APPENDIX C

COMPATIBILITY TEST RESULTS

ONONDAGA LAKE
PRE DESIGN INVESTIGATION
SEDIMENT CONSOLIDATION AREA (SCA)
COMPATIBILITY TESTING SUMMARY REPORT

Prepared For:

Honeywell

301 Plainfield Road, Suite 330
Syracuse, NY 13212

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
Syracuse, NY 13212
Phone: (315) 451-9560
Fax: (315) 451-9570

JANUARY 2010

1.0 INTRODUCTION

This summary report describes the results of bench-scale laboratory compatibility testing. The objective of the testing was to obtain data to assess the compatibility of the materials to be used in the Sediment Consolidation Area (SCA) construction (i.e., geotextile tubes and potential liner materials) with the materials to be dredged from Onondaga Lake. The sampling and testing activities presented in this report were conducted in accordance with the procedures outlined in the Phase IV PDI Work Plan and associated addendum (Parsons, 2008a and b). The details regarding the testing objectives, methods of sample collection and analysis, and results are described below.

2.0 SAMPLE COLLECTION AND ANALYSIS

A bulk sample of sediment from the in-lake waste deposit (ILWD) was obtained for compatibility testing since a majority of the sediment will be dredged from this area. The ILWD is predominantly comprised of Solvay waste, although some areas have an overlying layer of natural sediments. In addition, sediment in the ILWD has the highest average concentration for all the chemicals of concern, except for mercury, of all the remediation areas. The ILWD also has a high pH (approximately 11) and contains non-aqueous phase liquid (NAPL) in certain areas. The bulk sediment sample was collected at Station 10118 (i.e., Bulk Sample 1B) because previous sampling has shown that this area has the highest concentration of volatile organic compounds (VOCs) in the ILWD.

Sediment for Bulk Sample 1B was collected using the bulk-sample-collection procedures described in the work plan (Parsons, 2008a and b). Approximately 100 gallons of sediment were collected. Samples of geosynthetic materials were obtained from manufacturers as indicated in Table 1.

Compatibility tests were performed to monitor the physical properties of the geotextile tube material and geomembrane materials while immersed in the sediment that will be dredged. The physical condition of the materials was monitored as a function of cumulative exposure time by means of dimensional measurements and physical property tests.

Geotextile tube material was tested in accordance with ASTM D6389, and sewing thread was tested in accordance with ASTM D5446. The geotextile tube material and thread were immersed and tested at durations of 30, 60, 90, and 120 days. Two sets of testing were performed, one maintained at 23 degrees Celsius (C) and one at 50 degrees C. Geotextile tube materials were tested for puncture, trapezoidal tear, grab strength, apparent opening size, and permittivity. Geotextile tube threads were tested for tensile strength.

Table 1. Geosynthetic Materials

Geosynthetic Material	Manufacturer	Description
Geotextile Tube	Tencate	GT500, woven, polypropylene, woven, 17.3 oz/yd^2
Geotextile Tube Thread	Tencate	Polyester
High Density Polyethylene (HDPE)	GSE	40 mil, smooth
Linear Low Density Polyethylene (LLDPE)	GSE	40 mil, smooth
Polypropylene (PP)	Firestone	45 mil, smooth
Ethylene Propylene Diene Monomer (EPDM)	Firestone	45 mil, smooth

Geomembrane compatibility tests were performed in accordance with ASTM D 5747. Four geomembrane materials (HDPE, LLDPE, EPDM, and PP) were tested. The materials were immersed and tested at durations of 30, 60, 90, and 120 days. Two sets of testing were performed, one maintained at 23 degrees C and one at 50 degrees C. Geomembrane materials were tested for dimensional properties, puncture, density, hardness, 2% secant modulus, tear resistance, volatiles, extractables, and tensile properties.

The average value for each baseline test (pre-immersion) was computed and used as a reference for the subsequent immersion tests. As each test was performed after the 30, 60, 90, and 120 day immersion periods, the average results were computed. This average value was compared to the average baseline value and the percent change computed as shown on the data sheets in the attached report (Attachment 1). The data was plotted as percent change versus immersion period at 23 degrees C and 50 degrees C in the report.

