Sun Coast RESOURCES, INC.

Quality Fuels & Lubricants℠

ISOCLEAN™ SERVICES

Chevron

How Oil Gets Dirty

The journey from blend plant to customer presents many opportunities for lubricants to pick up contamination. As oil is transferred, it can pick up contaminants too small to see with the naked eye.

Lubricants shipped from the manufacturing and blend plant contain contaminants.

Then they are transported to the marketer warehouse by truck or rail.

The oil is pumped into marketer storage tanks.

Lubricants are transfered from the storage tanks into marketer delivery trucks.

Marketers deliver oil to customers.

Customers use the lubricants in equipment and may add contaminants by using dirty dipsticks, top off containers or hoses.

EXECUTE PROPER PRODUCT STORAGE AND HANDLING STANDARDS

MORE OFTEN THAN NOT, IMPROPER FLUID CLEANLINESS BECOMES A SELF-FEEDING CHALLENGE FOR A MAINTENANCE TEAM; DEBRIS INTRODUCED OR GENERATED BY THE IN-SERVICE FLUID GENERATES MORE WEAR-RELATED DEBRIS.

PROPER STORAGE

- Products are stored indoors or in oil sheds
- Larger volume products are stored in bulk
- Clearly visible product labels are on each bulk tank
- Each bulk tank includes a visible oil level gauge
- Each bulk tank includes a desiccant breather
- Each bulk tank includes a hatch cover that closes and seals properly
- Drums stored outdoors are stored on their sides with bungs at the three and nine o'clock positions
- Drums are rotated on a first-in first-out basis
- Drums include an adaptor for dispensing and have a desiccant breather
- Grease drums/kegs include pump, follower plate and dispenser with lid that seals and closes
- Product labels are clearly visible on drums, including fill dates
- Oil shed/area is clean and free of absorbent, oil and other contaminants
- Products are stored in a systematic manner and labeled as such (hydraulic oil, engine oil, etc.)
- The number of products are optimized based upon applications

PRODUCT HANDLING

- A dedicated hose reel and metered dispenser is plumbed into each bulk tank
- Each reel includes a product label
- Reel offers enough length for product to dispense directly into oil reservoir
- Properly sized oil/grease pump for each bulk tank that provides adequate flow for different product viscosities and product transfer distances
- Each pump seals properly to the bulk tank
- Dedicated drum pump and transfer line/dispenser
- Drum pump that properly seals to drum
- Dedicated oil-safe containers for each product that are color coded and labeled
- Product funnels are avoided, if possible; if used, they are cleaned after each use and stored in sealed bags
- Filter carts are dedicated or properly flushed and cleaned between use
- Desiccant breathers and point of dispensing filters are maintained on a scheduled basis

CONTAMINATION OF SYSTEM FLUIDS (LUBRICANTS, COOLANTS AND FUELS) MAY OCCUR FOR ANY OR ALL OF THE FOLLOWING:

1. Ingressed – During delivery (dirty fluid delivered – bulk), improper storage (package) or tank breathers (bulk), operator error (dirty top-off oil added), or poor system seals (e.g., hydraulic cylinders).
2. Work generated – Wear debris/particles generated during normal or abnormal operations.
3. Built in – System was not properly flushed during original installation or rebuild.
4. Maintenance – Routine filter changes, hose, seal and cylinder replacement, and even system inspections that open the system up for atmospheric contaminants to freely enter.

TYPICAL CONTAMINANTS FOR FLUID SYSTEMS CAN BE GROUPED INTO FIVE BASIC TYPES:

1. Metallic – By-product of component wear or production processes (e.g., machining).
2. Foreign materials – Thread tape and gasket sealers, gasket or hose materials, welding buckshot, shop rags, etc.
3. Wrong lubricant – Mechanic tops off with the wrong viscosity grade or wrong product type (gear oil vs. hydraulic oil).
4. Water, dirt, oxidation by-products – Water, either through process sources or condensation; airborne or maintenance-introduced dirt/silica; and fluid oxidation by-products, including varnishing.
5. Gases – Excessive aeration or pump cavitation (e.g., improper system design and leaking hoses and seals).

