

MEETING MINUTES: ROBO SURVEILLANCE PANEL

Meeting: ROBO SP Meeting

Date: May 12, 2022

Location: MS Teams (virtual)

Minutes by: Justin Mills – SP Chair

Meeting Outcome and Actions:

1. Dylan Beck will replace Tom Schofield as the TMC representative.
2. Revisions to the method, ASTM D7528, successfully went through balloting. Therefore, the revised method has been approved with only minor editorial changes.
3. Justin to tentatively add two topics to next meeting: Flow meter calibration and update on proposed SAE J300 MRV limit changes.
4. Next meeting tentatively scheduled for July 28th.

Membership and Attendance:

ASTM TMC	Dylan Beck
Afton	Shelia Thompson, Jeff Yang, Todd Dvorak
BG Products	*Madeleine Dellinger
Chevron Oronite	*Robert Stockwell
Evonik Oil Additives	*Justin Mills , Gabe Walkup, Justin Kontra
ExxonMobil	*Dennis Gaal
Infineum	Andy Richie, Sapna Eticala
Intertek	*Joe Franklin , Matt Schlaff, *Rachel Stone
Lubrizol	*Aimee Shinhearl , Jeremiah Westbrook
PetroChina	Li Shaohui , Sun Ruihua, Peng Wang, Xiaogang Li, Xu Li
SwRI	*Becky Grinfield , Joe De La Cruz, Mike Birke, *Yong-Li McFarland
Valvoline	Amol Savant, Amy Ross, Bruce Tonkel
Vanderbilt Chemicals	Al Filho, Christine Katrenya
Ace Glass	Dave Lawrence, *Tom Petrocella ,
Koehler Instruments	Raj Shah, Vincent Colantuini
Tannas/Savant	Greg Miller, Ted Selby
General Interest	*Alan Flamberg
Guests	*Jeff Clark (representing TMC)

* Denotes attendance

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Summary:

- Meeting convened at 10:02EDT on May 12.
- No modifications to agenda
- ASTM Antitrust and Recording Policy reviewed
- Membership review and update
 - Tom Schofield to retire on March 1st. Dylan Beck will be new TMC representative.
- Meeting minutes from February 3rd SP meeting were accepted (Motion made by Joe Franklin, Seconded by Alan Flamberg)
- Actions and outcome from the February 3rd meeting were reviewed.
 - Tom Schofield to update LTMS to require 2-test calibration when switching between NO2 delivery options (e.g. concentrated to dilute NO2).
 - Tom Schofield to add TVTM for the data dictionary for MRVVEOT to align with reporting in MRV method (ASTM D4684).
 - Complete
 - Next meeting tentatively scheduled for April 14th.
 - Postponed to May 12 due to no urgent topics.
- ROBO Status
 - Previous semester (October 1, 2021 – March 31, 2022) ended with a slight mild bias and precision was slightly worse than target. Stats can be found here <https://www.astmtmc.org/ftp/refdata/bench/robo> on the recently moved TMC website.
 - LTMS updated for ROBO at the request of the SP. Current and historic reference oils are now differentiated in two charts. The list of reference oils also added to the appendix (A-53)
 - As agreed at February SP meeting, the data dictionary was updated to add “TVTM” for “MRVVEOT”
 - Dylan Beck added to the roster as new TMC representative (Email: djb@astmtmc.org, Phone: 412-365-1037)
- Dilute NO2
 - Information letter (IL21-01) went to ballot in D02 (22-01) on January 24th and will close February 23rd (30day ballot). Ballot closed with no negatives, but several editorial comments to implement from Alan Flamberg and Terry Bates.
 - The editorial comments were incorporated and resubmitted to ASTM. Method expected to be published shortly.
- ASTM meeting in Seattle
 - Justin Mills provided an update on what he plans to share at the upcoming D02.B0.07 meeting in Seattle. Overall, the ROBO test is in very good standing from all aspects (method, parts, reference oils, availability, and precision)
- Additional topics
 - Alan Flamberg brought up the recent proposal at SAE EOVC to change the SAE J300 limits from 60,000cP to 40,000cP. SP agreed this topic of interest, so it will be included as a topic in the next agenda.
 - Over the past couple of SP meetings there has been some discussion regarding calibration of flow meters. Maddie Dellinger of BG Products said her company recently achieved ISO 17025 accreditation and would be happy to share their best practices for calibrating flow meters. SP agreed to tentatively add this as a topic for our next meeting.
- Next meeting tentatively scheduled on for July 28. Date may be postponed if necessary.
- Meeting adjourned

