



Test Monitoring Center

Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>
412-365-1000

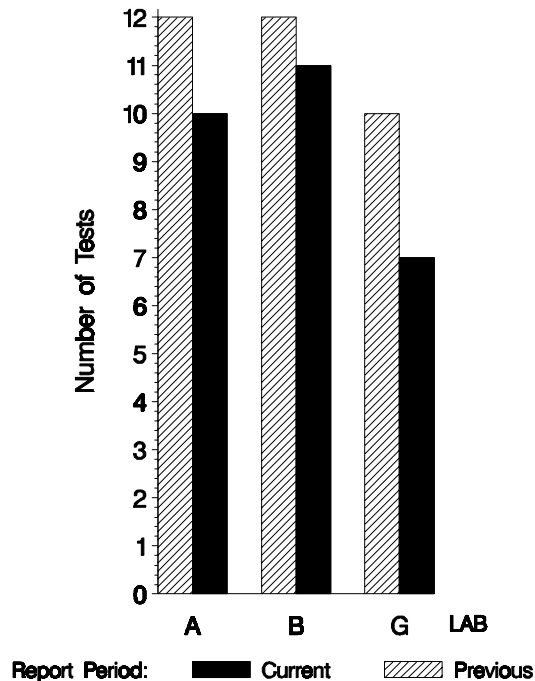
MEMORANDUM: 09-031
DATE: May 28, 2009
TO: Becky Grinfield,
Chairman, Engine Oil Elastomer Compatibility Surveillance Panel
FROM: Michael T. Kasimirsky *Michael T. Kasimirsky*
SUBJECT: EOEC Testing from October 1, 2008 through March 31, 2009

A total of 132 EOEC tests were reported to the Test Monitoring Center during the period from October 1, 2008 through March 31, 2009. Following is a summary of testing activity this period.

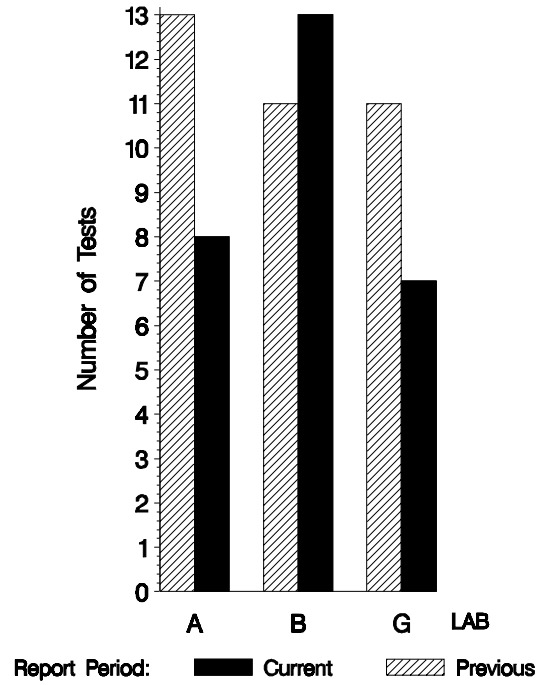
	Reporting Data
Number of Labs	3

Tests reported this period were distributed as shown below:

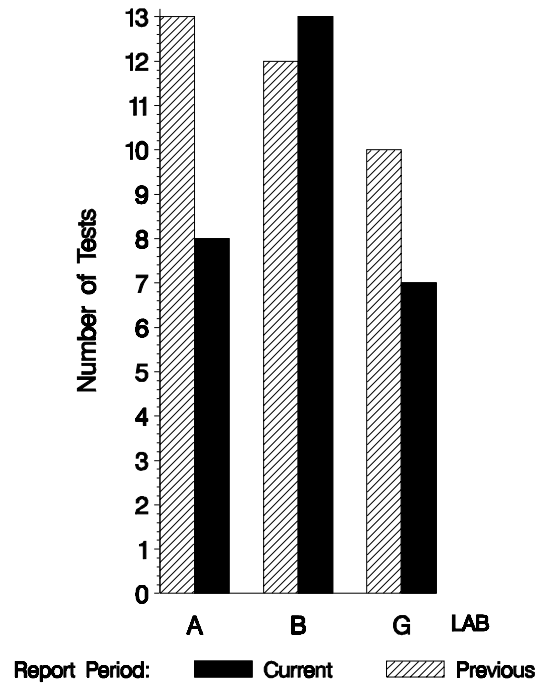
NUMBER OF FLUROELASTOMER TESTS REPORTED BY LAB AND REPORT PERIOD



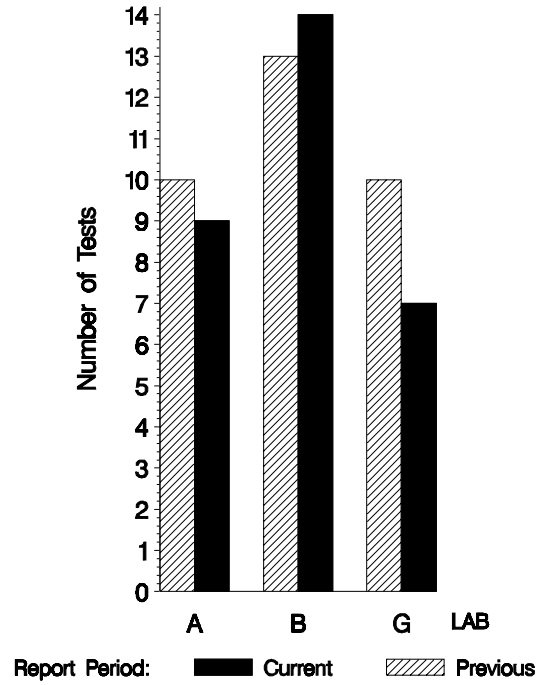
NUMBER OF NITRILE TESTS REPORTED BY LAB AND REPORT PERIOD



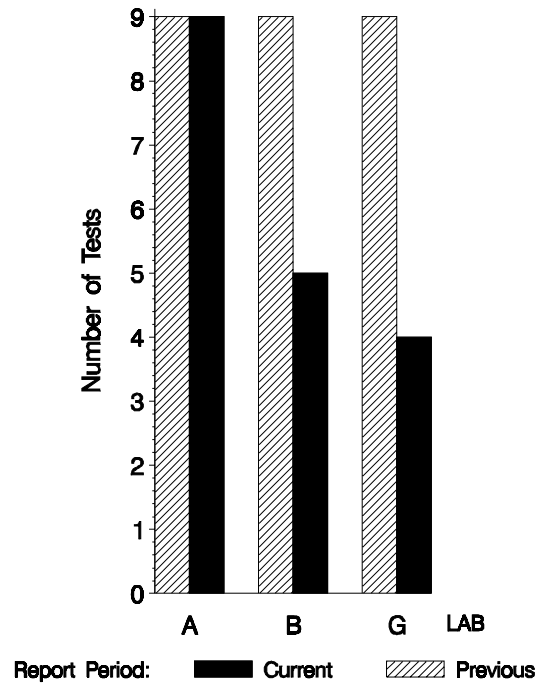
NUMBER OF POLYACRYLATE TESTS REPORTED BY LAB AND REPORT PERIOD



**NUMBER OF SILICONE TESTS
REPORTED BY LAB AND REPORT PERIOD**



**NUMBER OF VAMAC TESTS
REPORTED BY LAB AND REPORT PERIOD**

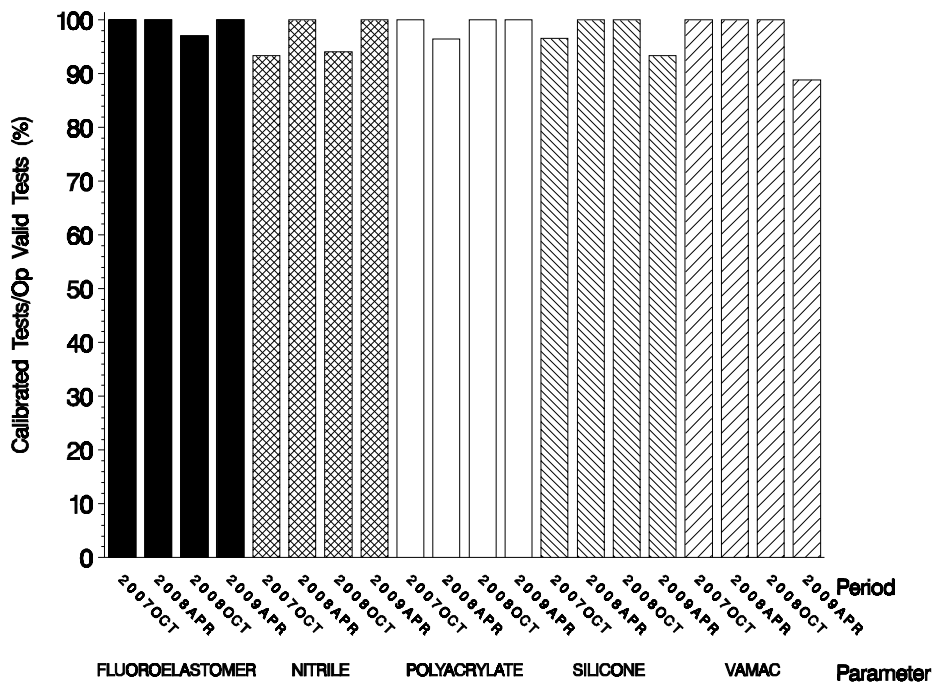


Test Distribution by Oil and Validity

Totals

		Fluoroelastomer	Nitrile	Polyacrylate	Silicone	Vamac	Last Period	This Period
Accepted for Calibration	AC	28	28	28	28	16	158	128
Rejected Mild	OC	0	0	0	0	2	1	2
Rejected Severe	OC	0	0	0	2	0	2	2
Information Run (not for calibration)	NI	0	0	0	0	0	0	0
Operationally Invalid (lab)	LC	0	0	0	0	0	3	0
Operationally Invalid (lab/TMC)	RC	0	0	0	0	0	0	0
Aborted Calibration	XC	0	0	0	0	0	0	0
Total		28	28	28	30	18	164	132

**OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA**



The above chart shows the percentage of accepted operationally valid tests. This period two silicone tests and two vamac tests failed to meet the acceptance criteria.

Lost Tests per Start by Lab and Elastomer Type

Lab	Fluoroelastomer			Nitrile			Polyacrylate			Silicone			Vamac			Total			
	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	
A	0	10	0	0	8	0	0	0	8	0	0	9	0	0	9	0	0	44	0
B	0	11	0	0	13	0	0	13	0	0	14	0	0	5	0	0	0	56	0
G	0	7	0	0	7	0	0	7	0	0	7	0	0	4	0	0	0	32	0
Total	0	28	0	0	28	0	0	28	0	0	30	0	0	18	0	0	0	132	0

Lost tests are those that were aborted, rejected by lab, or operationally invalid.

Average Δ 's by Lab						
Elastomer	Lab	n	VOLCYI	HARDYI	TENSYI	ELONYI
Fluoroelastomer	A	10	-0.554	-0.045	-0.710	-0.758
	B	11	-1.032	0.649	-0.437	-0.626
	G	7	1.429	-0.721	0.341	-0.303
	Industry	28	-0.246	0.058	-0.340	-0.592
Nitrile	A	8	2.366	0.540	-1.699	-0.218
	B	13	2.734	0.882	-0.690	-0.326
	G	7	2.439	0.186	0.674	0.160
	Industry	28	2.555	0.610	-0.637	-0.174
Polyacrylate	A	8	1.663	0.144	0.262	0.662
	B	13	1.981	-0.272	0.353	0.470
	G	7	2.195	0.125	-0.730	1.444
	Industry	28	1.944	-0.054	0.057	0.768
Silicone	A	9	-0.229	-0.002	-0.640	0.314
	B	14	1.070	0.170	-1.136	1.014
	G	7	0.969	1.479	0.241	-0.283
	Industry	30	0.657	0.424	-0.666	0.502
VAMAC	A	9	1.257	-2.127	1.306	0.422
	B	5	1.444	-1.168	1.919	0.059
	G	4	1.987	-1.484	0.906	0.718
	Industry	18	1.472	-1.718	1.387	0.387

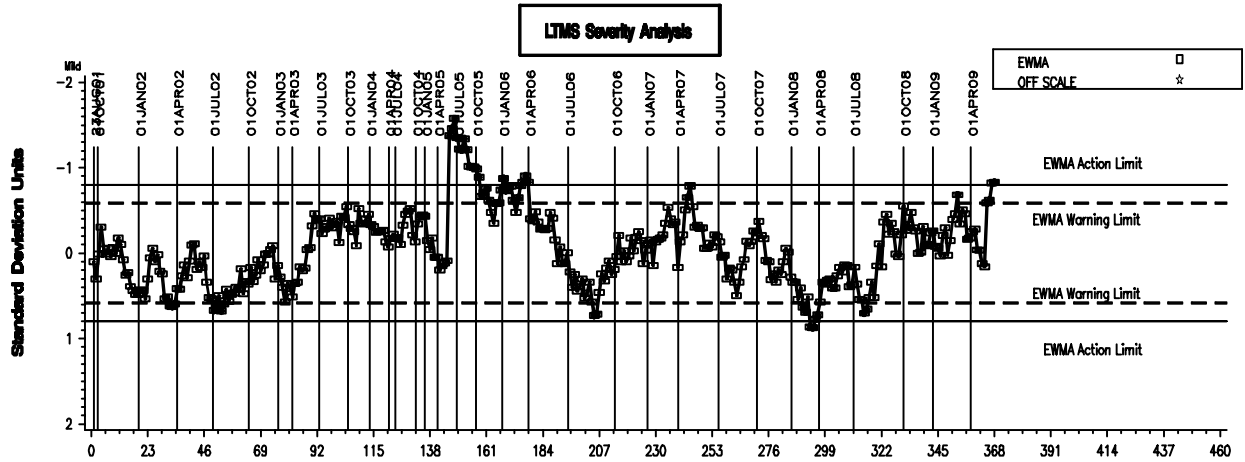
Individual test results can be viewed at the links shown in the following table:

<i>Links to Individual Test Result Data</i>	
Elastomer Type	Web Link to Data
Fluoroelastomer	ftp://ftp_astmtmc.cmu.edu/refdata/bench/eoecf/data/
Nitrile	ftp://ftp_astmtmc.cmu.edu/refdata/bench/eoecn/data/
Polyacrylate	ftp://ftp_astmtmc.cmu.edu/refdata/bench/eoecp/data/
Silicone	ftp://ftp_astmtmc.cmu.edu/refdata/bench/eoecs/data/
VAMAC	ftp://ftp_astmtmc.cmu.edu/refdata/bench/eoecv/data/

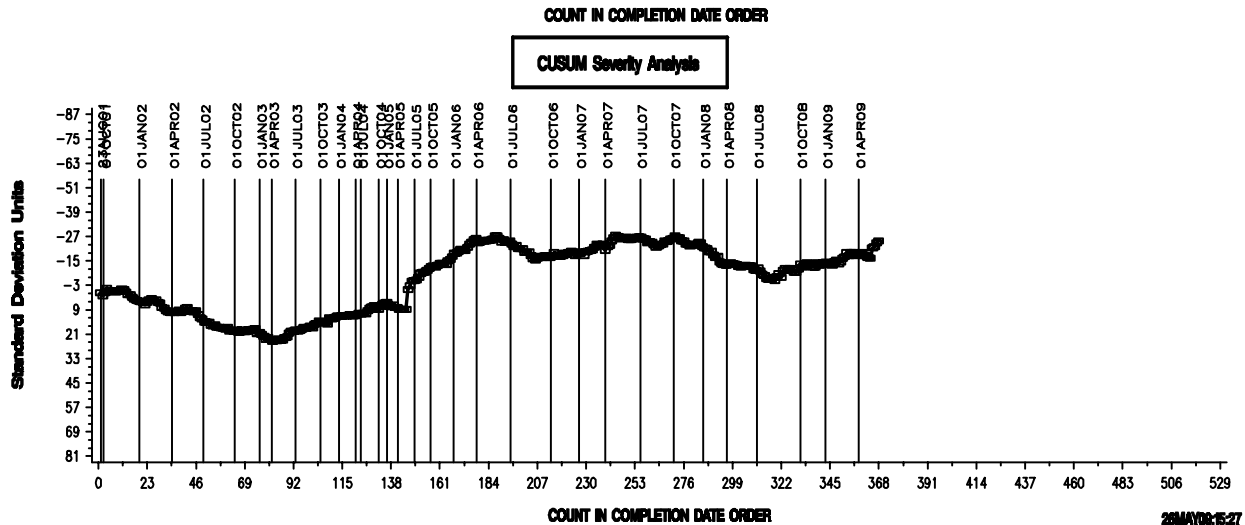
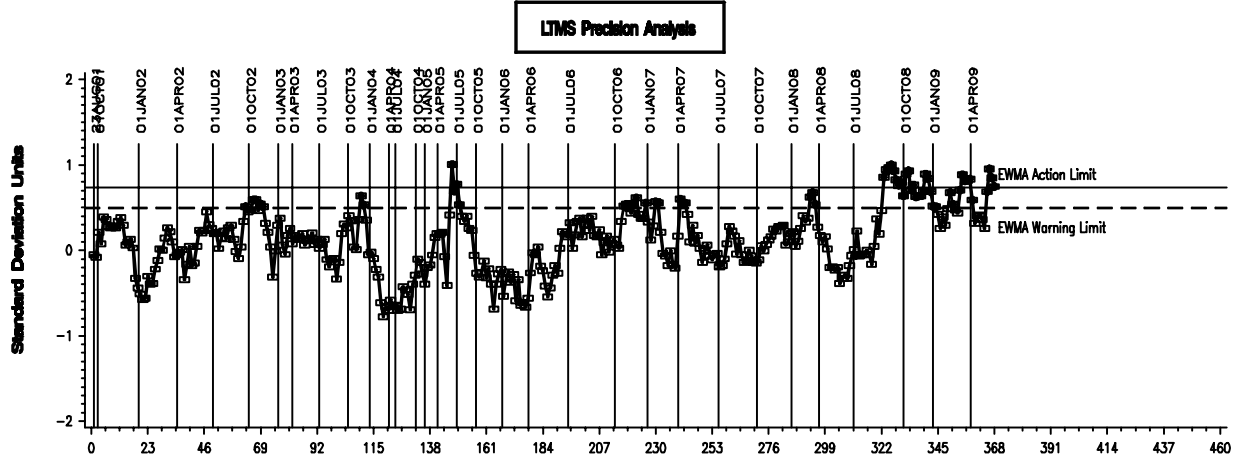
LTMS CONTROL CHARTS

