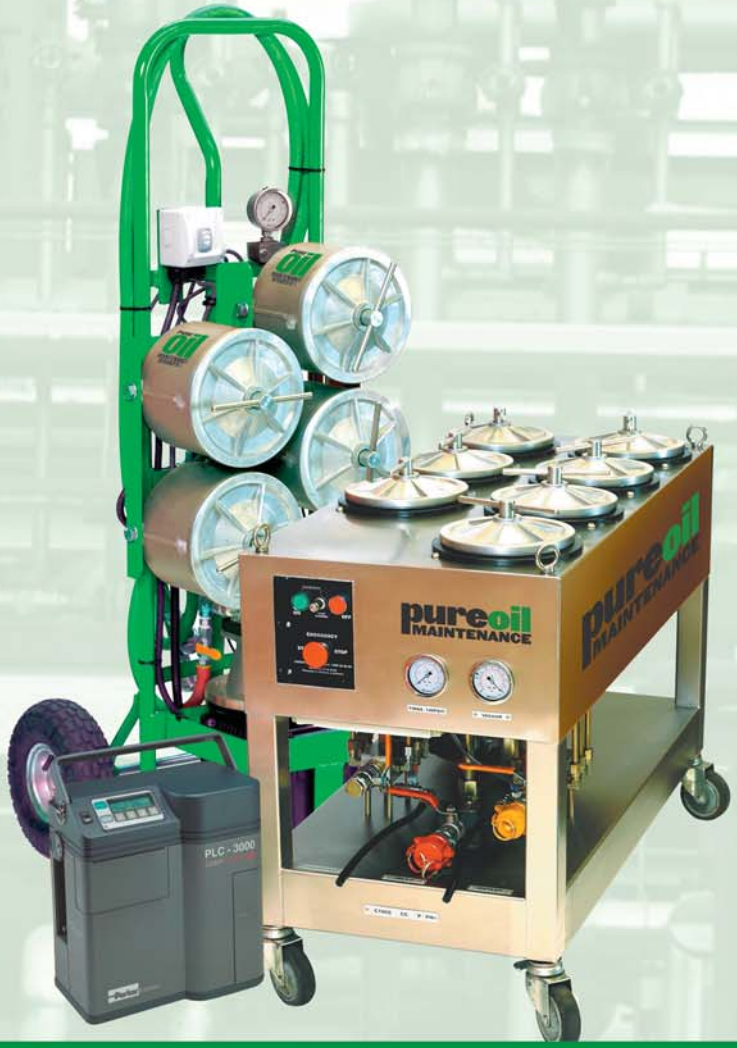
PURE Oil MAINTENANCE SERVICES PTY LTD

ISO 13/11 NAS 5 Technology

"No system has ever failed... because the oil was too clean!"



Pure Oil is in the business of filtering oil, supplying good quality oil and providing other services related to the upkeep and monitoring of the oil condition.

We specialise in keeping hydraulic equipment running at its best by ensuring your oil is ultra clean at a level of ISO 13/11 NAS 5. As our catch phrase states, "No system has ever failed… because the oil was too clean!" and we make that our mission and stand by it.

Our products include hydraulic oil, lubricating oils, bypass purifiers (motorised or under pressure), mobile and portable purifiers, spill absorbing materials, tanks and bunding. We also provide many on-site services including collecting oil analysis samples, oil purification, tank inspections, tank cleaning, extracting water from oil and waste oil removal. We are the sole importers for Yupao filtration products for Australia and New Zealand and have been dealing with them for nearly two decades.

We have customers all over Australia and have even exported and worked overseas. We are able to be competitive in the current market by creating a large brokerage of people who require the products that we do stock and are then able to pass the benefits on.

With a dedicated workforce including scientists, backed by the best of equipment (much designed in-house), we are proud to offer our products and services to assist our clients in achieving their lubrication needs and desires.

PO Box 5132 Victoria Point Qld 4165 **P: (07) 3829 1058** F: (07) 3829 1078 E: office@pureoil.com.au

ISO 13/11 NAS 5 Technology

So what does it all mean?

