

LABORATORY REPORT.

LAB REF. : 170912

COMPANY :

ATTN. :

SAMPLE NO. : 1

Customer :
Department :
Make machine : **Siemens 2,3 MW** Serial number : **330455-1**
Type of oil : **Castrol Hyspin AWH-M 32**
Sampling place : Date : **24-03-2017**

PROCEDURE TO ESTIMATE THE NUMBER OF PARTICLES.

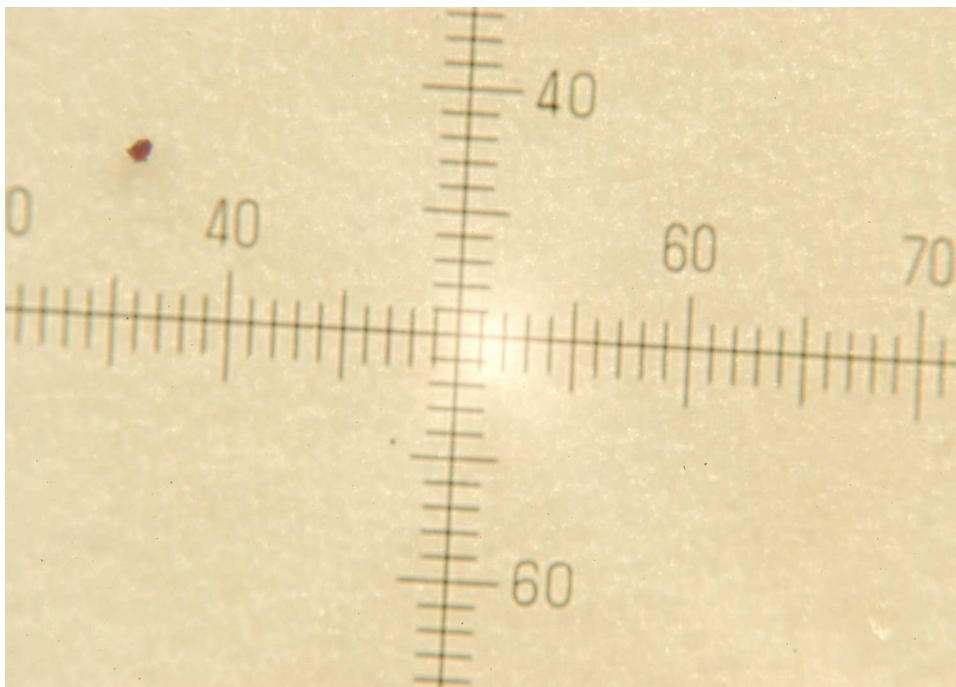
Pore size filter disc : **0,8 micron**
Sampled volume : **100 ml (Standard volume = 100 ml)**
Method of particle count : **ISO / Microscope**

PARTICLE COUNTING.

NUMBER OF PARTICLES PER 100 ML	> 2 µm	3387
	> 5 µm	2469
	> 15 µm	163
COLOUR TEST FILTER DISC		white
ISO CLASSIFICATION ACC. 4407		12/12/8

PARTICLES IDENTIFICATION.

Metal : **75 %**
Fibres : **5 %**
Synthetics : **10 %**
Resin : **10 %**



1 Div = 15 Micron

SPECTRAL ANALYSIS mg/kg (ppm)			
WEAR ELEMENTS AND SILICON		ADDITIVES	
Aluminium	: 0,2	Sodium	: 0,4
Boron	: 0,2	Nickel	: <0,1
Chromium	: 0,2	Silicon	: 19,2
Copper	: 2,9	Tin	: <0,1
Lead	: <0,1	Titanium	: <0,1
Manganese	: 0,4	Vanadium	: <0,1
Molybdenum	: 0,5	Iron	: 8,9
		Barium	: <0,1
		Calcium	: 11,1
		Phosphorus	: 375,9
		Magnesium	: <0,1
		Zinc	: 564,8

WATER DETERMINATION TEST .

Water concentration : **97 mg/kg** (accuracy <5 mg/kg) Normal **30 - 80 mg/kg**

Disapproval app. **300 mg/kg** Methode Karl Fischer Coulometric

(1 mg/kg = 1 ppm, 1% = 10000 mg/kg)

TEST RECORDS VISCOSITY DETERMINATION.

Viskosimeter OSTWALD serialnr.E2423 callibrated acc.: BS 188, ASTM D445, IP 71 and NEN 3026 accuracy 0,2%.

Used volume : 20 ml

VISCOSITY.

Viscosity : **29,7** cSt.(mm²/s) Temperature : 40 °C

ISOVG **32** : Min. **28,8** , Max **35,2**

TEST RECORDS DETERMINATION TOTAL ACID NUMBER.

