

ASTM Engine Oil Gelation Test (EOGT) WK86363 Update

EOFT and EOWTT Surveillance Panel Meeting

December 3, 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

Yuliza Rocha, Intertek

Michael Johnscher, ISP

Litchi Xie, Lubrizol Additive (Zhuhai) Co., Ltd.

Victoria Fein, Lubrizol

Jason Bowden, OH Technologies Inc

Greg Miiller, Savant Group

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
- Status:
 - Method: 1 draft (Afton method V9.2) uploaded on ASTM Collaboration Area
 - Oils: 11 potential reference oils offered; 17 oils received at TMC
 - Screening Tests and ILS: Screening Test and additional Pilot Tests ongoing
 - Timing: ILS tests to be run by March, and test available in June 2025



Pilot 1, 2, 3

Pilot # 1				
Storage Duration (days)	High Shear Speed (rpm)	High shear duration (sec)	Run #	Sample
3	14K	60	1	Oil F
3	14K	90	2	Oil F
3	16K	60	3	Oil F
3	16K	90	4	Oil F
5	14K	90	5	Oil F
7	14K	90	6	Oil F
3	10K	90 sec, no 7K step	7	Oil F
?	?	?	8	Oil K

Pilot # 1: Afton and SwRI to run Pilot #1 runs 1-7, determine conditions for #8, and run #8. Also recommend what results to report. Each run will be in duplicate.

- Compare data and create Tier 1, 2, 3 conditions for most stable "mayo" consistency
- Run additional conditions as needed

Pilot #2				
Status	Labs	Conditions	Technician	Sample
DONE	Afton	Double shear V9.2		1F
DONE	Intertek	Double shear V9.2		2K
DONE	SwRI	Double shear V9.2		
Started Dec 2	Valvoline	Double shear V9.2		
Complete Dec 9 week	Infineum	Double shear V9.2		
End Dec or when time permits	Savant	Double shear V9.2		
Start in Jan 2025	Lubrizol	Double shear V9.2		

Pilot #2: ILS labs run Oil F and K with preferably 2 techs, each 1 set of duplicate tests, under optimized Pilot #1 conditions

- Review data and change procedure wording or update conditions

Pilot # 3				
	Labs	Conditions		Sample
	Afton	Double shear V9.2		Oil 1
	SwRI	Double shear V9.2		Oil 2
				...
				Oil 17