EOEC - FLUROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FLUROELASTOMER VOLUME CHANGE AVERAGE

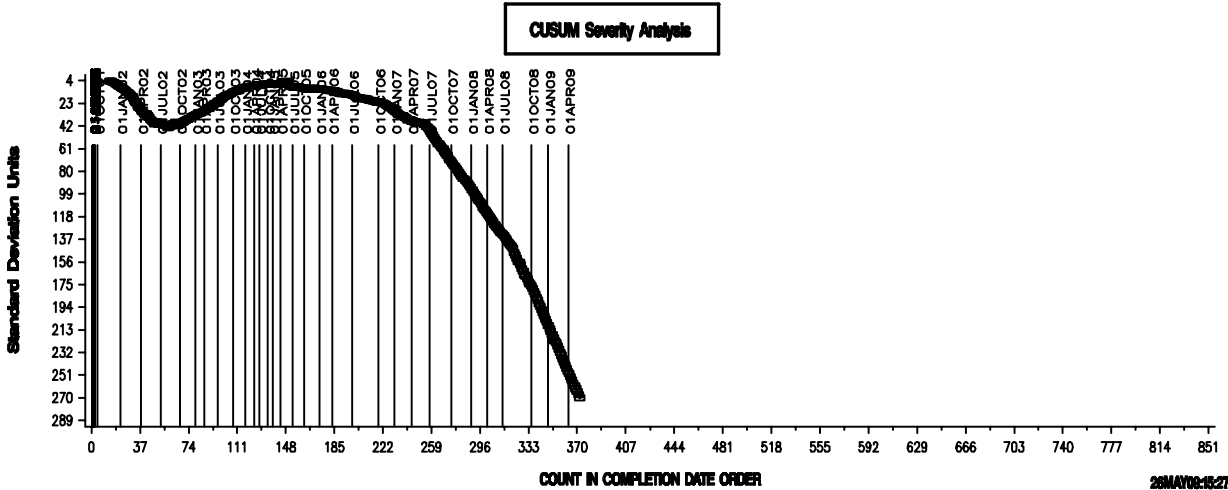
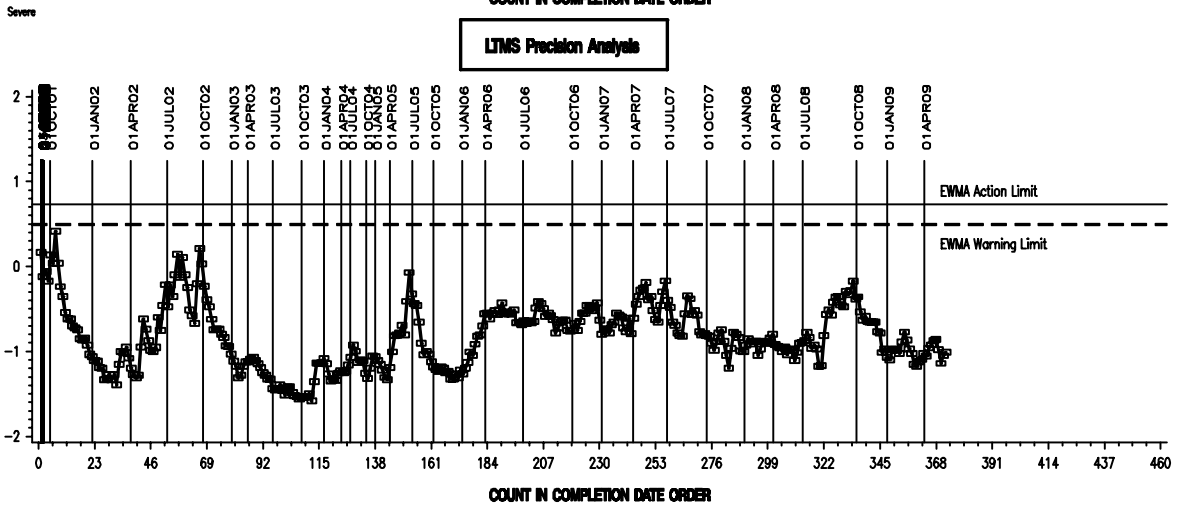
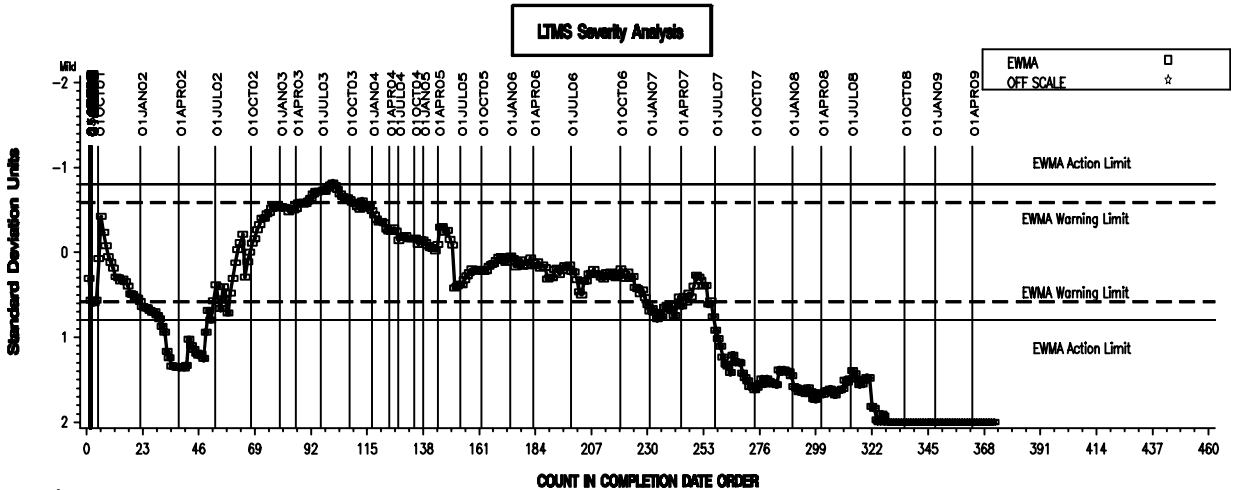


Severe



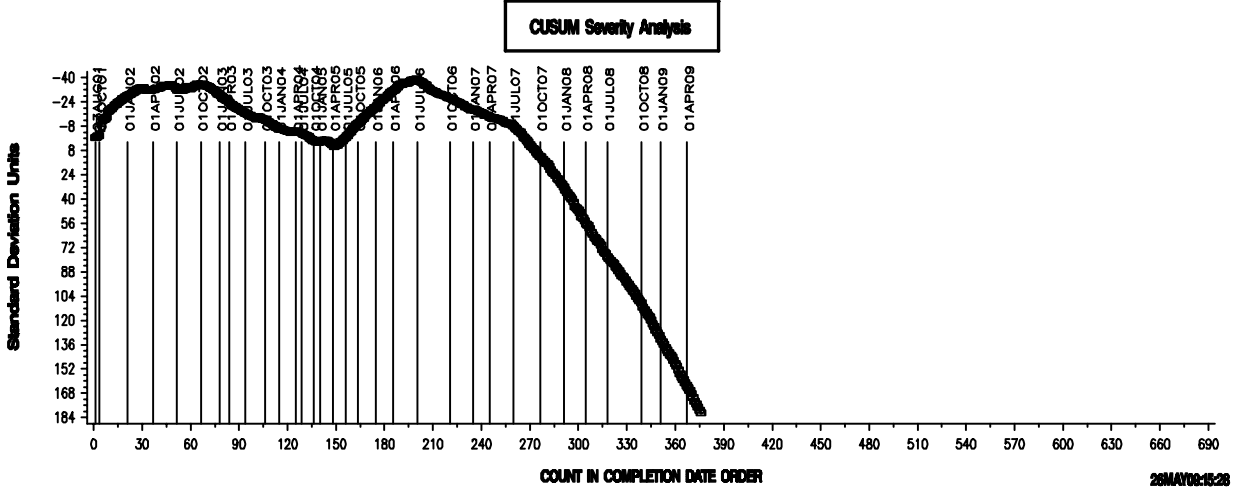
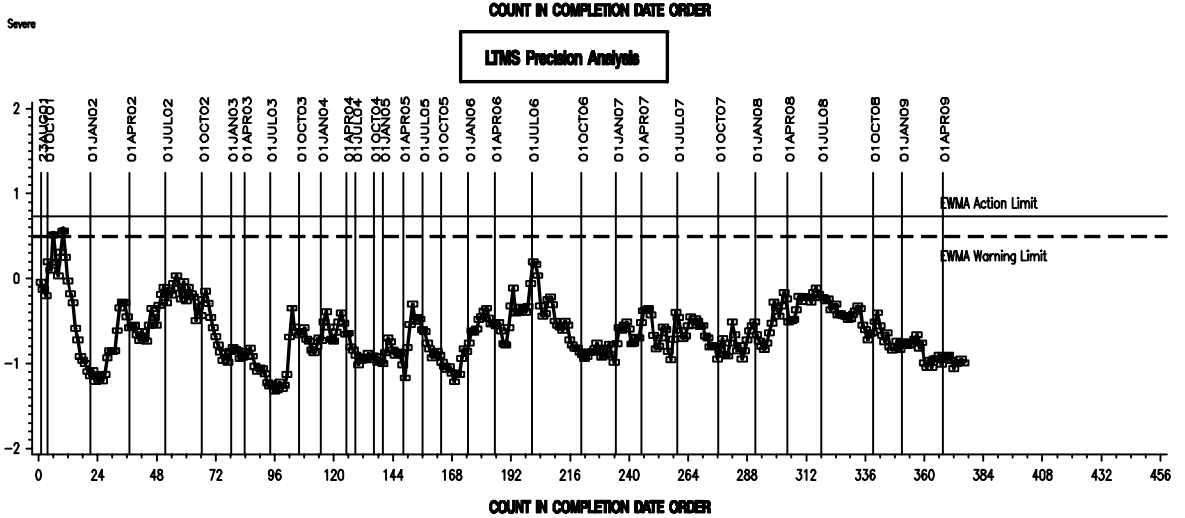
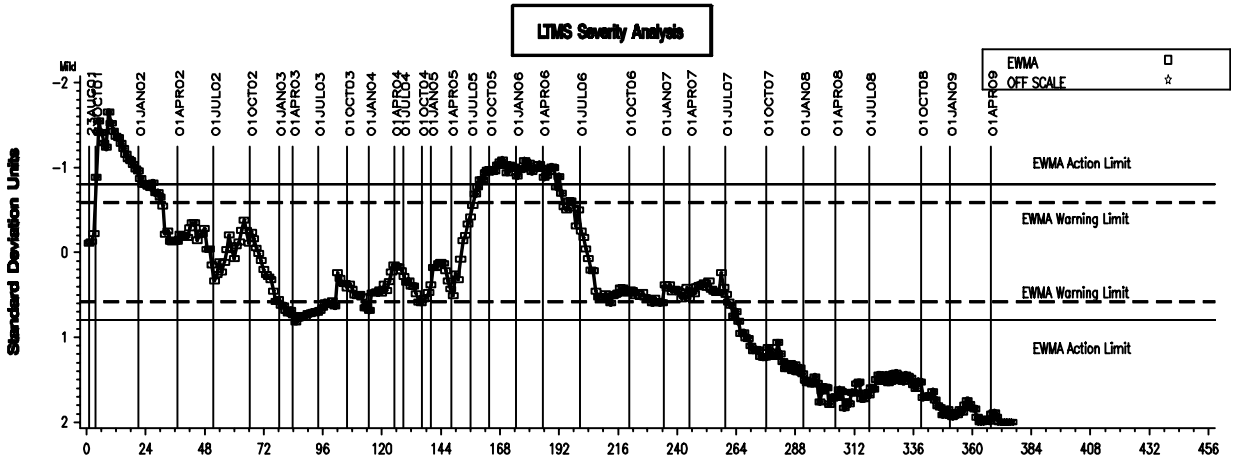
EOEC - NITRILE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE NITRILE VOLUME CHANGE AVERAGE



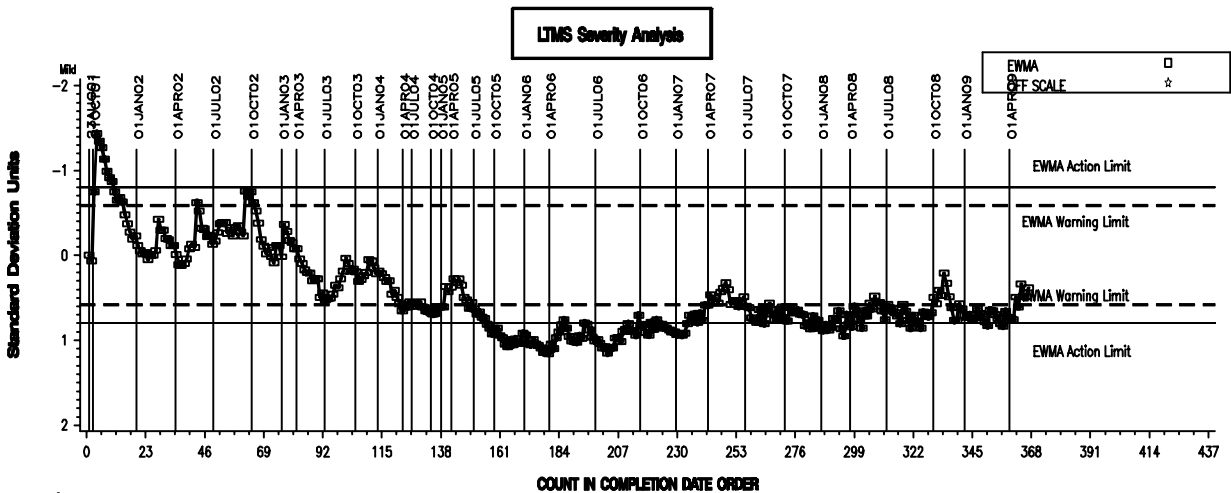
EOEC - POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

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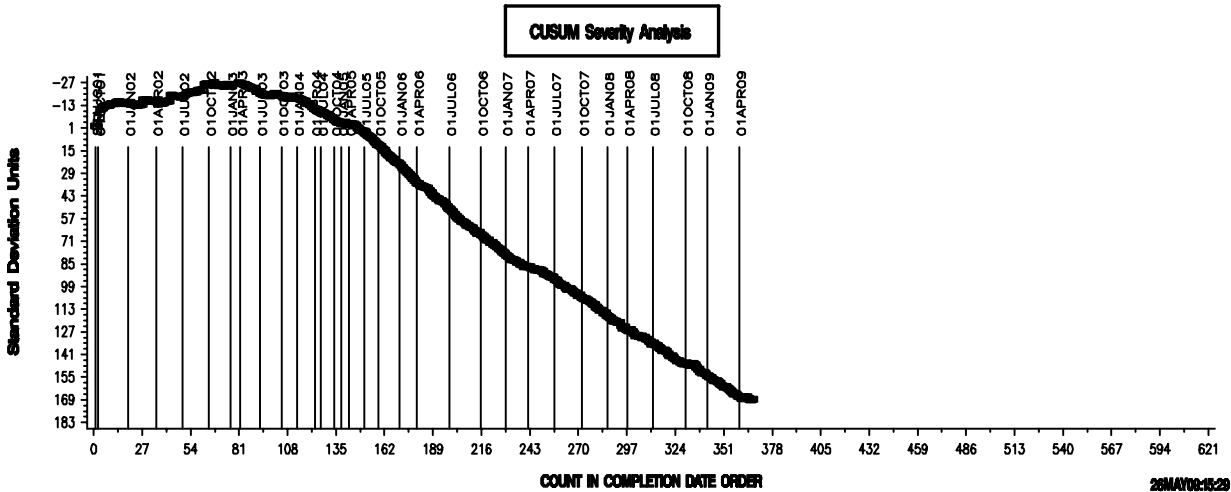
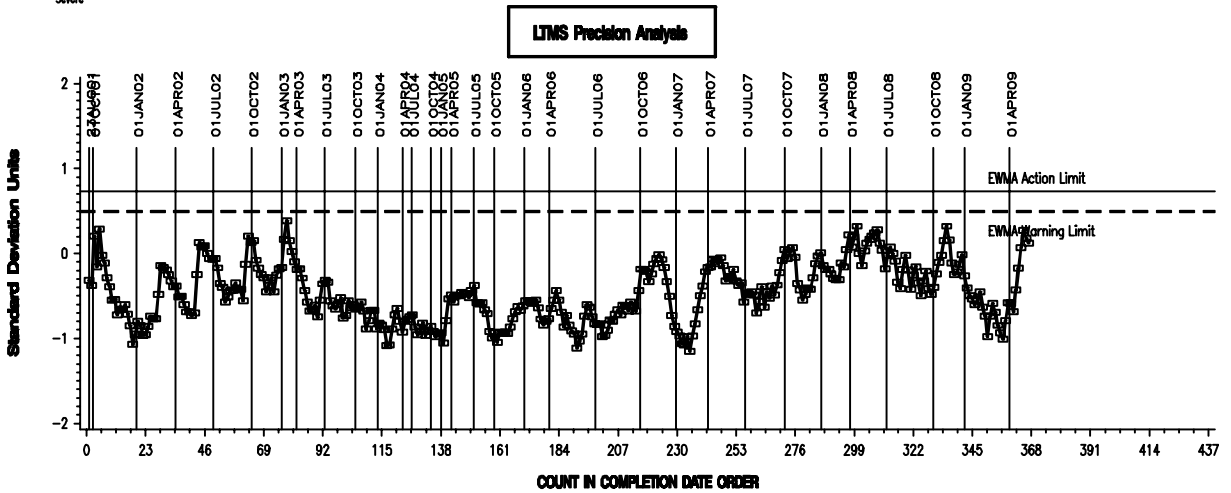


EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

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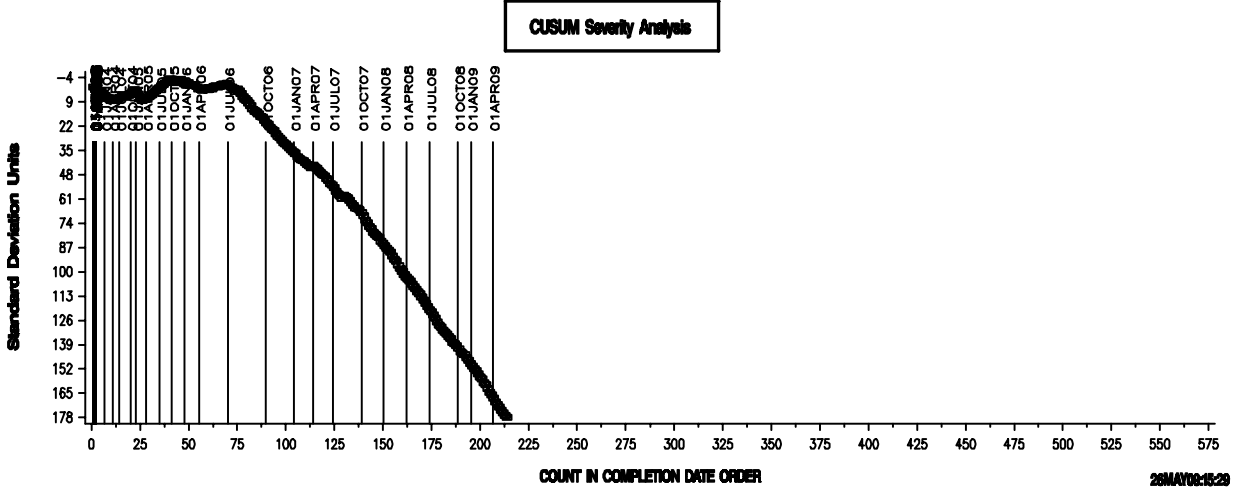
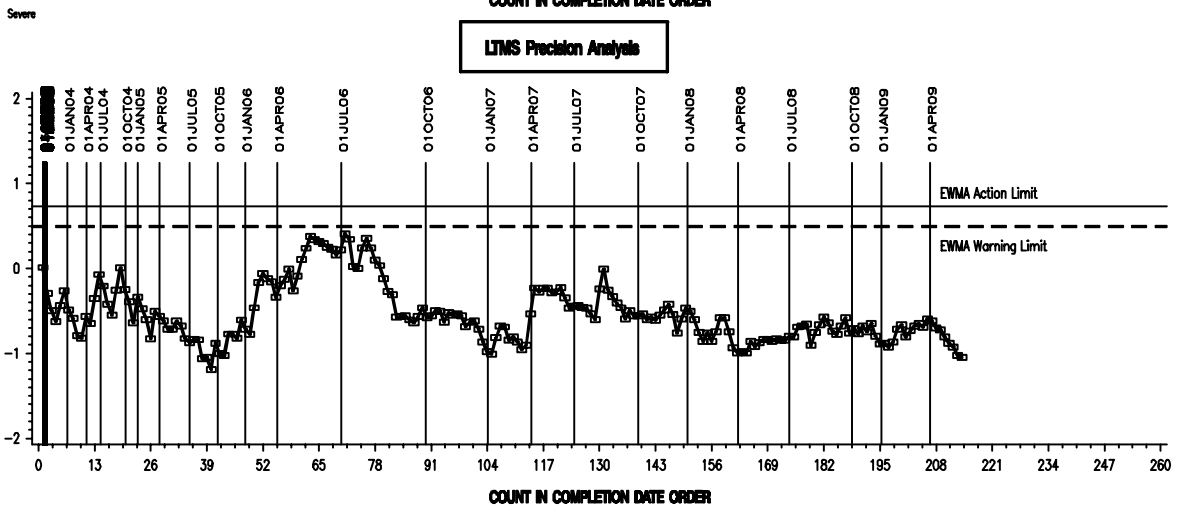
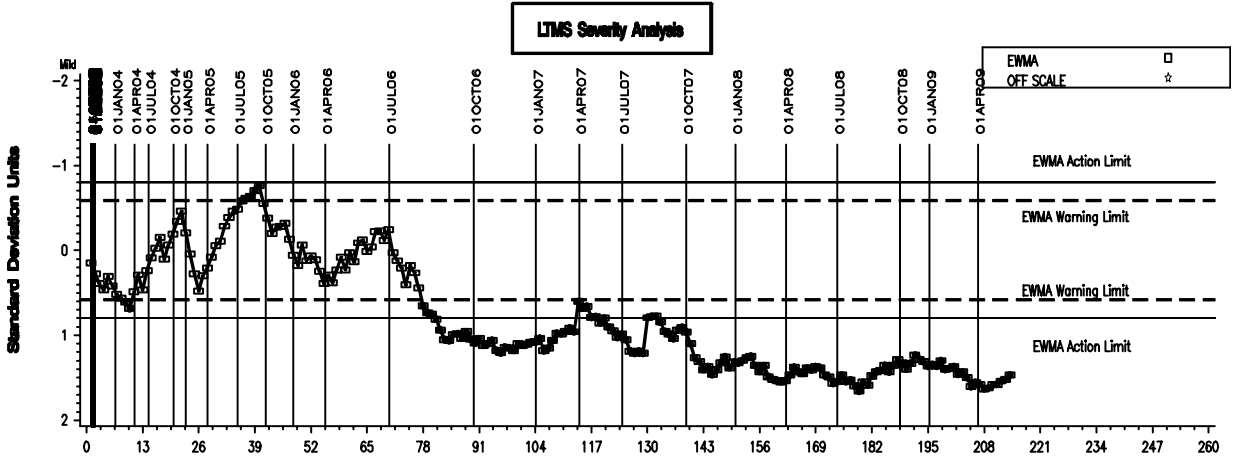


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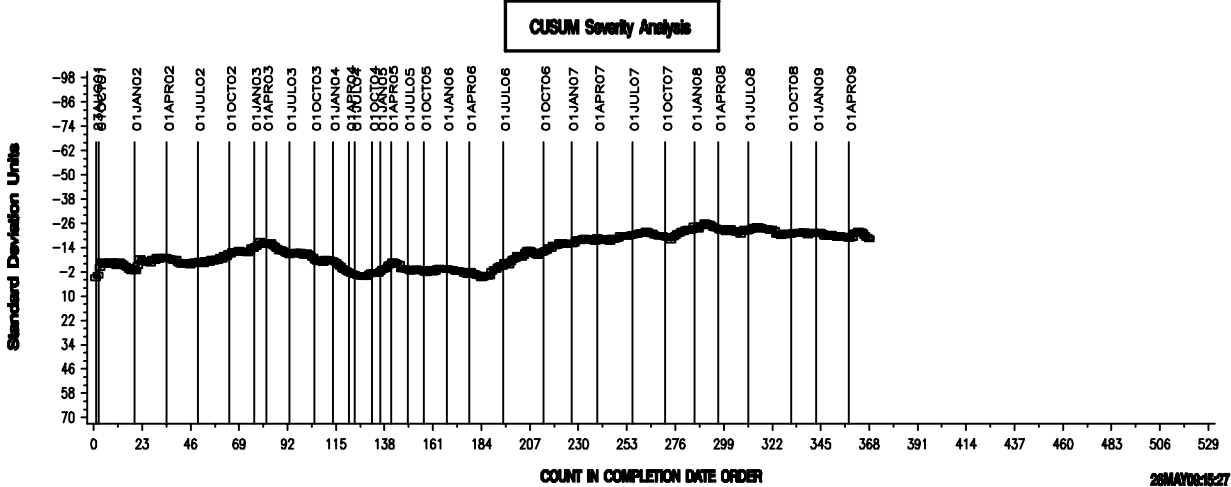
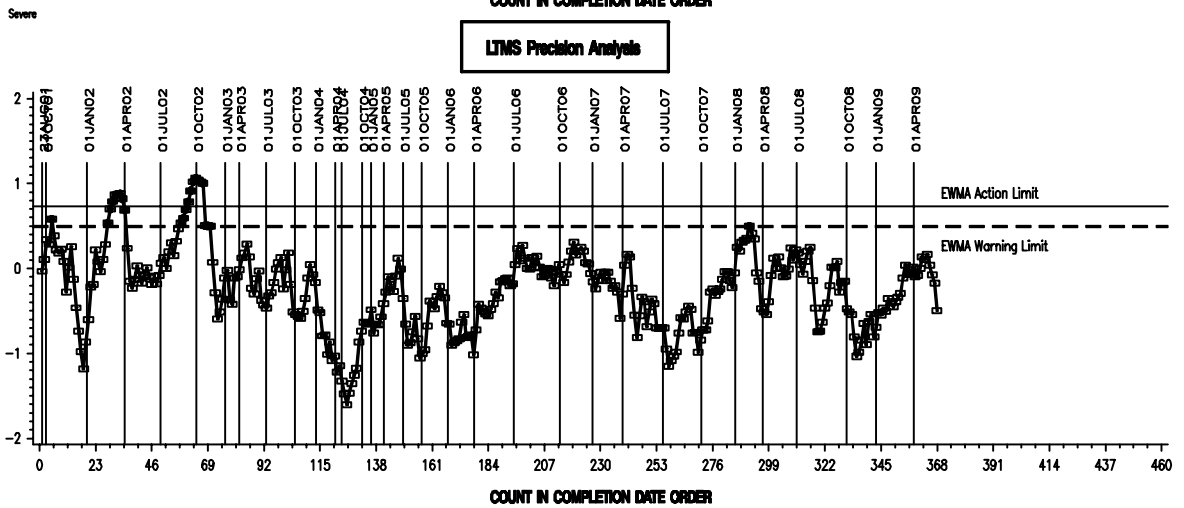
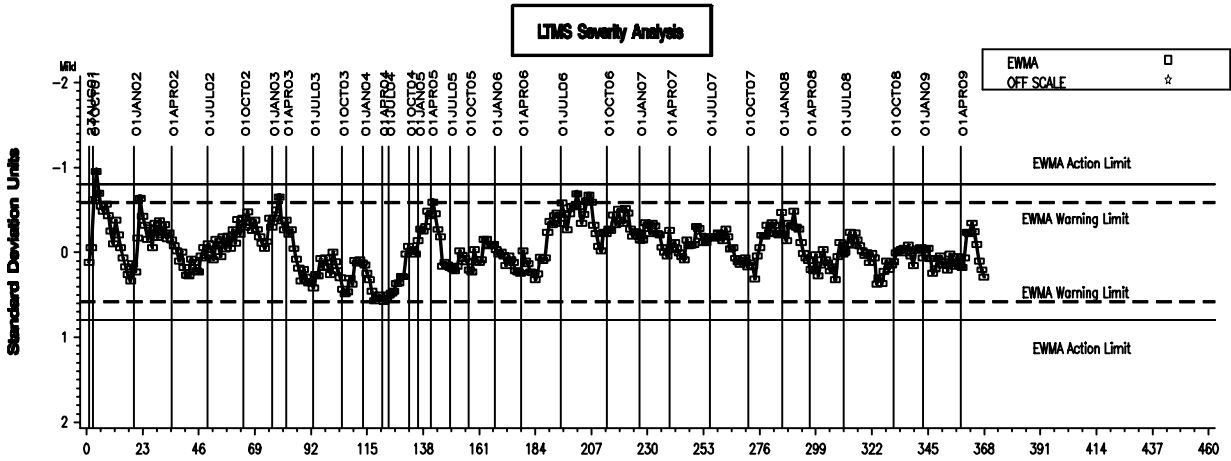
EOEC - VAMAC INDUSTRY OPERATIONALLY VALID DATA

REFERENCE VAMAC G VOLUME CHANGE AVERAGE



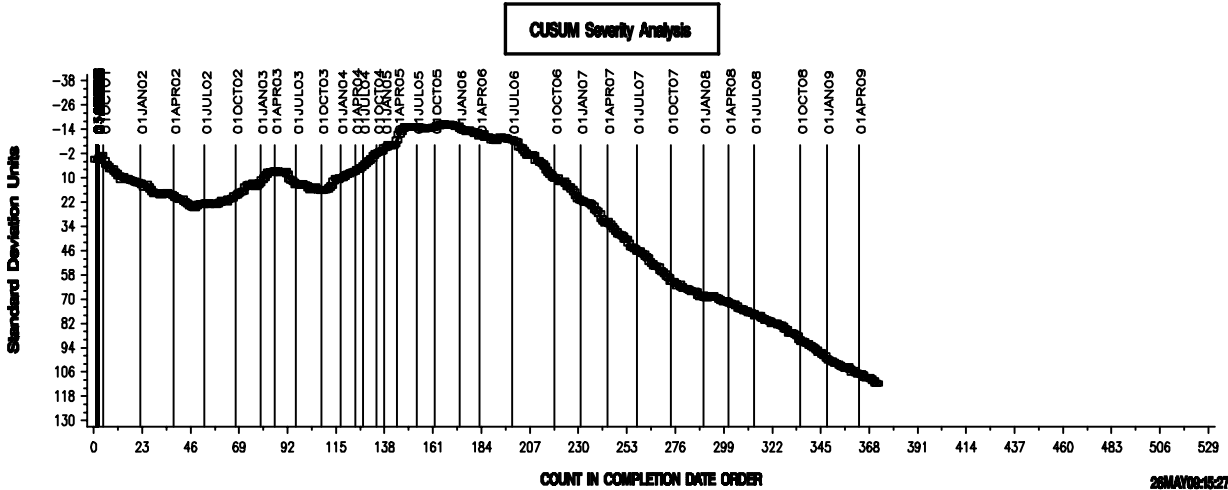
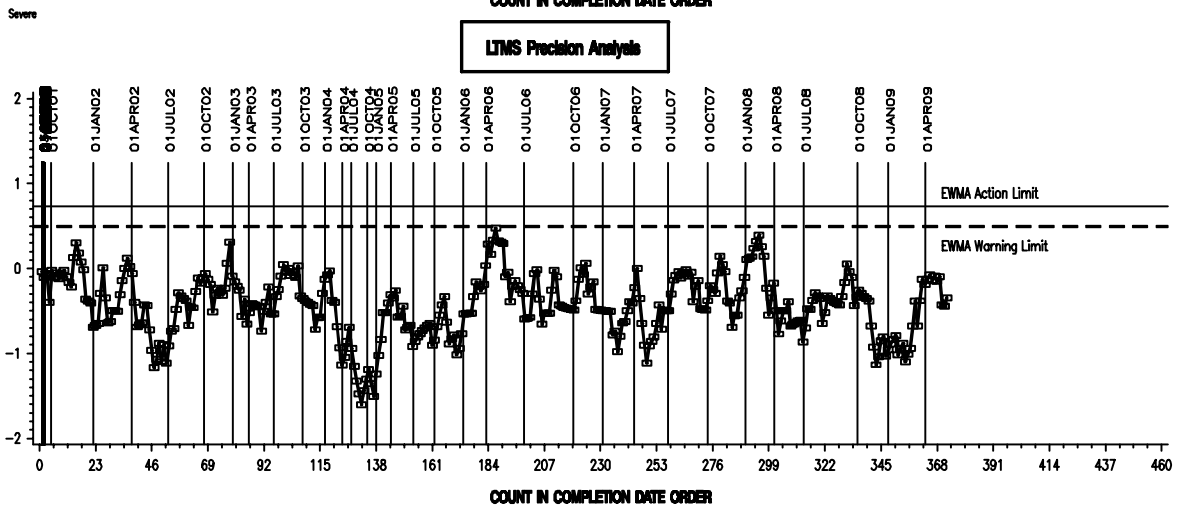
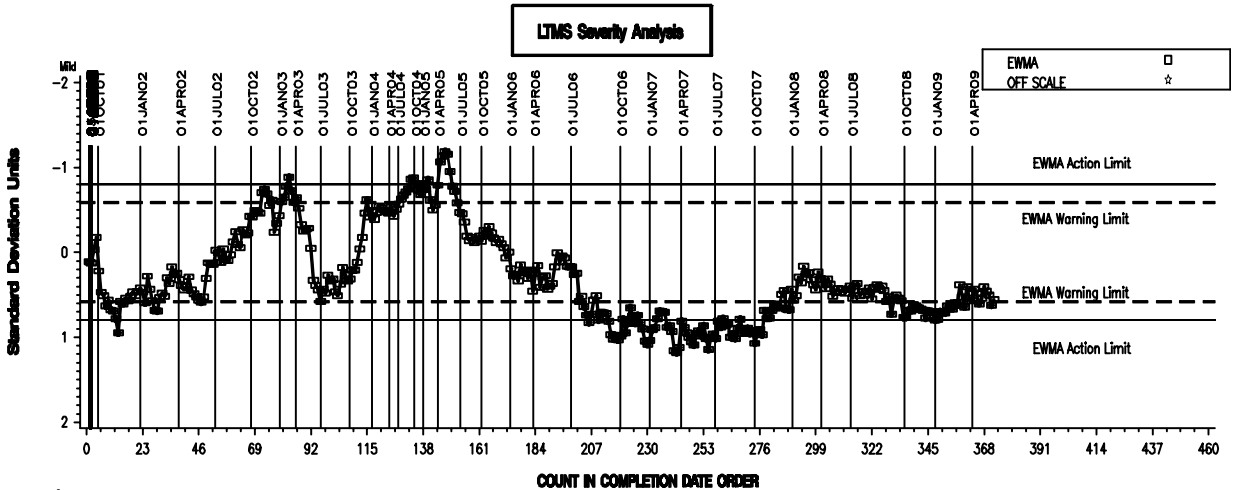
EOEC - FLUOROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FLUROELASTOMER POINTS HARDNESS CHANGE A



