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BY JH/Kashner/amb
DATE 9/22/71

STRETCH EFFECTS
ON LOAD
DEFLECTION
AND THICKNESS
OF Y-3333
CELLULAR SILICONE
SLABS

BDX-613-360 (Rev.)

August, 1971

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PDO 6984549
Interim Report

R1452

Technical Communications

**Kansas City
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ABSTRACT

The effects of stretch on the thickness and compressive load at deflection of Y-3333 (Union Carbide formulation) thin cellular silicone slabs was investigated. It was determined that unidirectional stretch up to 5.0 percent during testing does not produce load deflection or thickness variations of any consequence. At stretch values greater than 10.0 percent, an appreciable reduction in both thickness and compressive load deflection was observed.

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SUMMARY

Load deflection tests and thickness measurements were made on various test slabs, of three different thicknesses of Y-3333 cellular silicone, as the slabs were being subjected to varying amounts of unidirectional stretch. One group of slabs was subjected to various amounts of stretch from zero to 5.0 percent, and another group was stretched in amounts varying from 10.0 to 47.2 percent of the original slab length. The tests were made on the slabs while they were maintained at the various degrees of stretch in a fixture designed specifically for this purpose. The results of this study indicate that slight amounts of stretch (in the range of 5.0 percent, or less) do not appreciably affect the outputs obtained from the load deflection tests and thickness measurements. However, if stretch is applied in amounts greater than 10.0 percent the effect becomes increasingly significant, as both load deflection and thickness readings become decidedly lower at the higher stretch values.

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DISCUSSION

SCOPE AND PURPOSE

This investigation was undertaken to determine whether very slight stretches, induced into cellular silicone parts during positioning at setup for load-deflection testing, would affect the resulting load deflection data to a significant degree. A slight stretching of the part is to be expected when testing configured parts between the platens.

The work was performed for a potential Design Agency requirement for testing with platens contoured to match the cushion configuration. The study was limited to the Design Agency application of three different thicknesses of Y-3333 cellular silicone. Funding for this project was by process development EP 6984549.

PRIOR WORK

No prior work on stretch effects for the Y-3333 material, or similar materials, is known to have been performed.

ACTIVITY

The fixture used in applying stretch to the test slabs was designed to fit into the available space of the Tinius-Olsen compression tester. This fixture was designed to apply stretch to the slabs in one direction only. The limiting space in the area between the test platens made multidirectional stretch impractical. A sketch of this stretch fixture is included in Appendix B. The fixture was designed to produce a maximum stretch of 5.0 percent on the standard stretch slab.

The standard test slabs were fabricated 9-7/16 inches long by 2-3/8 inches wide, in three nominal thicknesses: 0.045, 0.060, and 0.092 inch. The standard slabs were all from the same material lot (H-3-1) and were processed under normal conditions for Y-3333 cellular silicone. Five slabs, 12 by 12 inches, were molded at each of the three material thicknesses, and up to six test slabs (9-7/16 by 2-3/8) were cut from each molded slab. Manufacturing records for these slabs are included in Appendix A. To obtain stretches greater than 5.0 percent, shorter (extended stretch) test coupons were fabricated. The extended stretch coupons were cut from nominal 0.060 thickness Y-3333 material (Lot F-5-1).

Several preliminary tests were conducted to try out the test fixture and to standardize the setup and testing methods. The finalized stretch procedure is included as Appendix B and the test procedure for thickness and load-deflection versus stretch as Appendix C.

The test results for standard test slabs (Appendix D) were obtained by testing 16 slabs of nominal 0.045-inch thickness, 24 slabs of 0.060-inch thickness, and 22 slabs of 0.092-inch thickness. Each slab was tested in four positions (as indicated in Figure C-1 of Appendix C), using a 1.129-inch diameter compression foot. Tests were run at zero-, 0.040-, 1.60-, 3.20-, and 5.00-percent stretch for the 0.060 and 0.092 thicknesses. The 0.045-inch-thick slabs were tested at zero-, 0.040-, 1.60-, and 5.00-percent stretch. All testing was at ambient conditions (approximately 70°F and 40 percent relative humidity).

