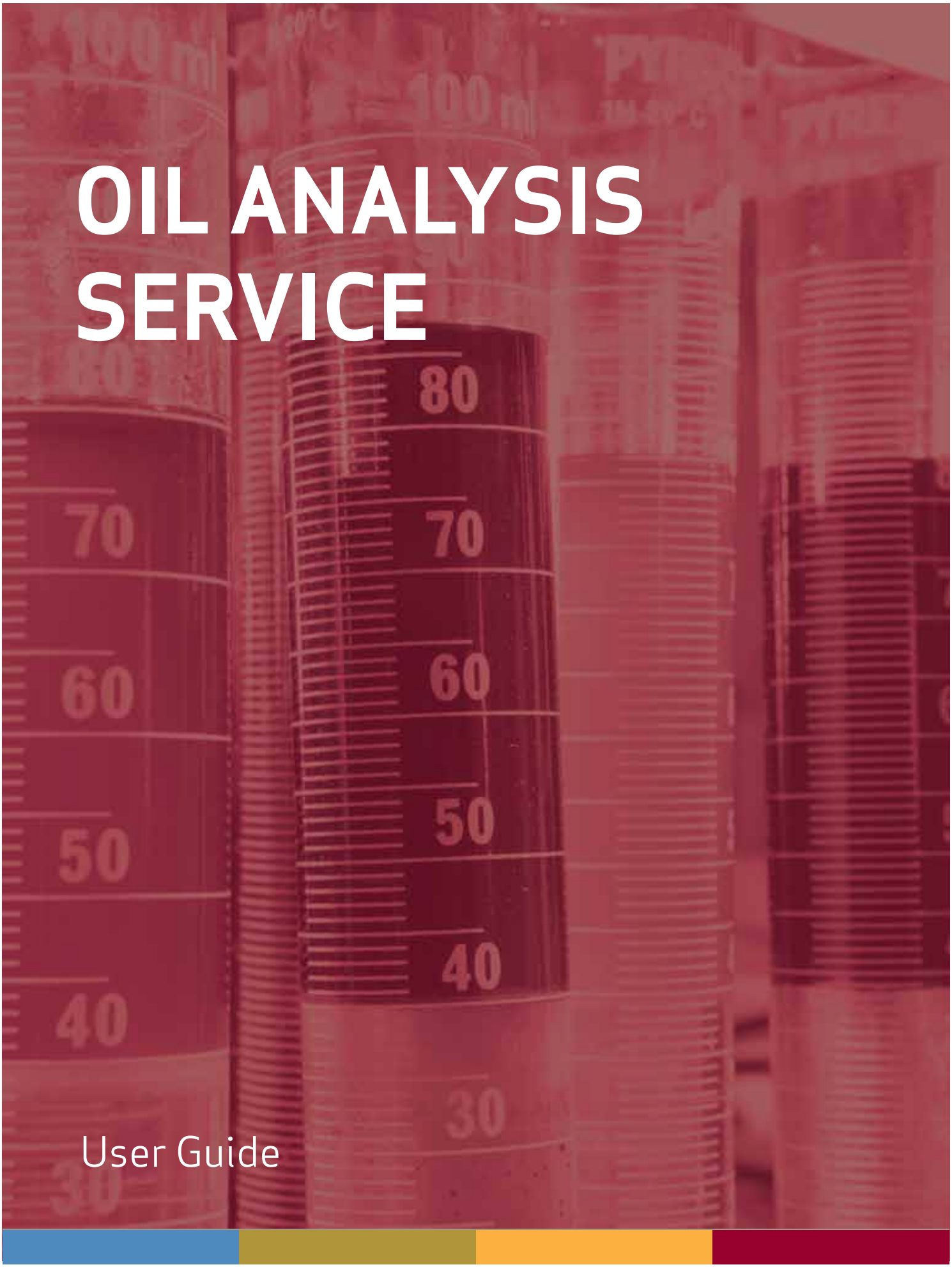


OIL ANALYSIS SERVICE

User Guide

WHAT MOVES YOUR WORLD

MOOG

ADVICE BEFORE YOU START

SELECTING A SAMPLE

To avoid potential cross contamination always use a new, Moog branded sample bottle and length of tubing for each sample taken.

REPRESENTATIVE SAMPLE

- If the machinery has to be switched off, ensure the sample is taken within 15 minutes of shutdown to ensure it is representative.
- All samples should be drawn in the same manner and from the same sample point.

TRAINING

If you are unsure how you take a sample, our Effective Maintenance of Hydraulic Servo Systems training course includes modules on obtaining oil samples both safely and efficiently.

Please email **training.uk@moog.com** for details.

