

Oil Seal Compatibility Test (OSCT) Surveillance Panel Meeting Minutes

November 9, 2022

Don Bell

Participants listed on attachment in Appendix.

An OSCT Surveillance Panel meeting was called to order by D. Bell at 2:03 pm on 11/9/2022.

A motion made by D. Bell and 2nd by A. Goyal was unanimously approved with 10 votes to approve the previous OSCT Surveillance Panel minutes from meeting held 9/28/2022.

The OSCT membership list was reviewed. S. Bealko was removed since he retired from Lubrizol. Meritor was changed to Cummins-Meritor with the recent merger. A motion made by W. Venhoff and 2nd by T. Muransky was unanimously approved with 10 votes to add J. Morris of Navistar and S. Carr of Dana as voting members, as well as replace M. Lopez with K. Gutierrez of Intertek as a voting member effective immediately.

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 and deemed adequate, so TEI was not instructed to order more elastomer at this time.

Polyacrylate (PA):

- PA366 20 approved slabs
- PA367 99 approved slabs
- PA368 259 approved slabs
- PA369 TEI to order later

Fluoroelastomer (FL):

- FL410 18 approved slabs
- FL414 169 approved slabs
- FL415 182 approved slabs
- FL416 TEI will order later

Nitrile (NI):

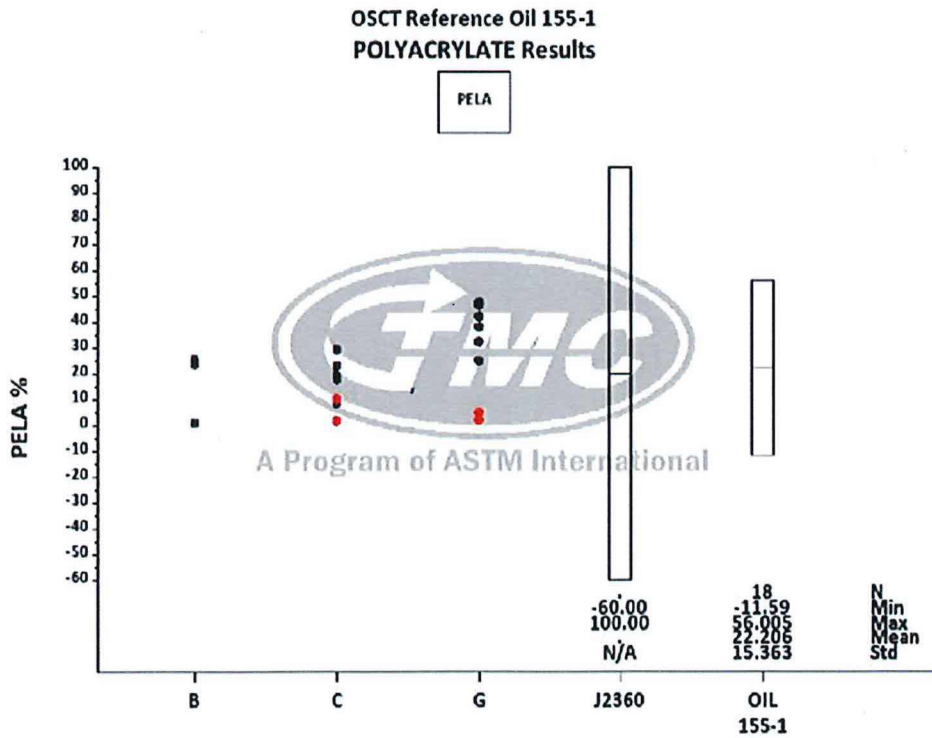
- NI353 130 approved slabs
- NI354 260 unapproved slabs—Lab C submitted passing data to TMC, so Lab G asked to do the same

The TMC reviewed the TMC 155-1 annual industry reference oil data, and the new reference oil replacement, TMC 155-2, data on PA and FL conducted at both labs.

