

Leaders in Marine Bio-Lubes

Vessel General Permit (EALs)

In March 2013, the US Environmental Protection Agency (EPA) published the final version of its 2013 Vessel General Permit (VGP) which will apply to all vessels entering US waters from 19th December 2013. The VGP requires that "All vessels must use an Environmentally Acceptable Lubricants (EAL) in all oil-to-sea interfaces, unless technically infeasible".

The applications covered by the VGP, which will be regulated by the US Coast Guard, include Controllable Pitch Propellers; Thruster Hydraulic Fluids and other Oil-to-Sea Interfaces including

- Lubrication Discharges from Paddle Wheel Propulsion;
- Stern Tubes;
- Thruster Bearings;
- Stabilisers;
- Rudder Bearings;
- Azimuth Thrusters;
- Propulsion Pod Lubrication;
- Wire Rope and Mechanical Equipment Subject to Immersion.

There are certain situations where "technical infeasibility" can be shown and which are defined in the legislation (see later comment).

Vickers Oils, which is the world market leader in this field and has supplied more than 1,400 vessels over the last 15 years, has approvals for its EALs from many of the relevant equipment manufacturers.

HYDROX BIO, ECOSURE HSE and BIOGREASE EP2 ranges of Environmentally Acceptable Lubricants (EALs) meet the detailed ecological definitions and requirements laid down in the 2013 Vessel General Permit (VGP). Stocks of these products are carried in ports around the world.

WHAT DOES IT MEAN FOR YOU

Any quotations are taken either from the 2013 Vessel General Permit itself ("VGP") or from the EPA's Response to Public Comments dated 28th March, 2013 ("Response") and are referenced as such.

Who is impacted and when does the 2013 VGP apply?

The VGP will apply to all vessels greater than 79 feet (excluding recreational vessels) entering US waters from 19th December 2013. The VGP requires that "All vessels must use an Environmentally Acceptable Lubricant (EAL) in all oil-to-sea interfaces, unless technically infeasible". The EPA's website further states that it intends to finalise the sVGP, (small vessel general permit) applying to vessels less than 79 feet, later this year before introduction in December 2014.

Vessel General Permit (EALs)

What does Environmentally Acceptable Lubricant (EAL) mean?

“Environmentally Acceptable Lubricants” means lubricants that are “biodegradable” and “minimally toxic” and are “not bioaccumulative” as defined in Appendix A [of the VGP] [VGP 2.2.9, p47]. “EPA notes that any lubricant meeting the operational needs of vessel owner/operators and the definition of EALs given in the permit can be used as an EAL. The definition of EAL hinges on biodegradability, toxicity, and bioaccumulation.” [Response, p1014]

For the purposes of VGP:

“Biodegradable” regarding environmentally acceptable lubricants and greases, biodegradable means lubricant formulations that contain at least 90% (w/w (weight in weight concentration)) or grease formulations that contain at least 75% (w/w) of a constituent substance or constituent substances (only stated substances present above 0.10% shall be assessed) that each demonstrate either the removal of at least 70 percent of dissolved organic carbon, production of at least 60 percent of the theoretical carbon dioxide, or consumption of at least 60 percent of the theoretical oxygen demand within 28 days. Acceptable test methods include: Organization for Economic Co-operation and Development Test Guidelines 301 A-F, 306, and 310, ASTM 5864, ASTM D-7373, OCSPP Harmonized Guideline 835.3110, and International Organization for Standardization 14593:1999. For lubricant formulations, the 10% (w/w) of the formulation that need not meet the above biodegradability requirements, up to 5% (w/w) may be nonbiodegradable (but not bioaccumulative) while the remainder must be inherently biodegradable. For grease formulations, the 25% (w/w) of the formulation that need not meet the above biodegradability requirement, the constituent substances may be either inherently biodegradable or non-biodegradable, but may not be bioaccumulative. Acceptable test methods to demonstrate inherent biodegradability include: OECD Test Guidelines 302C (>70% biodegradation after 28 days) or OECD Test Guidelines 301 A-F (>20% but <60% biodegradation after 28 days).

