacturers. In the Dunlop laboratories they apply the stringent ASTM D 1460 test standard which originated in the USA.

Belts with raised 'profiles' such as chevrons and cleats that wear and rip is again a question of manufacturing quality. "First, it's a question of the quality of the rubber compound and its ability to withstand wear, cutting and gouging. Then it's a question of the profiles being created as an homogenous part of the belt rather than being stuck or vulcanised on after the base belt has been made," explains Williams.

"We use special mould plates so the rubber flows into the moulds during the belt vulcanising process. This creates a much stronger profile."

A ripping good idea

Steel reinforced belting is often used to minimise ripping and tearing caused by sharp objects becoming trapped.

However, the inherent weakness is that the strongest steel cords run longitudinally while thinner steel cords are used horizontally primarily to hold the longitudinal cords in place, even though the force generated by trapped objects is longitudinal.

Dunlop's answer has been the development of their UsFlex range of specialist heavy-duty belting, which has a rip and cutting resistance that is more than four times greater than conventional multi-ply belts that have a similar tensile strength.

According to Dunlop, the resistance is not only superior in relation to the multi-ply EP belts but also steel reinforced, solid woven or EpP constructions.

Care and maintenance

The second action within the control of operators is the day-to-day cleanliness and maintenance of the conveyors themselves.

Keeping rollers, drums and pulleys clear of spillage and regularly checking and replacing seized or damaged parts plays a crucial role in reducing belt damage and lengthening operational life.

"I have visited so many sites where idlers and rollers are either damaged or missing altogether. Not keeping conveyors parts as clean as possible and carrying out planned maintenance is a false economy," advises Williams.

The third action, in the opinion of Dunlop, lies with the machine manufacturers. Even on the most expensive and highly efficient recycling machines the size of the drums and pulleys is often too small to allow belts with stronger tensile strengths to be used.

Dunlop say they are trying to forge closer cooperation with machine designers who may be unaware of the implications when it comes to fitting conveyor belts that could quite easily last much longer.

A bright future

Dunlop senior management says it firmly believes that the recycling and waste management industry has a very bright future and by the sound of it, they are determined to play an important part in it.

"We have the technical know-how and experience and we already have several products that have been specifically developed to cope with the very tough demands that are found within the industry," says managing director, Edwin Have.

"There are enormous possibilities for growth so the recycling world can expect to be seeing a lot more of us in the future" RWW