PA results:

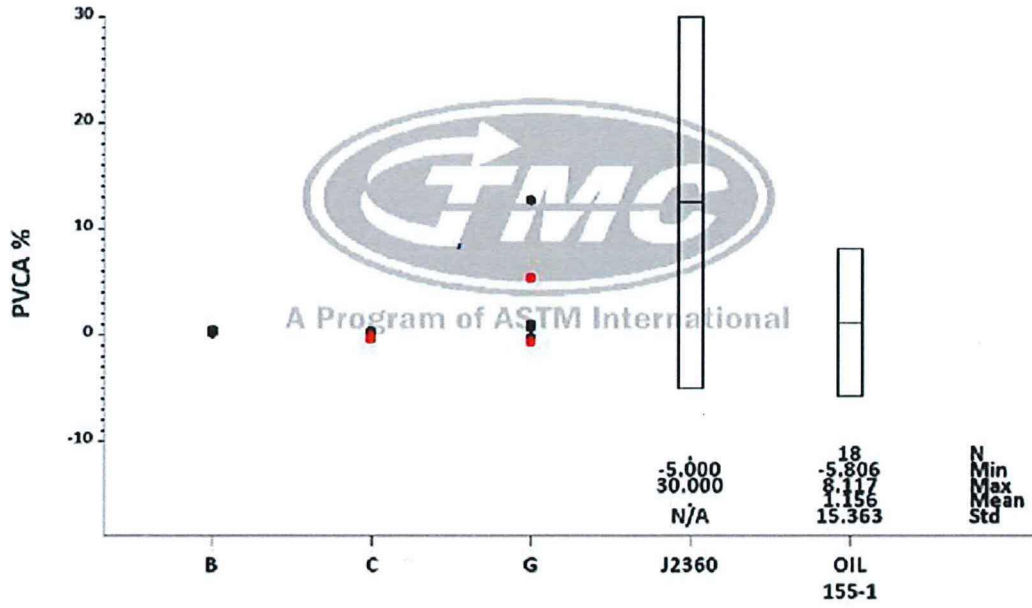
testkey	ltmslab	val	ind	ltmsdate	PVCA	SAHA	PELA	EBC
111179-OSCT	C	NI	155-1	20150927	0.4	1	8.6	PA352
116409-OSCT	B	NI	155-1	20160412	0.3	0	1	PA355
120856-OSCT	C	NI	155-1	20161013	0.1	-1	19.4	PA355
120886-OSCT	G	NI	155-1	20161020	-0.2	0	47.7	PA355
120861-OSCT	B	NI	155-1	20161027	0.5	-1	23.8	PA355
120865-OSCT	B	NI	155-1	20171214	0.2	-2	25.4	PA359
131157-OSCT	G	NI	155-1	20171214	0.7	0	38.2	PA359
120857-OSCT	C	NI	155-1	20171221	0.3	-2	23.2	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
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
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
148364-OSCT	C	NI	155-1	20211210	-0.1	2.2	1.8	PA366
173776-OSCT	G	NI	155-1	20220822	5.4	2.2	1.9	PA366
168843-OSCT	C	NI	155-1	20220809	-0.4	1.6	10.3	PA366
174349-OSCT	G	NI	155-2	20221007	12.2	-12	31.7	PA367
174345-OSCT	C	NI	155-2	20220926	-0.5	1	-9.9	PA366

2022 Test Result
2022 155-2 Results



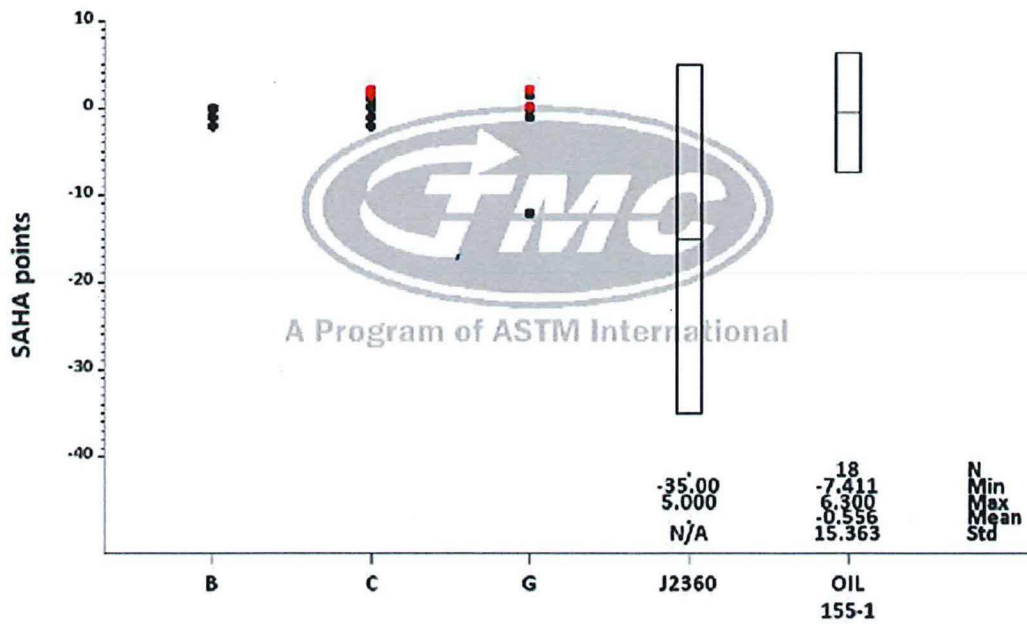
OSCT Reference Oil 155-1
POLYACRYLATE Results

