

API CI-4 Plus Performance Category

TEST TYPE	PURPOSE	PARAMETER	REQUIREMENT
Cat IK OR	Aluminum piston deposit evaluation	Weighted piston deposits Top groove fill Top land heavy carbon Oil consumption Scuffing	332 Demerits, max 24%, max 4%, max 0.5 g/kW-HR, max None
Cat IN	Aluminum piston deposit evaluation	Weighted piston deposits Top groove fill Top land heavy carbon Oil consumption Scuffing	286.2 Demerits, max 20%, max 3%, max 0.5 g/kW-hr, max None
Cat IR	Steel piston deposit evaluation	Weighted piston deposits Top groove carbon Top land carbon Initial oil consumption Final oil consumption Scuffing, ring sticking	382 Demerits, max 52 Demerits, max 31 Demerits, max 13.1 g/h, max IOC + 1.8 g/h, max None
EOAT	Aeration control	Aeration	8% volume, max
Mack T-8E D 5967	Soot-related viscosity control	Relative viscosity at 4.8% soot	1.8
Mack T-11	Soot-related viscosity control	Soot content @ 12 cSt, viscosity increase	6% min
Mack T-10	Cylinder and bearing wear protection	Liner Wear Top ring weight loss Lead increase (EOT) Lead increase (250-300 h) Oil Consumption	1000 Merits, min., and 32 mm, max 158 mg, max 35 ppm max 14 ppm max 65 g/h, max
Cummins M-11 EGR	Sliding valve train wear evaluation	Crossheads weight loss Oil filter Delta pressure Sludge	20.0 mg, max 275 kPa, max 7.8 merits, min
Roller Follower Wear Test D 5966 or RFWT	Rolling valve train wear evaluation	Roller follower axle wear, average	7.6 mm, max
Sequence III-F	Oxidation control	Viscosity increase at 40°C	275%, max



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Elastomer Compatibility	Elastomer compatibility	Nitrile	
		Volume change, %	+5/-3
		Hardness, points	+7/-5
		Tensile strength, change, %	+10/-TMC 1006
		Elongation, change, %	+10/-TMC1006
		Silicone	
		Volume change, %	+TMC 1006/-3
		Hardness, points	+5/-TMC 1006
		Tensile strength, %	+10/-45
		Elongation, change, %	+20/-30
		Polyacrylate	
		Volume change, %	+5/-3
		Hardness, points	+8/-5
		Tensile strength, %	+18/-15
		Elongation, change, %	+10/-35
FKM			
Volume change, %	+5/-2		
Hardness, points	+7/-5		
Tensile strength, %	+10/-TMC 1006		
Elongation, change, %	+10/-TMC 1006		
Foaming D 892	Control foaming tendency	Sequence I, mL/mL Sequence II, mL/mL Sequence III, mL/mL	10/0 mL/mL 20/0 mL/mL 10/0 mL/mL
High-Temperature Corrosion D 6594	Bearing corrosion control	Copper Lead Tin	20 ppm increase, max 120 ppm increase, max 50 ppm increase, max
High-Temperature, High-Shear D 4683	Viscosity control at high-temperature and high-shear	Viscosity, min @ 150°C	3.5 mPa-s (cP)
Mini-Rotary Viscometer (MRV) T-10 or T-10A Modified D 4684	Used oil pumpability	MRV (TP-1) Viscosity @ -20 degrees C	25,000 mPa-s, max No yield stress
Noack Volatility D 5800	Evaporative loss control	Volume loss	15%, max
Shear Stability D 6278	Viscosity control after shearing, 90 strokes	Viscosity, XW-30 XW-40	9.3 cSt, min 12.5 cSt, min

For more information, please contact:



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