3.0 RESULTS

The geotextile tube material performed well. The results indicate no significant deterioration of the fabric. The data showed an increase in the strength of the geotextile tube thread. This is most likely attributable to the thread being encased in Solvay waste when it was tested.

All four geomembrane types also performed well. The HDPE and LLDPE geomembrane performed the best since all of the properties were relatively consistent. With respect to the PP and EPDM, they both absorbed the most extractables and volatiles with more strength variations than the HDPE and LLDPE due to absorption and softening of the materials. The complete laboratory report is provided in Attachment 1.

4.0 REFERENCES

Parsons, 2008a. *Onondaga Lake Pre-Design Investigation: Phase IV Work Plan*. Syracuse, New York.

Parsons, 2008b. *Onondaga Lake Pre-Design Investigation: Phase IV Work Plan – Addendum 1 Bulk Sediment Collection, Dewatering Treatability Study, Material Compatibility and Dret Testing*. Syracuse, New York.

ATTACHMENT 1

COMPATIBILITY TEST RESULTS

JLT LABORATORIES, INC.
GEOTECHNICAL, GEOSYNTHETIC AND MATERIALS TESTING AND RESEARCH

June 29, 2009
09LR1826.01

Parsons
290 Elwood Davis Road
Suite 312
Liverpool, NY 13088

Attn: David Steele

RE: COMPATIBILITY TEST RESULTS
GEOMEMBRANE SAMPLES WITH SOLVAY WASTE
HONEYWELL PROJECT
PO NO. 444853.00001.00

Dear Mr. Steele:

Submitted herein is our report of 120 day compatibility testing performed on four (4) types of geomembrane identified as follows:

40 mil Smooth HDPE	Supplier: GSE
40 mil Smooth LLDPE	Supplier: GSE
40 mil Polypropylene	Supplier: Not Provided
40 mil EPDM	Supplier: Not Provided

Coupons of the materials were cut and tested for baseline properties as described herein. The remaining coupons were submerged in separate tanks containing Solvay waste. One set of sealed tanks were encased in a Styrofoam housing and maintained at 23 ± 1°C. The other set of tanks were placed on steel shelving, encased in Styrofoam walls and maintained at 50 ± 1°C.

After 30, 60, 90 and 120 days of continuous submergence in the Solvay waste, coupons were removed and tested for the following properties:

Dimensional Properties

The Width, Length, Thickness and Weight of the coupons were tested before exposure for baseline testing. They were then submerged in the tanks at 23°C and 50°C. At 30, 60, 90 and 120 days the coupons were removed, cleaned and retested for the same properties.

Puncture (ASTM D-4833)

Virgin material of each geomembrane type were tested for Puncture to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Puncture.

Density (ASTM D-1505)

Virgin material of each geomembrane type were tested for Density to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Density.

Hardness (ASTM D-2240)

Virgin material of each geomembrane type were tested for Hardness to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Hardness.

2% Secant Modulus (ASTM D-5323)

Virgin material of each geomembrane type were tested for Modulus to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Modulus.

Tear Resistance (ASTM D-1004)

Virgin material of each geomembrane type were tested for Tear Resistance to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Tear Resistance.

Volatiles (EPA-SW870)

Virgin material of each geomembrane type were tested for Volatiles to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Volatiles.

Extractables (EPA-SW870)

Virgin material of each geomembrane type were tested for Extractables to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Extractables.

Tensile Properties (ASTM D-669)

Virgin material of each geomembrane type were tested for Tensile Properties to develop baseline properties. At 30, 60, 90 and 120 days, coupons were removed from each tank and tested for Tensile Properties.

Test Results

The average value for each baseline test was computed and used as a reference for the subsequent immersion tests. As each test was performed after the 30, 60, 90 and 120 day immersion periods, the average result was computed. This value was compared to the average baseline value and the percent change computed as shown on the attached data sheets. The data was plotted as percent change vs immersion period at 23°C and 50°C as shown on the tables.

Testing Comments

It is noted the specified tests for this work were based on ASTM D-5747 criteria for HDPE geomembranes. Thus, many of the tests do not apply to LLDPE, Polypropylene and EPDM. However, for comparison purposes, it was decided to run the same tests regardless of the material types as a common baseline.

