



Taking up the slack

Tamara Wilson, Bryant Products Inc., US, explains why the value of take-ups needs to be better recognised.

A thought that may have crossed the minds of many people in the conveying industry over the years is that when it comes to conveyors, a take-up is just a take-up. However, the reality is that a take-up provides an important function in almost all conveyors. It applies tension to the belt, meaning products can move from one location to another. Without the take-up, nothing would move.

Recognising the importance of the take-up

A company that recognised the value of the take-up is Roberts & Schaefer (R&S), a company specialising in the design, engineering, procurement and construction of bulk material handling and processing systems for the power and mining industries.

R&S knew from experience that, during conveyor installation and set up, mechanics would tighten the take-up until any slack tension was gone and then give the wrench an extra pull, just to be sure the belt was tight and would keep running. In most applications, this seemed to work well until the belts stretched, which then required readjustment of the take-ups. This process would continue until the belt finally broke, resulting in expensive repairs and downtime.

R&S was introduced to the Bryant hydraulic telescoper take-up that could be charged with either grease or oil and provide a force determined by the design engineer. The company was willing to try this new design, with the thought that, if the hydraulic telescoper was all it was promised to be, many problems could be solved.

Pete Scheiner of R&S reports: "R&S has been using Bryant Telescoper® brand take-ups on belt feeders for more than 10 years. Their function is to provide the tension necessary to run very short conveyors or belt feeders where a gravity take-up tower and counterweights cannot be used. All of the belt feeders [at Kaltim Prima Coal (KPC) plants 1 and 2] use these take-ups. Before the emergence of the telescopers, R&S would have used a screw-type take-up system that uses all threaded rods and a heavy hex nut on each side of the tail pulleys and requires manual tightening. The telescopers can be adjusted by pumping grease into the intake port."

With the hydraulic telescoper take-up, R&S was able to combine tension calculations with basic hydraulic principles to determine the correct



This top angle design is used throughout the industry and is prone to seizing up.



Lack of movement of the top angle unit because of seizing allowed the belt to cut into the bearing base block.



Easy lubrication of the unit before installation ensures continued, easy adjustment.



The belt is tensioned and ready to run and track. A plant engineer reports that the work was carried out far quicker than normal, resulting in a quicker return time and, ultimately, less plant downtime.

tension for the belt. The ability to set it and forget it was an important feature of the design, because the belt feeder at KPC was located 50 ft underground. If the belt separated or experienced other problems associated with inaccurate belt tension, it would be difficult to get equipment and people to the conveyor for repairs. This meant that the longer the feeder conveyor could run without issues, the better.

Custom designed take-ups

In the long run, it can be beneficial to take the time to calculate tensions and requirements and search for the best components possible. If you are not sure where to start, contact a power transmission specialist or bearing distributor. There are computer programs designed to run through the necessary calculations to provide the correct tension required for a conveyor. Each and every conveyor and application are different, even for the same customer. Bryant recognises this and is able to design a telescoper take-up for each application, without adding long lead times.

Coal in South Wales

A coal mine in South Wales found traditional methods of tensioning conveyors and adjusting tail pulleys had numerous drawbacks and left the threaded bar exposed to the elements. While planning for a new coal washery that required 17 new conveyors, engineers knew they needed take-ups with completely enclosed threads to protect against dust, rust, corrosion and thread damage. Bryant's telescoper take-ups offer protected ACME threads, a more robust option that adjusts better than coarse threads under heavy loads. The engineers were also able to eliminate any conveyor structure behind the tail pulley to support a sliding adjuster block; they just needed guarding. Bryant, with the help of R.A. Rodriguez, designed part galvanised and part powder coated tensioners to meet the requirements and delivered on an expedited basis.

Gypsum in north England

Gypsum mines have also realised the benefits of improved take-up design.

British Gypsum in Barrow, UK, had continued unplanned downtime and maintenance as a result of the design of conventional take-ups supplied by the OEM with the conveyor system. The units were unable to deal with the harsh operating environment of a gypsum mine. These tensioners would get completely buried in gypsum dust and were nearly impossible to clean out because of guarding.

"Incorrect tension and the need to stop/isolate to clean the tension arrangement was leading to reduced life and tracking problems," explained mine manager, David North.

With output ranging from 700,000 – 1 million short tpa, the mine needed to find something better. Bryant and R.A. Rodriguez provided custom designed telescoper brand take-ups and the mine is reporting good tensioning and tracking and fully expects to get a longer life with less downtime.

Steel in north England

Corus Redcar maintenance engineers were also having difficulty adjusting tensions because of environmental conditions and lean maintenance schedules. During a plant shutdown, the engineers had trouble releasing tension on the tail end. This took considerable time and resulted in incorrect tension being applied.

The plant produces 3 million tpa of steel and needs to replace belts regularly. Not being able to release tension quickly exacerbates this routine and expensive work. Bryant telescoper take-ups were easily specified using bearing bore dimensions and bearing bolt hole dimensions. It took less than two hours to install the new take-ups. These have been installed to ensure easy access to adjustment points so they can be tracked while running. In addition, downtime resulting from belt change out has improved significantly.

Conclusion

The days of thinking that a take-up is just a take-up are over; the era of engineered products is here and the conveyor take-up is another example of the need for specially designed products. 