

## Keeping coal on the move with belts from Dunlop Conveyor Belting



Coal is one of the biggest cargoes involved in dry cargo transshipment, and conveyor belt systems remain a highly effective method of transportation within storage and distribution areas. The belt itself is often the most vulnerable part of a conveyor system. Every time a conveyor has to be stopped means cost, not only in terms of the replacing and fitting the actual belt, but also in terms of lost production time.

### THE DIFFERENT TYPES OF CONVEYOR BELT

There are essentially three different types of conveyor belt used to carry coal. In underground mines, safety has to be the primary concern. For this reason, very thick 'solid woven' belts using PVC or rubber protective outer layers are almost invariably used because they provide the greatest possible resistance to fire. Steel cord belting is normally used above ground when very long distances are involved, which can be several kilometres, because elongation (stretch) can be a problem. Steel cord conveyor belts are made using a layer of steel cords bonded together with rubber and covered with layers of protective rubber 'covers'

Rubber multi-ply belts, manufactured using layers of extremely strong but flexible synthetic fabric, are usually the preferred choice for most other uses above ground, including open cast mines. Netherlands-based Dunlop Conveyor Belting, which last year doubled its quality guarantee period, is widely recognised as being one of the world's leading producers of rubber multi-ply conveyor belts. It supplies belts and technical support to literally hundreds of mines, ports and high volume

coal consumers around the world. Dunlop is very proud of the fact, for example, that virtually every power station in Holland uses its belts, some of which have been running trouble-free since as long ago as 1986.

Rubber multi-ply belts used in coal fields, stock yards and ports should, in theory, be expected to enjoy a long operational life because coal is not particularly abrasive. But, as the head of Dunlop's technical engineering department, Sytze Brouwers, explains, moving coal is not always as simple as it may first appear.

"A tremendous amount of pollution [foreign objects] can occur during transportation. You would be amazed at what we find mixed in with the coal. Lengths of rail track, pieces of mechanical equipment of every description, pickaxes — the list is almost endless! These unwanted objects can cause very serious damage to conveyor belts and conveyor systems. This is why we generally recommend and supply our Trioflex belts for moving coal because they have exceptionally good resistance to the tearing and ripping caused by trapped pieces of metal."

For operators which have ATEX-regulated safety zones, all Dunlop fire-resistant belts exceed EN/ISO 284 standards, which according to Brouwers, is almost unheard of within the conveyor belt industry.

### FROM PROTECTOR TO AGGRESSOR

Apart from accidental mechanical damage, belts that operate in exposed environments can also be very prone to the damaging effects of ozone. At high altitude, ozone acts as a protective

shield by absorbing harmful ultraviolet rays but at low altitude, ozone becomes a pollutant. Research has shown that exposure to ozone can have a range of consequences such as a surface cracking and a decrease in the tensile strength of the rubber.

This can have very significant environmental and health and safety consequences because fine particles of coal penetrate the cracks, which are then discharged (shaken out) on the return (underside) run of the belt. It is becoming increasingly common to see belts being replaced prematurely because of surface cracking even though the covers are not completely worn.

Another effect is that moisture can seep into the cracks and penetrate through to the actual carcass, causing sections of the carcass to contract (shorten), which can result in belt tracking problems that are very difficult to pinpoint and correct.

#### EN/ISO 1431 TESTING

Because of the growing importance of ozone resistance, Dunlop was amongst the very first to make use of new technology to measure the effects of ozone. Mandatory testing to EN/ISO 1431 international standards using an ozone testing cabinet was introduced for all Dunlop belting products and comparison tests also applied to samples of belts made by other manufacturers.

Samples are placed under tension (20% elongation) inside the cabinet and exposed to highly concentrated levels of ozone for up to 96 hours. Dunlop engineers say that as a general rule, based on their experience, failure to exceed more than eight hours under test without cracking will most likely correlate to less than two years (under normal working conditions) before a belt starts to deteriorate. In some cases, particularly coastal

locations, deterioration can begin to occur within a matter of months.

Dunlop's director of production and product development, Dr. Michiel Eijpe, believes that EN/ISO 1431 ozone resistance testing is essential. "We engineer a high level of ozone and UV resistance into all of the belts that we supply for the movement of coal by using a mix of special chemicals and polymers in our rubber compounds. Tests have shown that all Dunlop [belt] covers achieve extremely high standards of resistance to ozone, which nowadays is an increasingly important factor in the operational lifetime of a conveyor belt."

#### SEEK ADVICE

What is clear is that there is a lot more to conveyor belts than meets the eye. The days when conveyor belts just seemed to be long lengths of black rubber is certainly a thing of the past. This has especially been the case during recent years; the technology used to manufacture conveyor belts has advanced enormously.

Today's users of belts should rightfully expect a much higher level of performance and longer operational life from their belts. Sadly, for many suppliers and service companies, conveyor belts that last longer and require less maintenance are not good for business. All too often, their philosophy seems to be "sell cheap and replace often."

Short-term cost 'savings' can prove to be a very expensive mistake. As often as not, the quality is reflected by the price so it is always worth the effort to check the original manufacturers specifications very carefully and ask for documented evidence of compliance.