-End report-

ASTM D7528: Bench Oxidation of Engine Oils by ROBO Apparatus

ROBO Surveillance Panel Meeting

May 12, 2022

Justin Mills

Agenda

- Welcome, ASTM statement
- Review of surveillance panel membership
- Minutes and actions from prior meeting (February 3, 2022)
- Current status of ROBO including statistics
- TMC update
- Dilute nitrogen dioxide update
- ASTM in Seattle update
- Additional business
- Set next meeting

ASTM Antitrust and Recording Policy

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The purpose of antitrust laws is to preserve economic competition in the marketplace by prohibiting, among other things, unreasonable restraints of trade. In ASTM activities, it is important to recognize that participants often represent competitive interests. Antitrust laws require that all competition be open and unrestricted.

It is ASTM's policy, and the policy of each of its committees and subcommittees, to conduct all business and activity in full compliance with international, federal and state antitrust and competition laws. The ASTM Board of Directors has adopted an antitrust policy which is found in Section 19 of ASTM Regulations Governing Technical Committees. All members need to be aware of and compliant with this policy. The Regulations are accessible on the ASTM website (<http://www.astm.org/COMMIT/Regs.pdf>).

Electronic recording of ASTM meetings is prohibited.

Membership

ASTM TMC	Dylan Beck, Jeff Clark
Afton	Shelia Thompson, Jeff Yang, Todd Dvorak
BG Products	Madeleine Dellinger
Chevron Oronite	Robert Stockwell
Evonik Oil Additives	Justin Mills , Gabe Walkup, Justin Kontra
ExxonMobil	Dennis Gaal
Infineum	Andy Richie, Sapna Eticala
Intertek	Joe Franklin , Matt Schlaff, Rachel Stone
Lubrizol	Aimee Shinhearl , Jerimiah Westbrook
PetroChina	Li Shaohui , Sun Ruihua, Peng Wang, Xiaogang Li, Xu Li
SwRI	Becky Grinfield , Joe De La Cruz, Mike Birke, Yong-Li McFarland
Valvoline	Amol Savant, Amy Ross, Bruce Tonkel
Vanderbilt Chemicals	Al Filho, Christine Katrenya
Ace Glass	Dave Lawrence, Tom Petrocella ,
Koehler Instruments	Raj Shah, Vincent Colantuini
Tannas/Savant	Greg Miller, Ted Selby
General Interest	Alan Flamberg
Guests	

Summary of changes:

1. Tom Schofield retired on March 1st.
2. Dylan Beck added for TMC



Motion to accept February 3, 2022 meeting minutes

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Meeting: ROBO SP Meeting
Date: February 3, 2022
Location: MS Teams (virtual)
Minutes by: Justin Mills – SP Chair

Actions:

1. Tom Schofield to update LTMS to require 2-test calibration when switching between NO2 delivery options (e.g. concentrated to dilute NO2).
2. Tom Schofield to add TVTM for the data dictionary for MRVVEOT to align with reporting in MRV method (ASTM D4684).
3. Next meeting tentatively scheduled for April 14th.

