

ASTM New Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

May 22, 2024

Yong-Li McFarland, Chair



ADVANCED SCIENCE. APPLIED TECHNOLOGY.

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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

Quanchang Li, ExxonMobil

Michael Deegan, Ford

Melissa Chu, 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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EOFT D6795 and EOWT D6794 New Item

- ASTM D6795 is up for 5-year review in 2024, ASTM D6794 is up for review in 2025
- Looking for participants for suggested edits and improvements- Maggie, Rachelle, Victoria, John L volunteered
- Group will meet in early June for more discussion



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 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 5-22-24

- Root Cause Subgroup update
- ISP rerun of performance oils estimated to complete in August
- 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)
- Eugene (Afton) to look into FTIR peak in ISP data around 2300 wavenumber to see what peak may be. This peak is related to CO₂, and Afton does a correction for CO₂ so not seen in Afton IR graphs. Not sure if ISP does a CO₂ correction in their FTIR.



EOGT FISHBONE ACTION ITEMS LIST - Revised 15May2024

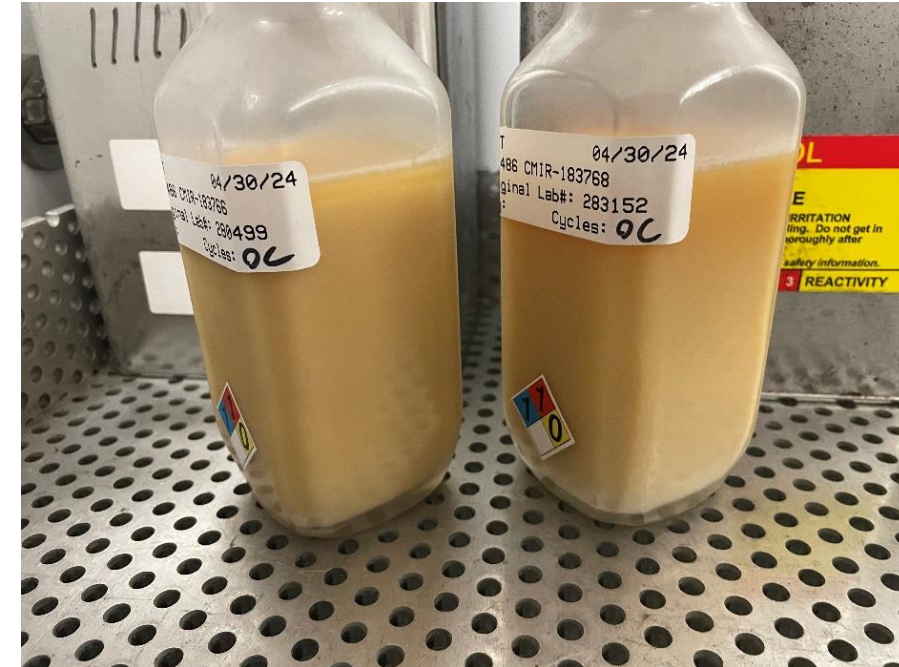
Category	Cause	Sub-Cause	Action to Evaluate	Due Date	Status	Date Closed
Method/Environment	Storage Time Temperature/Thermal Cycling	Cold temperature not being considered as a driving parameter	Savant performing "cold soak" on post test retains (repeat storage at 32F), bring to room temperature, then repeat filtration. Want additional tests on performance oils with cold soak: SwRI to run at cold storage -5C and 7C with waring blender with 2 CO2 tubes on 2 performance oils. Savant to consider a second run. Savant and SwRI did run filterability on EOT retain without cold soaks and no differentiation.	May 10	Savant reported differentiation on change in filter rate after cold soak for the 2 samples (retains from 8% water). Waiting for additional results from SwRI (repeating 0C storage with retains) by May 21-email Root Cause with results-Jared. -Savant to consider running D5133 on EOT sample -Group to decide next test runs	
Environment	Differences in storage conditions from initiating lab	Storage temperature possibly differ over time (not in controlled environment)	Request participating labs to monitor and report storage temperatures, as well as confirm they are in a controlled environment (set temperature, no fluctuations due to company energy savings)	May	YM to ask labs to provide response to TMC	
Equipment	Shearing tool and calibration	Differences in type of shearing tool used and how 18,000 rpm is calibrated may change results	ISP ask to share how rpm is calibrated; Group to review the different blade types used: Afton: IKA T25, IKA S25N-18G (rotor and stator gap: 0.3mm); ISP: IKA T18 now digital T18 , IKA S18N-19G (rotor and stator gap: 0.25 mm); SwRI: IKA S25N-18G; Savant: Waring blender	May	tool used hasn't been calibrated and uses setting 6 for 18,000 rpm; a new digital version has a connection to "calibrate"; ISP is using new head: https://www.ika.com/de/Produkte-LabEq/Dispergierer-pg177/T-18-digital-ULTRA-TURRAX-3720000/ , same blade. Group to wait to decide if this is a cause.	
Materials	different water types used		Angela to share differences between Type I, II, III and share links to papers on silica forming more carbonate; Check silica content of DI water from different labs (ISP, Savant, SwRI)	May	With increasing silica content, may form more carbonate; Type III has most silica (up to 500 ppb). Group to wait to decide if this a cause.	
Materials	filter paper variation	understand batch variability and if any differences in cutting filters	YM to ask OHT to provide 1) tolerances for pore size and beta efficiency from manf, 2) could share with main group their procedure for cutting filter paper and quality protocol to ensure integrity and compliance; 3) C of A possible to be shared. Rob to check on magnification to review filters and any suggestions on inspection process for filters from filter expert. Ask if labs would look at 3 filters under microscope under ? magnification and provide photos of what is representative. Ask ISP to send some filters to SwRI and Savant?	5-Jun	Ask: how is inspection done (microscope or by eye), detail on inspect: what happens to die if there are bent, slugs or debris; assume 13 mm diameter? For 1 batch cutting, what is inspection frequency for batch? How many total parts are inspected and how are they selected for inspection (are they representative of batch).	
Equipment	Filter holder		YM ask labs to share part #, vendor and photo of holder to TMC	May		
Methods	homogenizing step		YM ask labs to check if homogenization step is accurated described in Data excel			
	Humidity levels at labs		Next meeting: May 23 at 9am CDT			