“Minimally-Toxic” means a substance must pass either OECD 201, 202, and 203 for acute toxicity testing, or OECD 210 and 211 for chronic toxicity testing. For purposes of the VGP, equivalent toxicity data for marine species, including methods ISO/DIS 10253 for algae, ISO TC147/SC5/W62 for crustacean, and OSPAR 2005 for fish, may be substituted for OECD 201, 202, and 203. If a substance is evaluated for the formulation and main constituents, the LC50 of fluids must be at least 100 mg/L and the LC50 of greases, two-stroke oils, and all other total loss lubricants must be at least 1000 mg/L. If a substance is evaluated for each constituent substance, rather than the complete formulation and main compounds, then constituents comprising less than 20 percent of fluids can have an LC50 between 10-100 mg/L or a no observed effect concentration (NOEC) between 1-10 mg/L, constituents comprising less than 5 percent of fluids can have an LC50 between 1-10 mg/L or a NOEC between 0.1-1 mg/L, and constituents comprising less than 1 percent of fluids can have an LC50 less than 1 mg/L or a NOEC between 0-0.1 mg/L.

“Not Bioaccumulative” means:

- the partition coefficient in the marine environment is $\log KOW < 3$ or > 7 using test methods OECD 117 and 107,
- molecular mass > 800 Daltons,
- molecular diameter > 1.5 nanometer,
- BCF or BAF is < 100 L/kg, using OECD 305, OCSPP 850.1710 or OCSPP 850.1730, or a field-measured BAF or
- polymer with MW fraction below 1,000 g/mol is $< 1\%$.

What if I leak oil into the water?

The permit reconfirms that vessel owners/operators “must not discharge oil in quantities that may be harmful as defined in 40 CFR Part 110 from any oil-to sea interface” [VGP 2.2.9 p47]

What if I am unable to use an EAL?

“If a vessel is unable to use an EAL, the owner/operator must document in their records consistent with Part 4.2 of the permit, including an explanation of the owner/operator’s inability to do so, and must report the use of a non-environmentally acceptable lubricant to EPA in the annual report”. [Response p1012]

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What does “technically infeasible” mean?

“For purposes of requirements related to EALs, technically infeasible means that:

- i. no EAL products are approved for use in a given application that meet manufacturer specifications for that equipment;
- ii. products which come pre-lubricated (e.g., wire ropes) have no available alternatives manufactured with EALs;
- iii. products meeting a manufacturer's specifications are not available within any port in which the vessel calls; [see also Response p1016]
- iv. change over and use of an EAL must wait until the vessel's next drydocking.” [VGP 2.2.9 p47]

“EPA acknowledges that the mandatory requirement to use such products may not be attainable in all cases for vessels, particularly for existing vessels. Specifically, EPA believes use of these products might be problematic when there is existing equipment for which no compatible products are currently available. EPA added the “unless technically infeasible” provision for new vessel owner/operators to account for those instances in which technical limitations may prevent use of an EAL in an oil-to-sea interface”. [Response p1011]

“If the use of an EAL is not approved for a given piece of existing equipment, its use would not be technically feasible”. [Response p1012]

“Using a product that voids a manufacturer's warranty would not be using a product consistent with manufacturer specifications, and therefore, its use would not be technically feasible. In this case, their use is not technically feasible and would not be required. EPA understands lubricants are available for many existing applications. It is the vessel owner/operators' responsibility to determine whether products are available for the specific equipment on board their vessel”. [Response p1018]

“However, EPA expects that it will be technically feasible for a significant portion of vessel operators to use EALs, particularly for new build vessels during this permit term”. [Response p1011]

“For new build vessel operators, equipment can be selected for which EALs are available for many applications.... Newbuild vessels can select equipment during design and construction which is compatible with EALs for most oil-to-sea interfaces.” [Response p1012]

“Failure to use an EAL when it is technically feasible to do so would be a permit violation”. [Response p1012]

What about the need for EAL in above deck equipment?

Management requirements for deck equipment are provided at Part 2.2.1 of the permit (Deck Washdown and Runoff). Vessel owners/operators are required to minimize oily discharges from machinery and spills on deck by using coamings or drip pans and disposing of the waste in proper containers, regardless of lubricant type. [Response p207]

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“Additionally, to reduce the risk of any leakage or spills of harmful oils into the aquatic environment, EPA strongly encourages the use of environmentally acceptable lubricants in all above deck equipment” [VGP 2.2.1 p 24]

At this time, EPA has “not mandated that vessels “must” use EALs for their deck applications; however, the Agency has provided strong encouragement to do so.” [Response p1041]

Which labelling programs are likely to meet the definition of EALs in the permit?

