

Oil Seal Compatibility Test (OSCT) Surveillance Panel Meeting Minutes

November 8, 2023

Don Bell

Participants listed on attachment in Appendix.

An OSCT Surveillance Panel meeting was called to order by D. Bell at 10:30 am on 11/8/2023.

A motion made by J. Clark and 2nd by J. Morris was unanimously approved with 14 votes to approve the previous OSCT Surveillance Panel minutes from meetings held 8/9/2023 and 9/14/2023.

The OSCT membership voting list was reviewed. A motion made by D. Bell and 2nd by J. Morris was unanimously approved with 13 votes to replace J. Carter with J. Carowick and add R. Warden with A. Jackson as alternate to the voting membership.

Lab C has 3 baths and Lab G has 1 bath for testing PA, FL and NI with no bath issues.

The inventory of elastomer batches at Test Engineering Institute (TEI) was reviewed as follows:

Polyacrylate (PA):

- PA368 43 approved slabs
- PA369 ~200 unapproved slabs. Lab C submitted qualification data to TMC, but await Lab G results
- PA370 D. Bell requested TEI to place an order

Fluoroelastomer (FL):

- FL416 33 approved slabs
- FL417 184 approved slabs
- FL418 TEI ordered

Nitrile (NI):

- NI354 172 approved slabs
- NI355 TEI to place order

Lab C continues to struggle with passig elongation and hardness in only TMC 170. This may be an issue when the need arises to reference a new NI lot. If so, we may consider deleting TMC 170 for referencing for Lab C.

At the August OSCT Panel meeting a decision was made to add the Instron method to D5662. D. Bell issued a draft information letter to TMC to add to Appendix. Since the method is a 6 page table, it was decided to keep the method on the TMC website with reference to it in D5662. Therefore, the following addition is being made to D5662 as highlighted in red below:

6.1.2 Tension Testing Machine—See Test Methods D412. Set the testing machine rate of grip separation for the percent elongation change determinations at 8.5 mm/s +/- 0.8 mm/s. Calibrate the tension testing machine in accordance with manufacturer instructions. **See Example Settings for Instron Machine, available from the TMC website (<https://www.astmtmc.org>).**

The TMC reviewed the OSCT 155 annual PA and FL test results from both labs using TMC 155-2 industry reference oil to ensure the method stays in control with respect to J2360 limits. The data can be found in the Appendix. In summary, all TMC 155-2 data fell within J2360 limits showing the D5662 method is in-control for PA and FL testing.

After presenting the 1000 hour seal results at the May Panel meeting, the labs confirmed they were not using the exact same Instron test method settings, and thus some of the data did not match well between labs. Both labs then re-ran the 1000 hour seals on TMC 155 with the same setting and same lots of PA and FL. The data shows that the 240 hour data matches well with historical data and well within J2360 limits. For FL, up to 1000 hours the PVCA and SAHA stay within J2360 limits but at 500 hours the results fall low outside of PELA J2360 limits. For PA up to 1000 hours, PVCA and PELA stay within J2360 limits, but trend low. At 500 hours, the SAHA fall high outside of J2360 limits.

The Panel further discussed the need to pursue the 1000 hour testing. Some OEMs feel that 240 hours is not sufficient to correlate to field performance, but no one could provide insight to any seal field issues. The Army (A. Comfort) has an action item to identify any seal performance concerns raised by the Army. The Panel were reminded that 1000 hour seal testing was required during presentation of field trial results for approving new chemistry. However the 1000 hour seal test was not run referenced and had no J2360 limits, and was thus voted to be removed as a requirement back around 2010. D. Bell and D. Beck are to discuss the 1000 hour seal test with he Stats Group to determine a DOE that may be conducted to improve repeatability and eventually establish J2360 limits.

A motion made by D. Bell and 2nd by N. Ariemma to adjourn the OSCT Panel Webex at 11:52 am was unanimously approved with 14 votes.

Respectfully submitted,



Donald R. Bell/Chairman

Appendix



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LRI 211 Surveillance Panel Meetings OSCT 155 Annual Approval Testing

November 8, 2023

Background

- OSCT testing is done using reference oil 155-1/155-2 annually to ensure that a well performing oil produces results within the J2360 limits.
- In 2022 the panel switched over to running annual testing on 155-2 instead of 155-1.

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2023 Annual 155 Reference Oil – FL Results

testkey	ltmslab	val	ind	ltmsdate	PVCA	SAHA	PELA	EBC
116408-OSCT	B	NI	155-1	20160411	1	3	-47.8	FL398
120862-OSCT	B	NI	155-1	20161115	0.8	4	-45.1	FL399
120863-OSCT	B	NI	155-1	20171116	1.1	2	-46.4	FL402
111180-OSCT	C	NI	155-1	20150925	1.2	0	-41.5	FL396
120855-OSCT	C	NI	155-1	20161010	2.4	-1	-53.1	FL400
120858-OSCT	C	NI	155-1	20171221	1.4	3	-47.2	FL404
120860-OSCT	C	NI	155-1	20190903	1.4	4	-54.8	FL407
148363-OSCT	C	NI	155-1	20200925	0.9	3.8	-60.6	FL410
148365-OSCT	C	NI	155-1	20211122	1	4.1	-56.7	FL413
168844-OSCT	C	NI	155-1	20220808	0.7	4	-55.7	FL414
120890-OSCT	G	NI	155-1	20170309	1.3	3	-56.6	FL399
120891-OSCT	G	NI	155-1	20171219	2.6	-1	-40.7	FL403
131159-OSCT	G	NI	155-1	20181207	2.5	0	-48.9	FL405
131596-OSCT	G	NI	155-1	20190913	2.9	1	-46.3	FL407
131160-OSCT	G	NI	155-1	20200928	2.9	1.8	-62.8	FL409
131594-OSCT	G	NI	155-1	20211115	3	0.8	-52.9	FL409
173777-OSCT	G	NI	155-1	20220822	-3.3	-1.9	-44	FL413
174344-OSCT	C	NI	155-2	20220923	1	4.2	-55.7	FL414
174348-OSCT	G	NI	155-2	20221007	1.5	-0.9	-67	FL413
174350-OSCT	G	NI	155-2	20230928	1.50	3.4	-56.7	FL415
174347-OSCT	C	NI	155-2	20231016	1.4	3.6	-53.8	FL416