TAKING A SAMPLE FROM A PRESSURISED LINE

Method 1 involves making a connection to a pressurised part of the circuit. For safety reasons, choose a relatively low pressure location, such as:-

- Just upstream of the return filter in an open circuit system.
- Just downstream of the charge pump in a close circuit system.
- Alternatively run the whole circuit at low pressure while taking the sample (open circuit pump in unload, or closed circuit pump in neutral).

The sample should be taken from a line which has turbulent flow. Even if the fluid velocity is not high enough to achieve true turbulence, a sample taken downstream of a fitting or a flow disturbance such as a bend, is preferable to one taken from a laminar flow area.

Avoid taking a sample from a very low pressure line (pump or motor case drain line) because it can take a long time to collect enough fluid – and all that time the bottle is open to collecting atmospheric contamination.

Never try taking a sample from a suction line of a pump. There is a real possibility the pressure is less than atmospheric when the pump is running – opening a small connection will not give you a fluid sample and there is a considerable risk air could be drawn in to the system and damage the pump.

Never try to take a sample by cracking open a fitting or connection. The resulting sample will be heavily contaminated and there is a risk of excessive and unstoppable leakage.

OTHER FORMS OF ANALYSIS ARE AVAILABLE. PLEAS

SELECT YOUR METHOD FOR OBTAINING SAMPLES

1. SAMPLE VALVE OR TEST POINT METHOD

Ensure the machine has been working for at least 30 minutes immediately prior to taking sample.

- Open the sampling valve (or connect the open ended hose to the test point) and flush through at least 1 litre of fluid. Do not close the valve (or disconnect the open ended hose from the test point) after this short flushing process.
- Open the sample bottle (being careful not to allow any contamination to enter it) and half fill the bottle with system fluid. Use this fluid to rinse the inner surfaces of the bottle and then discard the fluid. Repeat this step (half fill – rinse – discard) to ensure the existing contamination in the bottle is exactly the same as the contamination level of the fluid. Do not close the valve (or disconnect the open ended hose) during this rinsing process.
- Fill the sample bottle nearly to the top and then redirect the fluid stream away from the bottle – do not close the valve (or disconnect the open ended hose) whilst still filling the bottle.
- Carefully cap the sample bottle and only then turn off the flow.
- Complete the sample form with sampled machine's details, and retain the top of the form for your records.
- Place sample bottle and form into the pre-addressed cardboard container and send via a traceable carrier to Moog Oil Analysis Laboratory.

MOOG GLOBAL SUPPORT™

2. THIEF PUMP METHOD

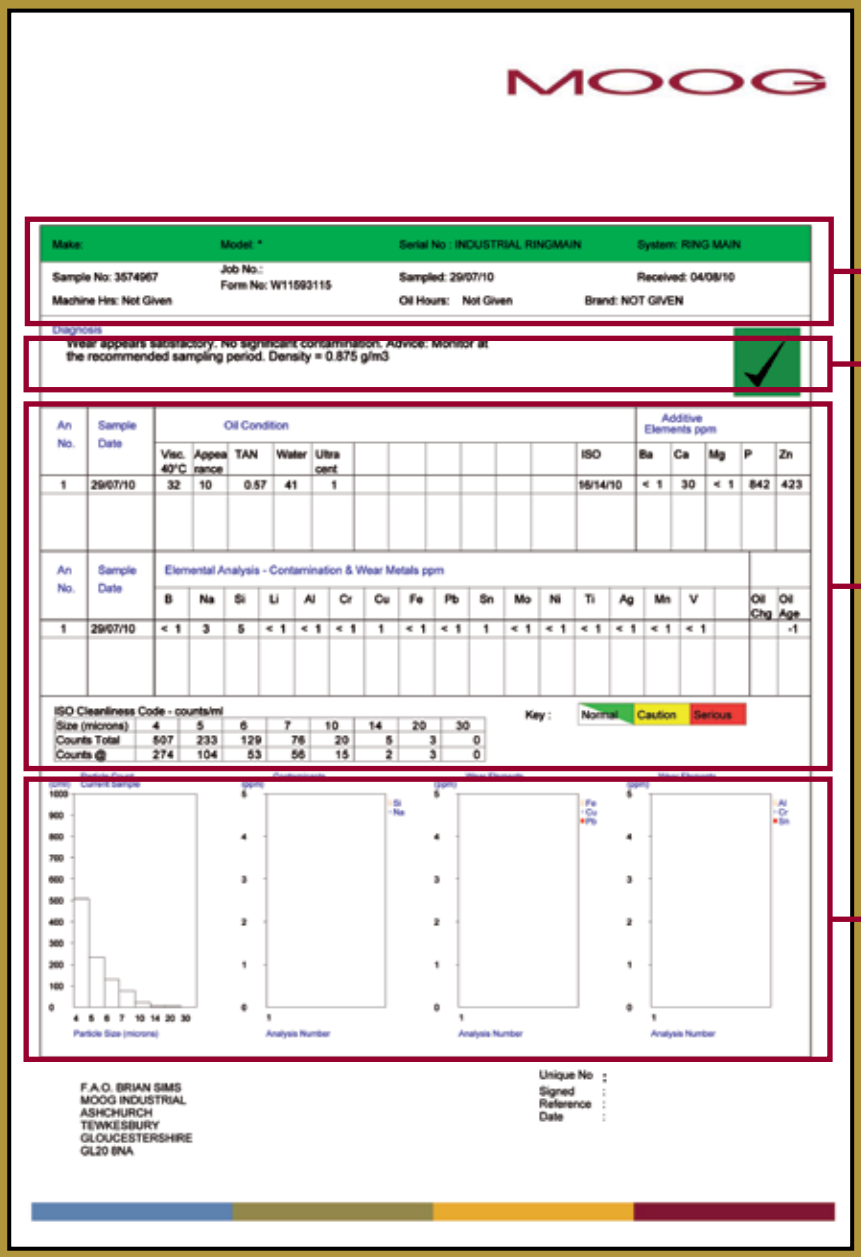
Ensure the machine has been working for at least 30 minutes immediately prior to taking sample.

