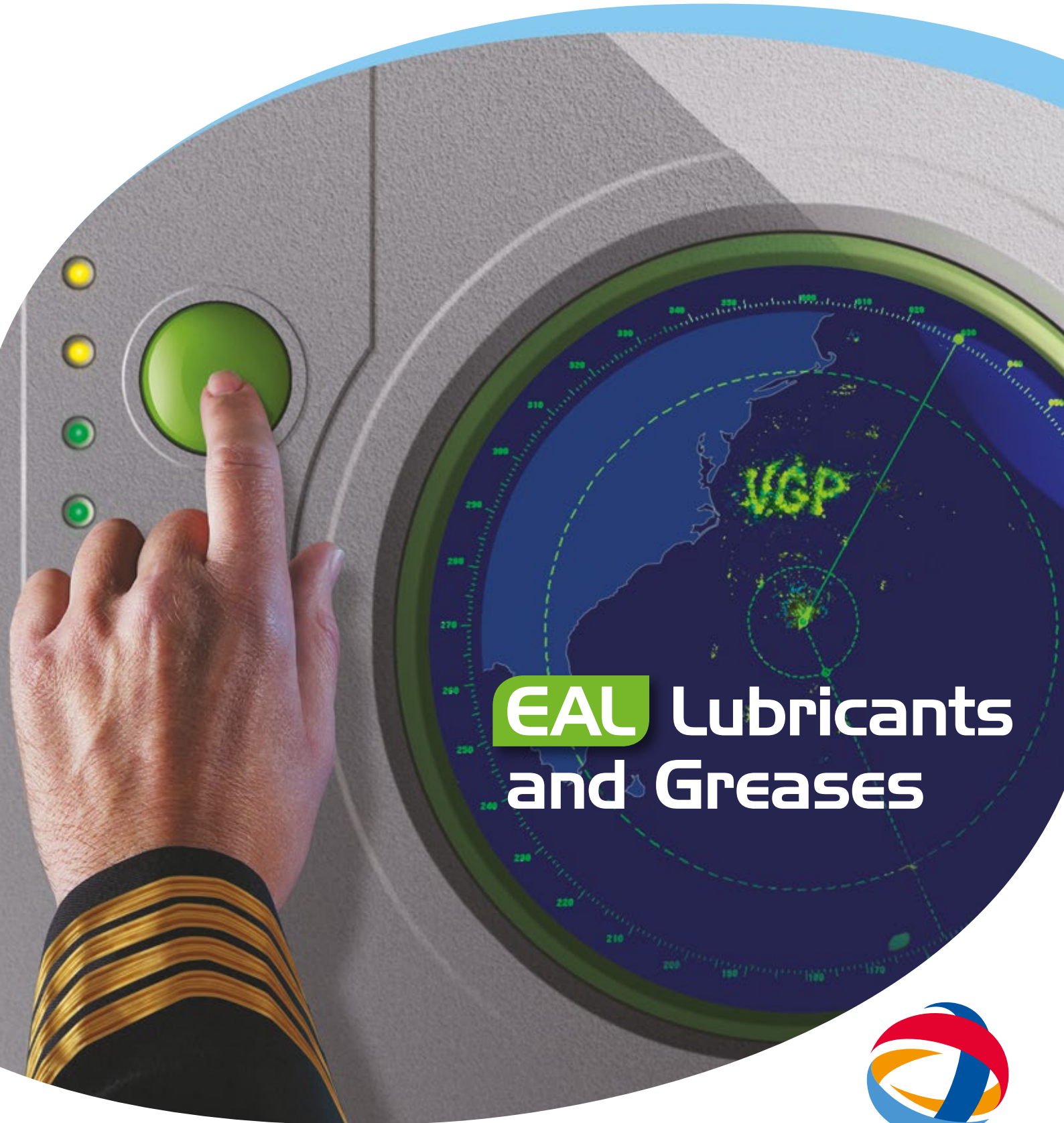


TOTAL
Lubmarine



EAL Lubricants
and Greases



TOTAL



MEETING YOUR EAL CHALLENGES AND EXPECTATIONS

— The shipping industry is becoming more complex every day

The use of Environmentally Acceptable Lubricants (EALs) became mandatory in United States waters on December 19, 2013.

This new regulation might appear as a new burden for ship operators; however, public opinion is influencing the shipping industry to reduce its global environmental impact.

Recent studies indicate that, due to leaking equipment, lubricant discharges exceed 200 million liters worldwide every year.