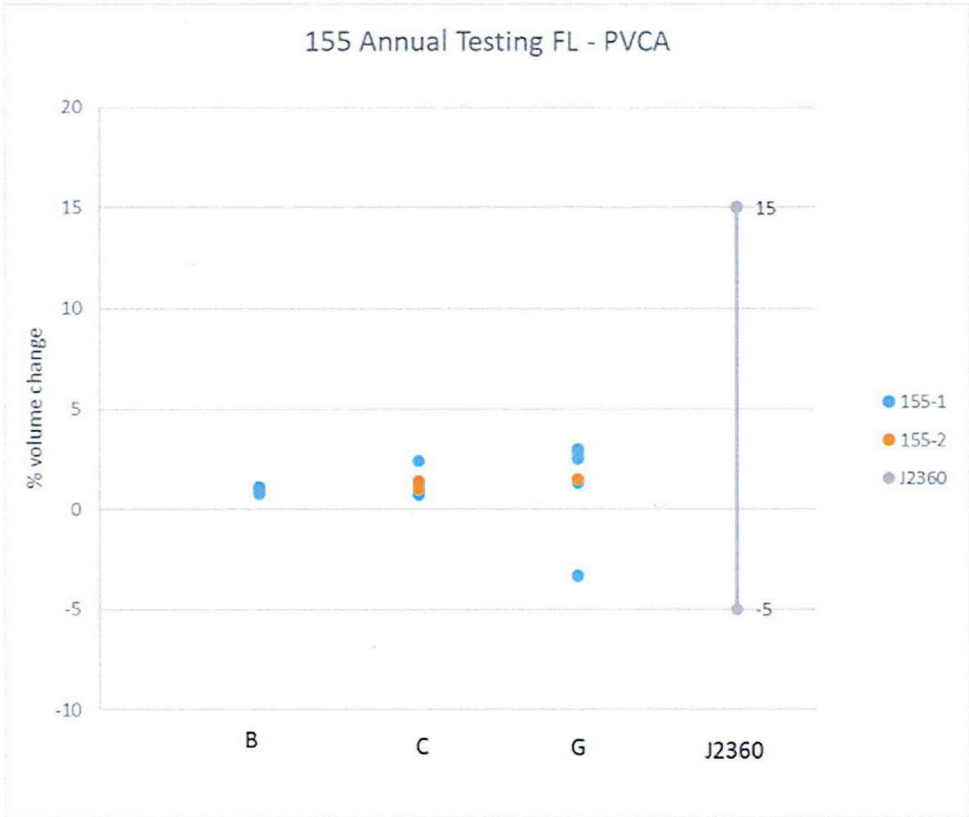
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2023 Annual 155 Reference Oil – FL Results