Summary of HDPE Results

HDPE Dimensional Properties
The values varied only slightly with less then 1% difference over the 120 day period. Thus, Solvay waste had little effect on these properties.

HDPE Puncture
The results varied with less then 10% decrease in strength over the 120 day period. This is well within the statistical variability of the material itself.

HDPE Density
The variation in Density was less then 1% over 120 days indicating the Solvay waste has little effect on the density.

HDPE Hardness
The Hardness decreased by 2.78% at 23°C and 8.33% at 50°C. With immersion, the material tends to soften slightly with greater softening at higher temperatures. However, this softening was quite minimal.

HDPE 2% Secant Modulus
At 23°C the Modulus decreased by 22.41% and 11.38% at 50°C. This is as expected. A softening of the material always decreases the Modulus value.

HDPE Tear Resistance
Tear strength decreased by 10.5% at 23°C and 8.0% at 50°C. These values are well within the statistical variation of the material itself.

HDPE Volatiles
For these tests, Volatiles varied the most. However, Volatiles evaporate very quickly. Once a sample is removed from the tank, volatiles begin to evaporate. The variation can easily be accounted to the time between the sample was extracted, washed and weighed for the test. These tests are not valid for evaluation unless other tests correlate with these results.

HDPE Extractables
At 23°C, the Extractables gradually increased over time with a maximum of 19.1% increase. Similarly, at 50°C the Extractables increased through 60 days but decreased at 90 and 120 days. It is difficult to explain this decrease but it does not appear to have an effect on the engineering properties of strength.

HDPE Tensile Properties
Although the properties varied vs exposure time, the statistical variations were well within the statistical variations of the material's virgin properties. The plots show no significant and consistent decrease with exposure time vs temperature to indicate degradation of the material.

Summary of LLDPE Results

LLDPE Dimensional Properties
The Length, Width, Thickness and Weight all varied by less then 1% indicating that swelling and absorption was very minimal.

LLDPE Puncture
Puncture strength did decrease by 15.7% at 23°C and 12.81% at 50°C indicating a slight and expected softening of the geomembrane.

LLDPE Density
The Density change was minimal (<1%) indicating a very slight swelling of the geomembrane.

LLDPE Hardness
Hardness increased somewhat. However, this test method is not applicable to LLDPE.

LLDPE 2% Secant Modulus
This value decreased by 23.00% at 23°C and 27.18% at 50°C. Although this test is not applicable to a LLDPE membrane, the results suggests a softening of the material.

LLDPE Tear Resistance
Tear strength varied by +2.94% at 23°C and 12.5% at 50°C. This variation is well within the statistical variation of the material itself.

LLDPE Volatiles
Volatiles increased significantly indicating the LLDPE absorbed the Volatile components in the Solvay waste. However a relationship between Volatiles and engineering properties is not evident.

LLDPE Extractables
This value also varied increasing at 23°C and decreasing at 50°C. Again these changes do not correlate well with any engineering properties.

LLDPE Tensile Properties
Yield stress and yield strain are not applicable to LLDPE. With respect to the Peak Stress and Peak Strain, the change was less then 8% over 120 days and well within the statistical variation of the material itself.

Summary of Polypropylene Results

Polypropylene Dimensional Properties
Length, Width, Thickness and Weight changes exhibition less then 2% change over the 120 days immersion period. This data does not suggest any significant degradation of the material.

Polypropylene Puncture
Over 120 days, Puncture strength decreased by 13.97% at 23°C and 21.89% at 50°C.

Polypropylene Density
The Density change was on the order of 0.5% which was insignificant at both 23°C and 50°C.

Polypropylene Hardness
Since Hardness does not apply to Polypropylene, no meaningful conclusions can be made.

Polypropylene 2% Secant Modulus
This test does not apply to Polypropylene. However, using the graphical procedure of the Standard indicated a 61% decrease after 120 days at 23°C and 50°C.

Polypropylene Tear Resistance
At 23°C the Tear strength decreased by 13% after 120 days and 21.95% after 120 days at 50°C. This suggests a softening of the material.

Polypropylene Volatiles
At both 23°C and 50°C after 120 days, the Polypropylene significantly absorbs Volatiles from the Solvay waste.

Polypropylene Extractables
Conversely after 120 days, the Polypropylene exhibited a significant decrease in Extractables.