This severely impacts marine life due to the toxicity of mineral oil and additives: a situation that can worsen over time due to the slow biodegradability of such substances.

— New lubricants for new circumstances

Environmentally Acceptable Lubricants (EALs) are defined as biodegradable, minimally toxic, non-bioaccumulative or products certified under various labels such as European Ecolabel.

EAL products must be used on equipment with oil-to-sea interfaces unless technically infeasible.

At Total Lubrificants, our teams have been working for more than 20 years on and have proven experience in developing and marketing a full range of biolubricants.

This range has been recently upgraded in order to be a solution to the United States Environmental Protection Agency's requirement to use EALs under the Vessel General Permit.





— Ensuring compliance is not enough, performance equally matters

Extensive lab and on-board testing demonstrates that operations will require marine lubricants formulated with advanced chemical properties, able to perform at a higher level.

Total Lubmarine's ester-based products perform much better than mineral oils.

As a result, operators benefit from modern lubrication solutions, extended operation time and reduced operating costs.



"In order to ensure the vessel's under my control meet the requirements of the US VGP 2013 I decided to equip them with EAL's during the recent phase of dry dockings. My first choice was Total Lubmarine due to their

long standing experience in providing biolubricants and excellent support offered by my local office. As I expected Total Lubmarine were able to provide exactly what I wanted, when and where I needed it.

First Class products, with First Class service."

*Stanislav Tritakov, Technical Manager
TNKC UK Limited (K Line Bulk Shipping)*



"Thanks for your interest in Total Lubmarine.

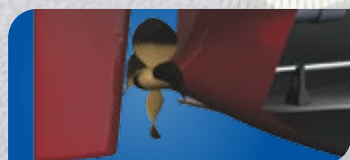
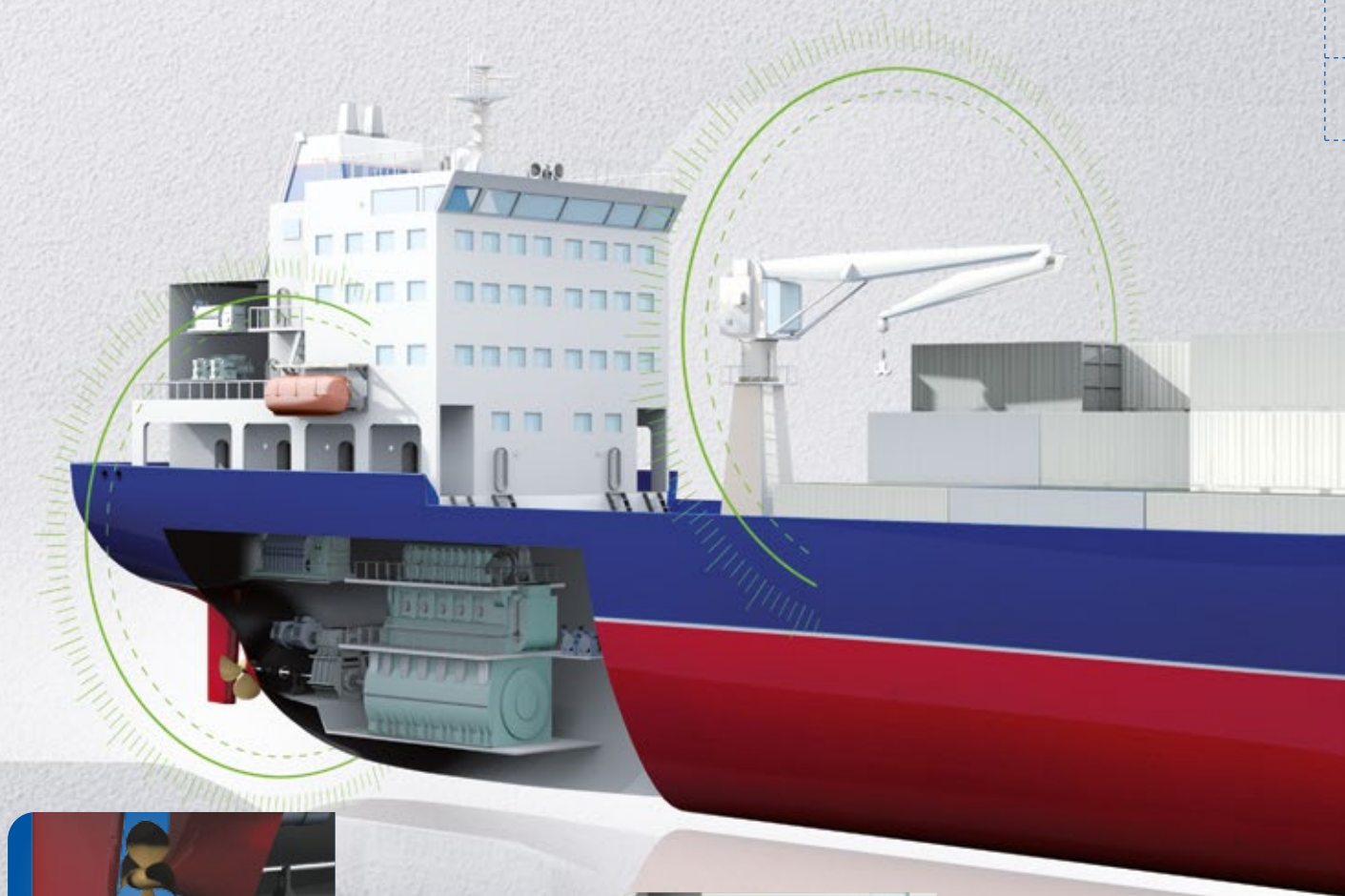
Our commitment, as a leading marine supplier, is to provide worldwide marine lubrication solutions for all your onboard equipment, from the engine room to deck.

