Lubricants Group Ballot - Requirements for API Service Category SQ and API SQ w/ “RC"

The API Lubricants Group (LG) met in person, on September 17, 2024, at Detroit Airport Marriott. At the meeting, the LG agenda was resolution of comments and changes to Table G-8—Requirements for API Service Category SQ and API SQ RC Rev4". The LG had a detailed discussion of which included Ash Level, Viscosity , WPD, MRV, and formatting changes. The agreed changes were captured and subsequently detailed in **Table G-8—Requirements for API Service Category SQ and API SQ RC Rev. 5**

After the LG discussion a motion to Ballot **Table G-8—Requirements for API Service Category SQ and API SQ RC Rev. 5** (*Attachment 1*)

The motion detail is:

Motion	**Motion to issue a 30-day Ballot on API SQ + API SQ RC 30-day Ballot with MRV updated to 40000 cP in Non-RC ILSAC Grades, additional Sulfur method, and editorial changes as discussed and captured.**
Motion by:	**Darryl Purificati**
Second by:	**Eric Kalberer**
Lubricants Group Voice Vote	Vote: **Approve Votes = 14** **Negative Votes = 0** **Abstain Votes = 0** Result: **Approval to issue an LG ballot for API SQ + API SQ RC** API to issue Electronic Ballot to be a minimum 30 Day Ballot

Lubricants Group Members should use the API Ballot System to cast their vote and make comments. The Ballot Link is: http://Ballots.api.org. The Lubricants Group Member votes will be counted, and all received comments reviewed and considered to determine it the ballot is passed.

Non-Lubricants Group Members may comment using the API Ballot system. The Ballot Link is: http://Ballots.api.org .

This Ballot will close on October 21, 2024. All votes on the API LG Ballot for **Requirements for API Service Category SQ and API SQ w/ “RC"** must be received by October 21, 2024.

Attachment 1
Table G-8 API SQ and API SQ RC

G.6 API SERVICE CATEGORY SQ (AND RELATED CLASSIFICATIONS)

Table G-8—Requirements for API Service Category SQ and API SQ with "Resource Conserving"[a]

	API SQ		API SQ with "Resource Conserving"	
SAE Grades:	XW-16, 0W-20, 5W-20, 0W-30, 5W-30, 10W-30	Other Eligible Viscosity Grades	All Viscosity Grades Except 0W-8 and 0W-12	0W-8, 0W-12
Engine Test Requirements				
ASTM D8111 (Sequence IIIH)[b]				
Kinematic viscosity increase @ 40°C, %, max	100	100	100	150
Average weighted piston deposits, merits, min	XW-16 = 4.2 Others = 4.6	4.6	XW-16 = 4.2 Others = 4.6	3.7
Hot stuck rings	None	None	None	None
ASTM D6891 (Sequence IVA)[c]				
Average Cam Wear, µm, max	NR	NR	NR	90
				OR
ASTM D8350 (Sequence IVB)[c]				
Average intake lifter volume loss (8 position avg), mm^3, max	2.7	2.7	2.7	2.7
End of test iron, ppm, max	400	400	400	400
ASTM D8256 (Sequence VH)[d]				
Average engine sludge, merits, min	7.6	7.6	7.6	7.6
Average rocker cover sludge, merits, min	7.7	7.7	7.7	7.7
Average engine varnish, merits, min	8.6	8.6	8.6	8.6
Average piston skirt varnish, merits, min	7.6	7.6	7.6	7.6
Oil screen sludge, % area	Rate & report	Rate & report	Rate & report	Rate & report
Oil screen debris, % area	Rate & report	Rate & report	Rate & report	Rate & report
Hot-stuck compression rings	None	None	None	None
Cold stuck rings	Rate & report	Rate & report	Rate & report	Rate & report
Oil screen clogging, % area	Rate & report	Rate & report	Rate & report	Rate & report
ASTM D8114 (Sequence VIE)[e]				
SAE XW-20 viscosity grade				
FEI SUM, % min			4.3	NA
FEI 2, % min after 125 hours aging			2.1	NA
SAE XW-30 viscosity grade				
FEI SUM, % min			3.6	NA
FEI 2, % min after 125 hours aging			1.8	NA
SAE 10W-30 and all other viscosity grades not listed				
FEI SUM, % min			3.0	NA
FEI 2, % min after 125 hours aging			1.4	NA
ASTM D8226 (Sequence VIF)				
SAE XW-16 viscosity grade				
FEI SUM, % min			4.3	NA
FEI 2, % min after 125 hours aging			2.1	NA

