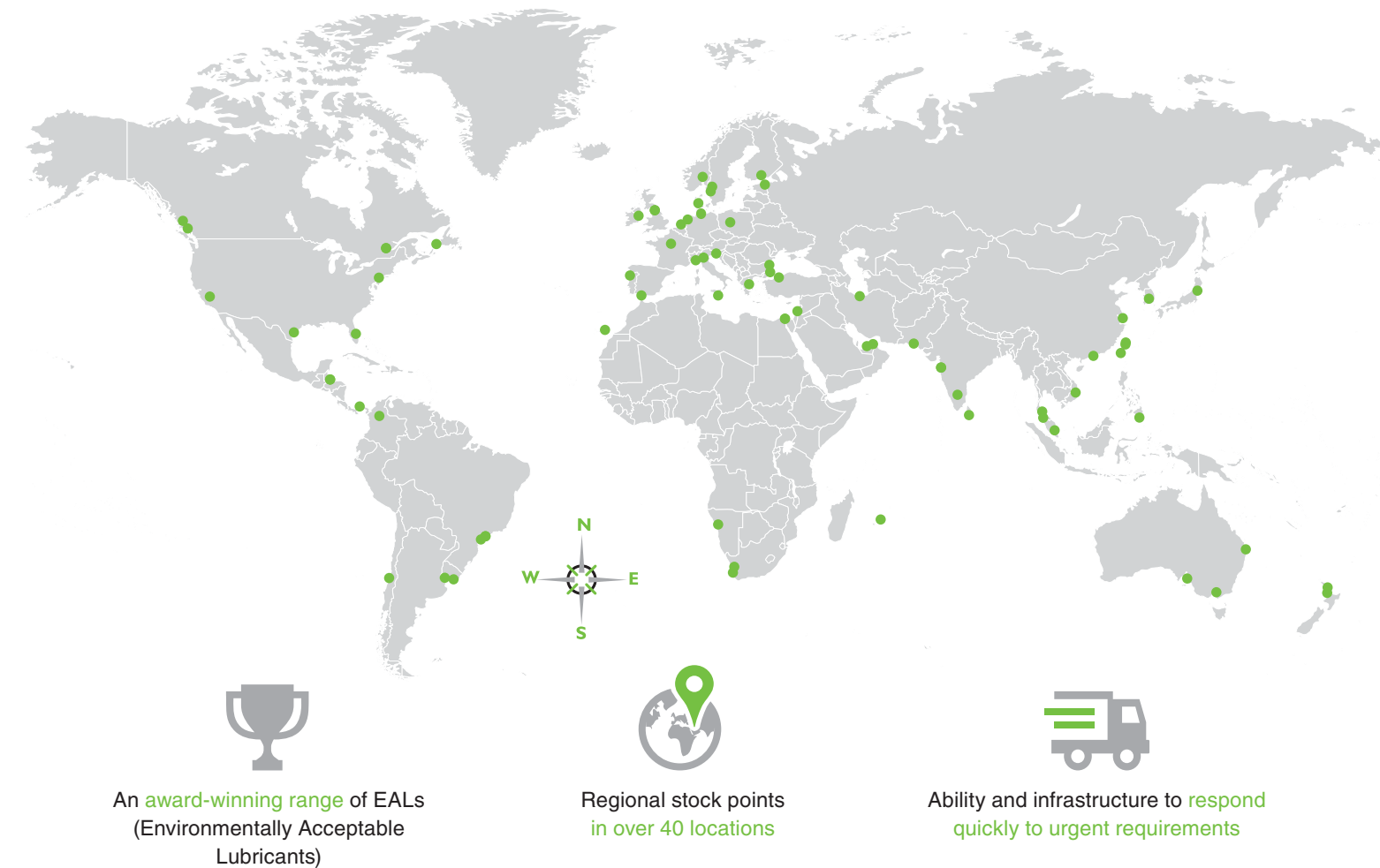




## Service & Support

30% of our workforce are employed in the technical team, focusing on Quality Control, R&D, OEM liaison and Technical Service allowing us to provide one-on-one dedicated customer support by our team of highly qualified experts.