Pilot # 3: SwRI and Afton run potential reference oils to select samples for ILS



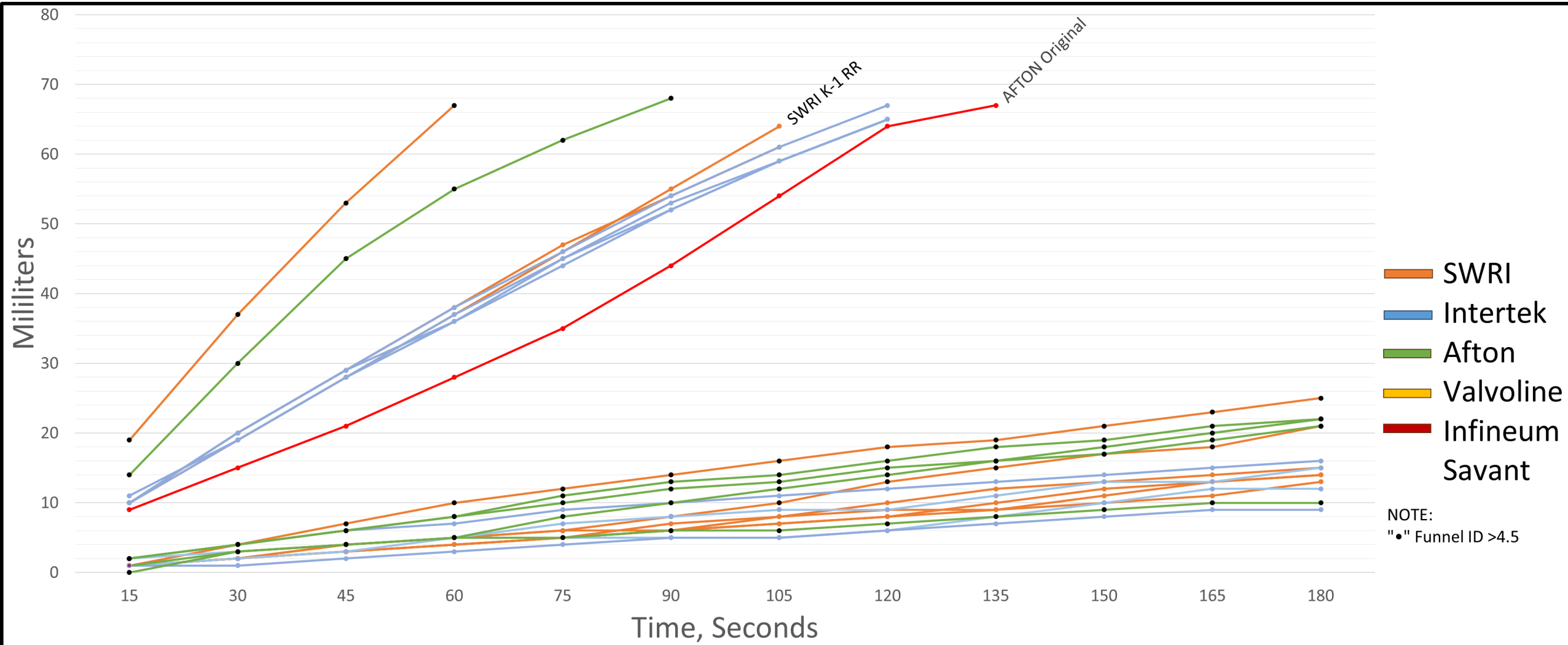
Afton Method Updates

- Afton: completed Pilot II
- SwRI: completed Pilot II, over 4.5 funnel inner diameter more affecting Oil K results (may want to give certain funnel inner diameter in Method), looked at overall flow rate and 45 sec flow rate, SwRI K-I RR was another off the shelf fluid and flowed like Oil K, also ran Afton poor oil, ran with I8G and I8G-ST and results were consistent
- Savant: hope to have results by end of Dec
- Intertek: completed Pilot II
- Valvoline: send results 12/5
- Infineum: Pilot II to completed by 12/13
- Lubrizol: Pilot II to run in early Jan

Criteria to move forward to ILS: Root cause group to finalize method(final result) and Ford to give recommendation to move forward

