

API ENGINE OIL CLASSIFICATIONS FOR SERVICE FILL OILS

Requirements for API SN are the same as those for API SN-RC, except as noted in the table to the right.

Footnotes

- (1) Not required for SAE 0W-20.
- (2) Not required for SN Non-ILSAC GF-5 viscosity grades.
- (3) 45 max for SN Non-ILSAC GF-5 viscosity grades.
- (4) No maximum for SN Non-ILSAC GF-5 viscosity grades.
- (5) If API CI-4 and/or CJ-4 categories precede the "S" category and there is no API Certification Mark, the Sequence VG (ASTM D6593), Ball Rust (ASTM D6557), and Gelation Index (ASTM D5133) tests are not required.
- (6) Viscosity grades are limited to SAE 0W, 5W and 10W multigrade oils.
- (7) Not required for monograde and SAE 15W, 20W, and 25W multigrade oils.
- (8) Calculated conversions specified in ASTM D5800 are allowed.
- (9) For all viscosity grades: If API CH-4, CI-4 and/or CJ-4 categories precede the "S" category and there is no API Certification Mark, the "S" category limits for phosphorus, sulfur, and the TEOST MHT do not apply. However, the CJ-4 limits for phosphorus and sulfur do apply for CJ-4 oils.
- (10) This is a non-critical specification as described in ASTM D3244.
- (11) After 1-minute settling period for all ILSAC viscosity grades and all SN-RC oils.
- (12) After 10-minute settling period for non-ILSAC GF-5 viscosity grades which are not SN-RC.
- (13) Shall remain homogeneous and, when mixed with ASTM reference oils, shall remain miscible.
- (14) To be evaluated from -5°C to temperature at which 40,000 cP is attained or -40°C, or 2 Celsius degrees below the appropriate MRV TP-1 temperature (defined by SAE J300), whichever occurs first.
- (15) Not Required for SN ILSAC GF-5 viscosity grades which do not also contain the API Certification Mark or are not SN-RC.

Passenger Car Engine Oil Laboratory/Bench Test and Engine Test Requirements For API SN-RC/ILSAC GF-5 Categories

