

Lubemaster Bluescope Steel Case Study



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Application: **HSM Steel Manufacturing**
Country: **Australia**

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Bluescope Steel is the largest manufacturer of Steel in Australia. It produces over 5 million tons of steel a year serving customers in the building and construction, manufacturing, automotive and packaging industries. It is also a major exporter supplying customers in USA, Asia, Middle East and Europe. The Hot Strip Mill produces Steel Coils from Steel Slabs. In order to make the rolling process easier the Steel Slabs are heated to 1280°C in the Walking Beam Furnace.

Case Study

PROBLEM:

Bluescope Steel Hot Strip Mill Walking Beam Furnace

The discharge table rolls are affected by extreme temperatures because of their close proximity to the discharge doors of the furnace. The furnace internal temperature is 1280°C and when the doors open to extract a slab out of the furnace, the table roll bearings, associated lubrication lines and hoses are exposed to these high temperatures.

Previous maintenance practise: The Mill Grease was fed from one bulk tank filled with Lithium Complex EP1 Grease. As this grease could not withstand the extreme temperatures, the discharge table roll bearings were over greased to keep the grease moving through the lubrication lines and bearings. Previous grease quantity for the 20 table roll bearings was 2000Kg/yr. If the 20 bearings were to receive their desired quantities of 200kg/yr the grease would solidify inside the lubrication lines and cause blockages.

Issues with current maintenance practise: On their maintenance days the table rolls experienced regular blockages to lubrication lines and grease hoses even with the increased grease quantities. High maintenance costs were experienced from rectifying blockages and changing hoses every maintenance day. As a result of the inadequate grease the HSM Furnace experienced on average two table roll bearing failures per year. In addition to this the practice of over greasing just to keep the grease moving through the pipe work and bearings added large cleanup costs for removing excess grease from surrounding equipment. The excess grease also resulted in regular spot fires to these table rolls causing delays and damage to equipment.



Hot Steel Slab Exiting the Furnace



Walking Beam Furnace Opening

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Case Study

SOLUTION:

Bluescope Steel Hot Strip Mill Walking Beam Furnace

By using Premalube Extreme Heat Shield Bluescope Steel was able to reduce grease consumption from 2000KG/year to just 200KG/year, reduce bearing failures from 2/year to 0/year and have had no blockages in the auto lubrication system

- Premalube Extreme Heat Shield is a high temperature Calcium Sulphonate based grease that can operate up to 1000°C.
- Premalube Extreme Heat Shield contains a higher concentration of Graphite and Moly than other Calcium Sulphonate greases and uses a synthetic blend base oil.
- Premalube Extreme Heat Shield contains Adhesive Cohesive Polymers that keep the grease in place even under heavy shock loading.

Implementation Steps Followed

Purchase one 200kg drum of Mantek grease to flush the lithium complex grease from the bearing lines and bearings Flush lubrication lines and bearings during a maintenance day. Install a pumping unit and another 2*200kg drum of Mantek grease to feed the bearings after flushing. Monitor performance of grease by removing one roll bearing end cover every 2 weeks and inspecting grease over a period of 6months. During this 6 month period the grease quantity was reduced based on the inspections carried out every 2 weeks. **Cost of Work = \$51300.**



Bearing Condition with Previous Grease



Bearing Condition with Premalube Heat Shield

Case Study

RESULTS:

Bluescope Steel Hot Strip Mill Walking Beam Furnace

R&M Savings	
Grease Costs down from \$17000/yr to \$10000	= \$7000
Labour to clean up excess grease down from \$5000/yr to \$1000/yr	= \$4000
Maintenance of grease system down from \$65000/yr to \$20000/yr	= \$40000
Table roll replacement due to collapsed bearings down from 2/yr to 0	= \$50000
Total	= \$101000

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RESULTS:

Bluescope Steel Hot Strip Mill Walking Beam Furnace

Lost Production Savings

Through put (Mill delay to 1 table roll failure per year) down from 1 to 0 (Based on 360min downtime at \$500/min)

Total	= \$180000
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Other

- Grease Consumption down from 2000kg/yr to 200kg/yr – improves our water quality.
- Reduction in the number of grease fires per day, down from 2 to 0 improves our environment.
- ROI on a \$51300 investment in just 3 months

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