Polypropylene Tensile Properties
Similar to LLDPE, yield stress and yield strain are not applicable to Polypropylene. Peak values did not change significantly and were well within the statistical variations of the material itself.

Summary of EPDM Results

EPDM Dimensional Properties
Length, Width, Thickness and Weight changes were all less then 2% after 120 days. These values are insignificant.

EPDM Puncture
After 120 days of exposure, the average values decreased by 18.66% at 23°C and 14.71 at 50°C. These values are not that significant in that the values can vary by +20% on virgin materials.

EPDM Density
At both 23°C and 50°C, the Density decreased by less then 1% which is insignificant but does suggest some slight absorption of liquid.

EPDM Hardness
The Hardness values decreased due to softening and corresponds with the decrease in Density.

EPDM 2% Secant Modulus
Although this test does not apply to EPDM, we used graphical procedure of the Standard. The data indicates a 40 ± % loss over 120 days. This suggests a softening of the material similar to Puncture.

EPDM Tear Resistance
Tear strength varied by +12.5% at 23°C and +4.17% at 50°C after 120 days of exposure. These values are within the statistical variation of the material itself.

EPDM Volatiles
After 120 days of exposure, Volatiles increased by 130% at 23°C and 216% at 50°C. This suggests the EPDM did absorb Volatiles from the Solvay waste.

EPDM Extractables
Similar to Volatiles, the Extractables also increased by about 60 ± % at 23°C and 50°C. This indicates the EPDM does absorb liquids from the Solvay waste.

EPDM Tensile Properties
Since yield stress and yield strain does not apply to EPDM, these results were not evaluated. Peak Stress after 120 days of exposure increase by about 15+% with a slight decrease in Peak Strain. This suggests a stiffening of the material which increases Strength but decreases Strain. However, these values are still within the statistical variation of the material itself.

Summary

All four (4) geomembrane types performed well. The HDPE and LLDPE geomembrane performed the best considering all of the properties were relatively consistent. With respect to the Polypropylene and EPDM, they both absorbed the most extractables and volatiles with more strength variations then the HDPE and LLDPE due to the absorption and softening of the materials.

We appreciate the opportunity to provide our services and look forward to working with you again. Should you have any questions, comments or require additional information, please do not hesitate to call. Thank you.

Sincerely,

JLT LABORATORIES, INC.

John Boschuk, Jr., P.E.
President

cc: Martin A. Switzer

Enclosures
JB/mlb
\wp10\letter\09121
Inv# 3827

Summary of Test Results

PROPERTY CHANGE (ASTM D-5747)

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB

23° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	9.5917	9.5931	0.01	9.61	0.20	9.62	0.25	9.60	0.09
Length, in	5.5443	5.6135	1.25	5.56	0.22	5.54	-0.14	5.54	-0.02
Width, in	2.6255	2.6153	-0.39	2.62	-0.34	2.61	-0.61	2.61	-0.49
Thickness, mils	41	41	0.00	41.33	0.00	41.33	0.00	41.33	0.00

50° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	9.1289	9.1593	0.33	9.18	0.52	9.17	0.49	9.15	0.24
Length, in	5.2642	5.2664	0.04	5.26	-0.05	5.26	-0.01	5.28	0.22
Width, in	2.7485	2.7465	-0.07	2.75	0.00	2.76	0.24	2.75	0.13
Thickness, mils	41	41	0.00	41.00	0.00	41.00	0.00	41.00	0.00

JLT Laboratories, Inc.

Property Change

ASTM D-5747, paragraphs 11.1 & 11.2

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB
	120 Day Testing		

23° C

PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	9.0441	9.8676	9.8882	9.6000	0.3931
Length	in	5.5875	5.5690	5.4725	5.5430	0.0504
Width	in	2.4030	2.6915	2.7435	2.6127	0.1498
Thickness	mils	42	40	42	41.3	0.9428