JASO M 365[f]				
SAE 0W-8 viscosity grade				
FEI, % min				2.0
SAE 0W-12 viscosity grade				
FEI, %min				1.7
				OR
JASO M 366[f]				
SAE 0W-8 viscosity grade				
FEI, % min				1.1
SAE 0W-12 viscosity grade				
FEI, %min				1.1
ASTM D6709 (Sequence VIII)				
Bearing weight loss, mg, max				
SAE XW-16	NR	NR	NR	NR
All other viscosity grades	26	26	26	
ASTM D8291 (Sequence IX)				
Average number of events for four iterations, max	5	5	5	NR
Number of events per iteration, max	8	8	8	
ASTM D8291 Appendix X2 (Sequence IX Aged)				
Average number of events for four iterations, max	5	5	5	NR
Number of events per iteration, max	8	8	8	
ASTM D8279 (Sequence X)				
% increase, max	0.080	0.080	0.080	0.080

	API SQ		API SQ with "Resource Conserving"	
SAE Grades:	XW-16, 0W-20, 5W-20, 0W-30, 5W-30, 10W-30	Other Eligible Viscosity Grades	All Viscosity Grades Except 0W-8 and 0W-12	0W-8, 0W-12
Bench Test and Measured Parameter[b]				
Aged oil low-temperature viscosity ASTM D8111, (Sequence IIIHA) or ASTM D7528 (ROBO Test), aged oil low-temperature viscosity[g]				
Measure aged oil low temperature viscosity on final formulation (pursuant to existing read across described in Annex F)—this includes base oil and additive combination being licensed—for each viscosity grade by either IIIHA or ROBO. Measure CCS viscosity of EOT IIIHA or ROBO sample at CCS temperature corresponding to original viscosity grade.	a)If CCS viscosity measured is less than or equal to maximum CCS viscosity specified for original viscosity grade, run ASTM D4684 (MRV TP-1) at MRV temperature specified in SAE J300 for original viscosity grade. b)If CCS viscosity measured is higher than maximum viscosity specified for the original viscosity grade in J300, run ASTM D4684 (MRV TP-1) at 5°C higher temperature (i.e., at MRV temperature specified in SAE J300 for next higher viscosity grade). c)EOT IIIHA or ROBO sample must show no yield stress in D4684 test and its D4684 viscosity must be below maximum specified in SAE J300 for original viscosity grade or next higher viscosity grade, depending on CCS viscosity grade, as outlined in a) or b) above.			