ISO/RANGE CODE	MIN PARTICLES/ML	MAX PARTICLES/ML
10	5	10
11	10	20
12	20	40
13	40	80
14	80	160
15	160	320
16	320	640
17	640	1,300
18	1,300	2,500
19	2,500	5,000
20	5,000	10,000
21	10,000	20,000
22	20,000	40,000
23	40,000	80,000
24	80,000	160,000
25	160,000	320,000

GENERAL RULES OF THUMB FOR INDUSTRIAL OILS

1. Greater fluid volume controls require increased fluid cleanliness.

Pump Type	Fixed Gear	Fixed Vane	Fixed Piston	Variable Vane	Variable Piston
	19/17/15	18/16/14		17/15/13	

2. Higher pressure demand requires increased fluid cleanliness.

Variable Piston	<2,000 psi	2,000–3,000 psi	3,000 + psi
	18/16/14	17/15/13	16/14/12

3. Increased flow control (valve speed and precision) requires increased fluid cleanliness.

2,500 psi	Solenoid	Standard Flow Control	Throttle/Proportional	Servo
	20/18/15	19/17/14	18/16/13	16/14/11

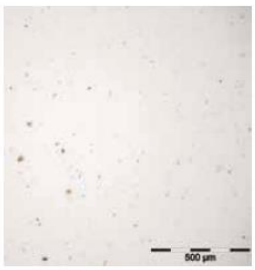
4. Work-Load Requirements – Increased HP, speed and direction require increased fluid cleanliness.

3,000 psi	Cylinders	Radial Piston Motors	Axial Piston Motors	Hydrostatic Trans.
	20/18/15	19/17/13	18/16/13	16/14/11

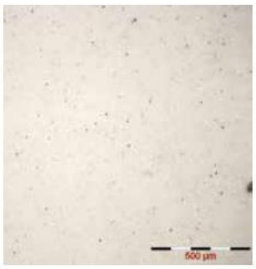
Journal Bearing Low Speed	Journal Bearing High Speed	Gearbox General Industrial	Roller Bearing	Ball Bearing
18/16/14	17/15/13	17/15/13	16/14/11	15/13/11

ISOCLEANLINESS RATING COMPARATOR

MAGNIFIED OIL SAMPLES SHOWING CONTAMINANTS.



20/19/15



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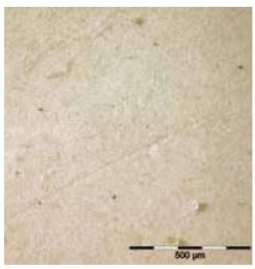

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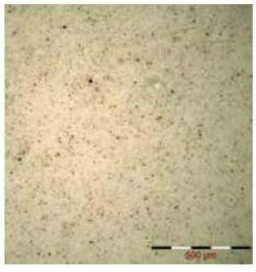
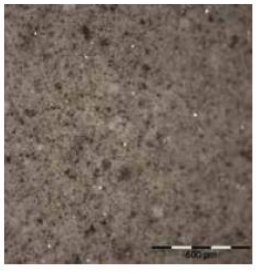


22/21/17

23/22/16



23/22/21

Reliability-based Lubricants (RbL®) practices for increased productivity and optimal equipment performance

With Sun Coast's ISOCLEAN Services, reliability is built in.

Reliability-based Lubrication (RbL) isn't just about lubricants. It's a powerful combination of knowledgeable people, targeted products and services and customized solutions for your equipment. Our RbL and ISOCLEAN Services are a comprehensive, proactive approach to achieving lubrication excellence that helps you add value to your business and achieve your financial goals.

