

TEOST Surveillance Panel Meeting Minutes

Meeting Date:

August 2nd, 2018

Attendance:

Mike Faile – The Lubrizol Corporation

Theresa Faison, Monica Johnson-Brown – Afton Chemical Corporation

Matt Schlaff – Intertek Automotive Research

Yong-Li McFarland, Adam Ramos – Southwest Research Institute

Greg Miiller – Tannas Company

Tom Schofield – ASTM Test Monitoring Center (TMC)

Agenda:

Review MHT Catalyst 18AB Round Robin results

Open Discussion: Any other TEOST updates/items

Mike Faile initiated the meeting at 11:23 am EST with the reminder of ASTM's anti-trust and recording policy, followed with a roll call.

The MHT Catalyst Batch 18AB Round Robin results were reviewed. Mike discussed the round robin data and statistical results of the tests run. Data is shown in the Appendix of these meeting minutes (below). Key points to highlight are both TMC oils 432 and 434 were mild of target but well within acceptance limits and the Tannas LDF, MDF and HDF were near target on average. Tom Schofield then discussed the slightly mild severity observations. Matt Schlaff commented he thought the batch was good. He then asked, and Tom confirmed that the new effective date for the 1st official run with batch 18AB will be added into the timeline. There were no further comments.

A motion was made and seconded for the surveillance panel to vote to approve the batch. All voting members All voted affirmative to approve catalyst batch 18AB.

Greg Miiller stated that Tannas will ship catalyst batch 18AB right away to fulfill open order. Tannas is retaining 7 vials of batch 16DA in case any issues arise.

It was commented and agreed by all that the rest of catalyst batch 16DA present at the labs can continue to be used until run out.

Mike opened up the meeting to all attendees to discuss other items, but no other items were brought up by the panel. The meeting was motioned and seconded to close and the meeting was adjourned at 11:35 am EST.

