8/4/2020

D5133 Scanning Brookfield Surveillance Panel Teleconference Minutes

A D5133 Scanning Brookfield Surveillance Panel Teleconference was held on Tuesday August 4th, 2020 at 9:30 CDT. The following were in attendance:

Peiyan	Lui	BP Castrol
Alexandra	Romo-Mendez	Chevron
Matt	Schlaff	Intertek Automotive Research
Mike	Birke	Southwest Research Institute
YongLi	McFarland	Southwest Research Institute
Becky	Grinfield	Southwest Research Institute
Adam	Ramos	Southwest Research Institute
Carmen	Robles-Feeney	The Lubrizol Corporation
Tom	Schofield	TMC

The antitrust statement was reviewed followed by roll call.

Revision to LTMS document

After review internally at the TMC, there was some ambiguity in the LTMS document, particularly for the instrument ID (INSTRUID). Tom Schofield reviewed revisions he made to clarify and improve the document. After, Tom made a motion to approve the document with an effective date of Oct. 1st 2020. The motion was seconded by Becky Grinfield. The motion passed unanimously.

Updates to report form and data dictionary

Tom Schofield proposed changes to the report form and data dictionary. Originally the plan was to implement the LTMS document with no changes to the data dictionary and have the HEADSN as the primary identifier instead of the current INSTRUID. Tom presented reasons why this was not the best path forward. The main reasons included:

- Changing the primary identifier from INSTRUID to HEADSN would require a lot of coding changes with a higher probability of debugging to implement correctly
- Changing the primary identifier would not be consistent with every other TMC monitored test
- Changing the primary identifier would make it impossible to calculate previous statistics
- TMC wouldn't be able to set an effective date for the change

The proposed changes were:

- Report Head Serial Number in INSTRUID
- Replace HEADSN with BATHSN
- Add METHVER

Tom made a motion to approve the changes with an effective date of Oct. 1st 2020. The motion was seconded by Becky Grinfield. There was discussion where the changes will be notated – here in the meeting minutes and on TMC website. There was also discussion on the logistics of the change. Labs will have 3 weeks notice to make changes

and beta test. That will be coordinated between the labs and the Data Communication Committee (DCC). After the discussion there was a vote. The motion passed unanimously.

Round Robin for new reference oil:
The details of the round robin for GIC18 were discussed. The TMC will ship the oil to the labs. Once received they will request each run as a "Non-Calibration; Industry Information Run". Each lab will complete 3 runs by October 31.

New Business:
There was no business.

The meeting was adjourned at approximately 10:06 CDT.

Respectfully Submitted,
Matt Schlaff
Intertek Automotive Research
ASTM D02.0B.07 D5133 Surveillance Panel Chair

D5133 Scanning Brookfield Surveillance Panel Teleconference

Matt Schlaff

Intertek Automotive Research

8/4/2020

Agenda

- Antitrust statement
- Roll Call
- Data Dictionary (DD) changes
- Round Robin for New Oil
- Adjournment

ASTM Antitrust Statement

ASTM International is a not-for-profit organization and developer of voluntary consensus standards. ASTMs leadership in international standards development is driven by the contributions of its members: more than 30,000 technical experts and business professionals representing 135 countries.

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 ASTMs 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.

Roll Call

Data Dictionary (DD) Changes

- Recently approved calibration requirements will need changes to DD
- Primary Key needs to stay INSTRUID (which is now Head S/N)
- Addition of BATHSN field (previously reported in INSTRUID)
- Addition of METHVER (as used in other TMC tests)