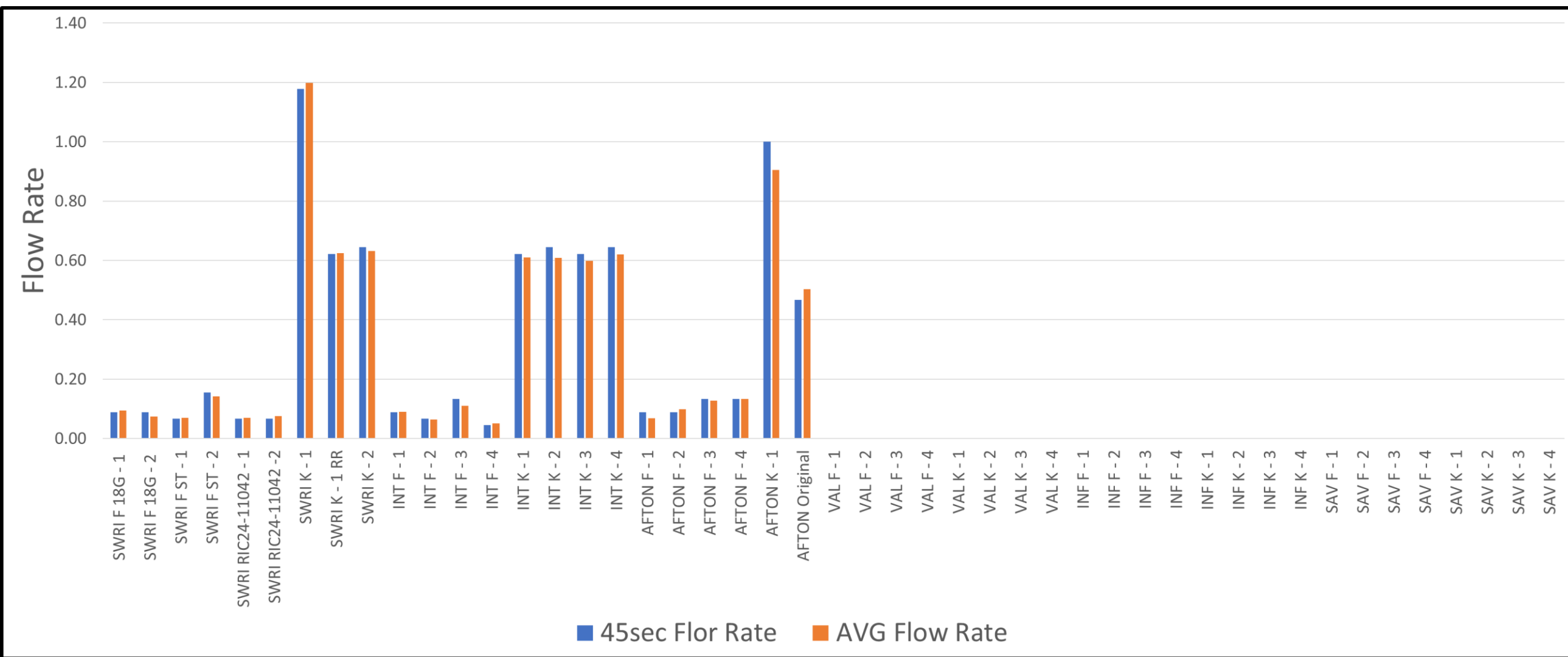


Pilot II Results - Flow Volume



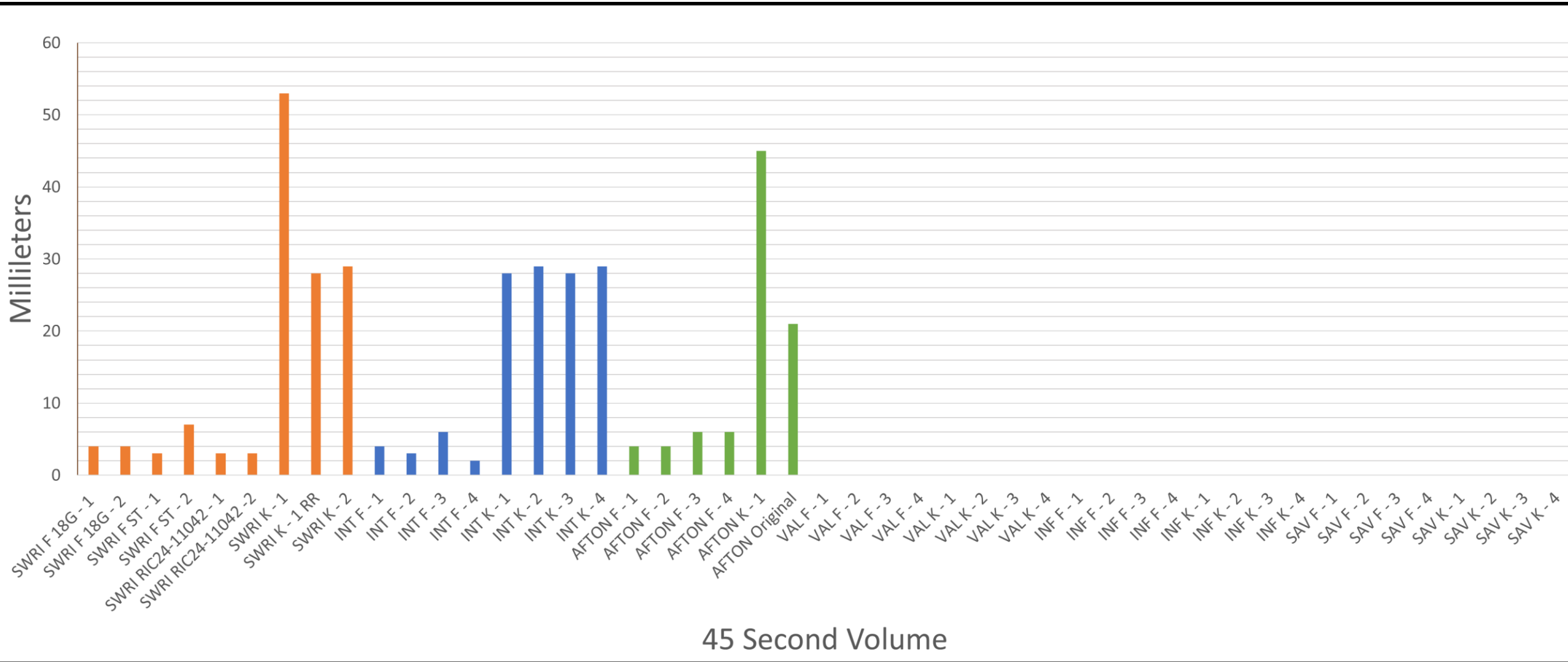
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Pilot II Results – Flow Rate at 45 sec vs total time



