

# LAB REPORT



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Unit ID **Hydraulic excavator**  
Component **Bio-hydraulic fluid**  
Current sample number **1700781**



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Machine type: **A 900 Litronic**  
Manufacturer: **Liebherr**  
Oil brand name: **Panolin HLP Synth 46**  
Oil quantity in system: **280 l**

Example report  
Analysis scope: Analysis-Kit 3 (Bioset)

## Diagnosis for the current laboratory values

The mineral oil content is less than 2% due to oil change or mixture with a mineral-oil based hydraulic oil. Iron slightly increased by wear or corrosion. Slight copper increase caused by wear particles or corrosion. Such changes are not abnormal, but they should be followed up by trend analysis. Oil cleanliness is lower than recommended by component manufacturers. The value for silicon, which indicates dust, has increased. I recommend that you improve the oil cleanliness by changing the filter element or with a by-pass filtration. A cleaner oil is fit for further use. Otherwise the oil should be changed.

Dipl.-Ing. Rüdiger Krethe

## Sample Rating



## Caution

ANALYSIS RESULTS			Current sample	Previous samples		
LAB NUMBER			1700781	1700782	1700783	
SAMPLE RATING			?	✓	✓	
Date tested			12.01.2015	11.10.2014	31.03.2014	
Date of sample taken			09.01.2015	06.10.2014	27.03.2014	
Date of last oil change			20.03.2014	20.03.2014	20.03.2014	
Top-up since change	l		20	0	0	
Operating time since change	h		1027	509	3	
Total operating time	h		1027	509	3	
Oil changed			no	no	no	
WEAR						
Iron	Fe	mg/kg	12	4	0	
Chrome	Cr	mg/kg	9	1	0	
Tin	Sn	mg/kg	1	0	0	
Aluminium	Al	mg/kg	0	0	0	
Nickel	Ni	mg/kg	0	0	0	
Copper	Cu	mg/kg	11	0	0	
Lead	Pb	mg/kg	1	0	0	
Molybdenum	Mo	mg/kg	0	0	0	
PQ index	-		< 25	< 25	< 25	
CONTAMINATION						
Silicon	Si	mg/kg	23	14	12	
Potassium	K	mg/kg	0	0	0	
Sodium	Na	mg/kg	1	0	0	
Water K. F.	ppm		773	476	319	
OIL CONDITION						
Viscosity at 40°C	mm²/s		46.41	46.37	46.21	
Viscosity at 100°C	mm²/s		8.01	7.99	8.03	
Viscosity index	-		145	144	147	
ADDITIVES						
Calcium	Ca	mg/kg	25	24	21	
Magnesium	Mg	mg/kg	3	3	2	
Boron	B	mg/kg	0	0	0	
Zinc	Zn	mg/kg	46	14	12	
Phosphorus	P	mg/kg	1638	1633	1679	
Barium	Ba	mg/kg	2	1	1	
Sulphur	S	mg/kg	1024	1117	1058	
ADDITIONAL TESTS						
AN / NN	mgKOH/g		1.08	0.85	0.67	
Density 15°C	kg/m³		919	920	920	
Cleanliness class	ISO 4406 (1999)		23/19/15	20/17/13	18/16/11	