One test slab from each molded slab was subjected to individual compression tests, with Position 1 being tested at zero stretch, Position 2 at 0.040-percent stretch, Position 3 at 1.60-percent, and Position 4 at 5.00-percent stretch. For the remaining test slabs, all four positions were tested at one condition of stretch. Testing was done as soon as possible after installation of slabs in the stretch fixture. Curves of thickness versus percent stretch and load deflection versus percent stretch are in Appendix E. Each data point on these curves is the average of all tests made at that condition.

Extended stretch coupons were cut from 0.050-inch-thick material (Y-3333, Lot F-5-1), eight from each of three pieces of material stock. The coupons were cut to four different lengths, and by using both the zero and 5.0-percent stretch capabilities of the stretch fixture, eight different stretch conditions were obtained. Thus, the extended stretch study includes various amounts of stretch from 10.0 to 47.2 percent. The resulting test data, plots of thickness versus percent stretch, and load versus percent stretch are included in Appendix F. Each data point on the extended stretch curves is the average of 12 test values (four positions on each of three test slabs at each stretch condition).

ACCOMPLISHMENTS

The results of this study have indicated that slight amounts of stretch (under 5.0 percent) during load deflection testing have no appreciable effect on test values. Stretch induced by testing contoured parts with flat platens is expected to be much less than 5.0 percent (for the particular application of material thickness and configuration under consideration by the Design Agency). Therefore, the potential requirement for testing with contoured platens has been eliminated.

FUTURE WORK

The need for any future work in this area is not anticipated.

Appendix A
MANUFACTURING RECORDS

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Table A-1. Manufacturing Records

Material Lot Number	Target Thickness (Inch)	Date Molded	Molding Control Number	Sample Serial Number	Mold Temperature (°F)	Molding Pressure (Tons)	Operator Number	Remarks
H-3-1	0.045	8-13-70	1	X001 X002 X003 X004	202	300	34-1	Thin spots
H-3-1	0.045	8-14-70	2	X005 X006 X007 X008	200	300	34-402	Thin spots, short Scorched
H-3-1	0.045	8-14-70	3	X009 X010 X011 X012	202	300	34-402	
H-3-1	0.045	8-14-70	4	X013 X014 X015 X016	203	300	34-402	Thin spots
H-3-1	0.045	8-14-70	5	X017 X018 X019 X020	203	300	34-402	Thin spots
H-3-1	0.060	8-13-70	1	X001 X002 X003 X004 X005 X006	203	300	34-1	
H-3-1	0.060	8-13-70	2	X007 X008 X009 X010 X012	202	300	34-1	

Table A-1 Continued. Manufacturing Records

Material Lot Number	Target Thickness (Inch)	Date Molded	Molding Control Number	Sample Serial Number	Mold Temperature (°F)	Molding Pressure (Tons)	Operator Number	Remarks
H-3-1	0.060	8-13-70	3	X013 X014 X015 X016 X017 X018	202	300	34-1	
H-3-1	0.060	8-13-70	4	X019 X020 X021 X022 X023 X024	202	300	34-1	
H-3-1	0.060	8-13-70	5	X025 X026 X027 X028 X029 X030	202	300	34-1	
H-3-1	0.092	8-14-70	1	X001 X002 X003 X004 X005 X006	203	300	34-402	Thin spots Rough spots Rough spots
H-3-1	0.092	8-14-70	2	X007 X008 X009 X010 X011 X012	203	300	34-402	Rough spots Thin spots
H-3-1	0.092	8-14-70	3	X013 X014 X015 X016 X017 X018	203	300	34-402	Thin spots

Table A-1 Continued. Manufacturing Records

Material Lot Number	Target Thickness (Inch)	Date Molded	Molding Control Number	Sample Serial Number	Mold Temperature (°F)	Molding Pressure (Tons)	Operator Number	Remarks
H-3-1	0.092	8-14-70	4	X019 X020 X021 X022 X023 X024	203	300	34-402	
H-3-1	0.092	8-14-70	5	X025 X026 X027 X028 X029 X030	203	300	34-402	