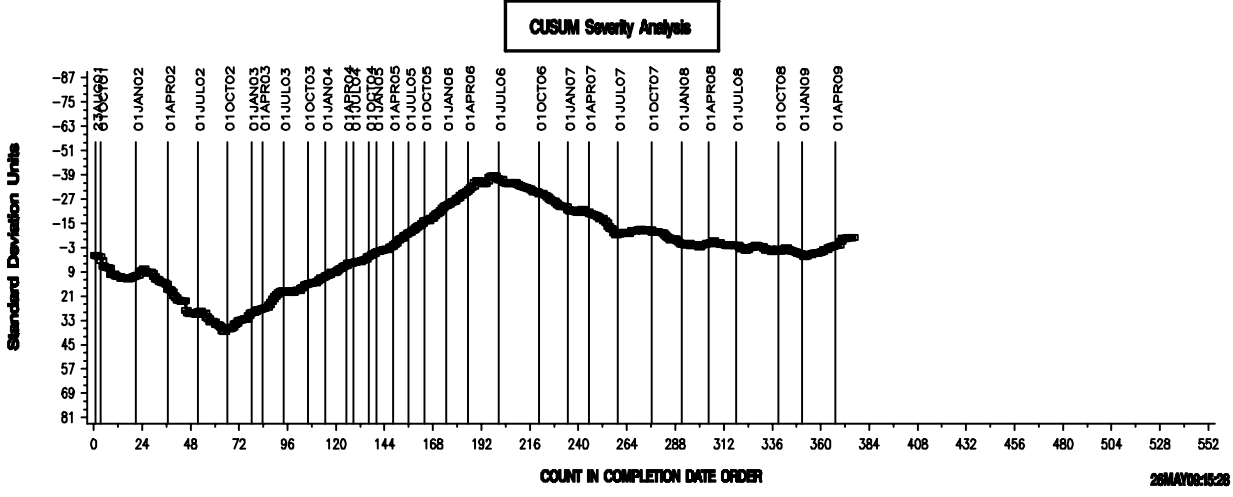
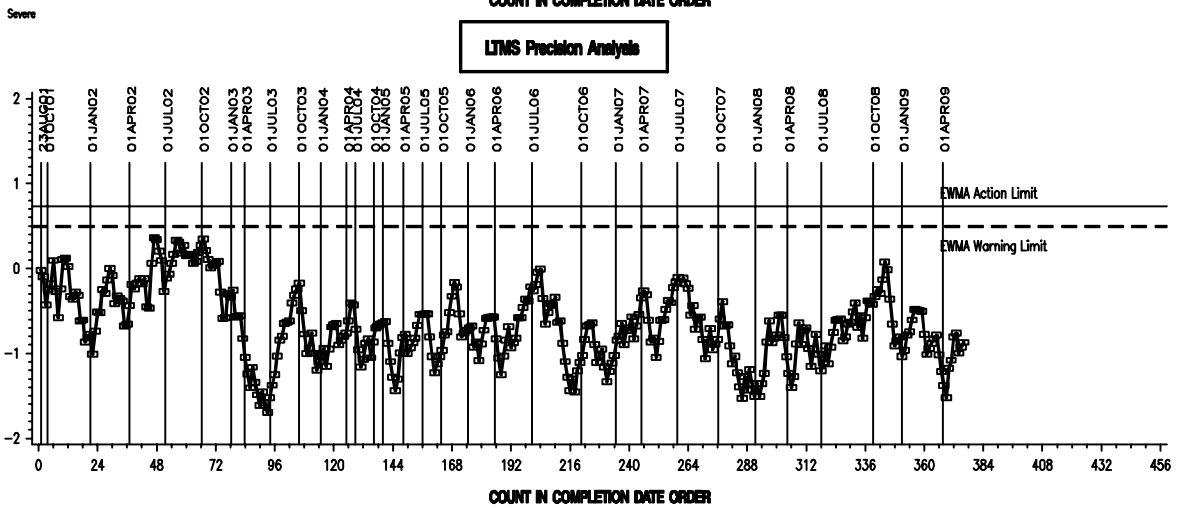
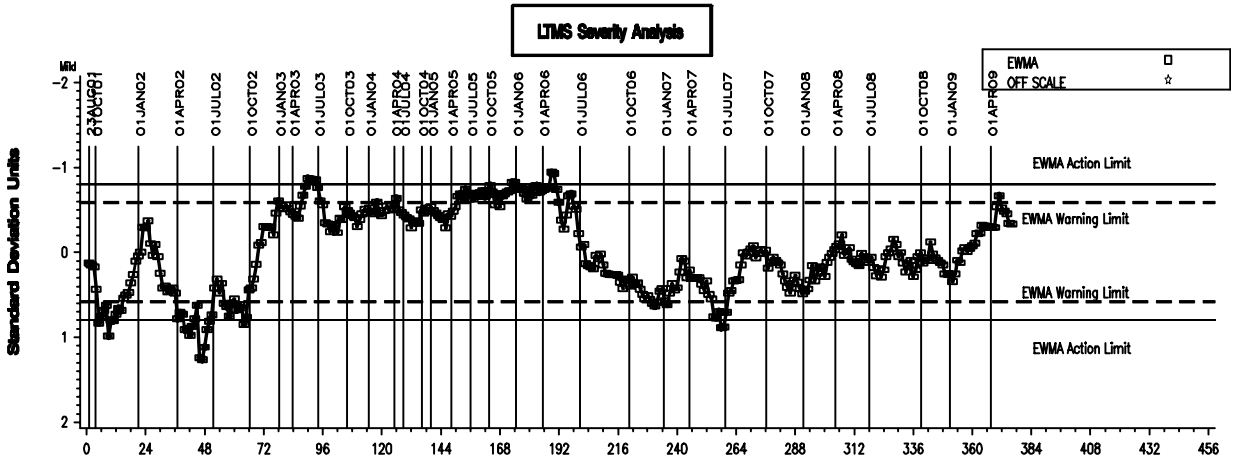
EOEC - NITRILE INDUSTRY OPERATIONALLY VALID DATA

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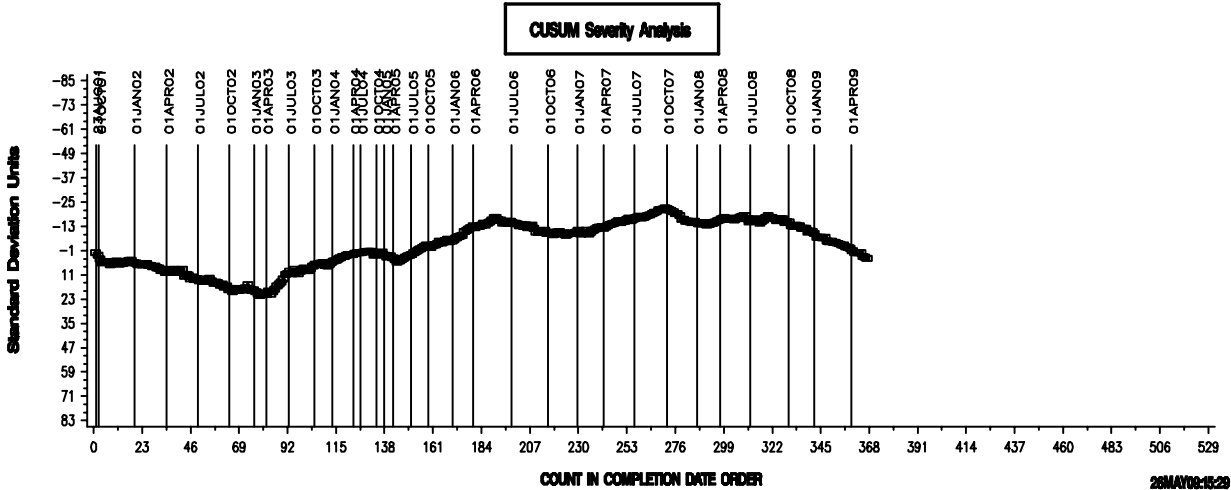
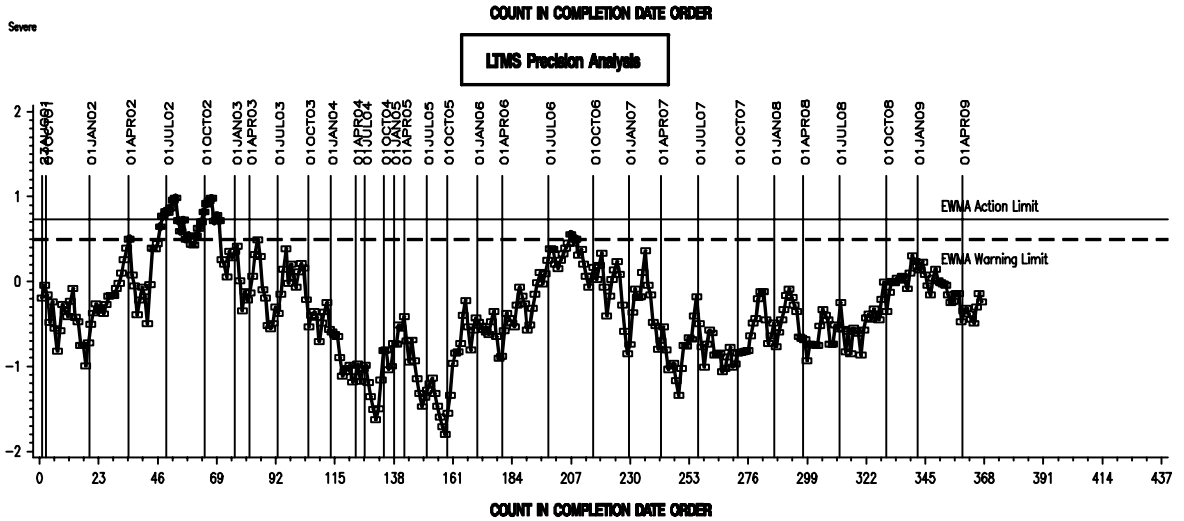
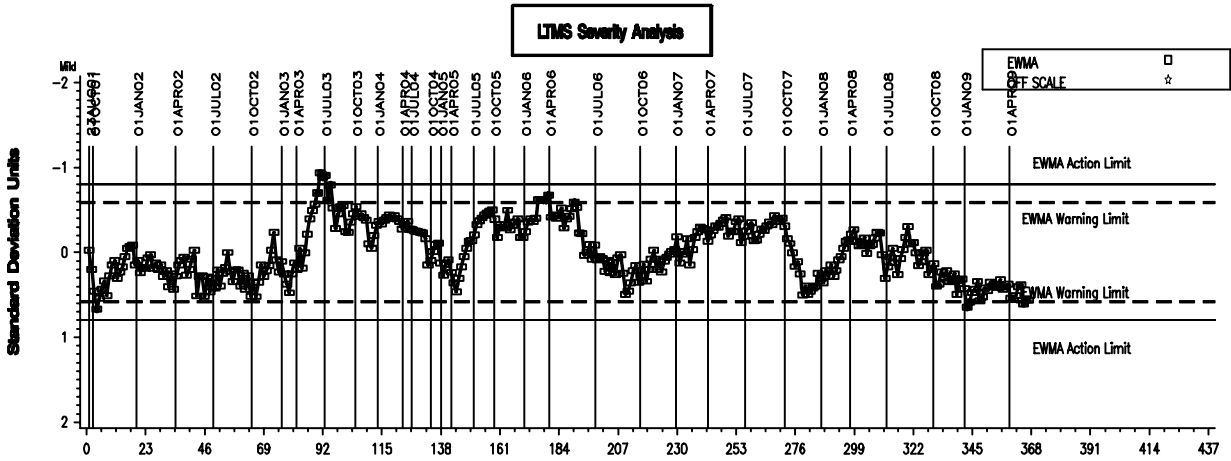
EOEC - POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE POLYACRYLATE POINTS HARDNESS CHANGE AVER



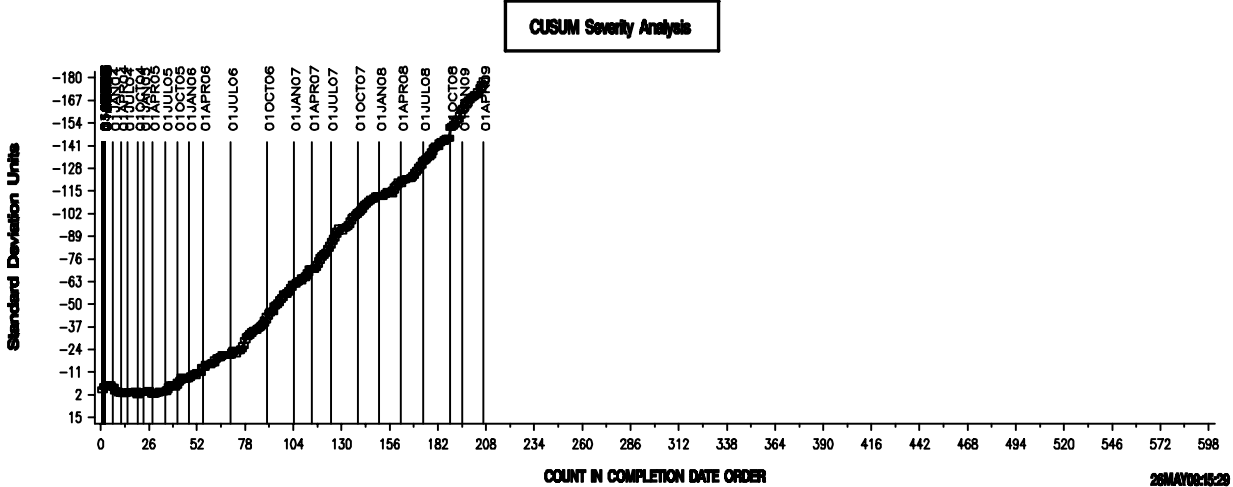
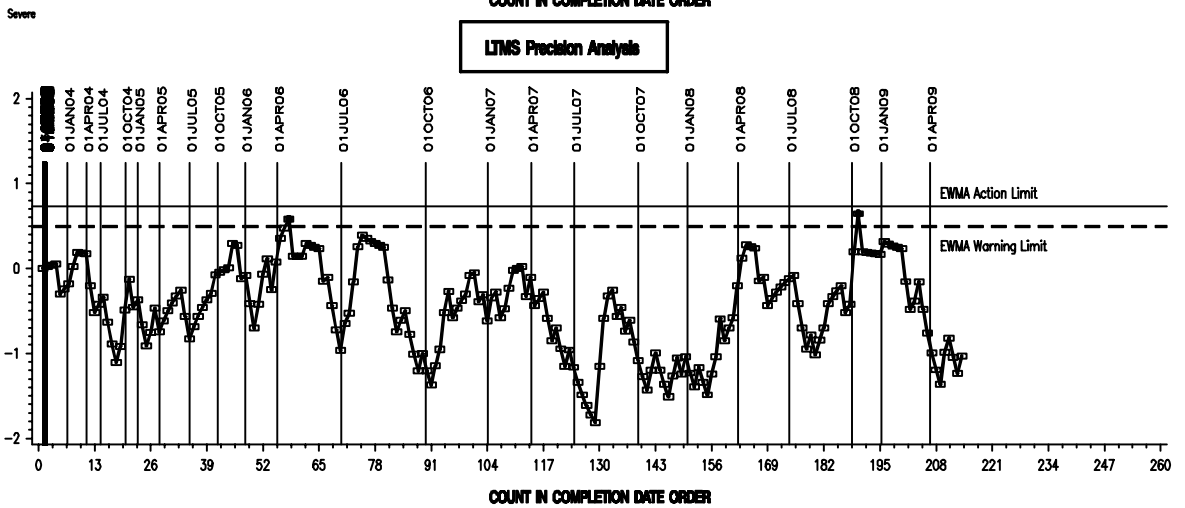
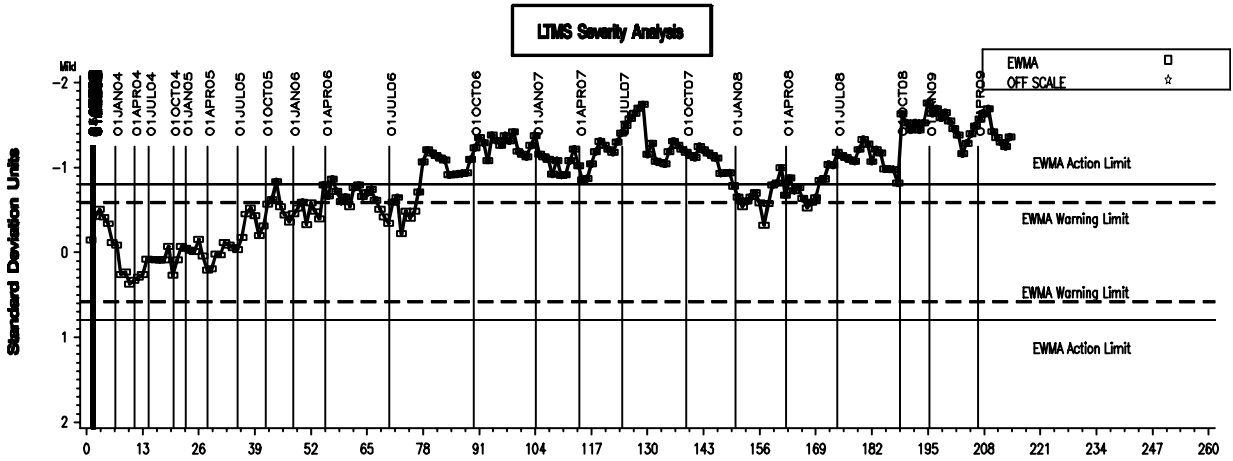
EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE SILICON POINTS HARDNESS CHANGE AVERAGE



