MP Fluid Analytics

Laboratory-based fluid analyses

MP Fluid Analytics

Description

MP Fluid Analytics is a range of service packages for carrying out professional laboratory-based fluid analyses. The central element is the provision of a comprehensive fluid condition report by an expert. In addition to the individual measured values of the analysis methods used, this also includes a general fluid health traffic light as well as recommendations for action and products. Furthermore, previous samples are listed for the purpose of trend analysis and taken into account in the evaluation. Fluid conditions are thus comprehensively analyzed and impending damage is detected at an early stage. Handling is extremely simple thanks to preconfigured sets tailored to the respective application. Simply take a fluid sample from your system and fill it into the ultra-clean sample bottle included in the scope of delivery. You then complete the sample information sheet and send both back to MP Filtri in the original packaging. The results and recommendations for action are then provided as a PDF by email or in the MP Smart Fluid cloud portal.

> Features

- Professional laboratory analysis to determine fluid conditions, oil ageing phenomena and mixtures as well as to check oil changes that have been carried out.
  In addition: early damage detection and root cause analysis
- Sample kits tailored to selected applications
- Set consisting of ultra-clean sample bottle in accordance with DIN ISO 5884, sampling adapter (set hydraulic), instructions and sample accompanying form
- Comprehensive report with proactive recommendations for action and products as a PDF document
- Optional sampling tools available
- Upgradable with MP Smart Fluid - cloud portal for correlating values measured on the machine with those in the laboratory

> Benefits

- Reduction of life cycle & total cost of ownership (TCO)
- Increasing machine availability and reliability
- Optimization and control of maintenance operations
- Can be used as part of quality and process assurance
- Comprehensive condition assessment of the fluid and the machine
- Root cause analysis in the event of damage and incidents
- No hidden costs thanks to advance payment and clearly defined inspection and service scopes
- Easy to handle
- Clear recommendations for action and products to reactively maintain system operation and proactively optimize the system

Think inline!

70 to 80 % of fluid system failures are due to contaminated fluid. For this reason, MP Filtri recommends permanent monitoring of fluid contamination with regard to solid particles and water content directly at the machine (inline) - e.g. with the Inline Contamination Monitor ICM. This avoids monitoring gaps and guarantees representative and repeatable sampling.

Fluid sensors such as the ICM therefore ideally complement MP Filtri's range of services in the field of laboratory-based fluid and material analysis and enable a holistic and representative view of the monitored fluid.

In addition, the results from the measurements in the laboratory and on the machine can be correlated with each other in the MP Smart Fluid cloud portal, enabling suitable recommendations for action and service operations to be derived.

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Sample analysis kits

Fluid samples are sent using pre-packaged sample analysis kits. You simply order an application-specific sample analysis set according to the order code, take the fluid sample, fill out the enclosed sample information sheet and send both back to MP Filtri in the existing box. After analysis and evaluation, you will receive a comprehensive fluid condition report with recommendations for action and products as a PDF document by e-mail. The report is also made available on the MP Smart Fluid cloud portal (optional).

Packaging and shipping carton

Sample information sheet

Instructions for taking fluid samples

Ultra-clean sample bottle acc. to DIN ISO 5884 with oil sampling adapter (set hydraulic only)

Scope of analysis*

Test	Standard / Norm	Sample analysis kit** Hydraulic	Gearbox
Element determination (ICP)	ASTM 5185	✓	✓
FT Infrared spectroscopy	DIN 51451 | ASTM E2412		
Oxidation	DIN 51453	✓	✓
Glycol	---	✓	×
Oil cleanliness (ISO 4406)	ISO 11500 | ASTM D7647	✓	✓
PQ Index	---	✓	✓
Viscosity			
V40 and V100	ASTM D445	✓	✓
Viscosity index (VI)	ASTM D2270	✓	✓
Visual Inspection	DIN EN 1308	✓	✓
Water content absolute (Karl Fischer)	DIN 51777 | ASTM 6304	✓	✓
Acid Number,(AN)	AN: ASTM D664	✓	✓

* Table shows extended scope of analysis (3 = standard) according to order code for fluid sample analysis sets
** Fluid sample analysis sets for other applications on request

Individual and special tests

	Ordering code	Description
Varnish Indication	F-Analytics-Varnish-1	Colorimetric membrane test (MPC = Membrane Patch Colormetry) for the indication of fluid ageing-related deposits (varnish) in fluid systems
Standard filter residue analysis	OILSERVICE-7	Microscopic/ visual particle analysis
Extended filter residue analysis	OILSERVICE-9	Microscopic/visual particle analysis and determination of elements using atomic emission spectroscopy (AES) and molecular compounds using infrared spectroscopy (FTIR)