While the revision of the Vessel General Permit is certainly a game-changer in the marine lubricant landscape, our long experience in biolubricants ensures that our customers have both high-performing products for all on-board applications and that they can achieve their environmental and compliance initiatives.

Exemplifying our passion for shipping, I am confident that our marine EALs and support services will be the solution to your needs when travelling into United States waters, protecting your onboard equipment and reducing your environmental impact."

*Norbert Schieren, General Manager
Total Lubmarine*

A FULL RANGE OF VGP COMPLIANT EALS



Stern tube oils

Bioneptan
Bioneptan HT



Gear oils

Carter Bio

Greases

Bio Adhesive Plus

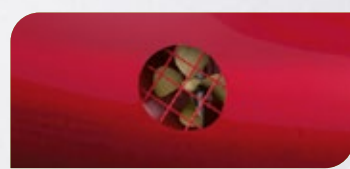
LUBRICANTS	EAL*	SAE or ISO	Density** kg/m ³		Viscosity mm ² /s 40°C	Pour Point (°C)	Flash Point COC (°C)	Application
			15°C	20°C				
Hydraulic oils* Methods			ISO 3675		ISO 3104	ISO 3016	ISO 2592 (or ASTM D 92)	
Biohydran TMP 32	✓	32	913	910	32	-39	>260	Biodegradable, minimally toxic and non-bioaccumulative hydraulic lubricants.
Biohydran TMP 46	✓	46	920	917	46	-39	>280	
Biohydran TMP 68	✓	68	935	932	68	-42	>300	
Biohydran TMP 100	✓	100	937	934	100	-42	>300	
Gear oils*								
Carter Bio 68	✓	68	951	948	68	-42	>240	Biodegradable, minimally toxic and non-bioaccumulative gear and bearing lubricants.
Carter Bio 100	✓	100	968	965	100	-42	>240	
Carter Bio 150	✓	150	960	957	150	-30	>240	
Carter Bio 220	✓	220	960	957	220	-27	>240	
Carter Bio 320	✓	320	964	961	320	-24	>250	



- **Hydraulic oils**
Biohydran TMP
- **Gear oils**
Carter Bio
- **Greases**
Bio Adhesive Plus
Biomultis EP 2



- **Hydraulic oils**
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LUBRICANTS	EAL*	SAE or ISO	Density** kg/m ³		Viscosity mm ² /s 40°C	Pour Point (°C)	Flash Point COC (°C)	Application
			15°C	20°C				
Stern tube oils*								
Bioneptan 100	✓	100	939	936	100	-40	> 250	Biodegradable, minimally toxic and non-bioaccumulative stern tube lubricants.
Bioneptan 150	✓	150	959	956	150	-32	> 250	
Bioneptan 220	✓	220	961	958	220	-28	> 250	
Bioneptan HT 100	✓	100	920	917	100	-30	> 278	

GREASES	EAL*	NLGI grade	Thickener	Temperature range (°C)	Dropping Point (°C)	Worked penetration at 25°C	Application
Methods		ASTM D 217		IP 396 ASTM D 217			
Bio Adhesive Plus	✓	1	Calcium	-20 to 90	> 145	310 - 340	Biodegradable, minimally toxic and non-bioaccumulative grease for metal cables, wire ropes and winches.
Biomultis EP2	✓	2	Lithium	-30 to 140	> 180	263	High-performance extreme pressure biodegradable lithium grease designed for applications in environmentally sensitive conditions.

