Lubricants Group Ballot - Seq. IX Aged Oil BOI/VGRA

The API Lubricants Group Standards (LGS) met in person, on June 19, 2024, during ASTM in Austin. At the meeting, the LGS agenda included a recommendation from the BOI/VGRA Task Force to consider including **Seq. IX Aged Oil BOI/VGRA ASTM 8291, Appendix X2** in Tables E-15 and F-15**.** Eric Kalberer, Chair BOI/VGRA TF, reviewed the industry and ACC data on New vs. Aged Candidate Oil in Seq. IX. (Attachment 1). The analysis established the BOI/VGRA was equivalent for New vs. Aged Oil.

After the data presentation there was a Motion to Ballot Seq. IX Aged Oil BOI/VGRA. (Attachment 2)

The motion detail is:

Motion	Motion to ballot updates to Annex E, Table E-15 BOI and Annex F, Table F-15 VGRA to include Sequence IX Aged Oil LSPI Test.
Motion by:	Eric Kalberer
Second by:	Mike Alessi
Lubricants Group Voice Vote	Vote: Approve Votes = 18 Negative Votes = 0 Abstain Votes = 0 Result: **Approved by LGS to issue ballot.** API to issue Electronic Ballot to be a minimum 30 Day Ballot

The Motion to ballot the inclusion of Aged Oil LSPI in Table E-15 and F-15 was approved by LSG.

In support of the Lubricants Group Ballot the draft changes to API 1509 are below.

E.2.2.4.11 For Sequence IX **or Sequence IX Aged Oil** tests required for interchanging the base stock, specific requirements are given in Table E 15.

Table E-15—Sequence IX Tests Required for Interchanging the Base Stock

Base Stock in Original Test Oil	Interchange Base Stock				
	Group I	Group II	Group III	Group IV	Group V
Group I	Required	Required	Required	Required	Required
Group II	Required	Not Required	Not Required	Not Required	Required
Group III	Required	Not Required	Not Required	Not Required	Required
Group IV	Required	Not Required	Not Required	Not Required	Required
Group V	Required	Required	Required	Required	Required

Note: The guidelines in this table were developed from data generated on oil with viscosity grades from SAE 0W-16 to SAE 10W-30. These viscosity grades do not restrict application of the guidelines by the marketer that is responsible for ensuring that each licensed engine oil satisfies all engine and bench test performance requirements.

Table F-15—Groups II, III and IV Viscosity Read-Across: Sequence IX Test or Sequence IX Aged Oil Test

	Can Be "Read-Across" to:					
Test Run on	0W-16	0W-20	0W-30	5W-20	5W-30	10W-30
0W-16	NA	X	X	X	X	X
0W-20	X	NA	X	X	X	X
0W-30	X	X	NA	X	X	X
5W-20	X	X	X	NA	X	X
5W-30	X	X	X	X	NA	X
10W-30	X	X	X	X	X	NA

Bracketing two passing formulations for a given technology may be used to waive additional viscosity grade testing. VGRA is allowed if the candidate's base oil viscosity at 100°C falls within the range of the base oil viscosity at 100°C of the two passing formulations. Additionally, the viscosity modifier content must be no more than 1.5 times higher than the highest viscosity modifier content in the oils used to support the VGRA bracket. This approach applies to formulations with base stock Group II, Group III, and Group IV. Oils containing Group I and/or Group V base stocks must contain an equal amount of the same base stock in the finished oil blend for application of viscosity grade read-across.

	Matrix Oil 1	Matrix Oil 2	Candidate Oil A	Candidate Oil B
Base Oil Viscosity @ 100°C, cSt	4.6	10.9	9.0	12.4
Sequence IX	Pass	Pass		
Test Required?			No	Yes
Reason			Formulation falls within base oil viscosity range	Formulation does not fall within base oil viscosity range

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 LG votes will be counted, and all comments reviewed and considered before the ballot may be considered passing.

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

This LG Ballot will close on Monday August 12, 2024. All votes and comments must be received by the ballot closing data.