Most of us know about ISO standards but the NAS system may be new to you. NAS is an acronym for **National Aerospace Standards** and is a U.S. Standard for both the civilian and military aviation industry. It is an equivalent of the ISO standard 4406 and is to do with the purity of oil measured by count of particles per ml.

NAS is however a more demanding standard than ISO, **NAS 5** being the mil-spec required for combat avionics. Even though your machine may not be a high powered piece of combat equipment we will still give your oil the same level of care and attention.

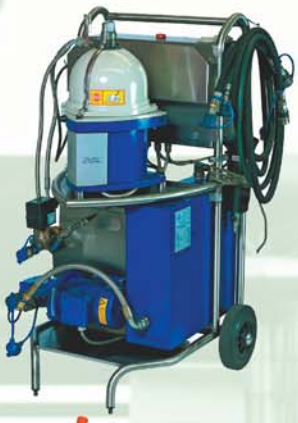
ISO 4406

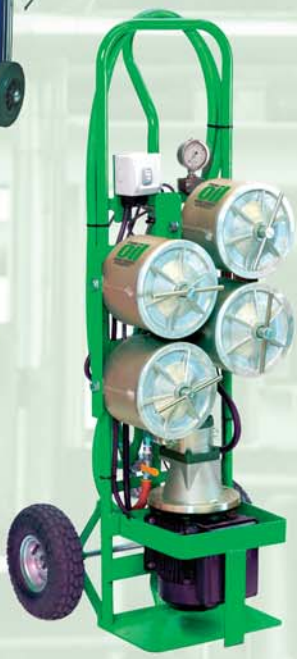
Number of Particles per ml		ISO Code
More Than	Up to & Including	
80,000	160,000	24
40,000	80,000	23
20,000	40,000	22
10,000	20,000	21
5,000	10,000	20
2,500	5,000	19
1,300	2,500	18
640	1,300	17
320	640	16
160	320	15
80	160	14
40	80	13
20	40	12
10	20	11
5	10	10
2.5	5	9
1.3	2.5	8
0.64	1.3	7
0.32	0.64	6
0.16	0.32	5
0.08	0.16	4
0.04	0.08	3
0.02	0.04	2
0.01	0.02	1
0.005	0.01	0
0.0025	0.005	00

6 Pot Mobile Unit

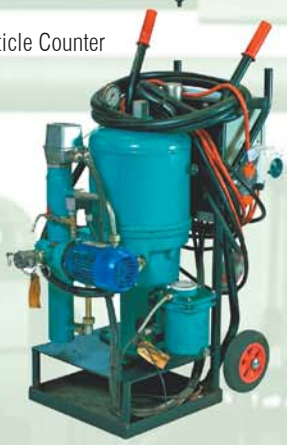
MB 100 Self Powered Unit


PLC-3000 Particle Counter


Alfa Lavall Centrifuge


4 Pot Trolley Unit


2 Pot Trolley Unit


Water Separator Unit

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BHRA Research Study

The British Hydromechanics Research Association (BHRA) has conducted a three year case study to determine the correlation between fluid cleanliness and breakdown frequency. This involved a controlled 'field' study of 117 hydraulic machines including: injection moulding; machine tools; materials handling; mobile equipment, for example, earth moving; and marine hydraulics.

Average ISO code	Average hours between break-downs	Relative life factor
24/21	200	0.19
23/20	250	0.24
22/19	325	0.31
21/18	430	0.41
20/17	600	0.57
19/16	800	0.76
18/15 - *Caterpillar in system operating target Also standard Aus refinery issue	1050	1 (arbitary base)
17/14	1400	1.33
16/13 - *Caterpillar new fill standard	1900	1.81
15/12	2600	2.48
14/11	3800	3.62
13/10 – *Pure Oils Products both new supply And operational target	5000	4.76
12/9	6500	6.19
11/8	9000	8.57
10/7	20,000	19.05

* notations added - typically, uncontrolled systems run well above ISO 18/15

The study allows the user of hydraulic equipment to quantify cost benefits of machine cleanliness, for example, by shifting the contamination level from ISO code 22/19 to 14/11 a tenfold saving can be achieved in machine failure costs.

