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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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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

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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, \pm , 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.

Attachment: 1 Page: 1/1

Attendance:

Representative

Organization

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

Attachment: 2 Page: 1/5

Volume		n			
-1.82	x le -3	2			
-0.97	-3 lt x le -2	1	-1 < yi ≤ 1	78.0%	90
-0.13	-2 lt x le -1	3	-2 < yi ≤ 2	96.5%	80
0.72	-1 lt x le 0	79	-3 < yi ≤ 3	97.9%	70
1.56	0 lt x le 1	31	>3	2.1%	60
2.41	1 lt x le 2	23			50
3.25	2 lt x le 3	1			
	3 lt x	1			
Mean = 0.72					
STD = 0.84					
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-3.63	x le -3	0			
-1.86	-3 lt x le -2	2	-1 < vi < 1	79 4%	60
-0.10	-2 lt x le -1	9	-2 < vi < 2	95.7%	
1 67	-1 lt x le 0	56	-3 < vi < 3	98.6%	50
3.43	0 lt x le 1	56	>3	1 4%	40
5 20	1 lt x le 2	14		11170	20
6.97	2 lt x le 3	2			30
0.07	3 lt x	2			20
Mean = 1 67	OICX	-			
STD = 1.77					
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T					~-5 -5 -2 -1 1 2 5 -5
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Tensile -49.44 -42.12 -34.79	x le -3 -3 lt x le -2 -2 lt x le -1	n 1 1 22	-1 < yi ≤ 1 -2 < yi ≤ 2	75.2% 95.7%	
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Tensile -49.44 -42.12 -34.79 -27.47 -20.14	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1	n 1 22 40 66	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	75.2% 95.7% 97.2% 2.8%	
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POLYACRYLATE