Requirements	Test Method	Properties	Unit	Limits SN-RC/GF-5
LABORATORY/BENCH TESTS				
Viscosity Grades	SAE J300	All those that apply, typically SAE 0W-20, 0W-30, 5W-20, 5W-30 and 10W-30	Manufacturer sets targets within SAE J300 specification	
Foam Tests	ASTM D892, Option A	Sequence I, tendency/stability ^{(11),(12)} Sequence II, tendency/stability ^{(11),(12)} Sequence III, tendency/stability ^{(11),(12)} Sequence IV, tendency/stability ⁽¹¹⁾	ml ml ml ml	10/0 max 50/0 max 10/0 max 100/0 max
	ASTM D6082, Option A			
EOFT	ASTM D6795	Filterability	% flow reduction	50 max
EOWTT	ASTM D6794	Filterability with 0.6% Water	% flow reduction	50 max
		Filterability with 1.0% Water	% flow reduction	50 max
		Filterability with 2.0% Water	% flow reduction	50 max
		Filterability with 3.0% Water	% flow reduction	50 max
TEOST 33C	ASTM D6335	High temperature deposits	total deposit weight, mg	30 max ^{(1),(2),(15)}
TEOST MHT ⁽⁹⁾	ASTM D7097	High temperature deposits	deposit weight, mg	35 max ⁽²⁾
Emulsion retention	ASTM D7563	Oil mixed with 10% Water and 10% E85	0°C and 25°C @ 24 hours	No water separation ^{(2),(15)}
Homogeneity & Miscibility	ASTM D6922	Oil Compatibility	None	Pass ⁽¹³⁾
Gelation Index ⁽⁵⁾	ASTM D5133	Scanning Brookfield Viscosity, Yield Stress	Calculated	12 max ^{(2),(14)}
	ASTM D5800	Evaporation Loss (Noack)	% off @ 250°C	15 max ⁽⁸⁾
Volatility	ASTM D6417	Simulated distillation (GCD)	% off @ 371°C	10 max
	ASTM D6557	Rust rating	Average Gray Value	100 min
Ball Rust Test ⁽⁵⁾	ASTM D6557	Rust rating	Average Gray Value	100 min
Elastomer compatibility	ASTM D7216, Annex A2			
Polyacrylate Rubber ACM-1 (SAE J2643)	ASTM D471	Volume	% change	-5,9
	ASTM D2240	Hardness	pts	-10,10
	ASTM D412	Tensile strength	% change	-40,40
Hydrogenated Nitrile HNBR-1 (SAE J2643)	ASTM D471	Volume	% change	-5,10
	ASTM D2240	Hardness	pts	-10,5
	ASTM D412	Tensile strength	% change	-20,15
Silicone Rubber VMQ-1 (SAE J2643)	ASTM D471	Volume	% change	-5,40
	ASTM D2240	Hardness	pts	-30,10
	ASTM D412	Tensile strength	% change	-50,5
Fluorocarbon Rubber FKM-1 (SAE J2643)	ASTM D471	Volume	% change	-2,3
	ASTM D2240	Hardness	pts	-6,6
	ASTM D412	Tensile strength	% change	-65,10
Ethylene Acrylic Rubber AEM-1 (SAE J2643)	ASTM D471	Volume	% change	-5,30
	ASTM D2240	Hardness	pts	-20,10
	ASTM D412	Tensile strength	% change	-30,30
Phosphorus ⁽⁹⁾	ASTM D4951	Phosphorus content	%	0.06 min ⁽¹⁰⁾
Phosphorus ⁽⁹⁾	ASTM D4951	Phosphorus content	%	0.08 max ^{(4),(10)}
Sulfur ⁽⁹⁾	ASTM D4951 or	Sulfur content of SAE 0W and 5W multigrades	%	0.5 max ^{(4),(10)}
Sulfur ⁽⁹⁾	ASTM D2622	Sulfur content of SAE 10W multigrades	%	0.6 max ^{(4),(10)}
ENGINE TESTS				
Sequence IIIG	ASTM D7320	Kinematic Viscosity increase Average weighted piston deposits Average cam plus lifter wear Hot stuck rings	% @ 40°C after 100 hours merits microns #	150 max 4.0 min 60 max none
ROBO or Sequence IIIGA ⁽⁷⁾	ASTM D7528 or ASTM D4684	Aged oil low temperature Cold Cranking Simulator (CCS) viscosity	Cp	Meet requirements of the original grade or the next higher grade
Sequence IIIGB	ASTM D7320	Phosphorus retention	%	79 min ^{(2),(15)}
Sequence IVA	ASTM D6891	Average Cam wear (7 position avg.)	microns	90 max
Sequence VG ⁽⁵⁾	ASTM D6593	Average engine sludge	merits	8.0 min
		Average rocker cover sludge	merits	8.3 min
		Average piston skirt varnish	merits	7.5 min
		Average engine varnish	merits	8.9 min
		Oil screen sludge	% area	15 max
		Hot stuck compression rings	#	none
		Cold stuck rings	#	rate & report
Oil ring clogging	% area	rate & report		
Oil screen debris	% area	rate & report		
Sequence VIII	ASTM D6709	Bearing weight loss 10-hour stripped Kinematic Viscosity	mg cSt @ 100°C	26 max Stay in original viscosity grade
Sequence VID ^{(2),(6),(15)} (Required for ILSAC GF-5 and SN-RC only)	SAE 0W-20 and 5W-20 viscosity grades	FEI SUM min / FEI2 min	% FEI SUM / % FEI2	2.6 min / 1.2 min
	SAE 0W-30 and 5W-30 viscosity grades	FEI SUM min / FEI2 min	% FEI SUM / % FEI2	1.9 min / 0.9 min
	SAE 10W-30 and all other viscosity grades	FEI SUM min / FEI2 min	% FEI SUM / % FEI2	1.5 min / 0.6 min