EnviroLogic® Frequently Asked Questions

SELECTION & PERFORMANCE OF ENVIROLOGIC® LUBRICANTS

Q: Do EnviroLogic® lubricants perform as well as petroleum based lubricants?

A: Based on extensive field testing performed by and with our customers and independent laboratories, we have found that our fluids perform equally or superior to their petroleum based counterparts. The performance benefits EnviroLogic® products offer include:

- Reduced environmental impact (Readily Biodegradable, Minimally Toxic and not Bioaccumulative)
- Equal or better lubricating performance relative to petro-chemical based fluids
- Equal or longer fluid change out intervals compared to incumbent petrochemical based fluids
- Improved hydraulic component wear protection
- Extended component life

Q: Can an EnviroLogic® product and a petroleum based product be mixed together?

A: Yes, EnviroLogic® and petroleum based fluids can be mixed together. When mixing fluids in a hydraulic power system, environmental benefits of EnviroLogic® are reduced in relative proportion to the amount of petroleum based oil. We recommend draining the system of petroleum oil, flushing with EnviroLogic® BioFlush and then refilling the system with recommended EnviroLogic® product for maximization of environmental benefits.

EnviroLogic® lubricants can be mixed and disposed of in the same waste oil drum as petroleum based fluids.

We also offer our EnviroLogic® customers reservoir and equipment decals to help minimize the risk of accidental system contamination.

Q: How do I choose the right EnviroLogic® biodegradable fluid for my system/equipment?

A: The following information is used to determine the best biodegradable fluid:

- Name and viscosity grade of current fluid used in the hydraulic system
- OEM hydraulic fluid specification or recommendations
- System operating temperature and pressure
- System application specifics

Please refer to our product data sheets at www.rscbio.com for best match or call our technical specialists for recommendation at (800) 661-3558.

Q: Are there any special procedures I should follow when replacing the petroleum oil product I currently use with EnviroLogic®?

A: The flush and fill procedure to convert to EnviroLogic® products is as simple as the cleaning and maintenance procedure you currently use for scheduled care of your equipment. Although it is not required, we recommend flushing the hydraulic system with EnviroLogic® BioFlush before filling with the appropriate hydraulic fluid.

A residual amount of petroleum oil will remain in the sump of the equipment. This will have no effect on the performance of the EnviroLogic® fluid. The second oil replacement will completely purge the system of any residual petroleum oil.

For further detailed equipment flushing procedures, please contact us at (800) 661-3558 for EnviroLogic® Changeover Procedure.

Q. How do I know when to replace the EnviroLogic® product I am using?

A. Always follow the original equipment manufacturer's suggested oil change frequency requirements or conduct regular oil sampling and analysis to determine exactly when oil needs to be changed. RSC Bio Solutions works closely with our customers to develop oil sampling and analysis programs. Please contact your sales representative to learn more.

Q. What tests should be used to monitor EnviroLogic® fluid field performance?

A. Key fluid performance indicators measured in oil sampling and analysis include:

- Stay-in-grade kinematic viscosity @ 40°C
- TAN increase
- Water contamination
- Additive/wear elements
- Particle counts

Q. What is the useful life of an EnviroLogic® fluid?

A: It will depend on the specific oil, operating system temperature and pressure. EnviroLogic® oils usually last as long as or longer than comparable petroleum based fluids.

Q: Are EnviroLogic® products compatible with seals?

A: Yes, they are compatible with NBR (Buna), HNBR (hydrogenated Buna), AU (Polyurethane) and FKM (Viton).

Q: How do EnviroLogic® products react with water intrusion (water getting into a system)?

A: Our products are formulated to have excellent demulsibility characteristics (splitting of water). If water is determined to be above 1000 pm measures should be taken (as with any hydraulic fluid) to remove the water to prevent interaction with additives and base fluids.

Q. What is the shelf life of EnviroLogic® products?

A. The shelf life for EnviroLogic® products is warranted for two years, after which it can be recertified by RSC Bio Solutions for an additional year.

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Q: Can you guarantee that your fluids will not cause issues with equipment?

A: EnviroLogic® readily biodegradable products have been thoroughly evaluated both in performance testing and in the field. The products meet or exceed the performance requirements of most major equipment manufacturers. EnviroLogic® products meet all relative API, ASTM, and other industry standards.

RSC Bio Solutions stands behind its products and will underwrite any proven lubricant related field failure, not warranted by the equipment manufacturer, caused from the use of these products and substantiated by records documenting the proper use of the fluids.

It is required for this General Product Warranty that any fluid that has prior service use in the field must have been utilized and handled according to equipment manufacturer requirements and standard lubrication practices. This would include the availability of appropriate maintenance records. RSC Bio Solutions warrants only EnviroLogic® fluid performance. This product warranty will apply to all EnviroLogic® products that are commercially available.

Q: Does using EnviroLogic® void the warranty in equipment?

A: EnviroLogic® is approved by many original equipment and subcomponent pump manufacturers and we continue to partner with specific OEMs to add others as customers' request. We recommend contacting your OEM and visiting our up-to-date approvals list at www.rscbio.com.