sequence	form_number	testtype	field_name	field_length	decimal_size	data_type	unit_of_measure	description
10	1	GI	VERSION	8	0	C	YYYYMMDD	GI VERSION 20050310
20	1	GI	TSTSPON1	40	0	C		CONDUCTED FOR, FIRST LINE
30	1	GI	TSTSPON2	40	0	C		CONDUCTED FOR, SECOND LINE
40	1	GI	LABVALID	1	0	C	V, I OR N	TEST LAB VALIDATION (V, I OR N)
50	1	GI	TSTOIL	2	0	C	NR or RO	OIL TEST TYPE
60	1	GI	INSTRUID	20	0	C		INSTRUMENT ID (HEAD SERIAL NUMBER)
70	1	GI	RUNNUM	10	0	C		TEST RUN NUMBER
80	1	GI	DTCOMP	8	0	C	YYYYMMDD	DATE COMPLETED
90	1	GI	EOTTIME	5	0	C	HH:MM	TIME COMPLETED
100	1	GI	OILCODE	38	0	C		OIL CODE
110	1	GI	ALTCODE1	15	0	C		ALTERNATE OIL CODE 1
120	1	GI	ALTCODE2	15	0	C		ALTERNATE OIL CODE 2
130	1	GI	ALTCODE3	15	0	C		ALTERNATE OIL CODE 3
140	1	GI	OPVALID	8	0	C		OPERATIONAL VALIDITY -- HAS/HAS NOT
150	1	GI	SUBLAB	40	0	C		TESTING LABORATORY NAME
160	1	GI	SUBSIGIM	70	0	C		TESTING LABORATORY VALIDATORS SIGNATURE
170	1	GI	SUBNAME	40	0	C		TESTING LABORATORY VALIDATORS NAME
180	1	GI	SUBTITLE	40	0	C		TESTING LABORATORY VALIDATORS TITLE
190	2	GI	LAB	2	0	C		LAB CODE
200	2	GI	IND	6	0	C		TMC OIL CODE
210	2	GI	LABOCODE	20	0	C		LABORATORY INTERNAL OIL CODE
215	2	GI	METHVER	10	0	C		TEST METHOD-VERSION
220	2	GI	DTLSTCAL	8	0	C	YYYYMMDD	DATE OF LAST TMC CALIBRATION
230	2	GI	DTCALEXP	8	0	C	YYYYMMDD	CALIBRATION EXPIRATION DATE
240	2	GI	VIS5G	5	1	N	deg C	VISCOSITY 5000 TEMPERATURE
250	2	GI	VIS10G	5	1	N	deg C	VISCOSITY 10000 TEMPERATURE
260	2	GI	VIS20G	5	1	N	deg C	VISCOSITY 20000 TEMPERATURE
270	2	GI	VIS30G	5	1	N	deg C	VISCOSITY 30000 TEMPERATURE
280	2	GI	VIS40G	5	1	N	deg C	VISCOSITY 40000 TEMPERATURE
290	2	GI	GELTEMP	5	1	N	deg C	GELATION TEMPERATURE
300	2	GI	GELIND	5	1	A		GELATION INDEX [<]
310	2	GI	BATHMODL	10	0	C		BATH MODEL
320	2	GI	HEADMODL	5	0	C		HEAD MODEL
330	2	GI	BATHSN	20	0	C		COOLING BATH SERIAL NUMBER
340	2	GI	SWMAKE	10	0	C		SOFTWARE MAKE
350	2	GI	SWOPSYS	1	0	C	D OR W	SOFTWARE OPERATING SYSTEM, DOS(D) OR WINDOWS(W)
360	2	GI	SWVER	7	0	C		SOFTWARE VERSION
370	2	GI	DTINTCAL	8	0	C	YYYYMMDD	DATE OF LAST INTERNAL CAL. OF HEAD BEING USED FOR TMC C
380	3	GI	TOTCOM	2	0	Z		TOTAL LINES OF COMMENTS & OUTLIERS
390	3	GI	OCOMRxxx	70	0	C		OTHER DOWNTIME COMMENT XXX

Round Robin For New Oil GIC18

- SWRI, Intertek, Savant, Lubrizol, and BP Castol volunteered to donate runs
- If each lab donates 3 runs we can have 15 points to set temporary limits
- Have runs completed and reported by 10/31/2020

New Business

D5133 (GI) TMC Calibration Requirements
Surveillance Panel Approved Version 2020072702~~17~~-TMS Draft 3~~2~~
(Head –Based Proposal plus discrimination run)

The following are the specific D5133 (GI) TMC calibration test requirements as approved by the ASTM D02.B0.07 Gelation Index Surveillance Panel by Teleconference vote on 2020080~~4~~0~~616~~, and effective 2020100~~1~~0~~819~~.