Mike Faile

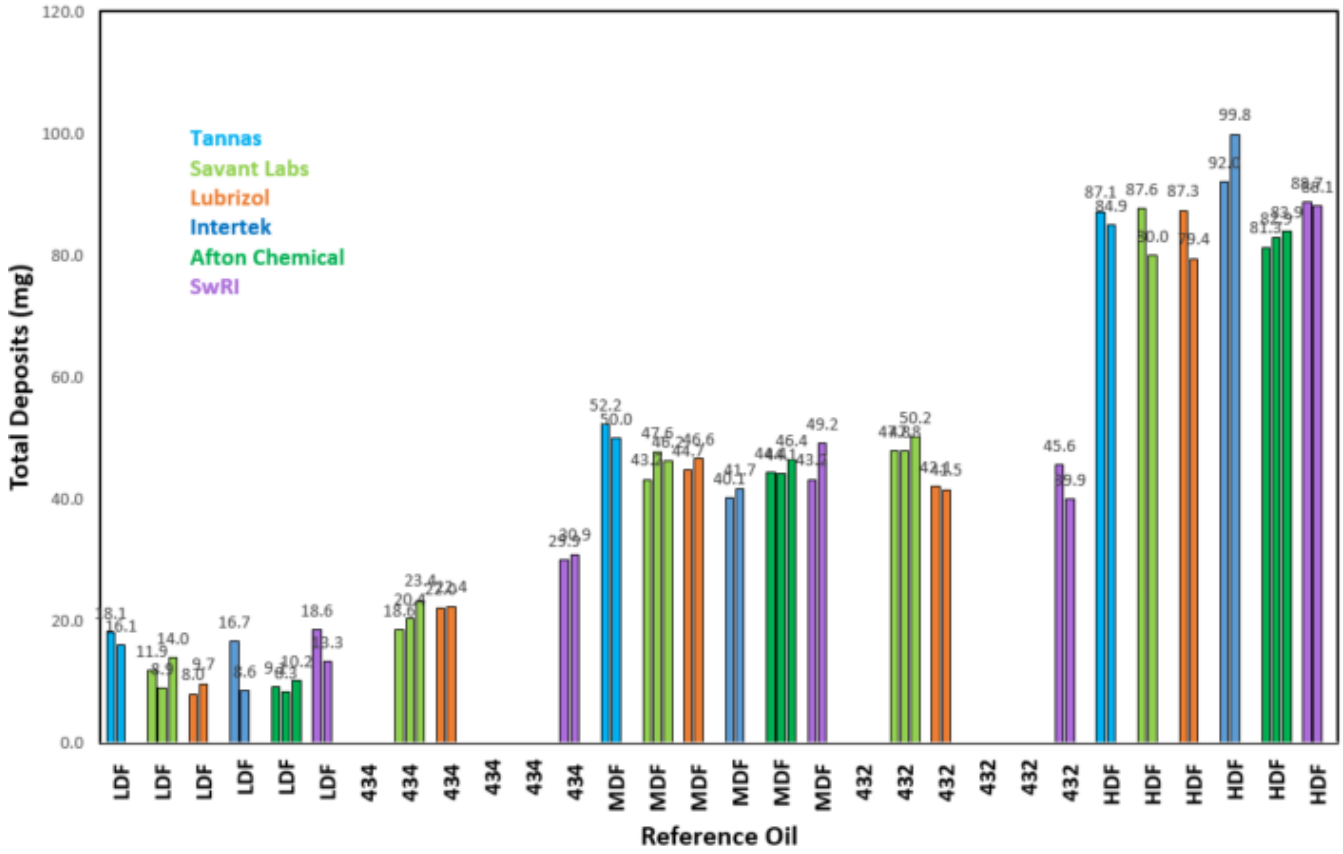
TEOST Surveillance Panel Chair

Appendix: MHT Catalyst b.18AB Test Results

TEOST MHT Test Data for Catalyst b.18AB

Lower End-cap - Sealed

*Tests were run on multiple instruments



	LDF	LDF	LDF	LDF	LDF	LDF
Target			11.1			
Run 1	18.1	11.9	8.0	16.7	9.1	18.6
Run 2	16.1	8.9	9.7	8.6	8.3	13.3
Run 3		14.0			10.2	
Average	17.1	11.6	8.9	12.7	9.2	16.0
repeatability	9.6	7.7	6.7	8.1	6.8	9.2
Reproducibility	10.6	8.6	7.4	9.0	7.5	10.2
Range	2	5.1	1.7	8.1	1.9	5.3
St. Dev.	1.4	2.6	1.2	5.7	1.0	3.7
95% Confidence	2.8	5.1	2.4	11.5	1.9	7.5

Overall Average	12.3
Overall repeatability	8.0
Overall Reproducibility	8.8
Overall Range	10.6
Overall St. Dev.	3.8
Overall 95% Confidence	7.7

Tannas	<u>Acceptance Range*</u>	
Savant Labs	Lower Limit	4.6
Lubrizol	Upper Limit	19.9
Intertek		
Afton Chemical		
SwRI		

Average of 13.8 --> Results listed are approximate from graph

*Calculated using ± the 95% Confidence

	434	434	434	434	434	434
Target	27.37					
Run 1		18.6	22.0			29.9
Run 2		20.4	22.4			30.9
Run 3		23.4				
Average	#DIV/0!	20.8	22.2	#DIV/0!	#DIV/0!	30.4
repeatability	#DIV/0!	10.7	11.1	#DIV/0!	#DIV/0!	13.2
Reproducibility	#DIV/0!	11.8	12.3	#DIV/0!	#DIV/0!	14.6
Range	0	4.8	0.4	0	0	1
St. Dev.	#DIV/0!	2.4	0.3	#DIV/0!	#DIV/0!	0.7
95% Confidence	#DIV/0!	4.8	0.6	#DIV/0!	#DIV/0!	1.4

Overall Average	23.9
Overall repeatability	11.6
Overall Reproducibility	12.8
Overall Range	12.3
Overall St. Dev.	4.7
Overall 95% Confidence	9.4

Tannas	<u>Acceptance Range</u>	
Savant Labs	Lower Limit	14.5
Lubrizol	Upper Limit	40.2
Intertek		
Afton Chemical		
SwRI		

Average of 20.8 --> Results listed are approximate from graph

	MDF	MDF	MDF	MDF	MDF	MDF
Target			45.1			
Run 1	52.2	43.2	44.7	40.1	44.4	43.2
Run 2	50.0	47.6	46.6	41.7	44.1	49.2
Run 3		46.2			46.4	
Average	51.1	45.7	45.7	40.9	45.0	46.2
repeatability	17.6	16.6	16.6	15.6	16.4	16.7
Reproducibility	19.5	18.3	18.3	17.2	18.2	18.4
Range	2.2	4.4	1.9	1.6	2.3	6.0
St. Dev.	1.6	2.2	1.3	1.1	1.3	4.2
95% Confidence	3.1	4.5	2.7	2.3	2.5	8.5

Overall Average	45.7					
Overall repeatability	16.6					
Overall Reproducibility	18.3					
Overall Range	12.1					
Overall St. Dev.	3.3					
Overall 95% Confidence	6.6					

Tannas	Acceptance Range*					
Savant Labs	Lower Limit 39.0					
Lubrizol	Upper Limit 52.3					
Intertek						
Afton Chemical						
SwRI						
	Average of 47.8 --> Results listed are approximate from graph					

	432	432	432	432	432	432
Target	47.04					
Run 1		47.8	42.1			45.6
Run 2		47.8	41.5			39.9
Run 3		50.2				
Average	#DIV/0!	48.6	41.8	#DIV/0!		42.8
repeatability	#DIV/0!	17.2	15.8	#DIV/0!	0.0	16.0
Reproducibility	#DIV/0!	19.0	17.5	#DIV/0!	0.0	17.7
Range	0.0	2.4	0.6	0.0	0.0	5.7
St. Dev.	#DIV/0!	1.4	0.4	#DIV/0!	#DIV/0!	4.0
95% Confidence	#DIV/0!	2.8	0.8	#DIV/0!	#DIV/0!	8.1

Overall Average	45.0					
Overall repeatability	16.4					
Overall Reproducibility	18.2					
Overall Range	10.3					
Overall St. Dev.	3.9					
Overall 95% Confidence	7.7					