PVCA



OSCT Reference Oil 155-1
POLYACRYLATE Results

SAHA

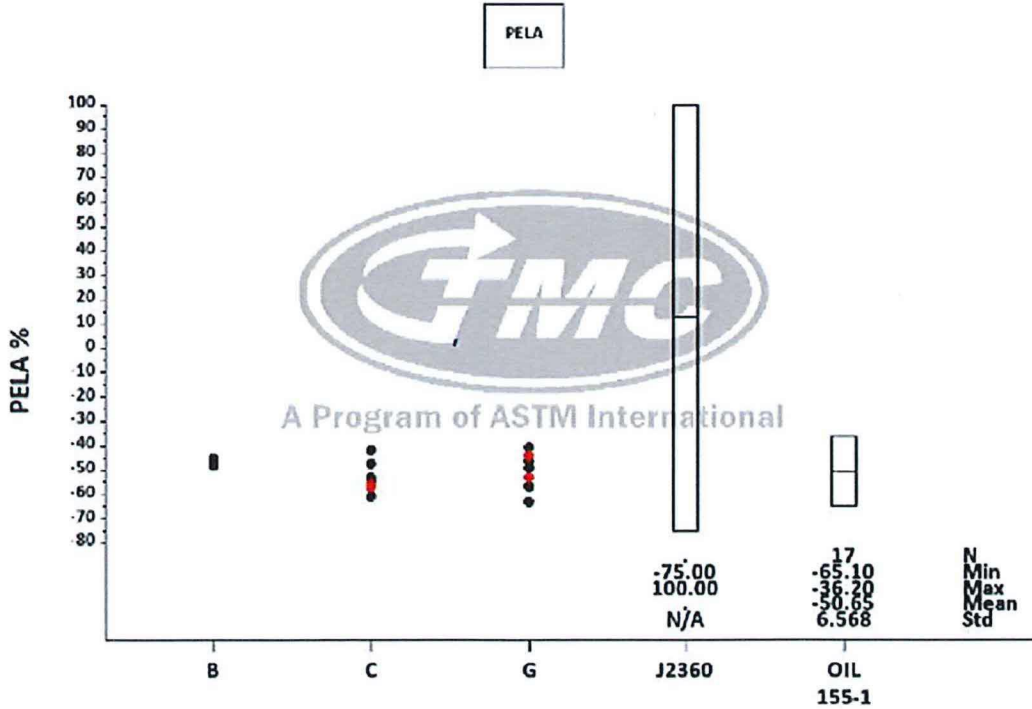


FL Results:

testkey	ltmslab	val	ind	ltmsdate	PVCA	SAHA	PELA	EBC
111180-OSCT	C	NI	155-1	20150925	1.2	0	-41.5	FL396
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
120890-OSCT	G	NI	155-1	20170309	1.3	3	-56.6	FL399
120855-OSCT	C	NI	155-1	20161010	2.4	-1	-53.1	FL400
120863-OSCT	B	NI	155-1	20171116	1.1	2	-46.4	FL402
120891-OSCT	G	NI	155-1	20171219	2.6	-1	-40.7	FL403
120858-OSCT	C	NI	155-1	20171221	1.4	3	-47.2	FL404
131159-OSCT	G	NI	155-1	20181207	2.5	0	-48.9	FL405
120860-OSCT	C	NI	155-1	20190903	1.4	4	-54.8	FL407
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
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
173777-OSCT	G	NI	155-1	20220822	-3.3	-1.9	-44	FL413
168844-OSCT	C	NI	155-1	20220808	0.7	4	-55.7	FL414
174348-OSCT	G	NI	155-2	20221007	1.5	-0.9	-67	FL413
174344-OSCT	C	NI	155-2	20220923	1	4.2	-55.7	FL414

