

14th May 2019
Press Release

It pays off to heed warnings provided by oil analysis

Oil analysis is an effective tool to provide advanced warning of engine issues that have potential to cause equipment breakdown and lost productivity.

As an independent total fluid management provider that has been specialising in this predictive maintenance method for almost 30 years, Techenomics sees many examples of the benefits of a regular oil analysis program.

One such example was provided recently in an operation in Laos where the signs provided by oil analysis were ignored by the operator with the result being very costly equipment breakdown.



Chris Adsett, CEO of
Techenomics International

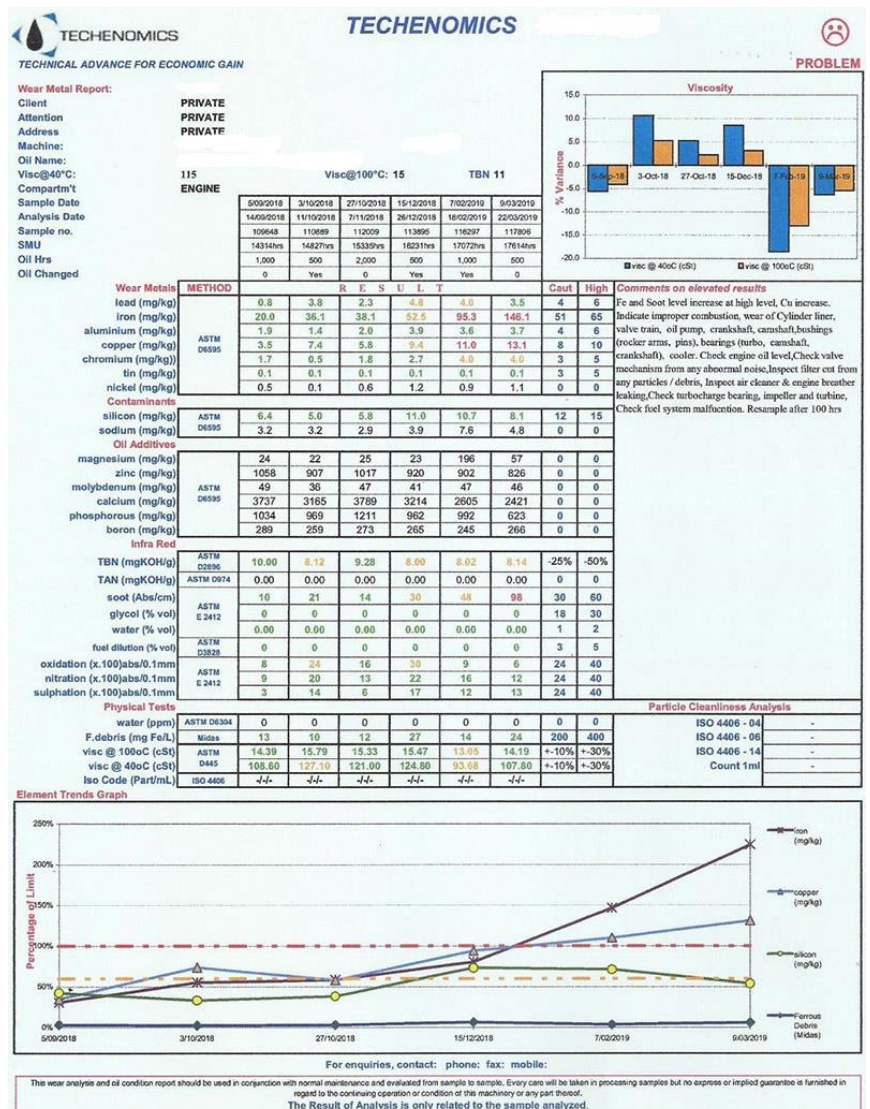
The analysis report from the dozer in question for a three month period (see below) showed increased levels of deleterious wear elements such as iron, lead, copper and chromium as well as the presence of problem indicators, including soot and low viscosity and TBN (to see a full-sized image of this analysis report scroll to the bottom of this release).

Techenomics CEO Chris Adsett said the report revealed issues with the equipment which showed that action was needed by the operator.

