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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

Reply to:

Scott Parke
ASTM Test Monitoring Center
6555 Penn Avenue
Pittsburgh, PA 15206

January 24, 2005

To: Engine Oil Elastomer Compatibility Surveillance Panel

Enclosed are the minutes of the EOEC Surveillance panel teleconference held January 17, 2005. Please forward any corrections or additions to my attention.

Scott Parke
Secretary EOEC Surveillance Panel

Attachments
cc: ftp://ftp.astmtmc.cmu.edu/docs/bench/eoec/minutes/TELECONFERENCE%202005-01-17.pdf

distribution: Email

TELECONFERENCE MINUTES

ENGINE OIL ELASTOMER COMPATIBILITY SURVEILLANCE PANEL

HELD JANUARY 17, 2005

13:00cst CALL TO ORDER

The teleconference began at 13:00 cst; the participants are listed in attachment 1. The only agenda item was to determine reference test acceptability criteria.

13:03cst REFERENCE TEST ACCEPTABILITY CRITERIA

Prior to the meeting, Scott Parke (TMC/secretary) provided two types of plot showing the distribution of results reported to the TMC. One type (attachment 2) shows how the results were distributed about the mean; the other type shows quasi control charts with lines for mean, +/-1, 2, and 3 standard deviations. These plots also show the unadjusted and adjusted specification limits.

Becky Grinfield (Southwest Research/chairman) noted that those present at this meeting had a lot of experience with this test. She reminded the group that, unlike most other tests, candidate and reference tests run concurrently and that this must be kept firmly in mind in whatever decisions are made. She solicited proposals for acceptance criteria. None were immediately forthcoming.

Scott Parke pointed out that review of the plots indicated that, except for Vamac, between 94.2 and 98.6% of the results fell within 2 standard deviations of the mean indicating that Shewhart control charting with a k value of 2.0 would not produce an unprecedented rejection rate. In her experience, Becky felt that 2.0 was a completely unreasonable figure. Mark Sutherland (Chevron), respectful of Becky's experience, agreed. Neither offered an alternative suggestion.

Scott Parke then moved for Shewhart control charting with a k value of 5. Mark said he'd have to see what control charts with that k value would look like. Scott explained that k values were limits on distance from the mean; k=5 is 5 standard deviations. There was no second for Scott's motion.

Becky Grinfield moved for Shewhart control charting with a k value of 3. Joe Franklin (PerkinElmer) seconded and the motion was passed 4-0-2 (for-against-waive) with Jason Bowden and Scott Parke abstaining. Later in the meeting, Scott noted that this motion neglected to stipulate an effective date. The panel agreed that this motion would be effective for tests ending on or after March 14, 2005.

13:18cst MECHANISM FOR HANDLING SHIFTS IN TEST SEVERITY

Becky Grinfield asked how TMC intends to react to shifts in test severity that could occur. Scott Parke noted that after analysis of the severity shift, the surveillance panel would be responsible for coming up with the appropriate resolution.

Becky explained that because candidate tests are run in conjunction with the reference, there is, potentially, extraordinary risk associated with severity shifts. She thought the eventuality of any severity shift should be accounted for in any acceptability criteria. Jason Bowden (OHT) questioned how it would be possible to correct or compensate or allow for a shift whose character is, at this point, unknowable.

Mark Sutherland suggested that, before consuming the last of their current batch, it would be prudent for labs to run a sample from a new elastomer batch as one of the candidates. Scott Parke asked Mark if he would like to move that his suggestion be formalized as part of the procedure. Becky and Mark were both emphatic in their lack of enthusiasm for doing so.

Joe Franklin asked Jason Bowden if industry was currently approaching the end of any of the batches. Jason said no. Jason was asked if OHT could provide inventory levels for the various elastomers. Jason said that detailed OHT inventory information was proprietary but he would provide Becky with a summary for her report to ASTM subcommittee B7.

Jason was asked about the manufacturing tolerances for the elastomers. He explained that when OHT's involvement in the elastomer tests began, OHT surveyed the elastomer industry to determine the tightest tolerances that were possible given the state of the art. OHT selected those values as their specifications for elastomer manufacture.

Business was concluded and the call ended at 13:40cst.

Attendance:

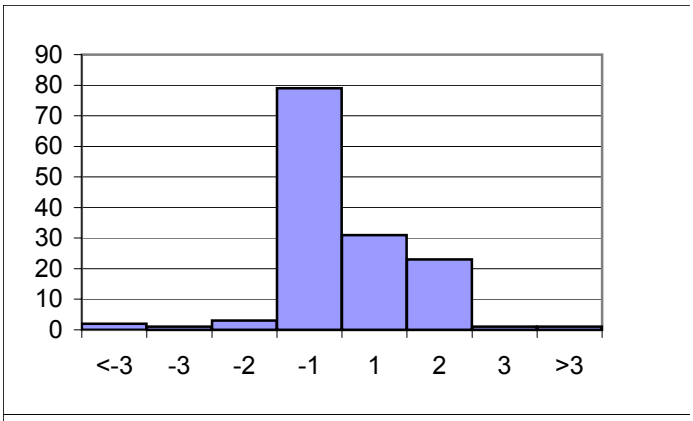
Representative	Organization
Becky Grinfield	Southwest Research
Joe Franklin	PerkinElmer
Diane Misich	Lubrizol
Jason Bowden	OHT
Mark Sutherland	Chevron
Scott Parke	Test Monitoring Center

NITRILE

Volume

		n		
-1.82	x le -3	2		
-0.97	-3 lt x le -2	1	-1 < yi ≤ 1	78.0%
-0.13	-2 lt x le -1	3	-2 < yi ≤ 2	96.5%
0.72	-1 lt x le 0	79	-3 < yi ≤ 3	97.9%
1.56	0 lt x le 1	31	>3	2.1%
2.41	1 lt x le 2	23		
3.25	2 lt x le 3	1		
	3 lt x	1		

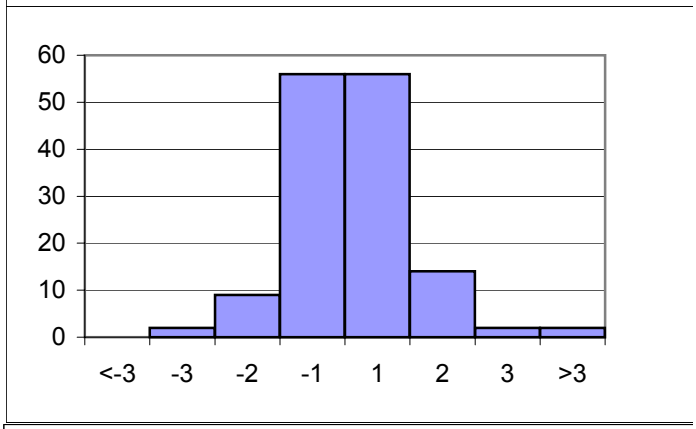
Mean = 0.72
STD = 0.84



Hardness

		n		
-3.63	x le -3	0		
-1.86	-3 lt x le -2	2	-1 < yi ≤ 1	79.4%
-0.10	-2 lt x le -1	9	-2 < yi ≤ 2	95.7%
1.67	-1 lt x le 0	56	-3 < yi ≤ 3	98.6%
3.43	0 lt x le 1	56	>3	1.4%
5.20	1 lt x le 2	14		
6.97	2 lt x le 3	2		
	3 lt x	2		

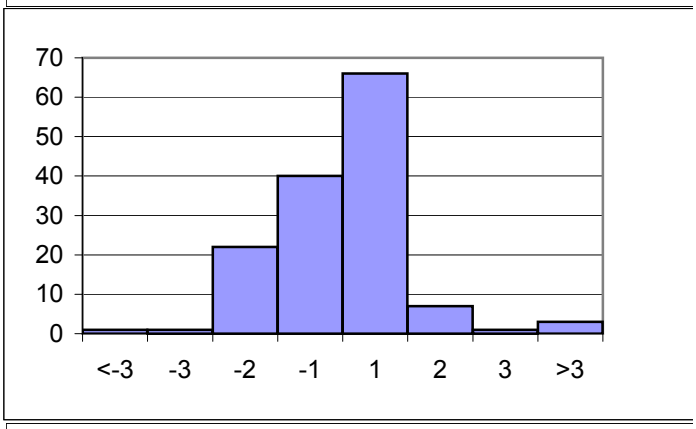
Mean = 1.67
STD = 1.77



Tensile

		n		
-49.44	x le -3	1		
-42.12	-3 lt x le -2	1	-1 < yi ≤ 1	75.2%
-34.79	-2 lt x le -1	22	-2 < yi ≤ 2	95.7%
-27.47	-1 lt x le 0	40	-3 < yi ≤ 3	97.2%
-20.14	0 lt x le 1	66	>3	2.8%
-12.82	1 lt x le 2	7		
-5.49	2 lt x le 3	1		
	3 lt x	3		

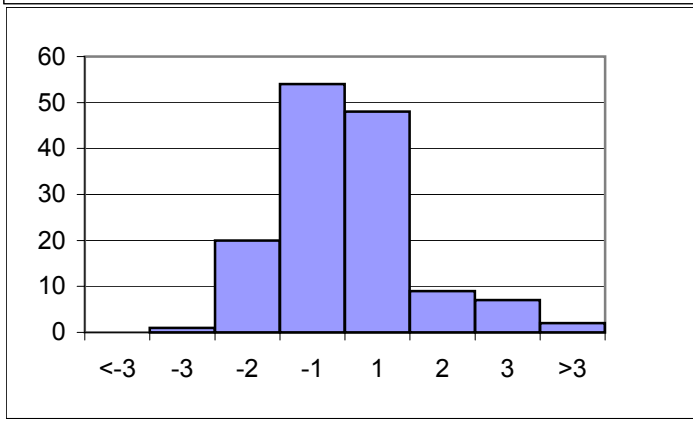
Mean = -27.47
STD = 7.33



Elongation

		n		
-71.02	x le -3	0		
-64.30	-3 lt x le -2	1	-1 < yi ≤ 1	72.3%
-57.58	-2 lt x le -1	20	-2 < yi ≤ 2	92.9%
-50.86	-1 lt x le 0	54	-3 < yi ≤ 3	98.6%
-44.14	0 lt x le 1	48	>3	1.4%
-37.42	1 lt x le 2	9		
-30.70	2 lt x le 3	7		
	3 lt x	2		

Mean = -50.86
STD = 6.72

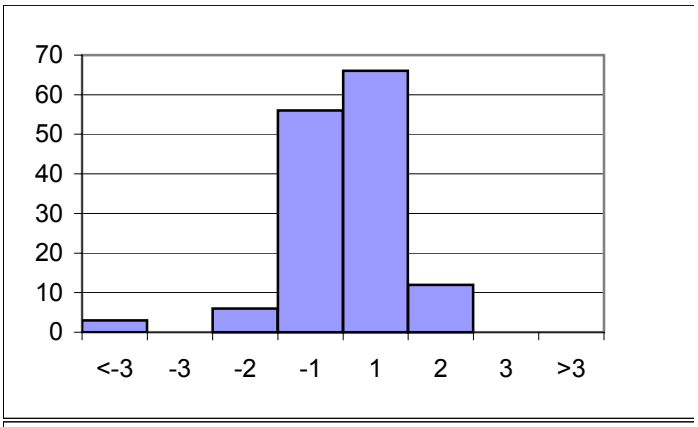


POLYACRYLATE

Volume

		n		
-1.44	x le -3	3		
-0.68	-3 lt x le -2	0	-1 < yi ≤ 1	85.3%
0.08	-2 lt x le -1	6	-2 < yi ≤ 2	97.9%
0.84	-1 lt x le 0	56	-3 < yi ≤ 3	97.9%
1.60	0 lt x le 1	66	>3	2.1%
2.37	1 lt x le 2	12		
3.13	2 lt x le 3	0		
	3 lt x	0		

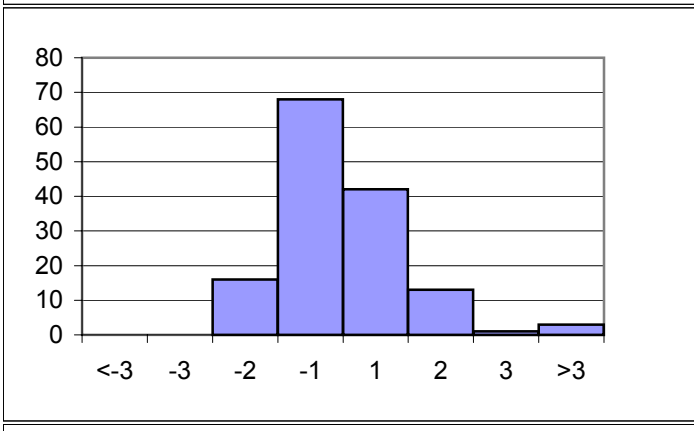
Mean = 0.84
STD = 0.76



Hardness

		n		
-6.90	x le -3	0		
-5.10	-3 lt x le -2	0	-1 < yi ≤ 1	76.9%
-3.30	-2 lt x le -1	16	-2 < yi ≤ 2	97.2%
-1.51	-1 lt x le 0	68	-3 < yi ≤ 3	97.9%
0.29	0 lt x le 1	42	>3	2.1%
2.09	1 lt x le 2	13		
3.89	2 lt x le 3	1		
	3 lt x	3		

