



# Test Monitoring Center

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412-365-1000

MEMORANDUM: 10-027  
DATE: July 6, 2010  
TO: EOEC Surveillance Panel  
FROM: Michael T. Kasimirsky *Michael T. Kasimirsky*  
SUBJECT: LDEOC Reference Oil 1006-1 Updated Test Targets

When the EOEC Surveillance Panel approved the introduction of the light duty elastomer materials into the EOEC test as the LDEOC, the panel approved a target update after six months as part of that action. These updated test targets are shown in Table 1, below:

Elastomer	Parameter	Mean	Standard Deviation
Hydrogenated Nitrile (N=48)	Volume Change, %	1.11	0.60
	Hardness Change, pts.	-1.15	0.87
	Tensile Strength Change, %	-2.08	4.87
Polyacrylate (N=42)	Volume Change, %	4.21	0.32
	Hardness Change, pts.	-5.33	1.03
	Tensile Strength Change, %	-4.82	6.85
Fluoroelastomer (N=38)	Volume Change, %	0.69	0.15
	Hardness Change, pts.	3.47	1.01
	Tensile Strength Change, %	-52.28	4.34
Silicone (N=39)	Volume Change, %	32.99	2.67
	Hardness Change, pts.	-21.56	2.04
	Tensile Strength Change, %	-38.06	3.79
Ethylene Acrylate (N=42)	Volume Change, %	24.85	0.77
	Hardness Change, pts.	-12.43	0.91
	Tensile Strength Change, %	-15.30	3.87

The individual test results used in generation of these test targets are shown in Tables 2-6. The individual test results, initial test target acceptance range, and the updated test target acceptance range for Reference Oil 1006-1 for *Volume Change*, *Hardness*, and *Tensile Stress*, on each of the five elastomer types used, are plotted in Figures 1 through 15, respectively.

These targets are effective on July 15, 2010.

c: <ftp://ftp.astmtmc.cmu.edu/docs/bench/ldeoc/memos/mem10-027.pdf>

Distribution: electronic mail

Testkey	Lab	Bath	Date	Validity	VOLC	HARD	TENS
71731	A	5	20100112	AC	23.81	-14	-19.8
71829	G	2	20100120	AC	24.36	-14	-9.4
71771	B	1	20100121	AC	24.34	-12	-17.7
71736	A	5	20100126	AC	23.82	-12	-20.5
73683	G	2	20100127	AC	25.59	-12	-12.8
73688	G	2	20100204	AC	25.57	-13	-10.6
71772	B	4	20100205	AC	24.33	-12	-15
73693	G	2	20100211	AC	25.54	-12	-11.9
73698	G	2	20100216	AC	25.18	-12	-10.4
71781	B	1	20100222	OC	24.35	-12	-25.4
71743	A	5	20100224	AC	24.07	-12	-14.9
73703	G	2	20100304	AC	26.3	-13	-11.9
73708	G	2	20100304	AC	26.52	-14	-15
73713	G	2	20100304	AC	26.24	-12	-14.6
71748	A	5	20100311	AC	24.3	-12	-20.5
73718	G	2	20100319	AC	25.98	-12	-13.3
74471	G	2	20100319	AC	25.72	-12	-13.4
74477	G	2	20100325	AC	26.25	-12	-16.3
71753	A	5	20100326	AC	24.62	-14	-22.5
71786	B	1	20100329	AC	24.46	-11	-17.5
71758	A	5	20100404	AC	24.02	-13	-18.3
74482	G	2	20100415	AC	26	-14	-13.1
71792	B	1	20100419	AC	25.07	-13	-14.9
71797	B	8	20100421	AC	24.86	-11	-10.8
71802	B	7	20100428	AC	24.82	-11	-13.4
71763	A	5	20100503	AC	24.28	-14	-12.7
75240	B	8	20100505	AC	24.38	-11	-12.1
74488	G	2	20100507	AC	25.8	-13	-8.8
74981	A	5	20100507	AC	24.28	-14	-18.8
75246	B	4	20100507	AC	24.4	-13	-11.8
75247	B	7	20100513	AC	24.42	-12	-15.3
74984	A	5	20100514	AC	24.44	-12	-13.4
75254	B	8	20100519	AC	24.2	-12	-13.5
73344	A	5	20100521	AC	24.07	-13	-13.4
75261	B	3	20100601	AC	24.76	-12	-20.7
74767	G	2	20100602	AC	24.5	-12	-15.2
74766	G	2	20100603	AC	24.56	-12	-14.5
74989	A	5	20100603	AC	24.34	-13	-11.2
74777	G	2	20100609	AC	25.7	-11	-18.2
75266	B	1	20100610	AC	24.88	-12	-19.6
74773	G	1	20100616	AC	24.24	-12	-22
74994	A	1	20100619	AC	24.2	-13	-17.4

Testkey	Lab	Bath	Date	Validity	VOLC	HARD	TENS
71729	A	3	20100106	AC	0.7	4	-59.4
71767	B	3	20100119	AC	0.51	2	-51.3
71734	A	3	20100120	AC	0.54	3	-56.1
71830	G	2	20100120	AC	0.9	3	-48.6
73684	G	2	20100127	AC	0.84	3	-45
71774	B	5	20100201	AC	0.63	4	-53.4
73689	G	2	20100205	AC	0.76	3	-48.4
73694	G	2	20100215	AC	0.69	3	-43.8
73699	G	2	20100215	AC	0.83	4	-45.9
71741	A	3	20100219	AC	0.53	4	-55.8
71778	B	1	20100219	AC	0.52	3	-56.4
73704	G	2	20100304	AC	0.84	1	-48.7
73709	G	2	20100304	AC	0.75	4	-46.9
73714	G	2	20100304	AC	1.08	2	-45.6
71746	A	3	20100309	AC	0.74	4	-57.7
73719	G	2	20100318	AC	0.88	3	-49.1
71751	A	3	20100324	AC	0.61	5	-59
74472	G	2	20100324	AC	0.86	2	-47.8
74478	G	2	20100325	AC	0.7	3	-50.4
71783	B	1	20100326	AC	0.59	4	-55.1
71756	A	3	20100409	AC	0.6	2	-59
74483	G	2	20100413	AC	0.82	3	-48.3
71789	B	1	20100419	AC	0.67	4	-54.5
71794	B	8	20100421	AC	0.67	3	-50.4
71799	B	3	20100426	AC	0.72	3	-55.8
71761	A	3	20100427	AC	0.46	6	-55.7
74987	A	3	20100428	AC	0.8	5	-53.7
71804	B	1	20100503	AC	0.53	4	-56.8
75242	B	4	20100506	AC	0.34	4	-56.5
74489	G	2	20100507	AC	0.91	4	-51
74979	A	3	20100512	AC	0.69	4	-58
75250	B	3	20100512	AC	0.61	3	-53.2
75253	B	1	20100517	AC	0.62	4	-49.7
75257	B	3	20100601	AC	0.7	4	-52.5
74497	G	2	20100603	AC	0.89	2	-52.2
74775	G	2	20100609	AC	0.6	4	-47.9
75262	B	5	20100609	AC	0.51	4	-52
74992	A	3	20100623	AC	0.49	5	-55.2

Testkey	Lab	Bath	Date	Validity	VOLC	HARD	TENS
71727	A	2	20100104	AC	1.61	-1	3.8
71732	A	2	20100118	AC	1.74	-2	-6
71831	G	1	20100120	AC	2.03	-1	-3.3
71769	B	2	20100122	AC	1.64	0	-1.7
73685	G	1	20100127	AC	1.79	-1	1.7
71737	A	6	20100201	AC	1.59	-1	-3.1
71775	B	6	20100202	AC	1.61	-2	-4.4
73690	G	1	20100203	AC	1.88	0	9.7
73695	G	1	20100215	AC	1.76	-1	10
71739	A	2	20100217	AC	1.81	-2	5
71782	B	6	20100222	AC	1.28	-2	0.2
73710	G	1	20100223	OC	-0.46	-1	0.8
71744	A	2	20100303	AC	1.63	-2	-0.1
73715	G	1	20100304	AC	1.99	0	5.3
73716	G	1	20100308	AC	1.15	0	-14.4
73794	G	1	20100316	OC	0.53	-1	-4.9
73793	G	1	20100317	OC	0.52	0	-3.9
71749	A	2	20100318	AC	1.46	-1	0.3
71787	B	2	20100329	AC	1.71	-2	-3.8
74469	G	1	20100329	OC	0.54	0	-4
74484	G	1	20100330	AC	1.02	-2	-2.9
74474	G	1	20100401	OC	0.65	-1	-5.1
71754	A	2	20100407	AC	1.09	-3	-0.7
71788	B	6	20100409	OC	0.53	1	2.8
71793	B	6	20100419	AC	1.63	-1	-2.4
74486	G	1	20100420	OC	0.58	-1	-4.5
71798	B	2	20100421	AC	1.63	-1	1.1
74479	G	1	20100421	OC	0.65	-2	-5.1
74491	G	1	20100421	OC	0.51	-2	-4.9
71759	A	2	20100422	AC	1.23	0	-0.2
71803	B	2	20100428	AC	1.73	-1	1.3
71806	B	2	20100504	AC	1.73	-1	-3.6
75241	B	6	20100505	AC	0.51	-1	-2.8
71765	A	2	20100507	AC	0.16	-2	-7
75244	B	6	20100507	AC	1.57	-1	0.6
74492	G	1	20100510	AC	0.54	1	-11.4
74982	A	8	20100510	AC	0.77	-2	2.2
75249	B	2	20100513	AC	1.63	-2	-3.6
74493	G	1	20100517	AC	0.48	-2	-10.4
74494	G	1	20100517	AC	0.52	-1	-8.1
75256	B	6	20100517	AC	1.51	-2	-4.1
74985	A	2	20100525	AC	1.08	-2	6.3
74495	G	1	20100528	AC	0.62	-1	-4.4
75259	B	2	20100601	AC	0.8	-1	-2
74774	G	1	20100610	AC	0.01	-1	-8.6
75263	B	6	20100611	AC	0.63	-2	-3
74990	A	2	20100619	AC	0.95	-2	-2.3
74778	G	1	20100622	AC	0.57	0	-4.4

