

# DEFEAT DOWNTIME WITH CORETECH NYLON ROLLERS

How a high production mine in NSW reduced roller failure, decreased downtime and increased productivity with CoreTech Nylon Rollers.



*Partners in Productivity*





### STEEL ROLLERS NO MATCH FOR HEAVY DUTY CONVEYOR

At a NSW Gold Mine approximately 250km west of Sydney, conveyor roller failure generally occurs due to advanced wearing of the steel shell. This creates further issues as failed rollers can potentially cause extreme damage to the conveyor belt, which is generally the most expensive component on the system. The originally installed 5mm steel V-Return rollers on the mine's portal and trunk conveyors continually failed in between planned shutdowns.

The steel rollers were lasting as little as one month in the worst areas. Significant carryback was building on the rollers, which rapidly increased shell wear and caused extensive roller failure and time lost on unscheduled shutdowns for maintenance and repairs.

The mine operates four main incline conveyors, all of which are steel cord conveyor belt and run at speeds in excess of 4.3mtr/sec. The mine was operating on a planned five weekly cycle for shutdowns per year, with bulk changes of rollers at three-to-six month intervals and as little as one month in the worst areas. Unfortunately, the steel rollers continued to fail in the high wear areas in between planned shutdowns, making the cost of bulk change outs expensive and causing considerable downtime.

With the steel rollers installed, the mine was operating at an average of 97 percent run time between planned shutdowns. Rather than seeing this as an acceptable figure, the mine saw it as room for a three percent improvement which led to investigations for a better solution to roller failure.

It was calculated that unplanned roller change outs in these locations due to split shells accumulated to an average of 17 hours per annum. At the current rate of production, 17 hours of unscheduled downtime could equate to approximately \$1.2 million dollars of lost production per annum.

### NYLON ROLLERS STAND UP TO THE TEST

Site management discussed their problems on site with a Flexco distributor who suggested the site trial Heavy-Duty CoreTech Nylon Conveyor Rollers from Flexco. Site management were initially sceptical of the durability and wear life of the nylon material, however agreed to trial CoreTech Nylon Vee Return Rollers. Six heavy-duty CoreTech nylon Conveyor Rollers were installed on the mine's Trunk 2 conveyor, chosen specifically as it was the worst area on the conveyor.

Due to the uncertainty of the new product, the CoreTech rollers were initially inspected every six hours by visual and temperature means, however after the rollers had been in operation successfully for over 24 hours confidence was restored and inspection intervals returned to normal routine inspections of the conveyor.



## DOWNTIME SIGNIFICANTLY REDUCED

After the rollers had been in service for six months the shells were tested for lineal wear rates which showed the CoreTech rollers lasted four times that of the steel rollers. Starting at 16mm, after 28 weeks of operation the nylon shell thickness was 9.2mm at the thinnest point of the most worn roller. Based on this data if lineal wear is seen, the mine would still gain a minimum of 12 months life from CoreTech Nylon Rollers in the most extreme areas on the conveyor. Site downtime due to roller shell failure improved by four times, and bulk rollers changes were pushed out to 12 monthly intervals.

CoreTech rollers are made of high strength, corrosion and abrasion-resistant composite materials, feature lightweight construction, and emit less noise than their steel counterparts. The mine has already begun the process of upgrading their whole system to CoreTech rollers.

## FLEXCO CORETECH NYLON CONVEYOR ROLLERS

CoreTech rollers last significantly longer than steel rollers in most applications. With ultra-light construction, up to 60 percent lighter than equivalent steel rollers, CoreTech rollers maintain durability in the toughest environments without sacrificing performance.

In addition to their wear capabilities, CoreTech rollers feature a rotating centrifugal seal, providing unmatched protection from bearing failure. If the roller does seize, however, a seized nylon roller is far less likely to develop sharp knife-like edges than a steel roller which could damage a belt by slicing through it. This dramatically decreases the possibility of belt replacement, generally the most expensive component on a belt conveyor system.

Heavy-duty CoreTech™ rollers from Flexco are strong enough to tackle a variety of tough environments. They are made of high strength, corrosion - and abrasion - resistant composite materials, feature lightweight construction, and emit less noise than their steel counterparts.

## LOOKING TO THE FUTURE

The mine was so impressed with the testing data of the CoreTech Nylon rollers, new orders have been placed and based on these trials and test data as well as other CoreTech trials held on site, the mine is looking at changing to CoreTech site-wide.