Potential Benefits

Efforts to control oil cleanliness within these limits can result in enormous benefits. Case studies from other industries have shown:

- Significant reduction in oil usage**.
- 50% reduction in mechanical downtime hours;
- 90% reduction in incidence of specific failures;
- 850% increase in equipment life.

**(Note: with bypass purification our new group II oil is warranted for 5 yrs)

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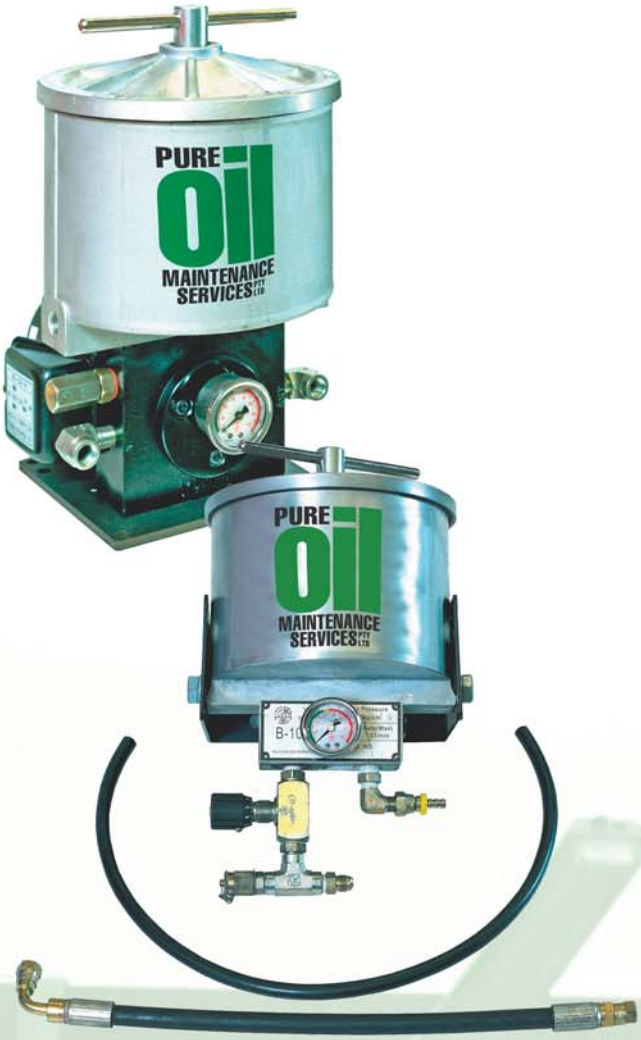
Effective Filtration



A process of filtration, removal of water contamination, and oil analysis is recommended to ensure that oil is kept in top condition. Use the following tips for managing your oil improvement program:

Filtration should target particle sizes 5 microns and over (it is particles in the five to ten micron range that cause the most damage to machine elements).

- In some cases particularly hydraulic systems incorporating spool valves etc. protection at 1-3 micron size is advisable;
- Removal of water contamination in oil is vital in ensuring top oil condition;
- Support your filtration program with regular oil analysis to prove its effectiveness;
- At least 50% of your reservoir capacity should be processed per hour for both particulate and water contamination removal;
- Analyse and upgrade contamination and exclusion and removal components such as seals, tank vents and caps and filtration;
- Evaluate your filtration systems for their ability to handle high contamination ingress (in the case of seal failure, filter failure, etc.).

Clean oil both indicates and ensures healthy equipment. Oil lubricates, cools, prevents corrosion in and removes impurities from mechanical systems. Attention to oil condition can result in a high standard of equipment performance and deliver returns in terms of lower operating costs and improved equipment reliability.

In a nutshell

This is what we do.

We take on the worry so you don't have to, and make sure that all the oil products in your expensive equipment maintain the highest standards - ISO 13/11 NAS 5 - indefinitely.

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