Testley	Lab	Bath	Date	Validity	VOLC	HARD	TENS
71728	A	4	20100105	AC	3.7	-6	-8.3
71733	A	4	20100119	AC	3.94	-6	-4.5
71828	G	2	20100120	AC	4.43	-5	-3
71768	B	3	20100121	AC	4.24	-7	-1.2
73682	G	2	20100127	AC	4.29	-5	8.4
71776	B	7	20100203	AC	4.34	-7	-7.1
73687	G	2	20100204	AC	4.43	-6	7.2
73692	G	2	20100211	AC	4.62	-5	5.6
71740	A	4	20100218	AC	3.86	-4	-10.8
73697	G	2	20100218	AC	4.61	-7	-1.9
71745	A	4	20100308	AC	3.9	-5	-16.1
73707	G	2	20100315	AC	4.66	-5	-8.4
73702	G	2	20100316	AC	4.64	-6	-5.3
73712	G	2	20100318	AC	4.64	-6	-5.7
73717	G	2	20100324	AC	4.64	-4	-18.8
74470	G	2	20100324	AC	4.41	-4	-9.1
71784	B	1	20100326	AC	4.32	-7	-9.7
74475	G	2	20100330	AC	4.35	-6	-5.9
71755	A	4	20100408	AC	3.73	-6	-4
74476	G	2	20100409	AC	4.62	-6	-6.8
74481	G	2	20100409	AC	4.56	-6	-3.8
71790	B	1	20100419	AC	4.34	-6	-7
71795	B	8	20100421	AC	4.33	-6	-6.9
71760	A	4	20100426	AC	3.79	-5	1.9
71779	B	1	20100426	AC	4.47	-6	-17.7
71800	B	3	20100427	AC	4.32	-5	1.2
71764	A	4	20100504	AC	3.83	-4	-15.1
71805	B	1	20100504	AC	4.1	-5	-1.4
75243	B	5	20100506	AC	4.05	-6	0.5
74487	G	2	20100510	AC	4.62	-5	-6.3
71766	A	4	20100511	AC	3.71	-4	10.2
75248	B	7	20100512	AC	4.1	-6	2.5
75252	B	1	20100518	AC	4	-6	1.6
74769	G	2	20100525	AC	4.22	-6	-8.9
74496	G	2	20100526	AC	4.22	-6	-8.9
74986	A	4	20100526	AC	3.92	-4	-4.7
75258	B	3	20100601	AC	4.49	-5	-0.3
75264	B	5	20100609	AC	4.08	-5	-4
74780	G	2	20100611	AC	3.77	-3	-10.9
74771	G	2	20100616	AC	3.88	-4	-12.8
74991	A	4	20100622	AC	3.72	-5	5.5
74781	G	2	20100624	AC	3.87	-3	-11.7

Table 6: Silicone Test Target Data							
Testkey	Lab	Bath	Date	Validity	VOLC	HARD	TENS
71827	G	2	20100105	AC	33.92	-18	-31.2
71730	A	1	20100111	AC	29.88	-20	-41.9
71770	B	1	20100120	OC	22.41	-24	-35
73681	G	2	20100120	AC	34.97	-19	-37.6
71735	A	1	20100125	AC	30.34	-22	-38.6
73686	G	2	20100127	AC	33.99	-18	-34.3
71738	A	7	20100202	AC	30.35	-23	-42.3
71773	B	4	20100204	AC	35.28	-23	-38.4
73691	G	2	20100204	AC	34.23	-21	-33.3
71777	B	5	20100212	AC	34.7	-23	-33.7
73696	G	2	20100217	AC	35.14	-18	-32.1
73701	G	2	20100218	AC	35.21	-19	-38.6
71742	A	1	20100222	AC	30.14	-22	-41.8
71780	B	1	20100222	AC	35.72	-24	-35.8
71747	A	1	20100310	AC	29.1	-22	-43.6
73706	G	2	20100311	AC	32.9	-20	-33.4
73711	G	1	20100318	AC	34.32	-19	-34.6
73720	G	2	20100322	AC	31.99	-21	-39.6
74473	G	2	20100322	AC	33.02	-20	-35.9
71752	A	1	20100325	AC	31.13	-21	-40.4
74480	G	2	20100326	AC	33.28	-17	-36.6
71785	B	1	20100329	AC	35.49	-24	-39.9
71757	A	1	20100413	AC	30.23	-22	-40
71791	B	1	20100419	AC	35.04	-24	-36.5
71796	B	8	20100421	AC	34.44	-23	-40.5
74485	G	2	20100422	AC	32.3	-21	-32.7
71801	B	7	20100427	AC	34.41	-23	-33.1
71762	A	1	20100430	AC	30.52	-24	-43
75239	B	8	20100505	AC	34.8	-23	-36.9
75245	B	4	20100507	AC	35.47	-24	-42.4
74980	A	1	20100513	AC	28.69	-22	-40.1
75251	B	5	20100514	AC	34.98	-24	-41.5
74490	G	2	20100517	AC	34.47	-20	-39.8
75255	B	8	20100519	AC	34.57	-23	-33.7
74988	A	1	20100531	AC	32.69	-22	-37.6
75260	B	3	20100601	AC	34.74	-23	-45.1
74498	G	2	20100603	AC	34.09	-20	-45.8
75265	B	1	20100610	AC	35.08	-24	-36.7
74772	G	2	20100611	AC	32.7	-21	-40.2