Appendix B
STRETCH PROCEDURE

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STRETCH PROCEDURE

1. Remove the Holding Clamp by loosening both screws (Figure B-1).
2. Remove the Stretching Clamps, Upper and Lower, by removing both Stretch Screws and the three flathead screws from the bottom.
3. Loosen the two screws that hold the Stretching Clamps (Upper and Lower) together and separate the clamps.
4. Install the test coupon between the Stretching Clamps, centered, with the end of the coupon flush with the edge of the clamps.
5. Cut a 4- by 6-inch piece of stencil board and lay it over the clearance slot to support the coupon from sag during installation.
6. Align the Stretching Clamps-Coupon Assembly on the top of the Base Plate, centered, so that the free end of the coupon matches the Scribe Line.
7. Remove the stencil board.
8. Attach the Holding Clamp to the Base Plate with the coupon in place.
9. Insert the Stretch Screws through the brackets and start them into the threaded holes in the Stretching Clamp, Upper.
10. Attach the Stretching Clamp Assembly to the Base Plate with the three slotted-head cap screws. Tighten them only enough to hold the Stretch Clamps flush against the Base Plate, but no tighter.
11. Insert the required feeler stock into the slot between the Base Plate notch and the Stretching Clamp, Lower, by adjusting the Stretch Screws until it slip-fits.

Figure B-1. Stretch Fixture Assembly

Appendix C

TEST PROCEDURE
FOR
THICKNESS AND LOAD DEFLECTION VERSUS STRETCH

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**TEST PROCEDURE
FOR
THICKNESS AND LOAD DEFLECTION VERSUS STRETCH**

I. EQUIPMENT

- A. Tinius-Olsen, 12,000-lb tester with 1.129-inch-diameter platens, air-bearing subpress, and shims per Section II-H.
 - 1. Load range: 120 lb, full scale.
 - 2. Crosshead speed: 0.050 in./in.
 - 3. Chart travel speed: 0.005 in./in.
- B. Stretch Fixture and Feeler Stock Numbers 1 to 7.
- C. Federal Thickness Gage, 578-1.

II. TEST METHOD

- A. Install test coupon in stretch fixture.
Refer to "STRETCH PROCEDURE".
- B. Use Feeler Stock as specified on the KCD 660.
- C. Measure the thickness of each test position to the nearest 0.001 inch with the Federal thickness gage. Adjust leveling legs to permit test coupon to rest flat on the base plate of the thickness gage.
- D. Position Stretch Fixture in Tinius-Olsen.
Exercise care in locating the stretch fixture on the bottom platen. The bottom of the stretch fixture should rest nearly flat on the base plate.
- E. Test the slab positions in the sequence of their identification in Figure C-1.
- F. Record shim lines at the heights indicated in the Deflection Table for the corresponding slab thickness.

Figure C-1. Test Slab Testing Positions, After Stretch

- G. Compress material three cycles to the height indicated in the Deflection Table for the corresponding slab thickness. Record all three cycles on a strip chart for each test position. The horizontal distance between starting points for different positions should be 1-inch minimum.
- H. Read load values to the nearest 0.1 pound at the heights indicated in the Deflection Table on the third cycle and record load values in the appropriate space on the KCD-2053, Load-Deflection Data Sheet.
- I. Run new shim lines for each different slab.

Table C-1. Deflection Table

Slab Thickness (Inch)	Shim Line Height (Inch)	Cycle Height (Inch)	Light Load Deflection Height (Inch)	Heavy Load Deflection Height (Inch)
0.045	0.045 0.018 0.023 0.035	0.018	0.035	0.023
0.060	0.060 0.024 0.036 0.044	0.024	0.044	0.036

Table C-1 Continued. Deflection Table

Slab Thickness (Inch)	Shim Line Height (Inch)	Cycle Height (Inch)	Light Load Deflection Height (Inch)	Heavy Load Deflection Height (Inch)
0.092	0.092	0.037	0.074	0.046
	0.037			
	0.046			
	0.074			
0.250	0.250	0.100	0.230	0.115
	0.100			
	0.115			
	0.230			

Appendix D

**LOAD DEFLECTION DATA
(STANDARD TEST SLABS)
LOT BATCH NO. H-3-1**

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KC17-2053 **LOAD DEFLECTION DATA SHEET**
 PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 in. Dia INSPECTOR VAN
 E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

KC17-2053 **LOAD DEFLECTION DATA SHEET**
 PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 in. Dia INSPECTOR VAN
 E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

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 E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

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PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VAN