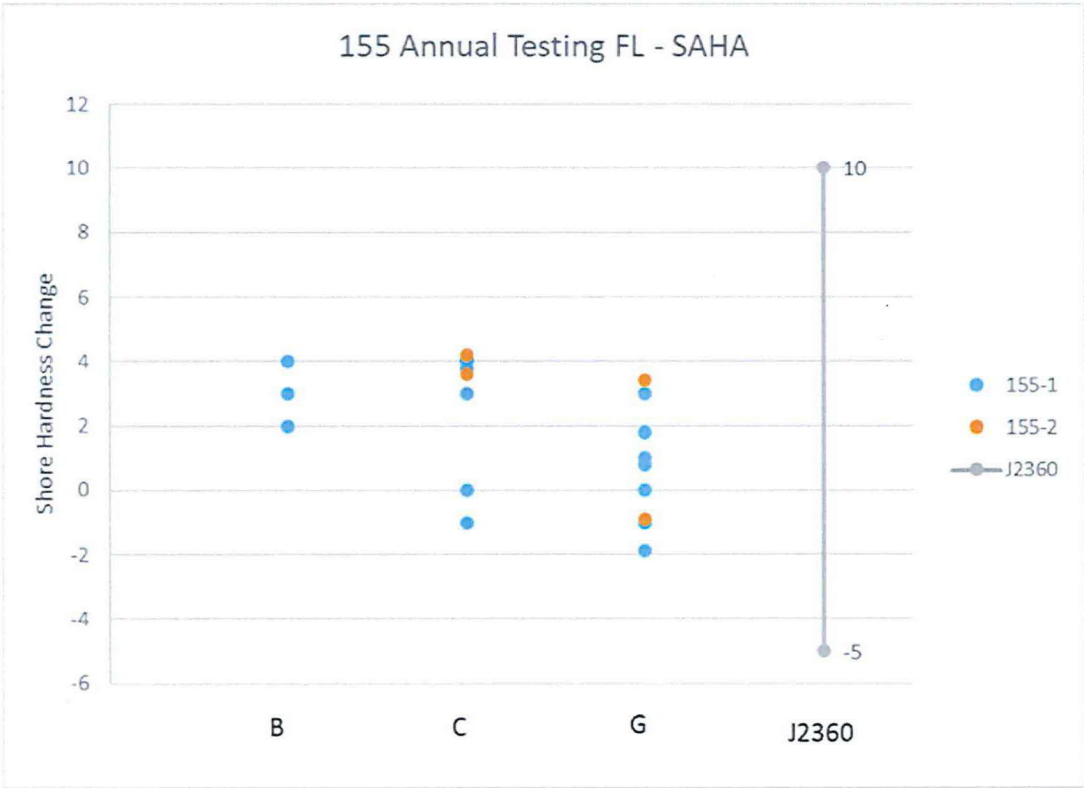


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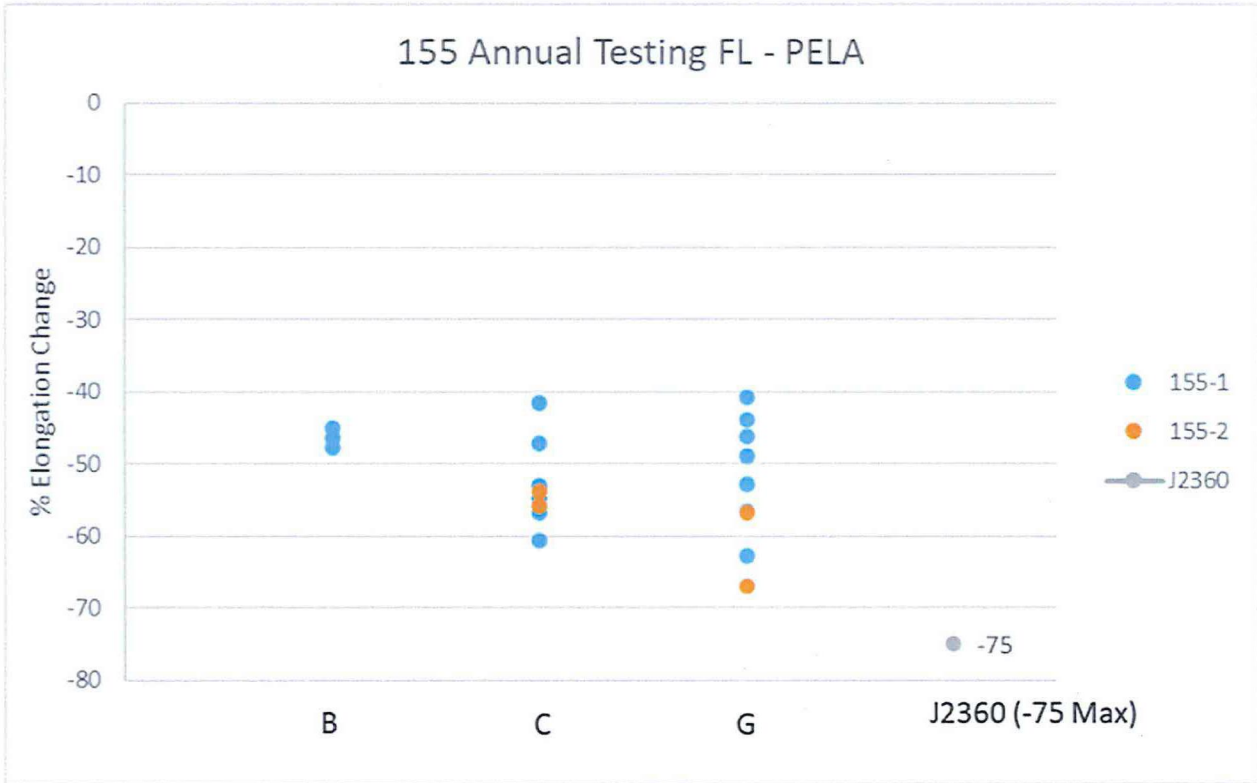
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2023 Annual 155 Reference Oil – FL Results



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2023 Annual 155 Reference Oil – PA Results

testkey	ltmslab	val	ind	ltmsdate	PVCA	SAHA	PELA	EBC
116409-OSCT	B	NI	155-1	20160412	0.3	0	1	PA355
120861-OSCT	B	NI	155-1	20161027	0.5	-1	23.8	PA355
120865-OSCT	B	NI	155-1	20171214	0.2	-2	25.4	PA359
111179-OSCT	C	NI	155-1	20150927	0.4	1	8.6	PA352
120856-OSCT	C	NI	155-1	20161013	0.1	-1	19.4	PA355
120857-OSCT	C	NI	155-1	20171221	0.3	-2	23.2	PA359
120859-OSCT	C	NI	155-1	20190905	-0.2	0	17.8	PA363
148362-OSCT	C	NI	155-1	20200924	-0.1	0.3	29.3	PA364
148364-OSCT	C	NI	155-1	20211210	-0.1	2.2	1.8	PA366
168843-OSCT	C	NI	155-1	20220809	-0.4	1.6	10.3	PA366
120886-OSCT	G	NI	155-1	20161020	-0.2	0	47.7	PA355
131157-OSCT	G	NI	155-1	20171214	0.7	0	38.2	PA359
131595-OSCT	G	NI	155-1	20190905	1	0	25.2	PA360
131158-OSCT	G	NI	155-1	20181207	1	-1	46.7	PA362
131591-OSCT	G	NI	155-1	20200928	12.7	-12	32.3	PA364
131592-OSCT	G	NI	155-1	20201214	-0.2	1.5	42.2	PA364
131593-OSCT	G	NI	155-1	20211115	-0.6	0.2	4.9	PA365
173776-OSCT	G	NI	155-1	20220822	5.4	2.2	1.9	PA366
174345-OSCT	C	NI	155-2	20220926	-0.5	1	-9.9	PA366
174349-OSCT	G	NI	155-2	20221007	12.2	-12	31.7	PA367
174346-OSCT	C	NI	155-2	20231002	-0.5	0.8	6.7	PA368
174351-OSCT	G	NI	155-2	20230928	0.1	1.7	12.4	PA368