Figure 1

# LDEOC Ethylene Acrylate Average Percent Volume Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

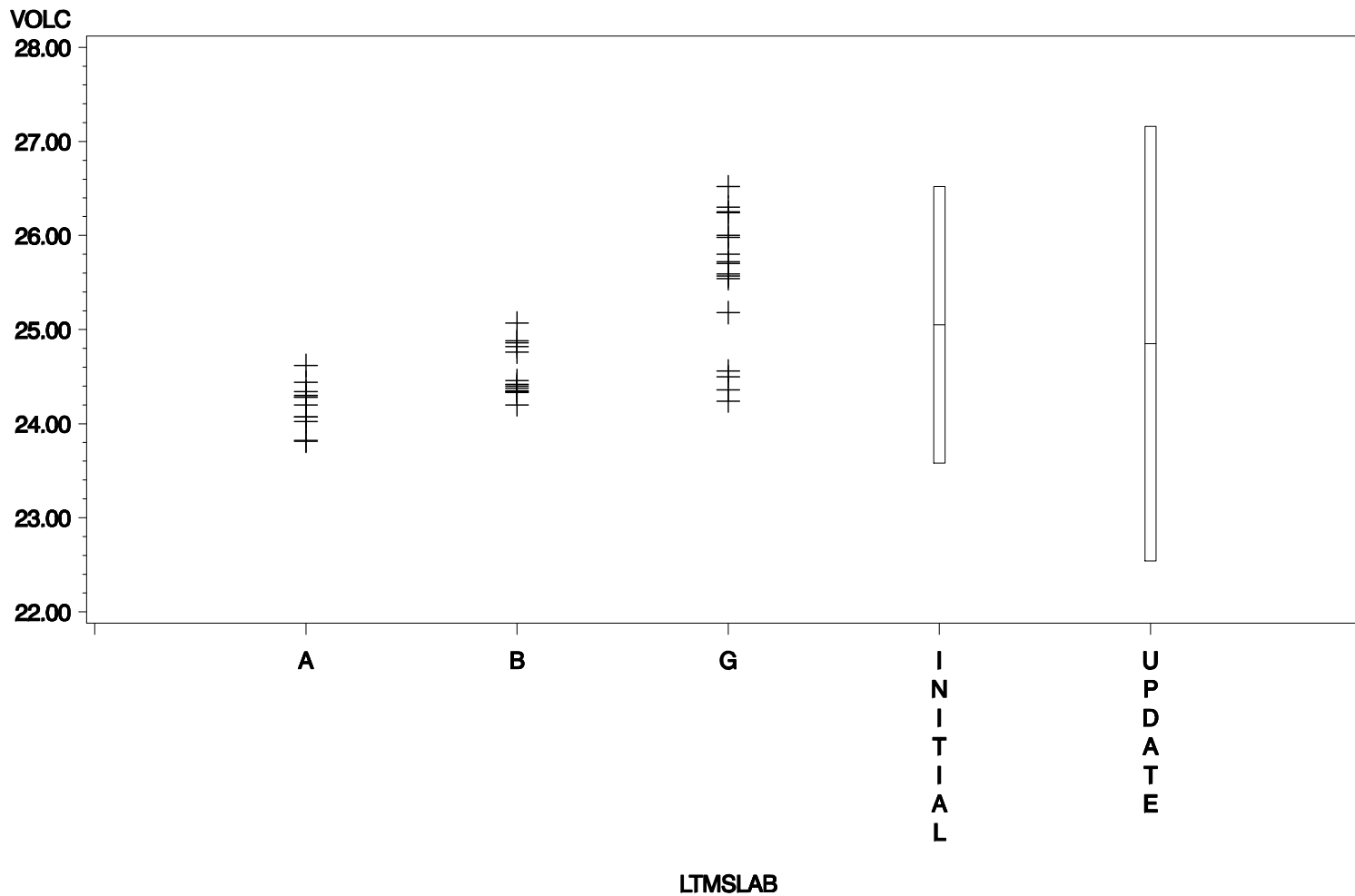


Figure 2

# LDEOC Ethylene Acrylate Average Shore A Hardness Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

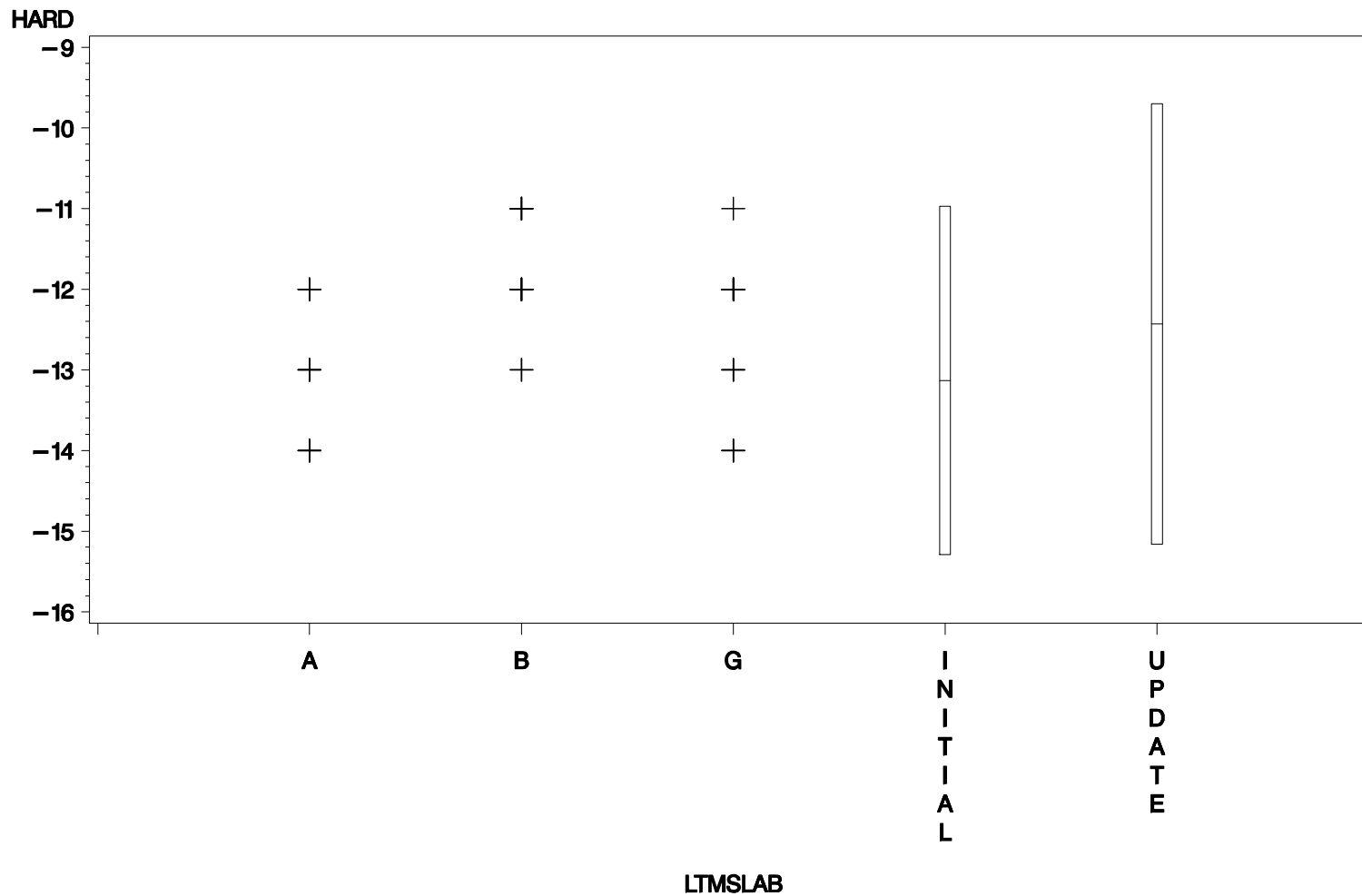




Figure 3

# LDEOC Ethylene Acrylate Average Tensile