Objective of TMC monitoring of D5133 (GI) test stands: The surveillance panel's intent is that each participating GI instrument ***head (viscometer drive module) and test cell (rotor and stator) combination*** must demonstrate accurate D5133 test performance on blind reference oils of known and varied GI severity performances at least once every 180 days, *and* demonstrate a passing result on a low-gelling (discrimination) reference oil every other calibration run (or, at least once every 360 days). The following requirements are intended to meet these objectives.

A. Reference Oils and Critical Parameters

1. The critical pass/fail parameter is Gelation Index (a unitless, derived value that measures the gelling tendency characteristics of a tested fluid). The reference oil performance targets and acceptance criteria required for calibration with the TMC are listed in Table 1 and have been approved by the ASTM D02.B0.07 Gelation Index Surveillance Panel.

2. Per the D5133 test method, a GI result less than 6.0 shall be reported as '<6.0', and GI result of 6.0 or greater shall be reported as a numeric value to one decimal.

Table 1
D5133 Reference Oil Targets and Acceptance Bands Effective YYYYMMDD

						Acceptance Bands*	
						95%	
Test	**Oil Code**	**Parameter**	**n**	**Mean**	**sR**	**Lower**	**Upper**
GI by	~~58~~	~~Gelation Index~~	~~17~~	~~5.80~~	~~0.69~~	~~4.4~~	~~7.2~~
	1009	Gelation Index	16	7.3	0.68	6.0	8.6
	GIB17 (Proposed)	Gelation Index		(~12.0)	TBD	TBD	TBD
D5133	62	Gelation Index	35	17.0	3.90	9.4	24.5
	GIA17	Gelation Index	18	19.0	1.87	15.4	22.7
	58	Gelation Index (Discrimination Oil)	--	<6.0	--	--	≤7.3

*95% Acceptance Bands = Mean +/- (1.960 x sR)

B. Test Stand Defined

~~1.~~ A GI test stand is defined as a single Scanning Brookfield head (also referred to in the test method as a 'Viscometer Drive Module'), and a single rotor and stator (test cell) combination~~, that is controlled by a single controller~~ and in conformance with ASTM Test Method D5133. The test sample and test cell may be cooled by liquid bath, air or

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thermoelectrically. The test cell may be cooled in a common cooling bath with other test cells, or by temperature controlled blocks with one or more test cells. Each stand (head and test cell combination) is to be identified by a unique manufacturers head serial number. ~~(Existing heads already registered with other identifications will be grandfathered in.)~~

1.

2. Testing labs are permitted to limit participation to any number of test stands on a multi-head instrument (or controller) with this notification that any test stands that are not specifically TMC calibrated under the specifications in this document cannot be used as, or implied to be, TMC calibrated test stands, heads or test cells.

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C. Acceptance Criteria

1. New Laboratory/Test Stand(s)

   a. All new test stands must first demonstrate acceptable discrimination performance by meeting the acceptance criteria on three ***consecutive*** blind test stand calibration runs using a TMC severe (high GI) performing GI reference oil, a TMC borderline-low GI performing reference oil, and a discrimination (low to non-gelling) GI reference oil with no significant instrument settings or changes between the runs. See Section C.2.h for a list of test stand changes considered to be operationally significant.

      1. Operational conformance as well as statistical evaluation of the reported test results will be reviewed to make validity determinations. Test stands that successfully pass the initial three-test calibration/discrimination requirement are considered to be TMC calibrated until the test stand calibration expires.