Membership and Attendance:

ASTM TMC	Tom Schofield
Afton	Shelia Thompson, *Jeff Yang, *Todd Dvorak
BG Products	Madeleine Dellinger
Chevron Oronite	*Robert Stockwell
Evonik Oil Additives	*Justin Mills, *Gabe Walkup, Justin Kontra
ExxonMobil	*Dennis Gaal
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General Interest	*Alan Flamberg
Guests	

* Denotes attendance

MEETING MINUTES: ROBO SURVEILLANCE PANEL

Summary:

- Meeting convened at 10:02EDT on February 3
- No modifications to agenda
- ASTM Antitrust and Recording Policy reviewed
- Membership review and update
 - Tom Schofield to retire on March 1st. Many thanks for his years of service to the ROBO Surveillance Panel and all the best in retirement!
 - Christine Katrenya added to roster for Vanderbilt.
- Meeting minutes from November 18, 2021 SP meeting were accepted.
- Actions from the November 18, 2021 meeting were reviewed.
 - Tom Schofield to update LTMS to reflect latest limits for 436 and incorporate the revised reference oil tables into the LTMS (approved at September 30, 2021 SP meeting).
 - Status - Limits are effective, but LTMS still needs to be updated – expected soon.
 - For reference, current limits for ROBO are shared below:

Oil	n	Natural Log Transformed Mean (ln) Units	s.d. (ln) Units	95% band in		95% band in		
				Min'	Max'	Min (ln)	Max (ln)	
434-2	36	*10.9284	*55.737	0.1551	*41.126	*76.008	*10.6244	*11.2386
434-3	22	*10.8172	*49.871	0.1389	*37.987	*65.473	*10.5450	*11.0894
435-1	22	11.0416	62.420	0.20295	444570	92910	*10.7048	11.4394
436	36	*10.3319	*30696	0.1290	23840	39525	10.0791	10.5847

- Justin Mills to tentatively schedule the next ROBO SP meeting for February 3, 2022. .
 - Status - Complete
- Test is running comparable to last semester. Precision is slightly worse than new target and test is running with slight mild bias.
 - Stats can be found here <https://www.astmtmc.org/ftp/refdata/bench/robo> on the recently moved TMC website.
- Dilute NO2
 - Information letter (IL21-01) went to ballot in D02 (22-01) on January 24th and will close February 23rd (30day ballot).
 - Surveillance panel agreed to require a 2-test calibration when switching between NO2 delivery options (e.g. concentrated to dilute NO2).
 - A motion was made by Joe Franklin, and seconded by Gabriel Walkup to "require a 2-test calibration when switching between nitrogen dioxide delivery methods (concentrated vs. dilute)". All affirmative and no negatives or further discussion, so the motion was accepted and carried. The LTMS will be updated accordingly.
- MRV Reporting
 - To align with the ASTM method for MRV (D4684) the SP agreed to add TVTM for the data dictionary for MRVVEOT.
 - A motion was made by Joe Franklin and seconded by Becky Grinfield to "add TVTM to the data dictionary for MRVVEOT". All affirmative and no negatives or further discussion, so the motion was accepted and carried.
 - A BETA will be required to prior to implementation in the data dictionary so timing expected to be 1-2 months.
- Flow meter calibration – nothing to report.
- Next meeting tentatively scheduled on April 14, 2022. Date may be postponed if necessary.
- Meeting adjourned

MEETING MINUTES: ROBO SURVEILLANCE PANEL

Meeting Outcome:

- 1) Surveillance panel agreed to require a 2-test calibration when switching between NO2 delivery options (e.g. concentrated to dilute NO2).
- 2) Surveillance panel agreed to add TVTM for the data dictionary for MRVVEOT to align with reporting in MRV method (ASTM D4684).
- 3) Next meeting tentatively April 14th.

-End report-

Actions from February 3, 2022 meeting

1. Tom Schofield to update LTMS to require 2-test calibration when switching between NO2 delivery options (e.g. concentrated to dilute NO2).
2. Tom Schofield to add TVTM for the data dictionary for MRVVEOT to align with reporting in MRV method (ASTM D4684).
 - Complete
3. Next meeting tentatively scheduled for April 14th.
 - Postponed to May 12 due to no urgent topics.