E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

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PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VANE P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.035 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.023 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X014	4	0	0.047				3.1					12.2				
X014	4	0.40		0.047				3.1					12.7			
X014	4	1.60			0.047				2.9					11.9		
X014	4	5.00				0.047				2.9					11.6	
X015	4	0.40	0.047	0.047	0.047	0.048	3.1	3.1	3.2	3.1		12.8	12.1	12.3	12.6	
X016	4	1.60	0.047	0.047	0.047	0.047	3.3	3.7	3.7	3.6		14.2	16.2	17.6	16.9	
X013	4	5.0	0.046	0.046	0.046	0.046	2.7	2.4	2.5	2.9		10.8	9.9	11.3	10.9	
Control Sample	4	0	0.047	0.047			3.8	3.2				12.8	12.6			

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PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VAN

E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

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LOAD DEFLECTION DATA SHEET

PART NO. Stretch SamplesMATERIAL Y-3333 Cellular SiliconeTEST FIXTURE 1.129 In. DiaINSPECTOR VANE P NO. 6984549LOT BATCH NO. H-3-1DATE 9-18-70QUANTITY

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.044 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.036 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X001	1	0	0.062				4.4					8.4				
X001	1	0.40		0.062				4.8					8.4			
X001	1	1.60			0.063				3.8					6.8		
X001	1	5.00				0.062				3.6					6.8	
X002	1	0	0.065	0.064	0.064	0.063	3.9	3.4	4.3	3.6		7.3	6.3	7.4	6.7	
X003	1	0.40	0.065	0.065	0.064	0.063	3.8	4.8	4.3	4.8		6.8	7.8	7.5	7.5	
X004	1	1.60	0.063	0.063	0.064	0.064	4.5	4.4	4.8	5.0		7.6	7.5	7.5	8.6	
X005	1	3.20	0.061	0.061	0.062	0.062	3.6	3.9	4.5	4.6		7.0	7.2	7.9	8.1	
X006	1	5.00	0.063	0.032	0.062	0.062	4.1	4.1	4.1	4.7		6.9	7.3	7.8	7.8	
Control Sample	1	0	0.061	0.062			3.6	4.2				6.8	7.8			

*Complete Load Curves are Available in D/335 Files.

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LOAD DEFLECTION DATA SHEET

PART NO. Stretch Samples MATERIAL Y-3533 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VANE P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY _____

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (in.)				LIGHT LOAD DEFLECTION (PSI) @ " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.036 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X007	2	0	0.062				4.3					7.8				
X007	2	0.40		0.062				4.7					8.3			
X007	2	1.60			0.063				4.3					7.7		
X007	2	5.00				0.063				4.3					7.5	
X008	2	0	0.059	0.059	0.059	0.059	4.3	3.9	4.2	4.3		7.3	7.3	7.9	8.4	
X009	2	0.40	0.063	0.063	0.063	0.064	4.3	4.8	4.3	4.9		7.7	7.9	7.6	8.3	
X010	2	1.60	0.062	0.063	0.064	0.063	4.3	4.5	3.9	4.5		7.1	7.7	7.0	8.0	
X011	2	3.20	0.062	0.062	0.063	0.063	4.2	3.6	4.7	5.1		7.5	7.2	7.9	8.7	
X012	2	5.00	0.063	0.062	0.062	0.062	4.3	4.7	5.0	4.5		7.3	8.1	8.9	7.7	
Control Sample	2	0	0.062	0.061			3.6	3.7				7.2	7.4			
28 Position Average		0	0.0614				4.23					7.61				
20 Position Average		0.40	0.0625				4.57					7.77				
20 Position Average		1.60	0.0627				4.63					7.70				
16 Position Average		3.20	0.0619				4.52					7.86				
20 Position Average		5.00	0.0622				4.33					7.66				

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PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VANE P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.036 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X013	3	0	0.060				4.0					7.2				
X013	3	0.40		0.061				4.3					7.7			
X013	3	1.60			0.062				4.8					8.1		
X013	3	5.00				0.061				4.3					7.3	
X014	3	0	0.061	0.060	0.060	0.062	4.1	4.5	4.1	4.8		6.8	7.4	7.3	8.1	
X015	3	0.40	0.061	0.063	0.063	0.062	4.3	4.1	5.1	5.0		7.6	6.8	8.6	8.0	
X016	3	1.60	0.062	0.063	0.062	0.061	5.0	4.2	5.1	4.7		8.4	7.2	8.4	7.6	
X017	3	3.20	0.062	0.062	0.062	0.063	4.3	4.7	5.7	5.3		7.4	7.9	9.3	8.5	
X018	3	5.00	0.062	0.062	0.062	0.062	3.8	4.6	4.6	3.8		7.4	7.5	8.0	8.1	
Control Sample	3	0	0.061	0.062			3.7	5.1				6.6	8.2			

KC.D-2053

LOAD DEFLECTION DATA SHEET

PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VAN

E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY.