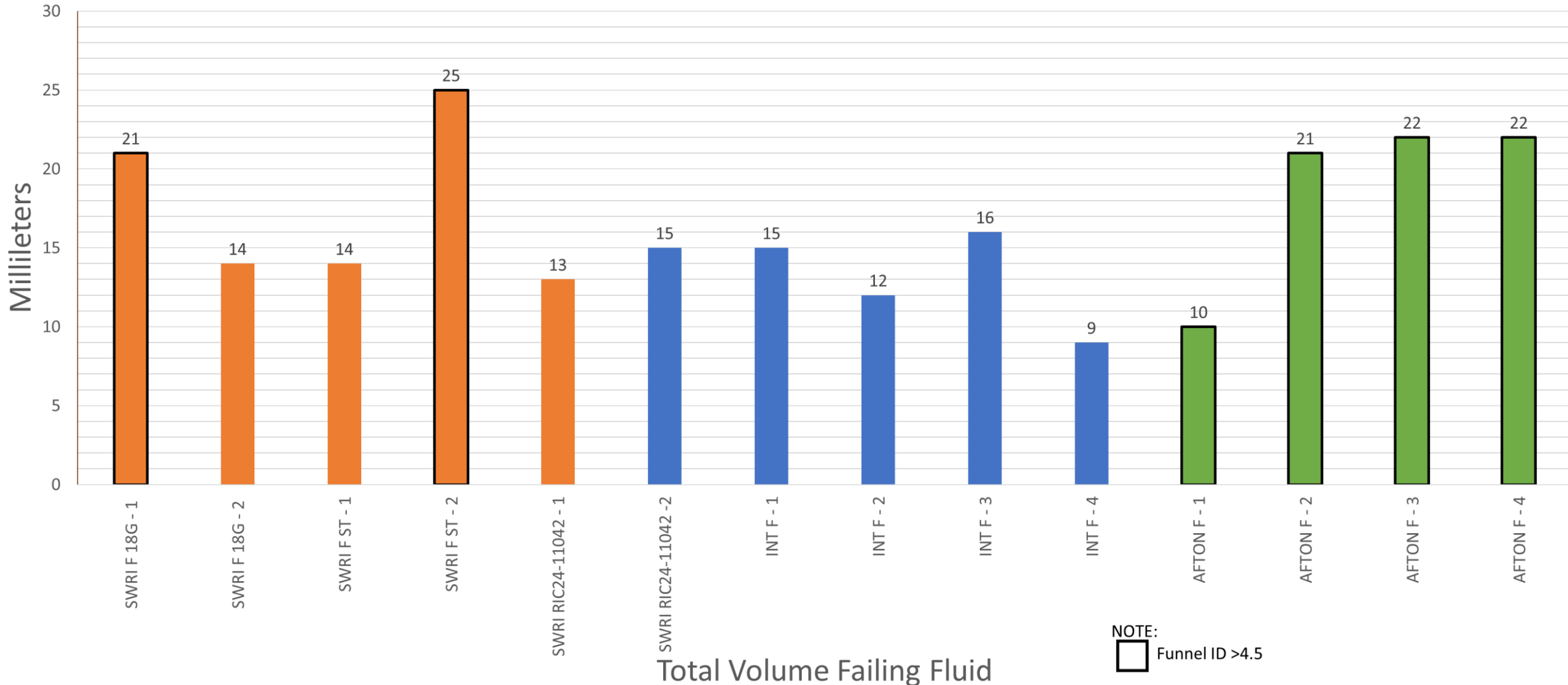
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Pilot II Results – Flow Volume at 45 sec