ATTACHMENT 1

ACC PAPTG Analysis of Aged Oil Sequence IX Data

Prepared for
April 30, 2024 BOI/VGRA meeting

American Chemistry Council | Petroleum Additives Panel

Background: Sequence IX BOI
from API 1509 22nd Edition

American Chemistry Council | Petroleum Additives Panel

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Group V	Required	Required	Required	Required	Required

Note: The guidelines in this table were developed from data generated on oil with viscosity grades from SAE 0W-16 to SAE 10W-30. These viscosity grades do not restrict application of the guidelines by the marketer that is responsible for ensuring that each licensed engine oil satisfies all engine and bench test performance requirements.

Background: Sequence IX VGRA
from API 1509 22nd Edition

American Chemistry Council | Petroleum Additives Panel

Table F-15—Groups II, III and IV Viscosity Read-Across: Sequence IX Test

	Can Be "Read-Across" to:					
Test Run on	0W-16	0W-20	0W-30	5W-20	5W-30	10W-30
0W-16	NA	X	X	X	X	X
0W-20	X	NA	X	X	X	X
0W-30	X	X	NA	X	X	X
5W-20	X	X	X	NA	X	X
5W-30	X	X	X	X	NA	X
10W-30	X	X	X	X	X	NA

Bracketing two passing formulations for a given technology may be used to waive additional viscosity grade testing. VGRA is allowed if the candidate's base oil viscosity at 100°C falls within the range of the base oil viscosity at 100°C of the two passing formulations. Additionally, the viscosity modifier content must be no more than 1.5 times higher than the highest viscosity modifier content in the oils used to support the VGRA bracket. This approach applies to formulations with base stock Group II, Group III, and Group IV. Oils containing Group I and/or Group V base stocks must contain an equal amount of the same base stock in the finished oil blend for application of viscosity grade read-across.

Example:

	Matrix Oil 1	Matrix Oil 2	Candidate Oil A	Candidate Oil B
Base Oil Viscosity @ 100°C, cSt	4.6	10.9	9.0	12.4
Sequence IX	Pass	Pass		
Test Required?			No	Yes
Reason			Formulation falls within base oil viscosity range	Formulation does not fall within base oil viscosity range

ACC PAPTG Analysis Summary

American Chemistry Council | Petroleum Additives Panel

- Data was shared by 3 companies and included 5 different DI/VM combinations.
- Comparisons included either combined BOI/VGRA or VGRA only.
- All VGRA comparisons utilized the bracketing approach based on Base Oil Viscosity @ 100°C.