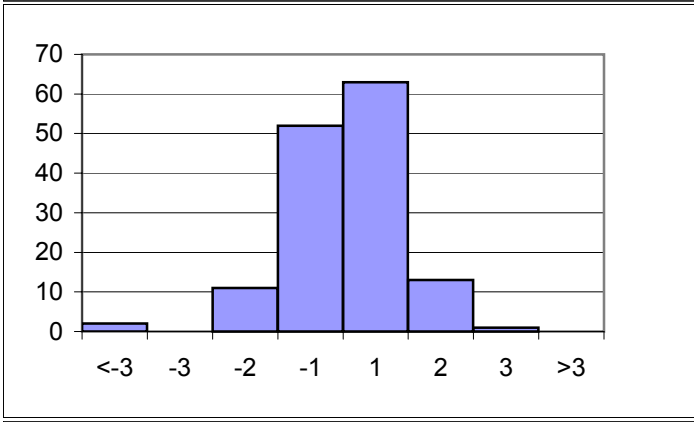
Mean = -1.51
STD = 1.80



Tensile

		n		
-23.29	x le -3	2		
-15.25	-3 lt x le -2	0	-1 < yi ≤ 1	81.0%
-7.20	-2 lt x le -1	11	-2 < yi ≤ 2	97.9%
0.84	-1 lt x le 0	52	-3 < yi ≤ 3	98.6%
8.88	0 lt x le 1	63	>3	1.4%
16.93	1 lt x le 2	13		
24.97	2 lt x le 3	1		
	3 lt x	0		

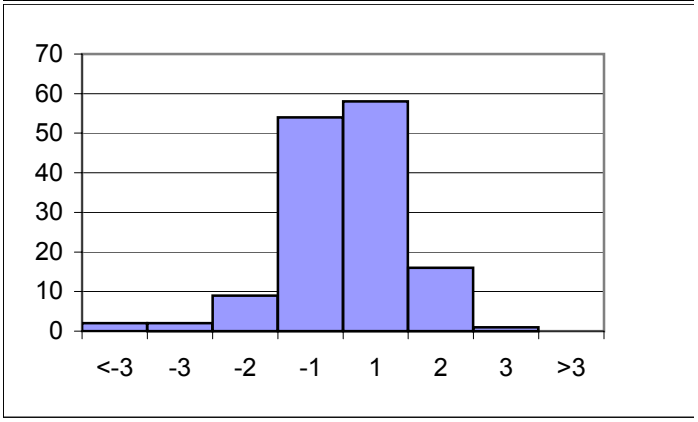
Mean = 0.84
STD = 8.04



Elongation

		n		
-44.89	x le -3	2		
-35.95	-3 lt x le -2	2	-1 < yi ≤ 1	78.9%
-27.01	-2 lt x le -1	9	-2 < yi ≤ 2	96.5%
-18.07	-1 lt x le 0	54	-3 < yi ≤ 3	98.6%
-9.12	0 lt x le 1	58	>3	1.4%
-0.18	1 lt x le 2	16		
8.76	2 lt x le 3	1		
	3 lt x	0		

Mean = -18.07
STD = 8.94

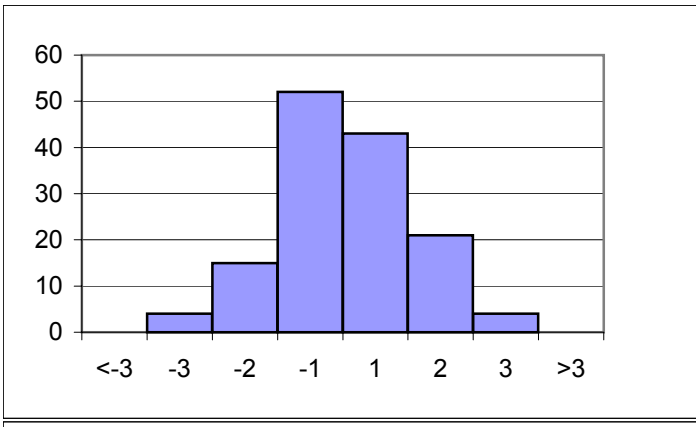


FLUOROELASTOMER

Volume

		n		
0.17	x le -3	0		
0.32	-3 lt x le -2	4	-1 < yi ≤ 1	68.3%
0.47	-2 lt x le -1	15	-2 < yi ≤ 2	94.2%
0.61	-1 lt x le 0	52	-3 < yi ≤ 3	100.0%
0.76	0 lt x le 1	43	>3	0.0%
0.91	1 lt x le 2	21		
1.06	2 lt x le 3	4		
	3 lt x	0		

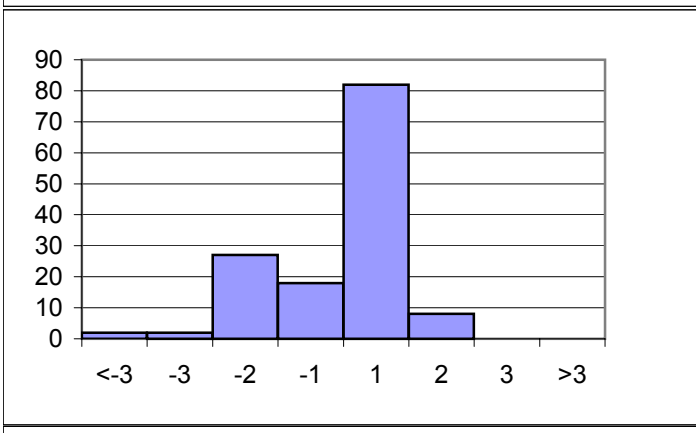
Mean = 0.61
STD = 0.15



Hardness

		n		
0.69	x le -3	2		
2.89	-3 lt x le -2	2	-1 < yi ≤ 1	71.9%
5.09	-2 lt x le -1	27	-2 < yi ≤ 2	97.1%
7.30	-1 lt x le 0	18	-3 < yi ≤ 3	98.6%
9.50	0 lt x le 1	82	>3	1.4%
11.70	1 lt x le 2	8		
13.91	2 lt x le 3	0		
	3 lt x	0		

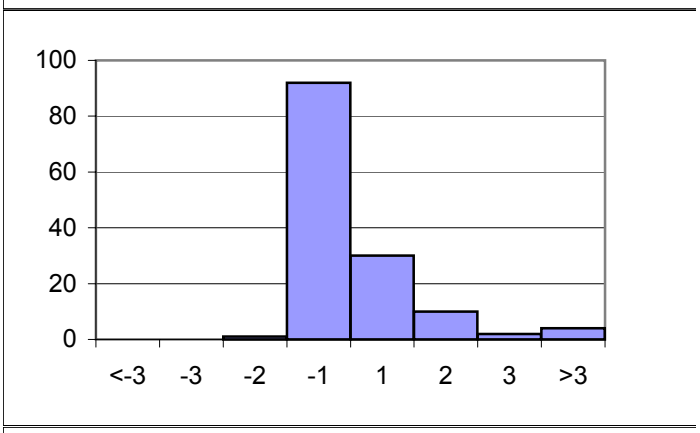
Mean = 7.30
STD = 2.20



Tensile

		n		
-85.33	x le -3	0		
-79.98	-3 lt x le -2	0	-1 < yi ≤ 1	87.8%
-74.63	-2 lt x le -1	1	-2 < yi ≤ 2	95.7%
-69.28	-1 lt x le 0	92	-3 < yi ≤ 3	97.1%
-63.94	0 lt x le 1	30	>3	2.9%
-58.59	1 lt x le 2	10		
-53.24	2 lt x le 3	2		
	3 lt x	4		

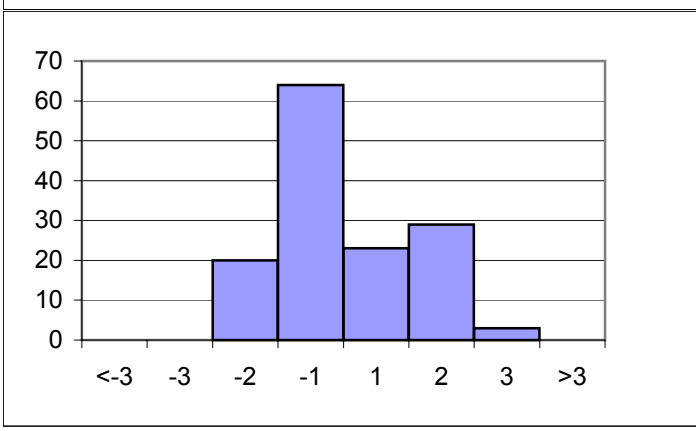
Mean = -69.28
STD = 5.35



Elongation

		n		
-85.66	x le -3	0		
-76.67	-3 lt x le -2	0	-1 < yi ≤ 1	62.6%
-67.68	-2 lt x le -1	20	-2 < yi ≤ 2	97.8%
-58.69	-1 lt x le 0	64	-3 < yi ≤ 3	100.0%
-49.70	0 lt x le 1	23	>3	0.0%
-40.71	1 lt x le 2	29		
-31.73	2 lt x le 3	3		
	3 lt x	0		

Mean = -58.69
STD = 8.99

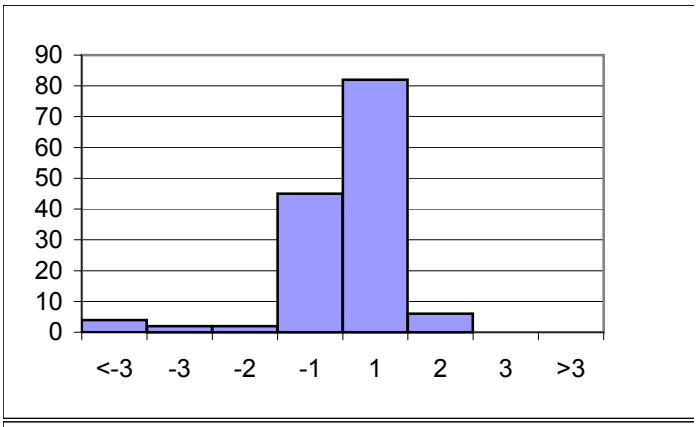


SILICONE

Volume

		n		
19.59	x le -3	4		
21.85	-3 lt x le -2	2	-1 < yi ≤ 1	90.1%
24.12	-2 lt x le -1	2	-2 < yi ≤ 2	95.7%
26.38	-1 lt x le 0	45	-3 < yi ≤ 3	97.2%
28.65	0 lt x le 1	82	>3	2.8%
30.92	1 lt x le 2	6		
33.18	2 lt x le 3	0		
	3 lt x	0		

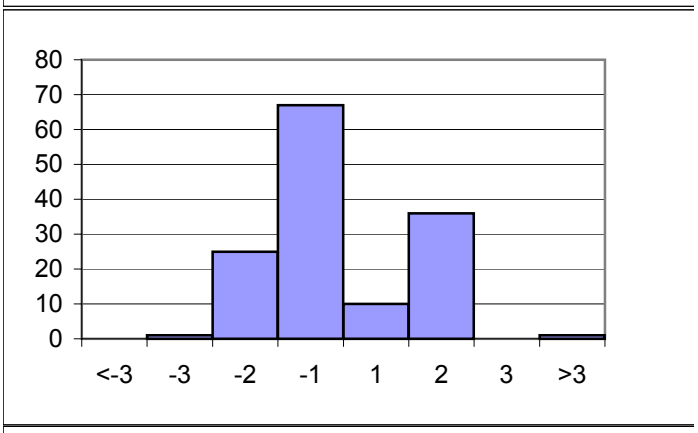
Mean = 26.38
STD = 2.27



Hardness

		n		
-25.74	x le -3	0		
-23.34	-3 lt x le -2	1	-1 < yi ≤ 1	55.0%
-20.94	-2 lt x le -1	25	-2 < yi ≤ 2	98.6%
-18.55	-1 lt x le 0	67	-3 < yi ≤ 3	99.3%
-16.15	0 lt x le 1	10	>3	0.7%
-13.75	1 lt x le 2	36		
-11.36	2 lt x le 3	0		
	3 lt x	1		

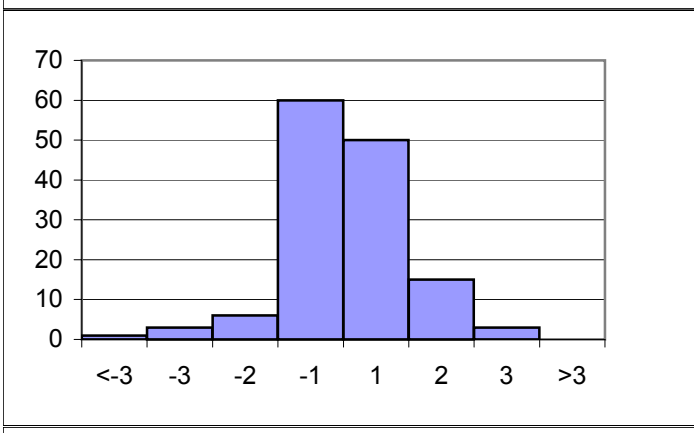
Mean = -18.55
STD = 2.40



Tensile

		n		
-26.41	x le -3	1		
-22.14	-3 lt x le -2	3	-1 < yi ≤ 1	79.7%
-17.87	-2 lt x le -1	6	-2 < yi ≤ 2	94.9%
-13.60	-1 lt x le 0	60	-3 < yi ≤ 3	99.3%
-9.33	0 lt x le 1	50	>3	0.7%
-5.07	1 lt x le 2	15		
-0.80	2 lt x le 3	3		
	3 lt x	0		