Strength Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

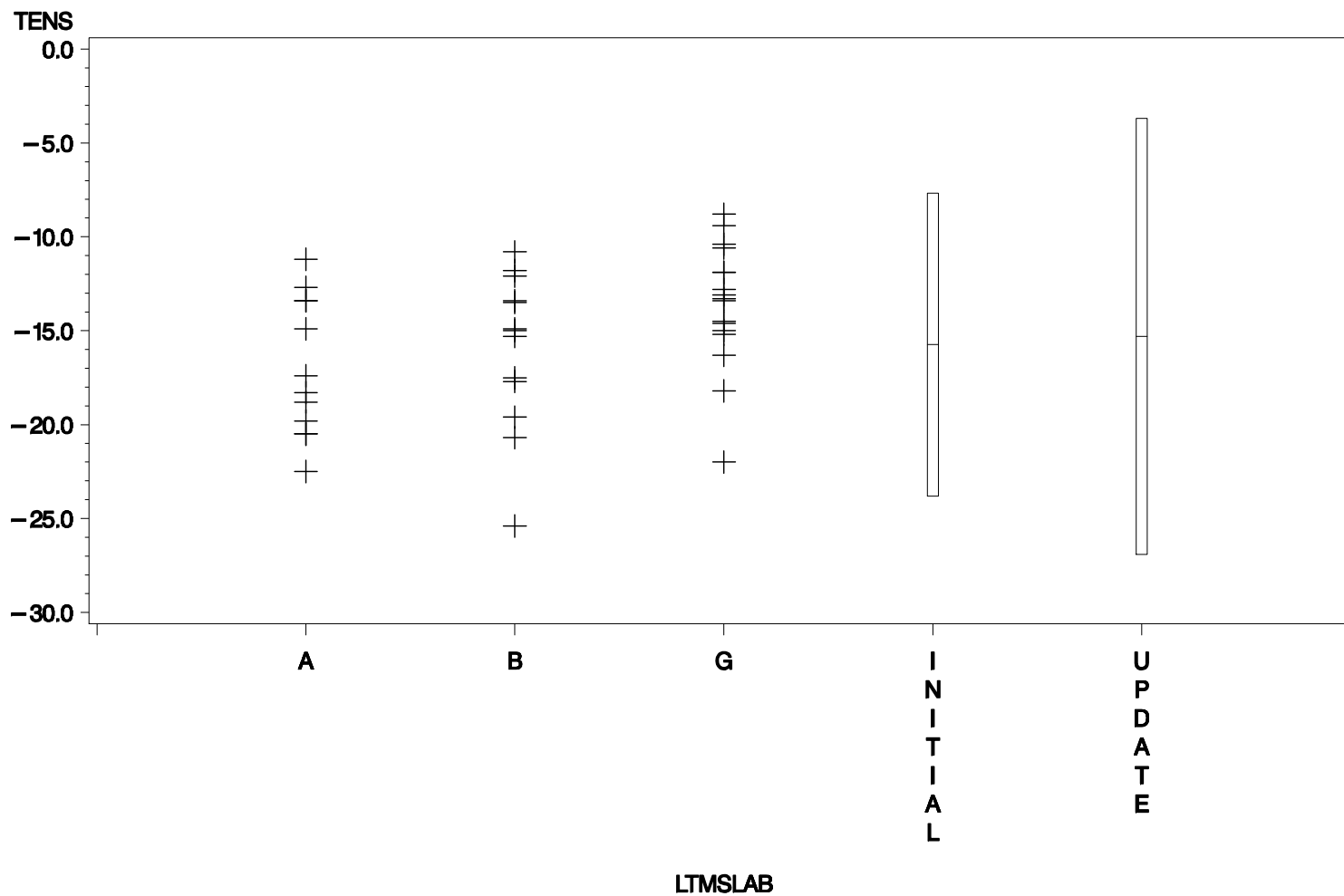


Figure 4

# LDEOC Fluoroelastomer Average Percent Volume Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

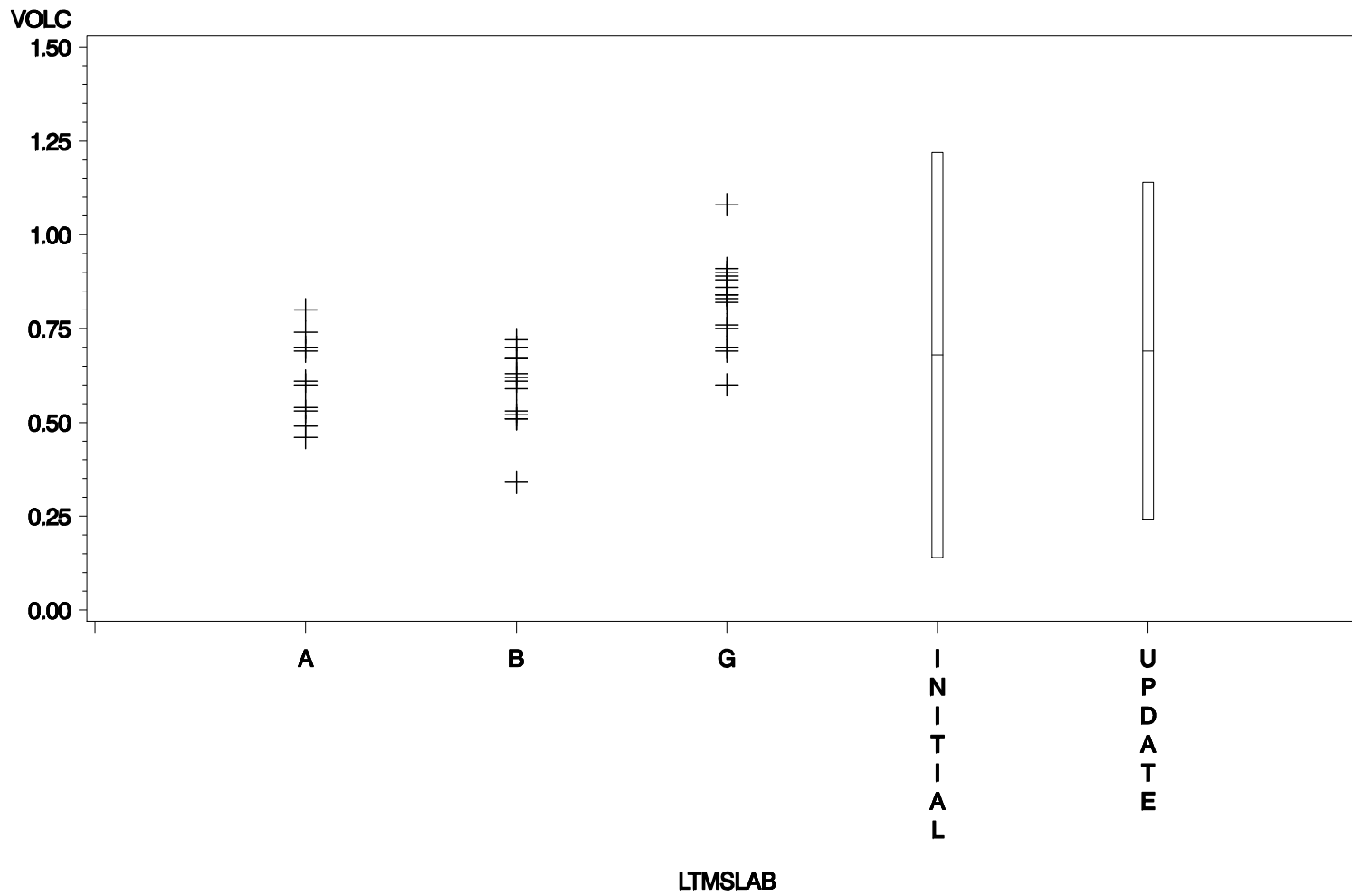


Figure 5

# LDEOC Fluoroelastomer Average Shore A Hardness Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

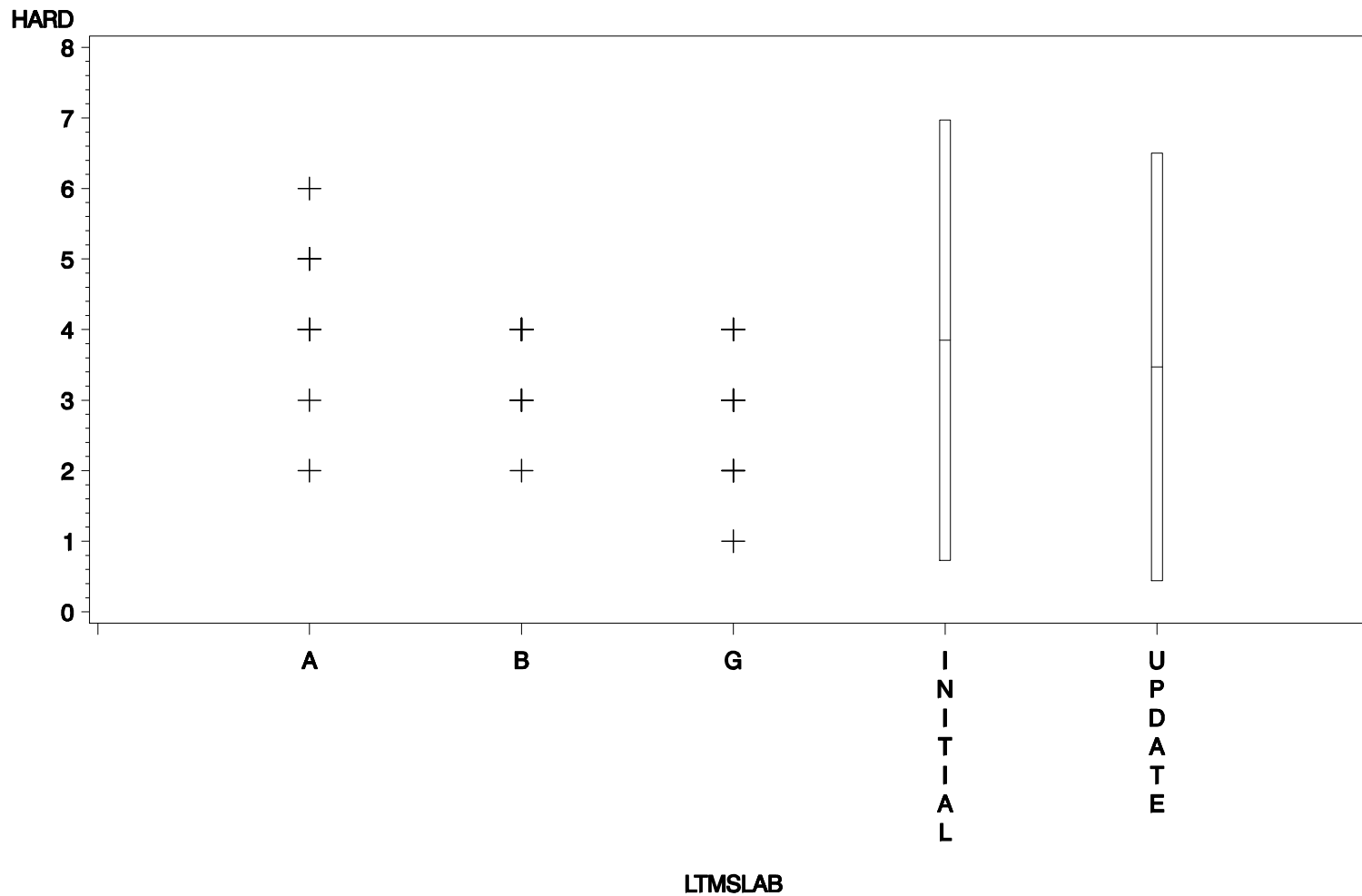


