INNOVATION

SPOTLIGHT from the brands of Altra Industrial Motion Corp.

HEAVY-DUTY ALTRA CALIPER BRAKES PROVIDE SUPERIOR PERFORMANCE ON GRINDING MILLS AT MINES WORLDWIDE

In the last five years, grinding units have increased considerably in capacity, resulting in a trend toward fewer comminution machines per grinding line. Today, 40 ft. diameter SAG mills and 30 ft. diameter ball mills, both with motor powers of more than 22 MW, are commonplace as mine operators look for even larger equipment to achieve greater economy of scale.

Mills with these larger drive capacities are driven exclusively by a "wrap around" ring motor (gearless mill drive). It is due to this development that powerful braking systems have become necessary. A typical braking system consists of two or more spring-applied, hydraulically-released brake calipers mounted onto two pedestals, positioned symmetrically on each side of the mill.

In an emergency or power failure, the brakes are used to stop a rotating mill from full speed in approximately 10 seconds to protect the bearings, or simply to hold the mill when it is out of balance for maintenance, including liner replacement. In all cases, the brakes provide complete static holding control of the mill, even at angles of up to 45 degrees.

These braking requirements demand very high static torque ratings, with the largest systems producing 51 million Nm of torque.

RELIABLE BRAKING TECHNOLOGIES FOR GEARLESS AND GEARED MILLS

Leading grinding mill OEMs and mine operators rely on Twiflex Limited for efficient and cost-effective hydraulic caliper braking solutions for ball and SAG mills.

www.altramining.com

Twiflex®
Altra Industrial Motion

In static operation, the braking system is used to hold the mill during liner replacement and general mill maintenance. For dynamic operation, the system can operate in two modes: stopping the rotating mill from full speed in an emergency or providing inching/creeping functions in the event of bearing lubrication problems or power failures. For the first, a controlled application of the brakes is required. For the second, the brakes are operated quickly to give accurate stops needed by the mill operator.

Calipers are controlled by a hydraulic power unit designed to meet each individual application. The HPU offers an advanced and flexible means of brake control and monitoring, providing both local and remote operation for inching and creep modes of mill control, interfaced through the main PLC.

TWIFLEX GRINDING MILL BRAKES ARE ENGINEERED FOR LONG-LASTING RELIABILITY

The Twiflex VMS-DP spring-applied, hydraulically-released floating caliper brakes are widely used on gearless ball and SAG mills around the world. The brakes provide an adjustable braking force from 590 to 737 kN at 2mm air gap and a friction coefficient of 0.4.

The friction material for the VMS-DP has been specifically chosen to meet mill emergency stopping duty requirements. The material provides excellent friction and wear properties.

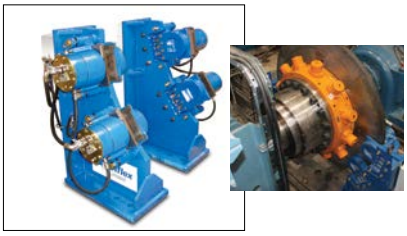
Twiflex VMS-DP brake calipers (with pedestals) plus a hydraulic power pack installed on a 22.5 MW SAG mill, 11.6 m dia. x 13.7 m long, at a copper mine in Sweden. The 8-off VMS-DP brakes produce 38 MNm braking torque and can stop the mill with the 1375 Mg full process charge in less than 2 seconds.

For geared grinding mills, Twiflex offers its popular VKSD spring-applied, hydraulically-released brake caliper which produces up to 119 kN braking force at 2mm air gap and 0.4 coefficient of friction.

Geared mills can also be direct-driven using a VFD motor to drive the pinion. In these cases, the monospring VKSD-FL (floating version) is commonly used to act on a brake disc fitted to the torque limiter. The floating option allows for movement of the disc during mill start up.

In addition to protecting the drive, the brakes are also used to prevent the mill from rocking during a power failure due to the unbalanced load.

If the mill is allowed to rock, having lost drive from the motor, there is a high risk of bearing damage. Under these conditions the brakes are used to provide a controlled stop between 30 and 60 seconds. Similar to the gearless mill requirements, the brakes are also designed for static holding of the mill charge.



Pairs of Twiflex VKSD-FL brakes (with pedestals) for installation on a 24 ft. dia. dual-pinion, direct-drive geared ball mill at a copper/gold mine in Canada. The VKSD-FL (floating) calipers act on a brake disc fitted to a torque limiter. The brakes provide 454 kNm on the mill's high-speed shaft.

Both VMS-DP and VKSD-FL brakes incorporate Twiflex's unique "Park Off" feature that allows the brakes to be set to remove all stored energy, making it completely safe for pad replacement and maintenance. This feature also permits brake installation without the need for hydraulic pressure.

Twiflex provides complete mill braking packages, including brake pedestals/stands, fully-assembled brakes with hydraulics and power packs.

* Source: International Mining Magazine