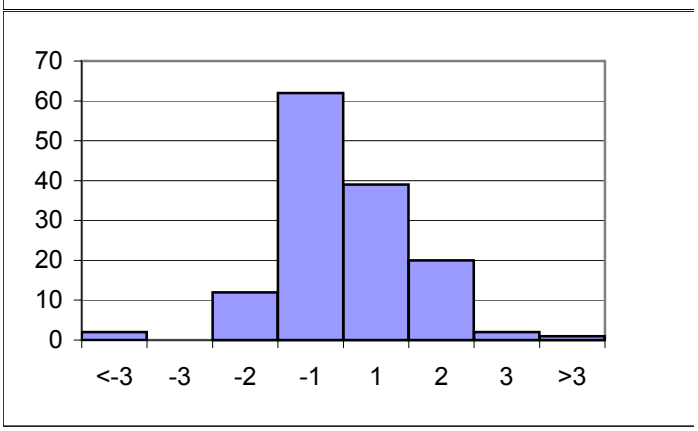
Mean = -13.60
STD = 4.27



Elongation

		n		
-44.10	x le -3	2		
-37.15	-3 lt x le -2	0	-1 < yi ≤ 1	73.2%
-30.20	-2 lt x le -1	12	-2 < yi ≤ 2	96.4%
-23.25	-1 lt x le 0	62	-3 < yi ≤ 3	97.8%
-16.29	0 lt x le 1	39	>3	2.2%
-9.34	1 lt x le 2	20		
-2.39	2 lt x le 3	2		
	3 lt x	1		

Mean = -23.25
STD = 6.95

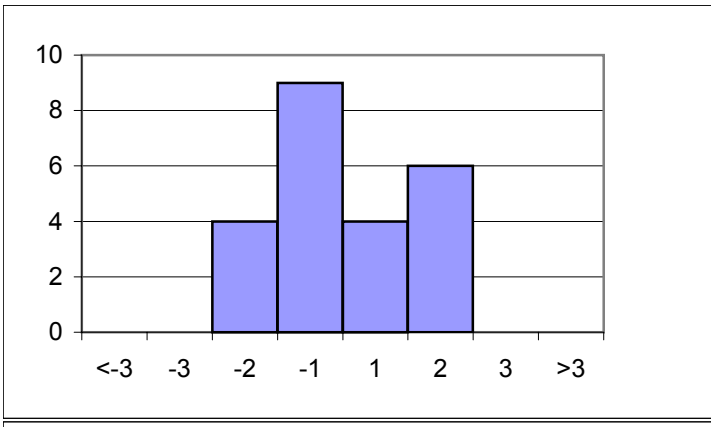


VAMAC

Volume

		n		
10.79	x le -3	0		
13.14	-3 lt x le -2	0	-1 < yi ≤ 1	56.5%
15.48	-2 lt x le -1	4	-2 < yi ≤ 2	100.0%
17.82	-1 lt x le 0	9	-3 < yi ≤ 3	100.0%
20.16	0 lt x le 1	4	>3	0.0%
22.50	1 lt x le 2	6		
24.85	2 lt x le 3	0		
	3 lt x	0		

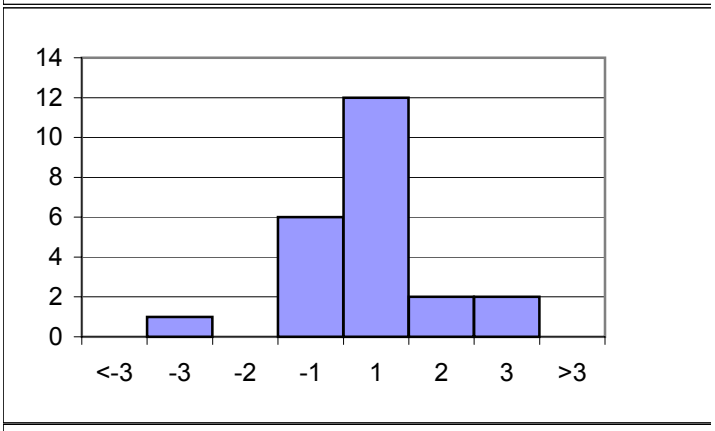
Mean = 17.82
STD = 2.34



Hardness

		n		
-10.93	x le -3	0		
-9.99	-3 lt x le -2	1	-1 < yi ≤ 1	78.3%
-9.04	-2 lt x le -1	0	-2 < yi ≤ 2	87.0%
-8.09	-1 lt x le 0	6	-3 < yi ≤ 3	100.0%
-7.14	0 lt x le 1	12	>3	0.0%
-6.19	1 lt x le 2	2		
-5.24	2 lt x le 3	2		
	3 lt x	0		

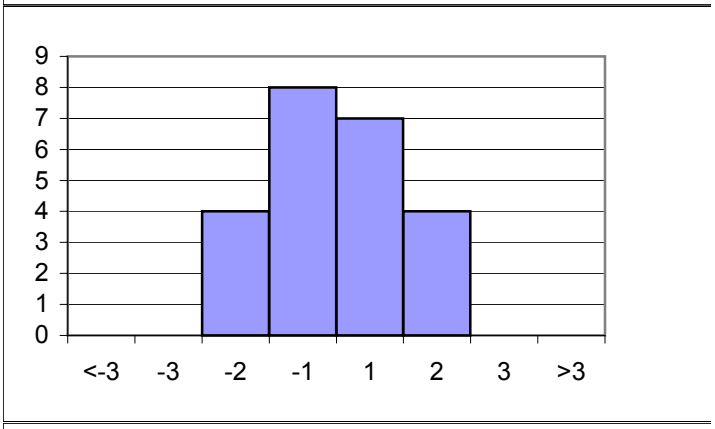
Mean = -8.09
STD = 0.95



Tensile

		n		
-43.84	x le -3	0		
-37.07	-3 lt x le -2	0	-1 < yi ≤ 1	65.2%
-30.31	-2 lt x le -1	4	-2 < yi ≤ 2	100.0%
-23.55	-1 lt x le 0	8	-3 < yi ≤ 3	100.0%
-16.78	0 lt x le 1	7	>3	0.0%
-10.02	1 lt x le 2	4		
-3.26	2 lt x le 3	0		
	3 lt x	0		

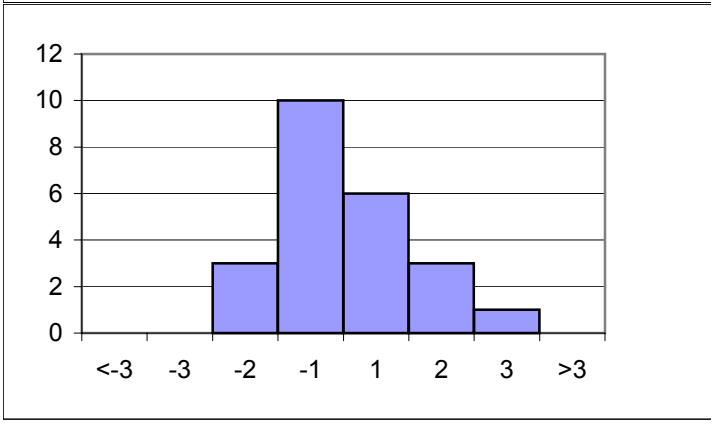
Mean = -23.55
STD = 6.76



Elongation

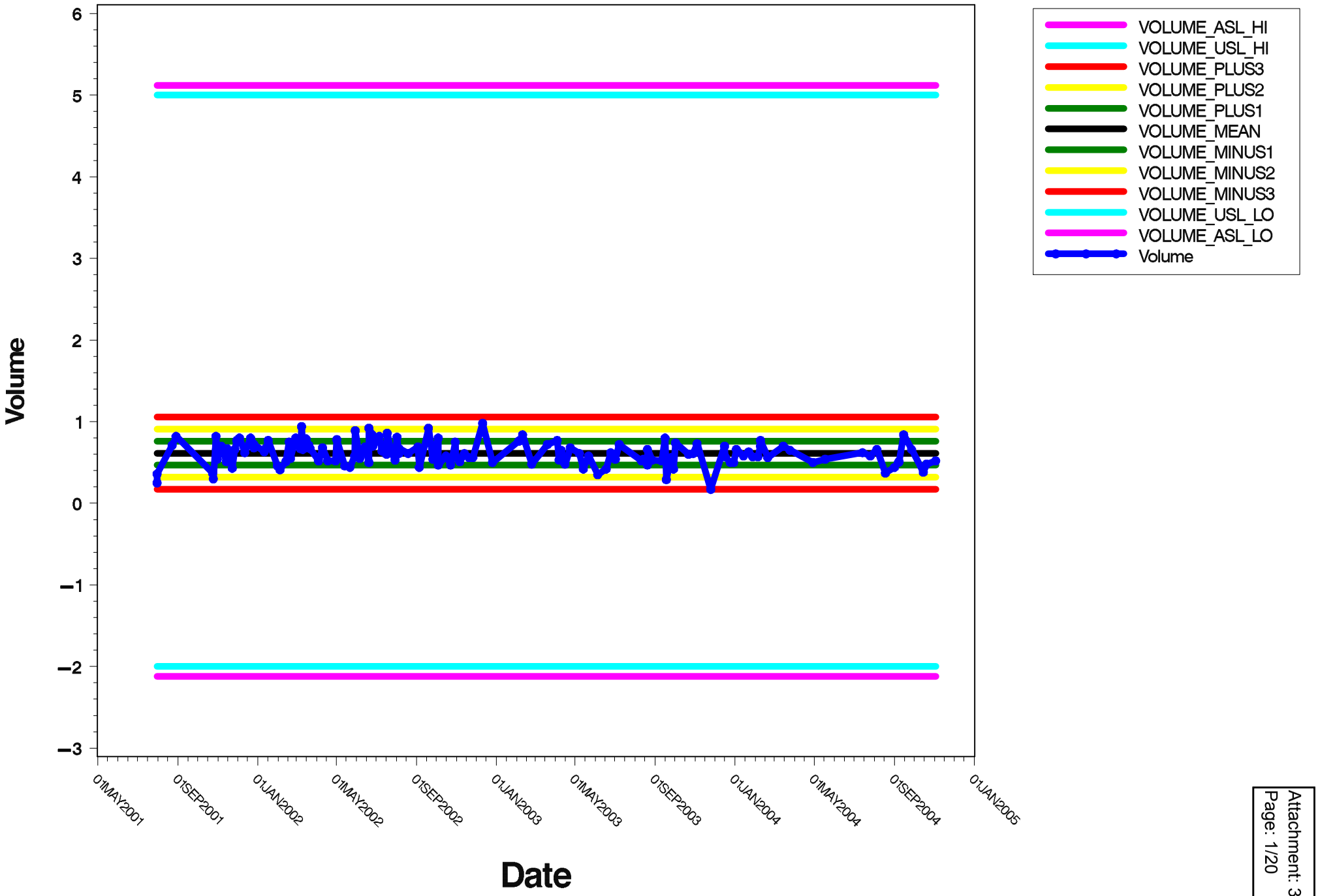
		n		
-63.95	x le -3	0		
-51.67	-3 lt x le -2	0	-1 < yi ≤ 1	69.6%
-39.40	-2 lt x le -1	3	-2 < yi ≤ 2	95.7%
-27.12	-1 lt x le 0	10	-3 < yi ≤ 3	100.0%
-14.85	0 lt x le 1	6	>3	0.0%
-2.57	1 lt x le 2	3		
9.71	2 lt x le 3	1		
	3 lt x	0		