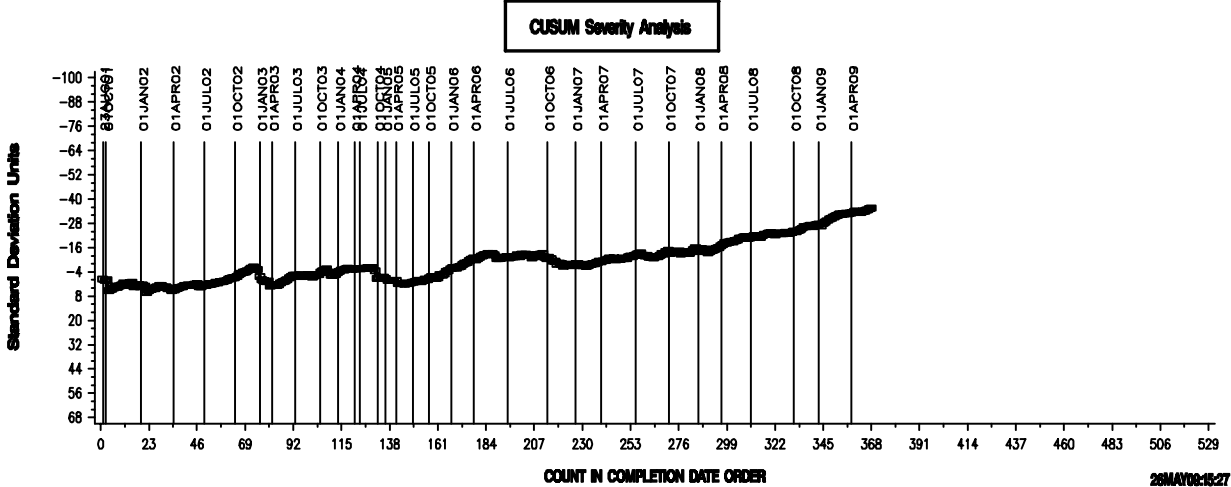
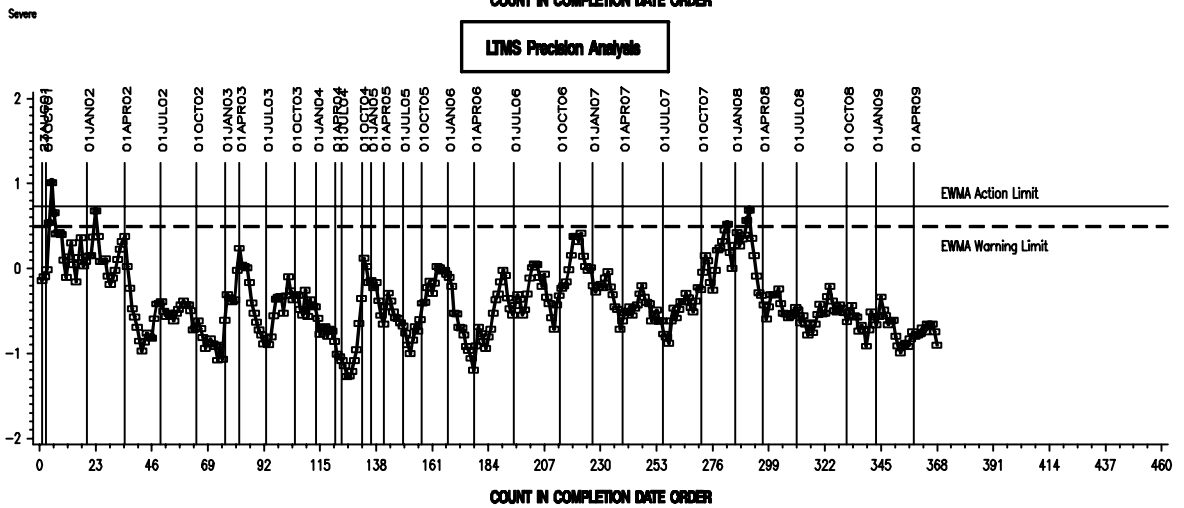
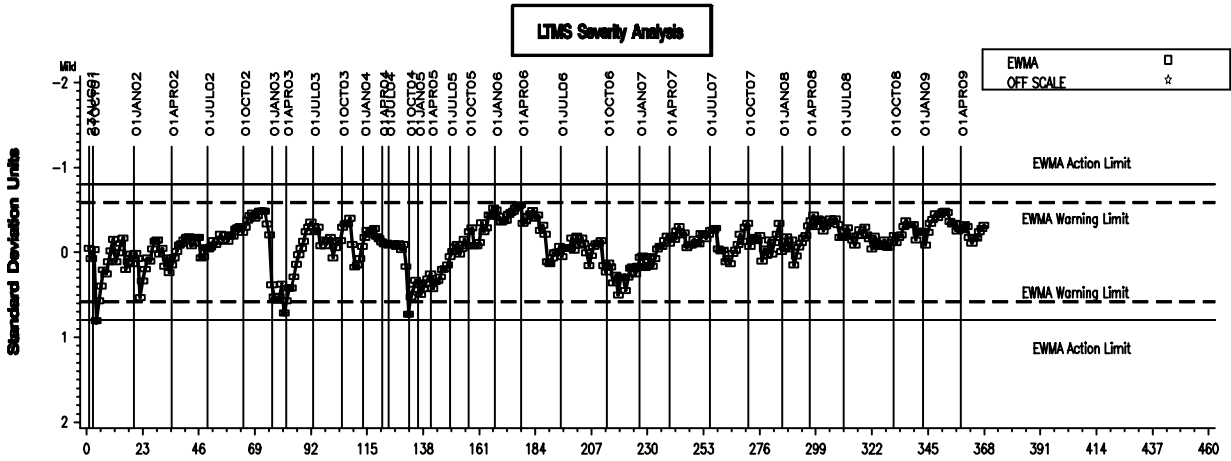
EOEC - VAMAC INDUSTRY OPERATIONALLY VALID DATA

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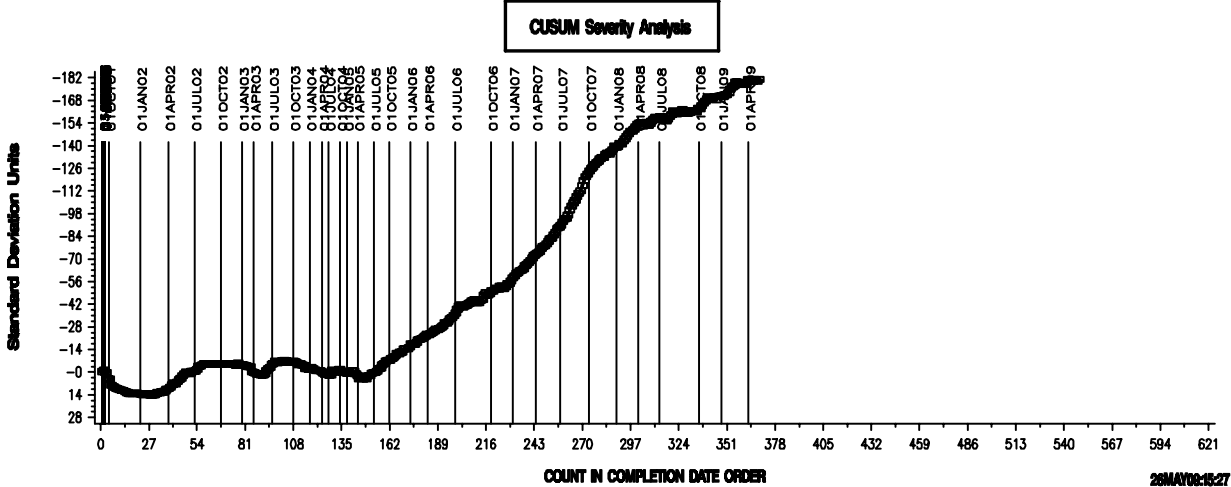
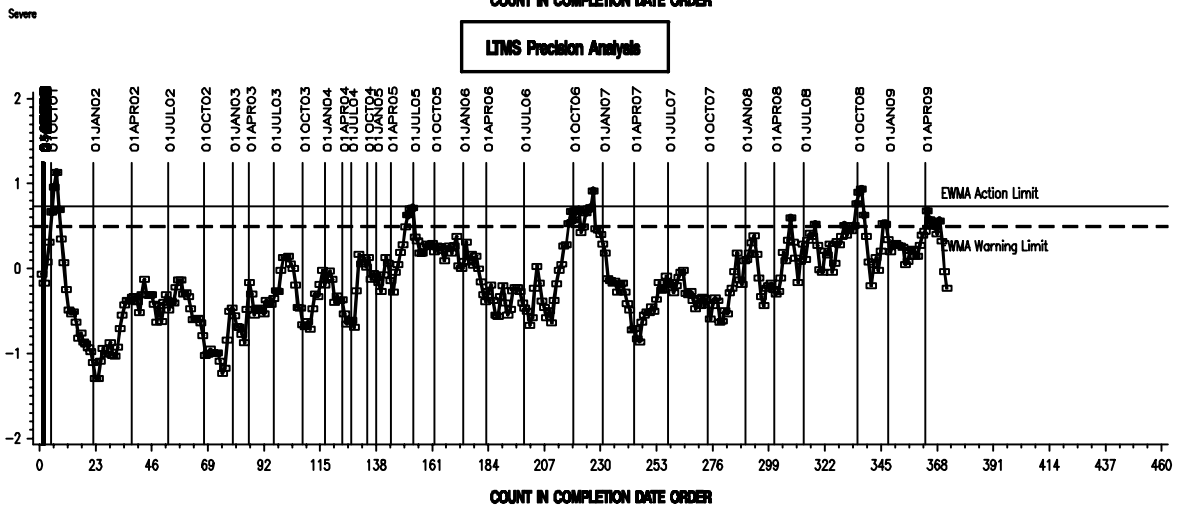
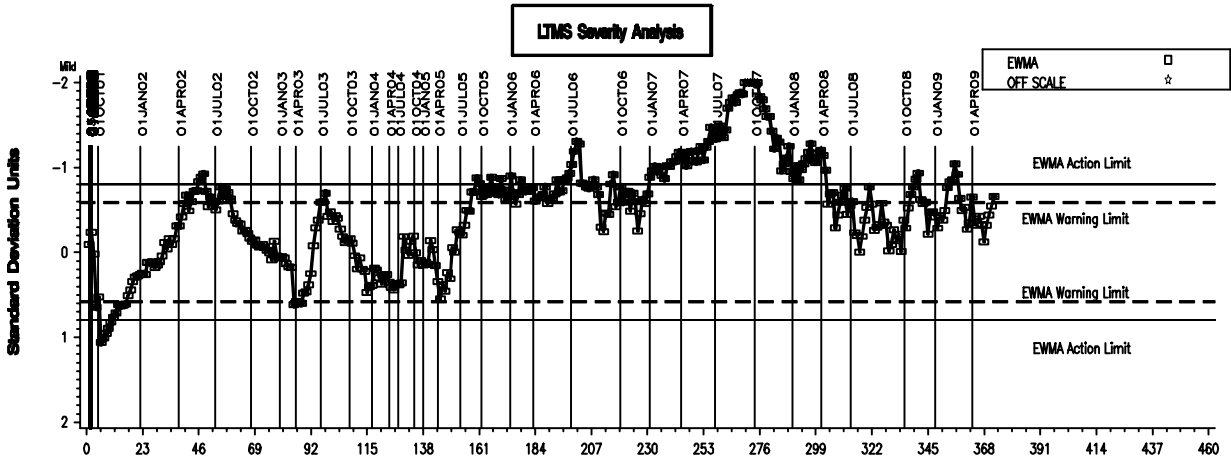
EOEC - FLUOROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FLUOROELASTOMER TENSILE STRENGTH CHANGE



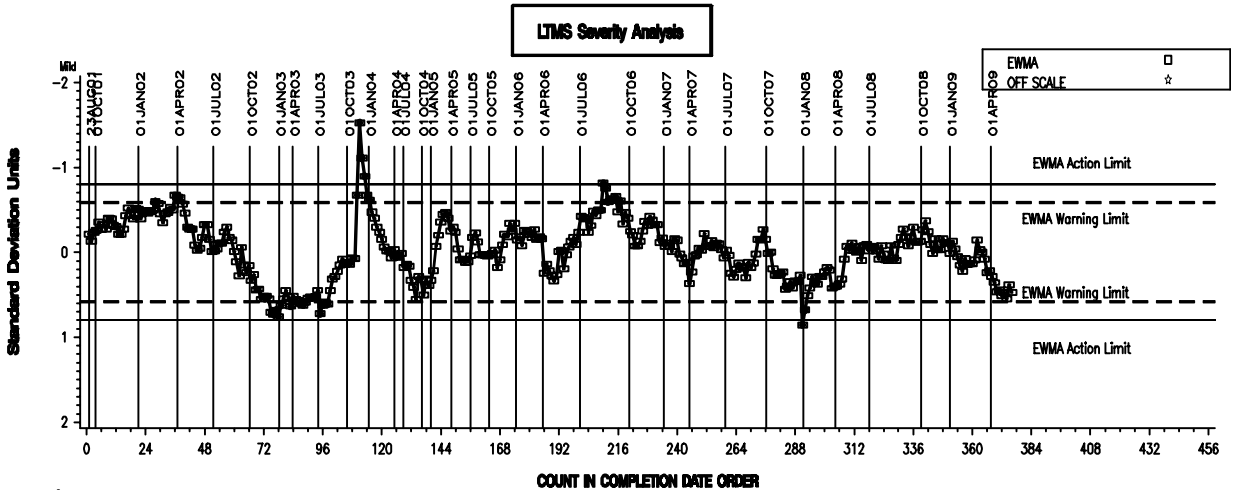
EOEC - NITRILE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE NITRILE TENSILE STRENGTH CHANGE AVERAGE

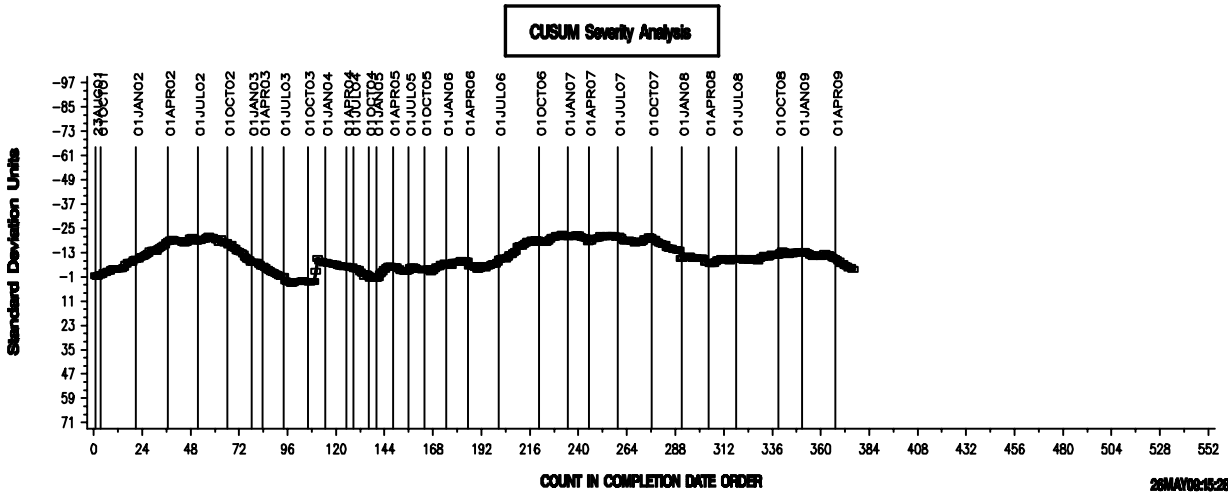
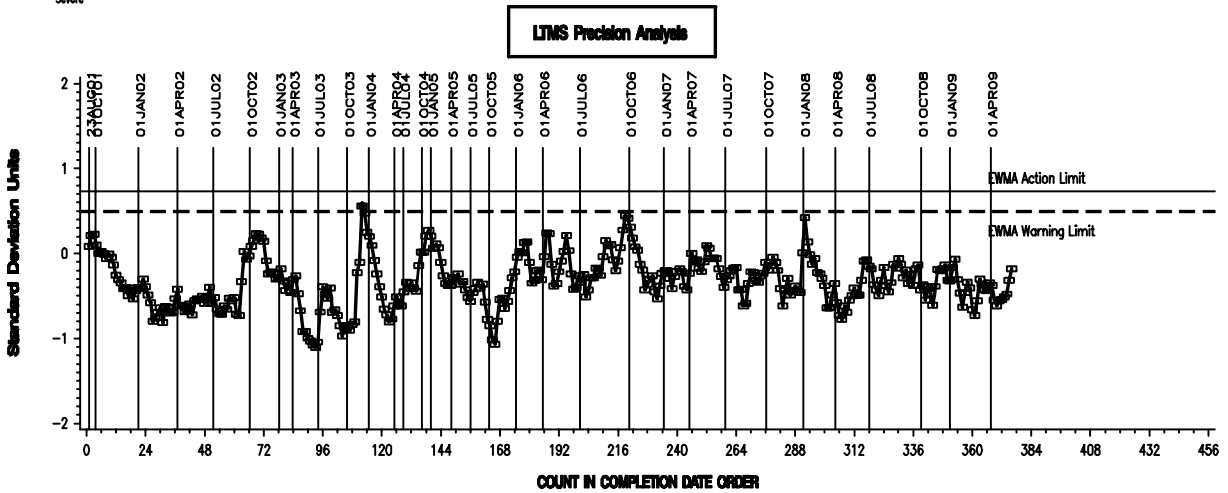