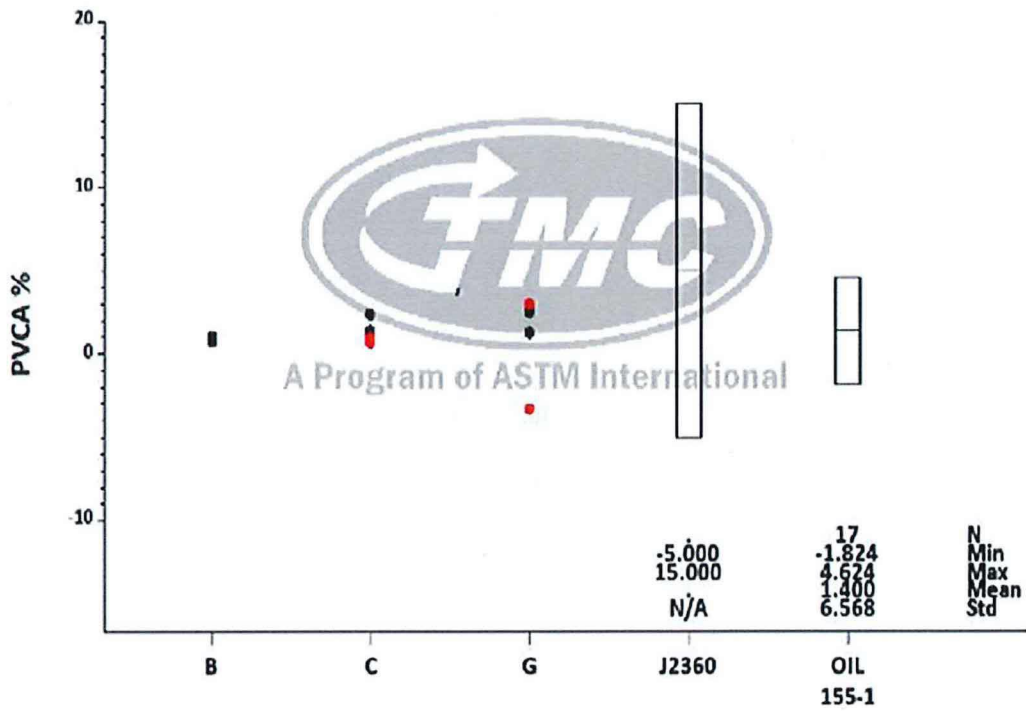
2022 Test Result
2022 155-2 Results

OSCT Reference Oil 155-1
FLUROELASTOMER Results



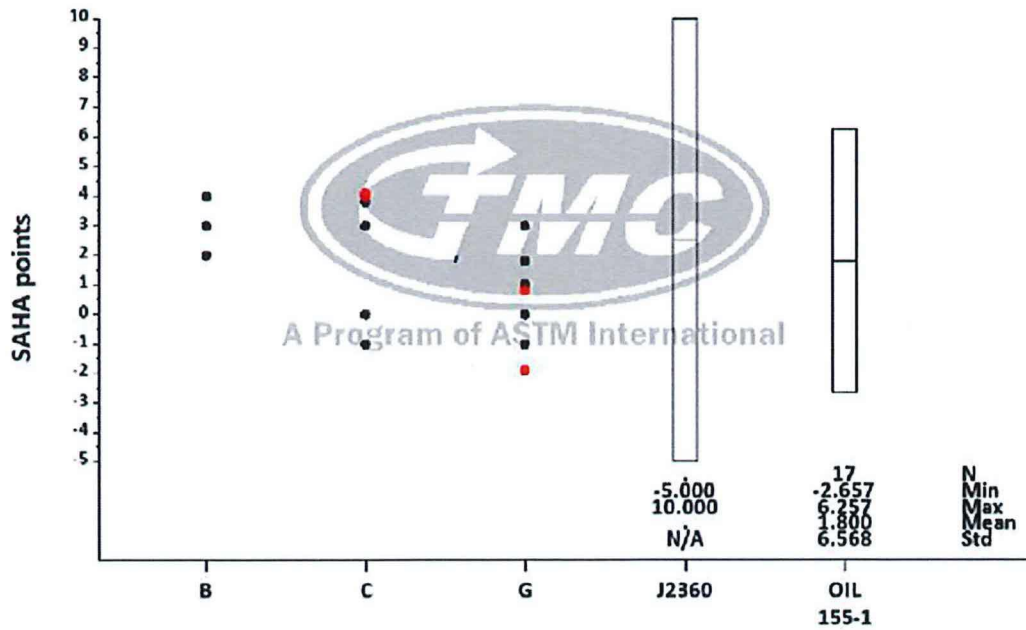
OSCT Reference Oil 155-1
FLUROELASTOMER Results