“There was potential to run for around another 2000 hours before failure, but the operator did not take action and the machine failed.”

After failure, there were holes found in the engine block on the left and right sides due to the connecting rod cap becoming loose (see photos below). Broken bolts on the connecting rod was the root cause.

The machine operator reported to the maintenance team that there was excessive engine noise during operation but the crew was unable to identify the source until it was too late.





Chris Adsett said: "From the analysis report, we recommended that action be taken to remedy the issue and therefore save the cost of replacing the components as well as of the unnecessary downtime needed for the repairs."

He said this situation indicated that oil analysis provided an effective early warning system. It also highlighted the costly issues that could occur if the oil analysis warnings were ignored.

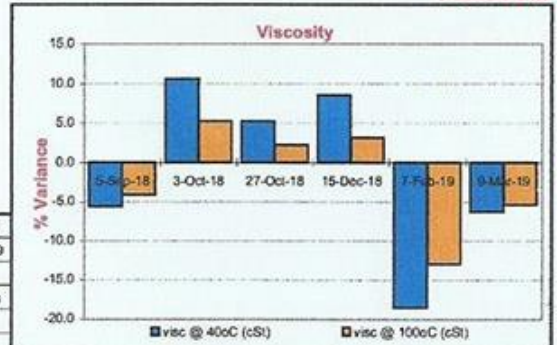


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PROBLEM
Wear Metal Report:

 Client: PRIVATE
 Attention: PRIVATE
 Address: PRIVATE
 Machine: 115 ENGINE
 Oil Name: Visc@100°C: 15 TBN 11
 Compartment: 115 ENGINE
 Sample Date: 5/09/2018
 Analysis Date: 14/09/2018
 Sample no.: 109648
 SMU: 14314hrs
 Oil Hrs: 1,000
 Oil Changed: 500


115 ENGINE Visc@100°C: 15 TBN 11

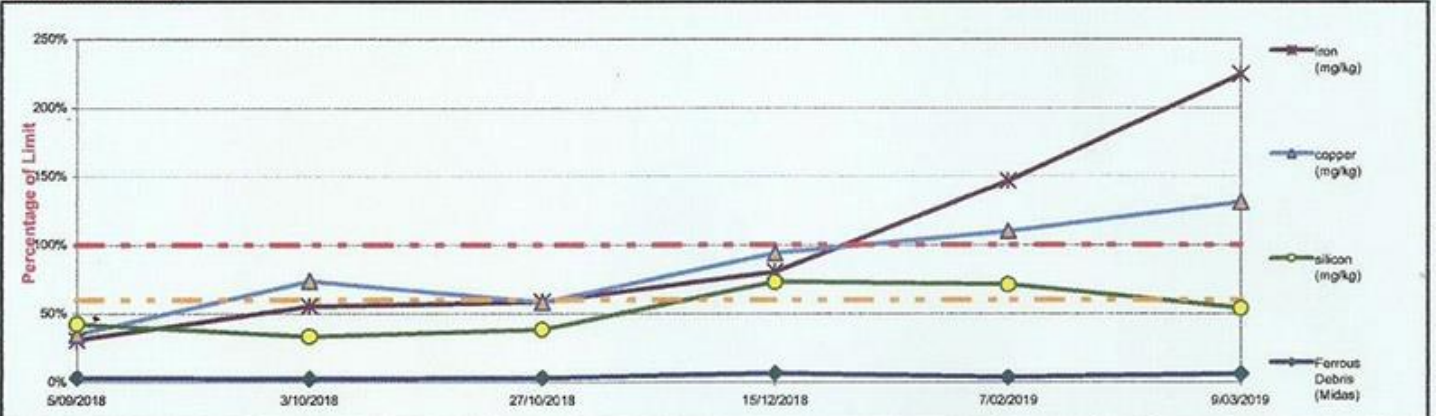
	5/09/2018	3/10/2018	27/10/2018	15/12/2018	7/02/2019	9/03/2019
14/09/2018	11/10/2018	7/11/2018	26/12/2018	18/02/2019	22/03/2019	
109648	110689	112009	113895	116297	117805	
14314hrs	14827hrs	15335hrs	16231hrs	17072hrs	17614hrs	
1,000	500	2,000	500	1,000	500	
0	Yes	0	Yes	Yes	0	