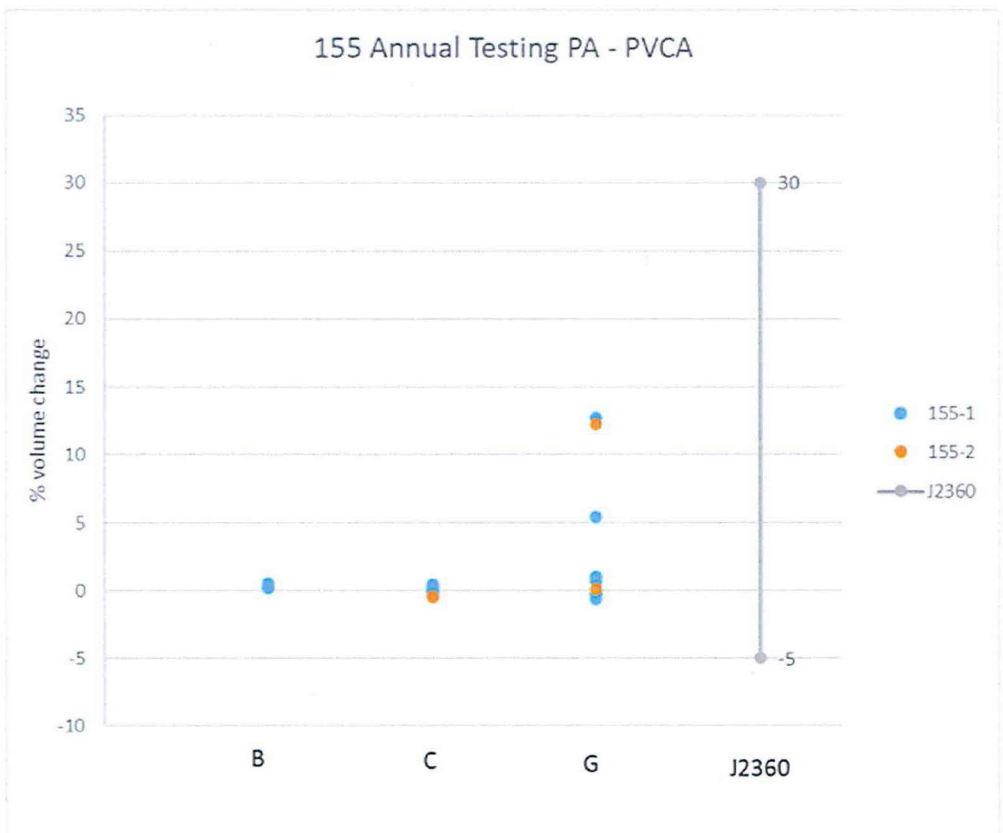


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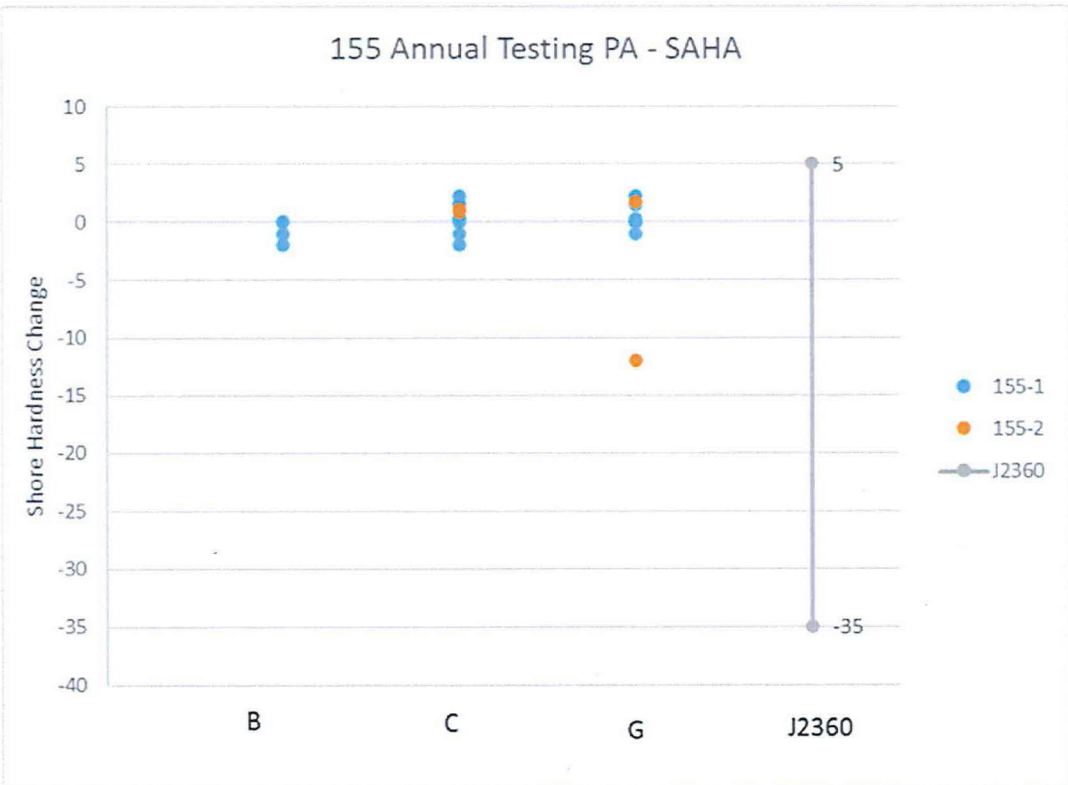
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2023 Annual 155 Reference Oil – PA Results