      2. A test stand that fails on either operational conformance or the statistical acceptance criteria will need to have the three-test runs repeated until a passing blind three-test sequence is achieved on the individual test stand.

      3. The passing consecutive three-test calibration/discrimination runs on a stand must occur within a period of 21 calendar days, as determined by date completed. Intervals of more than 21 days between three required consecutive stand calibration/discrimination runs, as determined by date completed, will operationally disqualify the test stand calibration attempt.

      4. The run order of the three initial required tests can be in any order, but must be consecutive, back-to-back runs.

      5. All three tests of a new test stand calibration sequence must be reported before any of the test results will be evaluated for validity by the TMC.

   b. TMC calibrated status of a test stand is valid for not more than 180 days from date completed of most recent of the two valid *calibration* runs (that is, the end of the test's cooling cycle needed to generate the second GI calibration test value). The date completed of the discrimination run will not be used in calculating calibration periods.

c. To renew the calibration at the end of the calibration period, see Section C.2 for Existing Laboratory/Test Stand(s).

2. Existing Laboratory Test Stand(s)

a. To maintain calibrated status, all participating test stands must demonstrate a single passing blind calibration performance at least once every 180 days. An existing TMC calibrated test stand, or one where the TMC calibrated status has expired for not more than 90 days, can renew its TMC calibrated status by demonstrating a successful blind calibration on at least one TMC blind calibration run on a current or recently calibrated test stand. This test must pass on both operational and statistical criteria.

b. For single-test blind calibrations, blind calibration samples will be assigned in approximate equal frequency from among the current surveillance panel approved reference oils.

c. To maintain calibrated status of the test stand, a successful passing discrimination run must also be run and reported at least every 360 days, and coincident with a blind calibration run, per Section C.5.

d. TMC calibrated status of an existing test stand is valid for no more than 180 days from date completed of a valid TMC calibration (that is, the end of the test's cooling cycle needed to generate the GI calibration test value).

e. Test stands that exceed the time periods specified in either Sections C.2.a or C.2.c for calibration or discrimination runs are considered to be out of calibration for TMC monitoring purposes.

f. A test stand that has been out of TMC calibration for more than 90 days past the prior TMC test stand calibration expiration date will require a New Test Stand calibration as specified in Section C.1.

g. A single-test stand calibration must pass the TMC calibration within two operationally valid calibration attempts, and within 14 days of each other. If a stand cannot produce a calibration test that falls into the acceptance bands for the assigned oil within two operationally valid runs, and within 14 days from the first failing attempt, renewing calibration on that stand will require a New Test Stand calibration as specified in Sections C.1.

h. Any of the following significant changes voids any current TMC calibrated status and will require a New Test Stand calibration as specified in Sections C.1:
   - Replacement or exchange of a head, rotor or stator in a test stand.
   - Replacement of a test cell previously matched and calibrated with a head.
   - Repair of a head or test cell.

i. Any of the following changes would void the current TMC calibration status and require a new single calibration as required in section C.2.

- Moving a test stand (head and/or test cell) to a new bath, cooling block or controller.

j. The following changes would require a calibration run of one test stand on the controller system. The lab will add test comment to report reason for calibration.
   - Repair of a central controller (this affects ALL test stands controlled by the repaired central controller).
   - Replacement of a thermocouple

   In the event of a failing calibration run, the lab shall verify the change was not the reason for the failure by running a calibration run on another test stand on the same controller system. The failing test stand will follow the calibration requirement listed in section C.2.

