



Product	Type
LUBRIZOL® 4970	Heavy Duty Diesel Engine Oil Additive

A multipurpose additive for API CF-4/SJ Mixed Fleet Engine Oil.

Application

Recommended for use at: 12.2 % by weight 11.1 % by volume
in suitable base stocks to formulate multigrade lubricants having the following performance credentials:

- ACEA E2-96 Issue 5 (2007)
- API SH
- ACEA A2-96 Issue 3 (2002)
- API CG-4
- ACEA B3-98 Issue 2 (2002)
- ACEA A2-96 Issue 3 (2002)
- API CF-4
- API SJ
- Volvo VDS
- Volkswagen VW 501.01
- Volkswagen VW 505.00
- MIL-L-2104E
- CCMC D-4
- CCMC G-4
- CCMC PD-2
- Mack EO-K/2
- MB-Approval 228.1
- MB-Approval 229.1
- Allison C-4
- Caterpillar TO-2
- MAN 271

MB228.1 is a blanket approval

Physical Characteristics

	Minimum	Target	Maximum
FLASH POINT, C, PMCC		165	
LBS PER U.S. GAL @ 15.6 C		8.16	
LBS PER IMP GAL @ 15.6 C		9.8	
POUR POINT, C		-12	
SPECIFIC GRAVITY @ 15.6 C	0.965	0.980	0.995
VISCOSITY @ 100 C, CST		290	
VISCOSITY @ 40 C, CST		8500.0	

Chemical Characteristics

	Minimum % Weight	Typical	Maximum % Weight
CALCIUM	2.03	2.25	2.47
MAGNESIUM	0.41	0.46	0.51
NITROGEN	0.59	0.65	0.71
PHOSPHORUS	0.83	0.92	1.01
SULFATED ASH		11.40	
SULFUR		2.70	
ZINC	0.91	1.01	1.11

General handling instructions - In general, The Lubrizol Corporation recommends, as a minimum, the use of neoprene or nitrile rubber gloves and safety glasses or chemical splash goggles. The Material Safety Data Sheet should be consulted for specific information and for information on health and safety when handling this product.

Fire and explosion hazard data

	Flash Point (method)	Classification
	165°C PMCC	N/A

Temperature recommendations

Unloading	Pumping Temperature	75°C	167°F
	Maximum temperature*	80°C	176°F
Storage			
Maximum temperature for long-term storage		45°C	113°F
Blending			
Maximum base oil temperature for mechanical or in-line mixing		80°C	176°F

Equipment recommendations

Type of Pump	Positive Displacement
Type of transfer line	Ball Launched, Insulated, Steam Traced Using 107°C/225°F Steam Max.
Transfer line size	4 inch/10 cm. Min.

Heat source

Type	Steam 107°C/225°F Max.
Storage tank	Suction Heater Recommended

Viscosity data	cSt	SUS
at 25°C, 77°F	29558	136730
at 40°C, 104°F	8500	39385
at 100°C, 211°F	290	1353

Notes

Pour Point	-12°C, 11°F
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Additional Recommendations

A higher storage temperature may be required due to viscosity at 45°C.* Holding the material in excess of this temperature may cause chemical degradation. Use steam for heating and tracing only when the material is in motion to avoid localized overheating. Cold Temperature Storage - If product has been stored below its pour point temperature it should be heated to 21°C/70°F before using.

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lubrex@lubrex.com.tr