ISOCLEAN Services

Depending on your business – whether it's construction, mining, waste collection, power generation, petrochemical, injection molding, marine, manufacturing or other – Sun Coast's ISOCLEAN Services will help you achieve the desired cleanliness levels required in the original equipment manufacturers' specifications.

ON-SITE FLUID PURIFICATION
Removing particle contamination will increase the reliability and the life of the system by minimizing fluid oxidation, maintaining lubricity properties and reducing fluid aeration.

SYSTEM DECONTAMINATION
Removing dirt and water through proper decontamination techniques will extend drains and fills.

HIGH-VELOCITY FLUSHING
Removing dirt and water through proper cleanup techniques extends fluid life.

RESERVOIR AND TANK DECONTAMINATION
Reservoir and tank cleanup is performed by fully trained technicians certified in confined-space entry. This service ensures safe and effective contaminant removal and clean oil storage.

CLEAN SYSTEM PREPARATION
Ensures systems are ready for Chevron ISOCLEAN Certified Lubricants to maintain fluid cleanliness levels to the point of equipment fill.

VARNISH REMOVAL/MITIGATION
Varnish removal and mitigation services utilizing the latest chemical cleaning and resin technologies, lubricant consulting and other proven methods to address all types of varnish problems.

CONDITION MONITORING AND SYSTEM AUDITS
Monitoring techniques to ensure the best possible lubrication cleanliness for rotating equipment. Sampling and analysis of lubrication fluids and performing corrective actions when indicated are key factors in maximizing uptime and reliability and extending oil and machine life.

FLUID DEHYDRATION
Vacuum dehydration and centrifugal separation for running equipment, bulk oil storage tanks and operating reservoirs.

LUBE OIL DISPOSAL ALTERNATIVE
This is an alternative to lube oil disposal during turnarounds, outages and planned or unplanned shutdowns resulting in the continued use of cleaned and certified oil.

FLUID HANDLING AND CONSULTATION
Ensures bulk storage facilities have the proper filtration to maintain ISO-Cleanliness levels and the proper breathers for air management.

Plastic injection molding

Vacuum dehydrator used to remove water contamination.

With the right support, running your business gets easier with time

Operating conditions are becoming more severe; manpower is becoming more precious; the cost of downtime is increasing; energy costs are cutting into profits; new government and environmental mandates are being introduced; and OEM requirements are becoming more demanding. All of these add to the challenge of running your equipment efficiently and profitably. These challenges are the very ones that require the expertise and services you will get from Sun Coast Resources Inc.

ISOCLEAN Services is a solution for meeting system fluid specifications for the following companies by segment:

INDUSTRIAL TURBINE SYSTEMS:
General Electric, Seimens, Mitsubishi, Alstom

HYDRAULIC SYSTEMS:
Bosch Rexroth, Eaton-Vickers, Parker Hannifin (Denison), Joy, MAG Cincinnati

MINING & CONSTRUCTION EQUIPMENT:
Caterpillar, John Deere, Komatsu, Hitachi, Volvo

PLASTIC INJECTION MOLDING:
Arburg, Battenfeld, Cincinnati Milacron, Engel Electric, HPM, Husky, Meiki, Newbury, Nissei, Sumitomo, Toshiba, Van Dorn

How to control your total cost of operation

Ultimately, the performance of your equipment depends on the cleanliness and integrity of the fluid being used. Equipment operating under normal temperature with fluid systems kept free of solids, moisture and gases are likely to last significantly longer than equipment with contaminated systems. The more sophisticated the equipment, the greater the cost and potential for failure or poor performance due to contaminated fluid systems.

