

Analysis Report

Component Information

Machine Type:	Anti-Friction Bearing	Sump Size: Unknown
Lubricant:	CONOCO/AW 46	
Machine MFG:	AIR PROD INC	
Machine MOD:	B175A	

Sample Information

Received:	01/06/2016
Report:	01/06/2016
Sample No.:	19 - 1 - 4 - 4
Data Analyst:	MMM

Customer Information

Lake Rd Plant
20338 Progress Drive
Strongsville, OH 44149
Contact: Jack Boileman

PROBLEMS

HIGH IRON.
HIGH LEAD.
High WATER CONTENT.
EXCESSIVE PARTICLE COUNT.

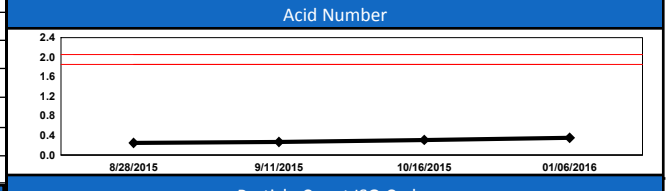
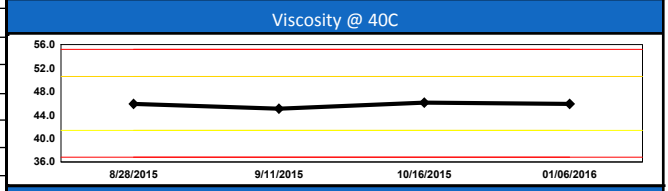
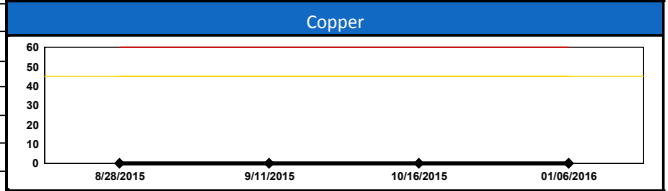
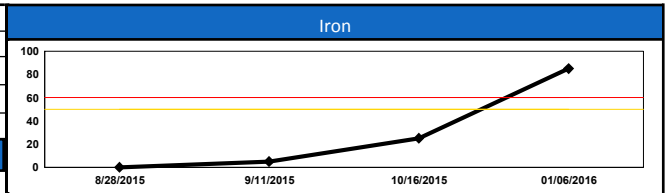
COMMENTS Water content at .689% (6890 ppm) is likely the result of condensation or water ingestion. Water contamination can lead to oil degradation, corrosion and reduction in load carrying capacity. If specific source of moisture cannot be located, inspect or install desiccant breathers. The particulate contamination exceeds our limits for a bearing (19/17/16). High particulate contamination will lead to abrasive wear and damage internal components. Reducing particle levels will significantly extend component life. Fluid contamination is a possible contributor to elevated wear metals.

CUSTOMER NOTES

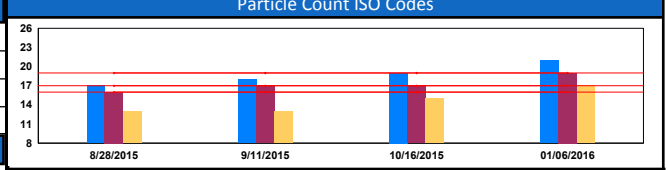
Mach Hours: 2016 * Filter change 11/5/2015

Date Sampled	NEW OIL	01/06/2016	10/16/2015	9/11/2015	8/28/2015
Lab No	1278905	168113	168112	168111	168110
Machine / Lube Cond.		C / C	N / M	N / N	N / N
Lube Hours		2016	1176	336	0
Machine Hours		2016	1176	336	0

ELEMENTAL SPECTROSCOPY (ppm) ASTM D5185 Mod (-) indicates below detection limit						
Wear Metals	Iron	-	85	25	5	-
	Copper	-	-	-	-	-
	Lead	-	49	9	-	-
	Aluminum	-	-	-	-	-
	Tin	-	-	-	-	-
	Nickel	-	-	-	-	-
	Chromium	-	-	-	-	-
	Titanium	-	-	-	-	-
	Vanadium	-	-	-	-	-
	Silver	-	-	-	-	-
Additives	Calcium	174	50	44	39	41
	Magnesium	2	-	-	-	-
	Phosphorus	429	329	318	341	321
	Zinc	659	495	495	472	484
	Barium	-	-	-	-	-
Contaminants	Molybdenum	3	-	-	-	-
	Silicon	4	14	7	9	6
	Boron	-	-	-	-	-
	Lithium	-	-	-	-	-
	Sodium	-	-	-	-	-
Potassium	-	-	-	-	-	



FTIR SPECTROSCOPY (Indexing Numbers) ASTM E2412					
Oxidation	2	2	3	2	2
Nitration	3	2	2	2	2
Anti Wear	12	12	12	12	12
Other Fluid	40	118	118	117	117