- With a lint-free cloth clean around the dipstick/filler cap area to ensure no external contamination.
- Push the tubing in to the thief pump through the brass connector until it reaches the neck of the sample bottle. Cut the tubing to the required length for your sample point.
- Using the bottle and pump – push the tubing into the oil via the dip-stick hole or filler cap and half fill the bottle with system fluid. Remove the thief pump (to avoid contamination), replace the cap and swirl this fluid around to rinse the inner surfaces of the bottle and then discard the fluid. Repeat this step (half fill – rinse – discard) to ensure the existing contamination in the bottle is exactly the same as the contamination level of the fluid.
- Pull the vacuum on the pump to draw oil into the bottle. Once the bottle is 90% full, remove from the pump and replace the cap IMMEDIATELY.
- Complete sample form with sampled machine's details, and retain the top of the form for your records.
- Place sample bottle and form into the pre-addressed cardboard container and send via a traceable carrier to Moog Oil Analysis Laboratory.

SE CONTACT MOOG FOR FURTHER INFORMATION

OIL ANALYSIS REPORT

This report will give you the oil condition of your system and help you take the right measures.



MOOG

Make: Model * Serial No : INDUSTRIAL RINGMAIN System: RING MAIN

Sample No: 3574967 Job No.: Sampled: 29/07/10 Received: 04/08/10

Machine Hrs: Not Given Form No: W11593115 Oil Hours: Not Given Brand: NOT GIVEN

Diagnosis

Wear appears satisfactory. No significant contamination. Advice: Monitor at the recommended sampling period. Density = 0.875 g/m3

An No.	Sample Date	Oil Condition											Additive Elements ppm				
		Visc. 40°C	Appearance	TAN	Water	Ultracent						ISO	Ba	Ca	Mg	P	Zn
1	29/07/10	32	10	0.57	41	1						16/14/10	< 1	30	< 1	842	423

An No.	Sample Date	Elemental Analysis - Contamination & Wear Metals ppm																	
		B	Na	Si	Li	Al	Cr	Cu	Fe	Pb	Sn	Mo	Ni	Ti	Ag	Mn	V	Oil Chg	Oil Age
1	29/07/10	< 1	3	5	< 1	< 1	< 1	1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1		-1

ISO Cleanliness Code - counts/ml

Size (microns)	4	5	6	7	10	14	20	30
Counts Total	507	233	129	76	20	5	3	0
Counts @	274	104	53	56	15	2	3	0

Key : Normal Caution Serious

F.A.O. BRIAN SIMS
MOOG INDUSTRIAL
ASHCHURCH
TEWKESBURY
GLOUCESTERSHIRE
GL20 8NA

Unique No :
Signed :
Reference :
Date :

This section of the report refers to the equipment that the sample has been drawn from and the oil sample details.