3. Tracking and Reporting Test Stand Runs
   a. Tracking a stands calibration status by run number will be effected by tracking and reporting Instrument ID ~~(controller serial number), Head ID (head serial number)~~ and Head Run Number to the TMC. ~~Head Run Number shall be a consecutive integer count of test starts on a head~~. Instrument ID and Run Number are separate fields on the approved data dictionary. An example is:

Instrument ~~(controller)~~ ID:	~~SBT1234567~~ C123456(C20)
~~Head ID:~~	~~C123456 (C12)~~
Head Run Number:	123456 (C10)

   b. ~~Head~~ Instrument ID shall be the serial number of the head that produced the test result being reported, and represents the monitored test stand. Repaired or overhauled heads will be reset in the test monitoring system per Section C.6.b. (Existing heads already registered with other identifications will be grandfathered in.)

   c. Head Run Number shall be a consecutive integer count of test starts on a head. Head Run Mumber is increased incrementally by one (1) for each new test start on a head, regardless of whether or not the test runs to completion, or whether or not the run is a TMC calibration attempt. Head Run Number will be reset to 1 for new or newly repaired heads.

4. Blind Calibration Test Evaluation:

   a. The calibration status of a test stand will be based on a review of reported operational parameters for compliance with the test method, followed by a statistical evaluation of the critical parameter test result against the acceptance ranges in Section A (commonly referred to as a Shewhart severity evaluation). Unless otherwise noted, the acceptance bands in Table 1 are based on a 95% confidence treatment of round robin test results with data exclusions as approved by the surveillance panel.

   b. Unless otherwise addressed by the panel, any operationally valid GI test result reported as '<6.0' for any non-discrimination reference oil cannot be

statistically interpreted. Such reported test results will be given a validity that indicates the result is operationally valid but not statistically interpretable, and therefore not chartable. (Validity OC, Chart N)

5. Discrimination Oil Test Criteria:

    a. A low to non-gelling discrimination oil (TMC oil 58 or an approved replacement) shall be requested and assigned on every calibrated test stand initially (per C.1.a) and at least once every 360 days, and run consecutively with a blind calibration run, to demonstrate that the test stand can discriminate a borderline non-gelling oil from the reference oils that have measurable gelling characteristics. Operational conformance will be evaluated, as will the GI test result per Table 1. However, the discrimination test results will not be otherwise statistically evaluated (non-chartable). A GI result less than 6.0 shall be reported as '<6.0', and GI result of 6.0 or greater shall be reported as a numeric value to one decimal. TMC pass/fail evaluation of the discrimination run will be based on the approved upper acceptance limit for the discrimination oil (see Table 1). A special discrimination run validity and comment will be applied, but the discrimination test result will not be otherwise statistically interpreted.

    b. A test stand must pass the acceptance criteria in Table 1 for the discrimination oil within two attempts. Failure of the first attempt on a discrimination run, while passing on the concurrent calibration run on the same test stand, will place the calibration status of the affected test stand as pending while a discrimination oil rerun is conducted. The discrimination test rerun must be completed within 14 days from the prior failing run. Passing a second consecutive discrimination run (following a failed discrimination attempt) will reinstate the calibrated status of the test stand until the test stand calibration expiration date (specified on the calibration test confirmation report). Two consecutive runs that fail to meet the acceptance criteria for the discrimination oil will void the current calibrated status of the test stand and require a full new stand calibration sequence as defined in section C.1. Shakedown runs will be permitted to troubleshoot stand performance before proceeding with the three-test calibration sequence.

    c. Failure of a lab to perform and report a discrimination run to the TMC in the time period referenced in section C.2.c and C.5.a voids the current calibrated status of the test stands and require a new stand calibration sequence as specified under section C.1.

    d. It is the referencing lab's responsibility to track when discrimination runs are due, the TMC will not send reminders on this.

6. Replacement or Repair of Heads:

    a. Repaired or refurbished heads, and/or repaired or replaced rotors or stators will be considered as new test stands and must be (re)introduced with a successful new test stand calibration sequence, as specified in section C.1.

b. Repaired or refurbished heads, or replaced test cells, will add a suffix to the Head ID starting with '-R1' and increasing numerically ('-R2', '-R3'…) following each successive repair. Head Run Number will be reset to 1 for new or newly repaired heads or replaced test cells, reflecting a new test stand and run count series for each new or newly repaired Head ID.

