

TECHNICAL BULLETIN ON MILITEC-1 LUBRICATION IN A LARGE AIR COMPRESSOR

January 6, 1992

These test results were reported by a leading U.S. food processing company. The testing began in early December, 1991.

Type of Compressor:

Test was conducted on a 1985 450 hp Joy turbo-air centrifugal compressor Model number 18. This is a 3-stage compressor. The first stage is an input shaft (air inlet) that operates at 3,600 rpm and connects to a bull gear which in turn drives two high-speed turbines; one at 30,000 rpm and the second at 50,000 rpm. The air is compressed in the second stage and then compressed further in the third stage to a final 110 psi. It uses a 50-gallon oil reservoir.

Test Methodology:

While there is considerable operational data available on this compressor over its years of operation, amp (electric current) and vibration measurements were taken the day before and again 40 minutes before Militec-1 was added. Militec-1 was added at a mixture of 7% (3.5 gallons). Amp measurements were first taken every 2 hours, then once per hour for the following sixty hours, and finally were monitored daily and then weekly. Vibration measurements were taken four times over the first six hours of operation and again after 60 hours.

Test Results:

Directly following the installation of Militec-1, a relatively steady decrease in amps was noted over the first two hours. The measurement after the third hour showed an additional decrease and the amp reading stayed close to that level through the reading after 60 hours of operation. Since that time, over the 740 hours that the air compressor has been operating (non-stop, no down time), there have been minor fluctuations in the reading. The amp level before using Militec-1 had been averaging close to 480 amps with fluctuations between 470 and 480. After three hours, the amp level had decreased to 460 amps and it stayed close to that level over the 60 hours. The decrease was 4.1 percent after 60 hours and has since fluctuated between that and 5 percent. It was estimated that the energy savings over one year will be about \$2,000.

The vibration reading of the input shaft was .7 mils the day before and .84 mils 40 minutes before Militec-1 was added. Thirteen minutes after installation, the vibration level was .82 mils. At 6 hours, the vibration level had fallen to .68 mils and at the end of 60 hours it was .64 mils. Historically, the input shaft vibration range was .7 to .8 mils. With Militec-1, the reading stayed in the .6 range. There was no significant change in vibration in the high-speed turbines but these normally operate with little vibration as they are only indirectly connected to the motor. The maintenance supervisor concluded that Militec-1 had reduced the load on the motor and, due to the direct connection between the motor and the input shaft, the lower load caused less vibration on the input shaft.