Mean = -27.12
STD = 12.28



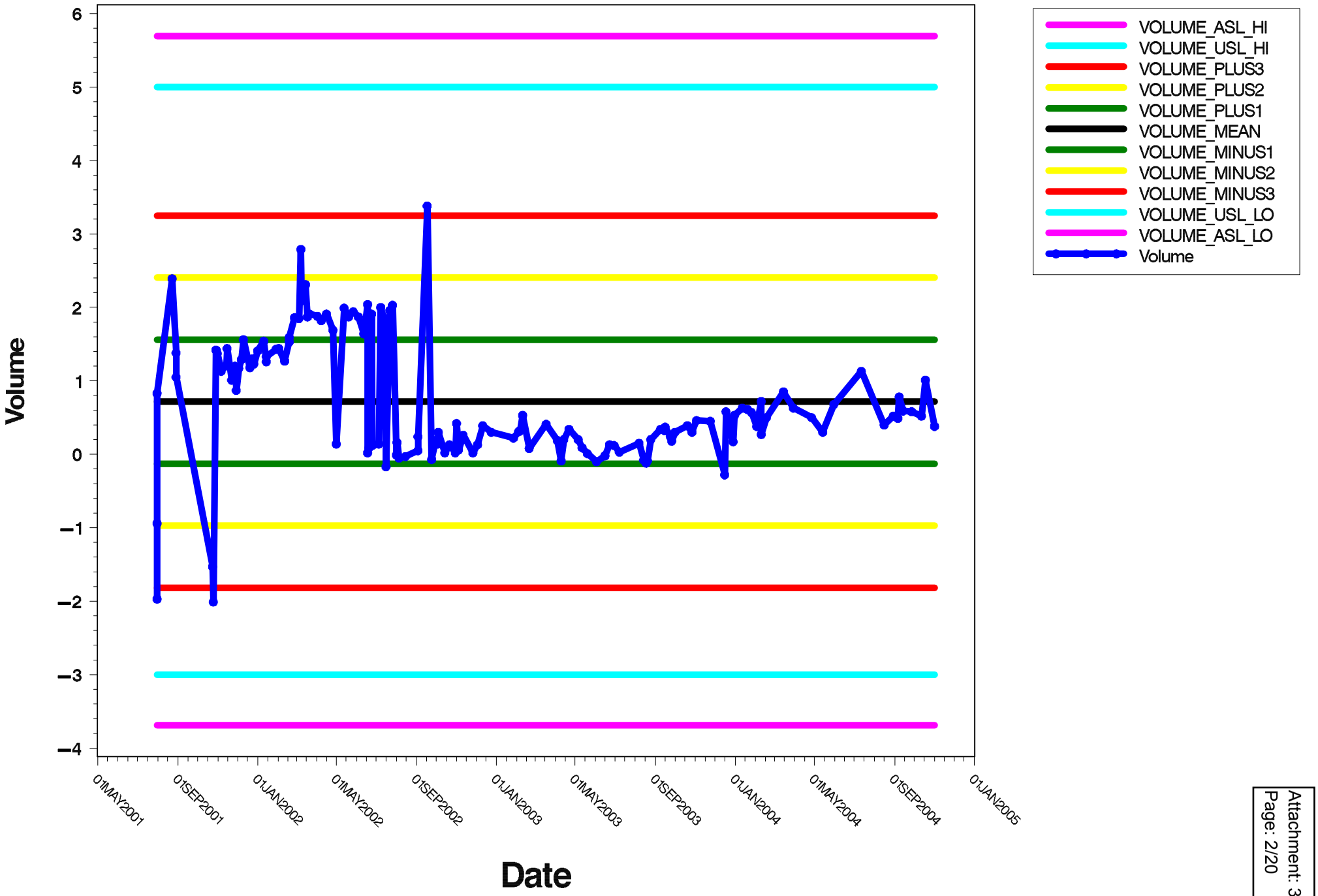
Volume

Elastomer= Fluoroelastomer



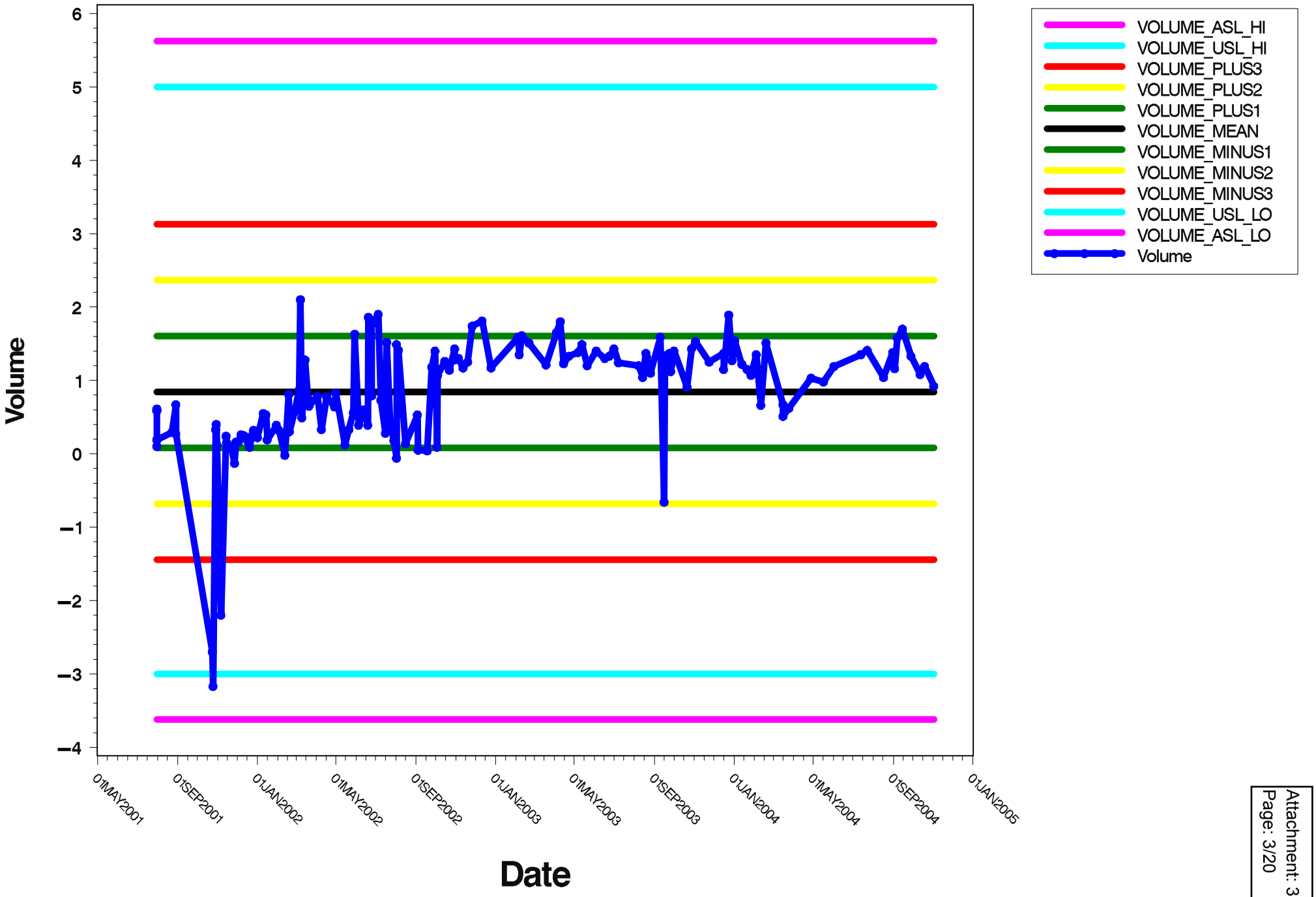
Volume

Elastomer = Nitrile



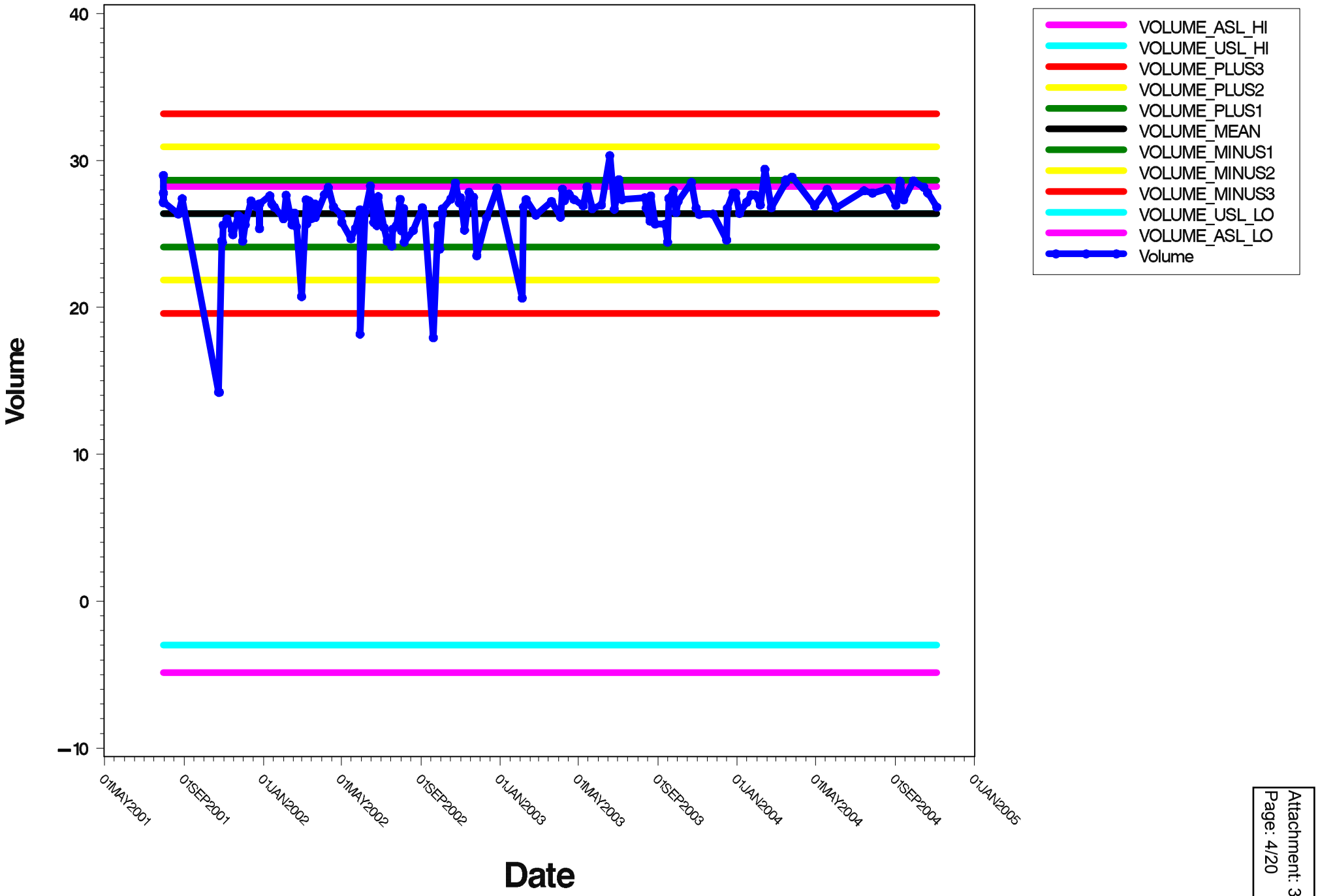
Volume

Elastomer= Polyacrylate



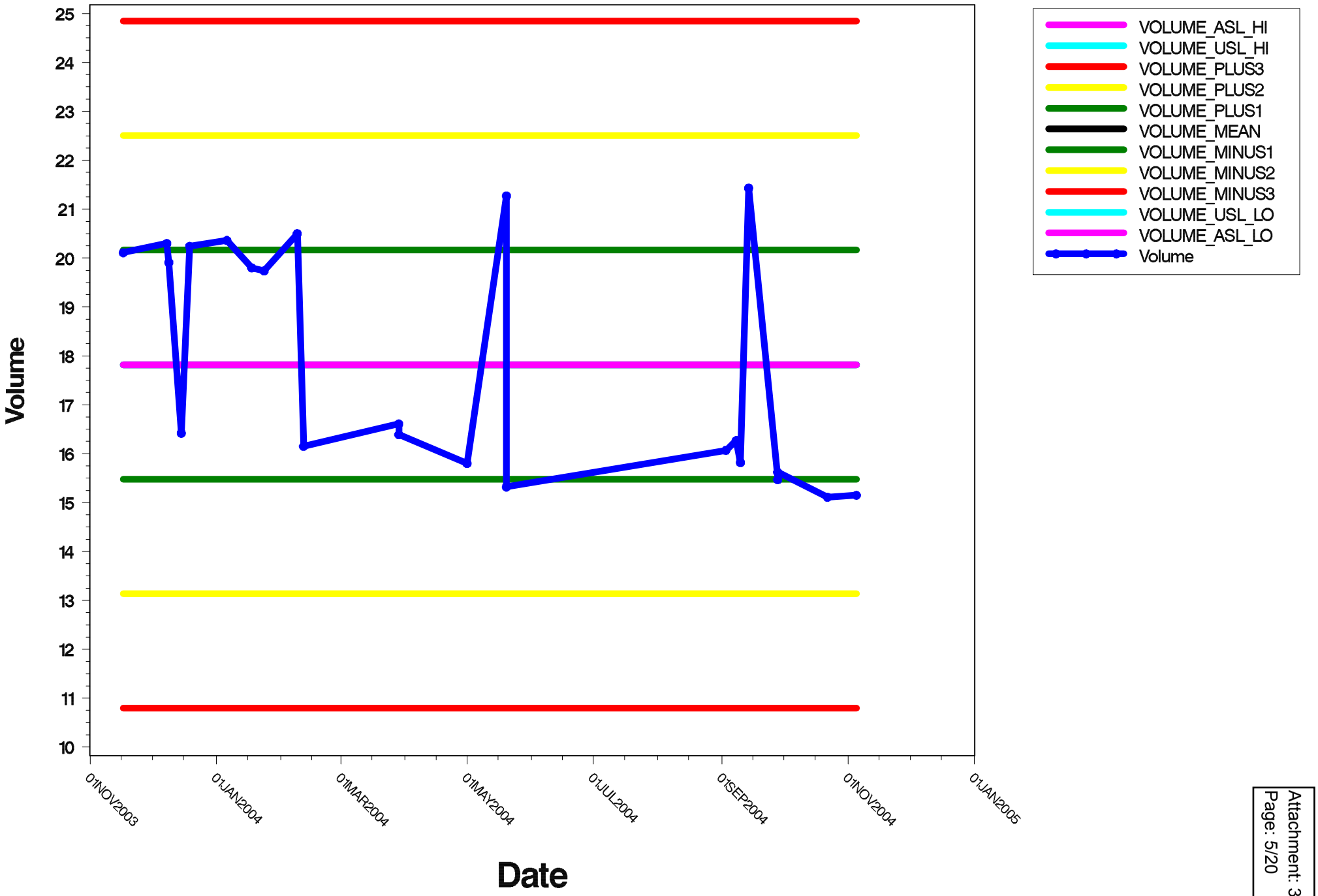