EPA notes that “EALs labelled by the following labelling programs are expected to meet the permit's limits:

- Blue Angel;
- European Ecolabel;
- Nordic Swan;
- the Swedish Standard SS 155434 and 155470;
- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR);
- EPA's Design for the Environment (DfE).” [VGP Definition of EAL, p143]

EPA has determined that “those listed have environmental standards in testing available at this time that meet the goals of the VGP.” [Response p219]

EPA notes that this list of labeling programs “is merely a tool for vessel operators to easily identify EALs that generally meet the permit requirements. It does not preclude vendors supplying products to any vessel operators from conducting independent testing of unlabeled lubricants to meet permit requirements for EALs.” [Response p211]

“Products that vendors or operators can independently document meet the VGP definition of “biodegradable,” “minimally-toxic,” and “not bioaccumulative” or have been labeled by the mentioned listed and screened programs above meet the requirements of an EAL for purposes of permit implementation.” [Response p219]

EPA also notes that “DfE is a U.S. labelling scheme led by the U.S. Environmental Protection Agency. The VGP is impartial to foreign or domestic products. Products that are not labelled in these labelling programs (including the United States’ DfE) can undergo independent testing and qualify as an EAL so long as EPA standards outlined in the definition are met.” [Response p219]

EPA generally expects that “use of products labeled by one of the labeling programs referenced in the VGP will meet the Environmentally Acceptable Lubricant (EAL) requirements in the permit. EPA believes that these labeling programs identify existing EALs that generally meet the VGP requirements as determined based on a review of product labeling standards. Though there are variations within these programs and some apply to broader application other than shipping and are not specifically limited to EALs, as a general matter to ease vessel operators’ ability to comply with the permit, EPA is specifically referencing these programs so vessel operators can use these programs as resources to help select products for their vessel applications.” [Response p222]

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Who is responsible for conducting testing required to confirm that the EAL definition is met?

"It is the responsibility of the product manufacturer to conduct the testing required to meet EPA's EAL definition." [Response p220]. EPA agrees that "vessel operators should be able to reasonably rely on product labels, but notes that if product labels are subsequently determined not to be EALs, then vessel operators should suspend further use of such products upon learning that the products do not meet the VGP standards for environmentally acceptable lubricants." [Response p220]

What documentation is required to confirm that a lubricant meets the EAL definition?

When assessing compliance with use of EALs, EPA would "look for documentation that lubricants used by the vessel either meet the approved labeling requirements or have undergone and met the requirements of independent testing." [Response p222]

"It is the responsibility of the product manufacturer to conduct the testing required to meet EPA's EAL definition. ...vessel operators should be able to reasonably rely on product labels..." [Response p 220]

"It is up to the vessel owner/operators to demonstrate compliance with this provision, and EPA will encourage vessel owner/operators to maintain such information." [Response p289]

"Documentation could include MSDSs that document such EAL labeling or testing (when listed)." [Response p222] EPA notes that "MSDSs are not required to list such labeling or testing" [Response p289]. The EPA notes that "the primary purpose of an MSDS is to provide safety information to the persons handling the product and responding to spills; it does not provide information regarding the product's potential impact on the environment." [Response p222]

Will the EPA review the labeling requirements in the future?

"EPA may re-evaluate the requirements for the existing labeling programs in the future, if and when new test methods or new data become available, the labeling programs change from those EPA evaluated for this iteration of the VGP, or whether other tools to ensure effective implementation of the permit become available." [Response p222]

Can I wait until the next dry docking to change to EAL?

EPA has specifically "included a transition period tied to drydocking schedule in the definition of technically infeasible. EPA has incorporated where lubricant types cannot be commingled in existing applications and the lubricants cannot be changed until the next drydock into the definition of technically infeasible for purposes of oil-to-sea interfaces. In these cases, use of an EAL can wait until the vessel's next drydocking." [Response p1020]

EPA ... has defined "technically infeasible to include situations when no EAL products are approved for use in a given application that meet manufacturer specifications and to allow the transition to EALs to wait until the vessel next drydocking." [Response p1027]

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Do I need to use an EAL in a new-build?