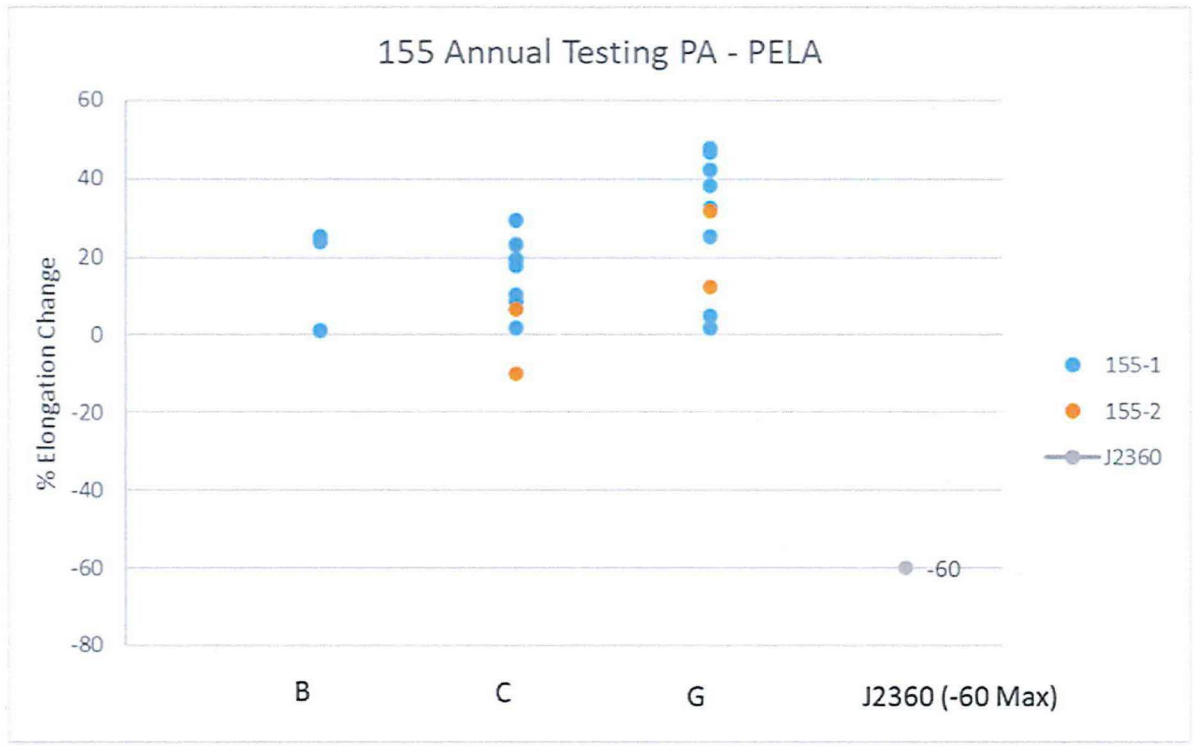
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2023 Annual 155 Reference Oil – PA Results



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Summary

- ▲ All TMC 155 data within the J2360 limits
 - ▲ PA PVCA trends slightly low and SAHA high



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Surveillance Panel Meetings OSCT Results of 1000 hr Testing

November 8, 2023

Summary:

- Labs were to run 1000 hour versions of the OSCT test taking measurements at 240hrs, 500 hrs, and 1000hrs.
- After presenting results at the May panel meetings, the labs were tasked with checking and comparing their Instron settings
- In July the labs confirmed that they were not using the same settings. It was decided that the 1000hr tests were to be re-run using the same settings.