Volume

Elastomer= Silicone



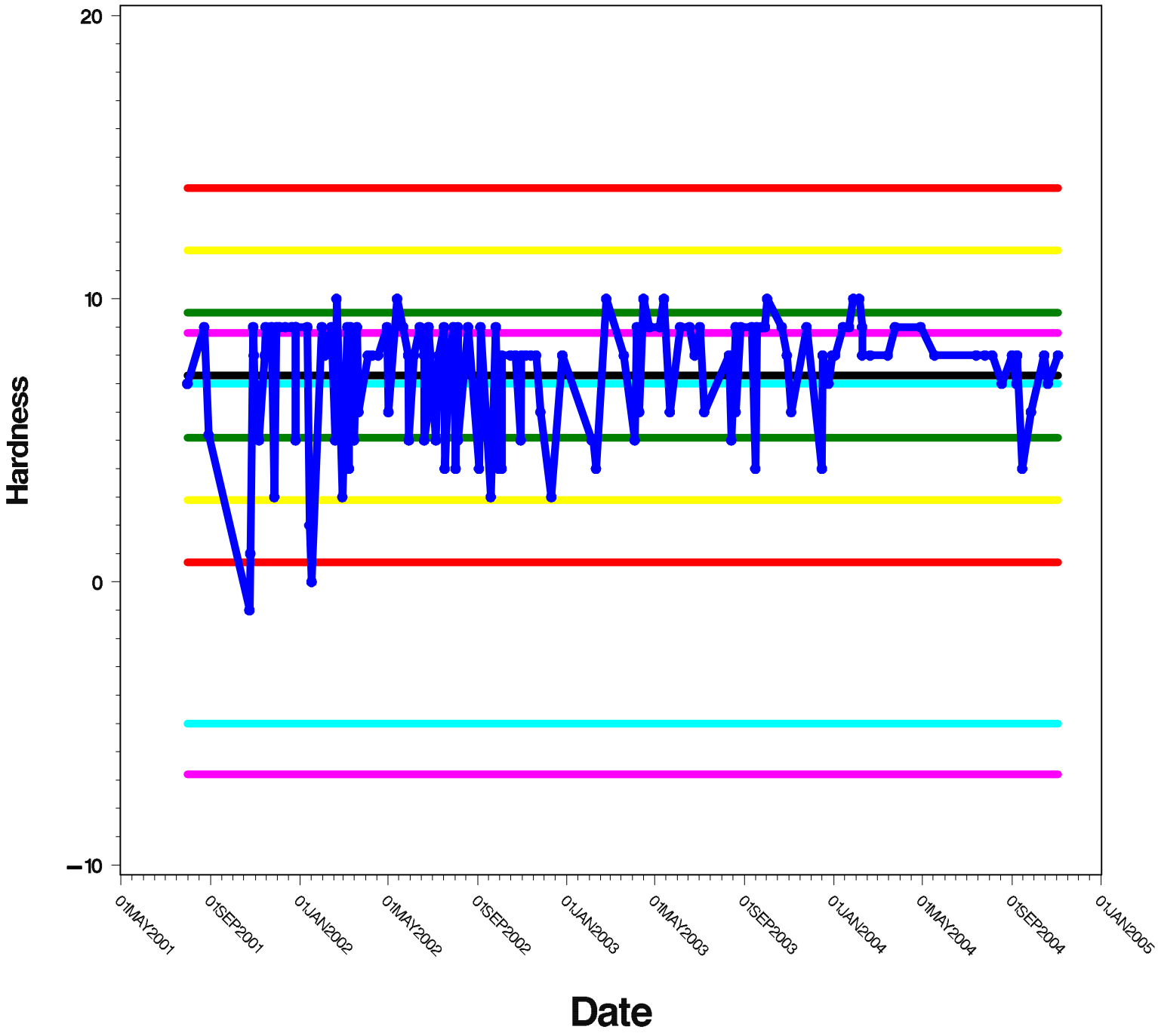
Volume

Elastomer = Vamac



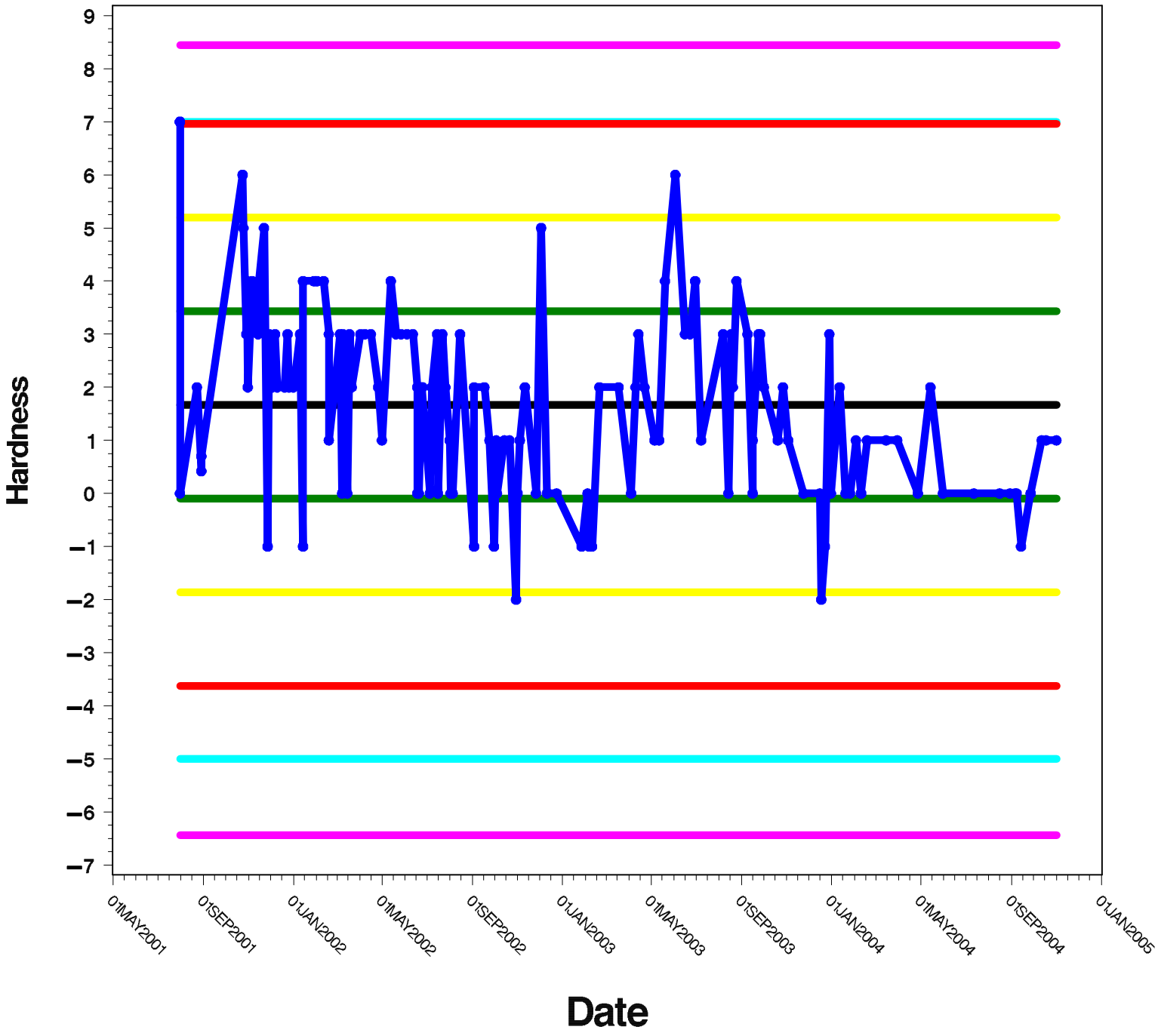
Hardness

Elastomer= Fluoroelastomer



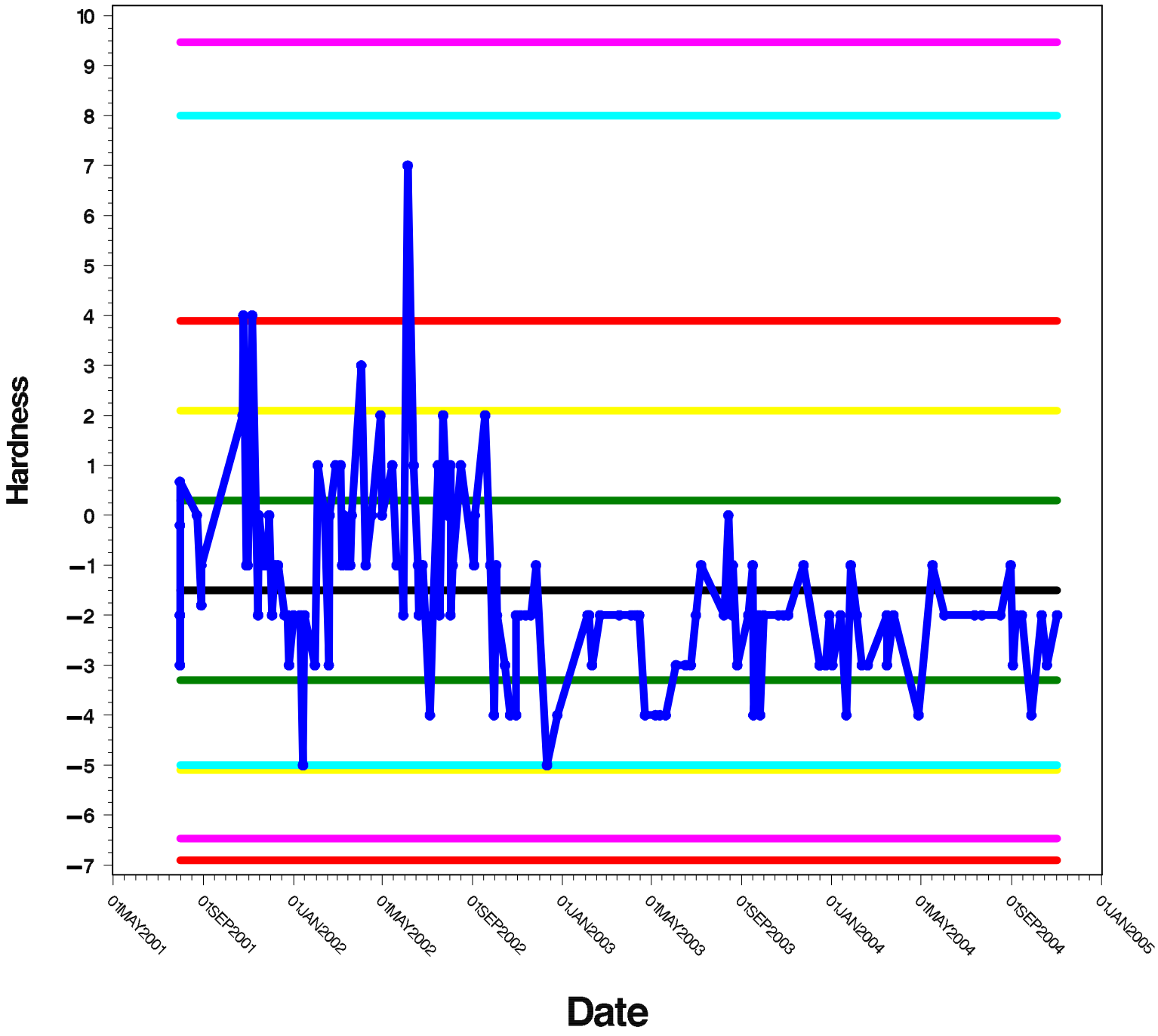
Hardness

Elastomer = Nitrile



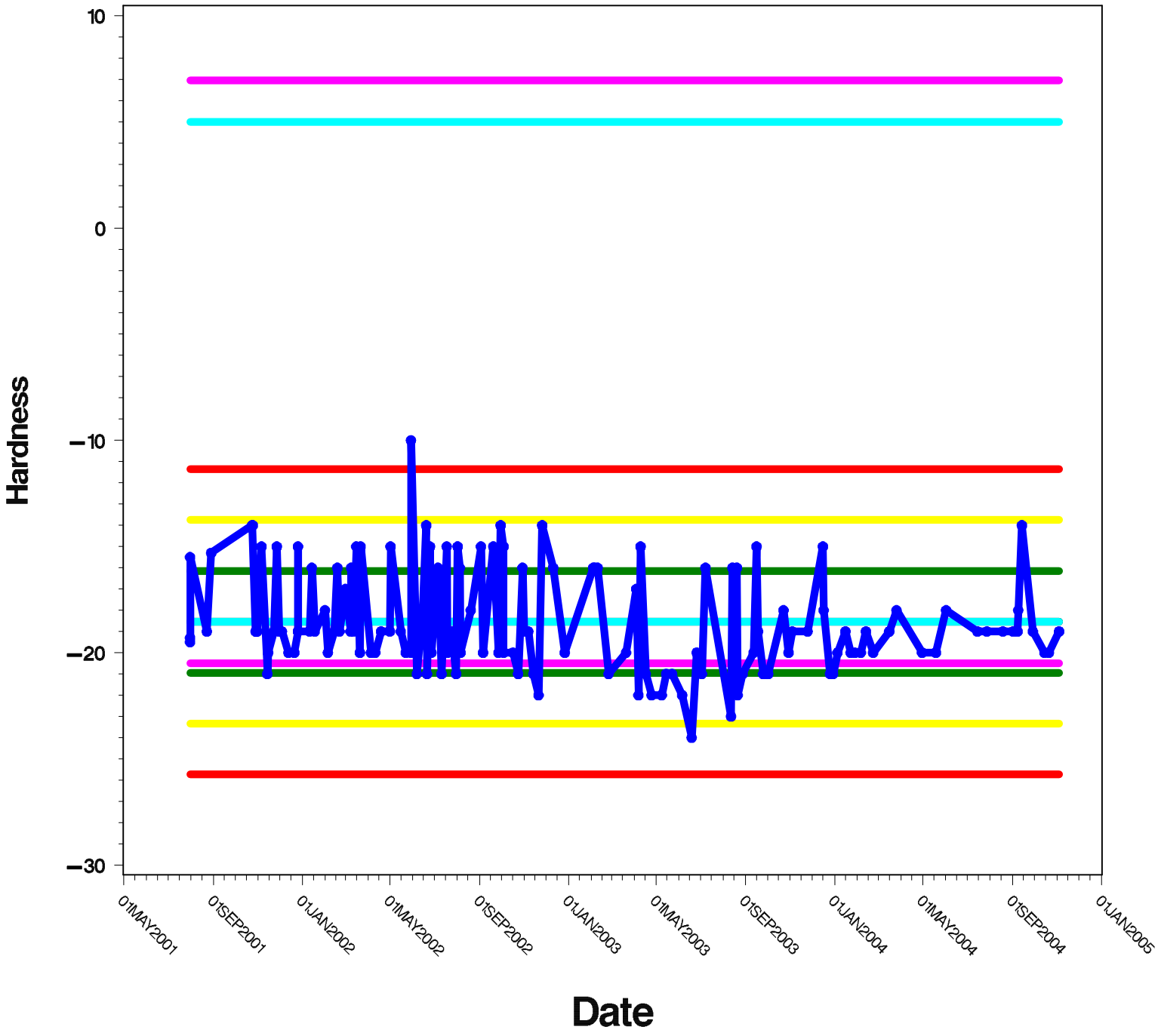
