ASTM New Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

July 24, 2023

Yong-Li McFarland, Chair

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Agenda

- New EOGT
  - Update on received donated oils
  - Report Form update
- Next meeting

EOFT and EOWTT Surveillance Panel Membership and Scope

19 members

Beth Schwab, Afton Chemical
Michael Kunselman, Center for Quality Assurance
Robert Stockwell, Chevron Oronite
Dennis Gaal, Exxonmobil
Ron Shah, Infineum
Joe Franklin, Intertek
Karina Gil, Intertek
Michael Johnscher, ISP
Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.
Victoria Fein, Lubrizol
Jason Bowden, OH Technologies Inc
Greg Miiller, Savant Group
Maggie Smerdon, Savant Labs
Sean Alston, SGS North America
Jared Cavaliere, SwRI
Becky Grinfield, SwRI
Yong-Li McFarland*, SwRI
John Loop, TMC
Amy Ross, Valvoline

*Chair

Scope and Objective

- It is the responsibility of this panel to provide surveillance over Test Methods D6794 and D6795 bench tests used in the ILSAC and API passenger car oil categories. The surveillance panel will review data semi-annually supporting the precision for each bench test and when necessary, conduct workshops to bring the bench tests within accepted limits. The surveillance panel will function with the support of the ASTM Test Monitoring Center (TMC) to monitor the bench tests and maintain appropriate and adequate supplies of reference oils for the monitoring process. The panel will maintain a liaison with the "expert groups" in ASTM, which may help in the maintenance and improvement of the bench test methods used in support of the current ILSAC and API categories. The surveillance panel will make recommendations for appropriate action through Subcommittee D02.B, Section 7.

New EOGT WK86363, ILS# 1854

- Ford request for a new Engine Oil Gelation Test (EOGT): request to add a new test filterability test to better screen oils for field issues
- Current status
  - Method: 2 drafts (large volume (600g) and small volume (200 g)) uploaded on ASTM Collaboration Area – Send latest 2 drafts with email, email Jared with procedure questions
  - Oils: **12** potential reference oils offered, additional samples may arrive
  - Screening Tests, Pilot Study, and ILS: Report form completed, Oils sent to labs, labs starting Screening Tests
  - Timing: Estimate Screening Tests run in August, Pilot Study tests run by November, ILS tests to be run by March, and final method ballot in May or June 2024

Oil Matrix

Participants	Potential Reference Oils Offered	Sample Received at TMC	Comments
Ford	2 oils (low and high known performance oils) - **confirmed** to be eligible reference oils	2 samples received	
Toyota	2 oils (2 technologies, 0W-20) - **unconfirmed** if eligible to be reference oils	2 samples received	
Afton	4 oils (1 technology, 2 vis grades, 2 base oils) – **confirmed** to be eligible reference oils	4 samples received	
Lubrizol	4 oils (2 technologies 2 treat rates, 1 vis grade, 1 base oil) – **confirmed** to be eligible reference oils	4 samples received	
Infineum	2 oils – **confirmed** to be eligible reference oils	1 sample received	
Oronite	4 oils (4 technologies, 1 vis grade, 1 base oil) – **unconfirmed** if eligible to be reference oils	3 samples received	
Subaru	0	1 sample received	Offer 1 field sample for later testing
Total Oils	**12 potential reference oils confirmed, 6 oils not confirmed**	**17 oils received, 2? oils to arrive**	

John Loop to manage Sample Information

Testing Status – July 21

Test Phase	Description	Status	Issues/questions
1. Screening Tests	-4 tests; 2 oils: low performance oil in duplicate, high performance oil in duplicate; 6 labs -Run LV method -Intent: check labs can run test as set up	Samples sent to labs; start testing week of July 24, estimate completion by Aug 28 week	Run SOT & 14 day EOT only.
2. Pilot Study	-? Tests; ? Oils; 4 labs -Run SV and LV methods -Intent: determine samples, method, and intervals for procedure and ILS	Waiting to determine samples	
3. Interlaboratory Study (ILS)	-? Tests; ? Oils; 6 labs -Run _ method -Intent: generate repeatability and reproducibility data on samples, determine at least 2 reference oils	Waiting to determine samples	

EOGT report form Rev4.5

Next Steps

- All labs (SwRI, ISP, Intertek, Afton, Valvoline, Savant) run Screening tests (LV tests on high and low performance oils) and send Data Report Form by email to John Loop
- Travis to analyze Screening Test data if all labs can participate in Pilot Study and ILS or if labs need to make adjustments before starting next tests
- Determine Pilot Study samples (# and which samples, and # repeats), and method (LV, SV, all intervals)
- Send out Pilot Study samples to Pilot Study labs
- Labs run Pilot Study