Current status of ROBO

ROBO Industry Statistics

Period	N-size	Degrees of Freedom	Pooled s	Mean Δ/s
Current Targets	80	77	0.1551	-----
4/1/18 through 9/30/18	126	122	0.2184	-0.49
10/1/18 through 3/31/19	100	96	0.2738	0.04
4/1/19 through 9/30/19	95	91	0.2492	-0.32
10/1/19 through 3/31/20	158	153	0.2723	-0.10
4/1/20 through 9/30/20	119	113	0.2264	-0.76
10/1/20 through 3/31/21	113	108	0.3188	-0.11
4/1/21 through 9/30/21	116	110	0.1992	-0.37
10/1/21 through 3/31/22	106	102	0.2103	-0.35
4/1/22 through 9/30/22	9	6	0.1746	-0.78

- Last semester finished running slightly mild with precision worse than target.
 - Comparable to prior semester

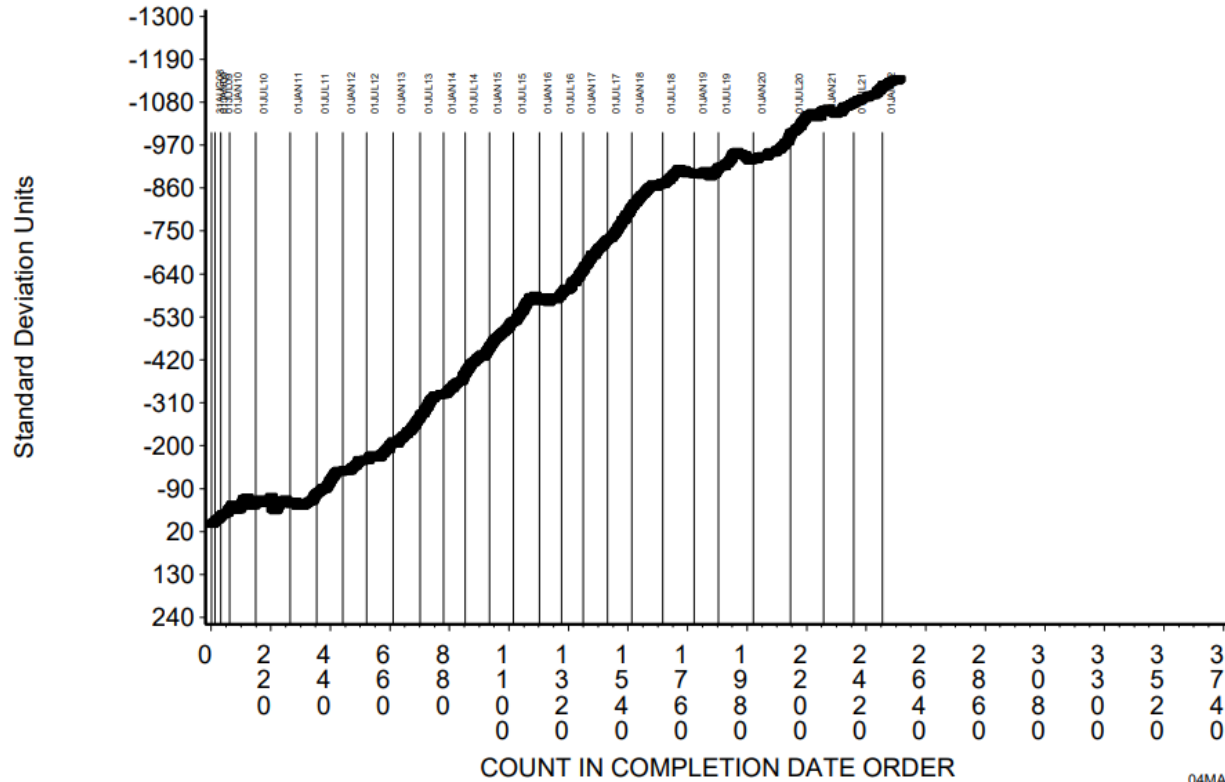
Source <https://www.astmtmc.org/ftp/refdata/bench/robo/data/statistics.txt> (May 9, 2022)

CUSUM severity analysis

ROBO TEST INDUSTRY OPERATIONALLY VALID DATA
 AGED OIL MRV APPARENT VISCOSITY



CUSUM Severity Analysis



04MAY22:14:13

Source: <https://www.astmtmc.org/ftp/refdata/bench/robo/plots/mrv%20INDUSTRY.pdf> (May 9, 2022)

LTMS updates

- LTMS updated for ROBO at the request of the SP. Current and historic reference oils are now differentiated in two charts.