7. Removal of Test Stands from the System

    a. The laboratory must notify the TMC when removing a stand from the system. No reference oil data shall be removed from the TMC's data base of prior TMC calibrations or calibration attempts. Return of the stand to the system will be evaluated as a new test stand per section C.1.

8. Introduction of New or Re-Blended Reference Oils
    a. Introduction of new or replacement reference oils will be conducted at the discretion of the surveillance panel. Participating laboratories may be asked to donate tests on the new oil(s) to establish baseline performance in the D5133 (GI) test. The number of tests requested will be sufficient to rigorously evaluate the oil's performance (typically a minimum of 15 tests total among all the participating labs). Preliminary statistical performance targets and acceptance criteria will be established by the surveillance panel, and those values will be re-assessed by the panel as the TMC collects additional calibration data.

9. Internal Calibration of Test Stand
    a. In addition to the TMC blind calibrations, Test Method D5133 specifies a separate calibration check for each test cell. To differentiate this requirement from the TMC calibrations, this is to be referred to in the data dictionary as an 'internal calibration'. The internal calibration is to be successfully performed as specified in the test method. The date of the last internal calibration is to be reported to the TMC with the TMC calibration run results for the test stand being reported. As part of the operational review, the TMC will confirm that the date completed of the most recent internal calibration (DTINTCAL) is prior to, and within the time specified in the test method, from date completed of the TMC calibration (DTCOMP) for each test stand. Test stands found to have delinquent test cell internal calibrations from the test method specification will be evaluated as operationally invalid.

10. Transitioning current registered instruments from an instrument based calibration monitoring system to a head-test cell based monitoring system:

    a. From the first day of implementing the head-test cell based test stand system, ALL current head calibrations will expire within 180 days of implementation. Labs with existing calibrated *baths*~~*instruments*~~ will have up to 180 days to newly recalibrate all *heads* with current calibrations as newly defined *test stands* by completing a single-test calibration followed consecutively by a discrimination oil run on each head/test cell (test stand), under the specifications in this document.

    b. Any heads with current calibrations expiring prior to 180 days from the implementation of this document will need to be recalibrated as test stands by

the head calibration expiration date shown on the most recent TMC Test Confirmation Report (TCR) for each currently calibrated head. This will require completing a single-test calibration followed consecutively by a discrimination oil run on each head/test cell (test stand), under the specifications in this document. Head calibrations will not be extended beyond current expiration dates as a result of this transition.

c. ~~Test Stand Apparatus will be reclassified at the TMC to be individual head/test cell combinations (as identified by the currently registered head serial numbers), and no longer will be evaluated by the Instrument ID as the test stand~~. Statistics will be reset for monitoring test stands by newly registered head serial numbers as the Instrument ID.

