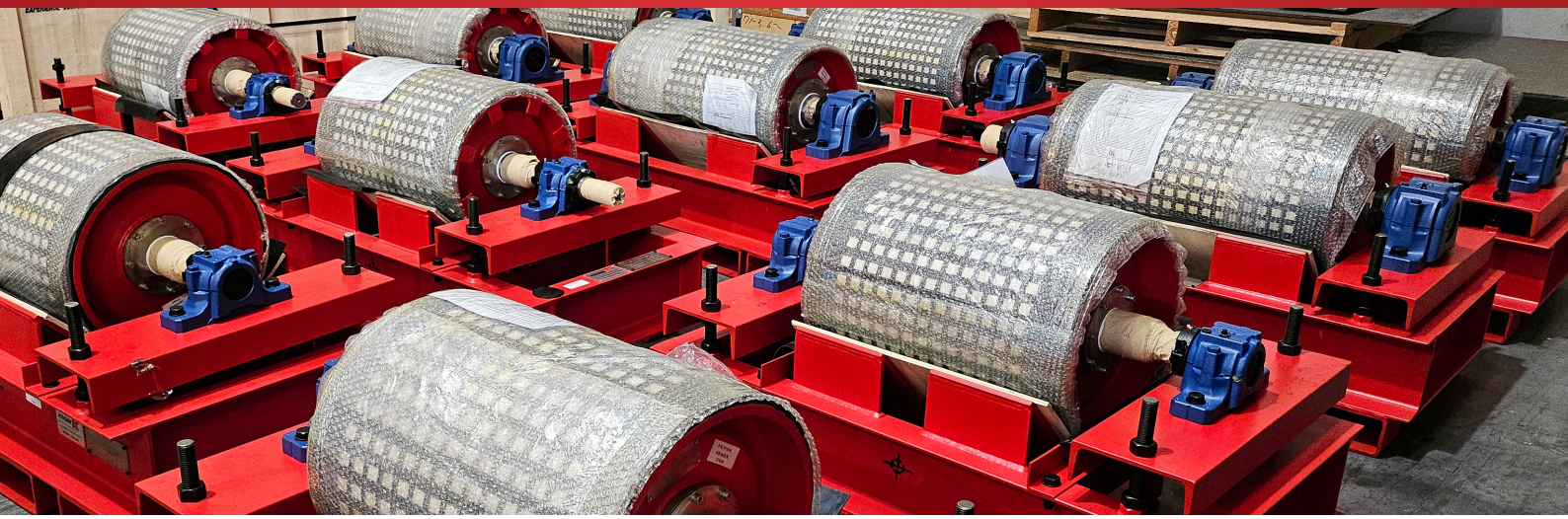
Case Study - K-Conveyor Pulley

KINDER™ EXPERIENCE INNOVATION PRODUCTIVITY

40 YEARS OF INNOVATION



Kinder Australia Product:	**K-Conveyor Pulley**
Product Category:	**Conveyor Pulleys & Lagging**
Location:	**New South Wales**
Conveyed Materials:	**Gold & Copper**
Conveyor Belt Width / Speed:	**600mm BW - 1.44mps | 450mm BW - 1.66mps**
Installation Date:	**June 2025**

OVERVIEW

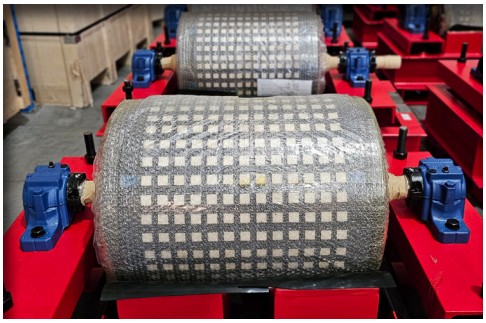
In the high-pressure world of mining, equipment reliability isn't optional — it's critical. A leading Australian gold and copper mining operation faced ongoing pulley failures that threatened production and raised maintenance costs. Their conveyors, running 600mm and 450mm belts at high speeds, were not keeping pace with rising output demands.

With downtime mounting and existing designs under strain, the site turned to Kinder, a proven bulk materials handling partner for a smarter, more resilient pulley solution.

CHALLENGE

The mining operation faced recurring failures in the take-up and tail pulleys, particularly on the 600mm belt width conveyor. Root cause analysis revealed that excessive bending moments and shaft deflection exceeded the load-bearing capacity of the original pulley shafts, which were made from 1045 steel.

- Excessive shaft deflection and bending moments.
- Undersized shafts made from 1045 steel.
- Pulley shell thickness inadequate for elevated stress loads.
- Increased wear and poor traction under demanding conditions.



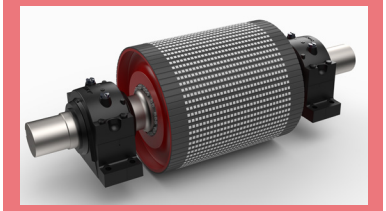
Photos:

K-Conveyor Pulleys packed and ready for shipment to our Mining client.

SOLUTION

A complete engineering-led redesign of the pulley systems was undertaken, leveraging advanced analysis tools and field expertise. The solution was tailored specifically to the site's performance requirements, incorporating the following critical upgrades:

- **High Strength Shaft Material:** Replaced standard 1045 steel with 4140 alloy steel for significantly higher tensile strength and fatigue resistance.
- **Larger Shaft Diameters:** Engineered increases in shaft size eliminated deflection issues and strengthened overall system integrity.
- **Reinforced Pulley Shells:** Upgraded shell thickness improved durability and load handling under continuous operation.
- **Smooth Ceramic Lagging:** Applied to all pulleys to deliver extended wear life, and consistent belt engagement.
- **System Compatibility:** Worked closely with site engineers to ensure upgraded bearing housings and shaft dimensions integrated seamlessly with existing structures.
- **Maintenance Enhancements:** Installed custom-designed locking element covers to protect critical components and reduce long-term service requirements.



This tailored approach ensured the pulleys weren't just stronger — they were built to fit the site's exact requirements and ready to handle increased output without compromising reliability.

RESULTS

- Significantly reduced risk of unplanned downtime.
- Extended pulley and component life.
- Lower maintenance overheads.
- Confidence in scaling output without compromising equipment reliability.

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The site now has a fully engineered pulley solution tailored to meet increased output demands. The design addresses all previous failure points and introduces robust, performance-focused upgrades to reduce unplanned downtime and maintenance requirements.

This proactive approach not only resolves existing challenges but also future-proofs the conveyor system for anticipated production growth. The collaborative design process and technical precision provided a high level of confidence in the long-term reliability of the upgraded system.

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