METHOD	R E S U L T						Caut	High
	5/09/2018	3/10/2018	27/10/2018	15/12/2018	7/02/2019	9/03/2019		
Wear Metals								
lead (mg/kg)	0.8	3.8	2.3	4.8	4.0	3.5	4	6
iron (mg/kg)	20.0	36.1	38.1	52.5	95.3	146.1	51	65
aluminium (mg/kg)	1.9	1.4	2.0	3.9	3.6	3.7	4	6
copper (mg/kg)	3.5	7.4	5.8	9.4	11.0	13.1	8	10
chromium (mg/kg)	1.7	0.5	1.8	2.7	4.0	4.0	3	5
tin (mg/kg)	0.1	0.1	0.1	0.1	0.1	0.1	3	5
nickel (mg/kg)	0.5	0.1	0.6	1.2	0.9	1.1	0	0
Contaminants								
silicon (mg/kg)	6.4	5.0	5.8	11.0	10.7	8.1	12	15
sodium (mg/kg)	3.2	3.2	2.9	3.9	7.6	4.8	0	0
Oil Additives								
magnesium (mg/kg)	24	22	25	23	196	57	0	0
zinc (mg/kg)	1058	907	1017	920	902	826	0	0
molybdenum (mg/kg)	49	36	47	41	47	46	0	0
calcium (mg/kg)	3737	3165	3789	3214	2605	2421	0	0
phosphorous (mg/kg)	1034	969	1211	962	992	623	0	0
boron (mg/kg)	289	259	273	265	245	266	0	0
Infra Red								
TBN (mgKOH/g)	10.00	8.12	9.28	8.00	8.02	8.14	-25%	-50%
TAN (mgKOH/g)	0.00	0.00	0.00	0.00	0.00	0.00	0	0
soot (Abs/cm)	10	21	14	30	48	98	30	60
glycol (% vol)	0	0	0	0	0	0	18	30
water (% vol)	0.00	0.00	0.00	0.00	0.00	0.00	1	2
fuel dilution (% vol)	0	0	0	0	0	0	3	5
oxidation (x.100)abs/0.1mm	8	24	16	30	9	6	24	40
nitration (x.100)abs/0.1mm	9	20	13	22	16	12	24	40
sulphation (x.100)abs/0.1mm	3	14	6	17	12	13	24	40

Comments on elevated results
 Fe and Soot level increase at high level, Cu increase. Indicate improper combustion, wear of Cylinder liner, valve train, oil pump, crankshaft, camshaft, bushings (rocker arms, pins), bearings (turbo, camshaft, crankshaft), cooler. Check engine oil level, Check valve mechanism from any abnormal noise, Inspect filter cut from any particles / debris, Inspect air cleaner & engine breather leaking, Check turbocharge bearing, impeller and turbine, Check fuel system malfunction. Resample after 100 hrs

Physical Tests	5/09/2018	3/10/2018	27/10/2018	15/12/2018	7/02/2019	9/03/2019
water (ppm)	0	0	0	0	0	0
F.debris (mg Fe/L)	13	10	12	27	14	24
visc @ 100cC (cSt)	14.39	15.79	15.33	15.47	13.05	14.19
visc @ 40cC (cSt)	108.60	127.10	121.00	124.80	93.68	107.80
Iso Code (Part/ml)	-/-	-/-	-/-	-/-	-/-	-/-

Particle Cleanliness Analysis	ISO 4406 - 04	ISO 4406 - 06	ISO 4406 - 14	Count 1ml
	-	-	-	-
	-	-	-	-
	-	-	-	-

Element Trends Graph


For enquiries, contact: phone: fax: mobile:

This wear analysis and oil condition report should be used in conjunction with normal maintenance and evaluated from sample to sample. Every care will be taken in processing samples but no express or implied guarantee is furnished in regard to the continuing operation or condition of this machinery or any part thereof. The Result of Analysis is only related to the sample analyzed.