

Gearbox Life Doubled with Optigear 1100

BUILDING PRODUCTS (USA)

Silo Discharger Gearboxes

Castrol Optigear® 1100 gear oil

ANNUAL SAVINGS: \$20,000



Silo Discharger Gearbox

THE SITUATION

A building products plant operates two silo discharger gearboxes. Each unit consists of upper and lower gearbox connected with a gear shaft. Upper gearbox is a parallel shaft gearbox and lower gearbox is planetary, using synthetic ISO 680 gear oil.

The plant was experiencing frequent gearbox failures. Average gearbox life was up to 2 years despite the very sophisticated maintenance program and modification of the lube system.

Castrol was challenged to extend gearbox life, reduce total maintenance cost, and increase uptime.

BEFORE

- **Cost of two Silo Discharger Gearboxes in 4 years - \$80,000**
- Each gearbox was replaced 2 times every 4 years.
- Parts cost: \$20,000 x 2 boxes x 2 times = \$80,000 per 4 yrs

AFTER

- **No Silo Discharger Gearbox failures in 4 years after change to Optigear 1100**
- Gearbox replacement cost - \$0.

THE SOLUTION

After investigation of the problem root causes, Castrol Engineering concluded the following:

- Condition of the lower part of the connecting gear shaft, as shown in the pictures below, indicated an advance spalling which occurs after severe destructive pitting reaches a critical stage when macropits coalesce to large craters.
- This type of wear is caused by high contact stress and low wear protection properties of the oil, such as low micropitting resistance and inadequate (low) lubrication film thickness.
- Previous gear oil was not capable to protect gearbox due to insufficient micropitting resistance and viscosity.
- Use of high priced synthetic gear oil was not justified by low working temperature which did not exceed 120F.

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RECOMMENDATIONS

Based on the conclusions above, to reduce destructive pitting and spalling and to significantly increase life of the gears, the following was recommended:

1. Convert to Optigear 1100 gear oil with high wear protection properties
2. Increase lubrication film thickness by increasing oil viscosity from ISO 680 to ISO 1000

Castrol Optigear 1100 was recommended based on the following:

- Optigear 1100 is formulated with a unique patented blend of oil soluble additives which provide very low friction, excellent anti-wear & EP properties, and surface protection capable to extend gear life.
- Optigear 1100 gear oil has high water tolerance and high maximum working temperature in combination with excellent oxidation resistance.

CONCLUSION

The result after conversion to Castrol was no silo discharger gearbox failures in 4 years, resulting in \$20,00 annual savings.*

*Note: Actual savings is much greater considering reduced oil usage and increased uptime.

*Update: The gearboxes continue to run without problems for beyond 4 years, so the savings will continue to increase.



Connecting gear condition after only 2 years in service before Castrol Optigear 1100/1000 gear oil



OTHER POTENTIAL APPLICATIONS

Optigear 1100 is a high performance gear oil designed for heavily loaded and shock loaded gearboxes working in the most difficult conditions, including where significant water is present. It can be used in all mining, steel, cement and other gear oil applications.

Benefits include: reduced downtime, increased parts life, less labor costs, reduced oil consumption and less waste oil.