	API SQ		API SQ with "Resource Conserving"	
SAE Grades:	XW-16, 0W-20, 5W-20, 0W-30, 5W-30, 10W-30	Other Eligible Viscosity Grades	All Viscosity Grades Except 0W-8 and 0W-12	0W-8, 0W-12
Bench Test and Measured Parameter[b]				
ASTM D8111, (Sequence IIIHB) phosphorus retention, % min	NR	NR	81	81
New Oil MRV, cP, max, at temperature specified in SAE J300	40,000	60,000	40,000	40,000
Sulfated Ash Content, ASTM D874, % max	NR	NR	0.9	NR
ASTM D6557 (Ball Rust Test), avg. gray value, min[d]	100	100	100	100
ASTM D5800, evaporation loss, 1 hour at 250°C, % max[h,i]	15.0	15.0	15.0	15.0
ASTM D6794, EOWTT, % flow reduction, max				
with 0.6% H_2O	50	50	50	50
with 1.0% H_2O	50	50	50	50
with 2.0% H_2O	50	50	50	50
with 3.0% H_2O	50	50	50	50
ASTM D6795, EOFT, % flow reduction, max	50	50	50	50
Engine Oil Gelation Test, WK86363, % flow reduction, max[j]	NR	NR	R&R	NR
ASTM D892 (Option A and excluding paragraph 11), foaming tendency				
Sequence I, mL, max, tendency/stability	10/0[k]	10/0[l]	10/0[k]	10/0[k]
Sequence II, mL, max, tendency/stability	50/0[k]	50/0[l]	50/0[k]	50/0[k]
Sequence III, mL, max, tendency/stability	10/0[k]	10/0[l]	10/0[k]	10/0[k]
ASTM D6082 (Option A), high-temperature foaming mL, max, tendency/stability[k]	100/0	100/0	100/0	100/0
ASTM D4951 or D5185, phosphorus % mass, max[m]	0.08[n]	NR	0.08[n]	0.08[n]
ASTM D4951 or D5185, phosphorus % mass, min[m]	0.06[n]	0.06[n]	0.06[n]	0.06[n]
ASTM D4951, D5185, or D2622, sulfur % mass, max[m]				
SAE 0W-16, 5W-16, 0W-20, 0W-30, 5W-20, and 5W-30	0.5[m]	NR	0.5[m]	
10W-30	0.6[m]	NR	0.6[m]	
0W-8, 0W-12				0.5
All other viscosity grades	NR	NR	0.6[m]	
ASTM D6922, homogeneity and miscibility	Shall remain homogeneous and, when mixed with ASTM Test Monitoring Center (TMC) reference oils, shall remain miscible.			
ASTM D5133, gelation index, max[d]	12[o]	NR	12[o]	12[o]
ASTM D6709, (Sequence VIII) shear stability				
XW-16, 0W-8, 0W-12	NR	NR	NR	NR
All other viscosity grades	Stay in grade[p]	Stay in grade[p]	Stay in grade[p]	

	API SQ		API SQ with "Resource Conserving"	
SAE Grades:	XW-16, 0W-20, 5W-20, 0W-30, 5W-30, 10W-30	Other Eligible Viscosity Grades	All Viscosity Grades Except 0W-8 and 0W-12	0W-8, 0W-12
Bench Test and Measured Parameter[b]				
ASTM D6278, or ASTM D7109 (Diesel Injector) shear stability, KV@100°C after 30 passes, min				
XW-16	5.8	5.8	5.8	0W-8 = 4.0 0W-12 = 5.0
All other viscosity grades	NR	NR	NR	
ASTM D7563, emulsion retention				
0°C, 24h	NR	NR	No water separation	No water separation
25°C, 24h	NR	NR	No water separation	No water separation
ASTM D6335, TEOST 33C, high-temperature deposits, total deposit weight, mg, max				
SAE XW-16	NR	NR	NR	NR
SAE 0W-20	NR	NR	NR	NR
All other viscosity grades	NR	NR	30	NR
ASTM D7216 Annex A2, elastomer compatibility	Table G-9	Table G-9Table G-9	Table G-9	Table G-9

[a] All oils shall meet the requirements of SAE J300, except as noted, in force at time of manufacture.

[b] ASTM test methods are per ASTM requirements and JASO test methods are per JASO requirements.

[c] Only one of Seq. IVA or IVB are required for 0W-8 or 0W-12 grades.

[d] If CI-4, CJ-4, CK-4 and/or FA-4 categories precede the "S" category and there is no API Certification Mark, the Sequence VH (ASTM D8256), Ball Rust (ASTM D6557), and Gelation Index (ASTM D5133) tests are not required.