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Pilot II Results – Oil F Total Volume at 3 mins



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ILS Oil Matrix –from Oct 6, 2023 – LETS REVIEW

Participants	Potential Reference Oils Offered	Oil Sample Received at TMC	Comments
Ford	2 oils (low and high known performance oils) - eligible to be reference oils	2 oil samples received	
Toyota: to review	2 oils - not eligible to be reference oil	2 oil samples received	Offer 2 field samples for later testing; Awaiting some Physical and Chemical data
Afton: to review	4 oils– eligible to be reference oils	4 oil samples received	
Lubrizol: likely stay the same	4 oils – eligible to be reference oils	4 oil samples received	
Infineum: likely stay the same	1 oil – eligible to be reference oil	1 oil sample received	
Oronite: to review	3 oils –not eligible to be reference oils	3 oil samples received	Awaiting Physical and Chemical data
Subaru: send email to check	1 oil – not eligible to be reference oil	1 oil sample received	Offer 1 field sample for later testing
Total Oils	<u>11 potential reference oils confirmed</u>	<u>17 oils received</u>	



John Loop to manage Sample Information

Notes 10-28-24: Samples will have to be resubmitted by suppliers

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ILS Planning

- Goals: Establish precision (repeatability and reproducibility) statement with different levels of performance and different operators, and select reference oil(s)
- Labs: 7 labs: Afton, SwRI, Intertek, Valvoline, Savant, Infineum, Lubrizol
- Oils: Optimal would be 2 good, 2 bad, 2 borderline oils. Each lab runs 24 tests total?
 - We have 11 oils eligible as reference oils and 6 additional oils at TMC
 - Run Pilot III at Afton and SwRI to generate initial data on 17 samples. There will be some lab bias. Select down
 - Include range of Vis grade samples, check with TMC on info supplied
 - Consider combine ILS with BOI-VGRA matrix: three technologies from at least 2 companies in different vis grades and base oils
- Travis to come up final test matrix
- Procedure notes:
 - All labs should prove they can gel (2?) poor oils before being included in ILS
 - Final Report section and Report form after Pilot II
 - Will EOGT be TMC monitored (like EOFT D6795) or not (like D7563)?
 - Yes, needs to be TMC monitored like D6795 with a quantitative result/acceptance limit on reference oil, based on ACC code of practice and/or Test Readiness recommendations, may need to be run in duplicate for reference oil. Method will include TMC inclusion and LTMS will include reference criteria for this test. Will wait on referencing period once more data comes in.
 - 120 mL volume for duplicate run per oil



Draft Timeline – updated Oct 29, 2024

Draft Timeline	Date												
	5-6 2023	7-8 2023	9-10 2023	11-12 2023	1-2 2024	3-4 2024	5-6 2024	7-8 2024	9-10 2024	Nov-Dec 2024	Jan-Feb 2025	Mar-Apr 2025	May-June 2025
Develop test procedure and ILS report form	█												
Collect and prepare donated oil samples (17 oils)	█	█											
Screening samples shipped to labs (6 labs)		█											
Screening labs run 4 tests			█	█									
Test development (Screening, Proposal tests, Root cause)			█	█	█	█	█	█	█				
Pilot #1									█				
Pilot #2 and #3									█	█			
ILS samples shipped and labs run tests										█	█		
Data analysis for ILS, generate Research Report (RR) & Precision												█	
Ballot test procedure and RR													█
Test available for industry use													█

Action Items and Next Meeting

- Valvoline, Infineum, Savant, and Lubrizol to run Pilot II
- Ford (Mike or Rob) to help determine which oil samples we should consider for ILS and work with participants on providing those samples
- Participants who offered Oils for ILS, please review the oils that were sent to TMC in 2023 and let Yong-Li know if they are still what your organization would like to submit or if there any changes. Need response from Toyota, Afton, Lubrizol, Infineum, Oronite, and Subaru.

- Next Meeting: Tuesday Dec 17 at 9AM CST for 1 hr



Thank you for your support!

Participants		
Method Development (11)	Oil Donations (9)	Testing Labs (9)
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 Infineum Intertek ISP Lubrizol Savant SwRI TMC (monitoring system only) Valvoline