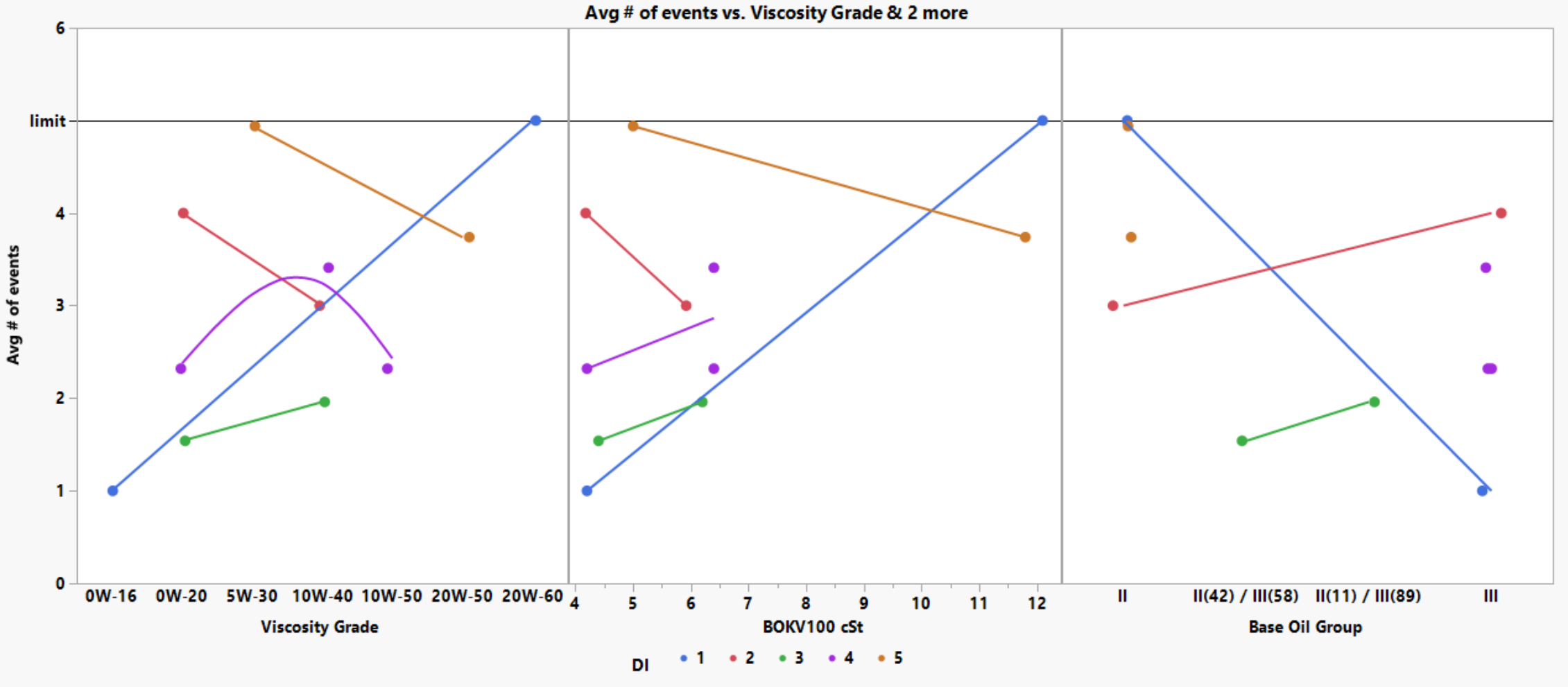
- Question being asked
  - Is there data in place to support adopting the Seq IX fresh oil BOI/VGRA guidelines for the Seq IX Aged Oil test?
- **The dataset reviewed by ACC is consistent with existing Sequence IX BOI/VGRA reads. There is nothing statistically different beyond technology as was seen with the fresh oil Sequence IX test. All provided data passes the Sequence IX Aged Oil Test.**