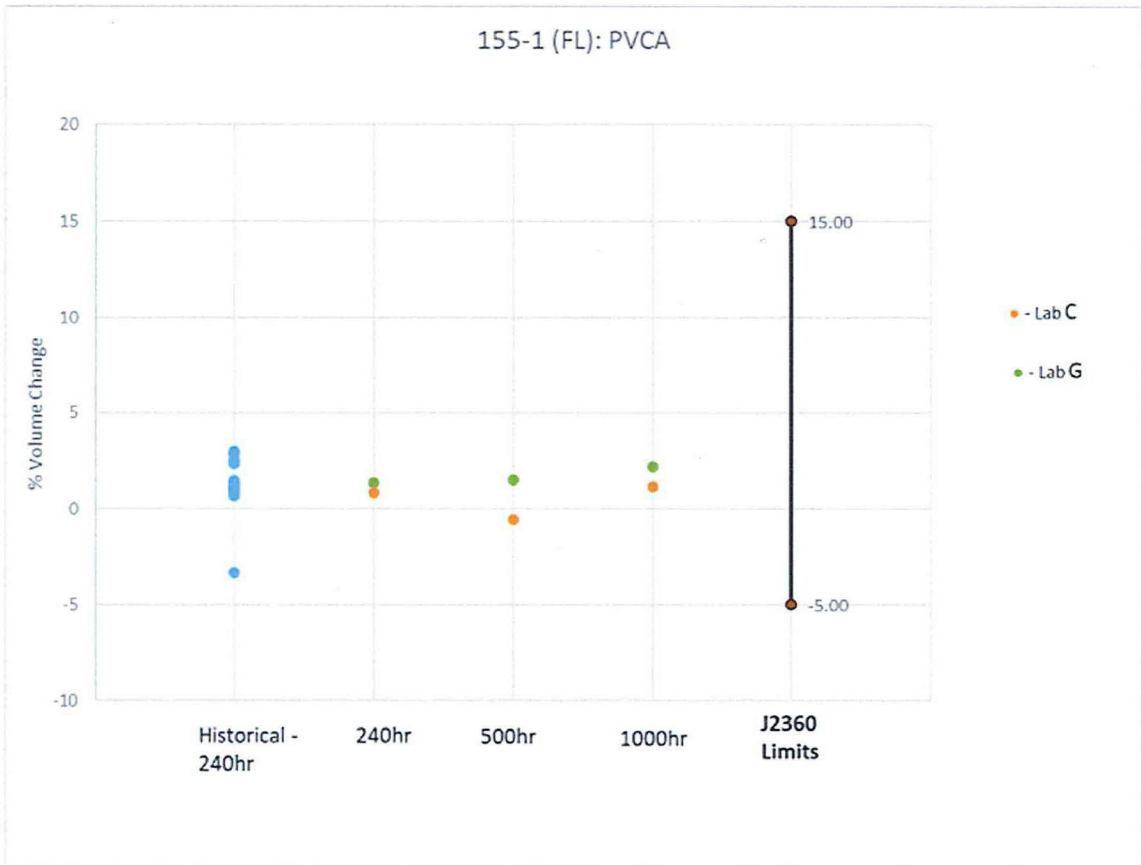
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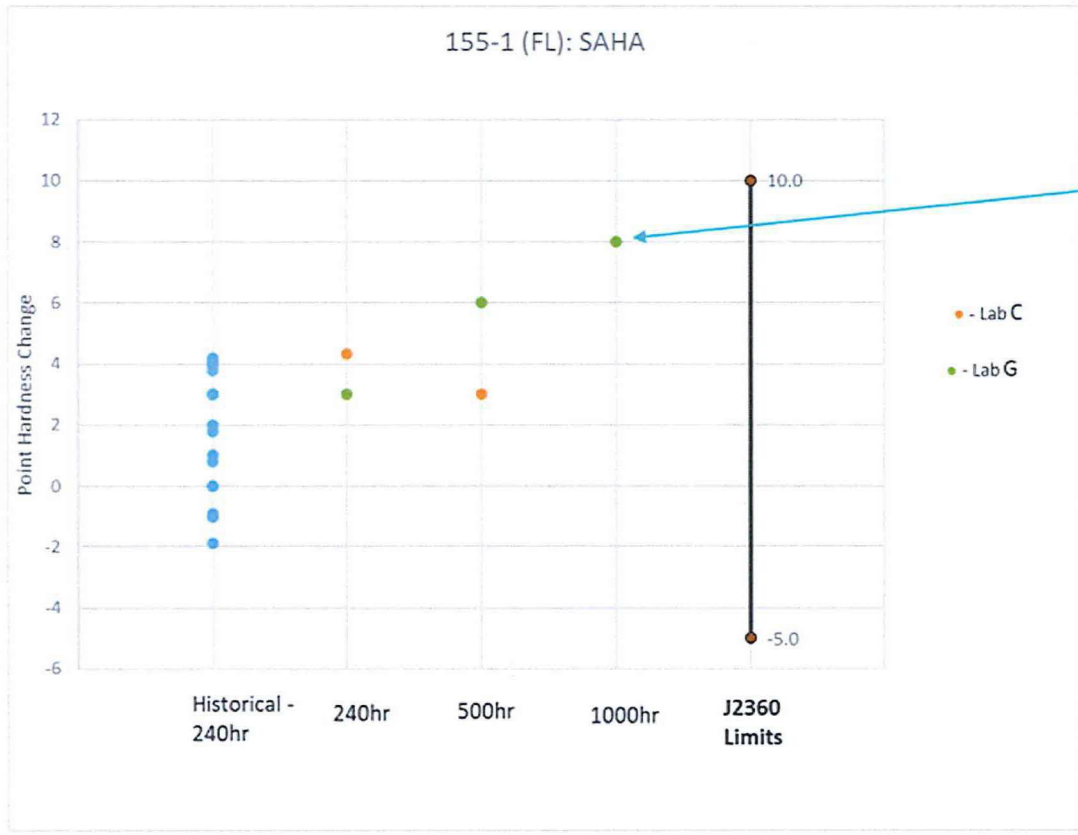
155-1 FL: PVCA



