

## CAT Aeration Test Task Force meeting Sep 23, 2014

### Proveout Matrix Plan

**Attendees:** Names Highlighted in **Yellow** attended the meeting

Participant	Name	Email	
1 Yes	Caroline Laufer Elisa Santos Pat Fetterman James Gutzwiller Bob Salgueiro	caroline.laufer@infineum.com elisa.santos@infineum.com pat.fetterman@infineum.com <a href="mailto:james.gutzwiller@infineum.com">james.gutzwiller@infineum.com</a> <a href="mailto:bob.salgueiro@infineum.com">bob.salgueiro@infineum.com</a>	Infineum
5 Waive	Jeff Clark Sean Moyer	jac@astmtmc.cmu.edu <a href="mailto:sam@astmtmc.cmu.edu">sam@astmtmc.cmu.edu</a>	TMC
6 Waive	Zack Bishop Dan Lancott	zbishop@tei-net.com <a href="mailto:dlancott@tei-net.com">dlancott@tei-net.com</a>	TEI
7 Waive	Jason Bowden Matt Bowden	jhbowden@ohtech.com	OHT
8 Yes	Mark Jarrett Hind Abi-Akar	jarrett_mark_w@cat.com <a href="mailto:abi-akar_hind@cat.com">abi-akar_hind@cat.com</a>	Caterpillar
10 No (need to see LAD at LZ)	Greg Miranda, Kevin O'Mally Chris Mileti Michael Conrad Ravi Tallamraju	greg.miranda@lubrizol.com <a href="mailto:Kevin.OMalley@lubrizol.com">Kevin.OMalley@lubrizol.com</a> <a href="mailto:Christopher.Mileti@Lubrizol.com">Christopher.Mileti@Lubrizol.com</a>	Lubrizol
11 waive (Box results and HA and d1005)	Bob Campbell Christian Porter	<a href="mailto:bob.campbell@aftonchemical.com">bob.campbell@aftonchemical.com</a>	Afton
12 yes	James McCord Martin Thompson	<a href="mailto:jmccord@swri.org">jmccord@swri.org</a> <a href="mailto:martin.thompson@swri.org">martin.thompson@swri.org</a>	SWRI
14 yes	Timothy Griffin Jim Moritz Adam Roig	tim.griffin@intertek.com <a href="mailto:jim.moritz@intertek.com">jim.moritz@intertek.com</a>	Intertek
16 waive (T effect verification, Si RR)	Jim Rutherford Mark Cooper	jaru@chevron.com <a href="mailto:MAWC@chevron.com">MAWC@chevron.com</a>	Chevron
18 yes	Mike Alessi Ricardo Conti	<a href="mailto:michael.l.alessi@exxonmobil.com">michael.l.alessi@exxonmobil.com</a>	ExxonMobil
19 Waive	Barb Goodrich	<a href="mailto:GoodrichBarbaraE@JohnDeere.com">GoodrichBarbaraE@JohnDeere.com</a>	John Deere
20 yes	Greg Shank	<a href="mailto:greg.shank@volvo.com">greg.shank@volvo.com</a>	Volvo
21 Yes (review)	Dan Arcy	<a href="mailto:Dan.arcy@shell.com">Dan.arcy@shell.com</a>	Shell

before start)			
---------------	--	--	--

Test plan update, 4 Sep 2014

La b	Test 0	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
A	LZ oil (OS)	HA	1005	HA	1005	LZ oil start Thurs	LAD1	1005/1004?
B	LZ oil (OS)	HA	1005	HA – Start Friday	LZ oil	LAD1	Obtain info on insulation box - validate	
C	LZ oil (OS) Hi Si	1005	HA	1005- start Thurs	LZ oil	LZ oil*	LAD1	

Done by NCDT  
meeting

Done since NCDT  
meeting

\*: different batch

**Update:**

Design features:

Target 35 deg C for the enclosure.  
 Micromotion itself has limited capability of T; so 35 deg C is preferred.  
 Intertek and SWRI setups are different, but with common design elements.  
 Enclosure must include transducers, thermocouples and micromotion.  
 Control valve did not appear to impact aeration results. It is optional to include it, but better to insulate it.  
 One data point will be added to the data reported to TMC: temperature of the enclosure.  
 Thermocouple location in the box: at 25 mm +/- 5 mm of the micromotion plane and half way between the inlet and outlet of the micromotion.  
 Heater elements are different between SWRI and Intertek.



Enclosure goal is to stabilize the delta T across the micromotion. Variation of delta of +/- 1 deg is

target.

Temperature control: Sample temperature and mitigating ambient temperature swings.

SWRI: waiting for heater elements.

LZ: expect to get this enclosure done in a week and a half – by the end of next week.

Validation of the enclosure:

1. Run a 5-hour short test using 15W-40 bring the engine to operating Ts so that delta T is within +/- 1 deg while the enclosure test is at 35 deg C. (Delta T was related to aeration changes). This also proves that the box can be controlled to target T.

Discussion of running a full test (LAD1 oil): Data analysis presented by Elisa Santos did not show the need to run this test.

**ACC input.**

ACC agrees the test is ready for matrix with several points:

- Concern about the Si issue (Si from gaskets)
- Enclosure validation
- Performance of HA and 1005
- Discrimination is the same across all labs
- Matrix testing needs to finish at the same time of T13 (not beyond)

**API:** agreed to move forward with the caveat of completing the enclosure.

**Discussion:**

Criteria for operational validity:

Continue to pursue Si-free gaskets

Engine hour's impact will be better understood as the hours increase during the matrix. SWRI continue to collect hours.

Rebuild during the matrix? No.

Reference: no references during the matrix. Repeats of the oils during the matrix are indicators.

Vote:

Based on the vote taken last time and:

Lubrizol changes the negative now that the data points have been finalized.