[e] Viscosity grades are limited to 0W, 5W and 10W multigrade oils.

[f] Only one of JASO M 365 or JASO M 366 are required for 0W-8 or 0W-12 grades and testing requirements will follow JASO base oil interchange (BOI) and JASO viscosity grade read-across (VGRA) guidelines.

[g] Not required for monograde and 15W, 20W, and 25W multigrade oils.

[h] Calculated conversions specified in ASTM D5800 are allowed.

[i] Per ASTM D5800 methods (B) or (D).

[j] If available at time of licensing.

[k] After 1-minute settling period.

[l] After 10-minute settling period.

[m] For all viscosity grades: If 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 and sulfur do not apply. However, the CJ-4 limits for phosphorus and sulfur do apply for CJ-4 oils, and the phosphorus limit in the "SQ with "Resource Conserving"" column (0.08% mass maximum) applies when CK-4 with SQ or FA-4 with SQ is claimed. Note that these "C" category oils have been formulated primarily for diesel engines and may not provide all of the performance requirements consistent with vehicle manufacturers' recommendations for gasoline-fueled engines.

[n] This is a non-critical specification as described in ASTM D3244.

[o] 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.

[p] Ten-hour stripped kinematic viscosity must remain in original SAE viscosity grade.

Table G-9—Elastomer Compatibility

Candidate oil testing for elastomer compatibility shall be performed using the Standard Reference Elastomers (SREs) referenced herein and defined in SAE J2643. Candidate oil testing shall be performed according to ASTM D7216 Annex A2, The post-candidate-oil-immersion elastomers shall conform to the specification limits detailed herein				
Elastomer Material (SAE J2643)	Test Procedure	Material Property	Units	Limits
Polyacrylate Rubber (ACM-1)	ASTM D471	Volume	% Δ	-5, 9
	ASTM D2240	Hardness	pts.	-10, 10
	ASTM D412	Tensile Strength	% Δ	-40, 40
Hydrogenated Nitrile Rubber (HNBR-1)	ASTM D471	Volume	% Δ	-5, 10
	ASTM D2240	Hardness	pts.	-10, 5
	ASTM D412	Tensile Strength	% Δ	-20, 15
Silicone Rubber (VMQ-1)	ASTM D471	Volume	% Δ	-5, 40
	ASTM D2240	Hardness	pts.	-30, 10
	ASTM D412	Tensile Strength	% Δ	-50, 5
Fluorocarbon Rubber (FKM-1)	ASTM D471	Volume	% Δ	-2, 3
	ASTM D2240	Hardness	pts.	-6, 6
	ASTM D412	Tensile Strength	% Δ	-65, 10
Ethylene Acrylic Rubber (AEM-1)	ASTM D471	Volume	% Δ	-5, 30
	ASTM D2240	Hardness	pts.	-20, 10
	ASTM D412	Tensile Strength	% Δ	-30, 30
Polyacrylate Rubber (ACM-2)	ASTM D471	Volume	% Δ	Rate & Report
	ASTM D2240	Hardness	pts.	Rate & Report
	ASTM D412	Tensile Strength	% Δ	Rate & Report
Ethylene Acrylic Rubber (AEM-2)	ASTM D471	Volume	% Δ	Rate & Report
	ASTM D2240	Hardness	pts.	Rate & Report
	ASTM D412	Tensile Strength	% Δ	Rate & Report
Ethylene Acrylic Rubber (AEM-3)	ASTM D471	Volume	% Δ	Rate & Report
	ASTM D2240	Hardness	pts.	Rate & Report
	ASTM D412	Tensile Strength	% Δ	Rate & Report
Fluoroelastomer Rubber (FKM-3)	ASTM D471	Volume	% Δ	Rate & Report
	ASTM D2240	Hardness	pts.	Rate & Report
	ASTM D412	Tensile Strength	% Δ	Rate & Report