Tannas	Acceptance Range					
Savant Labs	Lower Limit 38.2					
Lubrizol	Upper Limit 55.9					
Intertek						
Afton Chemical						
SwRI						
	Average of 48.6 --> Results listed are approximate from graph					

	HDF	HDF	HDF	HDF	HDF	HDF
Target			87.0			
Run 1	87.1	87.6	87.3	92.0	81.3	88.7
Run 2	84.9	80.0	79.4	99.8	82.9	88.1
Run 3					83.9	
Average	86.0	83.8	83.4	95.9	82.7	88.4
repeatability	23.6	23.2	23.2	25.0	23.1	23.9
Reproducibility	26.1	25.7	25.6	27.7	25.5	26.5
Range	2.2	7.6	7.9	7.8	2.6	0.6
St. Dev.	1.6	5.4	5.6	5.5	1.3	0.4
95% Confidence	3.1	10.7	11.2	11.0	2.6	0.8
Overall Average	86.4					
Overall repeatability	23.6					
Overall Reproducibility	26.1					
Overall Range	20.4					
Overall St. Dev.	5.5					
Overall 95% Confidence	10.9					
Tannas	Acceptance Range*					
Savant Labs	Lower Limit 75.5					
Lubrizol	Upper Limit 97.3					
Intertek						
Afton Chemical						
SwRI						
	Average of 84.9 --> Results listed are approximate from graph					

Lab	Date	Unit	Oil	Result	Operator
Tannas			LDF	18.1	
Tannas			LDF	16.1	
Tannas			MDF	52.2	
Tannas			MDF	50.0	
Tannas			HDF	87.1	
Tannas			HDF	84.9	
Savant Labs			LDF	11.9	
Savant Labs			LDF	8.9	
Savant Labs			LDF	14.0	
Savant Labs			434	18.6	
Savant Labs			434	20.4	
Savant Labs			434	23.4	
Savant Labs			MDF	43.2	
Savant Labs			MDF	47.6	
Savant Labs			MDF	46.2	
Savant Labs			432	47.8	
Savant Labs			432	47.8	
Savant Labs			432	50.2	
Savant Labs			HDF	87.6	
Savant Labs			HDF	80.0	
Lubrizol Wickliffe	6/27/2018	Unit #16	LDF-4	8.0	LADL

Lubrizol Wickliffe	6/27/2018	Unit #15	LDF-4	9.7	LADL
Lubrizol Wickliffe	6/28/2018	Unit #16	432	42.1	LADL
Lubrizol Wickliffe	6/28/2018	Unit #15	432	41.5	LADL
Lubrizol Wickliffe	6/29/2018	Unit #16	434	22.0	LADL
Lubrizol Wickliffe	6/29/2018	Unit #15	434	22.4	LADL
Lubrizol Wickliffe	7/3/2018	Unit #16	MDF-4	44.7	LADL
Lubrizol Wickliffe	7/3/2018	Unit #15	MDF-4	46.6	LADL
Lubrizol Wickliffe	7/10/2018	Unit #16	HDF-4	87.3	LADL
Lubrizol Wickliffe	7/10/2018	Unit #15	HDF-4	79.4	LADL
SwRI	7/24/2018	Inst. 3	LDF	18.6	JG
SwRI	7/24/2018	Inst. 4	LDF	13.3	JG
SwRI	7/25/2018	Inst. 3	MDF	43.2	JG
SwRI	7/25/2018	Inst. 4	MDF	49.2	JG
SwRI	7/26/2018	Inst. 3	HDF	88.7	JG
SwRI	7/26/2018	Inst. 4	HDF	88.1	JG
SwRI	7/27/2018	Inst. 3	432	45.6	JG
SwRI	7/27/2018	Inst. 4	432	39.9	JG
SwRI	7/29/2018	Inst. 3	434	29.9	JG
SwRI	7/29/2018	Inst. 4	434	30.9	JG
Intertek	7/3/2018	1710-174	LDF	16.7	A
Intertek	7/3/2018	060731-80	LDF	8.6	A
Intertek	7/3/2018	920909-62	MDF	40.1	A
Intertek	7/3/2018	000808-44	MDF	41.7	A
Intertek	7/3/2018	060411-79	HDF	92.0	A
Intertek	7/3/2018	940909-4	HDF	99.8	A
Afton Chemical	7/17/2018	6	LDF	9.1	M. Brown
Afton Chemical	7/17/2018	57	LDF	8.3	M. Brown
Afton Chemical	7/17/2018	74	LDF	10.2	M. Brown
Afton Chemical	7/19/2018	6	MDF	44.4	M. Brown
Afton Chemical	7/19/2018	57	MDF	44.4	M. Brown
Afton Chemical	7/19/2018	74	MDF	46.4	M. Brown
Afton Chemical	7/25/2018	6	HDF	81.3	M. Brown
Afton Chemical	7/25/2018	57	HDF	82.9	M. Brown
Afton Chemical	7/25/2018	74	HDF	83.9	M. Brown

TEOST MHT Test Data for Catalyst b.18AB

*Tests were run on multiple instruments

