

Ameridrives

Bauer Gear Motor

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Boston Gear

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Formsprag Clutch

Guardian Couplings

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Jacobs Vehicle Systems

Kilian

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Lamiflex Couplings

Marland Clutch

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Nuttall Gear

Portescap

Stieber

Stromag

Svendborg Brakes

TB Wood's

Thomson

Twiflex

Warner Electric

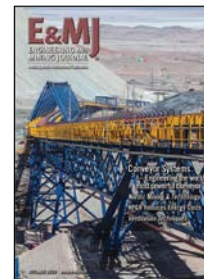
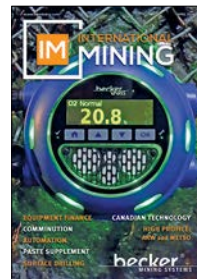
Wichita Clutch

Twiflex Turning/Locking System Provides Reliable Performance on HPGR Mill



As seen in
International Mining
April, 2019

As seen in
Engineering & Mining Journal
October, 2020



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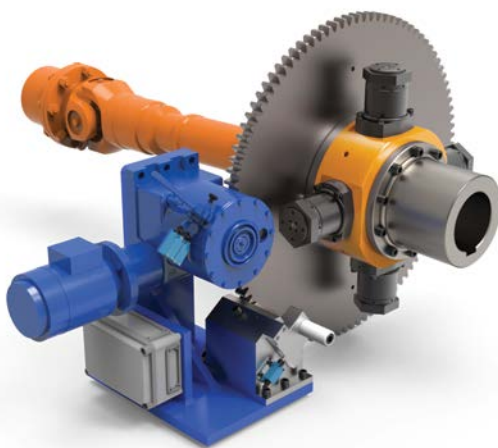
Brunel Corporation, a global leader in torque-limiting technologies, needed reliable power transmission components for use in a custom gear Turning and Locking (TL) system for FLSmidth, a leading manufacturer of High Pressure Grinding Rolls (HPGR).

A Twiflex TL system will be installed on a new dual-drive, 2000 kW (975 rpm) HPGR that will be used to crush/grind ore at a gold mine in Turkey. The system is utilized to slowly turn and lock the twin grinding rolls, allowing for the safe refurbishing/replacement of worn tires during scheduled maintenance shutdowns. The mine operator can move the TL system between the two roll driveshafts when maintenance is required. A chain/sprocket inching drive, that was time-consuming to install and cumbersome to operate, was previously used to perform this task.

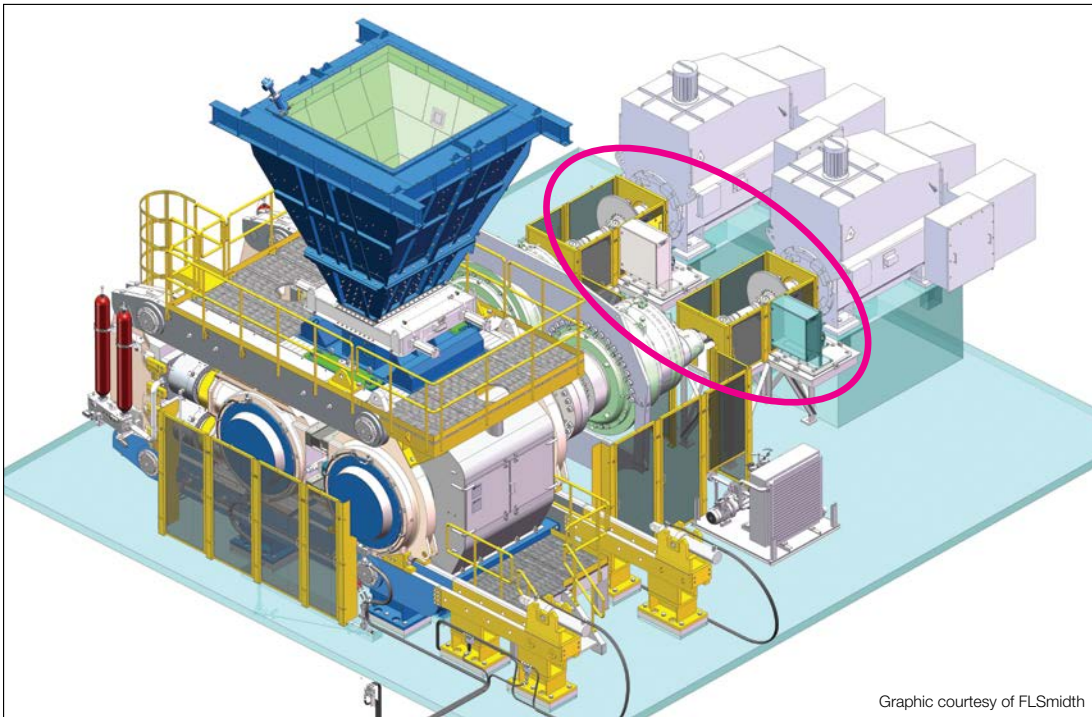
Based on many years of successful project collaboration, Brunel contacted Twiflex, part of Altra Industrial Motion, for assistance. To meet the application requirements, Twiflex supplied a TL system comprised of a turning gear which engages with a 1,000 mm dia. (39.3 in.) solid steel gearwheel mounted on the output flange of a Brunel torque limiter. The turning gear includes a 1.5 kW (1,445 rpm) motor with a gearbox to produce a start-up (breakaway) torque of 3,760 Nm (1,165 lb.ft.) and an output torque (continuous turning, bi-directional) of 1,580 Nm (1,165 lb.ft.) at a nominal turning speed of 5.2 rpm. A frequency converter is supplied to allow the turning speed to be controlled between 1.3 rpm and 5 rpm.

