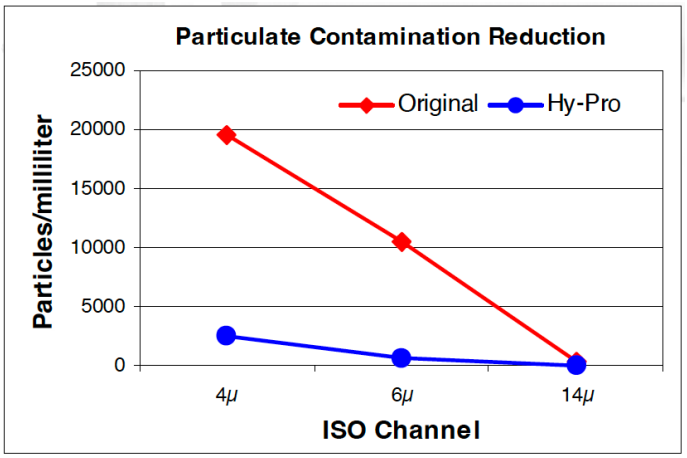
Donaldson HY-PRO™

Steel Mill Gear Lubricating Oil

FSL Install for Gear Lube Cleanliness Upgrade

The Problem

Frequent oil testing and subsequent preventive actions can help a production system avert the costs of total shutdowns for repair and component replacement. In this particular case regular tests of heavy-duty gear oil were consistently at unacceptable ISO cleanliness ratings. Filter and oil replacements were becoming a frequent and costly occurrence. An improved method was sought, and an eight month test was performed in which Donaldson Hy-Pro filtration equipment worked to cleanse the gear oil and protect the system.



The Solution

Filter Element Upgrade - The system originally had 74 micron wire strainer filters placed on the return line. A Donaldson Hy-Pro FSL3-L36-3MB was installed to filter the gear oil (Mobil MGEAR 634) as it was drained from the rolling mill and was re-circulated into the reservoir (~6000 gal) at the opposite side.

Breather Upgrade - The reservoir currently uses a vacuum system to control the head in the reservoir tank, but the next step in cleaning up this process is the planned installation of a large Donaldson Hy-Pro particulate breather.

The actual number of particles dropped by a factor of 17.5 from 10,414 to 593 per Milliliter.

The Results

The primary goal was to extend useful oil life and extend gear and bearing life. After the Donaldson Hy-Pro FSL system was installed the ISO cleanliness codes were lowered to long-term acceptable levels. On-line particle counting was used to quantify the fluid cleanliness after the Donaldson Hy-Pro upgrade. The Donaldson Hy-Pro elements yielded substantial improvement in ISO fluid cleanliness codes visible in the tables and graph below. With the Donaldson Hy-Pro elements there was a **87.5% reduction in particles 4m[c] and larger, a 94.3% reduction in particles 6m[c] and larger and a 90.1% reduction in particles 14m[c] and larger**. Water contamination is a common problem in Morgoil and gear lubricating systems. Ask us about vacuum dehydration solutions to control both water & particulate. **Stop decanting** water and putting oil down the drain, and extend oil life.

Original Elements	**4$\mu_{[c]}$**	**6$\mu_{[c]}$**	**14$\mu_{[c]}$**
ISO Code (Per 4406:1999)	21	21	15
Actual Particles per Millimeter	19,510	10,414	243

Donaldson Hy-Pro Upgrade	**4$\mu_{[c]}$**	**6$\mu_{[c]}$**	**14$\mu_{[c]}$**
ISO Code (Per 4406:1999)	18	16	12
Actual Particles per Millimeter	2427	593	24

The Conclusion

ISO fluid cleanliness ratings can sometimes be deceiving because what appears to be only a few numbers decrease in any channel is actually a significant improvement. Take as an example the 6µ channel in the two tables above: the original cleanliness code was 21 while the same channel after upgrade 16. This may seem like a minor change but a closer look at the actual data reveals the magnitude of the improvement:

- **The actual number of particles dropped by a factor of 17.5 from 10,414 to 593 per Milliliter.**
- There were 94.3% fewer particles 6m[c] and larger causing additive depletion and generating wear particles.

Want to find out more? Get in touch.

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