PVCA

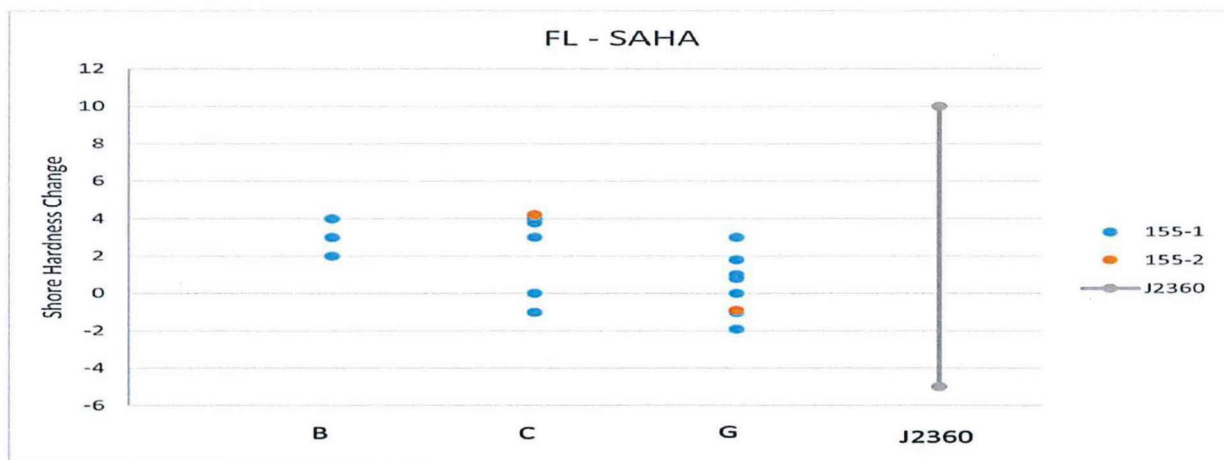
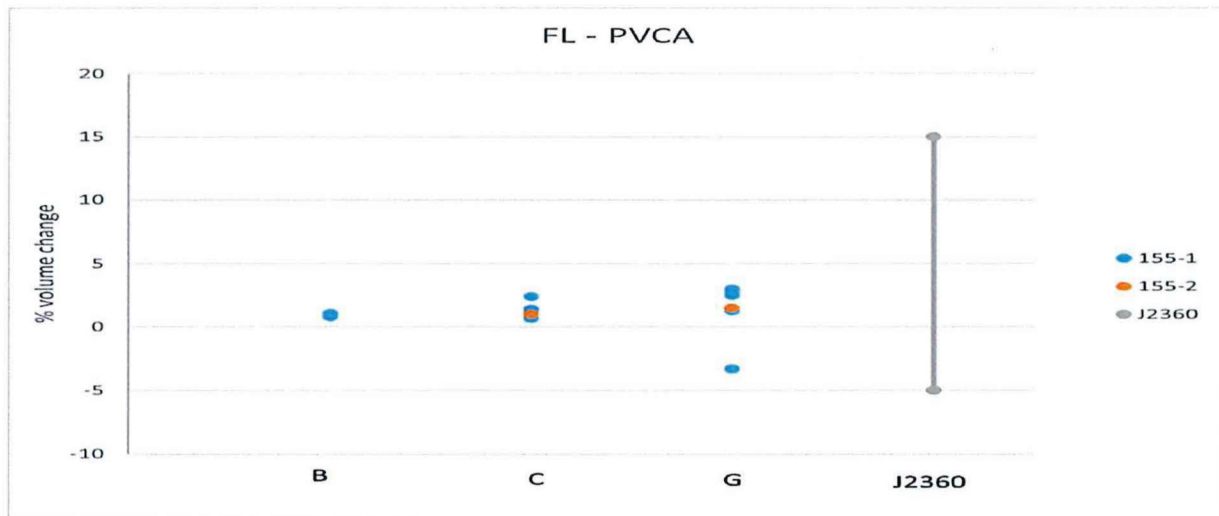
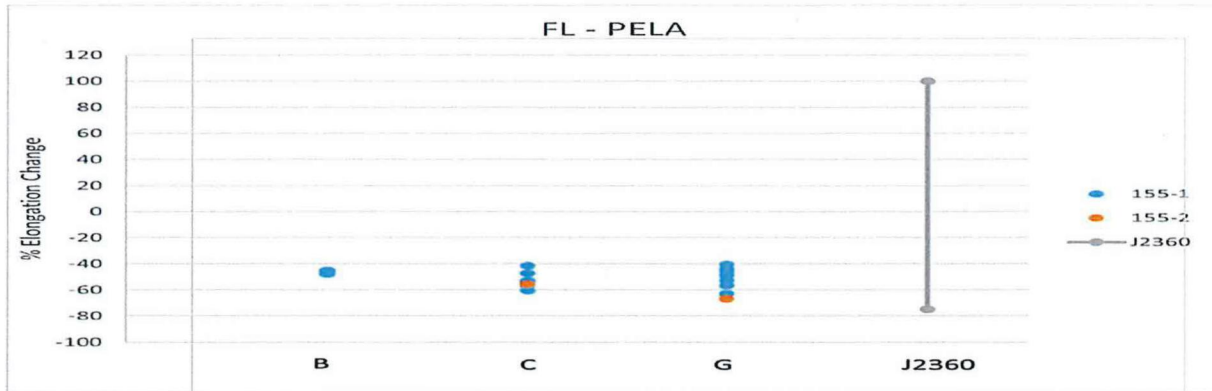