Hardness

Elastomer= Polyacrylate



Hardness

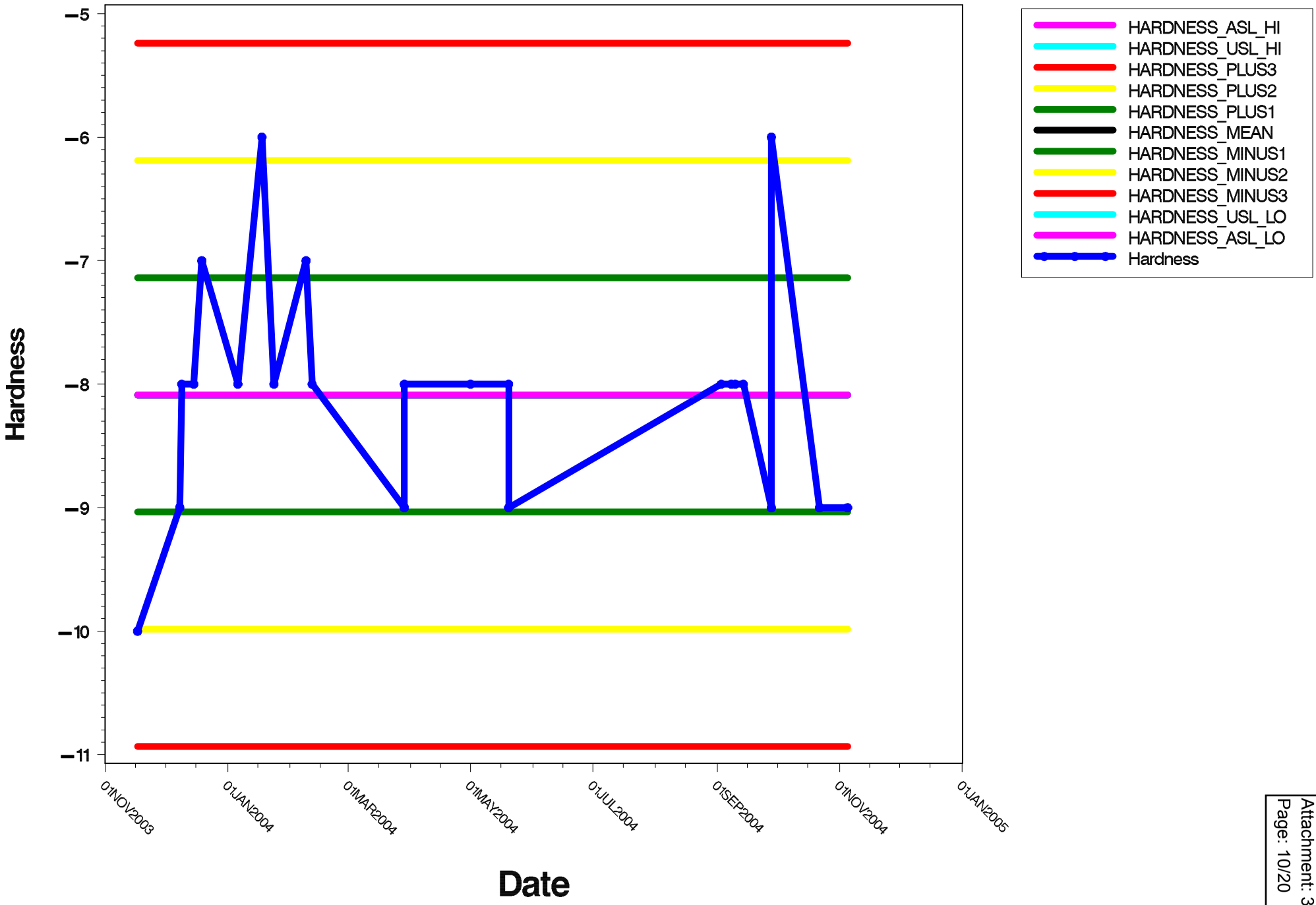
Elastomer= Silicone



HARDNESS_ASL_HI
HARDNESS_USL_HI
HARDNESS_PLUS3
HARDNESS_PLUS2
HARDNESS_PLUS1
HARDNESS_MEAN
HARDNESS_MINUS1
HARDNESS_MINUS2
HARDNESS_MINUS3
HARDNESS_USL_LO
HARDNESS_ASL_LO
Hardness