Figure 6

# LDEOC Fluoroelastomer Average Tensile Strength Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

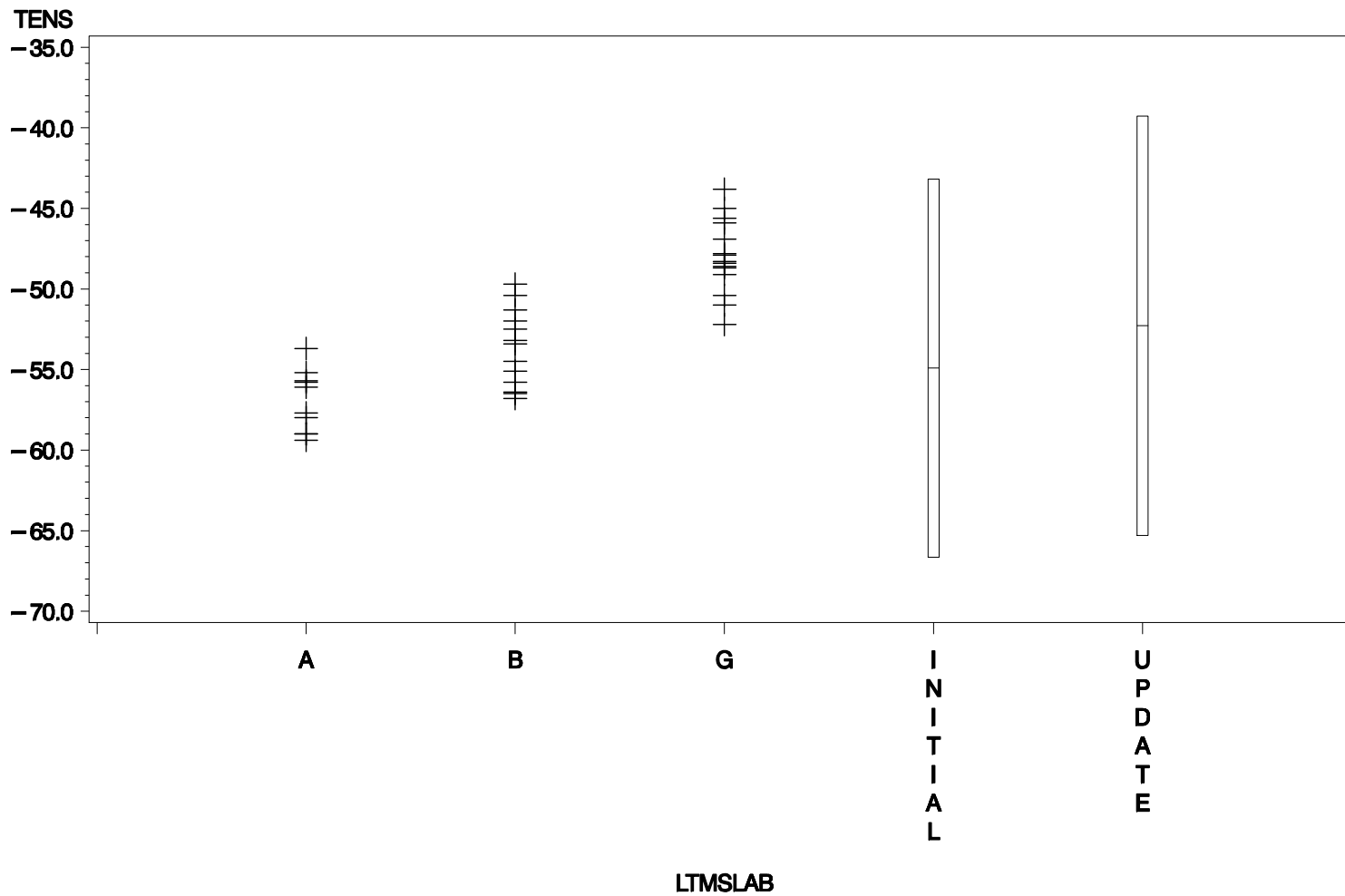


Figure 7

# LDEOC Hydrogenated Nitrile Average Percent Volume Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

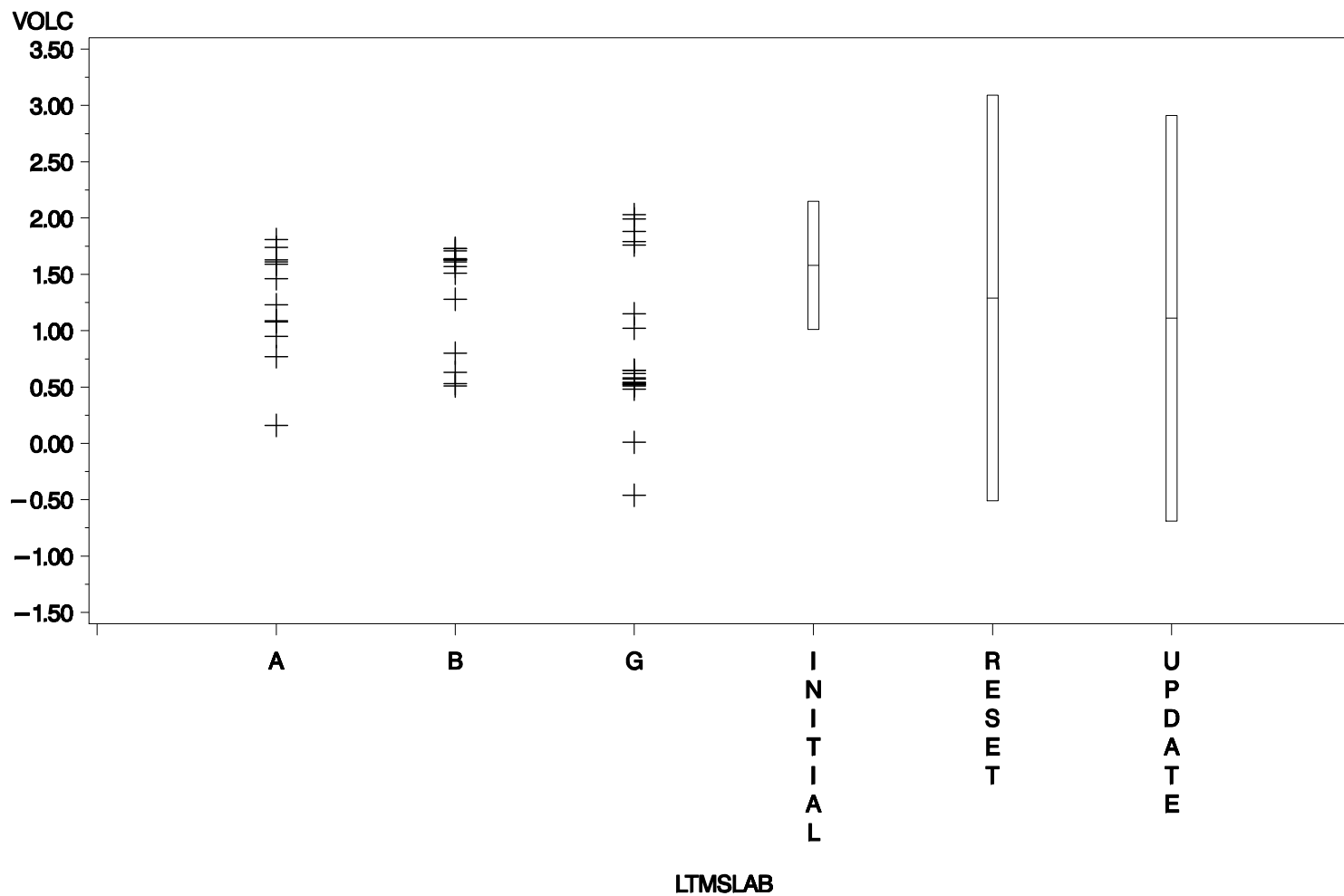


Figure 8

