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# Twiflex Disc Brakes Meet the Needs of Overland Coal Conveyors



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When coal processing plants are an appreciable distance from the mine, how best to transport the coal from one to the other is a key consideration. It is not unusual for the processing plant to be tens of miles away, which might at first glance suggest delivery by truck. But overland conveyors can often provide a far more economical solution, providing cost reductions in the order of 20-40% or more.

Of course with a conveyor that may run for miles, there are many design considerations to take into account; all of which will impact on long term reliability, availability and maintenance requirements. Transporting vast tonnages of coal overland, particularly where there are inclines involved, requires the highest levels of expertise in sophisticated conveyor and control systems.

One of the most important design considerations is the braking technology to be employed. With over 35 years experience in conveyor braking control, Twiflex, one of the premiere brands of Altra Industrial Motion, has become the first choice to provide reliable control for demanding materials handling applications. Today Twiflex offers the largest range of industrial disc brakes in the world.

Disc brakes meet the requirements of overland coal conveyors in several areas. As well as being the ideal technology for normal stopping and parking operations, they also provide vital emergency stop operation. They are the ideal choice where one conveyor feeds another and there is a risk of spill – for example where the conveyor from a crusher at the mine feeds the overland conveyor to the processing plant.

In normal operation, depending on the installation the disc brakes may only be used during the final stages of braking, when they are applied to lock the conveyor in its parked position. In other applications, they may be needed to provide general slowing and stopping duties. Most importantly, in the event of a power failure, the brakes will be required to stop and hold a fully loaded belt.

Twiflex specializes in ‘Power Off’ braking systems. To operate the brakes, powerful springs apply force to compress the brake pads against the disc. To release the brakes the springs are compressed by a retraction device, which in overland conveyor applications will typically be hydraulically actuated. Any failure in the supply to the retraction device would cause the springs to be released, so providing ‘Power Off’ braking.

Twiflex braking systems are used on overland coal conveyors across the globe, but some of the most demanding of these are installed in the USA. One example is a conveyor transporting 165 tons of coal per hour on a 5 degree incline. Here, two spring applied, hydraulically released VKSD type disc brakes are used, acting on 1in thick discs with 42 in. diameter to provide 77,000 lbs. ft. of braking torque. The VKSD is part of Twiflex’s modular series and is a standard two-module design, with the brake provided as standard with two pre-fitted brake pads. The brakes were supplied complete with an electro-hydraulic power pack with provision for variable deceleration control.



Twiflex VS180 spring-applied hydraulic released brake units fitted to an overland coal conveyor in West Virginia.

As an example of a longer conveyor, Bucim mine, Macedonia, has an installation that runs to 8,845 ft. long, transporting 5,181 tons per hour. Here two VKSD disc brakes act on 1.5 in. thick discs of 48 in. diameter, providing 44,500 lbs. ft. of braking torque. The brakes were supplied complete with an electro-hydraulic power pack with the provision for soft braking.

In a more demanding installation, VKSD disc brakes are used to provide 217,000 lbs. ft. of braking torque on an overland coal conveyor for Bowie Resources, Colorado. The conveyor carries a payload of 1,500 tons per hour along a 2,750 ft. conveyor with a 13.25 degree decline. The two VKSD brakes act on 1.5 in. thick discs of 56 in. diameter.

At an installation for Mulzer Crushed Stone, Indiana, an overland conveyor carries 1,100 tons per hour over 284 ft. with a 5 degree incline. Here Twiflex recommended the MXSH series disc brakes, which feature a patented, compliant link mechanism to ensure uniform pad wear. The two brakes act on 1.5 in. thick discs of 24 in. diameter, providing 4,400 lbs. ft. of braking torque. The supplied LC electro-hydraulic power pack offered provision for fast approach and variable deceleration control. LC power packs provide a range of standalone units with options for soft braking, a range of operating and motor voltages, and various add-on accessories including a terminal box.

On an installation for Cripple Creek and Victor Gold, Colorado, requiring 35,000 lbs. ft. of braking torque, Twiflex recommended a GMR-SH type disc brake acting on a 1 in. thick 30 in. diameter disc. Here the brakes were supplied with a Twiflex MP electro-hydraulic power pack with provision for fast approach and deceleration control. MP series power packs have been designed to provide an advanced and flexible means of brake control and to operate under the most arduous conditions where the environment is extreme but reliable operation all year round is paramount.

There are many other examples from around the world where Twiflex disc brakes are providing reliable and effective braking on overland coal conveyors, in some of the most demanding environmental conditions imaginable. Companies across the globe rely on Twiflex brakes to protect vital coal transportation lifelines between mining and processing installations that can represent investments of hundreds of millions of dollars.



Twiflex GMR-SH spring-applied hydraulic released brake units fitted to a power station conveyor in Victoria, Australia.



Twiflex VKSD spring-applied hydraulic released brake units fitted on copper mine conveyor in Tasmania, Australia.