EOEC - POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE POLYACRYLATE TENSILE STRENGTH CHANGE AVE

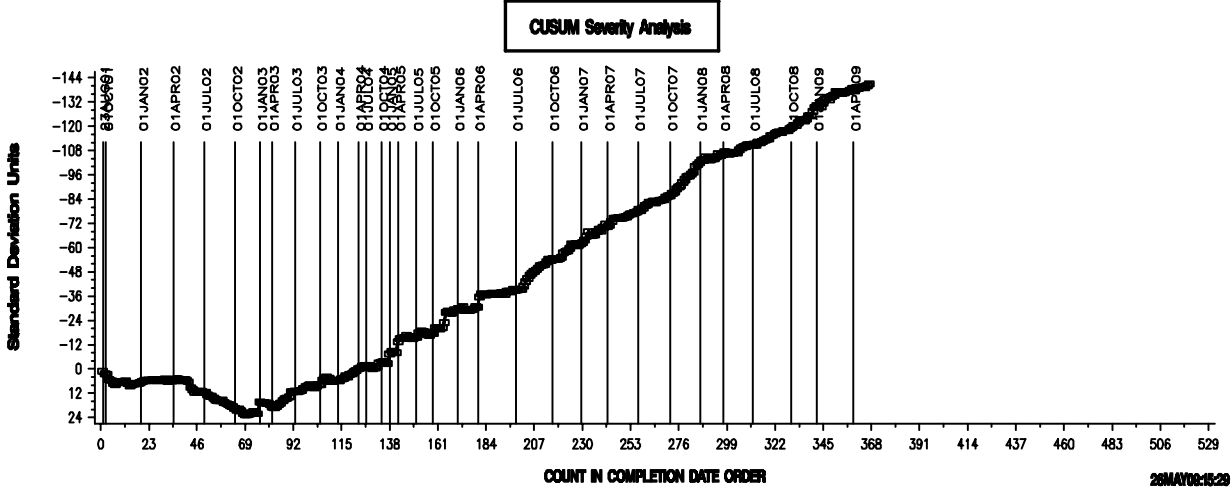
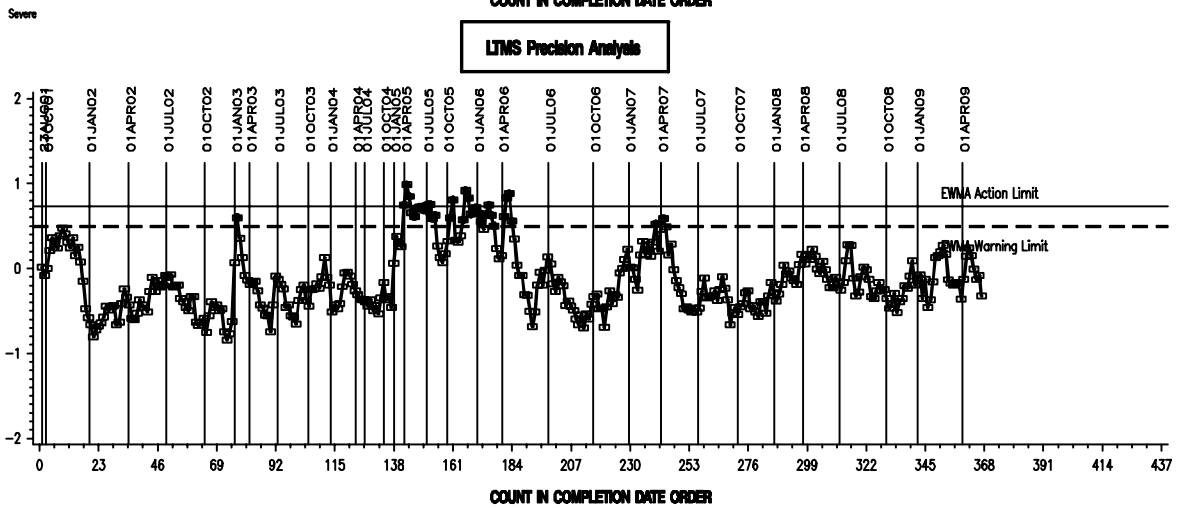
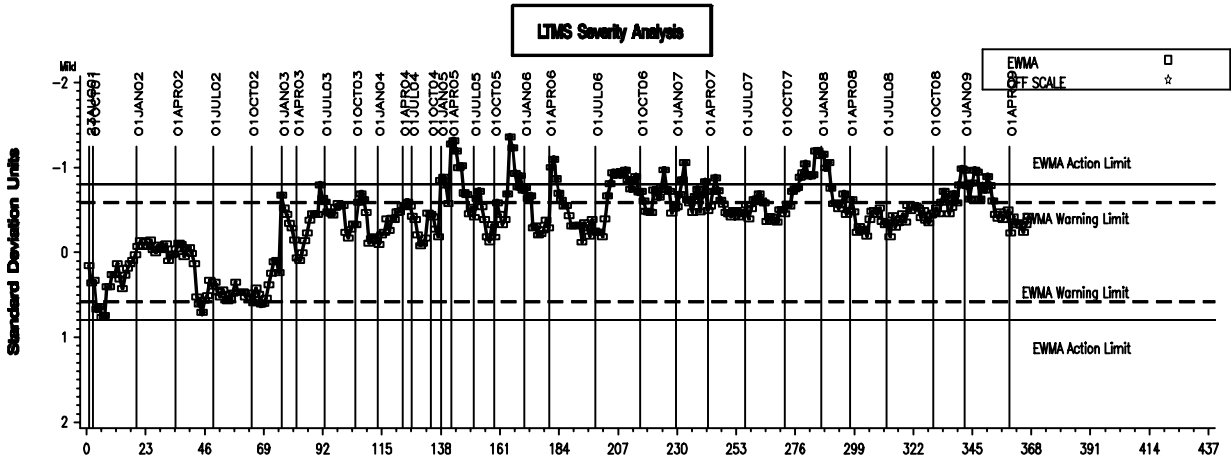


Severe



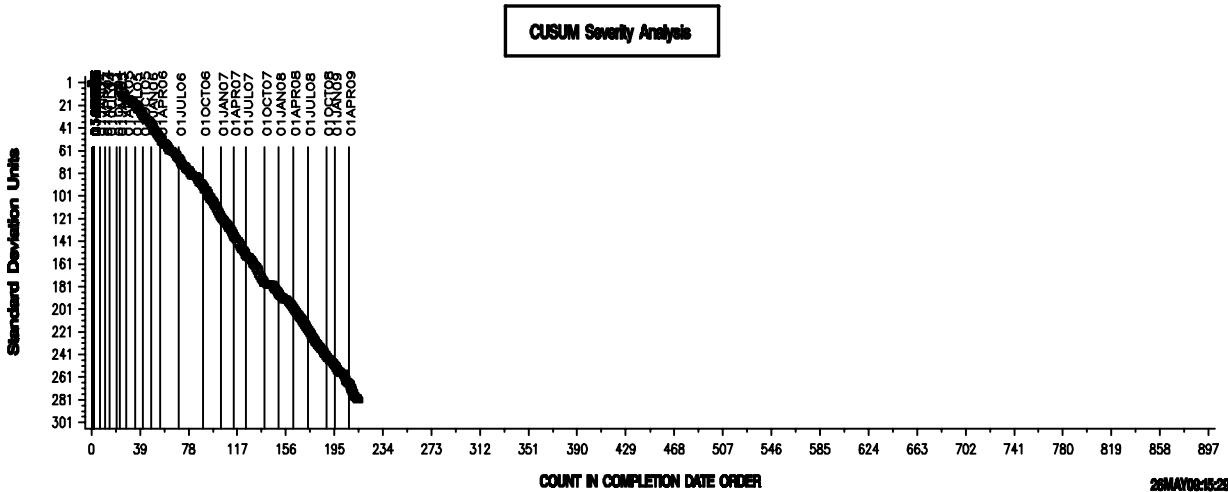
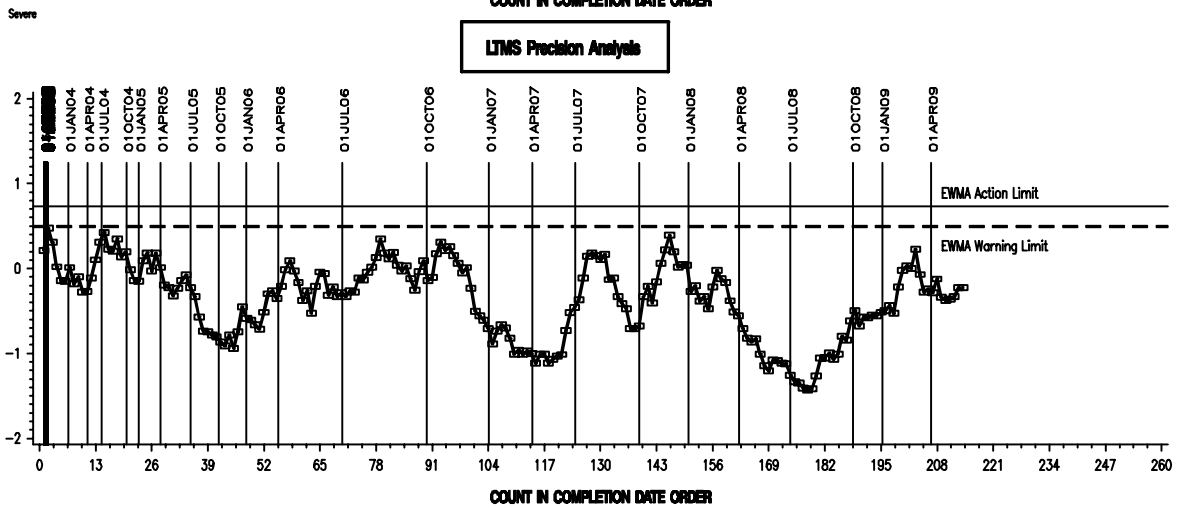
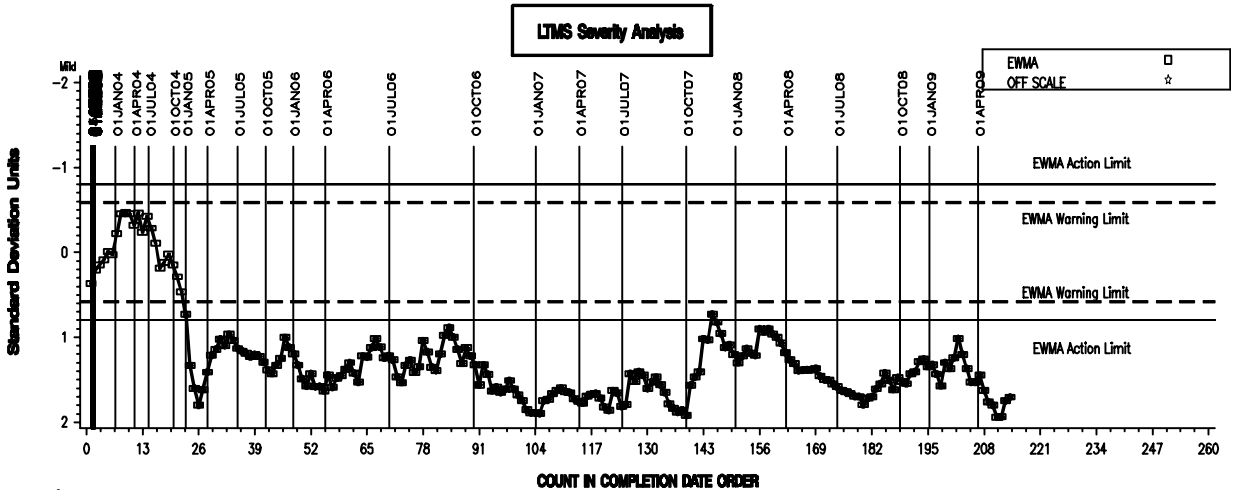
EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE SILICON TENSILE STRENGTH CHANGE AVERAGE



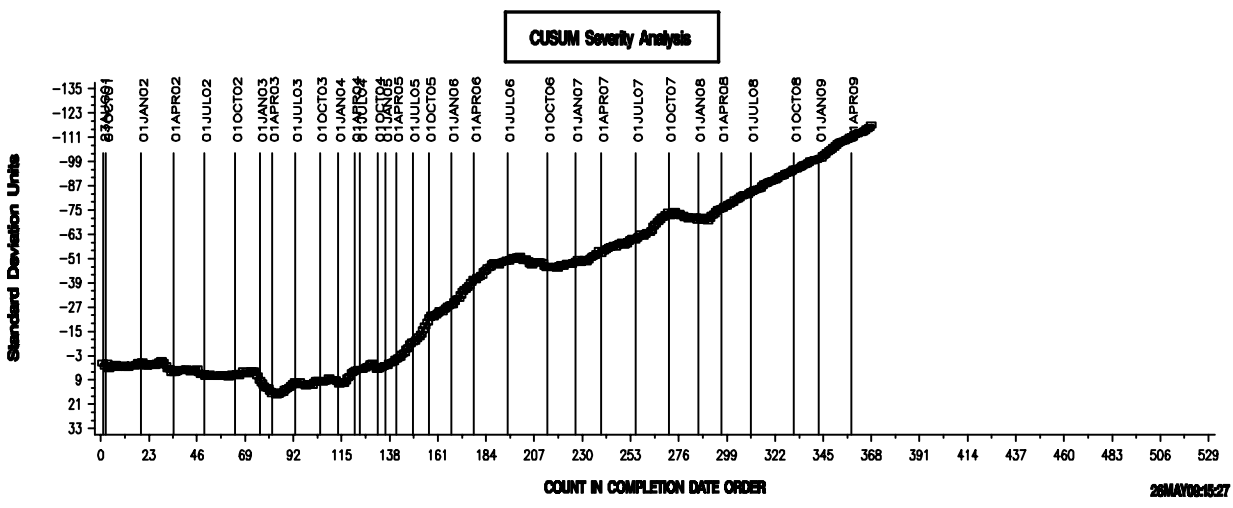
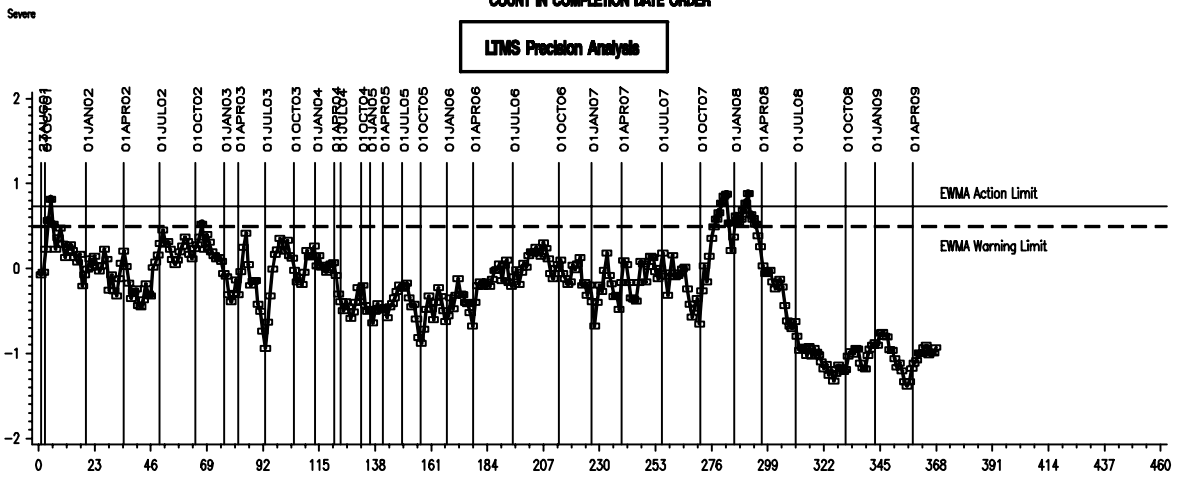
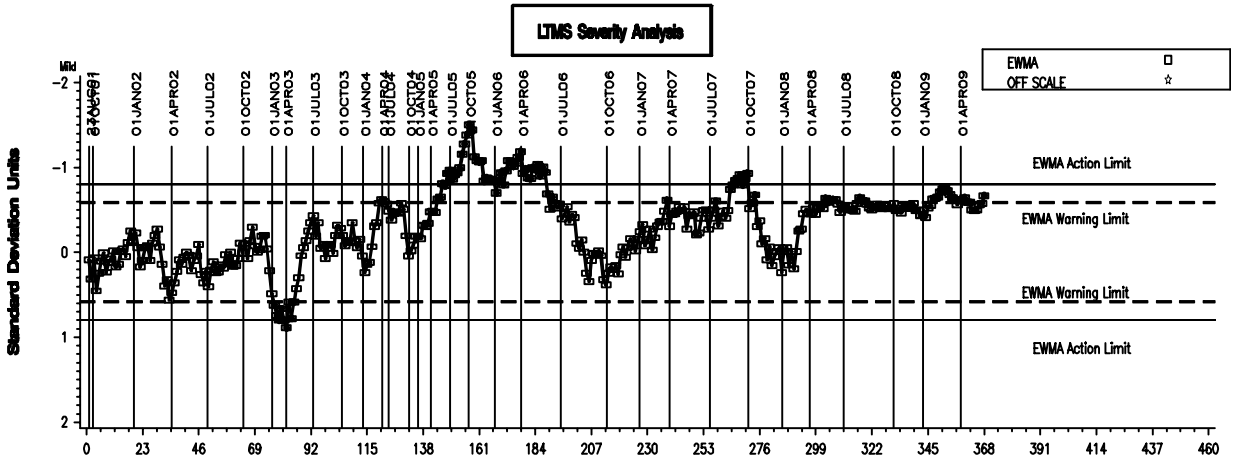
EOEC - VAMAC INDUSTRY OPERATIONALLY VALID DATA

