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"As a cylinder oil supplier, our expectation is that gas engines will take a growing share of the two-stroke market."
Jan Toschka, general manager, Shell Marine Products

Behind the label: choosing an EAL

Environmentally acceptable lubricants (EALs) are now essential in US waters, but product labelling schemes are inconsistent, says Mark Miller, executive vice president of business development for RSC Bio Solutions

What are Environmentally Acceptable Lubricants (EALs)?

One of the most comprehensive definitions is the US Environmental Protection Agency's (EPA's) definition. It defines an EAL as a "lubricant that is biodegradable, exhibits low toxicity to aquatic organisms and has a low potential for bioaccumulation." This definition is included in the EPA's 2013 Vessel General Permit (VGP) revision.

What is the EPA 2013 VGP?

The EPA 2013 VGP revision requires all vessels to use EALs in all oil-to-sea interfaces unless technically infeasible. The regulation is applicable to all commercial vessels larger than 79 ft (24.1m) operating within three nautical miles of either the United States coastline or in any one of the Great Lakes. The 2013 VGP also requires any above-water-line hull cleaning or deck washdowns resulting in discharge to be conducted with "minimally-toxic" and "phosphate free" cleaners and detergents as defined in the permit. There is no VGP equivalent for ships outside of US waters.

What is EU Ecolabel?

EU Ecolabel is a voluntary label that indicates products and services that have a reduced environmental impact throughout their life cycle, including mining raw materials, production, use and disposal. EU Ecolabel is recognised and widely accepted throughout Europe and, as of October 2014, can be found on more than 17,000 products.

Do VGP and EU Ecolabel requirements differ?

These labelling schemes vary in requirements for toxicity, bioaccumulation and biodegradation and, in the case of EU Ecolabel, have the additional requirement for biobased content. While biobased content has the benefit of increased sustainability, biobased content levels greater than 25 per cent can result in significant deterioration in fluid performance and durability.

How do companies demonstrate VGP compliance?

EAL compliance with VGP can be demonstrated through independent laboratory testing of the biodegradability, toxicity and bioaccumulation of fluid – often referred to as self-certification.

For European manufacturers, VGP compliance can be demonstrated through one of five EU labelling programmes that are accepted by the EPA: Blue Angel, Nordic Ecolabel, Swedish Standards Institute, OSPAR and EU Ecolabel.

How does this biobased content affect performance?

Developing products to meet the specifications of EU Ecolabel limits the formulation and can result in the loss of performance. EU Ecolabel has a biobased content requirement that calls for the use of ester technology that is prone to hydrolysis, or the breakdown of chemical bonds by the addition of water.

Wet environments, such as those found in the marine industry, cause base fluids to break down more quickly. Certain types of EALs, such as Hydraulic Oil Environmental Polyalphaolefines and Related Products (HEPRs) or readily biodegradable hydrocarbon and related types that do not contain the ester-like structures, are less susceptible to hydrolysis and offer improved protection of marine equipment.

How does lab testing differ from real-world performance?

Even among EALs, there is a wide variety of performance levels. Many EALs can meet ISO performance standards in the laboratory but may not perform well in a marine environment, forcing companies to choose between performance and sustainability.

This trade-off has been eliminated by some companies, who are able to produce readily biodegradable products that meet or, in some cases, exceed the performance of their petroleum-based counterparts in viscosity levels and wear performance.

How should operators evaluate labels?

Responsible suppliers clearly reference their definition of "environmentally preferable" and offer corroborating support. The US Federal Trade Commission (FTC) has been very specific in its recommendations for environmental claims and states: "look for evidence that gives some substance to the claim, the additional information that explains why the product is environmentally friendly." Many suppliers use misleading product environmental claims such as "biodegradable," "inherently biodegradable" or "food grade." Suppliers should be able to support performance claims with test data. For example, the FTC requires companies that use the term "readily biodegradable" when describing their products to state the test, such as "OECD 301B or ASTM D7373 compliant" in validation of the claim.

Mark Miller (RSC Bio Solutions): EAL suppliers should be able to support performance claims with test data (credit: RSC Bio Solutions)

What should an operator look for in an EAL supplier?

Any fluid supplier should be able to demonstrate the success of its product over time in a wide range of applications. It is important to partner with a fluid supplier with enough field and technical experience to provide a technically feasible EAL.

Since readily biodegradable products behave differently from conventional petroleum products, one should not count exclusively on the conventional oil analyst's interpretation of test lab results when comparing data. This information is critically important in evaluating the product's performance and determining its success in a specific application. ***MP***