New Oil Ca ICP (ppm)	New Oil Mg ICP (ppm)	New Oil B ICP (ppm)	336 hr EOT Ca ICP (ppm)	336 Hr EOT Mg ICP (ppm)	336 Hr EOT B ICP (ppm)	Change in Filter rate (%), Run 1	Change in Filter rate (%), Run 2	Change in Filter rate (%), Average			
									Storage Temperature	Sample CMIR	REF OIL ID
2093	10	<1	1702	5	<1	-10.6	-10.21	-10.4	0c	183766	F
-	-	-	1667	5	1	-10.56	-7.17	-8.86	9c		
-	-	-	-	-	-	-10.09	-10.37	-10.23	Room temp		
-	-	-	1765	6	1	-37.54	-36.43	-36.98	Old (Nov)+1 wk Cold (0C)		
1005	553	207	927	328	90	-8.35	-8.75	-8.55	0c	183768	K
-	-	-	916	321	84	-8.07	-8.36	-8.22	9c		
-	-	-	-	-	-	-7.29	-6.57	-6.93	Room temp		
-	-	-	523	281	76	-9.59	-9.57	-9.58	Old (Nov)+1 wk Cold (0C)		



24 Hours

No Photo



Room

9°C

0°C

72 Hours



Room



9°C



0°C

168 Hours



Room



9°C

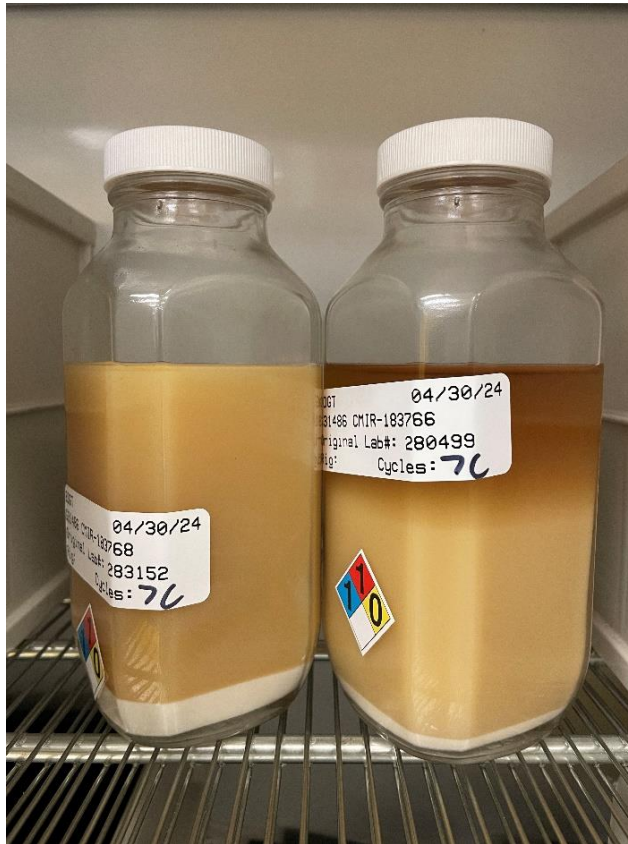


0°C

240 Hours



Room



9°C



0°C

336 Hours



Room



9°C



0°C

EOT 2 Hours

No Photo



Previous Storage + 168 Hr Cold



Surface Texture



Clear Gel Tailing

Clear Round Globules



Clear thick layer adhering over sediment

Draft Timeline – updated May 22

Task	Date										
	5-6 2023	7-8 2023	9-10 2023	11- 12 2023	1-2 2024	3-4 2024	May-Jun 2024	Jul-Aug 2024	Sept-Oct 2024	Nov-Dec 2024	Jan-Feb 2025
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			█	█	█	█	█	█			
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

- Group to decide next steps for EOGT
 - Labs to let TMC know on burette size opening by June 9
 - Labs to let TMC know on storage temperature (after blending and bubbling CO₂) by June 9
 - Labs to let TMC know on part number, vendor, and photo of filter holder; OHT also offered info on part by June 9
 - Labs to let TMC know if homogenization step description is accurate and add details to Data Excel (no changes from any lab) by June 9
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- Next Meeting: Monday June 10 at 8:30AM CDT



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)