[illegible]

KCD-2053

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PART NO. Stretch SamplesMATERIAL Y-3333 Cellular SiliconeTEST FIXTURE 1.129 In. DiaINSPECTOR VANE P NO. 6984549LOT BATCH NO. H-3-1DATE 9-18-70

QUANTITY

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.074 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.046 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X008	2	0	0.092				2.8					12.2				
X008	2	0.40		0.093				3.4					11.6			
X008	2	1.60			0.092				3.6					11.7		
X008	2	5.00				0.091				2.8					11.4	
X009	2	0	0.091	0.091	0.091	0.090	2.9	3.0	2.9	2.8		11.0	11.3	11.6	11.5	
X010	2	0.40	0.092	0.092	0.092	0.091	3.2	3.5	3.5	3.4		11.7	11.6	12.0	12.0	
X011	2	1.60	0.092	0.092	0.091	0.091	2.8	3.0	2.9	3.0		11.1	10.7	11.4	10.9	
X012	2	5.00	0.090	0.090	0.093	0.092	2.2	2.7	2.9	2.9		9.6	10.1	10.9	10.7	
Control Sample	2	0	0.090	0.089			2.9	2.8				11.3	11.0			

PART NO. Stretch Samples.

MATERIAL Y-3333 Cellular Silicone

TEST FIXTURE 1.129 In. Dia

INSPECTOR VAN

E P NO. 6984549

LOT BATCH NO. H-3-1

DATE 9-18-70

QUANTITY

[illegible]

PMT-2052

LOAD DEFLECTION DATA SHEET

PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VAN
 E P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.074 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.046 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X019	4	0	0.093				2.9					11.9				
X019	4	0.40		0.093				3.0					11.5			
X019	4	1.60			0.092				3.6					12.5		
X019	4	5.00				0.093				3.3					11.6	
X020	4	0	0.093	0.092	0.092	0.092	3.2	3.2	3.0	3.5		12.2	12.0	11.9	12.5	
X021	4	0.40	0.091	0.091	0.091	0.092	2.7	3.1	3.1	2.9		9.1	9.8	9.4	10.2	
X022	4	1.60	0.092	0.092	0.093	0.093	Strip chart functioned improperly - Data Questionable									
X023	4	3.20	0.092	0.091	0.090	0.091	2.9	2.9	3.1	3.0		10.4	10.8	10.8	11.2	
X024	4	5.00	0.091	0.091	0.090	0.092	2.9	3.1	2.8	3.0		10.4	10.9	10.1	10.4	
Control Sample	4	0	0.091	0.090			2.9	2.9				11.4	11.1			

KCD-2053

LOAD DEFLECTION DATA SHEET

PART NO. Stretch Samples MATERIAL Y-3E33 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VANE P NO. 6984549 LOT BATCH NO. H-3-1 DATE 9-18-70 QUANTITY _____

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.074 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.046 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X027	5	0	0.091				3.1					10.9				
X027	5	0.40		0.090				3.2					11.5			
X027	5	1.60			0.090				3.2					11.6		
X027	5	5.00				0.091				2.9					10.2	
X025	5	0	0.091	0.092	0.092	0.092	2.9	3.0	3.2	3.1		10.4	10.3	10.8	9.8	
X026	5	0.40	0.094	0.093	0.092	0.092	3.5	3.5	3.1	3.1		11.4	11.7	12.0	11.9	
X028	5	1.60	0.092	0.092	0.091	0.092	3.0	3.1	3.1	2.9		10.8	11.5	10.9	10.3	
X029	5	3.20	0.091	0.091	0.092	0.092	2.9	3.2	3.7	3.5		10.1	10.5	11.6	10.8	
X030	5	5.00	0.092	0.092	0.092	0.091	2.9	3.0	3.1	2.9		10.5	10.4	10.9	10.2	
Control Sample	5	0	0.091	0.090			2.9	2.9				11.4	11.1			
28 Position Average		0	0.0915				2.94					11.44				
20 Position Average		0.40	0.0921				3.18					11.32				
20 Position Average		1.60	0.0918	16 Position Average			3.14		16 Position Average			11.37				
8 Position Average		3.20	0.0913				3.15					10.78				
20 Position Average		5.00	0.0915				2.86					10.70				