Table 1
Current Reference Oils
MRV VISCOSITY
Unit of Measure: LN(MRV)

D7528 (ROBO) Aged Oil MRV Acceptance Bands, mPa's and ln(mPa's)								
Oil	n	Natural Log Transformed Mean (ln)	Mean in Original Units	s.d. (ln)	95% band in mPa's Min ¹	95% band in mPa's Max ¹	95% Bands Min (ln)	95% Bands Max (ln)
434-2	36	² 10.9284	² 55,737	0.1551	² 41,126	² 76,008	² 10.6244	² 11.2386
434-3	22	² 10.8172	² 49,871	0.1389	² 37,987	² 65,473	² 10.5450	² 11.0894
435-1	22	11.0416	62,420	0.20295	⁴ 44570	92910	⁴ 10.7048	11.4394
436	36	² 10.3319	² 30696	0.1290	23840	39525	10.0791	10.5847

Table 2
Historic Reference Oils (information only)
MRV VISCOSITY
Unit of Measure: LN(MRV)

D7528 (ROBO) Aged Oil MRV Acceptance Bands, mPa's and ln(mPa's)								
Oil	n	Natural Log Transformed Mean (ln)	Mean in Original Units	s.d. (ln)	95% band in mPa's Min ¹	95% band in mPa's Max ¹	95% Bands Min (ln)	95% Bands Max (ln)
434-1	13	10.6599	42,612	0.1672	30,706	59,136	10.3322	10.9876
435	15	11.4895	97,685	0.2932	³ 60,000	173,546	³ 11.0021	12.0642
438	14	10.2676	28,785	0.2037	19,308	42,912	9.8683	10.6669
438-2	19	² 10.5404	² 37813	0.2596	² 22,734	² 62,894	² 10.0316	² 11.0492

- List of reference oils also added to the appendix (A-53)

Data dictionary updates

- As agreed at February SP meeting, the data dictionary was updated to add “TVTM” for “MRVVEOT”
- ROBO version also updated to reflect change.

OLD	VERSION	1	C	8	0	YYYYMMDD	ROBO VERSION	20210819
NEW	VERSION	1	C	8	0	YYYYMMDD	ROBO VERSION	20220209 Beta
OLD	MRVVEOT	2	A	8	0	mPa-s	AGED OIL D4684 MRV APPARENT VISCOSITY	[<, >]
NEW	MRVVEOT	2	A	8	0	mPa-s	AGED OIL D4684 MRV APPARENT VISCOSITY	[<, >, TVTM]

TMC update

- Tom Schofield retired on March 1st.
- Dylan Beck to replace Tom on the Surveillance Panel – Welcome to Dylan!
 - Email: djb@astmtmc.org
 - Phone: 412-365-1037
- Jeff Clark will continue to support as backup.

Dilute NO₂

ROBO Information Letter

Issued November 3 → Effective December 1



ROBO IL 21-01



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

ROBO Information Letter 21-01
Sequence No. 3
November 3, 2021

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: ROBO Mailing List
SUBJECT: Revisions to ROBO Test Method D7528

The ROBO Surveillance Panel has approved revisions to the D7528 ROBO Test Method. The revisions are attached. The changes add an option to use dilute nitrogen dioxide in air. These changes are effective December 1, 2021.