Draft Timeline

Task	Date						
	May-Jun 2023	Jul-Aug 2023	Sept-Oct 2023	Nov-Dec 2023	Jan-Feb 2024	Mar-Apr 2024	May-Jun 2024
Develop test procedure and report form (ILS)							
Collect and prepare donated oil samples (18 oils)							
Screening samples shipped to Screening labs (6 labs)							
Screening labs run 4 tests							
Data analysis for Screening tests							
Pilot Study samples shipped to Pilot Study labs (4 labs)							
Pilot Study labs run ? tests							
Data analysis for Pilot Study							
ILS samples shipped to ILS labs (6 labs)							
ILS Labs run tests							
Data analysis for ILS, generate Research Report (RR) & Precision							
Ballot test procedure and RR							
Generate pass/fail limits [Outside this Surveillance Panel]							

Action Items and Next Meeting

- Oil Participants email Yongli M and John L on how many samples eligible as reference oil by Aug 1 otherwise assume no response means oils are NOT eligible as reference oils
- Yongli to add additional participants to ASTM Collaboration Area
- Labs to run Screening Tests

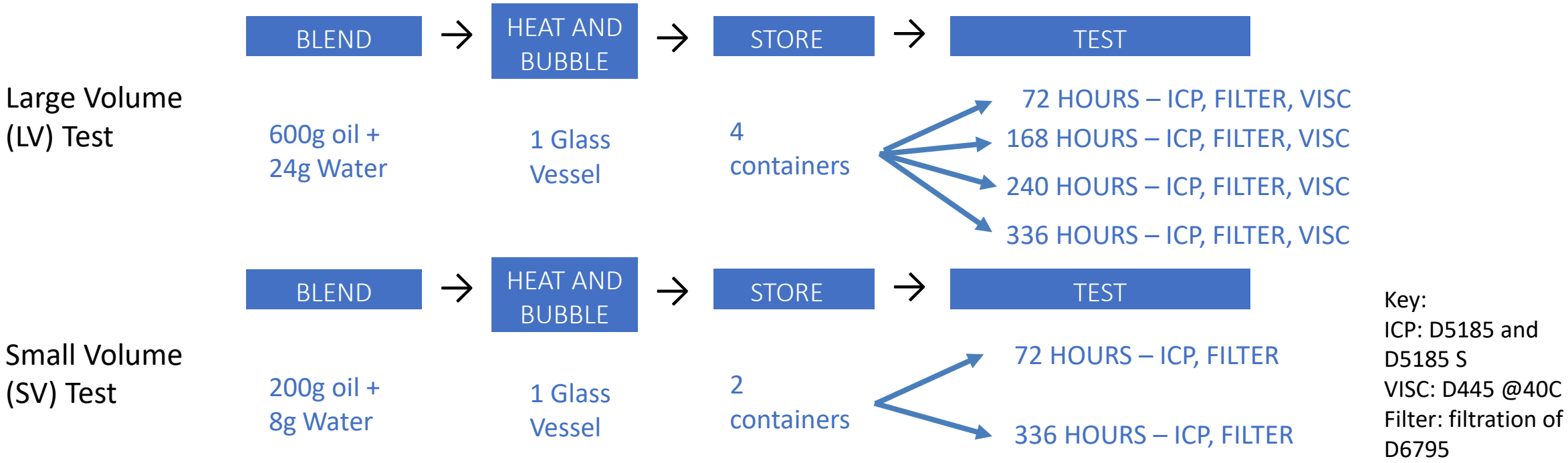
- Next Meeting: August 7 at 8:30AM CDT and every 2 weeks

Thank you for your support!

Participants		
Method Development	Oil Donations	Testing Labs
Afton ExxonMobil Ford Infineum Intertek ISP Lubrizol Oronite Savant SwRI TMC	Afton Ford Infineum Lubrizol OH Technologies (donate filters only) Oronite Subaru TMC (collection, shipping only) Toyota	Afton (Pilot and ILS) Intertek (Pilot and ILS) ISP (Pilot and ILS) Savant (ILS) SwRI (Pilot and ILS) TMC (monitoring system only) Valvoline (ILS)

Backup slides

New Filterability Test Flow



Key:
ICP: D5185 and D5185 S
VISC: D445 @40C
Filter: filtration of D6795

New Oil

Test ICP, VISC, Filter LV (@72 hours, 168 hours, 240 hours, 336 hours), Filter SV (@72 hours, 336 hours)

Zero Hour (SV & LV only)

Blend 30g oil + 1.2g Water (no heating or bubbling) → Test ICP, VISC (LV only)

Pilot Study and ILS Test Matrix

- ILS goals: 1) determine reference oil performance level, 2) precision (repeatability and reproducibility) of possible samples, and 3) select sample volume for final test
- As a TMC monitored test, this ILS needs to include high quality reference oil tests. Require running potential reference oils many repeats by labs. Target a low and high reference oil with some flexibility. Consider a border line reference as well. Will consider any existing reference oils if donated.
- Test precision: target 4-5 samples representative of current fluids to look at variance in results
- Pilot study: suggest 2-3 labs run offered potential reference oil samples to see initial expected performance on both SV and LV procedures. Data then determine which samples are included in full ILS with repeats.

