

Total Purity Solutions

Oil Condition Monitoring

Ocean Team
Total Purity Solutions
A Petrotec Company

Petrotec Total Purity Solutions (Ocean Team Qatar) works with a partner laboratory certified under ISO 17025 to support different customers, offering oil analysis. Petrotec has a specialised and trained team performing the lube and transformer oil sampling as per customer request, both onshore and offshore, and recommend action plans based on oil sample reports.

Petrotec along with their partner laboratory, can provide oil analysis for:

Fluid condition:

- Viscosity
- Acid Numb
- Ruler
- Foam
- Varnish
- RPVOT

Contaminants:

- Water
- Particle count (ISO Code 4 μ , 6 μ , and 14 μ)
- Sodium
- Potassium
- Silicon
- Silver
- Lithium
- Aluminum

Additives:

- Boron
- Zinc
- Magnesium
- Molybdenum
- Barium
- Sulfur
- Phosphorus
- Calcium

Wear metals:

- Tin
- Lead
- Copper
- Vanadium
- Iron
- Chromium
- Molybdenum
- Nickel
- Manganese
- Titanium
- Cadmium
- Aluminum



Contamination Removal / Filtration

Petrotec provides different contamination solutions by using specialist filtration equipment such as:

- Online / Offline filtration skids for particles filtration.
- Water separation and dehydration unit for water removal.
- Varnish removal (soluble and insoluble) by using Electrophysical Separation Process (ESP) together with Boost VR (solubility enhancer).



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Petrotec follows ISO 4406 and NAS1638 to evaluate the cleanliness levels of oil depending on customer requests. This parameter is performed using the latest Laser Particle Analyzer (LPA) technology for mineral and synthetic oils. Particle count based on the target cleanliness level is generally used as the criteria of acceptance during contamination filtration.

ISO cleanliness code

Range Code	More than(*)	Up to / Including(*)
24	80,000	160,000
23	40,000	80,000
22	20,000	40,000
21	10,000	20,000
20	5,000	10,000
19	2,500	5,000
18	1,300	2,500
17	640	1,300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5
8	1.3	2.5
7	0.64	1.3
6	0.32	0.64

* Number of particles per milliliter

NAS classes

Size range	5-15µm	15-25µm	25-50µm	50-100µm	>100µm
00	125	22	4	1	0
0	250	44	8	2	0
1	500	89	16	3	1
2	1,000	178	32	6	1
3	2,000	356	63	11	2
4	4,000	712	126	22	4
5	8,000	1,425	253	45	8
6	16,000	2,850	506	90	16
7	32,000	5,700	1,012	180	32
8(*)	64,000	11,400	2,025	360	64
9(*)	128,000	22,800	4,050	720	128
10	256,000	45,600	8,100	1,440	256
11	512,000	91,000	16,200	2,880	512
12	1,024,000	182,400	32,400	5,760	1,024

(*) Typical NAS class for a new fresh oil. Based on maximum contamination limits, particles per 100ml.

In addition, we also perform ISO 4407 on case to case basis. In this method, an optical microscope is used to view and count the particles. This enables us to have first hand information on the type of particle contamination prior to detailed laboratory analysis.



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Oil Flushing

Petrotec possesses the technical capabilities that allow them to perform oil flushing quicker than their competitors as well as meeting customer's requirements. Petrotec provides different oil flushing types such as:

- **Hot oil flushing:** Hot oil is circulated through associated systems at high velocity.
- **High velocity flushing:** An uninterrupted flushing using high flow flushing skids to pump oil through the piping at a specific flow rate to achieve the optimal Reynolds Number.
- **Pulsation flushing:** Exposing the flushing oil to pulses, caused by sudden but controlled compression, in order to create sound waves. This will generate an even higher Reynolds number in the pipe system, resulting in shorter flushing duration.

Oil Enhancement

Petrotec is the authorised distributor of Fluitec's products in Qatar since 2016. In order to reduce wasted oil, costs and to increase oil quality, Petrotec provides different "fill for life" solutions, such as:

BOOST AO

Boost AO is a proprietary technology created to replace depleted antioxidants in the oil - replenishing bad chemistry with good chemistry.

Infinity TO 32/46

Prolong the useful life of the turbine oil and also extend indefinitely the life of the machine, by preventing varnish and deposits formation.

DECON™

A patent pending technology to eliminate deposits from systems.

- Efficient cleaning of lube oil systems between fluid changes.
- Quickly and safely dissolves organic deposits from machine internals.
- Enhances deposit control performance of in-service fluids.
- Long term system protection against deposit, sludge and varnish.

FLUSHING IN HALF THE TIME

 **Boost AO**

 **Infinity TO**
THE LAST TURBINE OIL YOU'LL EVER NEED

 **DECON**

 **Boost VR**



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Offshore Chemical Cleaning

Petrotec has developed equipment, methods and technologies that efficiently clean a wide variety of systems, including produced water, closed cooling water, seawater cooling, flow lines, drains, pipes, vessels, coolers, heat exchangers, wellhead X-trees etc.

- On-line cleaning technology.
- A controlled process based on meticulous measurement of the contamination type.
- Preservation of pipes and equipment.
- Dosing and injection services.

Pressure Vessel Cleaning

Petrotec has developed procedures and risk assessments for safe confined space entry cleaning of pressure vessels such as inlet separators, test separators, hazardous and non-hazardous drain tanks, etc.

- Our fleet of Ex-proof specialised equipment is suitable for offshore space limitations.
- Our workforce is well trained in confined space entry requirements and have extensive experience in offshore pressure vessel cleaning.



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