sequence	form_number	testtype	field_name	field_length	decimal_size	data_type
10	1	GI	VERSION	8	0	C
20	1	GI	TSTSPON1	40	0	C
30	1	GI	TSTSPON2	40	0	C
40	1	GI	LABVALID	1	0	C
50	1	GI	TSTOIL	2	0	C
60	1	GI	INSTRUID	20	0	C
70	1	GI	RUNNUM	10	0	C
80	1	GI	DTCOMP	8	0	C
90	1	GI	EOTTIME	5	0	C
100	1	GI	OILCODE	38	0	C
110	1	GI	ALTCODE1	15	0	C
120	1	GI	ALTCODE2	15	0	C
130	1	GI	ALTCODE3	15	0	C
140	1	GI	OPVALID	8	0	C
150	1	GI	SUBLAB	40	0	C
160	1	GI	SUBSIGIM	70	0	C
170	1	GI	SUBNAME	40	0	C
180	1	GI	SUBTITLE	40	0	C
190	2	GI	LAB	2	0	C
200	2	GI	IND	6	0	C
210	2	GI	LABOCODE	20	0	C
215	2	GI	METHVER	10	0	C
220	2	GI	DTLSTCAL	8	0	C
230	2	GI	DTCALEXP	8	0	C
240	2	GI	VIS5G	5	1	N
250	2	GI	VIS10G	5	1	N
260	2	GI	VIS20G	5	1	N
270	2	GI	VIS30G	5	1	N
280	2	GI	VIS40G	5	1	N
290	2	GI	GELTEMP	5	1	N
300	2	GI	GELIND	5	1	A
310	2	GI	BATHMODL	10	0	C
320	2	GI	HEADMODL	5	0	C
330	2	GI	BATHSN	20	0	C
340	2	GI	SWMAKE	10	0	C
350	2	GI	SWOPSYS	1	0	C
360	2	GI	SWVER	7	0	C
370	2	GI	DTINTCAL	8	0	C
380	3	GI	TOTCOM	2	0	Z
390	3	GI	OCOMRxxx	70	0	C

unit_of_measure	description
YYYYMMDD	GI VERSION 20050310
	CONDUCTED FOR, FIRST LINE
	CONDUCTED FOR, SECOND LINE
V, I OR N	TEST LAB VALIDATION (V, I OR N)
NR or RO	OIL TEST TYPE
	INSTRUMENT ID (HEAD SERIAL NUMBER)
	TEST RUN NUMBER
YYYYMMDD	DATE COMPLETED
HH:MM	TIME COMPLETED
	OIL CODE
	ALTERNATE OIL CODE 1
	ALTERNATE OIL CODE 2
	ALTERNATE OIL CODE 3
	OPERATIONAL VALIDITY -- HAS/HAS NOT
	TESTING LABORATORY NAME
	TESTING LABORATORY VALIDATORS SIGNATURE
	TESTING LABORATORY VALIDATORS NAME
	TESTING LABORATORY VALIDATORS TITLE
	LAB CODE
	TMC OIL CODE
	LABORATORY INTERNAL OIL CODE
	TEST METHOD-VERSION
YYYYMMDD	DATE OF LAST TMC CALIBRATION
YYYYMMDD	CALIBRATION EXPIRATION DATE
deg C	VISCOSITY 5000 TEMPERATURE
deg C	VISCOSITY 10000 TEMPERATURE
deg C	VISCOSITY 20000 TEMPERATURE
deg C	VISCOSITY 30000 TEMPERATURE
deg C	VISCOSITY 40000 TEMPERATURE
deg C	GELATION TEMPERATURE
	GELATION INDEX [<]
	BATH MODEL
	HEAD MODEL
	COOLING BATH SERIAL NUMBER
	SOFTWARE MAKE
D OR W	SOFTWARE OPERATING SYSTEM, DOS(D) OR WINDOWS(W)
	SOFTWARE VERSION
YYYYMMDD	DATE OF LAST INTERNAL CAL. OF HEAD BEING USED FOR TMC CAL.
	TOTAL LINES OF COMMENTS & OUTLIERS
	OTHER DOWNTIME COMMENT XXX

Test Method D 5133
Gelation Index and Gelation Temperature Test

Version GI VERSION YYYYMMDD BETA

Conducted For
TSTSPON1
TSTSPON2

LABVALID	V = Valid
	I = Invalid

TSTOIL	NR = Non-Reference Test Oil
	RO = Reference Oil Result

Test Number	
Instrument ID: INSTRUID	Test Run: RUNNUM

Date Completed: DTCOMP		EOT Time: EOTTIME	
Oil Code: OILCODE			
Alternate Codes:	ALTCODE1	ALTCODE2	ALTCODE3

In my opinion this test OPVALID been conducted in a manner in accordance with the Test Method D5133 and the appropriate amendments through the information letter system. The remarks included in this report describe the anomalies associated with this test.

