



### PROJECT SCOPE

Project:	Vanadium Project, Western Australia
Material:	Magnetite
Equipment:	Screw Feeder
Capacity:	150 TPH
Scope:	Upgrade of existing Kiln Feed Screw
Aim:	To increase wear life and reliability and reduce downtime for maintenance

As an experienced, heavy duty screw feeder designer, Bulk Handling Technologies was engaged initially to provide an assessment and recommendations on how to increase the wear life of an existing kiln feed screw. Like many kiln feed screws, the flight shaft was designed as a cantilever with 'end discharge' to avoid the requirement for any supporting bearings internal to the kiln.

The flighting suffered significant wear along the entire length, but particularly at the discharge end, where the cantilevered shaft would rub and wear against the abrasive caked material inside the casing.

### DESIGN CHALLENGES AND CONSIDERATIONS

The particular challenge with kiln feed screws is that you often need to handle cohesive, moist product at the feed end, whilst dealing with extreme temperatures and hard, baked product on the inside of the casing at the discharge end.

Feeding abrasive materials in screw feeders at these rates can lead to high contact pressures on the flight faces and edges which can significantly affect the wear life of quenched and tempered plate.

Engineers at Bulk Handling Technologies proposed a number of changes to improve the wear life of the feeders, including a reduction in rotational speed, different flighting material, a different ribbon style flight design and a high temperature, dry-running discharge end journal bearing manufactured from a complex carbide alloy steel.

### FINAL SOLUTION

The upgrade of the kiln feed screws achieved an increase in wear life of over seven times the original and was completed by BHT in Perth, WA.

The final design incorporated the following key features to meet the specific requirements of the application:

Flights:	Ribbon Style, weld overlay plate
End Bearing:	Dry Running journal bearing from complex carbide alloy steel
Drive:	Re-design of drive arrangement to increase filling efficiency and reduce rotation speed

To ensure the unit was back on site as soon as possible, the new components had been pre-made and the entire refurbishment was completed and workshop tested within 7 days for delivery back to site.



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