

### BioRail® HIGH PERFORMANCE RAIL LUBRICANT

BioRail® is first and foremost a high performance rail curve grease. It is also based on oils from vegetable sources that are 100% biodegradable.

In wayside systems BioRail® forms a vertical bead that is easily picked up. It carries through multiple curves and forms a coating on the gage face that is clearly visible for ease of inspection. In many cases the use of BioRail® will result in reduced grease consumption.

BioRail® empties evenly from the holding tank, without slumping down to form a "V". This minimizes pump cavitation. Unlike some vegetable based products, BioRail® will not gel over time. It remains pumpable and does not plug ports.

BioRail® has been extensively tested on Class 1 freight railroads in the United States, which represent the most severely loaded conditions anywhere in the world. Field experience has shown that the carry down, coating of the rail, and level of wear protection are equal to Whitmore's non-biodegradable rail curve greases.

#### BENEFITS:

- NO MINERAL OIL – the oils used are from vegetable sources and fully biodegradable (100%) under all standard tests for biodegradability.
- NO HAZARDOUS COMPONENTS - the non-oil components are partially biodegradable and non hazardous.
- NOISE REDUCTION - especially valuable in urban areas.
- ADHESIVE AND COHESIVE - excellent track carry down, reducing the number of wayside lubricators.
- WIDE TEMPERATURE RANGE – the need for seasonal product grade changes is eliminated in many areas.

#### APPLICATIONS:

BioRail® is suitable for lubrication of rail curves where it protects the gage face and wheel flanges. It can also be used in bearings and to lubricate wire ropes, particularly in ecologically sensitive areas.

ASTM #	Grade	TYPICAL CHARACTERISTICS			
		BioRail® All-Season EP 1	BioRail® EP 1	BioRail® EP 1.5	BioRail® EP 2
D-217	Penetration (Worked)	310-340	305-335	285-315	265-295
D-2265	Dropping Point, °F (°C)	340 (171)	>500 (260)	>500 (260)	>500 (260)
D-445	Base Oil Viscosity				
	cSt @ 40°C	31.0	45.0	118.23	55.6
	cSt @ 100°C	6.1	9.9	19.89	12.8
D-2270	Viscosity Index of Base Oil	152	215	238	238
Gardener	Density, lb/gal @ 60°F (15.5°C)	7.72	8.43	8.72	8.72
Method	Specific Gravity, g/cc @ 60°F (15.5°C)	0.9274	1.0120	1.0470	1.0470
D-2596	Four Ball EP, Weld Point, kg	315	500	500	500
D-2266	Four Ball Wear, Wear Scar, mm	0.40	0.60	0.68	0.68
D-1264	Water Washout, % Loss	Not Tested	2.5	2.0	1.0
	Coefficient of Friction	0.063	0.065	Not Tested	Not Tested
	Ambient Usable Temperature Range, Wayside				
	°F	-40 to 60	-10 to 80	0 to 90	32 to >130
	°C	-40 to 16	-23 to 27	-18 to 32	0 to >54
	Thickener Type	Calcium	Calcium	Calcium	Calcium
			Sulfonate	Sulfonate	Sulfonate
FTM 321.2	Screen Bleed, %	Not Tested	4.46	4.10	3.14
	MITI Test OECD 301C, % biodegradation in 28 days	65 - 69	60 - 65	58 - 62	55 - 61

The above are average values. Minor variations which do not affect product performance are to be expected in normal manufacturing.

#### PACKAGING

Shuttle Tanks	Nonreturnable Totes	Drums	Kegs	Pails w/Liners
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#### THE WHITMORE MANUFACTURING COMPANY

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Performance Under Pressure Since 1893

LIMITED WARRANTY: The Whitmore Manufacturing Company makes the Limited Express Warranty that at the date of delivery, its goods shall be free from defects in Whitmore's materials and workmanship and shall meet the express written statements of quality, if any, made by Whitmore in connection with the sale of the goods. Other than such Limited Express Warranty, there are no express warranties made with respect to the sale of goods and all implied warranties existing under the law are expressly disclaimed and negated, particularly, Whitmore NEGATES AND DISCLAIMS THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. All other liability, either in contract or tort, including without limitation, strict liability found in Section 402A of the Restatement of Torts or otherwise, is negated and disclaimed. The sole remedy for Whitmore's breach of such Limited Express Warranty shall be a refund of the purchase price of its goods, and Whitmore shall have no responsibility for incidental or consequential damages sustained as a result of the use of the goods, whether sustained to the goods themselves or to other property. Data listed are subject to usual manufacturing variations.