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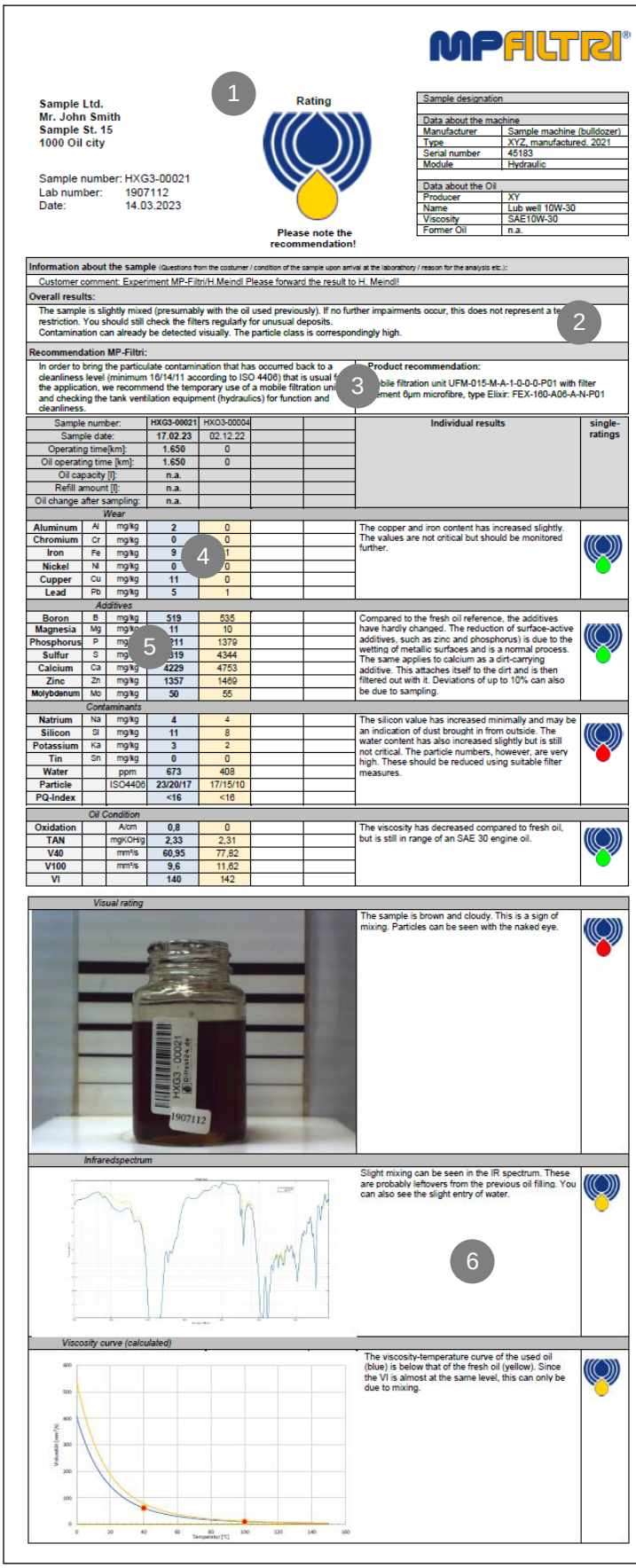
Fluid condition report



MPFILTRI

Sample Ltd.
Mr. John Smith
Sample St. 15
1000 Oil city

Sample number: HXG3-00021
Lab number: 1907112
Date: 14.03.2023

1

Rating

Please note the recommendation!

Sample designation	
Data about the machine	
Manufacturer	Sample machine (bulldozer)
Type	XYZ, manufactured. 2021
Serial number	45183
Module	Hydraulic
Data about the Oil	
Producer	XY
Name	Lub well 10W-30
Viscosity	SAE10W-30
Former Oil	n.a.

Information about the sample (Questions from the costumer / condition of the sample upon arrival at the laboratory / reason for the analysis etc.):

Customer comment: Experiment MP-Filtri/H. Meindl Please forward the result to H. Meindl!

Overall results:

The sample is slightly mixed (presumably with the oil used previously). If no further impairments occur, this does not represent a te restriction. You should still check the filters regularly for unusual deposits. Contamination can already be detected visually. The particle class is correspondingly high.

2

Recommendation MP-Filtri:

In order to bring the particulate contamination that has occurred back to a cleanliness level (minimum 16/14/11 according to ISO 4406) that is usual f the application, we recommend the temporary use of a mobile filtration un and checking the tank ventilation equipment (hydraulics) for function and cleanliness.

