



**Product Data Sheet**

# RAILROAD ENGINE OIL 413

**Product Description:**

**RAILROAD ENGINE OIL 413** is a high performance, zinc-free and chlorine-free oil specially designed to provide excellent engine cleanliness and oil filter life in the modern railroad diesel locomotive engines. **RAILROAD ENGINE OIL 413** is recommended for railroad diesel locomotive engines specifying LMOA Generation 5 quality oils & for medium speed two-cycle and four-cycle railroad engines, including newer diesel locomotive engines of GE and EMD of General Motors.

**RAILROAD ENGINE OIL 413** is also suited for marine and stationary engines for power generation or off-shore drilling requiring zinc-free oils and for Detroit Diesel 149 series engines operating under severe conditions and stationary engines requiring API CF and CF-2 quality oils.

**RAILROAD ENGINE OIL 413** is based on high quality virgin mineral base oil in combination with an unique additive package to ensure the following properties:

- Exceptional detergency and dispersancy provides excellent engine cleanliness, especially engine top decks.
- Excellent retention of TBN facilitates extended drain intervals.
- High thermo-oxidative.
- Zinc-free formulation protects silver bearings against corrosion.
- Non-chlorinated additive package helps in reducing used oil disposal costs.

**RAILROAD ENGINE OIL 413** exceeds the following performance criteria:

<b>Approved</b>	Electro-Motive Diesel (EMD)		
<b>Exceeds</b>	API CF / CF-2	LMOA Generation 5	GE Generation 4 Long Life

Property	Unit	Test Method	Typical Value
SAE Grade		SAE J 300	40
Density @15°C	kg/m <sup>3</sup>	ASTM D4052	898
Kin. Viscosity @40°C	mm <sup>2</sup> /s	ASTM D7042	150
Kin. Viscosity @100°C	mm <sup>2</sup> /s	ASTM D7042	15.1
Viscosity Index		ASTM D2270	102
Flash Point COC	°C	ASTM D92	>201
Pour Point	°C	ASTM D97	-18
Total Base Number	mgKOH/g	ASTM D2896	13,9
Sulphated Ash	%Wt	ASTM D874	1.5

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