Field Support



Lubrication Surveys and Recommendations



Equipment Reports and Analysis



Lubricant Analysis



Training

### BENJN R. VICKERS & SONS LTD.

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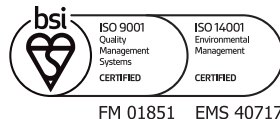
**Registered in England**  
Company No. 00130013

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FM 01851 EMS 40717



# HYDROX BIO: The IdEAL Solution

HYDROX BIO: The IdEAL Solution



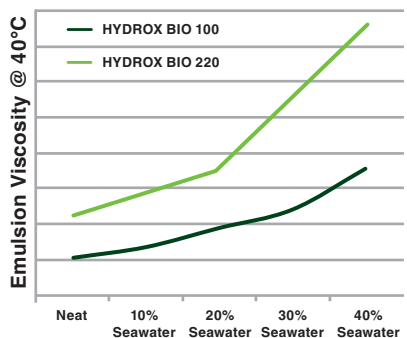
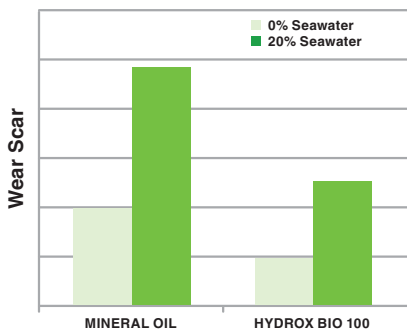
The Environmentally Acceptable Sterntube Lubricant delivering superior performance and wear protection even when water ingress occurs

For sterntubes, stabiliser bearings and CPP hubs

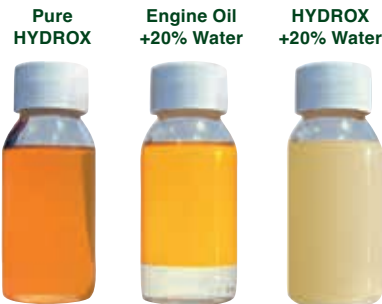
- Verified lubrication at high water levels
- Protects bearings against corrosion
- Excellent wear protection
- ISO 68, 100, 150 & 220

HYDROX BIO lubricants are biodegradable lubricants based on synthetic esters, developed primarily for use in sterntubes and bearings where water ingress may occur. The products provide:

- Superior level of lubrication even when water ingress occurs
- Excellent wear protection
- Excellent corrosion protection
- Compatibility with metals commonly used
- Biodegradable and non-toxic



| Product        | Description                                                                                                               | Typical Viscosity (cSt @40°C) | Viscosity Index | Density (kg/l @15°C) | Pour Point ASTM D7346 (°C) | Anti corrosion SKF Water Emcor Test | VGP Compliant | Emulsifiable |
|----------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------|----------------------|----------------------------|-------------------------------------|---------------|--------------|
| HYDROX BIO 68  | Emulsifiable, biodegradable sterntube lubricant for regular use and lubrication of some stabiliser bearings and CPP hubs. | 68                            | 215             | 0.92                 | < -24                      | Passes                              | ✓             | ✓            |
| HYDROX BIO 100 |                                                                                                                           | 100                           | 187             | 0.93                 | <-24                       | Passes                              | ✓             | ✓            |
| HYDROX BIO 150 |                                                                                                                           | 150                           | 181             | 0.93                 | <-24                       | Passes                              | ✓             | ✓            |
| HYDROX BIO 220 | Emulsifiable, biodegradable sterntube lubricant for use in the event of outboard leakage.                                 | 220                           | 200             | 0.93                 | < -24                      | Passes                              | ✓             | ✓            |



Using HYDROX BIO lubricants dramatically reduces wear to sterntube bearings in the event of seawater ingress.

HYDROX BIO lubricants will absorb sea or fresh water entering the sterntube to form a fluid emulsion. This reduces the risk of free water being present 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 achieve a biodegradability of greater than 60% in the 28 day OECD 301B and OECD 306 tests and are considered non-toxic in the marine environment based on the following results:

Fish LC50 exceeds 1000mg/l;  
Daphnia EC50 exceeds 1000mg/l;  
Algae EC50 exceeds 1000mg/l.

HYDROX BIO meets the detailed ecological definitions and requirements laid down in the 2013 Vessel General Permit (VGP) published by the US EPA in March 2013.

HYDROX BIO 68, 100 & 150

HYDROX BIO 68 and HYDROX BIO 100 are the viscosity grades generally recommended by the bearing and seal manufacturers for regular running in the sterntube. They can also be used in certain stabiliser systems and CPP hubs.

HYDROX BIO 150 is for use if the shipyard recommends an ISO VG 150 sterntube EAL in order to give improved oil film thickness under severe conditions as may arise if the aft bearing is subject to edge loading. This can occur when the design tolerances or other factors are marginal.

These products are approved by many of the leading OEMs such as SKF Marine, Wärtsilä and Kemel for up to 5 years when used with OEM elastomers recommended for EALs. For specific details please contact us.

HYDROX BIO 220

HYDROX BIO 220 has become widely accepted as the lubricant of choice should vessels require emergency assistance in reducing leakage from the sterntube past a damaged or worn aft seal. It outperforms other competing biodegradable leak reducing lubricants by forming a stable, high viscosity emulsion at the point of water entry.

In the majority of cases a significant reduction in leakage rate can be achieved, typically up to 70%. The lubricant offers the greatest benefit when used to completely fill the sterntube system.