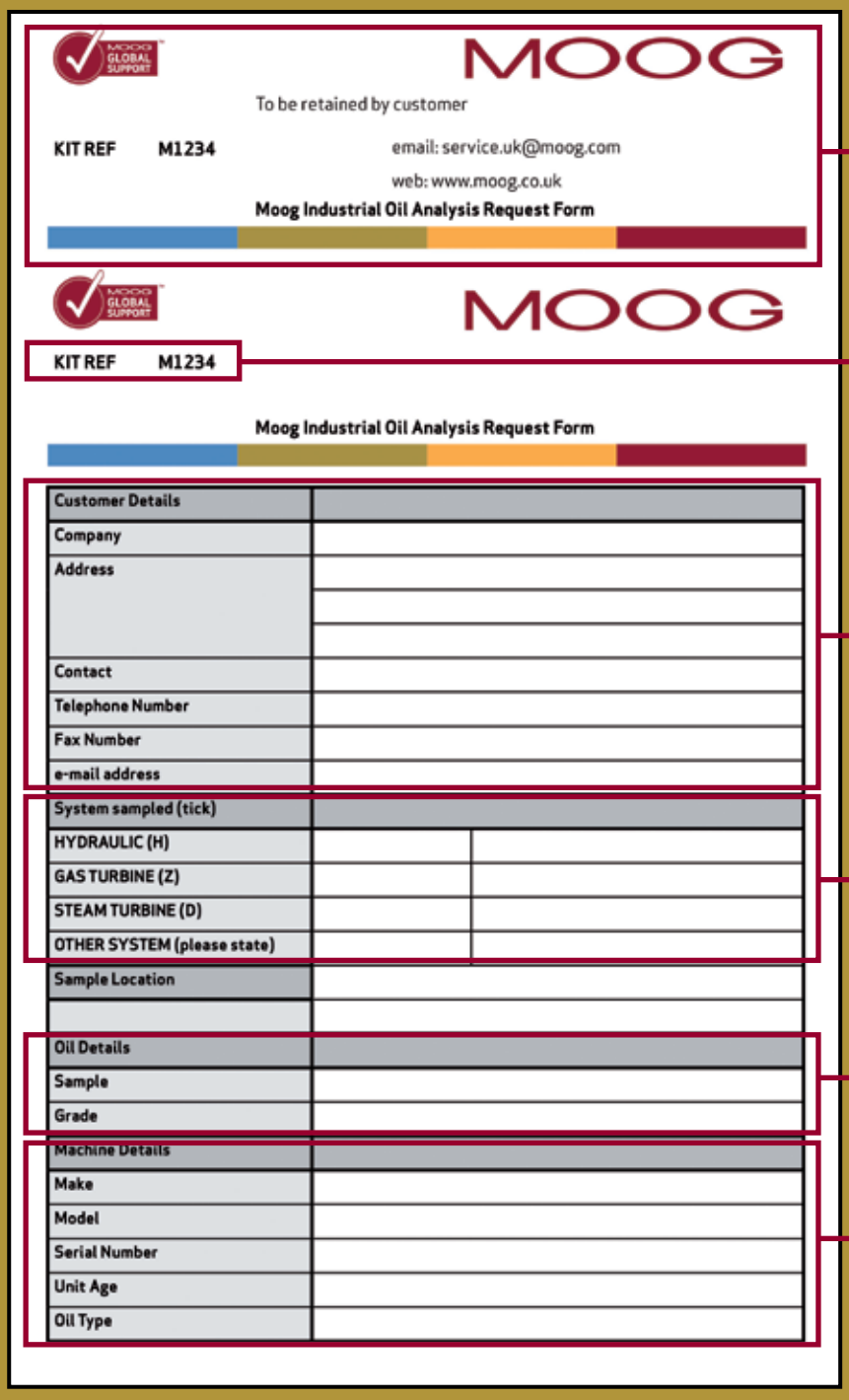
This is the diagnosis and recommendations relating to the condition of the oil and machinery.

The results section of the report is split into 4 categories, oil condition, additive levels and elemental analysis. The particle count information is also reported here.

The graph section displays the test results in a graphical format to aid the viewing of trends.

YOUR SAMPLE RETURN FORM

Each sampling bottle contains a form with a unique reference enabling you to track your samples. Please use these guidelines to help you fill in this form.



To be retained by customer

KIT REF M1234

email: service.uk@moog.com

web: www.moog.co.uk

Moog Industrial Oil Analysis Request Form

MOOG

KIT REF M1234

Moog Industrial Oil Analysis Request Form

Customer Details	
Company	
Address	
Contact	
Telephone Number	
Fax Number	
e-mail address	

System sampled (tick)		
HYDRAULIC (H)		
GAS TURBINE (Z)		
STEAM TURBINE (D)		
OTHER SYSTEM (please state)		

Sample Location	

Oil Details	
Sample	
Grade	

Machine Details	
Make	
Model	
Serial Number	
Unit Age	
Oil Type	

This section to be retained by you to track samples

Use this reference to track samples

Your company details

Type of equipment providing sample, to enable appropriate tests to be carried out.

Any details filled in here will aid the interpretation of the samples' results, especially if the oil grade is known.

Details of the unit sampled should be noted here, machine ID or serial no. and must be consistent for trending purposes.

TAKE A CLOSER LOOK.

For more information visit our web site or contact one of the locations below.

INDUSTRIAL CONTROLS

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www.moog.co.uk/oiltest