Justin Mills
Chair
ROBO Surveillance Panel

Frank M. Farber
Director
ASTM Test Monitoring Center

Ballot issued for in ASTM Ballot D02 (22-01)






Technical Contact = Justin Mills

- 30-day ballot concurrent with B0.07
- Issue Date = January 24, 2022 / Close Date = February 23, 2022
- Closed with no negatives, but several editorial comments to implement from Alan Flamberg and Terry Bates. Scope of editorial comments were:
 - adding missing words
 - changing “concentration” to “volume fraction”
 - reporting SI unit first (example: 20 °C (68 °F))
- Editorial comments were incorporated and resubmitted to ASTM. Method expected to be published shortly.

ASTM in Seattle

ASTM D7528: ROBO

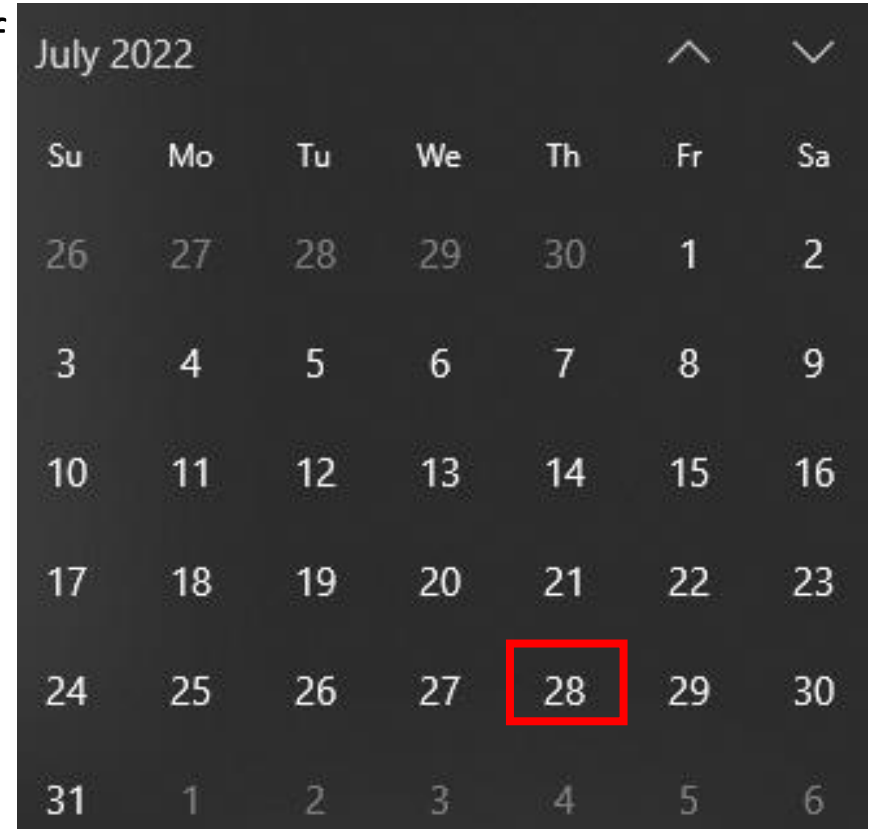
Summary for D02.B0.07 – June 27, 2022

Status	Test Aspect	Comments
	Method	Test method is in good standing. <ul style="list-style-type: none">IL 21-01 effective December 1, allowing usage of dilute NO₂. Subsequently went to ballot in January 2021. Approved with no negatives and several editorial comments.
	Parts Availability	All ROBO hardware and test materials are available <ul style="list-style-type: none">Nitrogen dioxide, the primary catalyst for ROBO, is available from multiple suppliersAlternative procedure with dilute nitrogen dioxide effective December 1.
	Reference Oils	All current reference oils are in good supply at TMC: multiyear supply of each oil <ul style="list-style-type: none">Final limits set for 436 and effective October 2021.
	Test Availability	Test is available with no significant queues to report. <ul style="list-style-type: none">Less activity than prior semesters
	Severity and Precision	In last semester (October 2021 – March 2022) precision was on target and test ran with a slight mild bias: <ul style="list-style-type: none">N = 106, Pooled s = 0.21 and Mean Δ/s = -0.35

Any Additional Topics?

Next Meeting

- Next meeting tentatively scheduled for July 28. May be postponed if there are not enough topics.



July 2022

Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6