50° C

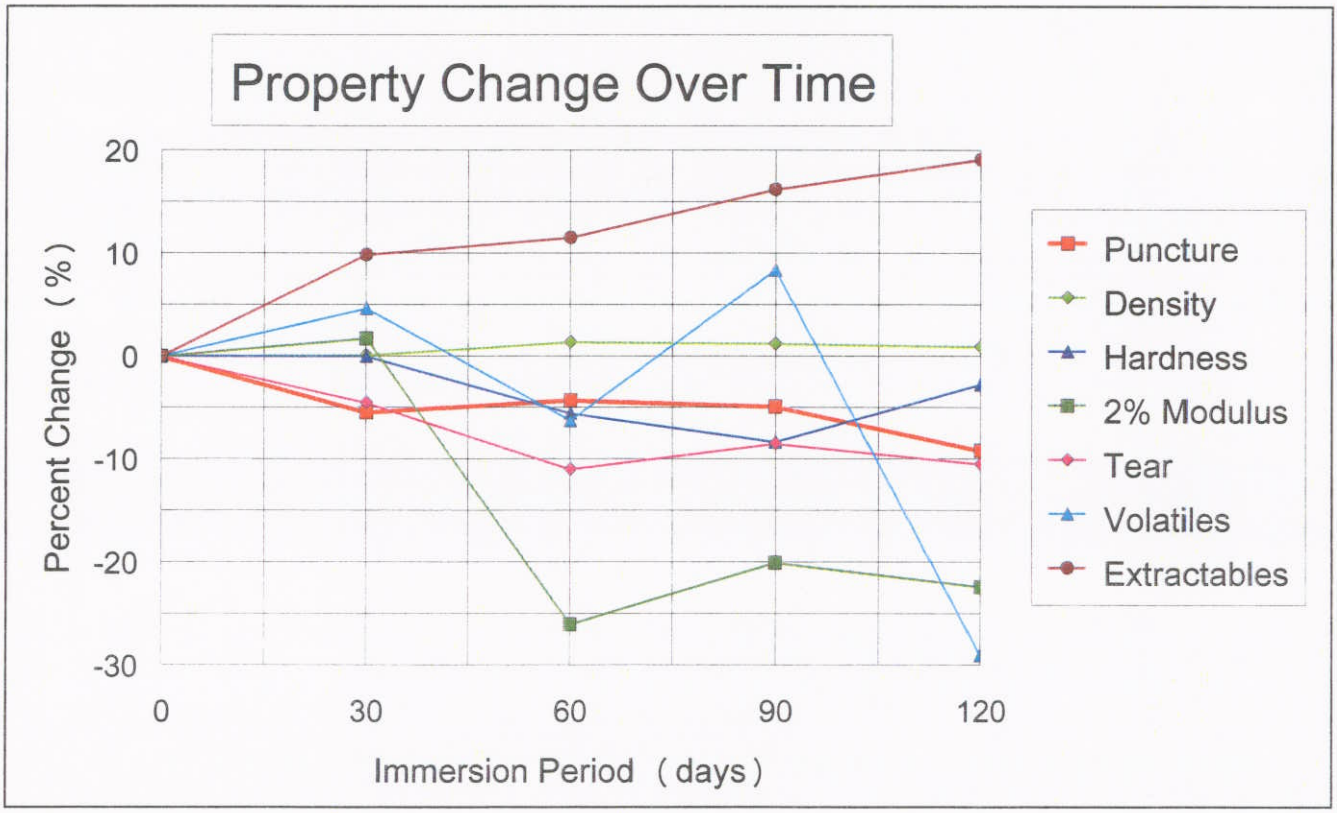
PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	8.7853	9.4372	9.2310	9.1512	0.2721
Length	in	5.1890	5.3900	5.2475	5.2755	0.0844
Width	in	2.6835	2.7645	2.8080	2.7520	0.0516
Thickness	mils	41	41	41	41.0	0.0000

JLT *Laboratories, Inc.*

Summary of Test Results
HDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	108.4	102.5	-5.44	103.8	-4.28	103.1	-4.89	98.5	-9.17
Density	0.931	0.932	0.07	0.944	1.36	0.943	1.22	0.940	0.89
Hardness	12	12	0.00	11	-5.56	11	-8.33	12	-2.78
2% Modulus	49750	50600	1.71	36800	-26.03	39768	-20.06	38602	-22.41
Tear	40.0	38.2	-4.50	35.6	-11.00	36.6	-8.50	35.8	-10.50
Volatiles	0.6637	0.6943	4.61	0.6221	-6.27	0.7194	8.38	0.4710	-29.04
Extractables	0.3410	0.3746	9.85	0.3803	11.52	0.3963	16.21	0.4061	19.10