PARTICLE COUNT (particles per ml) ISO 4406:99					
ISO Code	18/16/13	21/19/17	19/17/15	18/17/13	17/16/13
>4 Micron	1543	10156	2518	1456	899
>6 Micron	600	2695	789	654	401
>14 Micron	45	1256	198	78	52
>50 Micron	2	25	5	2	1
>100 Micron	0	12	2	0	0

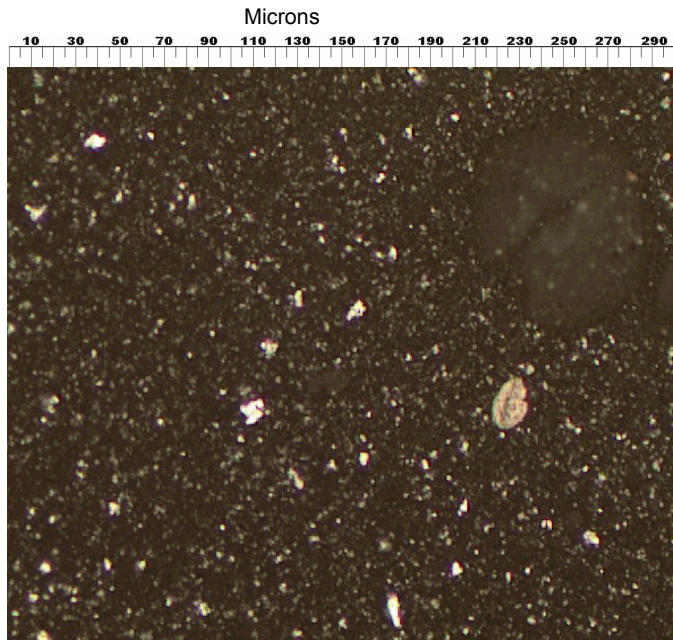
Date	Customer Corrective Actions
11/19/15	changed oil
3/21/14	corrected oil leak
6/3/12	replaced bearing ;

VISCOSITY (centistokes) ASTM D445					
Viscosity@40°C	42.4	45.9	46.1	45.1	45.9
ACID NUMBER (mg KOH/g) ASTM D974					
Acid Number	0.94	0.35	0.31	0.27	0.25
WATER (%) a-ASTM D6304A b-IWI-133 c-ASTM D6304C d-IWI-134* e-IWI-135* f-IWI-136* g-Crackle h-IWI-370*					
Water		0.689 (a)	0.325 (a)	0.043 (a)	0.009 (a)

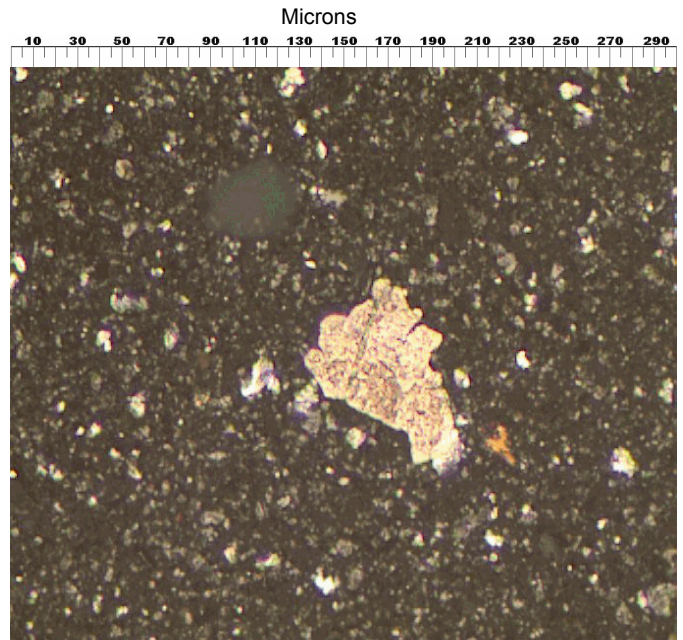
Wear Particle Analysis Report

	Trace	Light	Moderate	Heavy	Max. Size	Particle Composition
Rubbing Wear	[Red bar]				15-30	Ferrous
Rolling Contact						
Sliding Wear	[Red bar]				>100	Ferrous
Rolling/Sliding Wear						
Cutting Wear						
Chunks						
Spheres						
Corrosion	[Yellow bar]					
Dark Metallic Oxides	[Red bar]					
Red Oxides	[Yellow bar]					
Dust/Dirt	[Red bar]					
Other Contaminants						
Oxidation By-Products						

Observations: Analytical ferrography has discovered the following abnormalities. Heavy levels of ferrous rubbing wear particles up to 30 microns in size. Rubbing wear particles are generated as the result of normal sliding wear in a machine. Excessive particulate contamination in the lubricating system can significantly increase the generation of rubbing wear particles. Heavy levels of ferrous sliding wear particles over 100 microns in size. Severe sliding wear occurs under excessive load and/or speed. These particles are distinguished by linear striations indicating sliding contact. High levels of dark metallic oxides. Dark metallic oxides, partially oxidized ferrous wear particles, are typically generated under high temperatures and loads.



100x Severe sliding wear particles.



100x Severe wear debris.