ASTM Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

August 5, 2024

Yong-Li McFarland, Chair

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EOFT and EOWTT Surveillance Panel Membership

21 members

Beth Schwab, Afton Chemical
Michael Kunselman, Center for Quality Assurance
Robert Stockwell, Chevron Oronite
Quanchang Li, ExxonMobil
Michael Deegan, Ford
Melissa Chu, Infineum
Angela Willis, 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

EOFT D6795 and EOWT D6794 Method Review cont.

- 3. Consider rewording for which side to test on filter. The method says "filter smooth side up". It isn't always easy to see which side is "smooth".
  - Current wording: *Section 10.1: Assemble apparatus as shown in Fig.1 with filter installed in proper orientation (25 µm smooth side up).*
  - Request labs to respond to TMC on how they determine smooth side up. Group believes labs aren't able to tell which side should be up and would then remove words: "*installed in proper orientation (25 µm smooth side up).* Around 2000, change in filter paper made it difficult to determine smooth side.

- WK91396 opened to revise D6795
- WK91397 opened to revise D6794

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: 3 drafts (large volume (600g), small volume (200 g), and Afton method) uploaded on ASTM Collaboration Area
  - Oils: 11 potential reference oils offered; 17 oils received at TMC
  - Screening Tests and ILS: Screening Test and additional tests ongoing
  - Timing: ILS tests to be run by October, and final method ballot in January or February 2025

Updates 8-5-24

- Root Cause Subgroup update (water type update, Cold Soak tests update, Afton method update)
- ISP rerun of performance oils estimate to complete by August 16, please confirm lab running Oils F and K before starting
- New Afton EOGT modified procedure
- TMC update on labs' response for burette size opening (missing 1 lab response)
- TMC update on labs' response for storage temperature (after blending and bubbling CO2) (missing 4 labs response)
- TMC update on labs' response for part number, vendor, and photo of filter holder to TMC; OHT also offered info on part (missing 4 labs response)
- TMC update on labs' response if homogenization step description is accurate and add details to Data Excel (no changes from any lab)

Savant Cold Storage Tests

Sample IDs		Time Inteval	ROOM TEMP Percent Change			0C Percent Change		
		Week	Run 1	Run 2	Average	Run 1	Run 2	Average
CMIR 183759	S20231005-017 (Oil F)	Week 1	-12.29	-9.57	-10.93	-7.40	-8.05	-7.73
CMIR 183761	S20231005-019 (Oil K)		-9.40	-6.50	-7.95	-8.96	-5.37	-7.17
CMIR 183759	S20231005-017 (Oil F)	Week 2	-17.61	-15.85	-16.73	-6.47	-9.96	-8.22
CMIR 183761	S20231005-019 (Oil K)		-7.65	-6.86	-7.26	-8.29	-7.61	-7.95
CMIR 183759	S20231005-017 (Oil F)	Week 4	-15.62	-1.78	-8.70	1	-6.85	-2.93
CMIR 183761	S20231005-019 (Oil K)		-6.69	-11.67	-9.18	-13.25	-5.32	-9.29
CMIR 183759	S20231005-017 (Oil F)	Week 8	-36.75	-49.94	-43.35	-17.18	-27.9	-22.54
CMIR 183761	S20231005-019 (Oil K)		-20.69	-16.32	-18.51	-16.43	-6.64	-11.54

Test again Week 9

Our cold and room temperature storage continues to show discrimination at 8 weeks

Notes 7-15-24: Could we control cooling ramp for storage with slower cooling ramp for more gelling?
Savant did run samples with D5133 cooling ramp. Root cause to review actions.
-Consider checking water content on 6 month retains and fresh runs.

Intertek Cold Storage Results – Aug 2 2024

CMIR	Rate Change 1	Rate Change 2	Rate Change Average
182324 (Oil K)	-11.23	-11.35	-11.29
182325 (Oil F)	-61.13	-60.19	-60.66
182159/182160 (Oil K)	-8.73	-4.35	-6.54
182161/182162 (Oil F)	-71.85	-72.41	-72.13

1. Place retain in cold storage at -5 to 0C for 7 days.
2. After 7 days, remove and allow it to sit, on a counter is fine, for 2 hours to reach room temp (above 16C)
3. Homogenize by inverting container 20 times and then use a rubber policeman or spatula to mix any precipitate still sticking to the container. Don't use forceful mixing but it will take some work to mix it.
4. Run filterability normally. May need to gently mix the sample again if it separates before adding to the burette.