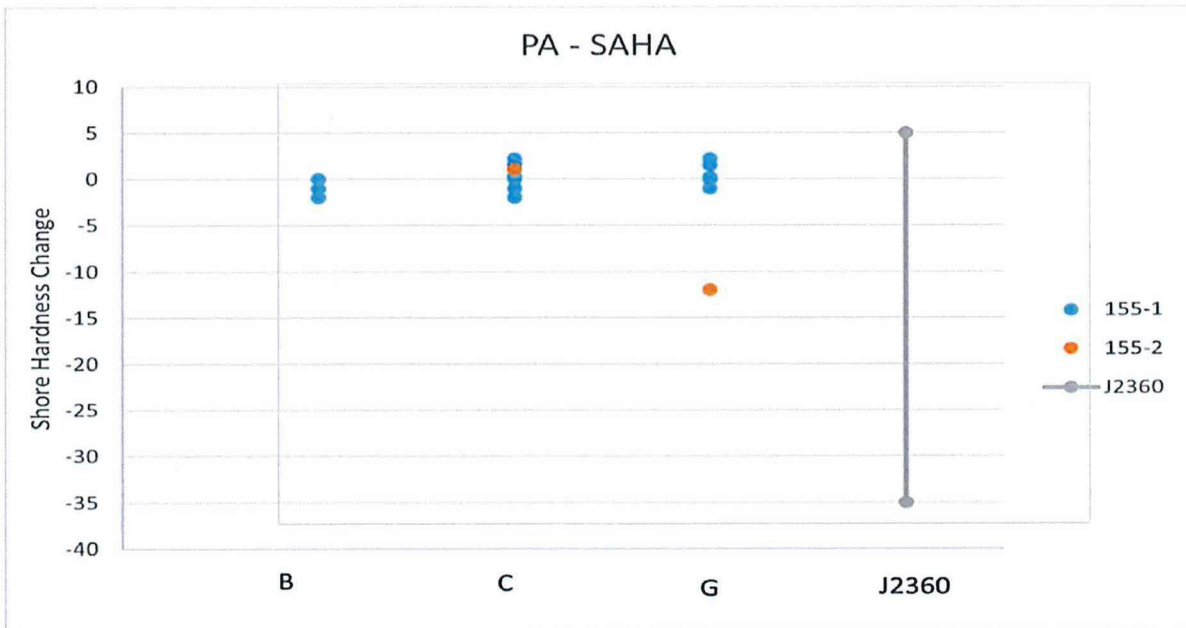
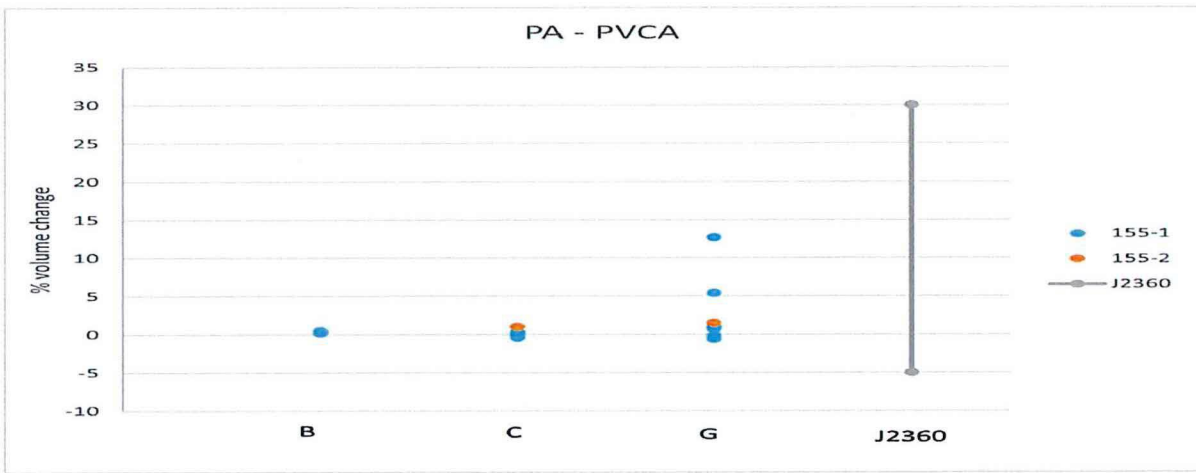