The bi-directional turning gear is designed to turn the grinding rolls in either a clockwise or counter-clockwise direction and is rated for continuous operation. A hand-operated clutch mechanism is used to engage and disengage the drive with a limit switch fitted to indicate its position.

The system includes a manually operated tooth-locking device with a rated torque of 52,000 Nm (38,353 lb.ft.), that locks the gearwheel in place. The status of the locking device is monitored using limit switches (i.e. lock on/lock off).



The system supplied comprises a turning gear with a 1.5 kW motor and gearbox, 1 m dia. gearwheels and torque limiter for both roll driveshafts, frequency converter, manual locking device and an operation panel.



Twiflex provided a complete Turning and Locking (TL) System to Brunel who packaged a unique system with a JSE torque limiter.

The Twiflex TL system also includes an operation panel for local control of the turning gear. A plug-in handheld corded pendant is also supplied for remote control of the turning gear close to the equipment.

Specially-designed safety element modules were introduced by Brunel engineers for use on their JSE torque limiter to provide protection from damage to the U-joint shaft, planetary gearbox or grinding rolls. The overload can come from either direction: 1) obstruction in the mill drive, or 2) short circuit of the medium voltage AC VFD causing the motor rotor to lock up. Based on the SE30 torque elements from Bibby, also part of Altra, the modules set to 169 kN (38,000 lb.ft.) tangential force automatically disconnect if the mill gets jammed by rock debris or drive short circuit.

Brunel engineered and delivered a unique packaged solution that incorporated all the components into a tight footprint assembly. The ability to single-source the power transmission components required for this application from Altra brands, Twiflex and Bibby, saved Brunel much time and effort.

About Altra Motion

Altra is a leading global designer and producer of a wide range of electromechanical power transmission and motion control components and systems. Providing the essential control of equipment speed, torque, positioning, and other functions, Altra products can be used in nearly any machine, process or application involving motion. From engine braking systems for heavy duty trucks to precision motors embedded in medical robots to brakes used on offshore wind turbines, Altra has been serving customers around the world for decades.

Altra's leading brands include Ameridrives, Bauer Gear Motor, Bibby Turboflex, Boston Gear, Delevan, Delroyd Worm Gear, Formsprag Clutch, Guardian Couplings, Huco, Jacobs Vehicle Systems, Kilian, Kollmorgen, Lamiflex Couplings, Marland Clutch, Matrix, Nuttall Gear, Portescap, Stieber, Stromag, Svendborg Brakes, TB Wood's, Thomson, Twiflex, Warner Electric, and Wichita Clutch.



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