Submitted By:

SUBLAB
Testing Laboratory

SUBSIGIM
Signature

SUBNAME
Typed Name

SUBTITLE
Title

Test Method D 5133
Gelation Index and Gelation Temperature Test
Form 2

Oil Code: OILCODE
Lab Sample Code: LABOCODE

Testing Lab: LAB	TMC Reference Oil ID: IND
Date Completed: DTCOMP	Time Completed: EOTTIME

Instrument ID: INSTRUID	
Test Run: RUNNUM	Test Method-Version: METHVER
Date of Last TMC Calibration: DTLSTCAL	TMC Calibration Expiration Date: DTCALEXP

Viscosity (cp)	Temperature (°C)
5,000	VIS5G
10,000	VIS10G
20,000	VIS20G
30,000	VIS30G
40,000	VIS40G

Gelation Temperature, °C	GELTEMP
Gelation Index	GELIND

Operational
(Report For TMC Calibration Only)

Bath Model	BATHMODL
Head Model	HEADMODL
Cooling Bath Serial No.	BATHSN
Software Make	SWMAKE
Software Operating System	SWOPSYS
Software Version	SWVER
Date of Last Internal Calibration Of Head Being Used for TMC Calibration	DTINTCAL

Test Method D 5133
Gelation Index and Gelation Temperature Test
Form 3
Comments

Oil Code: OILCODE
Lab Sample Code: LABOCODE

Testing Lab: LAB	TMC Reference Oil ID: IND
Date Completed: DTCOMP	Time Completed: EOTTIME

Instrument ID: INSTRUID	
Test Run: RUNNUM	
Date of Last TMC Calibration: DTLSTCAL	TMC Calibration Expiration Date: DTCALEXP

Out-Of-Limit Data And Time, Test Modifications And Comments

Number of Comment Lines	TOTCOM	
OCOMR001		
OCOMR002		
OCOMR003		
OCOMR004		
OCOMR005		
OCOMR006		
OCOMR007		
OCOMR008		
OCOMR009		
OCOMR010		
OCOMR011		
OCOMR012		
OCOMR013		
OCOMR014		
OCOMR015		

Test Method D 5133
Gelation Index and Gelation Temperature Test
Form 3A
Comments

Oil Code: OILCODE	
Lab Sample Code: LABOCODE	

Testing Lab: LAB	TMC Reference Oil ID: IND
Date Completed: DTCOMP	Time Completed: EOTTIME

Instrument ID: INSTRUID	
Test Run: RUNNUM	
Date of Last TMC Calibration: DTLSTCAL	TMC Calibration Expiration Date: DTCALEXP

Out-Of-Limit Data And Time, Test Modifications And Comments

Number of Comment Lines	TOTCOM
OCOMR016	
OCOMR017	
OCOMR018	
OCOMR019	
OCOMR020	
OCOMR021	
OCOMR022	
OCOMR023	
OCOMR024	
OCOMR025	
OCOMR026	
OCOMR027	
OCOMR028	
OCOMR029	
OCOMR030	

TEST METHOD D 5133
Gelation Index and Gelation Temperature Test
Form 3B
Comments

Oil Code: OILCODE
Lab Sample Code: LABOCODE

Testing Lab: LAB	TMC Reference Oil ID: IND
Date Completed: DTCOMP	Time Completed: EOTTIME

Instrument ID: INSTRUID	
Test Run: RUNNUM	
Date of Last TMC Calibration: DTLSTCAL	TMC Calibration Expiration Date: DTCALEXP

Out-Of-Limit Data And Time, Test Modifications And Comments

Number of Comment Lines	TOTCOM	
OCOMR031		
OCOMR032		
OCOMR033		
OCOMR034		
OCOMR035		
OCOMR036		
OCOMR037		
OCOMR038		
OCOMR039		
OCOMR040		
OCOMR041		
OCOMR042		
OCOMR043		
OCOMR044		
OCOMR045		