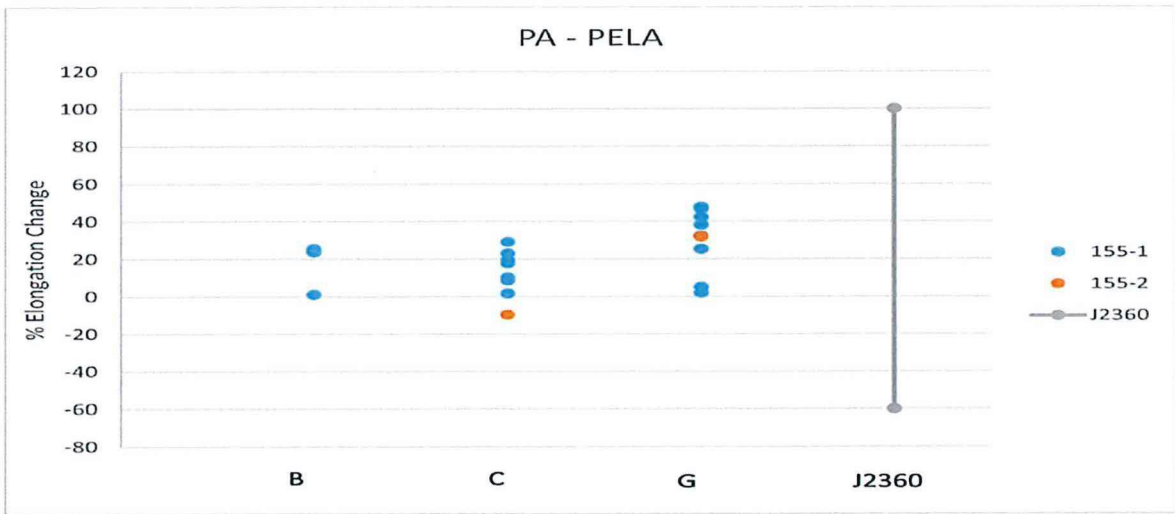
OSCT Reference Oil 155-1
FLUROELASTOMER Results

