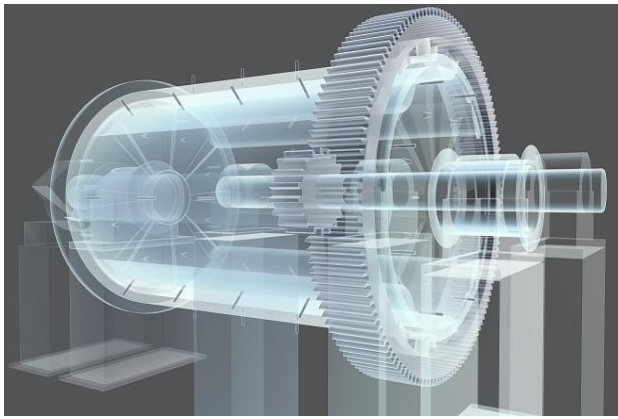
* Formerly known as Optifluid 4 EP

Success of Ball Mill Open Gear Lubrication with Optigear OG 4 EP



MINING PROCESSING PLANT (Brazil)

BALL MILL OPEN GEARS

Castrol Optigear® OG 4 EP*

ANNUAL SAVINGS: US$6,767

THE SITUATION

A major ore mining processing plant was using conventional open gear lubricant with base oil viscosity of 17,000 cSt to lubricate their Metso “5M5C” ball mill.

The environment around the ball mills was heavily contaminated with dust from the ore. Poor flow of the conventional open gear lubricant caused contaminant build-up at the root of the teeth which created additional stress on the bearings. It also formed an abrasive paste which expedited scuffing and pitting damage to teeth and temp rise due to the high friction.

The dark color of the conventional lubricant and build up of contamination made visual inspection of the gears impossible without equipment shutdown for teeth cleaning. In addition, the lube accumulated on the walls of the equipment guards which then required annual shutdowns for cleaning.

BEFORE

- Average gear working temperature: 62°C/144°F
- Lubricant consumption – 160 g/hr (5.6 oz./hr).
- Annual lubricant consumption – 1,152 liters (304 gal)
- Annual lubrication cost - $19,515

AFTER

- Average gear working temperature – 56°C/133°F **(11°F cooler)**
- Lubricant consumption – 120 g/hr (4.23 oz./hr) **(25% lower)**
- Annual lubricant consumption – 864 liters (228 gal)
- Annual lubrication cost - $12,748

THE SOLUTION

- To significantly reduce maintenance cost without compromising wear protection of the gears, Castrol recommended Optigear OG 4 EP.
- Optigear OG 4 EP is a high viscosity base oil in combination with EP (Extreme Pressure) additive technology to provide optimum protection of gears. It was especially developed for the use in open gears subject to high loads.
- This fluid is designed to be used specifically in open gears in cement mills, kilns, coal mills, mining & ore processing mills, and SAG mills.
- **Castrol Optigear OG 4 EP has Metso approval.**

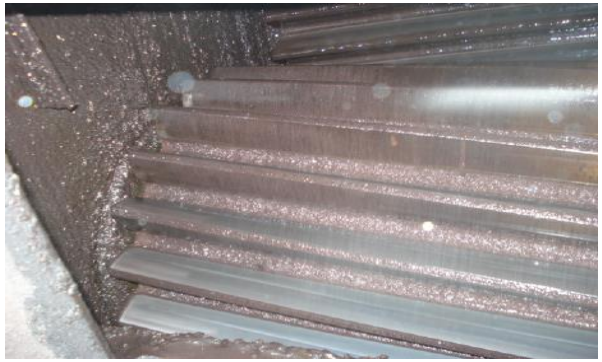
Success of Ball Mill Open Gear Lubrication with Optigear OG 4 EP

BENEFITS

- Lower consumption - reduces cost of lubricant
- Lower operating temperature and higher wear protection - longer gear life
- Light color - aids visual inspections with no need to stop the machine
- High flowability - drains more easily, removes contaminants
- Excellent pumpability - easier to pump, less demanding on lubrication systems

Typical gear appearance with conventional open gear lubricant

- Accumulation at the root of the teeth and on guard walls
- Visual inspection of the gears impossible without equipment shutdown for teeth cleaning
- Clogging of nozzles



Typical gear appearance with Optigear OG 4 EP open gear lubricant

- No contaminant build-up at the root of the teeth
- No accumulation on guard walls
- Visual inspection of the gears can be done without shutting down equipment
- No clogging of nozzles

CONCLUSION

- No ball mill open gear problems related to the lubricant during 5 years in service with Optigear OG 4 EP.
- Average gear working temperature reduction of 6°C/11°F.
- Lubricant consumption reduction of 385 gallons (7 drums) in 5 years.
- Annual open gear lubricant savings - $6,767.21
- **Total savings in 5 years - $33,836**

OTHER POTENTIAL APPLICATIONS

Optigear OG 4 EP lubricant was especially developed for use in open gears subject to high loads including:

- Cement mills
- Cement kilns
- Power Generation coal mills
- Mining and Ore processing mills
- SAG mills