

# ***Machinery Lubrication***

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## **Trial and Air**

Making a case for air as an oil contaminant

**NORIN**  
Publishing



# Oil Analysis and Lubricant Management Prove Successful

By BILL GUYNES, LUBRICATION ENGINEERS, INC.

**S**outhern Champion Tray Company is a manufacturer and printer of food containers. The firm was motivated to change its oil analysis and lubricant management programs after company personnel were introduced to Noria Corporation's Machinery Lubrication Technician (MLT) training. This case study chronicles how plant personnel made important changes after oil analysis reflected high contamination levels.

## Solving the Problem

Southern Champion Tray made a proactive decision to implement a filtration process. Two targets were selected for improvement: the baler's hydraulic systems and the printing

press' circulating oil. The company installed desiccant breathers on all of its hydraulic systems, with quick-disconnects and sample ports, then added an off-line filtration cart (kidney system) with 12- and six-micron filtration. From a philosophical standpoint, the plant veered away from using time as an oil change interval. Instead, it utilized condition monitoring with the help of the Lubrication Engineers Analysis Program (LEAP).

UNIT ID:  
MDH1-H CENTER H  
SECOND ID  
MAREN HYDRAULIC RCC203103  
UNIT TYPE  
HYDRAULIC GEAR PUMP  
APPLICATION  
PLANT/INDUSTRIAL

COMPANY INFORMATION  
SOUTHERN CHAMPION TRAY LP  
DAVID LEATHERS  
949 SOUTH 6TH AVENUE  
MANFELD, TX 76063

ACCOUNT NUMBER  
5930006300018  
DATE SAMPLED  
06/20/07  
DATE RECEIVED  
07/13/07  
DATE COMPLETED  
07/16/07

OVERALL SEVERITY OF REPORT  
based on comments, not individual flags

0	1	2	3	4
NORMAL	AB	NORMAL	CRITICAL	

TRACKING #:  
06304000710  
MANUFACTURER/MODEL:  
LUBRICATION ENGINEERS  
LUBE TYPE:  
LUBE TYPE - GRADE:  
G110 MOLECOLE HYDRAULIC OIL 150  
46  
MICRON RATING:  
0  
FILTER TYPE:  
FULLFLOW - BYPASS  
SUMP CAPACITY:  
00166  
HYD SYSTEM PRESSURE:  
0  
FLUID ADDED:

LAB #  
476214  
LOCATION  
1  
ANALYST  
RUT

FLUID ANALYSIS REPORT - 677-888-3750

COMMENTS Data flagged for observation only; Particle Count is at a MODERATE LEVEL (LEVEL 2):

WEAR METALS - PPM										CONTAMINANT METALS - PPM				MULTI-SOURCE METALS - PPM				ADDITIVE METALS - PPM			
SA	CH	AL	CO	CA	SI	VA	PO	HA	MA	LI	HA	CA	BA	PH	OS						
AMP	RO	UM	UM	AD	LI	HA	AS	AN	AN	TH	BO	SE	LC	NO	SS						
PLE	UM	CE	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM						
SE	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM						
1	0	0	0	22	0	0	0	0	0	0	0	0	0	1	83						
														0	420						
														0	513						

  

SA	CH	AL	CO	CA	SI	VA	PO	HA	MA	LI	HA	CA	BA	PH	OS
AMP	RO	UM	UM	AD	LI	HA	AS	AN	AN	TH	BO	SE	LC	NO	SS
PLE	UM	CE	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM
SE	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM
1	0	0	0	22	0	0	0	0	0	0	0	0	0	1	83
														0	420
														0	513

SAMP #

1

Figure 1. Fluid Analysis Report



Figure 2. Site Glass to Check for Water



Figure 3. Breather Keeps Contamination and Water Out of System



Before, oil analysis showed that system lubricant (an ISO-46 product) was in good condition but highly contaminated. The filtration measures improved the lubricant from an ISO cleanliness level of 22/20/17 to 18/15/11; this is essentially 32 times cleaner oil. A higher level of cleanliness is expected when the site begins to implement six-micron to three-micron filters on the filter cart.

## Results of the Case Study

One of the benefits of the work completed was that lubricant consumption was reduced by 75 percent. Southern Champion Tray's efforts completely solved the problem of having to use time-based drains on these units. Before, the plant was changing oil annually. Now, it changes oil every five years or longer. Time to failure is now more than five times longer before a failure is anticipated. And, disposal costs were cut by 75 percent.



**Figure 4. Breather Keeps Paper Dust Out of Gearbox**



**Figure 5. Clean Oil Storage**

To monitor the program's progress, the plant has used on-site visual inspections, infrared thermography and oil analysis.

The real costs of implementing the improvements included:

- Filtration costs, including off-line system, \$3,396
- Site glasses for units, \$302
- LEAP (oil analysis), \$295

The total cost to implement the changes were \$3,993. Add in labor costs of \$18 per hour for two hours and the grand total was \$4,029.

From a technical perspective, no special skills were involved in this project, other than sizing the filtration to the equipment.

## Making it Happen

At first, the implementation team was resistant to change because team members didn't fully understand the benefits that would be realized at their level. Management wanted to know what kind of a return on investment was possible, and when those returns would be noticed. The work and data supplied by plant engineer David Leathers and the author helped push the programs through those potential roadblocks.

Return on investment (ROI) came at the first oil change not needed, or four months after implementation.

Contamination control served a significant role in achieving savings and benefits. It was of utmost importance in achieving the target of extended drain intervals without compromising equipment life. The contamination level before the improvements was 22/20/17. The current level is 18/15/11. Breathers were incorporated at the fill port.



**Figure 6. Oil Storage Before Cleanup**



The LEAP program (laboratory service) included particle count along with spectroanalysis. A full report showed particle count, viscosity, water and acid, along with all additive and wear metals. The program provided assistance through online and on-site programs in reading and understanding the oil analysis results.

Besides the work of David Leathers and suppliers, program success was the result of integrated lubrication and oil analysis with other maintenance technologies. As the units are checked and hours of operation recorded, personnel take oil samples and visually inspect the machines. Units are checked using thermographic techniques as added insurance that nothing is out of line.

## Lessons Learned

Looking back, the plant admits it would have done a few things differently. It would have communicated to everyone in the plant what benefits would be achieved by implementing the different filtration units. It would have done a better job from the onset to make everyone as knowledgeable as those in the engineering department. **ML**

## About the Companies

More information about Southern Champion Tray can be found at [www.sctray.com](http://www.sctray.com). To learn more about Lubrication Engineers, visit [www.le-inc.com](http://www.le-inc.com).

## Get Your Employees Trained

Machinery Lubrication I and II is a certification series that provides powerful training for maintenance and reliability professionals. Course information can be found at [www.noria.com/training](http://www.noria.com/training).

## Become Certified

The International Council for Machinery Lubrication (ICML) is a vendor-neutral, not-for-profit organization founded to facilitate growth and development of machine lubrication as a technical field of endeavor. Among its various activities, ICML offers skill certification testing for individuals in the fields of machine condition monitoring, lubrication and oil analysis.

ICML is an independently chartered organization consisting of both paid professional staff members and volunteer advisors. For more information: [www.lubecouncil.org](http://www.lubecouncil.org) or [info@lubecouncil.org](mailto:info@lubecouncil.org).

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- Electronic Trigger
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