EPA recognizes that “there may be specific applications where use of EALs is not technically feasible; however, the Agency expects that the bulk of operators, particularly for new build vessels, will switch to using EALs for the majority of their oil-to-sea applications. Failure to use an EAL when it is technically feasible to do so is a permit violation.” [Response p1029]

EPA believes “the use of EALs for most oil to sea interfaces for all new build vessels it is less likely to be technically infeasible and would be economically practicable and achievable. New build vessels can select equipment during design and construction which is compatible with EALs for most oil-to-sea applications.” [Response p1012]

“There may be specific oil-to-sea applications for which use EALs is not technically feasible, but EPA expects to see most new build vessels using EALs in the bulk of their oil-to-sea applications.” [Response p1012]

What do I have to do if I do not use an EAL?

“If a vessel is unable to use an EAL, the owner/operator must document in their records consistent with Part 4.2 of the permit, including an explanation of the owner/operator’s inability to do so, and must report the use of a non-environmentally acceptable lubricant to EPA in the annual report. For further discussion on documentation, see Part 4.4.9 of the factsheet.” [Response p1012]

How do I get a permit?

To obtain a Vessel General Permit it will be necessary to submit a Notice of (NOI) to discharge to the EPA before entering US waters. This should be submitted to the EPA at least 7 days in advance for the electronic NOI and 30 days for a paper NOI. A copy of the NOI is provided within the VGP with details of how it is applied and deadlines for submission. The permit will last for 5 years , but annual reports must be provided to the EPA to demonstrate compliance.

THE MARINE MEDIA

The announcement of the Vessel General Permit has been widely covered in the Marine media and as the recognised authority on marine EALs, Vickers have regularly been asked to contribute. Below is a selection of references to these articles which can either be found on our website www.vickers-oil.com.

- **Marine Propulsion –‘VGP requirement will drive uptake of green lubes’**
- **Cruise Line Industry Association**
- **Marine Engineers Review Discusses VGP**
- **Peter Vickers talks to Fathom**
- **The Journal of the Japan Institute of Marine Engineering**

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VICKERS RANGE OF VGP COMPLIANT PRODUCTS

| Application | Vickers Grade |
|-----------------------|--|
| CPPs | ECOSURE HSE 32, 46, 68, 100 |
| Stern tube Lubricants | HYDROX BIO 68, 100, 220 |
| Stabiliser Lubricants | HYDROX BIO 68, 100, 220 ECOSURE HSE 68 |
| Hydraulic Fluids | ECOSURE HSE 32, 46, 68, 100 |
| Grease | BIOGREASE EP2 |

Please contact us for specific advice and recommendations appropriate to your vessel equipment.

When water ingress occurs in stern tubes, **HYDROX BIO** lubricants will absorb any sea or fresh water entering the stern tube to form a fluid and stable emulsion, thereby reducing the risk of free water being present. The emulsion is stable and continues to provide the required lubrication and corrosion protection. Conventional oils do not emulsify in the same way and tend to separate, exposing components to free water and potential wear damage.

HYDROX BIO lubricants are developed primarily for use in stern tube applications where elastomeric lip seals and circulatory oil feed systems are fitted. The products provide superior level of lubrication, excellent wear protection, excellent corrosion protection and are compatible with most commonly used metals.

HYDROX BIO are approved by many of the leading OEMs such as B+V, Wärsilä and Kemel.

ECOSURE HSE is a range of biodegradable, high performance and anti-wear hydraulic fluids. Available in ISO 32, 46, 68 and 100 viscosities, these HSE fluids are based on fully saturated synthetic esters and use state-of-the-art ashless, zinc-free technology.

ECOSURE HSE can be used in hydraulic applications in sensitive environments, especially marine, where there is the potential for fluid loss to occur and are typically used in CPPs, water tight doors, ramps, platforms, davits, cranes, winches, capstans and some designs of stabilisers.

BIOGREASE EP2 is a Lithium/Calcium thickened lubricating grease based on renewable, biodegradable, fully saturated esters. It is designed for use in sensitive marine environments, has a biodegradability of greater than 60% in the 28 days OECD 301B test and is proven to be practically non-toxic to marine organisms.

BIOGREASE EP2 can be used in a variety of marine applications which demand a NLGI 2 grease and works effectively at temperatures ranging from -25°C to +130°C. The EP additives provide excellent load carrying properties.