

Suggested Sampling Procedures

Pre-Plan Preparation

- **Develop a plan for oil samples, what tests, how many bottles and how much oil is needed?**

TIP: 4 oz bottles are needed for Laser Net Fines Cleanliness and Patch Tests, if you are going to do foam/water separability or anything else get a larger sample (1 quart)

TIP: Kick off discussion at customer/prospect location to set up a route that allows for most efficient collection.

- **Make sure to collect enough oil at the time a sample is collected, use this chart to quantify the sample amount needed.**

For example, ISOCLEAN testing on Turbine/R&O oils require 2 oz for water separability, 15 oz for three sequence foam testing and 3 oz particle count meaning, thus 20 oz needs to be collected. This means a larger sample bottle is needed.

Test Name	Volume Needed	
	mL	OZ
Acid Number	50	2
Water Separability	50	2
Foam Sequence - Only one	250	8
Foam Sequence - All Three	450	15
ICP Metals	10	0.3
Particle Count - ISO Cleanliness	100	3
Karl Fischer Water	25	1
MPC (Membrane Patch Colorimetry)	75	3
RPVOT	100	3
Viscosity - 40C/100C/Index	30	1
Total Volume		

Conversion factor 1 mL = 0.033814 oz

Tests Explained

LNF Particle Contamination - Cleanliness rating shows the level of a particulate contaminant based on size of 4 micron / 6 micron and 14 micron particles in a 1 mL sample.

Karl Fisher – Test performed to measure trace amounts of water. Reported in ppm.

Patch Test – Lubricant is passed through a ½ micron patch and analyzed under a microscope by a technician.

Foam Sequence One & Three ASTM D-892 – measures lubricants ability to release air over time. Results are reported in as two digits, like 0/0 (total amount of foam/amount of foam remaining after 10 minutes to dissipate). New lubricants should be at a 0/0. Sequence one tests how long to foam/stability and Sequence 2 is how long until the foam goes away and Sequence Three is where the same lubricant from Sequence II is cooled and tested again.

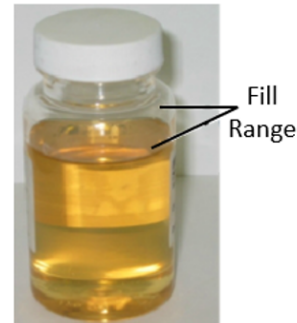
Water Separability ASTM D-1401 – the lubricants ability to separate water and resist emulsion are important for performance/protection. The test provides 3 measurements reported as oil/water/emulsion and the number of minutes shown in parenthesis, e.g. 40/40/0 (15). The end of the test is 3 mL or less emulsion or 60 minutes from end of stirring. Results typically reported as pass/fail.

ICP Metals – tests the oil for metallic additives, contaminants and wear.

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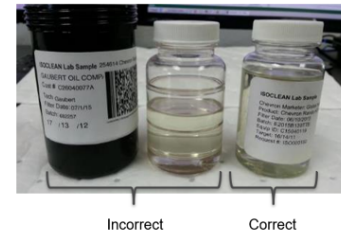
Oil Sampling Procedure

1. Start with clean new sample bottles designed for oil
2. Fill sample bottle half full and cap it
3. Vigorously agitate/shake for 5 seconds
4. Empty
5. Repeat 2 more times
6. Fill bottle $\frac{3}{4}$ of the way (Fill Range), label and send to lab
7. Make sure lid is tight/sealed prior to shipping
8. Complete & include form for lab and send out promptly



Bottle Labeling

- Ensure labels are properly install on the sample bottles and not the secondary mailing container when sent for certification.



Labs for Submission

- RMFS – USE THIS LAB FOR ISOCLEAN Baseline samples
 - Select Laser Net Fines and Patch Test.
 - If water contamination is of concern also get water by Karl Fisher testing.
- ALS Laboratory
- Polaris Laboratory
 - All contact info and forms are available within Chevron Marketing Hub

Cleaning Oil Sampling Equipment

A solvent (like mineral spirits) is best for cleaning oil from your sampling equipment. It can be messy, so work in a safe and well-ventilated location. Supplies needed: safety protection (rubber gloves and safety glasses), drop cloths or newspapers to protect work surface, cleaning tray, drying tray, lint free paper towels and container to collect used solvent for appropriate disposal. You may contact your local waste disposal service to ensure proper disposal.

Steps:

1. Put on safety gear (may want to wear an old shirt too)
2. Protect work area by laying drop cloth or newspapers under both trays
3. Pour Solvent in Cleaning tray, make sure equipment is submerged. Let it soak, there is no specified amount of time, but would recommend at least 15 minutes.
4. Lay Lint free paper towels in drying tray, you may wipe down equipment
5. Once cleaned place equipment into new, clean zip lock bags and seal tight. Place cleaned equipment back into oil sampling kit for future use.

Items in the Kit - Reordering Information

Kit Component	Reordering Information - Ordering Site/Item Code
1 - Carry-On Approved Rolling Case - Nanuk 935	https://www.amazon.com - Nanuk 935 Black
1 - Small - tools case for sampling equipment	https://www.amazon.com - PFC 135-100-044-5SF
2 - WIX 24290 Oil Analysis Pumps	https://www.amazon.com - WIX 24290 (Includes one length of plastic tubing)
6 - Lengths of plastic tubing	https://gosm.com/products/1-4-tubing?_pos=2&_sid=429ac3655&_ss=r&variant=41032541766
2 - Specialized threaded pipe adapters for pump	Call Chevron Merch Center - 1.877.491.3619
1 - Complete Set of Sampling Pipe and Fittings	Entire fitting kit with pump and 4 oz bottles found on www.chevronmerchcenter.com
10 - 4 oz. plastic bottles	https://gosm.com/collections/bottles/products/clear-bottle?variant=21462052038
2 - 1 qt. plastic bottles	https://gosm.com/collections/bottles/products/hdpe-bottles?variant=23432203270
1 - Pair safety glasses	https://www.uline.com - 17944C
1 - Disposable ear protection	https://www.uline.com - 17098
1 - Box of 180 lint free towels	https://www.uline.com - 13737
12 - Delo [®] branded oil rags	www.chevronmerchcenter.com - CDL059
1 - Safety Vest	https://www.safetysmartgear.com -RCZ2410
1 - NEBO 6657 Flashlight	https://www.amazon.com - Nebo 6657 LEO Work Light
1 - Box of 100 Disposable Nitrile Gloves	https://www.uline.com - S-14179
100 - ISOCLEAN hard hat decals	www.chevronmerchcenter.com - ST078
1 - Clip Board	https://www.uline.com - S-15545
2 - Sharpie Markers	Local Office Supply
1 - Sheet of Avery labels (5163)	Local Office Supply
12 - Heavy Duty Zip Lock Bags	https://www.uline.com - S-17770
1 - 18" Guide Wire	Local Hardware Store - (9 gauge galvanized straight wire)
1 - Roll Electrical Tape	Local Hardware Store
10 - RMFS Sample Form	Chevron Marketing Hub