Appendix E

THICKNESS AND LOAD DEFLECTION VERSUS STRETCH
(STANDARD TEST SLABS)

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Figure E-1. Thickness Versus Stretch

Figure E-2. Load Deflection Versus Stretch (0.045-Inch Nominal Thickness)

Figure E-3. Load Deflection Versus Stretch (0.060-Inch Nominal Thickness)

Figure E-4. Load Deflection Versus Stretch (0.092-Inch Nominal Thickness)

Appendix F

EXTENDED STRETCH TEST RESULTS

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LOAD DEFLECTION DATA
(TEST COUPONS)
LOT BATCH NO. F-5-1

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PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VANE P NO. 6984549 LOT BATCH NO. F-5-1 DATE 10-14-70 QUANTITY 24

SERIAL NO.	Control No.	Percent Stretch	THICKNESS (IN.)				LIGHT LOAD DEFLECTION (PSI) @ 0.044 " HEIGHT					HEAVY LOAD DEFLECTION (PSI) @ 0.036 " HEIGHT				
			POS 1	POS 2	POS 3	POS 4	POS 1	POS 2	POS 3	POS 4	AVE	POS 1	POS 2	POS 3	POS 4	AVE
X001	1012	10.0	0.061	0.061	0.061	0.061	3.4	4.2	4.3	4.0		6.0	6.9	7.2	6.9	
X002	1012	15.5	0.063	0.063	0.063	0.063	3.3	3.8	3.7	4.0		5.4	6.6	6.2	6.9	
X001	1012	20.0	0.062	0.061	0.061	0.061	3.6	3.6	3.8	3.6		6.1	6.0	6.4	6.3	
X002	1012	26.1	0.061	0.061	0.061	0.061	3.3	3.3	3.4	3.4		5.6	5.4	6.0	5.7	
X001	1012	30.0	0.060	0.061	0.061	0.061	3.0	3.3	3.3	3.3		5.5	5.8	5.7	5.8	
X002	1012	36.7	0.061	0.061	0.061	0.061	1.4	2.8	3.3	3.0		3.8	5.0	5.8	5.4	
X001	1012	40.0	0.059	0.059	0.059	0.058	1.8	2.8	3.0	2.7		3.6	4.8	4.8	4.6	
X002	1012	47.2	0.059	0.060	0.060	0.060	1.8	2.4	2.5	2.4		4.2	4.8	4.8	4.8	
X001	1013	10.0	0.061	0.061	0.061	0.061	4.1	4.1	4.3	4.4		6.8	6.8	7.4	7.5	
X002	1013	15.5	0.062	0.062	0.062	0.062	3.7	3.7	4.0	3.8		5.6	6.2	6.6	6.5	
X001	1013	20.0	0.062	0.061	0.060	0.060	3.7	3.6	3.8	3.8		6.1	6.1	6.5	6.2	
X002	1013	26.1	0.059	0.060	0.060	0.061	3.0	3.1	3.5	3.6		5.0	5.2	5.7	5.7	
X001	1013	30.0	0.060	0.060	0.061	0.061	2.1	3.3	3.6	3.4		4.3	5.5	6.0	5.6	
X002	1013	36.7	0.058	0.060	0.060	0.062	2.9	3.0	3.0	3.1		4.8	5.3	5.5	5.6	
X001	1013	40.0	0.059	0.058	0.057	0.057	2.9	2.6	2.7	2.7		5.0	4.7	4.9	4.8	
X002	1013	47.2	0.058	0.057	0.057	0.057	2.0	2.5	2.5	2.5		4.1	4.5	4.5	4.4	

*Complete load curves are available in D/835 Files.

KC 0-2053

LOAD DEFLECTION DATA SHEET

PART NO. Stretch Samples MATERIAL Y-3333 Cellular Silicone TEST FIXTURE 1.129 In. Dia INSPECTOR VAN

E P NO. 6C84549 LOT BATCH NO. F-5-1 DATE 10-14-70 QUANTITY 24

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GRAPHS SHOWING LOAD DEFLECTION AND THICKNESS
VERSUS EXTENDED STRETCH

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Figure F-1. Load Deflection Versus Extended Stretch

Figure F-2. Thickness Versus Extended Stretch

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