Shared Comparisons

American Chemistry Council | Petroleum Additives Panel

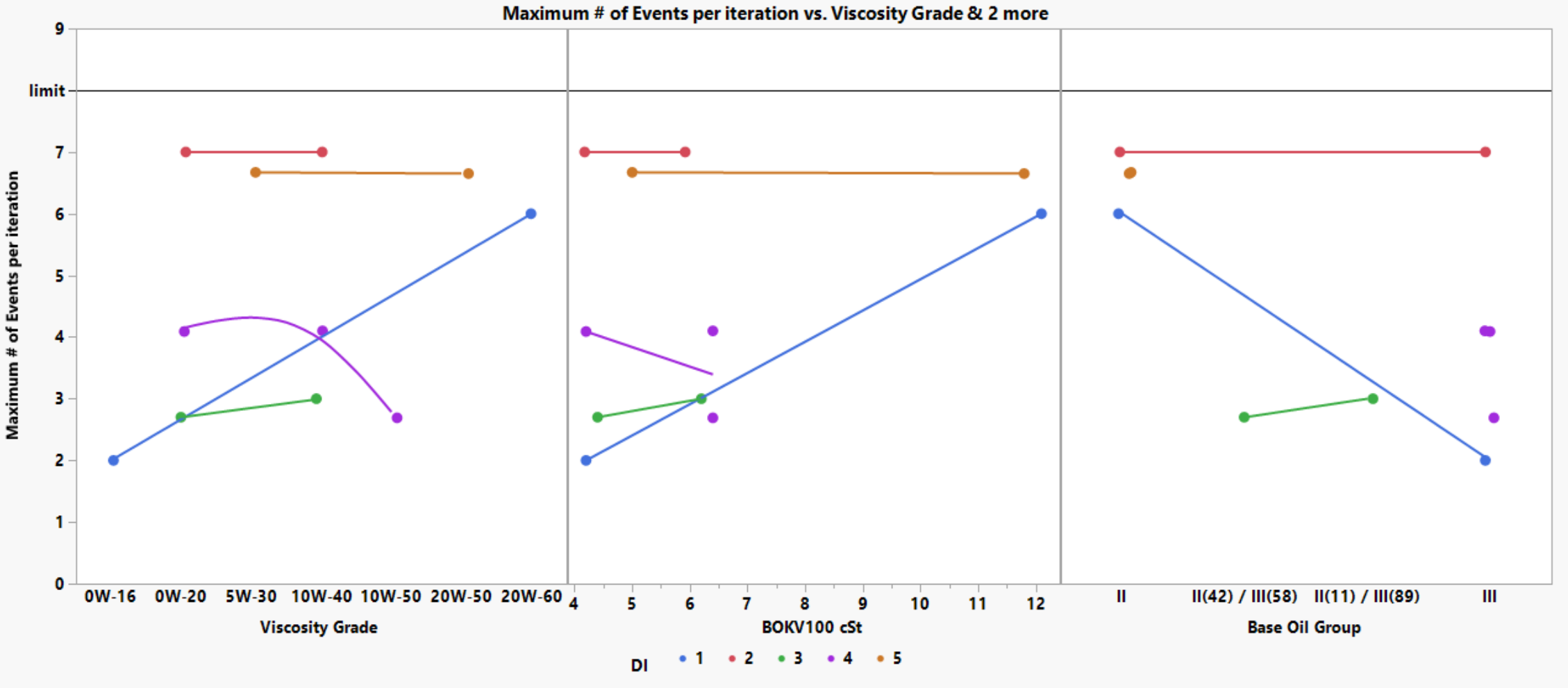
DI/VM	VM Treat	Viscosity Grade	Group II Base Stock 1	Group III Base Stock 2	BOV	Avg # events	Max # of events per iteration
1	X	0W-16		IIIB1	4.2	1	2
1	1.7X	20W-60	IIA1		12.1	5	6
2	X	0W-20		IIIB2	4.2	4	7
2	1.43X	10W-40	IIA2		5.9	3	7
3	X	0W-20	42% IIA3	58% IIIB3	4.4	2	3
3	2.24X	10W-40	11% IIA3	89% IIIB3	6.2	2	3
4	X	0W-20		IIIB3	4.2	2	4
4	1.8X	10W-40		IIIB3	6.4	3	4
4	3.15X	10W-50		IIIB3	6.4	2	3
5	X	5W-30	IIA3		5	5	7
5	1.2X	20W-50	IIA3		11.8	4	7

Plotted Data – Avg # Events



Like the Seq IX fresh oil tests, some technologies see decreases and/or increases in number of events. This led to a bracketed approach in the Seq IX fresh oil. Everything in between the high and low value of BOV is considered to pass based on existing VGRA rules. These comparisons include viscosity grades outside of ILSAC grades.

Plotted Data – Maximum # of Events per Iteration



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ATTACHMENT 2

Seq. IX Aged Oil BOI/VGRA

Motion to Present to Lubricants Group Sequence IX Aged Oil in BOI/VGRA Tables

Example of Revised Tables

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0W-20	X	NA	X	X	X	X
0W-30	X	X	NA	X	X	X
5W-20	X	X	X	NA	X	X
5W-30	X	X	X	X	NA	X
10W-30	X	X	X	X	X	NA

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BOI/VGRA Voted to Send to LG for Balloting

- To be presented to Lubricants Group
- Any online that would vote against sending to Lubricants Group
  - No objection from BOI/VGRA Members
  - BOI/VGRA motion passed.

Request LG Ballot Seq. IX Aged Oil BOI/VGRA

- BOI/VGRA Requests LG to Ballot Seq. IX Aged Oil BOI/VGRA as given is draft tables.

Motion to LG Ballot Seq. IX Aged Oil BOI/VGRA

- Motion to ballot updates to annex e table E-15 BOI and Annex F Table F-15 VGRA into include Sequence IX Aged Oil LSPI Test

- Motion by Eric Kalberer
- Second by Mike Alessi

- LG Members in favor = 18
- Opposed = 0
- Abstain = 0

30 Day ballot duration