3

Product recommendation:

obile filtration unit UFM-015-M-A-1-0-0-0-P01 with filter ment 8µm microfibre, type Elixir: FEX-160-A08-A-N-P01

Sample number:			HXG3-00021	HXO3-00004			Individual results	single-ratings
Sample date:			17.02.23	02.12.22				
Operating time[km]:			1.650	0				
Oil operating time [km]:			1.650	0				
Oil capacity [l]:			n.a.					
Refill amount [l]:			n.a.					
Oil change after sampling:			n.a.					
Wear								
Aluminum	Al	mg/kg	2	0			The copper and iron content has increased slightly. The values are not critical but should be monitored further.	
Chromium	Cr	mg/kg	0	0				
Iron	Fe	mg/kg	9	1				
Nickel	Ni	mg/kg	0	0				
Cupper	Cu	mg/kg	11	0				
Lead	Pb	mg/kg	5	1				
Additives								
Boron	B	mg/kg	519	535			Compared to the fresh oil reference, the additives have hardly changed. The reduction of surface-active additives, such as zinc and phosphorus) is due to the wetting of metallic surfaces and is a normal process. The same applies to calcium as a dirt-carrying additive. This attaches itself to the dirt and is then filtered out with it. Deviations of up to 10% can also be due to sampling.	
Magnesia	Mg	mg/kg	11	10				
Phosphorus	P	mg/kg	211	1379				
Sulfur	S	mg/kg	4319	4344				
Calcium	Ca	mg/kg	4229	4753				
Zinc	Zn	mg/kg	1357	1469				
Molybdenum	Mo	mg/kg	50	55				
Contaminants								
Natrium	Na	mg/kg	4	4			The silicon value has increased minimally and may be an indication of dust brought in from outside. The water content has also increased slightly but is still not critical. The particle numbers, however, are very high. These should be reduced using suitable filter measures.	
Silicon	Si	mg/kg	11	8				
Potassium	Ka	mg/kg	3	2				
Tin	Sn	mg/kg	0	0				
Water		ppm	673	408				
Particle		ISO4406	23/20/17	17/15/10				
PQ-Index			<16	<16				
Oil Condition								
Oxidation		A/cm	0,8	0			The viscosity has decreased compared to fresh oil, but is still in range of an SAE 30 engine oil.	
TAN		mgKOH/g	2,33	2,31				
V40		mm²/s	60,95	77,82				
V100		mm²/s	9,6	11,62				
VI			140	142				

4

5

Visual rating

The sample is brown and cloudy. This is a sign of mixing. Particles can be seen with the naked eye.

Infraredspectrum

Slight mixing can be seen in the IR spectrum. These are probably leftovers from the previous oil filling. You can also see the slight entry of water.

6

Viscosity curve (calculated)

The viscosity-temperature curve of the used oil (blue) is below that of the fresh oil (yellow). Since the VI is almost at the same level, this can only be due to mixing.

1 **Easy to interpret**

Capture the fluid status at a glance thanks to the three-color fluid condition traffic light

2 **Meaningful**

Application- and practice-oriented evaluation of the fluid condition by experienced tribologists

3 **Action and solution-oriented**

Specific recommendations for action and products to reactively maintain system operation and proactively optimize the fluid system

4 **Trend-based**

Long-term observation of the health status of a system and detection of changes in the fluid - compared to previous samples or a stored reference

5 **Comprehensive**

Detailed data on measurement results and their evaluation and indication (traffic light) for the following categories:

- Wear
- Additives
- Contamination and oil condition

6 **Analytical**

Photography of the sample bottle for visual inspection and provision of spectra and curves for detailed analysis

MP Fluid Analytics

Ordering code

MP Fluid Analytics – fluid sample analysis sets

F-Analytics | 1 | 3 | 0 | 1 | P01

Service package
F-Analytics – Sample analysis set incl. sample bottle and shipping box

Application**
1 Hydraulic
2 Gearbox

Scope of analysis
3 Extended

Additional tests
0 without
7 Standard filter residue analysis (OILSERVICE-7)*
9 Extended filter residue analysis (OILSERVICE-9)*
V Varnish Indication (F-Analytics-Varnish-1)*

Set Scope
1 Standard

Version
P01 Standard

* Also available as an individual analysis (order code given in brackets)
** Fluid sample analysis sets for other applications on request

Recommended accessories and consumables

Item / Ordering code	Description
P.02	Sample bottle 100 ml “ultra clean” according to ISO 5884
P.0225	Sample bottle set (25 glass bottles à 100 ml) “ultra-clean” according to ISO 5884
On request	Sample bottle set for hydraulic systems; set content: sample bottle 100 ml “ultra clean” according to ISO 5884 with closed lid, additional lid with hose connection and oil sampling adapter for Minimess couplings
P.03	Sample bottle 250 ml “ultra clean” according to ISO 5884
P.0320	Sample bottle set (20 glass bottles of 250 ml each)
BS0020	Hand pump for fluid sampling (vampire pump)
BS0022	Transparent hose (can be shortened), 1,000 mm
On request	Sampling case for 100 ml sample bottles Contents of case (335 x 240 x 71mm): Vacuum pump, 5m hose (transparent), 5x 100 ml sample bottles (DIN/ISO 5884 Ultra Clean), tool for shortening the hose, zip lock bag, pen
95.Y30Y30X261060	Microbore pressure hose M16x2, 600 mm, steel coated, suitable for mineral and synthetic oils (e.g. PAO) as well as natural and synthetic esters