Q: Do EnviroLogic® products cost more?

A: An EnviroLogic® product cost relative to petroleum oils will depend greatly on petroleum oil utilized. Our customers tell us that, EnviroLogic® products save them more overall:

- Little if any protective equipment needed
- Lower shipping, handling and containment costs
- Lower cleanup costs
- Lower regulatory costs and reduced risk of fines
- Potentially longer changeover intervals

BIODEGRADABILITY & OTHER ENVIRONMENTAL BENEFITS

Q: What does biodegradability actually mean?

A: Biodegradability is defined as the ability of a substance to be digested or consumed by naturally occurring microorganisms present in water, air and soil systems. Complete biodegradability is the conversion of a substance to carbon dioxide and water.

Q: How is biodegradability measured?

A: There are several standard test methods used to measure biodegradability. The test generally accepted in Europe is the Organization of European Cooperative Development (OECD) 301B test. This test is accepted by product developers and consumers as a "measuring stick" to help the user to understand the products' environmental impact. ASTM D7373 is gaining acceptance as evidenced by EPA's inclusion into the 2013 VGP guidelines.

Acceptable or passing levels for these tests are as follows:

Biodegradability, %	ASTM D7373	> 60%
Biodegradability, % in 28 days	OECD 301B	≥ 60%

Q: What differentiates Inherently Biodegradable from Readily Biodegradable?

A: *Inherently biodegradable* is defined as the characteristic of a product to be consumed by naturally occurring organisms in nature over an indefinite period of time (> 20% but < 60% as measured by OECD 301B testing). This characteristic is defined by the original composition of the product). *Readily biodegradable* is defined as the ability of a product to biodegrade quickly and completely (≥ 60% by OECD 301/ASTM D7373 testing).

Q: Are there different types of biodegradable hydraulic fluids?

A: As categorized by ISO 6743 there are four types of biodegradable fluids:

1. Hydraulic Environmental Triglycerides (HETG)
2. Hydraulic Environmental Polyalkylene Glycols (HEPG)
3. Hydraulic Environmental Synthetic Esters (HEES)
4. Hydraulic Environmental PAO (Polyalphaolefins) and related hydrocarbon products (HEPR)

Q. Why would I want to use readily biodegradable lubricants?

A. Biodegradable oil can be used in any equipment operating in sensitive environments. Biodegradable oils have been designed for equipment that has the ability to come in direct contact with air, soil, or water systems and pose no risk to mammalian, vegetation or aquatic life because these products are minimally toxic and not bioaccumulative.

Q. Will EnviroLogic® environmentally acceptable lubricants biodegrade in my equipment?

A. No, the products need temperature, microbes and water to biodegrade.

Q: Do I have to report a spill with EnviroLogic® lubricants?

A: Reporting requirements varies from state to state and county to county across the United States. You should always report a spill and also notify the regulating entity that it is a *readily biodegradable product* and provide them with the safety data sheets if necessary. There is a good probability that reduced cleanup and fine response will be much less severe as compared to spilling a hazardous product.

Q: I know remediation costs for a petroleum spill is costly. What is the price range for remediation costs for petroleum based products and readily biodegradable products?

A: Our customers have reported remediation costs for petroleum based spills to range anywhere from $2,000 to $10,000 and sometimes beyond. Cleanup costs for readily biodegradable products have ranged from $500 to $1000 (mostly for absorbent and cleaner costs), however, that is dependent on the county and state where the spill occurred.

Q. How do I dispose of a used EnviroLogic® lubricant?

A. Disposal of all EnviroLogic® products should be handled according to the same used for conventional petroleum oils. They can also be mixed with petroleum based products in waste drums and if used in a recycling / fuel process and or product.

Q: What are some of the public relations benefits that customers have benefitted from when using readily biodegradable EnviroLogic® fluids?

A: For example, work truck fleets that are promoting CNG can also add truck body decals to promote use of EnviroLogic® fluids. Many companies and cities have generated press releases and shared the news on local and national levels. When a spill occurs that could be potentially hazardous, use of readily biodegradable fluid mitigates a potentially negative event more.

EPA 2013 VESSEL GENERAL PERMIT (VGP)

Q. What characteristics are required for environmentally acceptable lubricants to be compliant Vessel General Permit (VGP) 2013?

A: There are three key characteristics of Environmentally Acceptable Lubricants (EALs) that are defined in EPA 2013 VGP Appendix A:

- Biodegradable
- Minimally toxic
- Not bioaccumulative

If a product meets the above criterion, it is approved by the EPA and self-certified as VGP 2013 compliant. The EPA does not certify or recommend EALs.

Q. How do you know if an EAL is technically feasible for use in original equipment?

A: If a product meets the following criterion, it is considered technically feasible:

- One or more OEM has approved EALs for use
- EALs are available for pre-lubricated products
- EALs are available in Vessel's ports of call
- Next dry dock has occurred