# LDEOC Hydrogenated Nitrile Average Shore A Hardness Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

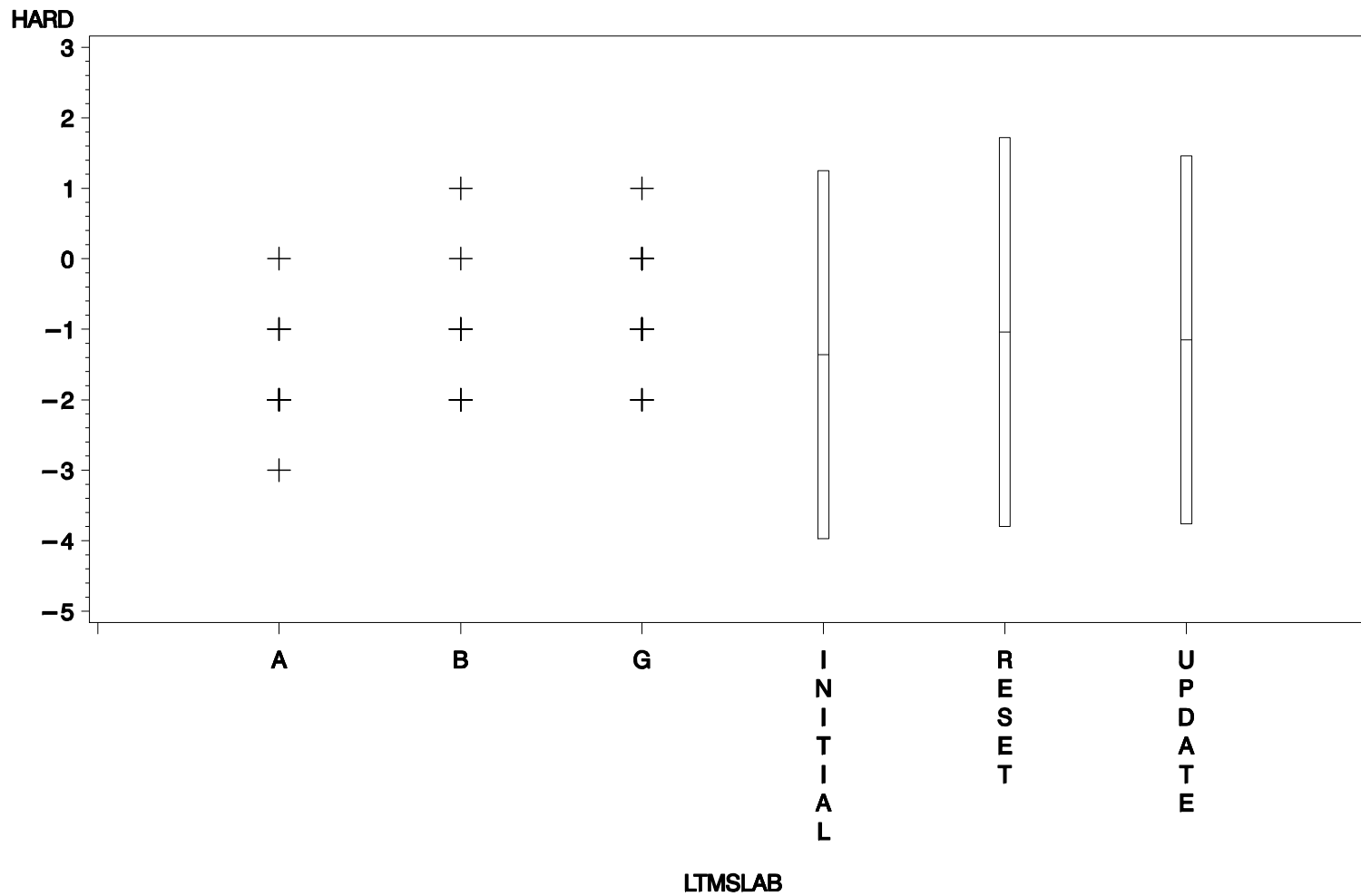


Figure 9

# LDEOC Hydrogenated Nitrile Average Tensile Strength Change Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

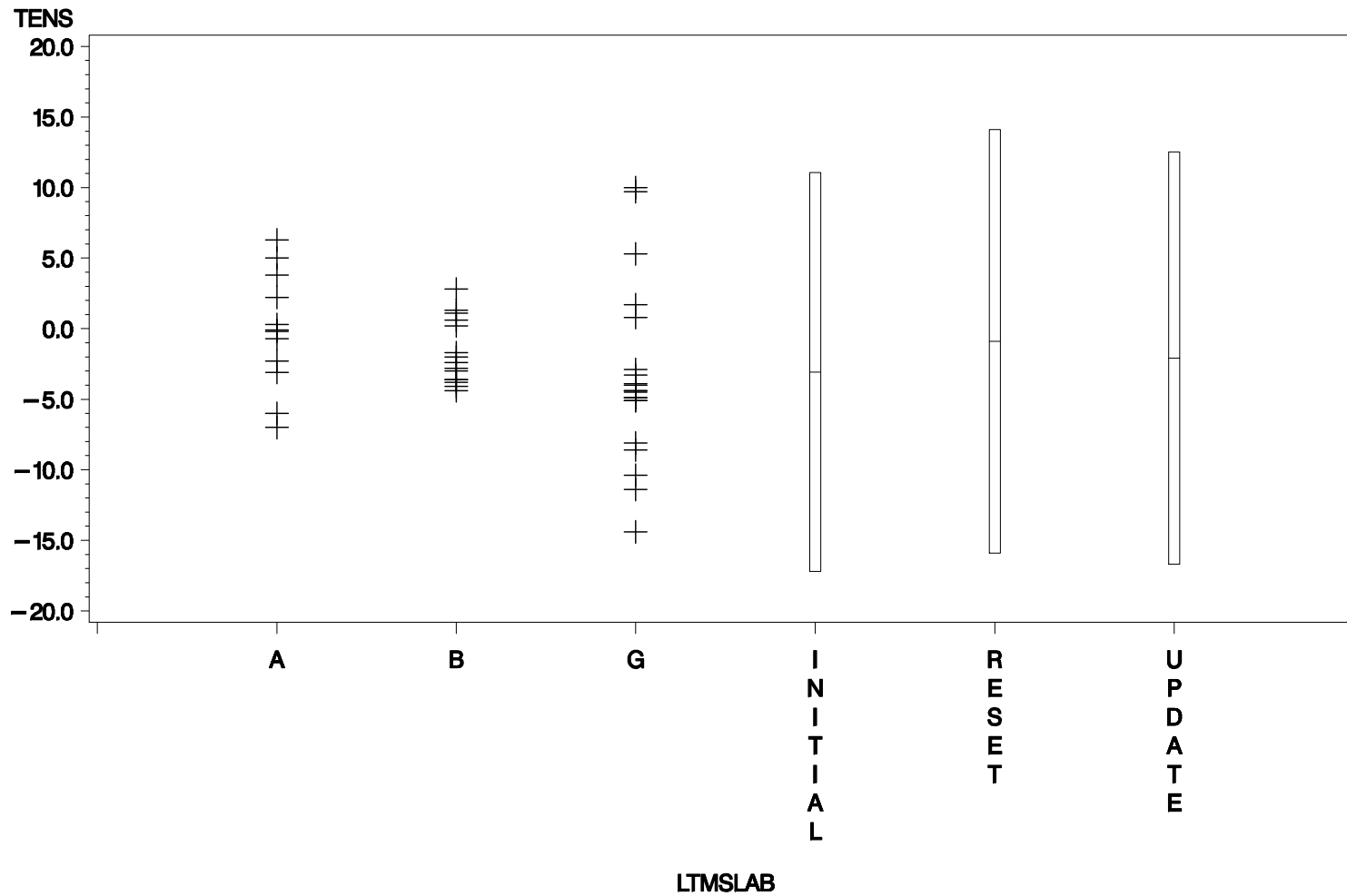


Figure 10

# LDEOC Polyacrylate Average Percent Volume Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

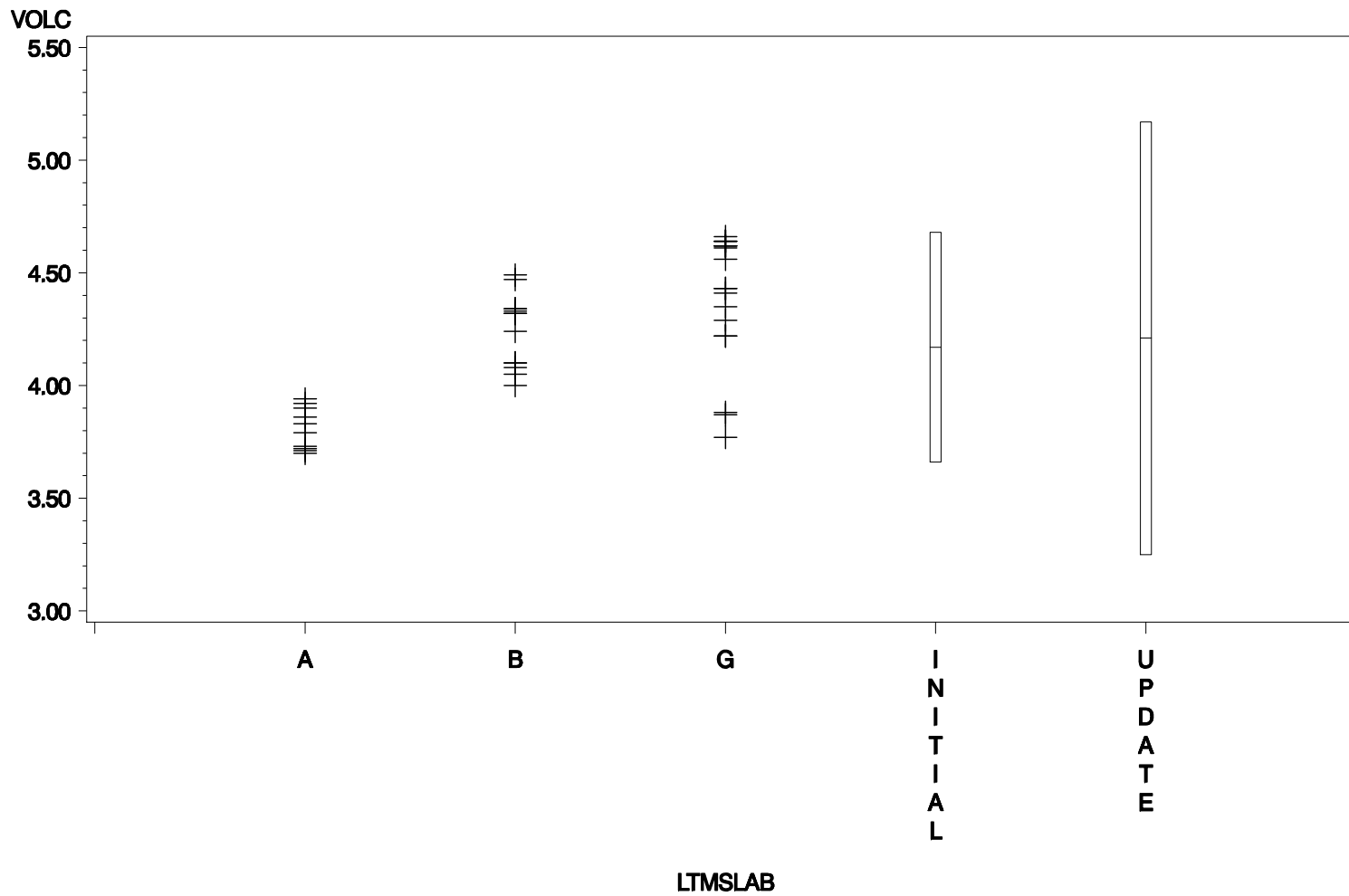




