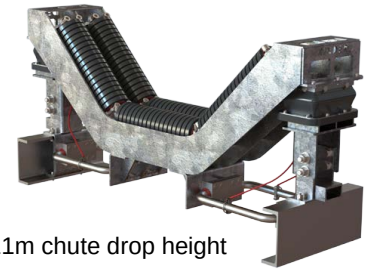
Case Study – K-Shield Dynamax® Impact Idler

Kinder Australia Product:	**K-Shield Dynamax® Impact Idler**
Product Category:	**High-Capacity Conveyor Transfer Point**
Location:	Western Australia
Conveyed Materials:	Iron Ore – Up to 500mm lump size
Belt Width | Prod. Capacity:	1800mm | 4 m/s | 5500 tonnes per hour | 11m chute drop height
Installation Date:	From May 2018



CHALLENGE:

- *Frequent failures at primary sizer's load zone.*
- *Reduce unscheduled maintenance and extend shutdown interval time.*
- *Address belt cleaning, tracking and spillage issues due to top belt cover damage.*
- *Improve the service life of critical conveyor components.*
- *Extend Conveyor Belt Life.*

Our client is one of Australia's Mining "Giants" who specialise in the exploration, development, production, processing, and sale of iron ore. They are strategically located Western Australia's Pilbara region and the central hub for iron ore mining and processing.

The client initially expressed interest in an email campaign promoting Kinder's innovative K-Flexal® Elastic Belt Support System. A site inspection was later organised to better understand the client's operations and key pain points. During the comprehensive site inspection our technical team quickly realised the operation's heavy-duty processing environment would exceed the K-Flexal® System capacity and a customised solution was recommended to meet client's demanding high capacity / speed mining application.

Conveyor located under primary sizer.

Lump size up to 500mm and 11mm drop height.

Kinder proactively engaged with the operational team, strategically timing their mine visit during peak iron processing period. The focus was firsthand observations of the primary sizer load zone, where persistent failures were disrupting the seamless flow of operations. These failures, necessitating unscheduled maintenance, not only brought production to a standstill but also inflicted substantial financial losses, significantly impacting the overall profitability of the operation and dampening site morale.

The system handles 5500 tonnes / hour of iron ore with a lump size up to 500mm, the financial implications of **any production downtime were staggering, equating to approximately $1.5 million in lost revenue per hour.** Mitigating these losses and minimising production shutdowns became a high-priority focus for the collaborative team.

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Our mining client had originally installed a **10-roll PROK series 59 'jack down' idler frame.** A further three attempts and modifications to the load zone involving **Kupper Heavy Duty Catenary Idlers**, **Richwood Impact Saddle, Custom stiffened impact idler** and further conveyor reinforcements all failed to extend idler service life and improve wear impact to the belt's top cover. Refer to **Technical Paper** *"Reducing Belt Conveyor Transfer Impact Energy Using a Dynamic Idler"*, Author Cameron Portelli.

< FAILURE

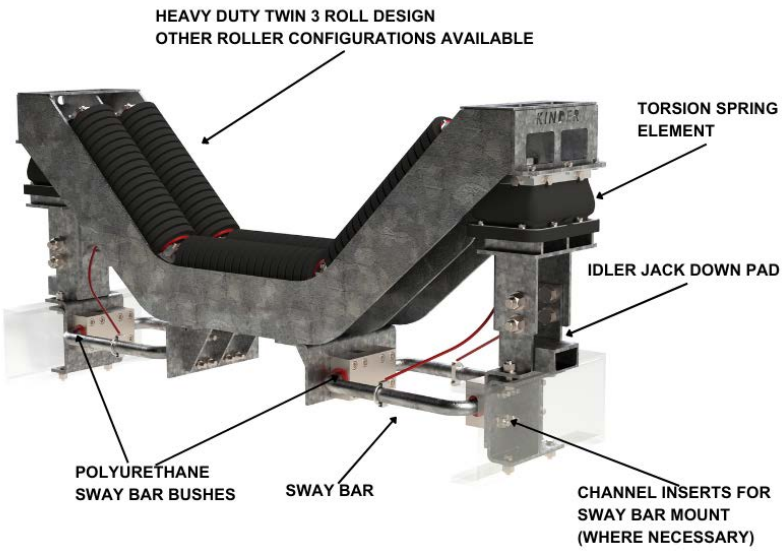
SOLUTION:

To extend the longevity of the conveyor belt, other critical conveyor componentry (rollers and frames) and reduce unplanned maintenance, a high capacity / speed impact belt support system with encompassing dynamic characteristics was engineered to overcome the operators' key challenges. Our client was receptive to new and innovative roller and engineered load zone belt support design concepts.

Kinder Engineers designed four unique concepts, which were presented to our client for review and consideration. **K-Shield Dynamax® Impact Idler** was a standout due to its cost-effectiveness, ergonomic and maintenance-friendly features. This choice proved advantageous, especially when compared to larger impact beds that would have necessitated the use of more extensive lifting equipment and cranes.

SUCCESS >

APPROVED FINAL DESIGN



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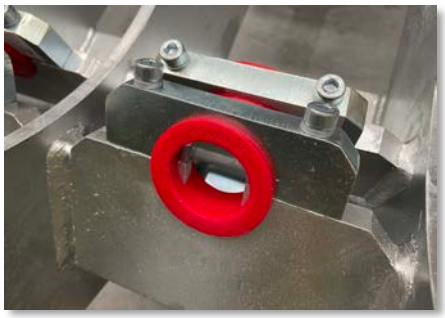
SOLUTION Continued:

K-Shield Dynamax® Impact Idler can be seen mounted on a **torsion spring element**, the final design incorporates a **Polyurethane Sway Bar** and **Roller Shaft bushes**, both designed to enhance the lifespan of conveyor components and frames. The Sway Bar maintains rigidity and contributes to stability during suspension travel.

Additionally, a **Rubber Dust Boot** prevents dust accumulation around the torsion spring element, while an **Air Filter** efficiently cools the torsion spring, collectively and harmoniously ensuring optimal performance and longevity.



RESULTS:

- *Elimination of unscheduled shutdowns.*
- *Frames and rollers now exceed service and maintenance interval thresholds.*
- *Improved belt, roller and frame reliability and service life.*
- *Noise reduction due to dampened impact load.*
- *Exceeded product performance expectations.*

"The Kinder Frames Are Bullet Proof" The K-Shield Dynamax® Impact Idler installation has surpassed expectations by eliminating unplanned shutdowns, extending service intervals for frames and rollers, and from an internal company source has **"extended conveyor belt life by approximately 30%".**

After two years, the targeted load zone has experienced no major service interruptions, a significant improvement from the previous 3–4-week replacement turnover, as seen with some of the previous inferior systems trialled.

More positive outcomes reported include improved frame reliability / lifespan and reduced roller replacement frequency. Prior to the K-Shield Dynamax® Impact Idler installation roller failures were a regular monthly maintenance occurrence and have now been extended to over 18 months. Also worth mentioning is the conveyor belt service extension from 6-9 months to 12-month mandatory replacement, this coupled with effective noise reduction has greatly boosted the overall system efficiency.

The initial two trial idlers were delivered in May 2018, and subsequently, the K-Shield Dynamax® Impact Idler has been deployed in various locations and across different sites within the Mining group.

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