INGERSOLL-RAND

XLE 10-STROKE COMPRESSOR TEST RESULTS

CONDUCTED BY: Micro-Specialty Lubricants

Donald W. Higginbotham, President
Tony DeGregory, Field Advisor

CONDUCTED FOR: Test Purposes Only

DATE: July 6th - 19th, 1982

The following report is a summary on the effects of what Micro-Specialty Lubricants and Microlon can do for the Compressor Manufacturing Industry.

We observed an XLE 10-stroke compressor for a day, noting the 3/4 load running amperage (according to the gauge on the power supply) was approximately 43 amps. Under full load, the compressor was operating at 62 amps (according to the gauge on the control panel).

The temperature was 92°F in the room, and the water temperature was 105°F. On July 12th, we came back and read it again. The water temperature was 98°F and the room was 93°F. The 3/4 load current draw was 43 amps (according to the gauge) and 62 under load with the variance of temperature.

We proceeded to mark off 14 test points on the XLE 10-stroke, and checked decibel readings at these points. The way we did this was to hold a decibel reading meter one inch from the frame of the compressor and take the readings. We also took temperature readings on the 12th of July at the same points.

We compared the readings of July 6th with the readings of July 12th. There was no appreciable change in decibels or temperature readings.

The treatment for the XLE 10-stroke is a 4-part treatment. On the 12th of July, at 9:00 a.m., we gave it the first treatment. That evening, at about 6:00 p.m., we came back and gave it the second treatment. All the treatment amounts to is introducing Microlon into the proper areas . . . the crankcase and the piston lubrication oil system or Induction System . . . in the proper quantities.

We returned the following morning, the 13th of July, and gave it the third treatment. That afternoon, at 4:00 p.m., we gave it the fourth/final treatment. We then informed the foreman that we would be back on Monday, the 19th of July, to take the readings.

Enclosed you will find a chart which indicates the "before" and "after" readings, and the dates, and what the temperature and decibel readings were. The impressive thing in my mind was, if you will look at the ampere chart, the ampere reading was 3/4 load - 38 amps. Under a full load, it was pulling 55 amps . . . a reduction of 7 amps. According to the gauge, the operating temperature of the water was about 100°F. A few things should be noted at this point.

My impressions, from observance, and checking temperatures and decibel readings on the XLE 10-stroke over a period of 3 or 4 days, are:

> The compressor that we treated was constantly oscillating from full load to 3/4 load, then would stay at 3/4 load back to full load. It would stay there for a while, then it would go back to the 3/4 load, and it was oscillating constantly, and I'm sure that's the way it's adjusted.
>
> After treatment, I stood and observed the XLE 10-stroke, the operating temperature was 92°F, and it never varied from the 3/4 load, which, in my estimation, tells me that the compressor is working more efficiently.

The only way that we could get the compressor into a full load situation was to have the maintenance man change the regulator, and he had to change the regulator to the point where it stayed in the full load position at all times until he readjusted it, and then at that point, it pulled 55 amps of power at 100°F outside temperature and a 94°F-day room temperature.

If you'll observe the temperatures and the decibel readings, I'm sure they will confirm the fact that the noise level of the machine went down, and the operating temperature of the machine decreased, which means the Microlon film had relieved a lot of the friction and made the XLE 10-stroke a more efficient compressor.

Based on the current price per kilowatt hour for electricity, and the fact that the compressor runs 24 hours a day, seven days a week, Micro-Specialty Lubricants has determined a savings of approximately $2,792.25* a year on electricity alone. Also, the fact that the compressor won't run as much at full load, the savings should be even greater, along with less maintenance, less downtime, and less wear.

* The above figure was derived in the following manner:

7 amps, 480V, 3 phase = 5.8 kw
24 hrs/day, 5.8x24 = 139 kw hrs
139x.055 = $7.65x365 = $2,792.25

TREATMENT TEST SHEET

INGERSOLL-RAND
XLE 10-STROKE

BEFORE

DATE: July 6, 1982

TEST POINTS	READINGS (100% Capacity)	
	db	Temperature
1	95.0	107°
2	97.0	118°
3	95.0	115°
4	99.0	129°
5	95.0	134°
6	93.5	138°
7	94.0	---
8	94.5	105°
9	93.0	180°
10	93.0	160°
11	93.0	127°
12	94.5	120°
13	94.0	108°
14	94.0	112°

AMPERES: ~~XX~~ load 42 (3/4 load)
Load 62

NORMAL OPERATING TEMPERATURE:
Water 102°
Oil 125° Crankcase
130° External*

OUTSIDE TEMPERATURE: 92°

FINAL DISCHARGE TEMPERATURE:
Test No. 1 264°
Test No. 2 257°
Test No. 3 277°
Test No. 4 261°
Test No. 5 150°

AFTER

DATE: July 19, 1982

TEST POINTS	READINGS (100% Capacity)	
	db	Temperature
1	93.0	98°
2	94.0	112°
3	93.0	105°
4	97.0	114°
5	95.0	124°
6	92.5	126°
7	93.0	---
8	94.0	99°
9	92.5	175°
10	92.0	156°
11	94.0	105°
12	94.0	96°
13	92.0	104°
14	93.0	104°

AMPERES: ~~XX~~ load 38 (3/4 load)
Load 55

NORMAL OPERATING TEMPERATURE:
Water 100°
Oil 118° Crankcase
111° External*

OUTSIDE TEMPERATURE: 94°

FINAL DISCHARGE TEMPERATURE:
Test No. 1 273°
Test No. 2 280°
Test No. 3 266°
Test No. 4 265°
Test No. 5 162°

INGERSOLL RAND
AIR COMPRESSORS

Reciprocating Compressor Operations
Ingersoll-Rand Company
100 Chemung Street
Painted Post, N. Y. 14870
(607) 937-2011

September 3, 1982

Mr. Donald W. Higginbothan
President
Micro-Specialty Lubricants
12 Main Street, P.O. Box 225
Akron, New York 14001

Dear Don:

We conducted a mechanical loss test on one of our compressor housings which contained shafts, bearings and gears. The test was conducted in a manner which established a base horsepower curve over a speed range, then Microlon was added and the reduction in mechanical losses were documented.

Below are the results of the test:

Shaft RPM	Without Microlon		With Microlon		Percent Reduction in H.P.
	Net H.P.	Sump Temp °F	Net H.P.	Sump Temp °F	
2520	13.3	128.0	11.8	125.3	11.3 %
2784	16.0	132.7	14.2	123.2	11.3 %
2916	17.3	137.1	15.6	123.6	9.8 %
3520	25.5	138.1	23.5	131.5	7.8 %

The actual data sheets show that after Microlon was added, the sump temperatures dropped. It was difficult to raise the oil temperature for a true comparison before Microlon was added. If the sump temperatures were raised there would probably had been further percent reduction in horsepower.

Should you have any questions about the test results, please feel free to call.

Very truly yours,

Larry Willover

Larry N. Willover
Development Engineer
Recip Air Compressor Division

LNW:sue