

ENVIRONMENTAL ACCEPTABLE LUBRICANT (EAL) LIST FOR SIMPLEX STERN TUBE BUSHES AND SEALS

The following list is based on the results achieved during static and dynamic testing. These tests are intended to replicate as closely as possible actual operating conditions on board. However, as the individual operating conditions of each sealing system varies from vessel to vessel, this list serves as a recommendation only. Furthermore it applies solely to SIMPLEX stern tube seal systems and not to intermediate shaft bearings, thrust bearings, gears, clutches, roller element bearings or other components of the propulsion system. It should be noted that not all bio oils are EALs in accordance with VGP 2013. Consequently we rely on the information provided by the oil companies both in respect of the technical data as well as the statement that the listed lubricants are EALs.

The SIMPLEX seal has to be fitted with sealing rings of FKM Pod or FKM Bio material.

We kindly ask you to inform us if you wish to use any lubricants which are not listed below. We will test these lubricants accordingly.

All listed EALs can be used for oil lubricated SIMPLEX stern tube bushes and seal systems.

For SIMPLEX sterntube bushes please use only the viscosity specified by SKF Marine for your application (+/-5% of the stated viscosity grade). For technical advice regarding the viscosity to be used for SIMPLEX sterntube bushes, please contact SKF Marine.

Brand	Product Name	Sealing Ring Material	Viscosity cSt. 40°C	Classification	Type
ACT	EcoSafe EAL 100	FKM Pod, FKM Bio	98	Biodegradable	Hydraulic Oil
ACT	EcoSafe EAL-68	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
ACT	Neptune 109 ***		103	Biodegradable	Gear Oil
ACT	Neptune 159 ***		146	Biodegradable	Gear Oil
ACT	Neptune AW-68 ***		68	Biodegradable	Hydraulic Oil
BioBlend	Bioflo STL 100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
BioBlend	Bioflo STL 150	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Castrol	BioStat 100 *	FKM Pod, FKM Bio	100	Biodegradable	Multipurpose Oil
Castrol	BioStat 150 *	FKM Pod, FKM Bio	150	Biodegradable	Multipurpose Oil
Castrol	BioStat 220 *	FKM Pod, FKM Bio	220	Biodegradable	Multipurpose Oil
Castrol	BioStat 68 *	FKM Pod, FKM Bio	68	Biodegradable	Multipurpose Oil
Chevron	Clarity Bio EliteSyn AW 100	FKM Pod, FKM Bio	100	Biodegradable	Hydraulic Oil
Chevron	Clarity Synthetic	FKM Pod, FKM	100	Biodegradable	Gear Oil

	EA Gear Oil 100 *	Bio			
Chevron	Clarity Synthetic EA Gear Oil 150 *	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
Chevron	Clarity Synthetic EA Hydraulic Oil 100	FKM Pod, FKM Bio	100	Biodegradable	Hydraulic Oil
Chevron	Clarity Synthetic EA Hydraulic Oil 68	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
ExxonMobil	Mobil SHC Aware Gear 100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
ExxonMobil	Mobil SHC Aware Gear 150	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
ExxonMobil	Mobil SHC Aware Gear 68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
ExxonMobil	Mobil SHC Aware ST 100 ***	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Fuchs / Lukoil	Plantogear 100 S	FKM Pod, FKM Bio	100	Biodegradable	Multipurpose Oil
Fuchs / Lukoil	Plantogear 150 S	FKM Pod, FKM Bio	150	Biodegradable	Multipurpose Oil
Fuchs / Lukoil	Plantogear 320 S	FKM Bio	320	Biodegradable	Multipurpose Oil
Fuchs / Lukoil	Plantosyn 68 HVI	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
Gulf Oil Marine Ltd.	GulfSea BD Gear Oil 100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
Gulf Oil Marine Ltd.	GulfSea BD Gear Oil 150	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
Gulf Oil Marine Ltd.	GulfSea BD Gear Oil 68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
Gulf Oil Marine Ltd.	GulfSea BD Sterntube Oil 100 ***	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Gulf Oil Marine Ltd.	GulfSea BD Sterntube Oil 68 ** / ***	FKM Pod, FKM Bio	68	Biodegradable	Sterntube Oil
KAJO	Bio-Gear Oil 100*	FKM Bio	100	Biodegradable	Gear Oil
Klüber	Klüberbio EG 2-100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
Klüber	Klüberbio EG 2-150	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
Klüber	Klüberbio EG 2-68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
Klüber	Klüberbio LR	FKM Pod, FKM	46	Biodegradable	Hydraulic Oil