REFERENCE VAMAC G TENSILE STRENGTH CHANGE AVERAGE



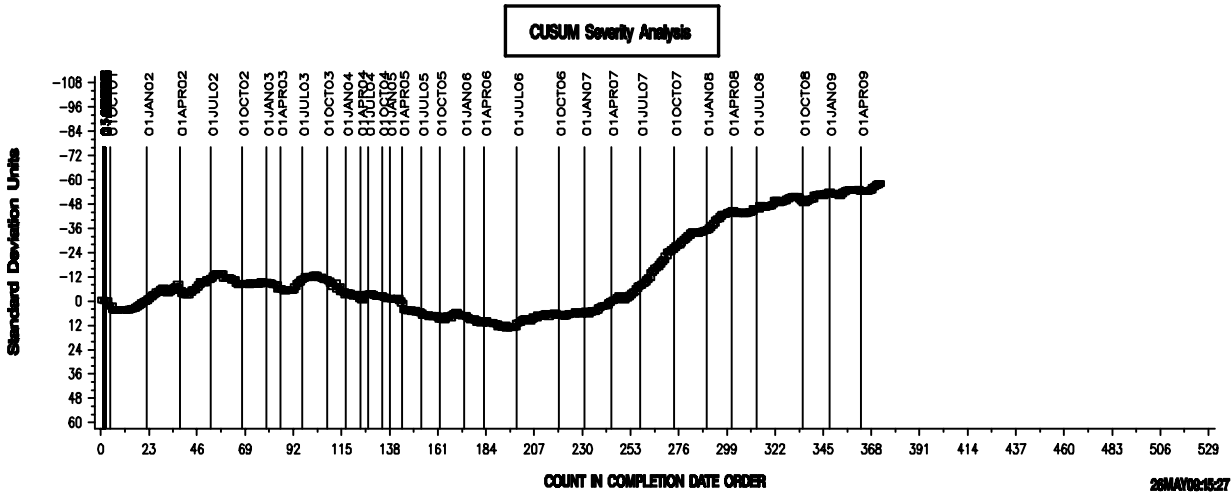
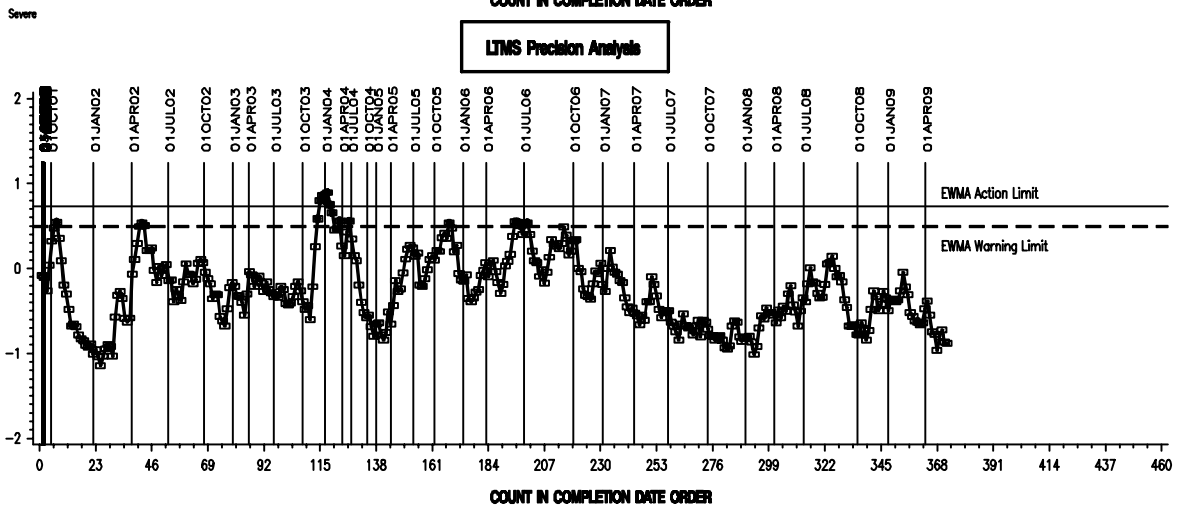
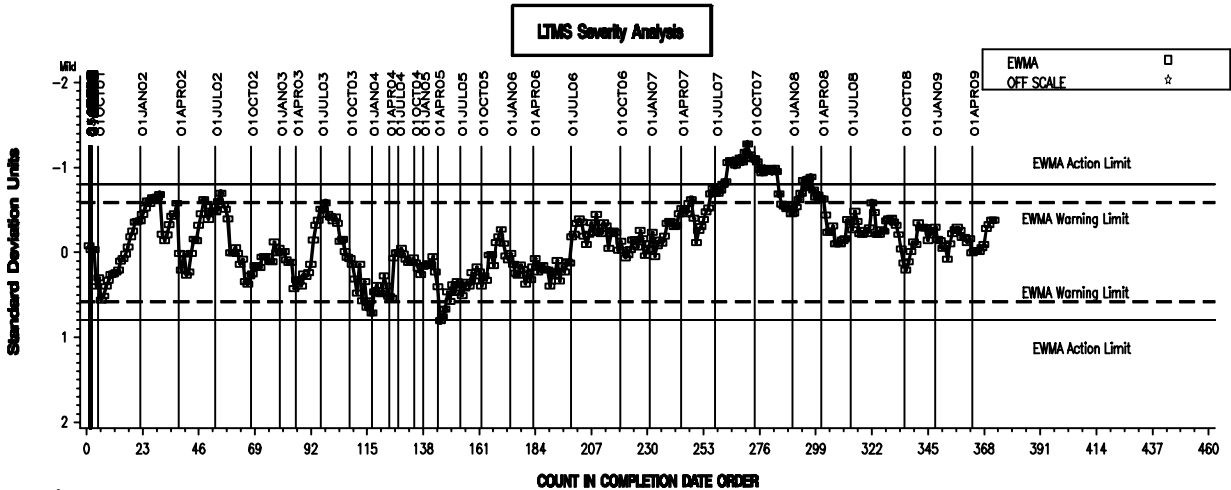
EOEC - FLUOROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FLUOROELASTOMER ELONGATION CHANGE AVERAG



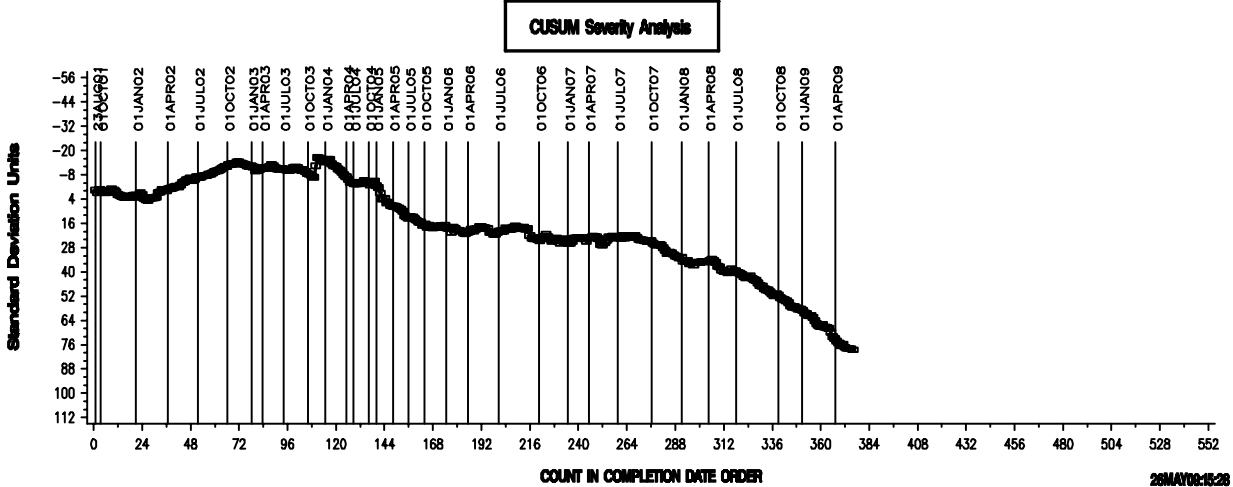
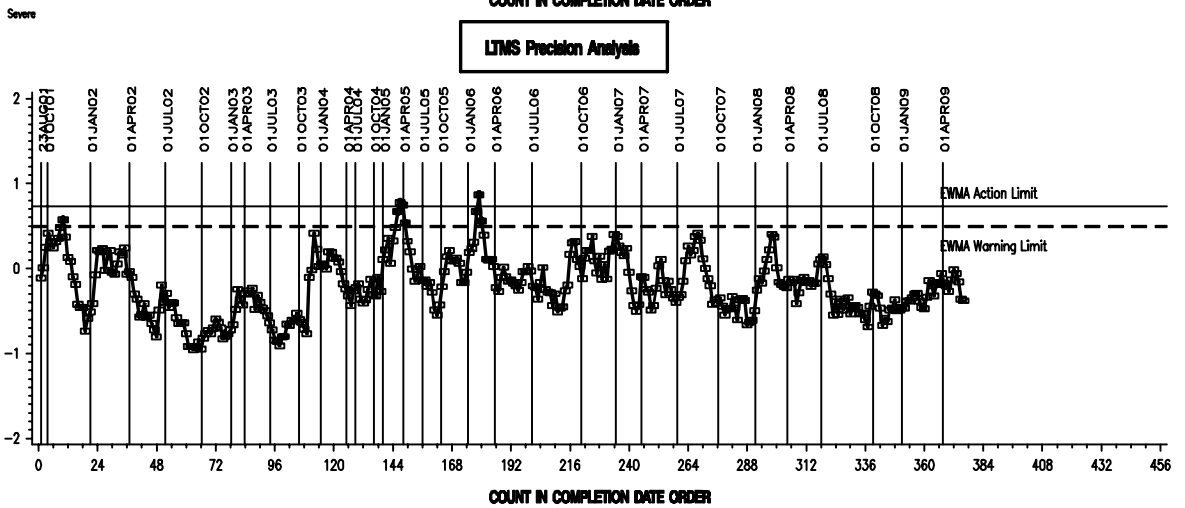
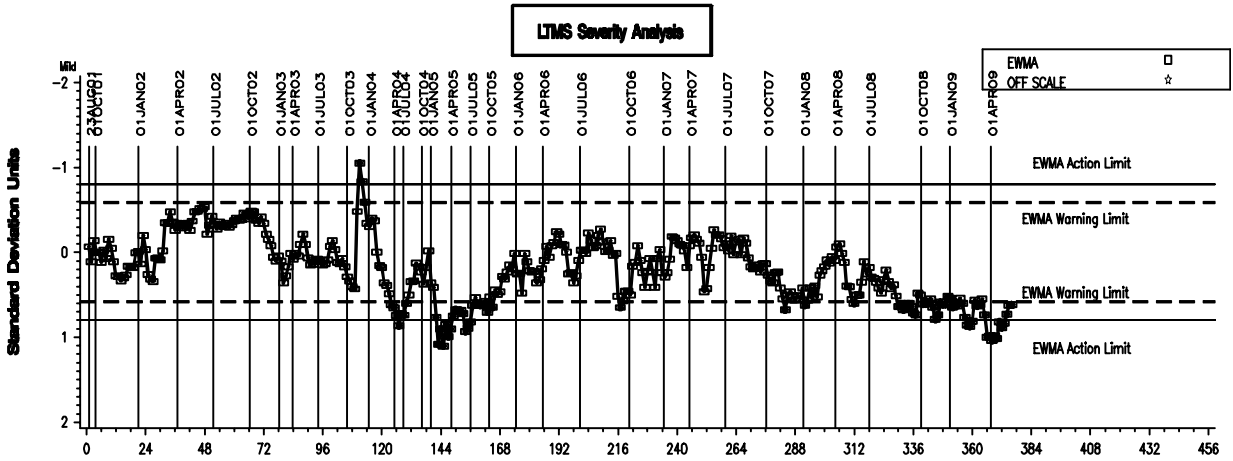
EOEC - NITRILE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE NITRILE ELONGATION CHANGE AVERAGE



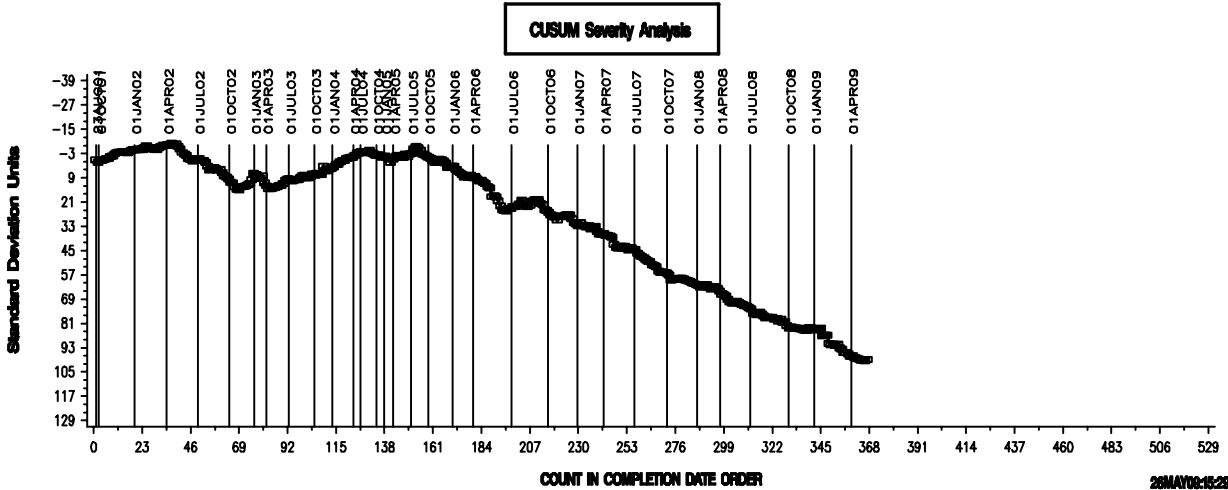
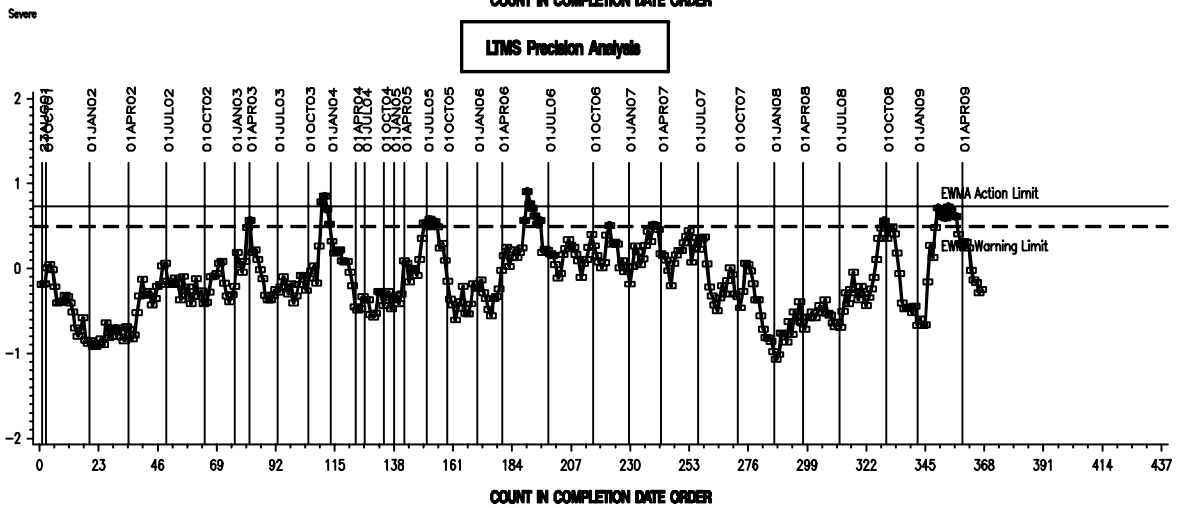
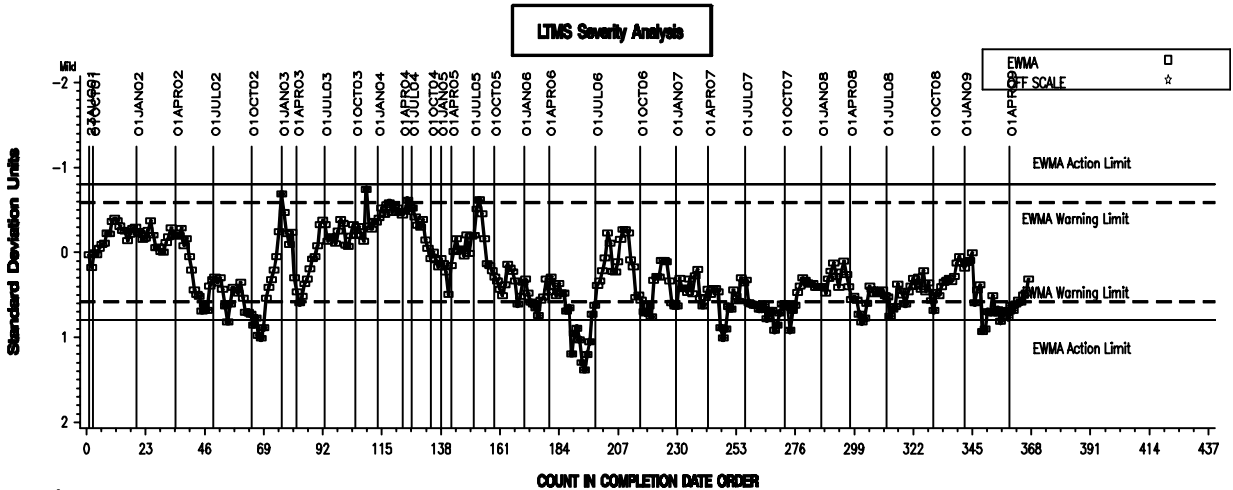
EOEC - POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