Total acid number (T.A.N.) determination by ASTM D664-81 / European standard 55.

T.A.N. mg. KOH/g: **0,46** Fact. stat. max : **1,5**

REMARKS / ADVICE.

Contamination level of the oil reviewed as good.

Wear assessed as normal.

Directive wear values:

20 - 40% wear due to scraping

10 - 20% surface fatigue wear

10 - 30% wear to friction

5 - 10% corrosion

5 - 10% erosion

The degradation by-product level of the oil in the form of varnish is found to be at: <10 %

The varnish level is scaled as:

Low 0 - 30%

Medium 30 - 60%

High 60 - 100%

Spectral analysis entails measurement of dissolved metals and their particles up to 25 microns.

The high concentration of silicon and iron does not tally with the optical inspection of the test filter, indicating dissolved metals. These are not directly harmful to the system but contribute to a faster oxidation of the oil.

The chemical condition of the oil is still good and suitable for further use.

We advise you to have the oil checked once a year for viscosity, acid number, and additives.

Customer : **E-on**
 Mark machine : **Siemens 2,3 MW**
 Date : **24-03-2017**

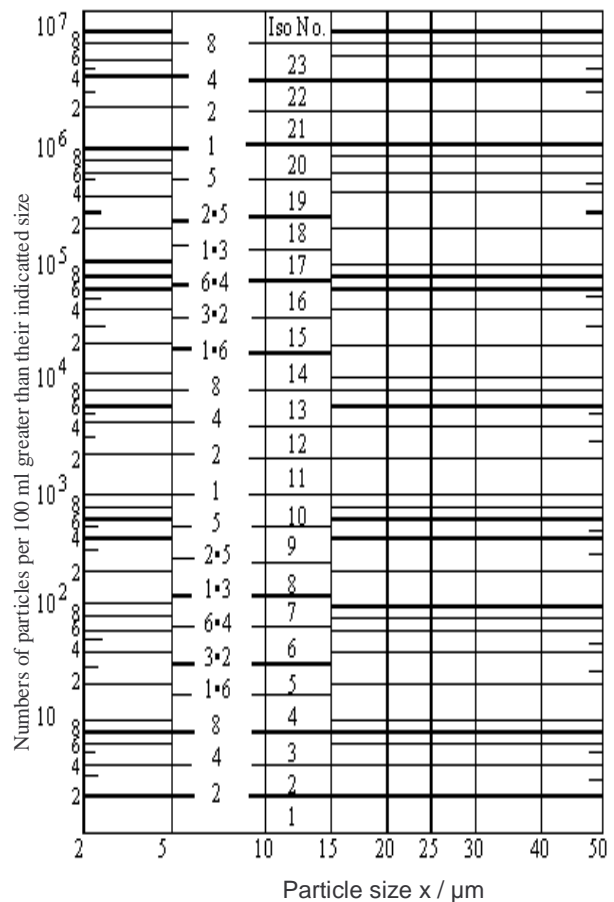
Department : **Rødsand 2**
 Type machine : **K09, 52673 hrs**
 Executed by : _____

**CONTAMINATION CLASSIFICATION
 ACCORDING TO ISO / DIS 4407**

CLASS : 12/12/8

1st number particles > 2 µm
 2nd number particles > 5 µm
 3th number particles > 15 µm

Max. number of particles per 100 ml.hydraulic fluid after size ranges		
More than	Till	Class
8.000.000	16.000.000	24
4.000.000	8.000.000	23
2.000.000	4.000.000	22
1.000.000	2.000.000	21
500.000	1.000.000	20
250.000	500.000	19
130.000	250.000	18
64.000	130.000	17
32.000	64.000	16
16.000	32.000	15
8.000	16.000	14
4.000	8.000	13
2.000	4.000	12
1.000	2.000	11
500	1.000	10
250	500	9
130	250	8
64	130	7
32	64	6



RECOMMENDED CONTAMINATIONLEVEL FOR HYDRAULIC SYSTEMS.

ISO	14/12/9	Silt sensitive systems aerospace or laboratory	5,5 kg*
ISO	16/14/10	Critical systems general servosystems.	11 kg*
ISO	17/15/11	High quality general proportional valves.	22 kg*
ISO	18/16/13	Medium pressuresystems.	44 kg*
ISO	20/18/14	Low pressure systems with large clearances.	90 kg*
ISO >	21/19/15	Not suitable for hydraulic systems.	>190 kg*

* "If the oil passes through a pump with the capacity of 200 ltr/min., 8 hours a day, 230 working days per year the amount of dirt passing the pump per year is listed above with coresponding ISO code".