- Oils Donation Volunteers: we are only looking for fluids that could be supplied as reference fluid for this test for the next 3-5 years, sample volume estimate around 330 gallons (for 5 year supply). Confirmation from Afton, Infineum, Lubrizol on oil samples provided.
- Determine sample volumes to be shipped to TMC: ?
- Determine sample volume per sample to ship to lab: ?

Pilot Study Matrix (suggested)

Test Number	Lab A	Lab B	Lab C	Lab D
1	Sample 1 (LV)	Sample 1 (SV)	Sample 1 (LV)	Sample 1 (SV)
2	Sample 2 (LV)	Sample 2 (SV)	Sample 2 (LV)	Sample 2 (SV)
3	Sample 3 (LV)	Sample 3 (SV)	Sample 3 (LV)	Sample 3 (SV)
4	Sample 4 (LV)	Sample 4 (SV)	Sample 4 (LV)	Sample 4 (SV)
5	Sample 5 (LV)	Sample 5 (SV)	Sample 5 (LV)	Sample 5 (SV)
6	Sample 6 (LV)	Sample 6 (SV)	Sample 6 (LV)	Sample 6 (SV)
7	Sample 7 (LV)	Sample 7 (SV)	Sample 7 (LV)	Sample 7 (SV)
8	Sample 8 (LV)	Sample 8 (SV)	Sample 8 (LV)	Sample 8 (SV)
9	Sample 9 (LV)	Sample 9 (SV)	Sample 9 (LV)	Sample 9 (SV)
10	Sample 10 (LV)	Sample 10 (SV)	Sample 10 (LV)	Sample 10 (SV)
11	Sample 11 (LV)	Sample 11 (SV)	Sample 11 (LV)	Sample 11 (SV)
12	Sample 12 (LV)	Sample 12 (SV)	Sample 12 (LV)	Sample 12 (SV)
13	Sample 1 (SV)	Sample 7 (LV)	Sample 7 (SV)	Sample 1 (LV)
14	Sample 2 (SV)	Sample 8 (LV)	Sample 8 (SV)	Sample 2 (LV)
15	Sample 3 (SV)	Sample 9 (LV)	Sample 9 (SV)	Sample 3 (LV)
16	Sample 4 (SV)	Sample 10 (LV)	Sample 10 (SV)	Sample 4 (LV)
17	Sample 5 (SV)	Sample 11 (LV)	Sample 11 (SV)	Sample 5 (LV)
18	Sample 6 (SV)	Sample 12 (LV)	Sample 12 (SV)	Sample 6 (LV)
19	Sample 1 (LV)	Sample 7 (SV)	Sample 10 (LV)	Sample 4 (SV)
20	Sample 2 (LV)	Sample 8 (SV)	Sample 11 (LV)	Sample 5 (SV)
21	Sample 3 (LV)	Sample 9 (SV)	Sample 12 (LV)	Sample 6 (SV)
22	Sample 4 (SV)	Sample 10 (LV)	Sample 7 (SV)	Sample 1 (LV)
23	Sample 5 (SV)	Sample 11 (LV)	Sample 8 (SV)	Sample 2 (LV)
24	Sample 6 (SV)	Sample 12 (LV)	Sample 9 (SV)	Sample 3 (LV)

Total LV	15	9	15	9
Total SV	9	15	9	15

1. Do we really need look at 12 samples or reduce number? ILS precision matrix likely 4-6 samples with repeats Response: try to reduce with info on low & high performance oil runs
2. Do we want to give more weight on Low and High performance oils than other? If so, then reduce number of samples or add more tests

SV volume ship out: 600 mL
LV volume ship out: 1500 mL

Total 10 L (~2.5 gallons) per sample for all labs & tests to TMC for Pilot Study
? Weeks to complete pilot

Group would like to run LV tests on low and high performance oils at all 6 labs before starting Pilot Study. This determines if lab is fit to run Pilot and ILS.

TMC can ship out samples week July 10 to all 6 labs in LV quantities
Labs to start testing week July 17