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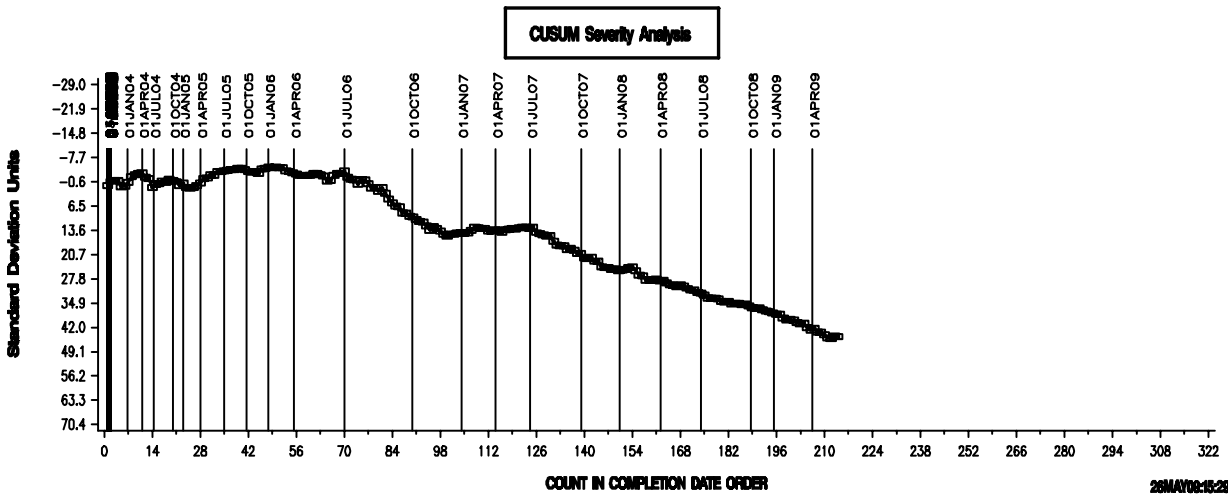
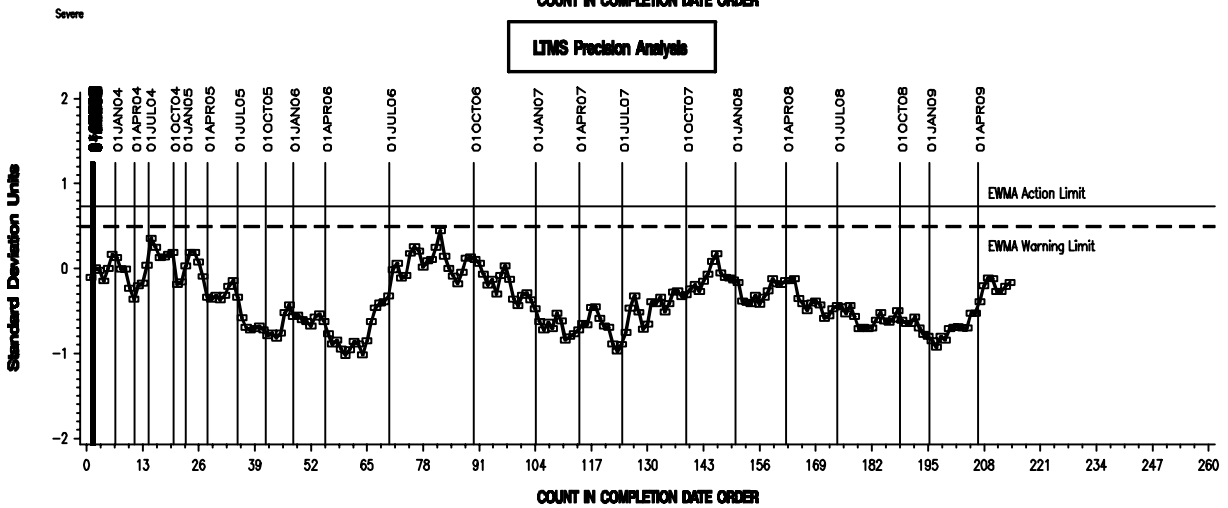
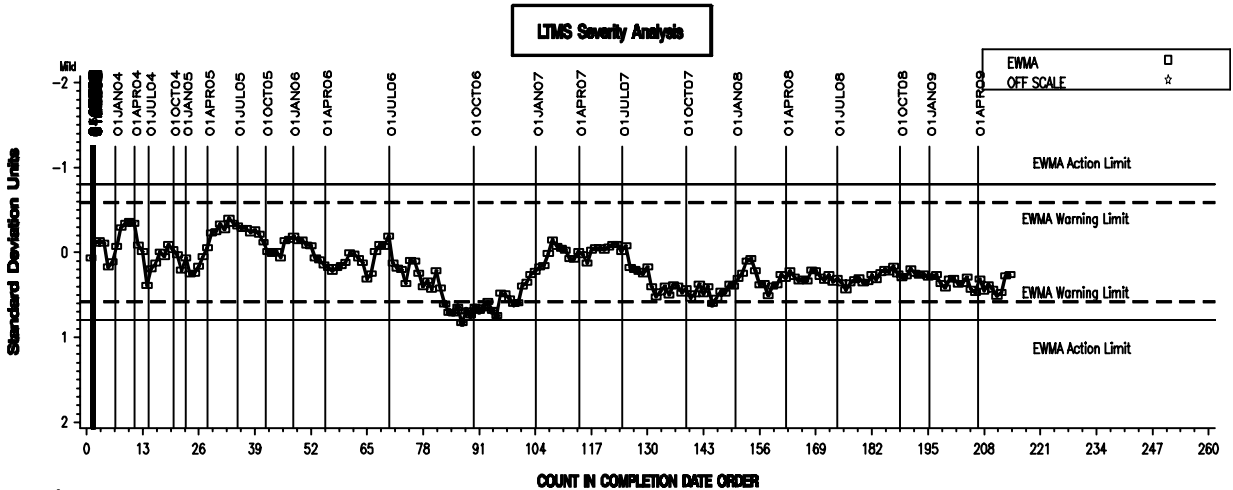
EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

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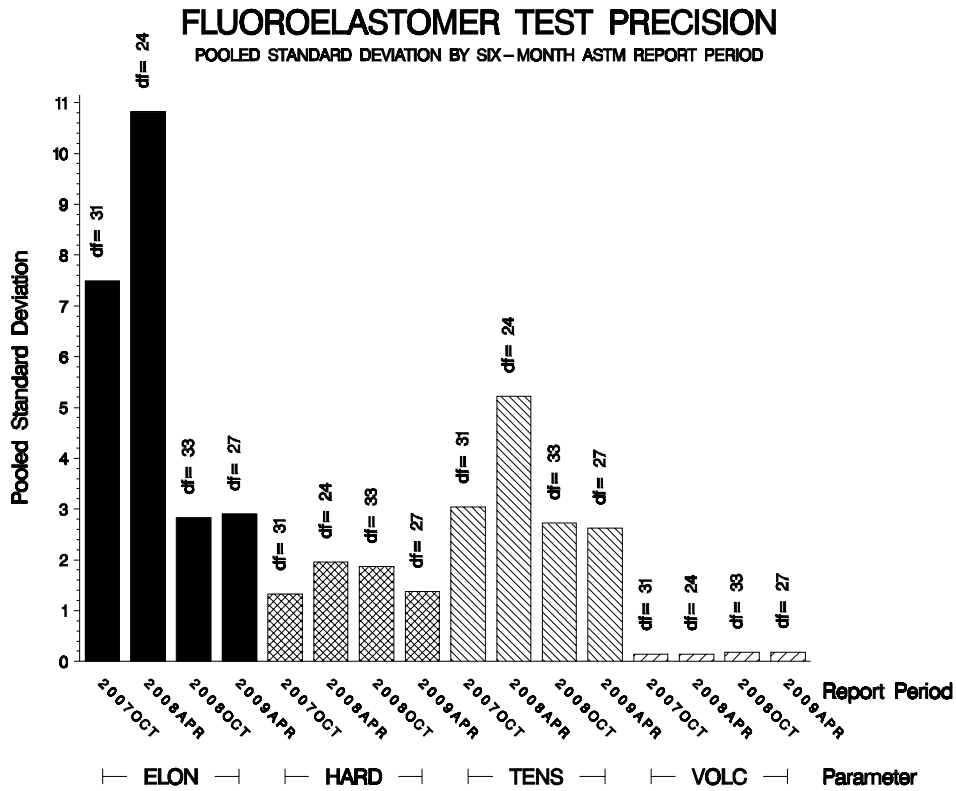
EOEC - VAMAC INDUSTRY OPERATIONALLY VALID DATA

REFERENCE VAMAC G ELONGATION CHANGE AVERAGE



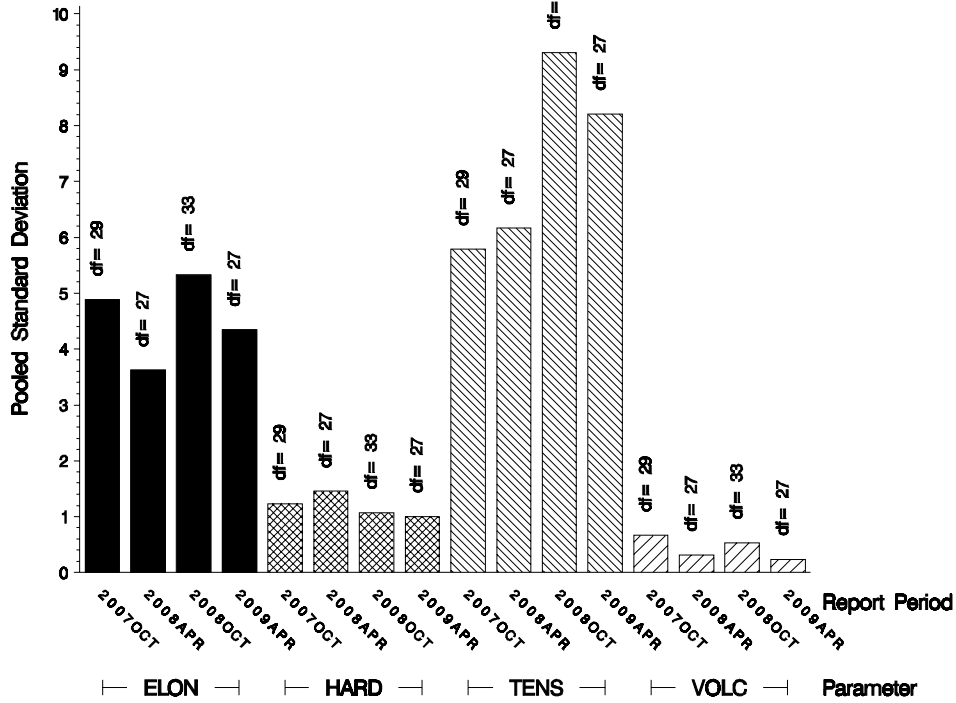
POOLED S:

Shown below are bar charts comparing the pooled s values for the EOEC test parameters over the last four report periods. Where degrees of freedom equal zero, no bars are shown. This will occur where only one test was reported or where multiple tests are reported but all are on different oils. Periods showing no information had no tests reported.



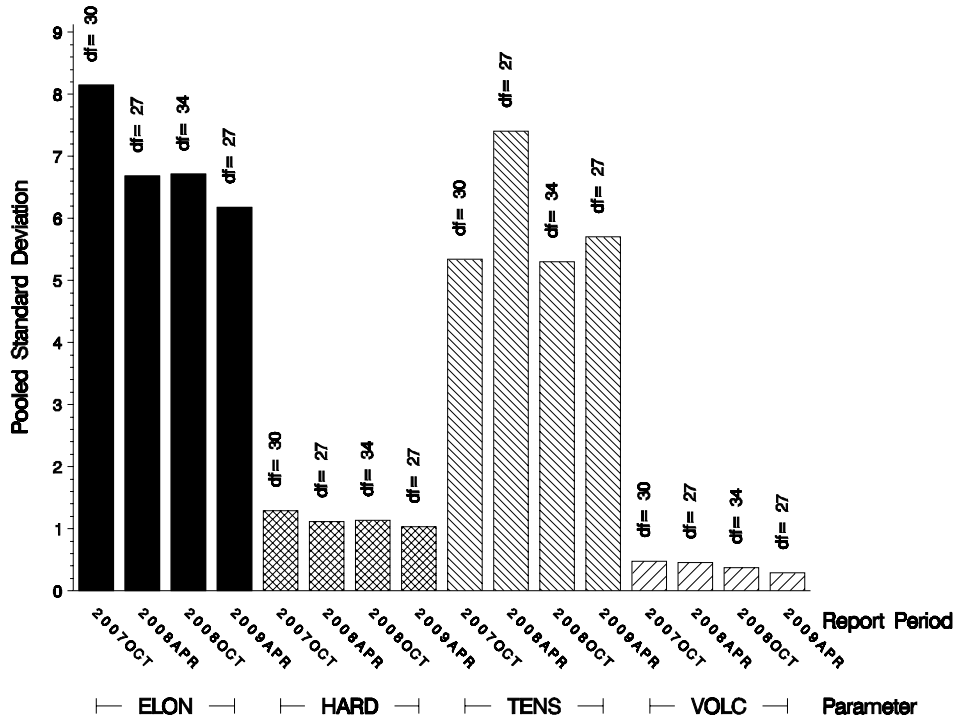
NITRILE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



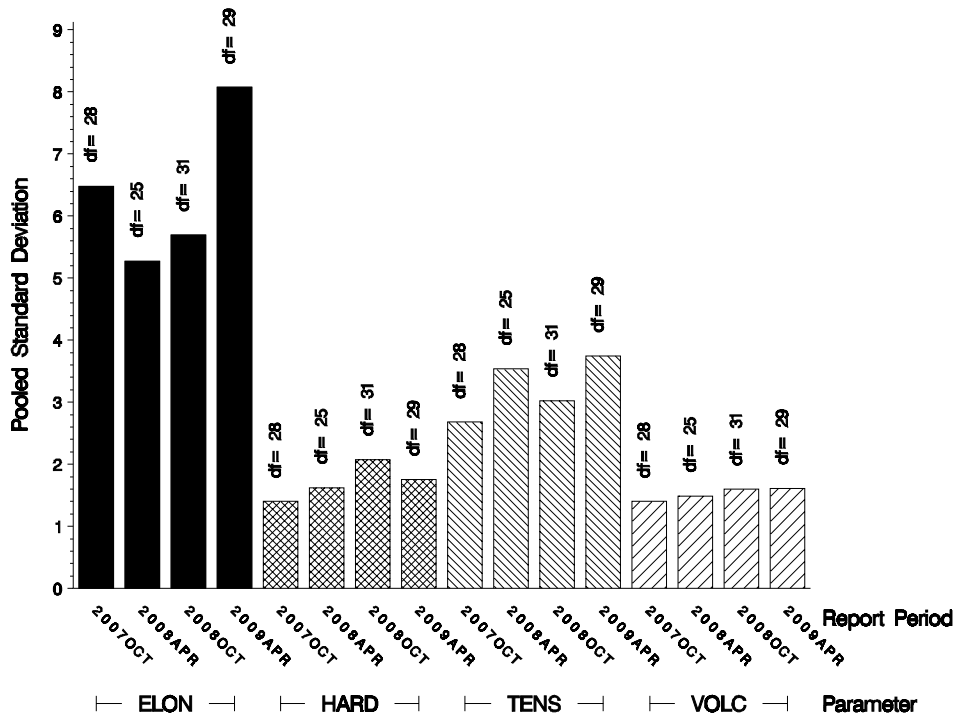
POLYACRYLATE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



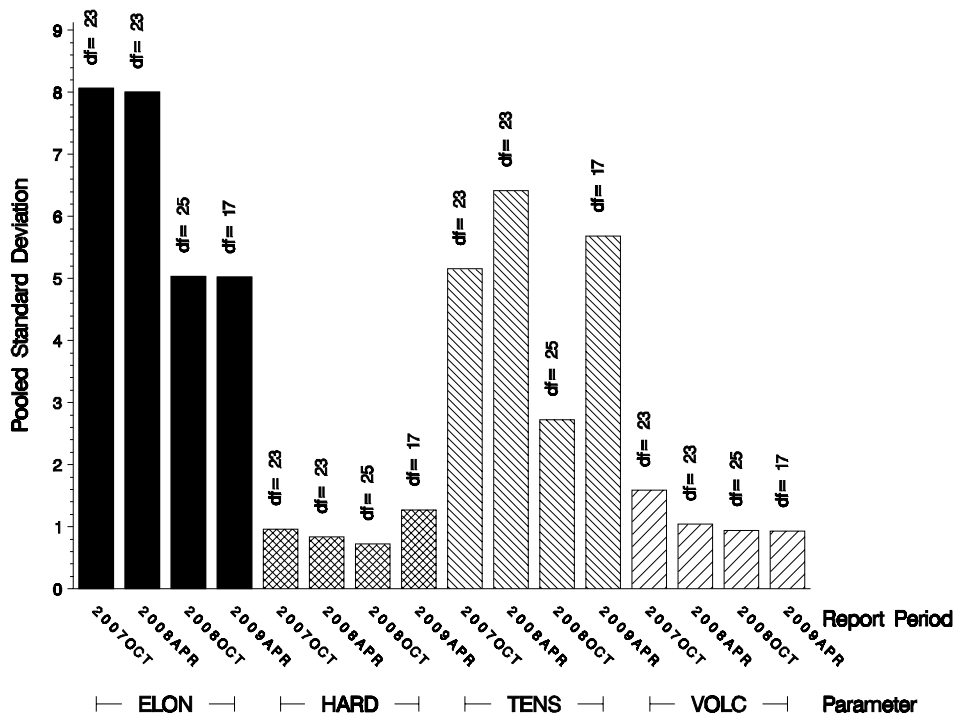
SILICONE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



VAMAC TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



STATUS OF REFERENCE OIL SUPPLY:

At the end of this report period, the testing oil supply stood as outlined in the following table:

Oil	Samples @ Labs	@ TMC	
		Samples	Gallons
1006-1	54	12747	2526
Total	54	12747	2526

* Future reblends of oils marked with an asterisk are not obtainable by TMC.

Be aware that this table presumes that all of each of these oils is dedicated to the EOEC test area. This is not the case, as oil 1006-1 is also used in several other test areas.

INFORMATION LETTERS:

EOEC Information Letter No. 08-1, Sequence No. 2, dated December 2, 2008, was issued during the period and contained the addition of Passenger Car Elastomers and Editorial Corrections.

SUMMARY

Summary of Severity as Measured by LTMS Control Charting				
Elastomer	VOLC	HARD	TENS	ELON
Fluoroelastomer	Within limits	Within limits	Within limits	Mild
Nitrile	Severe	Severe	Mild	Within limits
Polyacrylate	Severe	Within limits	Within limits	Severe
Silicone	Severe	Within limits	Within limits	Severe
VAMAC	Severe	Mild	Severe	Within limits
Summary of Precision as Measured by LTMS Control Charting				
Elastomer	VOLC	HARD	TENS	ELON
Fluoroelastomer	Warning	Within limits	Within limits	Within limits
Nitrile	Within limits	Within limits	Within limits	Within limits
Polyacrylate	Within limits	Within limits	Within limits	Within limits
Silicone	Within limits	Within limits	Within limits	Within limits
VAMAC	Within limits	Within limits	Within limits	Within limits

MTK/mtk/astm0409.doc/mem09-031.mtk.doc

- c: J. L. Zalar
- F. M. Farber
- M. T. Kasimirsky
- EOEC Surveillance Panel
- <ftp://ftp.astmtmc.cmu.edu/docs/bench/eoec/semiannualreports/eoec-04-2009.pdf>

Distribution: email