	9-46	Bio			
Klüber	Klüberbio LR 9-68	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
Klüber	Klüberbio RM 2-100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Klüber	Klüberbio RM 2-150	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Klüber	Klüberbio RM 8-100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
NOF Corporation	Millube ST-100U	FKM Bio	125	Biodegradable	Sterntube Oil
Panolin	Panolin MarGear 100	FKM Bio	100	Biodegradable	Gear Oil
Panolin	Stella Maris 100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Panolin	Stella Maris 150	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Panolin	Stella Maris 220	FKM Pod, FKM Bio	220	Biodegradable	Sterntube Oil
RSC Bio Solution	RSC EnviroLogic GO 100 *	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
RSC Bio Solution	RSC EnviroLogic GO 150 *	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
RSC Bio Solution	RSC EnviroLogic HF 100 HP	FKM Pod, FKM Bio	100	Biodegradable	Hydraulic Oil
RSC Bio Solution	RSC EnviroLogic HF 68 HP	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
RSC Bio Solution	RSC Futerra HF 100	FKM Pod, FKM Bio	100	Biodegradable	Hydraulic Oil
RSC Bio Solution	RSC Futerra HF 68	FKM Pod, FKM Bio	68	Biodegradable	Hydraulic Oil
Shell	Naturelle S4 Gear Fluid 100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
Shell	Naturelle S4 Gear Fluid 150	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
Shell	Naturelle S4 Gear Fluid 68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
Shell	Naturelle S4 Stern Tube Fluid 100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
SK	SK BIO SG EP 100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
SK	SK BIO SG EP 68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
SK	SK BIO ST ***	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil

SK	SK BIO ST 150 ***	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Total Lubmarine	Biohydran TMP 100	FKM Pod, FKM Bio	100	Biodegradable	Hydraulic Oil
Total Lubmarine	Bioneptan 100	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Total Lubmarine	Bioneptan 150	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Total Lubmarine	Bioneptan HT 100	FKM Pod, FKM Bio	100	Biodegradable	Multipurpose Oil
Vickers Oils	Biogear XP 100	FKM Pod, FKM Bio	100	Biodegradable	Gear Oil
Vickers Oils	Biogear XP 150	FKM Pod, FKM Bio	150	Biodegradable	Gear Oil
Vickers Oils	Biogear XP 68	FKM Pod, FKM Bio	68	Biodegradable	Gear Oil
Vickers Oils	Hydrox Bio 100***	FKM Pod, FKM Bio	100	Biodegradable	Sterntube Oil
Vickers Oils	Hydrox Bio 150***	FKM Pod, FKM Bio	150	Biodegradable	Sterntube Oil
Vickers Oils	Hydrox Bio 68 ** / ***	FKM Pod, FKM Bio	68	Biodegradable	Sterntube Oil

- * Oil with general limited application temperature, 60° C
- ** Oil not suitable for SIMPLEX Airspace seals
- *** The application of this lubricant is limited. It should be used in consultation with SKF Marine only.

This list is not subject to revision service. The current approval list can be viewed and downloaded on the following website https://skf-simplex.com/lubricant_index.php.

NOTICE

The VGP 2013 rules issued by the EPA require certain vessel operating conditions/limits in general unless technically infeasible. Amongst others, all oil to sea interfaces must use EAL unless technically infeasible. Depending on the individual seal system, the chosen EAL and the bearing load of the respective vessel, special operating conditions e.g. limits in temperatures, water content, etc., may apply and additional equipment might be considered.

Wherever an EAL is used our special FKM (FKM Pod or FKM Bio) sealing material must be installed. If FKM Bio is already installed, it is not necessary to change the seals when switching to EAL. All other seal materials require the seals to be changed when switching to EAL. If an Airspace seal is installed, an EAL is not required.

In order to achieve an operating life of 5 years when using EALs, please follow our maintenance instructions.

Maintenance instructions for SIMPLEX standard seals with approved EALs for 5 years service interval:

- flush and change the oil of the AFT seal according to the manual
- change the oil of the FWD seal according to the manual
- ensure the following operational limits:

	SC2 FKM Pod	SC3 FKM Pod / FKM Bio
Operating temperature AFT stern tube bearing	55°C	None under normal operating conditions
Alarm temperature AFT stern tube bearing	60°C	
Operating oil temperature FWD seal	60°C	None under normal operating conditions

Maintenance instructions for SIMPLEX Airspace seals with approved EALs for 5 years service interval:

- maintain the stern tube bearing and seal-system according to the standard manual
- no additional operational limits

Important note:

EAL means lubricants that are biodegradable, non-bio accumulative, and minimally toxic. They must meet EPA's EAL definition and shall be approved by labelling programmes such as Blue Angel, European Ecolabel, Nordic Swan, the Swedish Standards SS 155 434 and 155470, OSPAR, EPA's DfE or self-certified by the maker. It is the responsibility of the oil product manufacturer to meet the EPA's EAL definition. Vessel operators have to note that not every bio-oil is an EAL.

Environmentally acceptable lubricants in combination with SIMPLEX lip ring seals require the use of FKM Pod or FKM Bio as the sealing ring material.

The oils listed here are approved in their pure, exclusively type only. Mixtures with other listed or not listed oils are not approved.

Please keep in mind that the approvals does apply to the formulation provided by the oil manufacturer for specific testing only. These should in general correspond with products available on the marine market. The oil manufactures are responsible to inform SKF Marine of changes in formulation.

For further information please get in contact with your local sales agent. Please ask SKF Marine GmbH for approval before use of an EAL to achieve reliable operation with your individual sealing system.

This EAL list is subject to the update service.