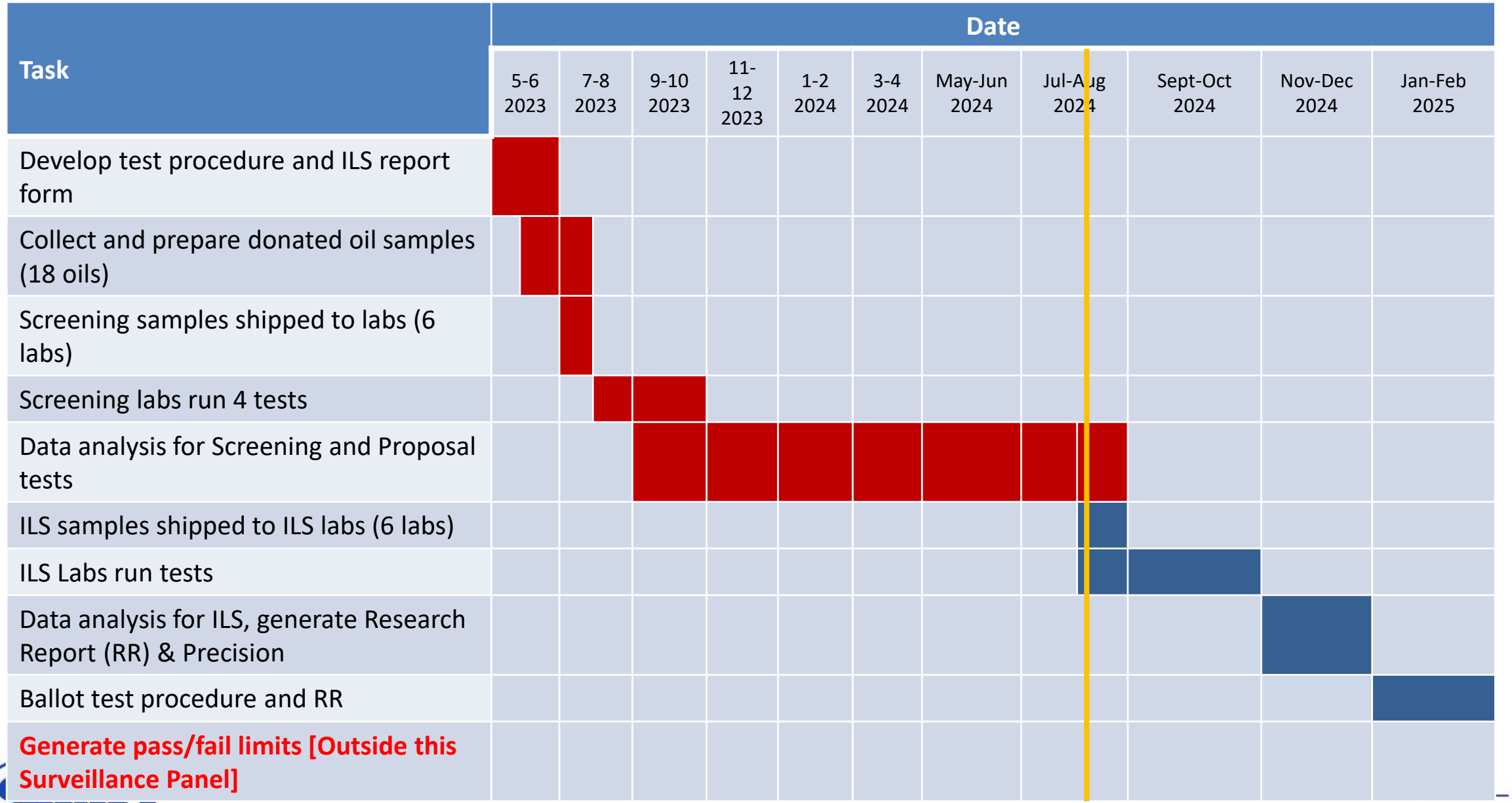
Notes 8-5-24: Consider looking at acidity of retains and possibly review/observe filter or gel and test for chemical composition for calcium carbonate (viscosity, FTIR? (ATR vs flow cell), aqueous ICP, EDX?, XRF?, MRV?)

Afton Method Test Results

- Savant update: Shared results on Oil F and K. Both samples looked the same by results, need to verify with TMC, (CMIR 188849 and 188851) will run GC, ICP to check if same or different samples.
- SwRI update: materials arrived and will start tests ASAP
- Afton update: looking at shorter duration tests, and optimizing conditions, able to repeat results many times

- Afton to post method on ASTM Collaboration Area for others to review method
- Labs, please review posted video on mixing
- Any other labs to participate?

Draft Timeline – updated August 2



Action Items and Next Meeting

- Group to decide next steps for EOGT.
- SwRI, Savant, Afton (and any other labs) to report on their Afton EOGT modified procedure test results
- Afton to upload Afton method to Collaboration Area
- Labs to send TMC info on how to identify smooth side up filter.
- Labs to let TMC know on storage temperature (after blending and bubbling CO2) from Labs I, D, A and G.
- Labs to let TMC know on part number, vendor, and photo of filter holder; OHT also offered info on part from Labs D, A, G, EI.
- YM to confirm with ISP and TMC on running oils F and K
- YM to check with Intertek on additional EOT sample analyses

- Next Meeting: Monday August 19 at 9:30 AM CDT for 1.5 hrs

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 Intertek ISP Savant SwRI TMC (monitoring system only) Valvoline