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155-1 FL: SAHA



Lab C and G points on top of each other

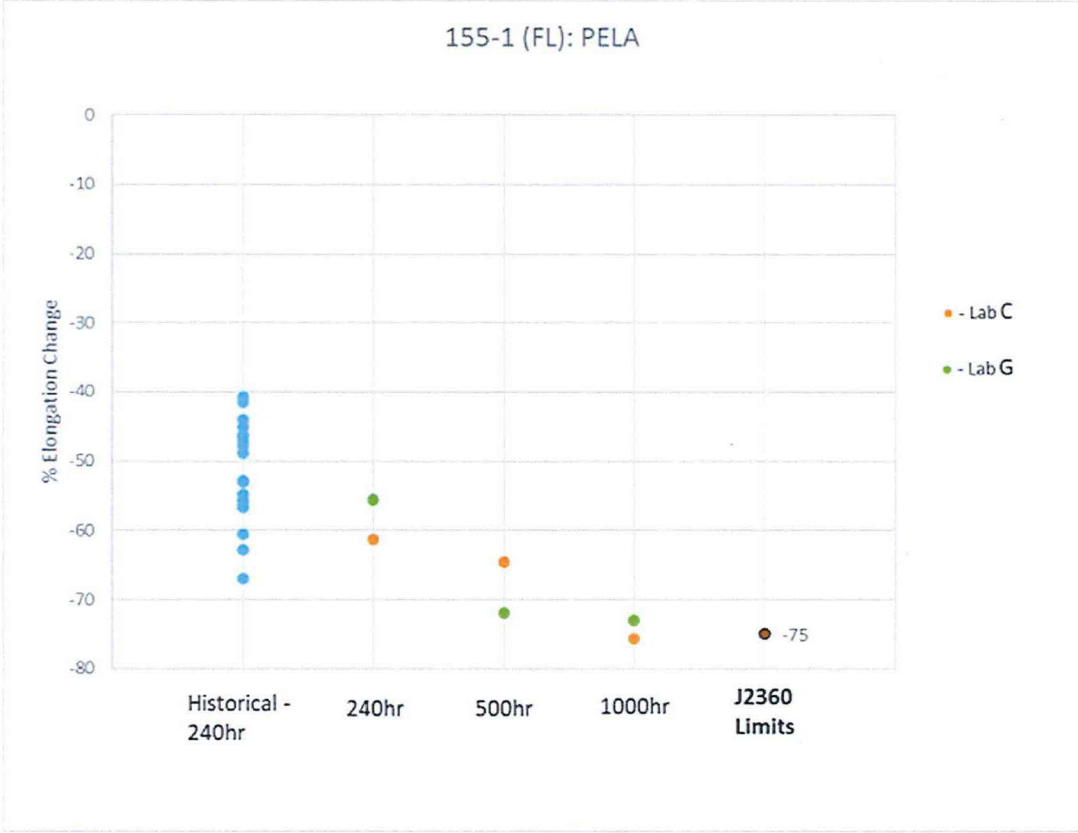


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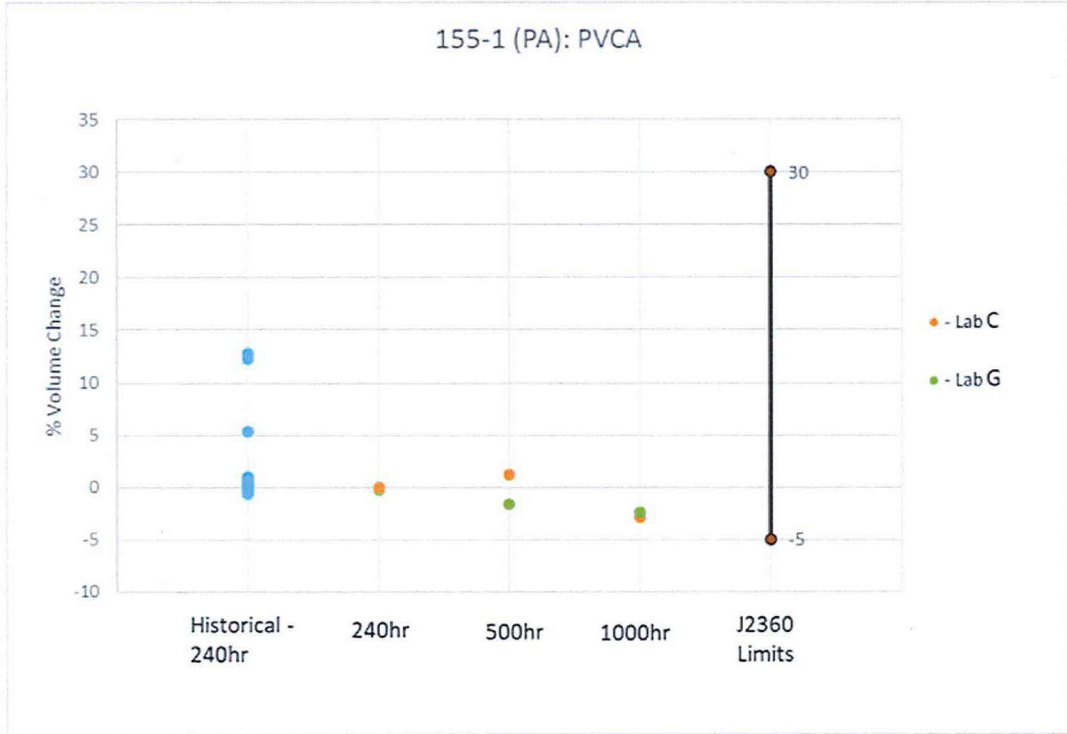
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155-1 FL: PELA



