



Double the life, and half the trouble

AN OPEN-CAST MINE OPERATOR IN GERMANY MINES COAL, WHICH IS ESTIMATED TO BE AROUND 30 MILLION YEARS OLD. HOWEVER, IT WAS THE TWO BRIEF YEARS THE BEARINGS ON ITS CONVEYORS WERE LASTING WHICH WAS ONE OF THE OPERATOR'S MOST PRESSING CONCERNS.



There are 250km of conveyors on the site, operating – like the mine – round the clock, 365 days a year. The longest section is 5.6km, and each section incorporates around 40 bearings, in the head and tail pulleys and the bend rolls. The conveyors transfer approximately 240,000m³ per day of mined coal, and move approximately 500 million tons every year of other material, that's been extracted and is then used to rebuild the mine.

Grease was the word

The bearings used by a coal mine operator on the conveyors were open spherical roller bearings, which were continually failing.

The working environment at the mine is by its nature highly contaminated with dirt, grit and other foreign bodies, all of which frequently found their way into the bearings, causing repeated failures and downtime. Downtime in any process obviously has a negative effect on productivity, but in a non-stop operation it's catastrophic.

As a stop-gap measure, the customer's maintenance engineers frequently applied large amounts of grease to the bearings. However, this not only created an unwanted cost, but also caused additional problems and expense in terms of disposal, and raised concerns relating to Germany's strict environmental regulations.

Doubling the duty

One aspect of conveyor maintenance is lagging rework on the pulleys. With the aim of minimising downtime – and achieving a target 3% reduction in operating costs – the coal mine operator called in SKF to see if they could find a solution which would keep the bearings operating until the lagging rework was required.

SKF application specialists suggested a test of sealed spherical roller bearings on the bend rolls, to replace the existing open versions. As well as installing SKF 23228-2CS5/VT143 sealed spherical roller bearings, the housings were filled with grease (for life), and a labyrinth seal was added at the end of the roller.

WHILE THE PREVIOUS OPEN BEARINGS TYPICALLY LASTED AN AVERAGE OF 730 DAYS, THE SKF SEALED SOLUTION LASTED MORE THAN FOUR FULL YEARS: A 100% INCREASE IN SERVICE LIFE.

The longer life enabled the coal mine operator to achieve its goal of performing bearing maintenance at the same time as lagging rework. Additional benefits included cost savings on used grease disposal, and a reduction in bearing mounting time from four hours to two. This also meant a reduction in downtime, and enabled maintenance engineers to gain time to spend on other critical tasks.

Would the coal mine operator go back to their old-style bearings? Not in 30 million years!

Hard as (rubber) nails?



IMAGINE A GAME OF 'SCISSORS, PAPER, STONE' BUT WITH RUBBER AND STEEL INSTEAD. MOST OF US WOULD PUT OUR MONEY ON STEEL TO WIN. BUT IN A HOSE APPLICATION, IT WOULD BE RUBBER THAT COMES OUT ON TOP FOR ABRASION AND WEAR RESISTANCE. WHICH IS WHY NOVAFLEX® USE RUBBER COMPOUNDS IN THEIR MINING SLURRY HOSES.

The hardest material is not always the hardest-wearing. And that's particularly true if you need a material to resist abrasion rather than, for instance, impact. Even the hardest steels can be gradually worn away by contact with abrasive materials, whereas a soft and elastic rubber compound will last longer, with less wear.

Novaflex® take advantage of the abrasion-resistant properties of certain rubber compounds, to produce hoses with a longer service life, that offer better value for money.

Soft is hard to beat

The unique ability of rubber compounds to resist abrasion, cutting, ripping and other types of wear is down to their elasticity.

This means that, when they're hit by a particle (a tiny piece of grit in the slurry that's being pumped, for example), the compounds deform to absorb the kinetic energy. This means less or no damage to the material, and less wear as a result, where a harder-surfaced material would resist the energy instead, and end up being chipped.

It's knowing which compounds are best for each abrasion resistance requirement that enables Novaflex® to create longer-lasting hoses for applications such as mining slurry transfer.

Going round the bend

It's not only abrasion that affects the performance and service life of a transfer hose. Bends, offsets, misalignments, expansion, contraction and vibration can be all in a day's work for a hose, and the hose material and construction need to be flexible enough to cope.

Even so, engineering as large a bend radius as possible into the hose system will help to reduce wear and increase service life. Hose wear always occurs on the outside radius of the bend, so the greater the bend radius, the lower the angle of impact and the lower the rate of wear.

The optimum bend radius to reduce wear is ten times the inside diameter of the hose.

Slurry in a hurry

As well as the standard Novaflex® abrasion-resistant mining slurry hoses, there are more wear-resistant and quicker installation options available too.

The Novaflex® Slurry King 5000 saves time over engineered hoses and steel pipe installations, with its unique quick installation system. Simply stock the bulk hose (up to 14" diameter) and couplings, then cut the hose to length, attach the coupling and install – in minutes, with no welding. And for the greatest abrasion, cut and gouge resistance, for dry or wet material transfer, there's the NovaWear-YG™ Tube.

So whatever you need to transfer by hose, the most effective hose material is soft, and the choice isn't hard: it's Novaflex®.