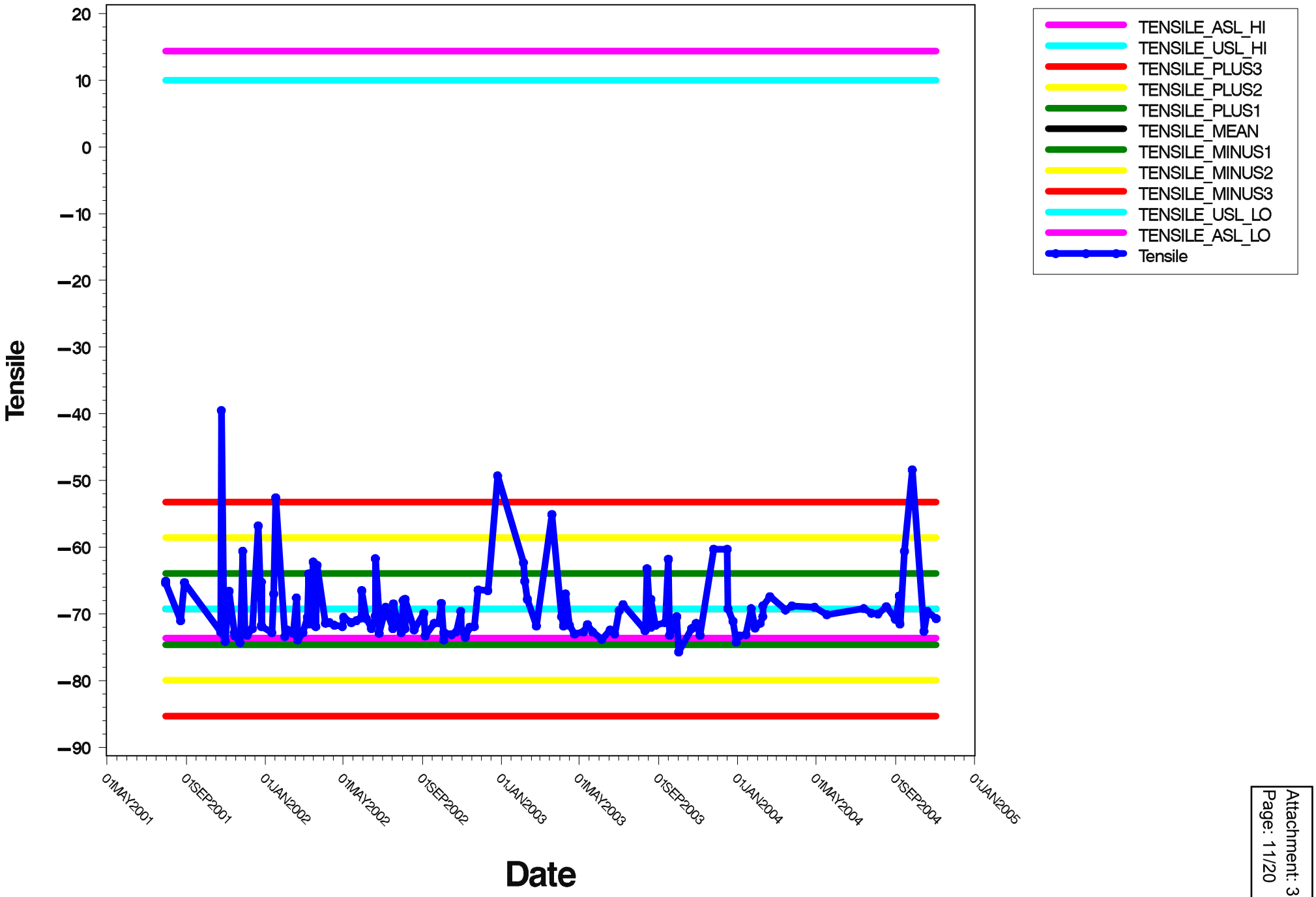
Hardness

Elastomer = Vamac



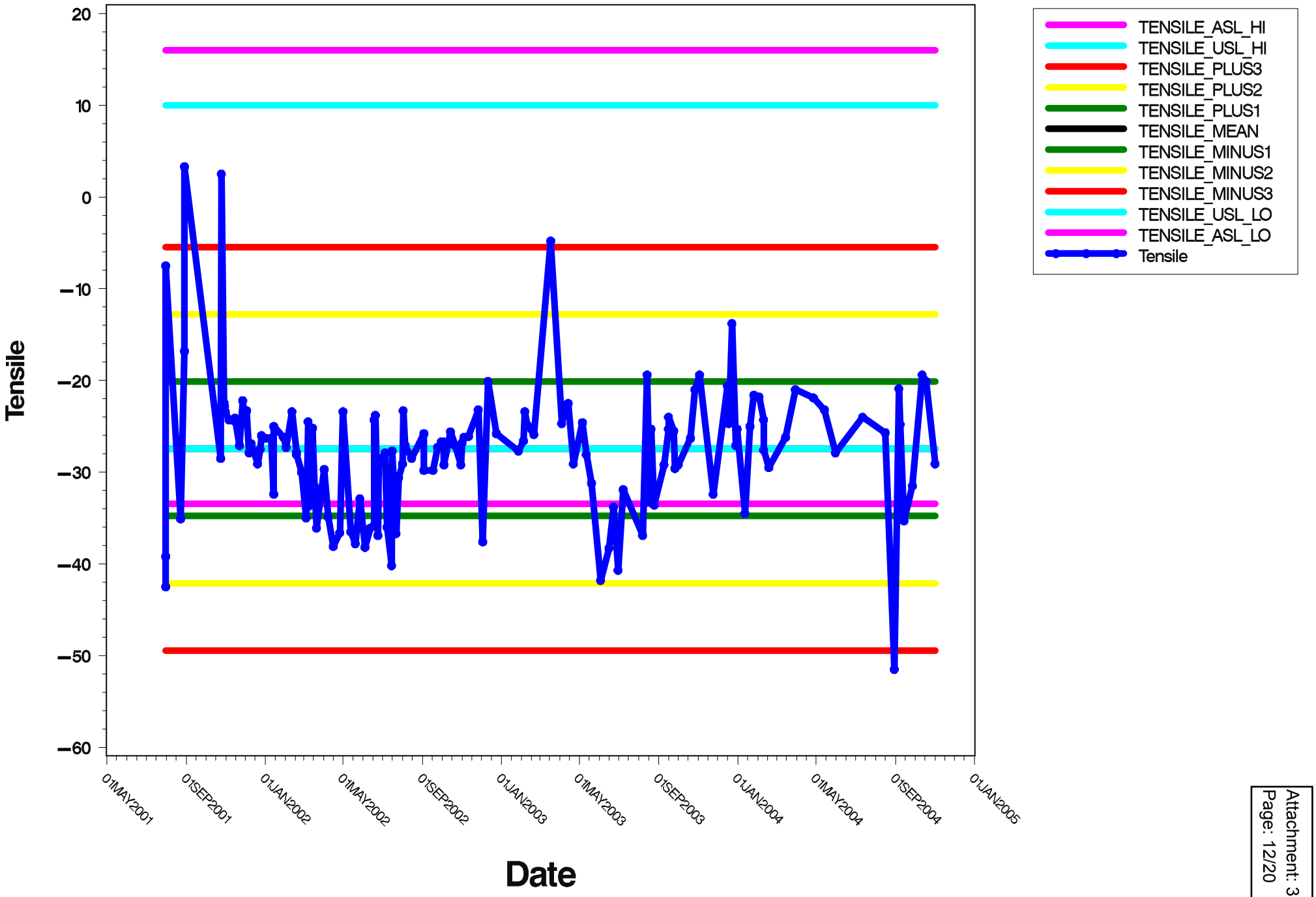
Tensile

Elastomer= Fluoroelastomer



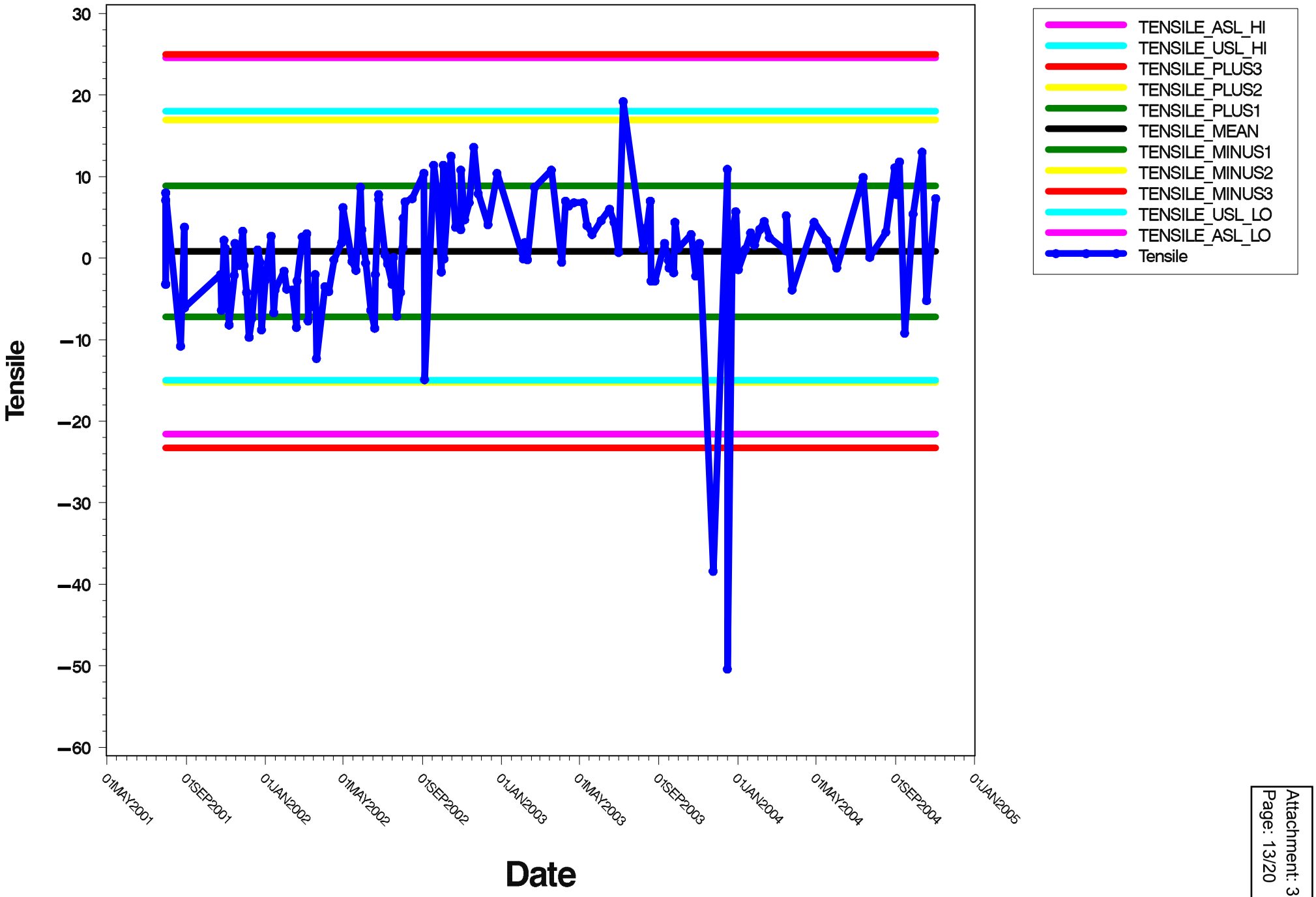
Tensile

Elastomer = Nitrile



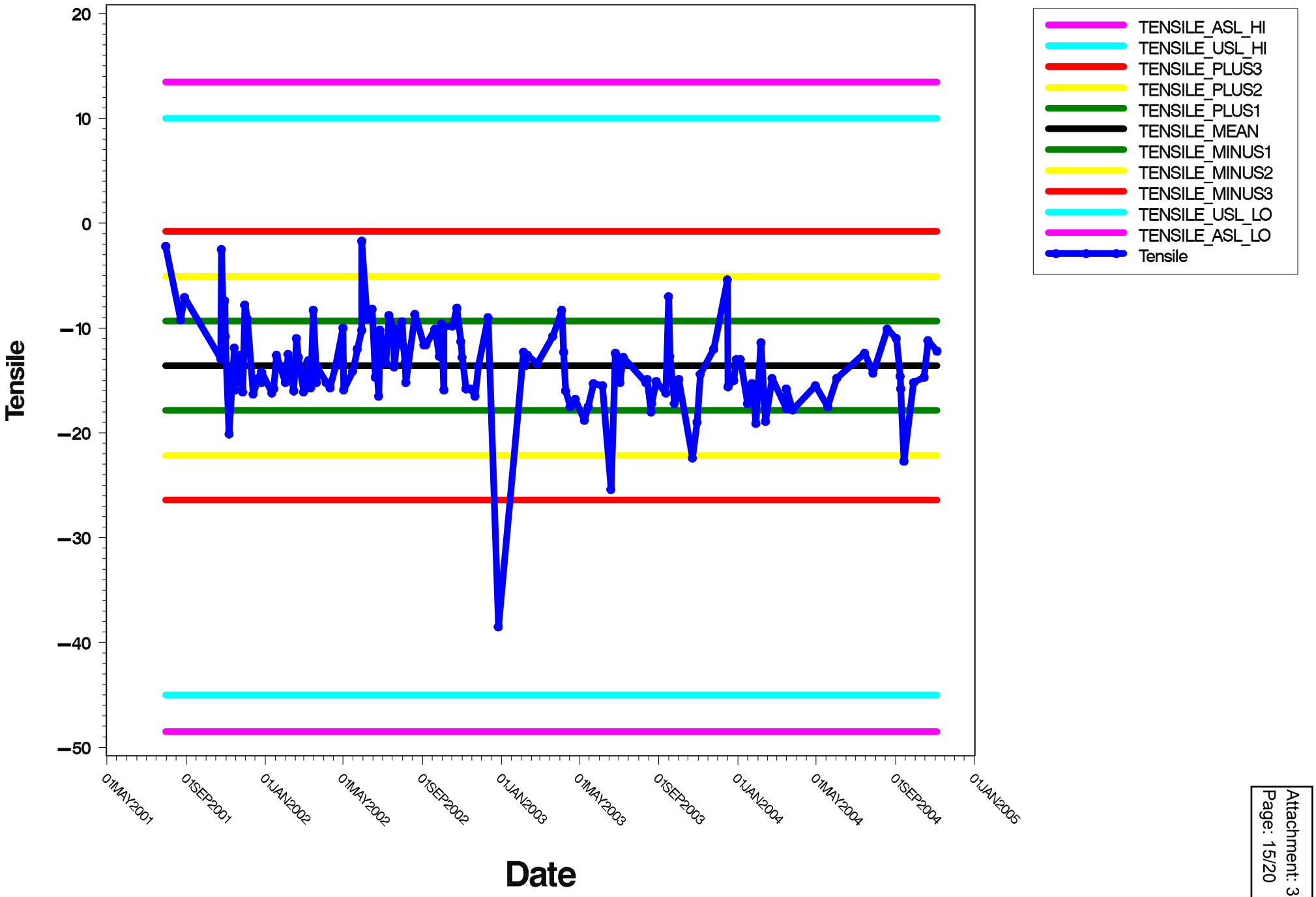
Tensile

Elastomer= Polyacrylate



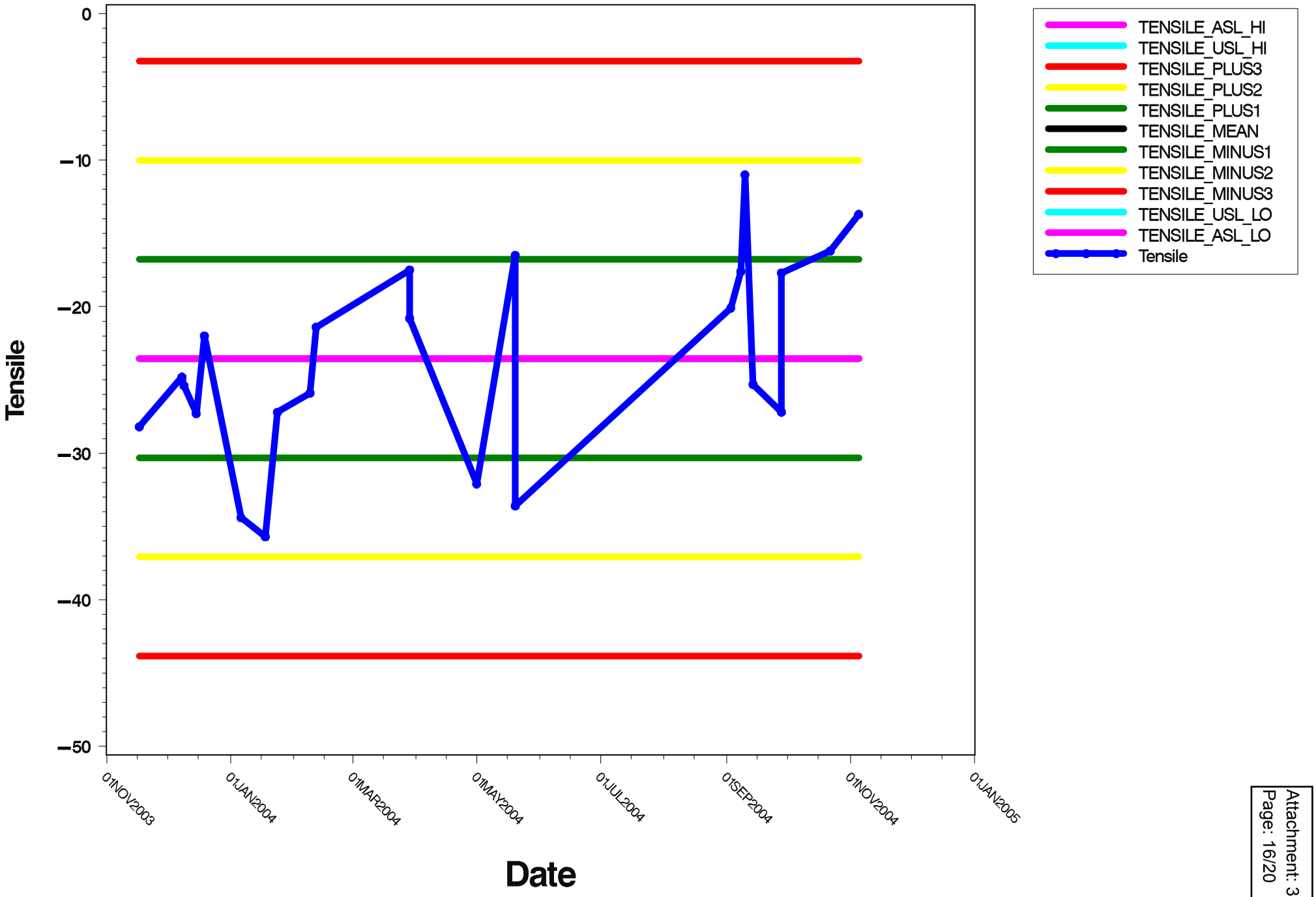
Tensile

Elastomer= Silicone