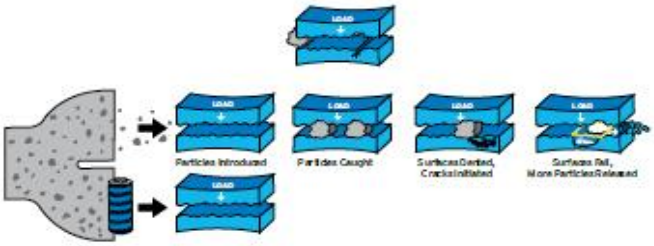
Our ISOCLEAN Services are a proactive approach to maintaining your systems for peak performance and maximum component service life. It starts with a detailed site assessment by certified ISOCLEAN technicians to establish base-line conditions and best-in-class performance standards for your specific operation. Immediate corrective action plans are recommended to get poor-performing systems up to standards or to reduce imminent threats to your production.

Once under control, our ISOCLEAN technicians execute on a proactive program through advanced oil analysis and equipment inspection programs to identify problems before they shut you down.

The left beaker pictured is actual hydraulic oil with high levels of moisture and particle contamination at ISO-Cleanliness code 22/21/20. The right beaker shows the same sample after the contaminants were removed at the new ISO-Cleanliness code 18/16/13.

SOLID CONTAMINATION

When solids such as metal particles, dirt and other contaminants enter the dynamic lubrication zone of machine components, the chain reaction of wear begins. The initial contact of the particle with component surfaces generates additional wear debris that, if not removed, remain in the system and accelerate the cycle. Leaking or ruptured hoses, leaking seals, pump, bearing, and servo failures are the direct results.



MOISTURE CONTAMINATION

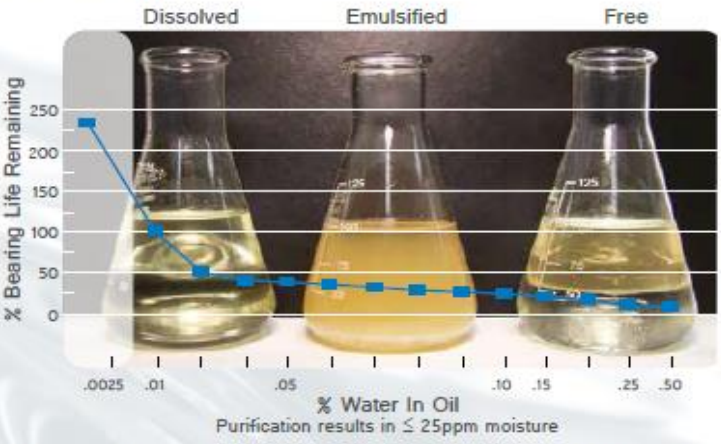
Water affects both the fluid and your equipment. It promotes oil oxidation and hydrolyzes (chemically attacks) fluid additives that compromises lubricant performance and can actually generate highly corrosive byproducts. A moisture-degraded fluid cannot protect equipment leading to wear and failure. Moisture also attacks through rust, corrosion, vaporous cavitation and loss of lubricant film strength.

Industrial turbine systems

LIQUID AND GAS CONTAMINATION

When external gases, liquids and process carryovers mix with a system's fluid, significant changes in the fluid's physical and chemical properties can result. Some of the effects of foreign fluid and gases are foaming, loss of lubricant film strength, fluid becoming acidic, cavitation erosion, and reduced flashpoint.

Mining and construction equipment



Bulk storage tanks

The greater percentage of water in a lubricant accelerates wear on bearings. In the beakers on the right, the concentration of water increases from left to right, reducing the bearing life.

Contact us today to take advantage of ISOCLEAN services to achieve lubrication excellence that will help you add value to your business and achieve your financial goals.

EXPERIENCE IN THE INDUSTRY AND PROVEN PERFORMANCE

SAFETY AND COMPLIANCE PROGRAM

INSURANCE

SPILL RESPONSE

TRAINING PROGRAM

PROCESS LIBRARY

VERIFICATION OF RESULTS (THIRD-PARTY LABORATORY ANALYSIS)

MSHA AND OSHA CERTIFIED

Sun Coast RESOURCES, INC.

Quality Fuels & Lubricants℠

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