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

HDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB
	120 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	102.8	97.0	97.6	97.6	97.3	98.5	2.1814
Density	gr/cucm	0.94	0.94	0.94			0.94	0.0005
Hardness		11	12	12			12	0.4714
2% Secant Modulus	psi	38500	37850	38640	39140	38880	38602	434.5
Tear (MD Only)	lbs	37	35	32	38	37	35.8	2.1354
Volatiles	%	0.4372	0.5048				0.4710	0.0338
Extractables	%	0.3997	0.4125				0.4061	0.0064

JLT *Laboratories, Inc.*

Summary of Test Results
HDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	108.4	106.5	-1.73	111.4	2.73	108.1	-0.24	104.1	-4.00
Density	0.931	0.944	1.32	0.945	1.43	0.942	1.11	0.939	0.86
Hardness	12	12	0.00	11	-5.56	11	-5.56	11	-8.33
2% Modulus	49750	51500	3.52	45700	-8.14	44582	-10.39	44088	-11.38
Tear	40.0	36.6	-8.50	38.0	-5.00	37.0	-7.50	36.8	-8.00
Volatiles	0.6637	0.8376	26.20	0.8614	29.78	0.9374	41.23	0.9218	38.88
Extractables	0.3410	0.5713	67.55	0.7804	128.88	0.3568	4.64	0.3466	1.65

JLT Laboratories, Inc.

Geomembrane Conformance Test Results

HDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB
	120 Day Testing		

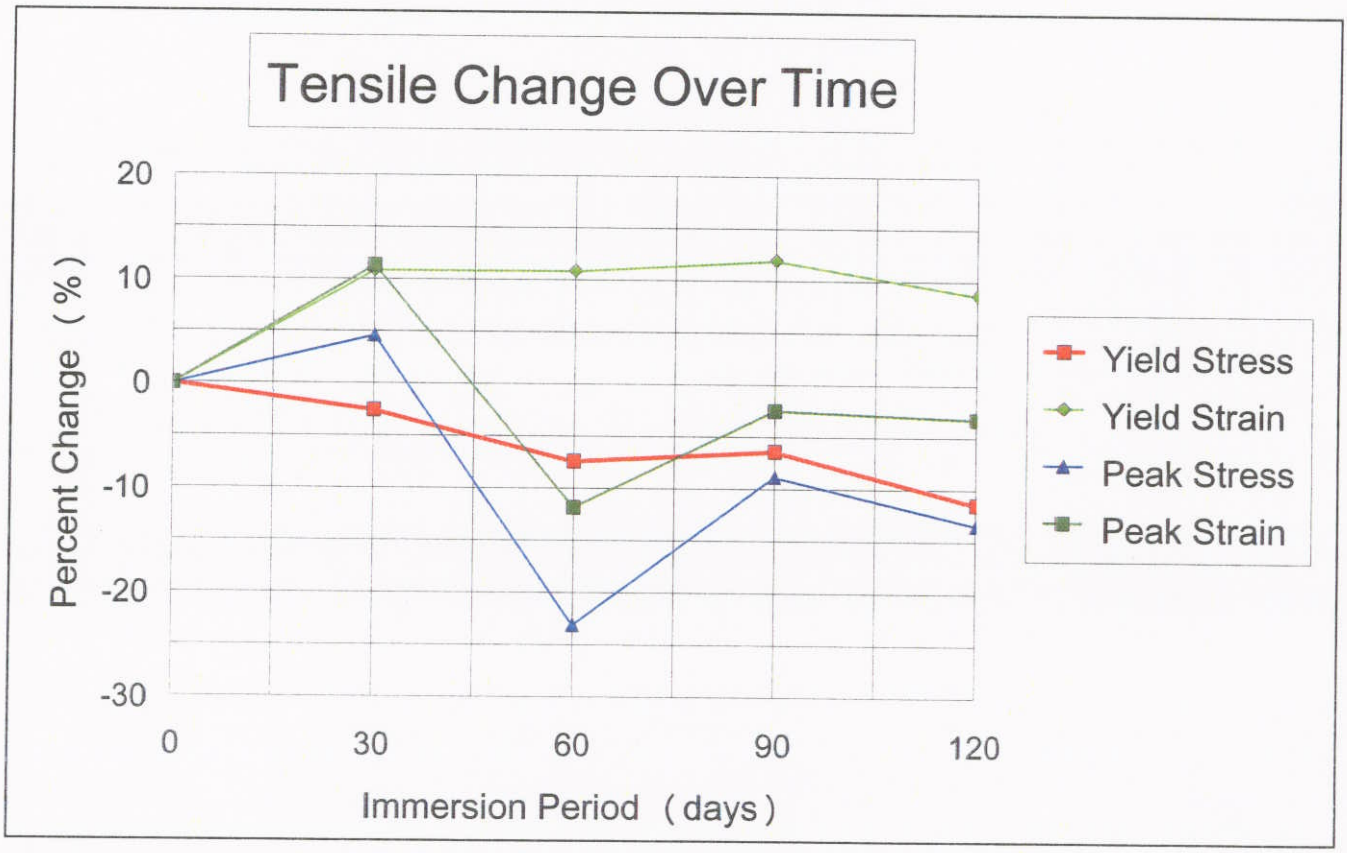
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	103.7	104.5	105.3	106.6	100.2	104.1	2.1546
Density	gr/cucm	0.94	0.94	0.94			0.94	0.0005
Hardness		11	12	10			11	0.8165
2% Secant Modulus	psi	43670	43260	44120	45100	44290	44088	620.7
Tear (MD Only)	lbs	39	39	35	35	36	36.8	1.8330
Volatiles	%	0.9321	0.9114				0.9218	0.0103
Extractables	%	0.2355	0.4577				0.3466	0.1111