SAHA



For the 2022 round of 155-1 annual testing, labs also conducted testing with their replacement TMC reference oil, TMC 155-2. The data was deemed acceptable and comparable to TMC 155-1 data. A motion made by D. Beck and 2nd by B. Grinfield was unanimously approved with 10 votes to replace TMC 155-1 with TMC 155-2 for the annual (~September) industry reference oil testing at both labs. When the annual TMC 155 results are reported and plotted, the annual TMC reference results should also be plotted for comparison.





The background of the 1000 hour ASTM D471 seal test was discussed. The 1000 hour seal test was removed in 8/2010 from the PD4000 as part of the J2360 field trial requirement since:

- some data suggested it did not discriminate between a gear oil that caused seals leaks in the field and those that did not
- The seal materials used for the 1000 hour test were obsoleted
- Insufficient data to set statical limits
- TMC did not monitor the test
- No leaking seal issues noted in the field, thus the ASTM D5662 seal test deemed

It was emphasized that axle OEMs like Dana prefer seal data to at least 1000 hours to provide confidence that the seals will not cause oil leakage in the field, especially since the trend in the industry to lower viscosities could make them more aggressive to seals.

The D471 1000 hour testing has been initiated at Lab C at 150°C for PA and FL, but at 100°C for the more sensitive NI seals on the following J2360 approved gear oils:

- TMC 155-1 industry reference oil
- BASF FE 75W-90
- Dana approved 75W-90

Lab G testing will begin 11/18 with the same gear oils with the same batches of seals. It was agreed that the three proposed reference oils noted above will be tested via ASTM D471 (3 dumbbells using Die C + 3 rectangles using ASTM D5662 for measurement) , one tube/elastomer/interval) for PA, FL and NI with samples tested for the following parameters measured at 240, 500, and 1000 hours:

- % Elongation change
- Points hardness change
- % Volume change
- % Tensile strength change
- Reversion (1)
- Bend test (2)
- Visual sediment

No new seal materials were addressed at this time. If the 1000 hour testing moves forward, then TMC would need a new ASTM D#.

A motion made by D. Bell and 2nd by B. Grinfield to adjourn the OSCT Panel Webex at 2:59 pm was unanimously approved with 10 votes.

Respectfully submitted,



Donald R. Bell/Chairman

Appendix

OIL SEAL COMPATIBILITY SURVEILLANCE PANEL

Date: NOV. 9, 2022 of 34

Initials	V = Voting NV = Non-	Name	Company & Address	Phone:	e-Mail:
Rob	V	Rob Banas	ExxonMobil Technology and Engineering Co. 535 Thomas Lane Waleska GA 30183	770-833-5920	Rob.a.banas@exxonmobil.com
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DB	V	Don Bell Chairperson	Afton Chemical Corp. 500 Spring Street Richmond, VA 23219	804-788-6332	don.bell@aftonchemical.com
MC	NV	Margaret Caridi	BASF 500 White Plains Road Tarrytown, NJ 10951 NY 10591	845-216-5535	margaret.caridi@basf.com
Steve	NV	Steve Carr	Dana		Steve.carr@dana.com
MC	V	Jason Carter	Meritor Cummins - Meritor		Jason.carter@meritor.com
MC	NV	Michael Charron	SWRI		Michael.charron@swri.org
	NV	Jeff Clark	TMC 203 Armstrong Dr. Freeport, PA	412-365-1032	jac@astmtmc.org
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(D)	NV	Dan Horvath	Afton Chemical 2000 Town Center Southfield, MI 48075	e-Mail:	dan.horvath@aftonchemical.com
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ML	NV	Mike Lopez	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238	e-Mail:	mike.lopez@intertek.com

JM	NV ✓	Jeanelle Morris	Navistar	e-Mail:	Jeanelle.morris@navistar.com
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	NV	Caroline Mueller	SWRI	Phone: e-Mail:	210-522-2671 Caroline.louis@swri.org
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	NV	Amy Zyski	Dana Inc. 3939 Technology Drive Maumee, OH 43537	Phone: e-Mail:	419-887-3432 Amy.zyski@dana.com

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