Figure 11

# LDEOC Polyacrylate Average Shore A Hardness Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

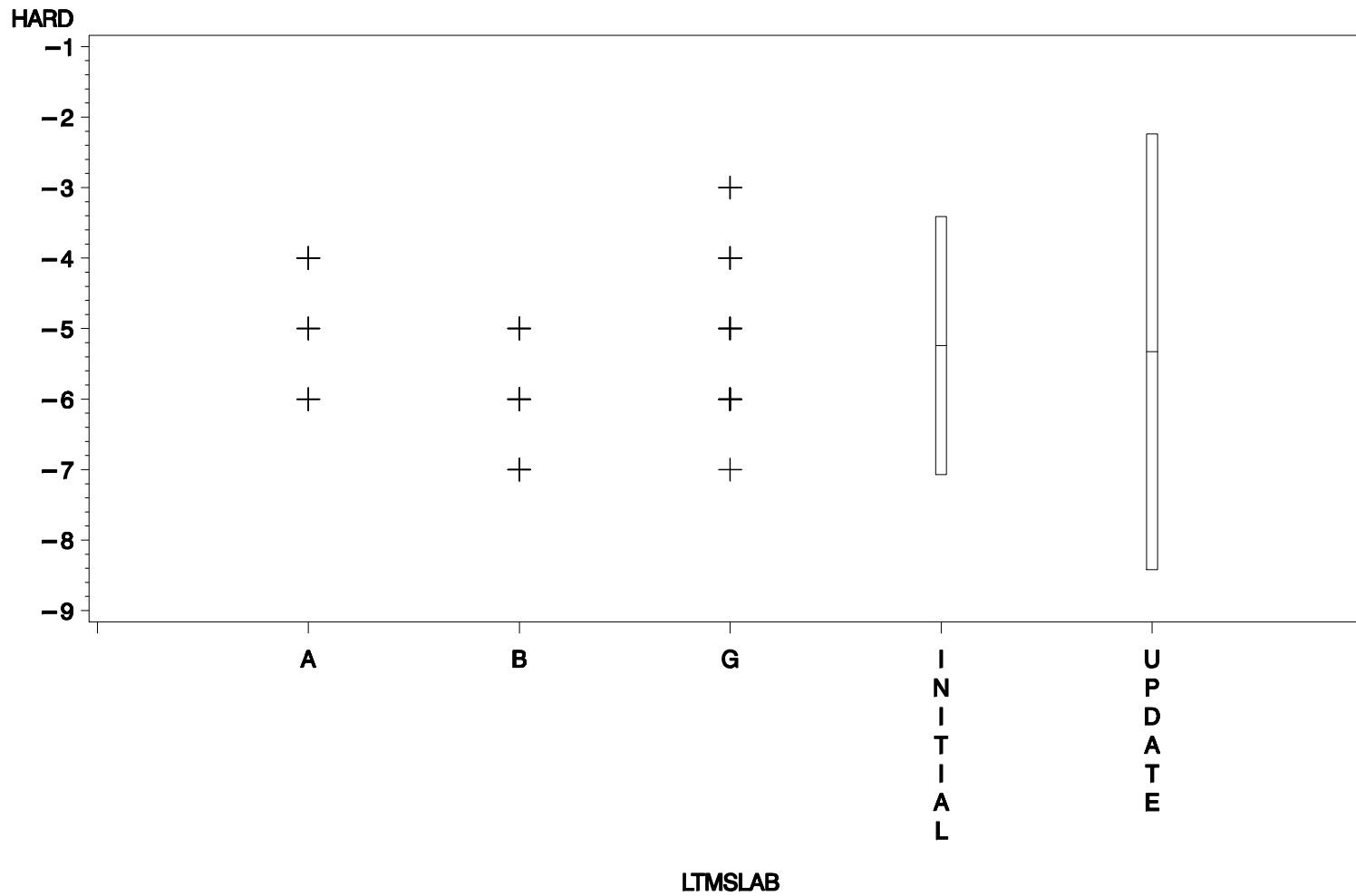


Figure 12

# LDEOC Polyacrylate Average Tensile Strength Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

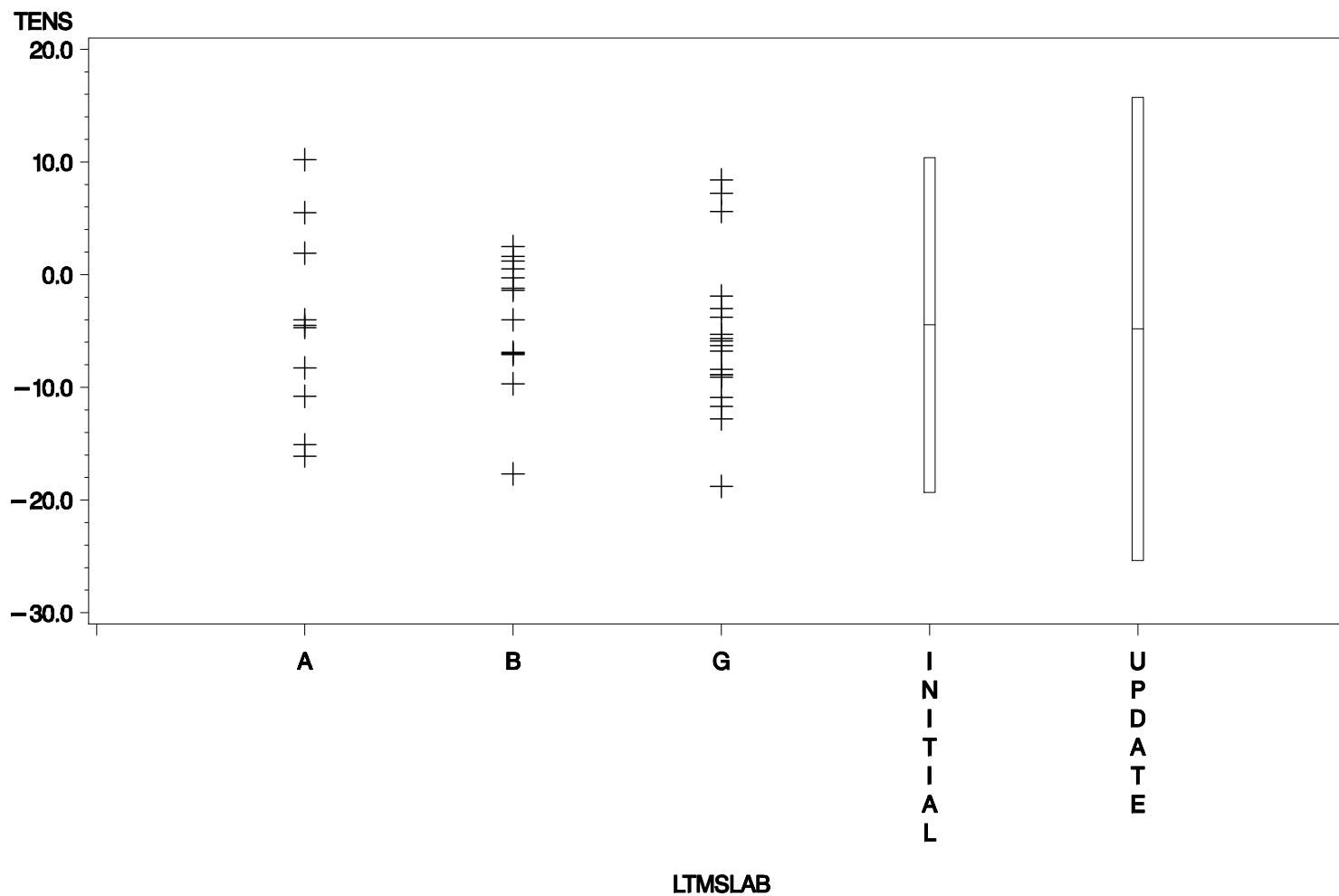


Figure 13