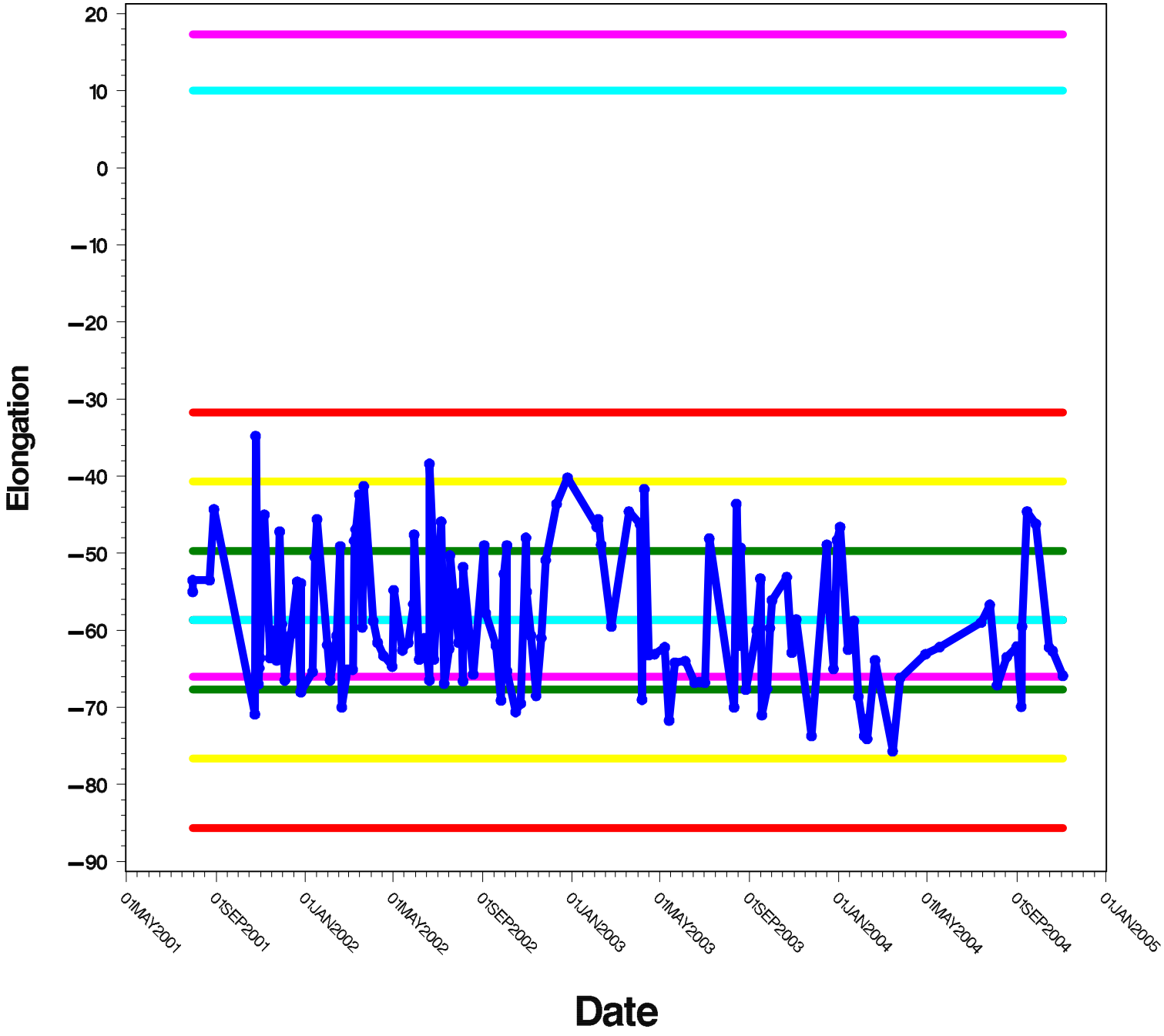
Tensile

Elastomer = Vamac



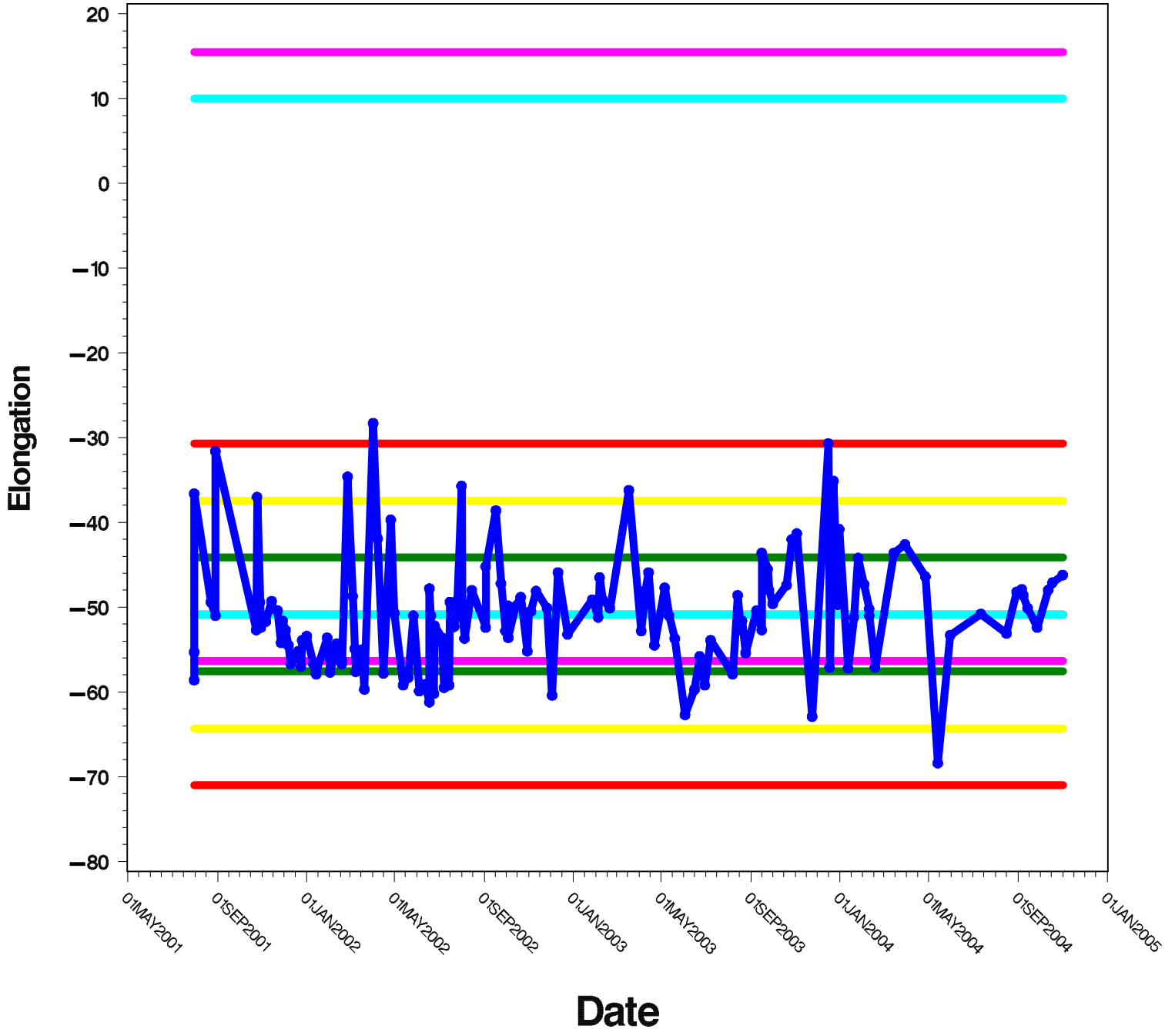
Elongation

Elastomer= Fluoroelastomer



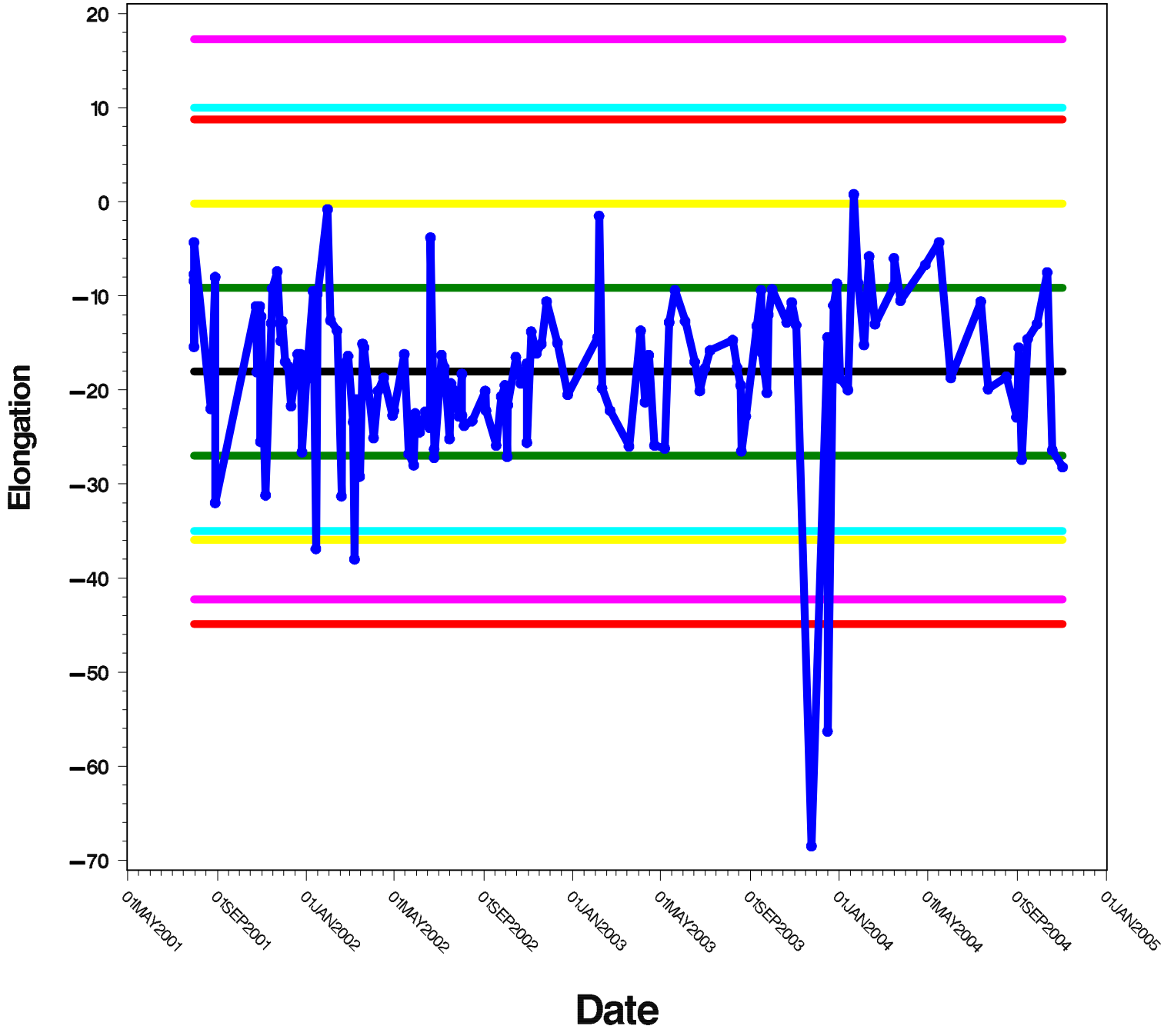
Elongation

Elastomer = Nitrile



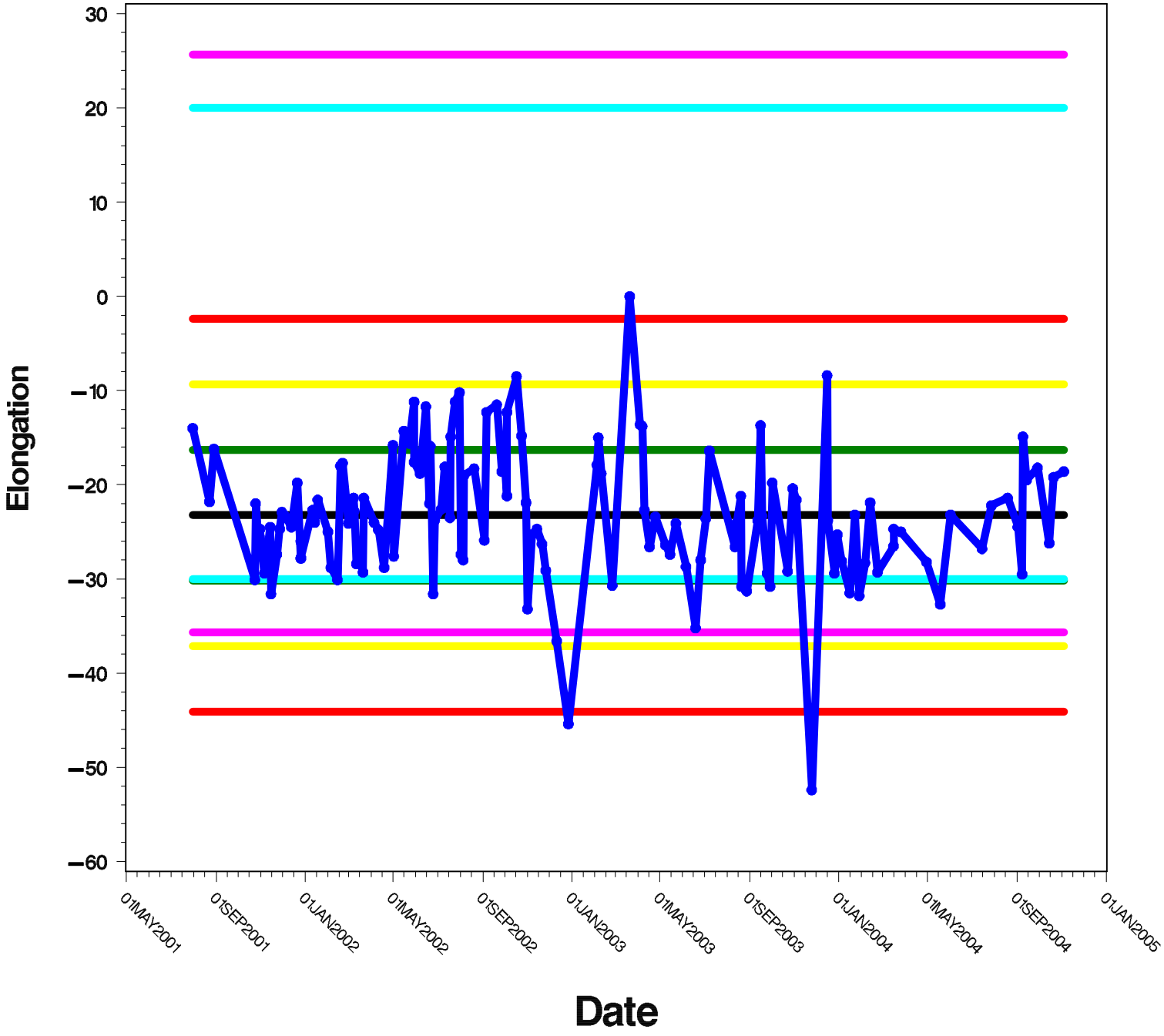
Elongation

Elastomer= Polyacrylate



Elongation

Elastomer= Silicone



Elongation

Elastomer = Vamac