

## Oil Seal Compatibility Test (OSCT) Surveillance Panel Meeting Minutes

5/12/2010

D. Bell

Please refer to the attached membership list for participants.

A motion made by D. Bell and 2<sup>nd</sup> by J. Gropp to approve the prior OSCT Surveillance Panel meetings that are on the TMC website from 3/26/2010 was approved unanimously (8 approvals).

There are multiple baths available at both Lz and SWRI with no known related "stand" bath problems. Lubrizol is not having any issues with using the new Bluehill Instron calibration method and SWRI continues to use the older but effective Instron calibration procedure. Both procedures are allowed as per D5662, so no more discussion is necessary on this topic until SWRI transitions to the Bluehill method.

Over the past month there have been five D5662 warning alarms that have come to the attention of the OSCT chairman regarding poor precision and severity for % elongation for polyacrylate. The root cause of the alarms was contributed to one questionable batch of a polyacrylate, PA341, that the panel approved for candidate testing knowing that it had borderline elongation performance. PA341 has since been depleted so the severity levels are expected to return to historic levels.

A new lot of polyacrylate, PA342, consisting of 300 slabs has been sent to each test lab from Test Engineering Institute (TEI) for qualification testing, so when both labs complete this task the chairman will call an OSCT surveillance panel meeting to decide upon approval of the lot. The most recent lot of fluoroelastomer, FL377, has been depleted at TEI, so a new lot, FL378, consisting of 300 slabs has been ordered from Freudenberg FNOK. TEI currently has ~100 slabs of nitrile, NI335, and ordered 300 slabs more of NI336.

At the end of March, FNOK unexpectedly decided to stop supply of all three elastomers to TEI due to the concern that the confidentiality of their elastomer formulations was compromised by using the current elastomer designations. After several conversations with FNOK, they finally decided to resume supply of all three elastomers under the following conditions which will be followed:

- Fluoroelastomer will now be referred to only as TM1041-09D
- Polyacrylate will now be referred to only as TM1041-08D
- Nitrile will now be referred to only as TM1040-09D
- No reformulation efforts of any kind will be undertaken by any laboratory or organization involved in the testing
- On an annual basis, FNOK is to receive result reports for testing of these elastomers

We are taking the following actions to comply with FNOK's request. We have determined that there is no need to revise D5662 since it does not use the seal designations that were an issue with FNOK. jPRI will revise their website to change the current designation of the elastomers to those requested above by FNOK. The TEI has changed their elastomer ordering forms and procedure to only reflect the new names shown above for the elastomers. TEI will also continue to assign a sequential batch number to each new elastomer for testing and tracking purposes, i.e. PA342. At this time, we will not pursue non-analysis agreements between TEI, test labs, and FNOK unless requested by FNOK. All parties involved

verbally agreed to not attempt to deformulate any of the elastomers. The chairman will provide FNOK with TMC's website link so that FNOK can review the OSCT qualification data from each new elastomer batch that is tested.

FNOK releases elastomers based on data from neat slabs, with typical values shown below:

	PA	FL	NI
Hardness Points	79	81	73
% Elongation	83	200	450
Tensile Strength, kg/cm2	80	?	145
Sp gravity	1.395	2.11	1.500
Rheometer plot of time vs. torque	Must pass	Must pass	Must pass

However, there is no correlation established to the hardness, %elongation, and %volume change data generated as per OSCT D5662 testing in reference oils for each elastomer. FNOK has agreed to run similar tests, but Test Monitoring Center (TMC) is reluctant to supply reference oils to them because some are in short supply and we have never had the need to do this in the past two decades. The chairman has taken the action item to attempt to define a correlation between the FNOK measured values and OSCT D5662 data.

Due to the elastomer supply issues noted above with FNOK, the chairman will coordinate efforts with TEI to send the current FNOK seal specs (with no reference to FNOK) to the selected top two potential alternate seal suppliers, SKF and Federal Mogul, to determine if they have similar slabs of elastomers that they could supply for evaluating.

TMC was recently notified by the anonymous suppliers of reference oils, TMC 161-1 and 168, that some of the components used to blend these are no longer available, thus both reference oils will no longer be supplied. The third OSCT reference oil, TMC 160-1, is not affected. The chairman issued a letter to the LRI mailing list asking for potential replacement reference oils, but no responses were received. TMC 168 was introduced in 2006 following depletion of TMC 162. There is currently ~30 gallons remaining, which may be a sufficient quantity for 3 years or so. The supplier cannot reblend and has not offered a replacement oil. Two or three potential replacement oils have been identified between Afton and Lz and will be evaluated at a later date as low priority. TMC 161-1 was introduced in 1995 but now has outdated chemistry and only 10 gallons remaining, which may be sufficient for ~6 months. The current supplier of TMC 161-1 can provide an alternate reference oil using J2360 approved fluid currently successfully used in the marketplace.

TMC provided the following comparison of the potential alternate reference oil data relative to the current TMC 161 targets.

	%vol change	% elongation change	Hardness
PA	1.9	64.8	-3
PA Target	19.6	68.88	-24.9
FL	4.5	-34.4	0
FL Target	6.2	-34.57	1.6
NI	11.9	-27.2	-8
NI Target	18.4	10.4	-16.1

A motion made by J. Gropp and 2<sup>nd</sup> by B. Grinfield to adopt the alternate oil from the current supplier of TMC 161-1 as a replacement oil for TMC 161-1 was unanimously approved (8 approvals). Another motion by J. Gropp and 2<sup>nd</sup> by D. Bell to have the TMC assign this new reference oil for testing each time they assign an OSCT reference oil was also approved unanimously (8 approved). This will allow data to be generated side-by-side on the potential alternate oil and TMC 161-1 until TMC 161-1 is depleted, at which time new acceptance bands will be defined for the alternate reference oil.

The current shelf life for elastomers is two years. A chief seal chemist for FNOK noted that under the current storage conditions of refrigeration in the dark, that these elastomers should last "forever". There was an outstanding action item for the past year to have the test labs evaluate a 2003 lot of nitrile, NI329, per D5662 to determine if we could increase the shelf life to at least 5 years for nitrile. The panel decided that this should no longer be pursued since the current lots of PA and FL are depleted within months and nitrile is not required for J2360 and the inventory is seldom an issue now that the ordering pattern is better matching demand.

Motion unanimously approved (8 approved) to adjourn at 3:04 pm on 5/12/2010.

OIL SEAL COMPATIBILITY SURVEILLANCE PANEL

Date: May 12, 2010

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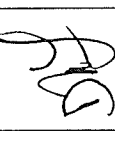
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**OIL SEAL COMPATIBILITY SURVEILLANCE PANEL**

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# OIL SEAL COMPATIBILITY SURVEILLANCE PANEL

Date: 5/12/2010

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