*Environmentally Acceptable Lubricant (EAL) according to the definitions and requirements of the U.S. Environmental Protection Agency (EPA) 2013 Vessel General Permit (VGP).
 **The reference density for volume conversion for invoicing purposes is 15°C for BULK DELIVERIES and 20°C for ALL PACKAGE DELIVERIES.

BETTER PERFORMANCE THAN MINERAL EQUIVALENTS

— Synthetic ester-based lubricants perform better than mineral equivalents

TOTAL Lubmarine biolubricants are carefully formulated using synthetic ester base oils and highly selected additives. Produced from renewable raw materials, our range of biolubricants has been designed to reduce the environmental impact of shipping operation by demonstrating proven biodegradable, non-toxic and non-bio accumulative properties.

In addition, the synthetic nature of our range of biolubricants actually improves performance by adapting to increased thermal and mechanical stress in varying operating conditions.

Synthetic lubricants also have a significant more extended lifetime than its mineral equivalents, thereby mitigating procurement costs.

TOTAL Lubmarine biolubricants are compatible with the majority of equipment, paints and seals available on the market.

— Bioneptan, the stern tube lubricant solution to comply with the Vessel General Permit

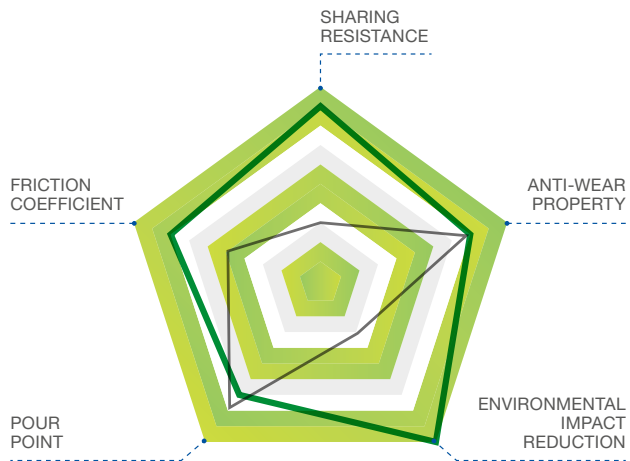
The stern tube can experience water contamination. According to IACS *, the acceptable amount of water inside the stern tube oil system must not exceed 1%.

To ensure that your marine propulsion equipment is protected, VGP-compliant and performing, Total Lubmarine developed the Bioneptan range, specific biolubricants that demonstrate excellent water filtration and strong resistance to hydrolysis. More than 250 successful field trials have been conducted on vessels with Bioneptan in use.

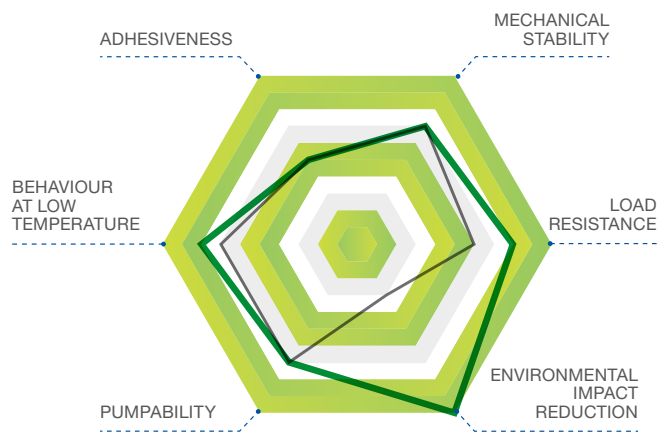
*IACS International Association of Classification Societies LTD

— Also your deck equipment solution

The United States Environmental Protection Agency (EPA) strongly suggests that operators use Environmentally Acceptable Lubricants (EALs) for their deck equipment, Total Lubmarine offers a full range of products, from hydraulic gear oils to multipurpose grease. Due to the properties of Total Lubmarine biolubricants, our range has received many approvals from original equipment manufacturers (OEMs) such as Rolls Royce and TTS.



— **Bioneptan**
 — Standard Stern Tube oil



— **Biomultis EP2**
 — Non-bio equivalent grease

WE ARE WHERE YOU ARE GOING



VISIT OUR WEBSITE:
<http://portdirectory.lubmarine.com>



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