# LDEOC Silicone Average Percent Volume Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

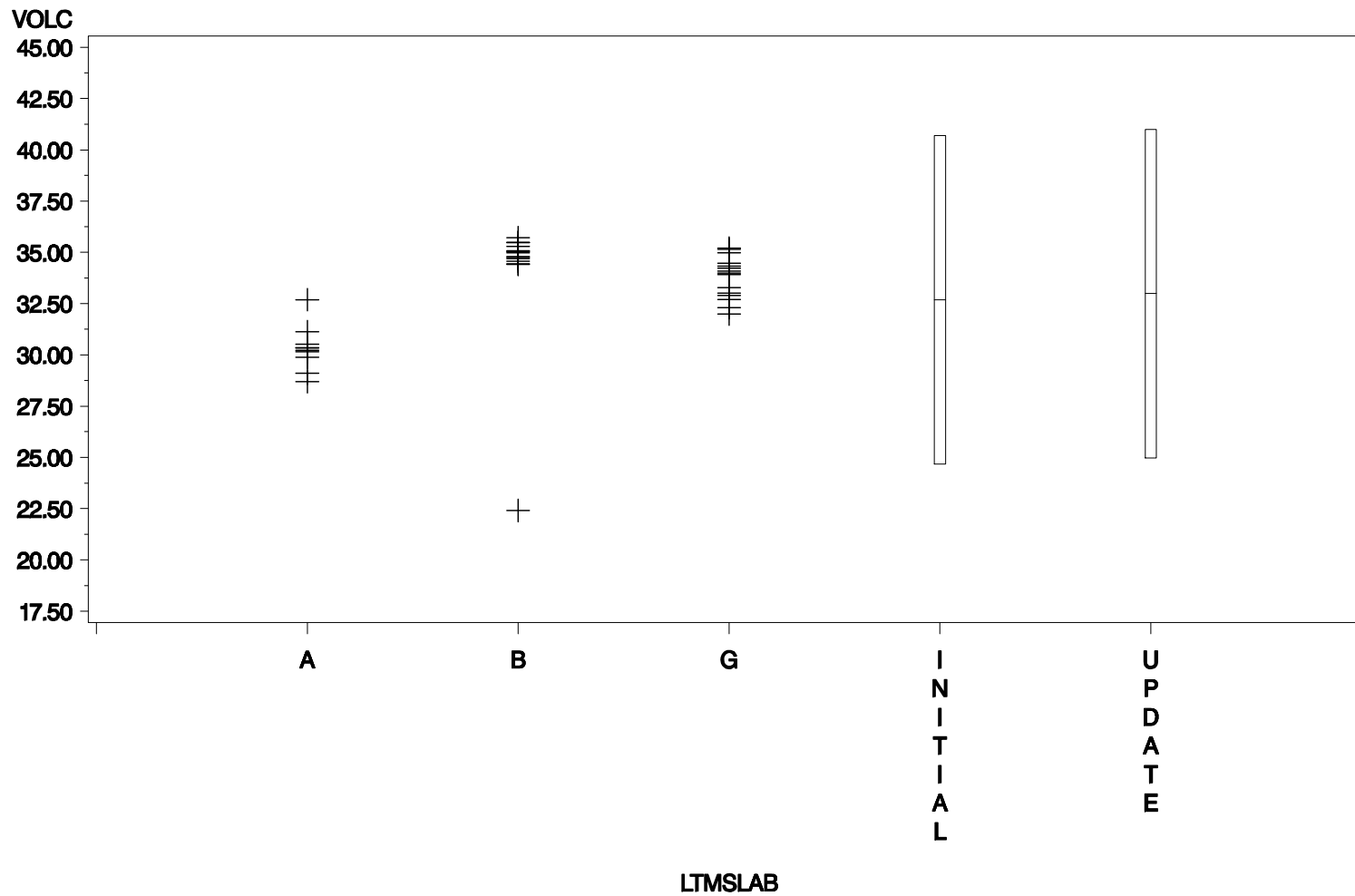


Figure 14

# LDEOC Silicone Average Shore A Hardness Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

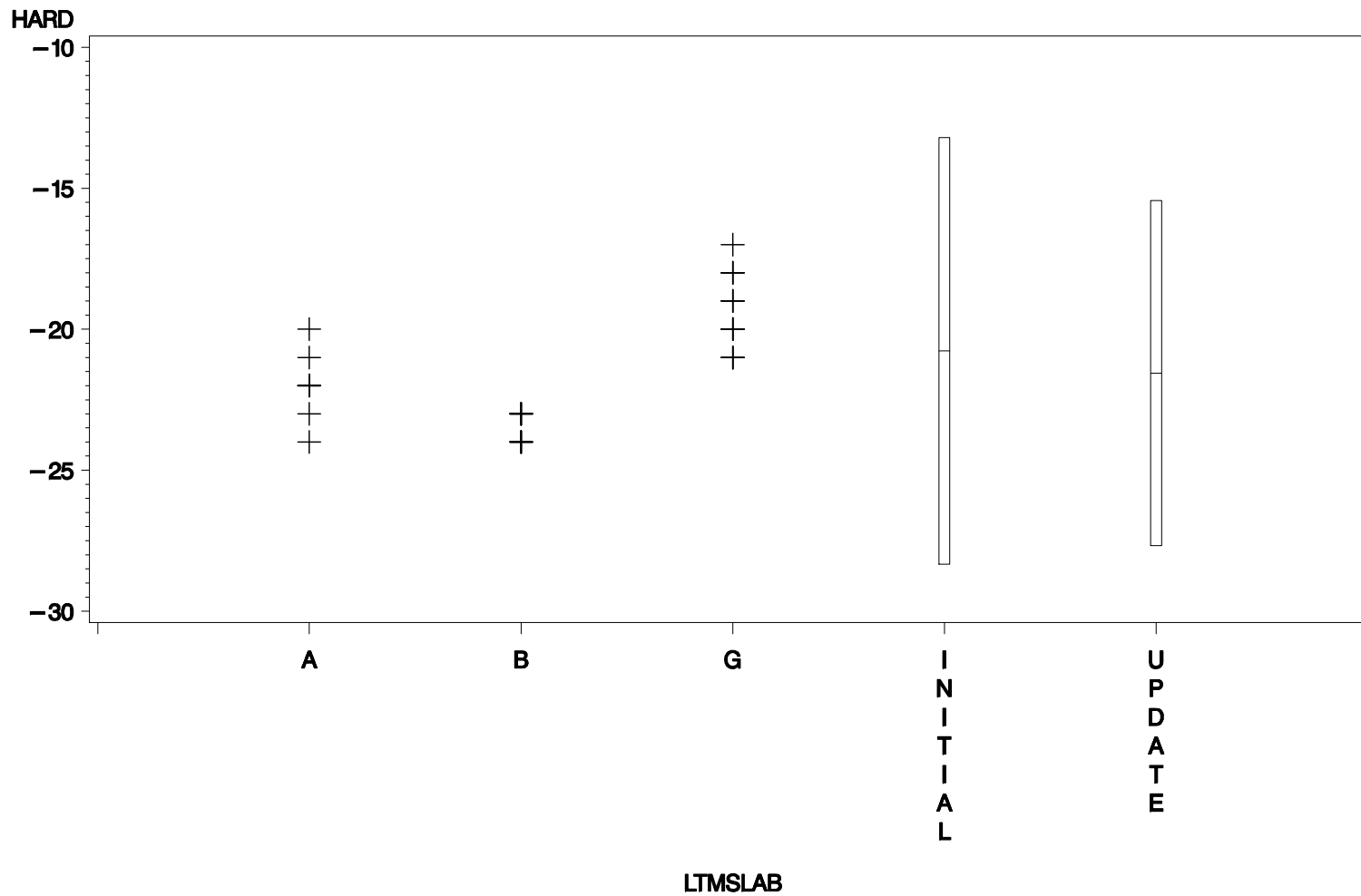


Figure 15

# LDEOC Silicone Average Tensile Strength Change

## Test Target Data Set and Acceptance Bands

Reference Oil 1006-1

