

ASTM New Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting
December 11, 2023

Yong-Li McFarland, Chair



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EOFT and EOWTT Surveillance Panel Membership

20 members

Beth Schwab, Afton Chemical

Michael Kunselman, Center for Quality Assurance

Robert Stockwell, Chevron Oronite

Dennis Gaal, Exxonmobil

Michael Deegan, Ford

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



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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, email Jared with procedure questions
 - Oils: **11** potential reference oils offered; 17 oils received at TMC
 - Screening Tests, Pilot Study, and ILS: Screening Test completed, start additional Proposal testing
 - Timing: Pilot Study tests run by February, ILS tests to be run by June, and final method ballot in Sept or Oct 2024



Testing Status – updated Nov 16 [EOGT report form Rev 6](#)

Test Phase	Description	Status	Comments
1. Screening Tests	<p>-4 tests; 2 oils: low performance oil in duplicate, high performance oil in duplicate; 6 labs</p> <p>-Run LV method</p> <p>-Intent: check labs can run test as set up</p>	All 6 labs submitted data	Run SOT & 14 day EOT only. -REVIEW data
2. Pilot Study	<p>-? Tests; ? Oils; 4 labs</p> <p>-Run SV and LV methods, all intervals</p> <p>-Intent: determine samples, method, and intervals for procedure and ILS</p>	<p>Waiting to determine samples:</p> <p>-Plan to include either 6 or 10 oils including 2 performance oils, and then each of the other oil participants select 1 or 2 “borderline” oil for total of 6 or 10 oils to run. “Borderline” is something that would fall in-between the 2 performance oils (less Ca than Oil F?)</p> <p>-Pros/cons: 6 oils – shorter to run, but may not find a borderline reference and may need another Pilot run; 10 oils-longer to run, but more likely to find a borderline reference</p>	Group to decide as we move forward
3. Interlaboratory Study (ILS)	<p>-? Tests; ? Oils; 6 labs</p> <p>-Run _ method</p> <p>-Intent: generate repeatability and reproducibility data on samples, determine at least 2 reference oils</p>	Waiting to determine samples	

Proposal Experiments – December 8

Proposal Experiments	Lab(s)	Status	Next Step
1. Sediment-only Filterability	Afton	Completed	GROUP to make comments on if this is helpful – no feedback to use
2. Include 0 Hr filterability	ISP	Completed	No need to include 0 Hr filterability currently
3. Run EOGT on Ref Oil 79 and 77-3	ISP and Afton	ISP: Completed Afton: Complete – TO SHARE	
4. Run EOGT with 8% water	Savant and Intertek	Savant: Completed Intertek: Completed	No need to use 8% water
5. Characterize gel	Savant and Valvoline	Savant: Completed IR Valvoline: tried microscopy, will try IR on 4% water as well - share at Jan meeting	Unsure how results will be helpful in test currently
6. Centrifuge sample before filterability	SwRI	Complete – TO SHARE	
7. No homogenizing before filterability	Intertek	Completed	GROUP to make comments on if this is helpful- no feedback to use
8. Run EOGT with 4 hr CO2 bubbling and heating (run with 2 flow tubes)	SwRI	Complete – TO SHARE	Additional CO2 not necessary, running with 2 tubes helps,

3. Run EOGT on Ref Oil 79 and 77-3

- ISP Results, video

Sample	Filter Change Rate (%) Run 1	Filter Change Rate (%) Run 2	Filter Change Rate (%) Avg.
182063+064+065 (Ref Oil 77-3)	-13.33	-10.34	-11.84
182083+084+08 (Ref Oil 79 on EOFT avg is +36%)	-10.34	-6.90	-8.62

- Afton Results (to be shared at next meeting)



Other updates Dec 11

- Blending Equipment update- add photo of regulator compared to filter set and distance of tubing from labs, send info by January to John Loop
- ISP Video: Blending mixer/homogenizing/shearing blade used is different from waring blender in method with higher shearing; will need to standardize mixing setup likely part numbers; group to update method with more details on blender in EOGT;
- Additional testing: 1) request for Afton to run with 1 CO2 tubes, plastic jars for storage and using dispersing tool on Change in filtering rate results on 2 oils, request oil from TMC with IR on fresh oil, top layer, sediment layer, and mixed EOT spectra
- 2) Request for ISP to run with 2 CO2 tubes, plastic jars for storage, and using waring blender setup on Change in filtering rate results on 2 oils, request oil from TMC with with IR on fresh oil, top layer, sediment layer, and mixed EOT spectra
- Afton to help write a IR detection method for calcite, if any other methods to detect calcite, please let group know.
- Others?
- TMC shared amounts of 2 performance oils



Draft Timeline – updated Dec 11

Task	Date									
	May-Jun 2023	Jul-Aug 2023	Sept-Oct 2023	Nov-Dec 2023	Jan-Feb 2024	Mar-Apr 2024	May-Jun 2024	Jul-Aug 2024	Sept-Oct 2024	
Develop test procedure and report form (ILS)	█									
Collect and prepare donated oil samples (18 oils)	█	█								
Screening samples shipped to labs (6 labs)		█								
Screening labs run 4 tests			█	█						
Data analysis for Screening and Proposal tests			█	█	█					
Pilot Study samples shipped to 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]										



Next Steps

- Labs to run additional Proposal Experiments and group to review results
- Request TMC to send 2 samples each of both Performance oils to ? Labs for additional testing; ask labs to let John Loop know how much sample remaining by Nov 29. John to check on remaining fluids at TMC
- If change in flow rate not showing difference between the 2 performance oils, will group consider IR or other data as criteria for test?
- What is the direction for next steps – Copy ISP equipment, look at other report metrics, proceed with Pilot Study, something else? Provide Yongli feedback
- On Hold-Determine Pilot Study samples (# and which samples, and # repeats), and method (LV, SV, all intervals)
- On Hold- Send out Pilot Study samples to Pilot Study labs
- On Hold- Labs run Pilot Study

Action Items and Next Meeting

- All to review Proposal Experiment results and make any comments on method improvements
 - Afton and ISP Labs to run additional proposal tests and let Yongli know on estimated EOT dates by Jan meeting
 - Labs to update Screening tests with Mo and B data by email to John Loop ASAP
 - Labs to let John Loop know how much sample remaining ASAP. John to check on remaining fluids at TMC and let Yongli know
 - Labs to send John Loop inf on blending, filtration setup by Dec 29
 - ISP to let me know if ISP videos can be shared with group
 - Afton to help write an IR detection method for calcite, if any other methods to detect calcite, please let group know.
 - All to let Yongli know on direction for next steps
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- Next Meeting: Monday January 8 at 8:30AM CDT and every 2 weeks



Thank you for your support!

Participants		
Method Development (11)	Oil Donations (9)	Testing Labs (7)
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 (Screening, Pilot, and ILS) Intertek (Screening, Pilot, and ILS) ISP (Screening, Pilot, and ILS) Savant (Screening and ILS) SwRI (Screening, Pilot, and ILS) TMC (monitoring system only) Valvoline (Screening and ILS)