Attachment: 2 Page: 2/5



FLUOROELASTOMER

Attachment: 2 Page: 3/5



SILICONE

Attachment: 2 Page: 4/5

Volume		n				
19.59	x le -3	4				
21.85	-3 lt x le -2	2	-1 < yi ≤ 1	90.1%	90	
24.12	-2 lt x le -1	2	-2 < yi ≤ 2	95.7%	80	
26.38	-1 lt x le 0	45	-3 < yi ≤ 3	97.2%	70	
28.65	0 lt x le 1	82	>3	2.8%	60	
30.92	1 lt x le 2	6			50	
33.18	2 lt x le 3	0			40	
	3 lt x	0			30	
Mean = 26.38		-				
STD = 2.27						
0.2 2.2.						
					<-3 -3 -2 -1 1 2 3 >3	
Hardness		n				
-25.74	x le -3	0				
-23.34	-3 lt x le -2	1	-1 < yi ≤ 1	55.0%	80	
-20.94	-2 lt x le -1	25	-2 < yi ≤ 2	98.6%	70	
-18.55	-1 lt x le 0	67	-3 < yi ≤ 3	99.3%	60	
-16.15	0 lt x le 1	10	>3	0.7%	50	
-13.75	1 lt x le 2	36			40	
-11.36	2 lt x le 3	0			30	
	3 lt x	1				
Mean = -18.55					10	
STD = 2.40						
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Tensile		n			<-3 -3 -2 -1 1 2 3 >3	
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Tensile -26.41 -22.14	x le -3 -3 lt x le -2	n 1 3	-1 < yi ≤ 1	79.7%	<-3 -3 -2 -1 1 2 3 >3 70	
Tensile -26.41 -22.14 -17.87	x le -3 -3 lt x le -2 -2 lt x le -1	n 1 3 6	-1 < yi ≤ 1 -2 < yi ≤ 2	79.7% 94.9%	<-3 -3 -2 -1 1 2 3 >3 70 60	
Tensile -26.41 -22.14 -17.87 -13.60	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0	n 1 3 6 60	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3	79.7% 94.9% 99.3%	<-3 -3 -2 -1 1 2 3 >3 70 60 50	
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Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	<pre><-3 -3 -2 -1 1 2 3 >3</pre>	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	<pre><-3 -3 -2 -1 1 2 3 >3</pre>	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%		
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	< -3 -3 -2 -1 1 2 3 > 3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	< -3 -3 -2 -1 1 2 3 > 3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3	n 1 3 6 60 50 15 3 0 n 2 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2	n 1 3 6 60 50 15 3 0 n 2 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 23.25	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1	n 1 3 6 60 50 15 3 0 n 2 0 12 62	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $3 < yi \le 3$	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 16.20	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1	n 1 3 6 60 50 15 3 0 15 3 0 12 62 30	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 0.24	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 -1 lt x le 2	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 -9.34 2 20	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 -1 lt x le 2 2 lt x le 3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 2 -2 lt x le 3 -3 lt x le -2 -2 lt x le 3 -3 lt x le 2 -2 lt x le 3 -3 lt x le 3 -3 lt x le 2 -2 lt x le 3 -3 lt x le 2 -2 lt x le 3 -3 lt x le 2 -2 lt x le 3 -3 lt x le 3 -2 lt x le 3 -3 lt x le 3 -3 lt x le 3 -3 lt x le 3 -2 lt x le 3 -3 lt x le 3 -2 lt x le 3 -3 lt	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20 2	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	-3 -3 -2 -1 1 2 3 >3	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 -9.34 -2.39	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 -1 lt x le 2 2 lt x le 3 -3 lt x le -2 -2 lt x le 3 -3 lt x le -2 -2 lt x le 3 -3 lt x le 2 -2 lt x le 3 -3 lt x le 4 -1 lt x le 3 -3 lt x le 4 -1 lt x le 4 -1 lt x le 4 -1 lt x le 5 -2 lt x le 4 -1 lt x le 4 -1 lt x le 5 -2 lt x le 4 -1 lt x le 4 -1 lt x le 5 -2 lt x le 4 -1 lt x le 4 -1 lt x le 5 -2 lt x le 4 -1 lt x le 6 -1 lt x le 4 -1 lt x le 6 -1 lt x le 4 -2 lt x le 5 -2 lt x le 4 -1 lt x le 5 -2 lt x	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20 2	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 -9.34 -2.39	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20 2 1	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 -9.34 -2.39 Mean = -23.25	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20 2 1	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Tensile -26.41 -22.14 -17.87 -13.60 -9.33 -5.07 -0.80 Mean = -13.60 STD = 4.27 Elongation -44.10 -37.15 -30.20 -23.25 -16.29 -9.34 -2.39 Mean = -23.25 STD = 6.95	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 1 3 6 60 50 15 3 0 15 3 0 12 62 39 20 2 1	$-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3 >3 $-1 < yi \le 1$ $-2 < yi \le 2$ $-3 < yi \le 3$ >3	79.7% 94.9% 99.3% 0.7% 73.2% 96.4% 97.8% 2.2%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	

