ROYAL PURPLE® SYNTHETIC OIL

TECHNICAL DATA SHEET

BioMax Gear EAL

ENVIRONMENTALLY ACCEPTABLE GEAR LUBRICANT

Royal Purple's BioMax EAL product line is comprised of environmentally friendly, synthetic, high-performance lubricants formulated for equipment operating in environmentally sensitive areas. Environmentally friendly lubricants often compromise performance and durability to meet requirements of Environmentally Acceptable Lubricants, but BioMax EAL provides uncompromised lubrication and protection for all lubricated components.

BE/027/004

EU Ecolabel www.ecolabel.eu

Gear systems often operate under severe conditions, subjecting the gears to high temperatures, heavy contact and sliding loads, and start-stop shock loading. BioMax Gear EAL provides unmatched protection in these conditions for all enclosed gear systems. The superior synthetic formulation and Royal Purple's proprietary Synerlec® additive technology are the key to outstanding protection from contact and sliding wear, and damaging shock loads. The EU Ecolabel certification of BioMax Gear EAL guarantees superior environmental and technical standards.

BioMax Gear EAL is recommended for any enclosed gear sets requiring an environmentally friendly oil or EAL. Common applications include, but are not limited to, the applications below:

APPLICATIONS

- Inland waterways and offshore marine equipment including vessel thruster, controllable pitch propellers (CPP) and deck machinery
- Wind turbine and other power generation equipment
- Construction and mining, mobile and stationary equipment
- Forestry service equipment
- Waterparks and water treatment facilities

PERFORMANCE ADVANTAGES

- HIGH FILM STRENGTH - Synerlec® additive technology dramatically reduces metal-to-metal contact, friction, and wear
- OUTSTANDING EP PROTECTION - Provides protection against damage due to severe operation and shock loads
- EXCEPTIONAL CORROSION & RUST PROTECTION - Prevents internal damage to equipment from chemical attack
- SUPERIOR THERMAL STABILITY – Very high operating temperature range (-25°C to 125°C)
- ENHANCED HYDROLYTIC STABILITY – Resists breakdown and acidity due to water contamination
- OUTSTANDING SYSTEM PERFORMANCE - Lowers operating temperatures and improves efficiency
- REDUCED CARBON FOOTPRINT – Extended oil change intervals reduces waste, energy expenditure and CO2 production

SPECIFICATIONS AND APPROVALS

- EU Ecolabel License No. BE/027/004
- US EPA VGP (2103) and VIDA
- AAA Propulsion (BioMax Gear 100)
- ISO 12925-1
- DIN 51517 Part 1, 2 & 3
- AGMA 9005-F16
- David Brown S1.53.101
- GM LS2 EP Gear Oils
- U.S. Steel 22

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Typical Physical Properties							
Property	**Test Method**	**100**	**150**	**220**	**320**	**460**	**680**
Viscosity @ 40°C, cSt	ASTM D445	100.00	150.00	220.00	320.00	460.00	680.00
Viscosity @ 100°C, cSt	ASTM D445	14.40	19.70	26.30	34.80	46.10	61.60
Viscosity Index	ASTM D2270	146	149	152	153	156	159
Density @15°C, g/ml	ASTM D4052	0.880	0.895	0.908	0.917	0.931	0.945
Demulsibility, ml/ml/ml	ASTM D1401	40/40/0	42/37/1	41/39/0	40/40/0	43/37/0	43/37/0
Copper Corrosion, 3hr @ 100°C	ASTM D130	1A	1A	1A	1A	1A	1A
Rust Prevention, Dist. Water	ASTM D665A	PASS	PASS	PASS	PASS	PASS	PASS
Rust Prevention, Sea Water	ASTM D665B	PASS	PASS	PASS	PASS	PASS	PASS
Elastomer Compatibility	ISO 6072	PASS	PASS	PASS	PASS	PASS	PASS
Pour Point, °C (°F)	ASTM D97	-39 (-38)	-36 (-33)	-36 (-33)	-33 (-27)	-33 (-27)	-30 (-22)
Flash Point, °C (°F)	ASTM D92	224 (435)	242 (468)	243 (469)	254 (489)	260 (500)	267 (513)
Foam Tendency, Seq. I, II, III	ASTM D892	0/0	0/0	0/0	0/0	0/0	0/0

Wear and Extreme Pressure Properties							
Property	**Test Method**	**100**	**150**	**220**	**320**	**460**	**680**
FE8 Roller Bearing Wear Test	DIN 51819-3	<14	<14	<14	<14	<14	<14
Four-Ball Wear, mm	ASTM D4172	0.49	0.48	0.50	0.46	0.45	0.45
Four-Ball Wear, mm (1800 rpm, 20kgf, 54°C, 60 min)	ASTM D4172 Mod.	0.28	0.28	0.28	0.28	0.28	0.28
Four-Ball EP, LWI	ASTM D2783	60.3	60.1	68.8	86.8	85.6	86.4
Four-Ball EP, Weld Load, kg	ASTM D2783	315	315	315	315	315	315
Timken OK Load, lb	ASTM D2782	100	100	100	100	100	100
FZG Gear Test, A/8.3/90	ASTM D5182	>12	>12	>12	>12	>12	>12

Environmental Properties							
Property	**Test Method**	**100**	**150**	**220**	**320**	**460**	**680**
Biodegradability, % (28 days)	ASTM D7373	>60	>60	>60	>60	>60	>60
Toxicity (Algae), mg/L	OECD 201	>1000	>1000	>1000	>1000	>1000	>1000
Toxicity (Daphnia), mg/L	OECD 202	>1000	>1000	>1000	>1000	>1000	>1000
Toxicity (Fish), mg/L	OECD 203	>1000	>1000	>1000	>1000	>1000	>1000
Toxicity (Bacteria), mg/L	OECD 209	>1000	>1000	>1000	>1000	>1000	>1000
Bioaccumulation, log POW	OECD 107	<3	<3	<3	<3	<3	<3

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