**12x**

**Minimum 12x longer life in the most extreme areas of the conveyor system**



**12 months**

**Even in the most extreme areas of the beltline, CoreTech would still achieve a minimum life of 12 months**



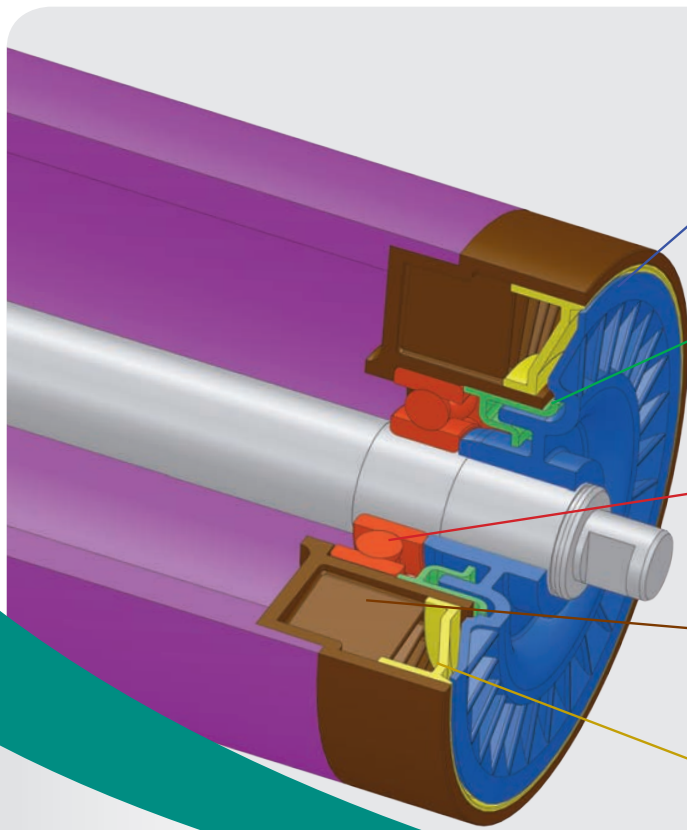
**\$1.2M**

**Saving of \$1.2M in lost production per annum**





## Field-Proven Seal Design



**Rock Shield** – The rock shield is pressed tight on the shaft and is stationary when the roller is in operation. This is the first line of defense and prevents larger material from damaging the seal. Since the rock shield is stationary, it improves safety by limiting rotating components accessible to workers near the outside of the idler.

**Centrifugal Seal** – The key to the CoreTech™ sealing arrangement, the centrifugal seal rotates with the roller and is specifically designed to create a vortex with forces up to 9X gravity. This action expels moisture and fines that may pass the rock shield. Centrifugal sealing is the most effective method of preventing moisture and dirt from entering the bearing chamber without the need for a grease pack.

**Deep Groove Ball Bearing** – A last line of defense, all CoreTech rollers use deep groove, factory lubricated and sealed for life ball bearings. The bearing selection ensures all CoreTech rollers meet the required application ratings and protect the bearings from premature failure due to corrosion or spalling.

**Bearing Housing** – The bearing housing is fused to the roller tube in a way that guarantees there is no path for moisture or dust to enter the roller. While many rollers use press fit end discs, the CoreTech roller is a unitary housing design. This means no end disk walk out and no risk of "pizza cutter" belt damage.

**Housing Guard** – The smooth surface of the housing guard provides for optimal operation of the centrifugal seal.

## CORETECH TACKLES COMMON ISSUES:

**Life.** CoreTech rollers offer structural strength which couples with the requirements of mining. This strength includes corrosion resistance, abrasion resistance, and very low surface friction.

**Corrosion.** When moisture, salt, or other corrosive materials are present, CoreTech provides an excellent alternative to steel rollers. CoreTech rollers provide the same CEMA ratings as steel rollers, with no loss of functional performance, and a much longer wear life.

**Weight.** CoreTech rollers are approximately 40 percent lighter than equivalent steel rolls, meaning CoreTech rollers only require only one individual to lift. This ultimately results in a safer and more productive working environment.

**Power consumption.** CoreTech rollers have lower running friction values, which, depending on the application, can decrease power bills by up to 30 percent a year. Less power is used during start-up and while in operation, contributing to lower electrical consumption.

**Noise.** CoreTech rollers create far less noise than steel rollers. This noise variation can mean the difference between functioning below the maximum decibel levels and violating ordinances and compromising worker safety.

	127mm (5") Diameter	152mm (6") Diameter	178mm (7") Diameter
<b>Shell Material Construction</b>	Polyamide Composite Plastic	Polyamide Composite Plastic	Polyamide Composite Plastic
<b>Bearing Housing Material Construction</b>	Glass Reinforced Polyamide 6	Glass Reinforced Polyamide 6	Glass Reinforced Polyamide 6
<b>Weight Reduction over Steel Rolls</b>	Min 40% Less	Min 40% Less	Min 40% Less
<b>TIR (Total Indicated Runout)</b>	< 0.4mm	< 0.4mm	< 0.4mm
<b>Roll Max Face Length</b>	2046mm	2452mm	2452mm
<b>Bearing Type (Double Rubber sealed, greased for life)</b>	2RS C3	2RS C3	2RS C3
<b>Seal Type</b>	Non Contact Centrifugal Seal	Non Contact Centrifugal Seal	Non Contact Centrifugal Seal
<b>Breakaway Mass (Energy Required to cause rotation)</b>	< 50grams	< 50grams	< 70 grams
<b>Running Friction (Energy Required to maintain a given RPM)</b>	Ave <= 2.1 N	Ave <= 2.1 N	Ave <= 2.1 N
<b>Noise Emission (Tested at 90% less than steel)</b>	Ave 60% less than steel	Ave 60% less than steel	Ave 60% less than steel