VAMAC

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Attachment: 2 Page: 5/5

volume		n			
10.79	x le -3	0			
13 14	-3 lt x le -2	0	-1 < vi ≤ 1	56 5%	10
15.11	2 ± 10	4	2 < y < 2	100.0%	
10.40		4	-2 < yi ≤ 2	100.0%	8
17.82	-1 It x le 0	9	-3 < yi ≤ 3	100.0%	
20.16	0 lt x le 1	4	>3	0.0%	6
22.50	1 lt x le 2	6			
24 85	2 lt x le 3	0			
21.00	2 lt x 10 0	0			
Maan - 47.00	JILX	U			2
Mean = 17.82					
STD = 2.34					
					<-3 -3 -2 -1 1 2 3 >3
Hardness		n			
-10.93	x le -3	0			
_0.00	_3 t v o _2	1	$-1 < v_i < 1$	78.3%	14
-9.99		0	-1 < y1 = 1	70.070	
-9.04	-2 it x ie - i	0	$-2 < y_1 \leq 2$	87.0%	12
-8.09	-1 lt x le 0	6	-3 < yi ≤ 3	100.0%	10
-7.14	0 lt x le 1	12	>3	0.0%	
-6.19	1 lt x le 2	2			8
-5 24	2 lt x le 3	2			6
-0.24		2			
	3 IL X	U			4
Mean = -8.09					2
STD = 0.95					
					<-3 -3 -2 -1 1 2 3 >3
- ··					
Tensile		n			
Tensile -43.84	x le -3	n O			
Tensile -43.84 -37.07	x le -3 -3 lt x le -2	n 0 0	-1 < vi ≤ 1	65.2%	9
Tensile -43.84 -37.07 30.31	x le -3 -3 lt x le -2	n 0 0	-1 < yi ≤ 1	65.2%	9
Tensile -43.84 -37.07 -30.31	x le -3 -3 lt x le -2 -2 lt x le -1	n 0 0 4	-1 < yi ≤ 1 -2 < yi ≤ 2	65.2% 100.0%	9 8 7
Tensile -43.84 -37.07 -30.31 -23.55	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0	n 0 4 8	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3	65.2% 100.0% 100.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1	n 0 4 8 7	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2	n 0 4 8 7 4	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3	n 0 4 8 7 4 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0 \end{array}$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -53\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ -1\\ -1\\ 2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$9 \\ 7 \\ 6 \\ 5 \\ 4 \\ 3 \\ 2 \\ 1 \\ 0 \\ -3 \\ -3 \\ -3 \\ -2 \\ -1 \\ 1 \\ 2 \\ -1 \\ -1 \\ 2 \\ -1 \\ -1$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$9 \\ 7 \\ 6 \\ 5 \\ 4 \\ 3 \\ 2 \\ 1 \\ 0 \\ -3 \\ -3 \\ -3 \\ -2 \\ -1 \\ 1 \\ 2 \\ -1 \\ -1 \\ 2 \\ -1 \\ -1$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$9 \\ 7 \\ 6 \\ 5 \\ 4 \\ 3 \\ 2 \\ 1 \\ 0 \\ -3 \\ -3 \\ -3 \\ -2 \\ -1 \\ 1 \\ 2 \\ -1 \\ -1 \\ 2 \\ -1 \\ -1$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2	n 0 4 8 7 4 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 0\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ 3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -2\\ -1\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1	n 0 4 8 7 4 0 0 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2	65.2% 100.0% 100.0% 0.0% 69.6% 95.7%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0	n 0 4 8 7 4 0 0 0 0 3 10	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < vi ≤ 3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -2\\ -1\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1	n 0 4 8 7 4 0 0 0 10 6	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ 3\\ -3\\ -2\\ -1\\ 1\\ 2\\ 3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ 3\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ 3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 -1 lt x le 0	n 0 4 8 7 4 0 0 0 10 6 2	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 8\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -2\\ -2\\ -1\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 -1 lt x le 2	n 0 4 8 7 4 0 0 0 10 6 3	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ -1\\ 2\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -3\\ -3\\ -2\\ -1\\ -1\\ -2\\ -2\\ -2\\ -1\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3	n 0 4 8 7 4 0 0 0 3 10 6 3 1	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ -1\\ 2\\ -1\\ -1\\ 2\\ -1\\ -1\\ 2\\ -1\\ -1\\ -1\\ 2\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0 0 3 10 6 3 1 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3\\ -3$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71 Mean = -27.12	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0 0 3 10 6 3 1 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\ 2\\ -1\\ 1\\ 2\\ -1\\$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71 Mean = -27.12 STD = 12.28	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0 0 3 10 6 3 1 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} 9\\ 9\\ 7\\ 6\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 0\\ -3\\ -3\\ -2\\ -1\\ 1\\ 1\\ 2\\ -1\\ -1\\ 1\\ 2\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1\\ -1$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71 Mean = -27.12 STD = 12.28	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x = -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0 0 3 10 6 3 1 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} \begin{array}{c} \\ 9\\ 7\\ 6\\ 5\\ 4\\ 3\\ 2\\ 1\\ 0\\ -3\\ -3\\ -3\\ -2\\ -1\\ 1\\ 0\\ -3\\ -3\\ -2\\ -1\\ 1\\ 1\\ 2\\ -2\\ 0\\ -2\\ -1\\ 1\\ 2\\ -2\\ -1\\ 1\\ 2\\ -2\\ -1\\ -2\\ -2\\ -1\\ -2\\ -2\\ -1\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2\\ -2$
Tensile -43.84 -37.07 -30.31 -23.55 -16.78 -10.02 -3.26 Mean = -23.55 STD = 6.76 Elongation -63.95 -51.67 -39.40 -27.12 -14.85 -2.57 9.71 Mean = -27.12 STD = 12.28	x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x x le -3 -3 lt x le -2 -2 lt x le -1 -1 lt x le 0 0 lt x le 1 1 lt x le 2 2 lt x le 3 3 lt x	n 0 4 8 7 4 0 0 0 0 3 10 6 3 1 0	-1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3 -1 < yi ≤ 1 -2 < yi ≤ 2 -3 < yi ≤ 3 >3	65.2% 100.0% 100.0% 0.0% 69.6% 95.7% 100.0% 0.0%	$\begin{array}{c} & & & \\ & &$