155-1 PA: PVCA



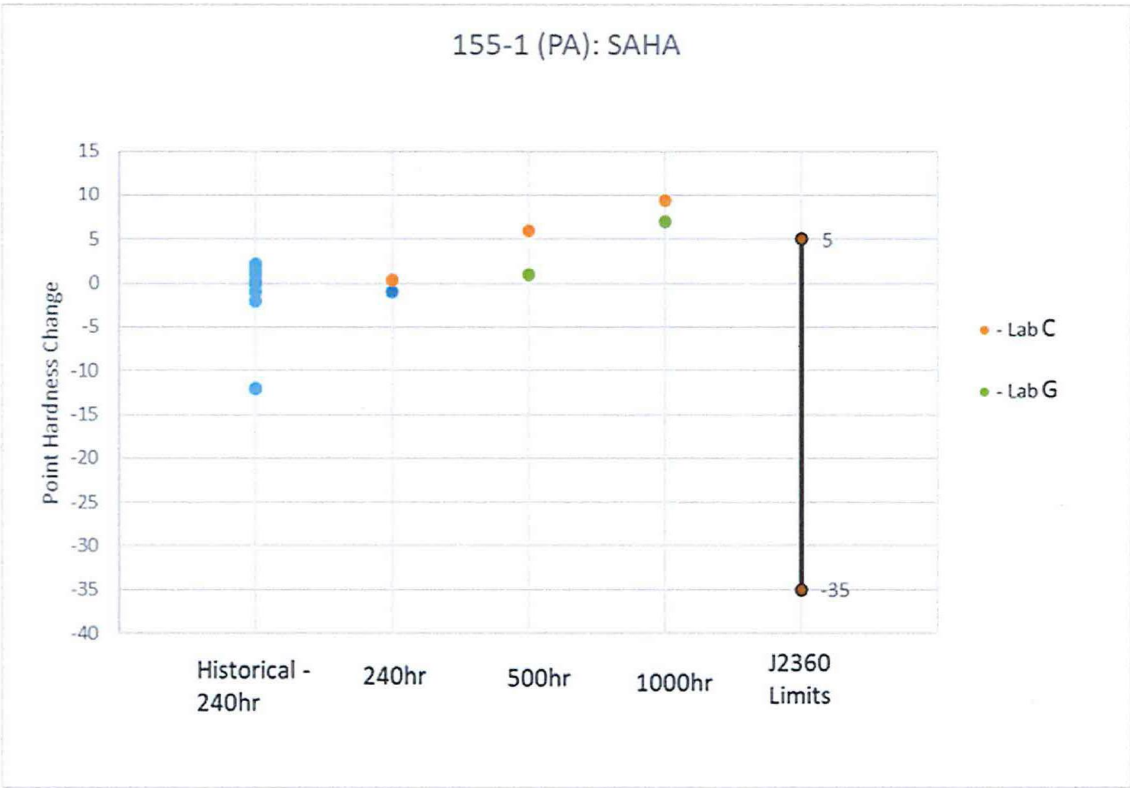
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155-1 PA: SAHA

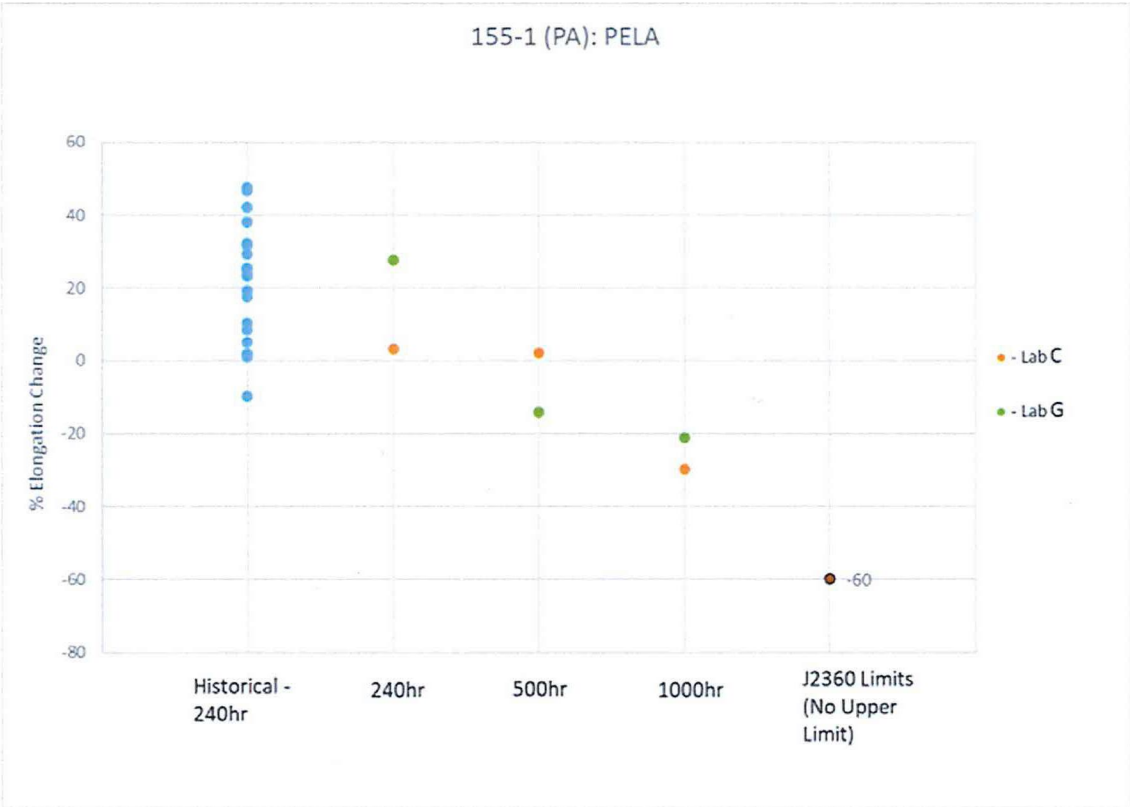


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155-1 PA: PELA



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Summary

▲ 240 hr TMC 155 PA & FL data points match well with historical data range and well within J2360 limits

▲ FL

- ▲ Up to 1000 hrs, TMC 155 PVCA & SAHA stay within J2360 limits
- ▲ At 500 hrs, TMC 155 falls low outside of PELA J2360 limits

▲ PA

- ▲ Up to 1000 hrs, TMC 155 PVCA & PELA stay within J2360 limits but trend low
- ▲ At 500 hrs, TMC 155 falls high outside of SAHA J2360 limits

OIL SEAL COMPATIBILITY SURVEILLANCE PANEL

Date: Nov. 8, 2023

Initials	V = Voting NV = Non-voting	Name	Company & Address	e-Mail:	
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DB	V	Don Bell <i>Chairperson</i>	Afton Chemical Corp. 500 Spring Street Richmond, VA 23219	Phone: e-Mail:	804-788-6332 don.bell@aftonchemical.com
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