emulov

Attachment: 3 Page: 1/20

Elastomer = Nitrile Volume



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Attachment: 3 Page: 2/20

Elastomer= Polyacrylate Volume



VOLUME ASL HI VOLUME USL HI VOLUME USL HI VOLUME PLUS3 VOLUME PLUS3 VOLUME PLUS3 VOLUME MINUS3 VOLUME MINUS3 VOLUME MINUS3 VOLUME MINUS3 VOLUME ASL LO VOLUME ASL LO

Date

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Elastomer = Silicone Volume



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Attachment: 3 Page: 4/20





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Attachment: 3 Page: 5/20

Hardness





Hardness

Attachment: 3 Page: 6/20

Hardness Elastomer = Nitrile



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

Hardness

Hardness Elastomer = Polyacrylate



Hardness

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

Attachment: 3 Page: 8/20

Hardness Elastomer = Silicone



HARDNESS_ASL_HI HARDNESS_USL_HI HARDNESS_USL_HI HARDNESS_PLUS3 HARDNESS_PLUS1 HARDNESS_MEAN HARDNESS_MINUS1 HARDNESS_MINUS3 HARDNESS_MINUS3 HARDNESS_MINUS3 HARDNESS_MINUS3 HARDNESS_MINUS3 HARDNESS_MINUS3 HARDNESS_ASL_LO HARDNESS_ASL_LO HARDNESS_ASL_LO

Date

Hardness

Hardness Elastomer = Vamac



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

Attachment: 3 Page: 10/20

Tensile Elastomer = Fluoroelastomer



TENSILE_USL_HI TENSILE_USL_HI TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_MEAN TENSILE_MINUS3 TENSILE_MINUS3 TENSILE_USL_LO TENSILE_USL_LO TENSILE_USL_LO TENSILE_USL_LO

Tensile Elastomer = Nitrile



TENSILE ASL HI TENSILE USL HI TENSILE USL HI	TENSILE_PLUS1	TENSILE_MEAN TENSILE_MINUS1 TENSILE_MINUS2	TENSILE_USL_LO	TENSILE_ASL_LO Tensile

Tensile Elastomer = Polyacrylate



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Attachment: 3 Page: 13/20

Tensile Elastomer = Silicone



TENSILE_ASL_HI TENSILE_USL_HI TENSILE_USL_HI TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_MINUS3 TENSILE_MINUS3 TENSILE_MINUS3 TENSILE_USL_LO TENSILE_USL_LO TENSILE_ASL_LO TENSILE_ASL_LO TENSILE_ASL_LO TENSILE_ASL_LO

Date

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Tensile Elastomer = Vamac



TENSILE_ASL_HI TENSILE_USL_HI TENSILE_USL_HI TENSILE_PLUS3 TENSILE_PLUS3 TENSILE_PLUS1 TENSILE_PLUS1 TENSILE_PLUS2 TENSILE_PLUS2 TENSILE_PLUS2 TENSILE_PLUS3 Attachment: 3 Page: 16/20

Date

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Elastomer = Fluoroelastomer



Attachment: 3 Page: 17/20 Elongation Elastomer = Nitrile



ELONGATION ASL HI ELONGATION USL HI ELONGATION USL HI ELONGATION PLUS3 ELONGATION PLUS3 ELONGATION MEAN ELONGATION MINUS3 ELONGATION MINUS3 ELONGATION USL LO ELONGATION USL LO ELONGATION USL LO ELONGATION USL LO ELONGATION ASL LO Attachment: 3 Page: 18/20 Elastomer = Polyacrylate



ELONGATION ASL_HI ELONGATION_USL_HI ELONGATION_USL_HI ELONGATION_PLUS3 ELONGATION_PLUS1 ELONGATION_MINUS1 ELONGATION_MINUS3 ELONGATION_MINUS3 ELONGATION_MINUS3 ELONGATION_MINUS3 ELONGATION_USL_LO ELONGATION_ASL_LO ELONGATION_ASL_LO

Elongation Elastomer = Silicone



Elongation

Elongation Elastomer = Vamac



Attachment: 3 Page: 1/20