JLT Laboratories, Inc.

Summary of Test Results
HDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	103.2	100.6	-2.52	95.6	-7.36	96.6	-6.40	91.4	-11.43
Yield Strain	18.4	20.4	10.87	20.4	10.87	20.6	11.96	20.0	8.70
Peak Stress	190.4	199.2	4.62	146.4	-23.11	173.6	-8.82	164.8	-13.45
Peak Strain	532.2	592.6	11.35	469.2	-11.84	519.0	-2.48	515.0	-3.23



JLT Laboratories, Inc.

Tensile Test Results

HDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
Baseline Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	102	102	105	103	104	103.2	1.17
Yield Strain	%	18	18	19	19	18	18.4	0.49
Peak Stress	lb/in	168	220	176	192	196	190.4	22.86
Peak Strain	%	184	683	557	613	624	532.2	178.64

JLT *Laboratories, Inc.*

Tensile Test Results

HDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	99	102	100	98	104	100.6	2.15
Yield Strain	%	21	19	21	19	22	20.4	1.20
Peak Stress	lb/in	164	220	216	204	192	199.2	25.51
Peak Strain	%	506	641	642	615	559	592.6	52.75

JLT *Laboratories, Inc.*

Tensile Test Results

HDPE - 23° Celcius

Client:	Parsons
Project:	Honeywell
Material:	GSE 40 mil Smooth
Sample ID:	101130132 - HDPE
	60 Day Testing

Job No.:	09LR1826.01
Date:	03/15/2009
Tested By:	RL/AM/MLB
Checked By:	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	99	94	96	98	91	95.6	2.87
Yield Strain	%	22	22	19	19	20	20.4	1.36
Peak Stress	lb/in	220	140	96	136	140	146.4	51.33
Peak Strain	%	598	445	450	403	450	469.2	66.78

JLT *Laboratories, Inc.*

Tensile Test Results

HDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	100	95	98	93	97	96.6	2.42
Yield Strain	%	20	21	21	21	20	20.6	0.49
Peak Stress	lb/in	192	144	164	184	184	173.6	19.69
Peak Strain	%	568	441	491	535	560	519.0	47.34

JLT Laboratories, Inc.

Tensile Test Results

HDPE - 23° Celcius

Client:	Parsons
Project:	Honeywell
Material:	GSE 40 mil Smooth
Sample ID:	101130132 - HDPE
	120 Day Testing

Job No.:	09LR1826.01
Date:	05/15/2009
Tested By:	RL/AM/MLB
Checked By:	JB

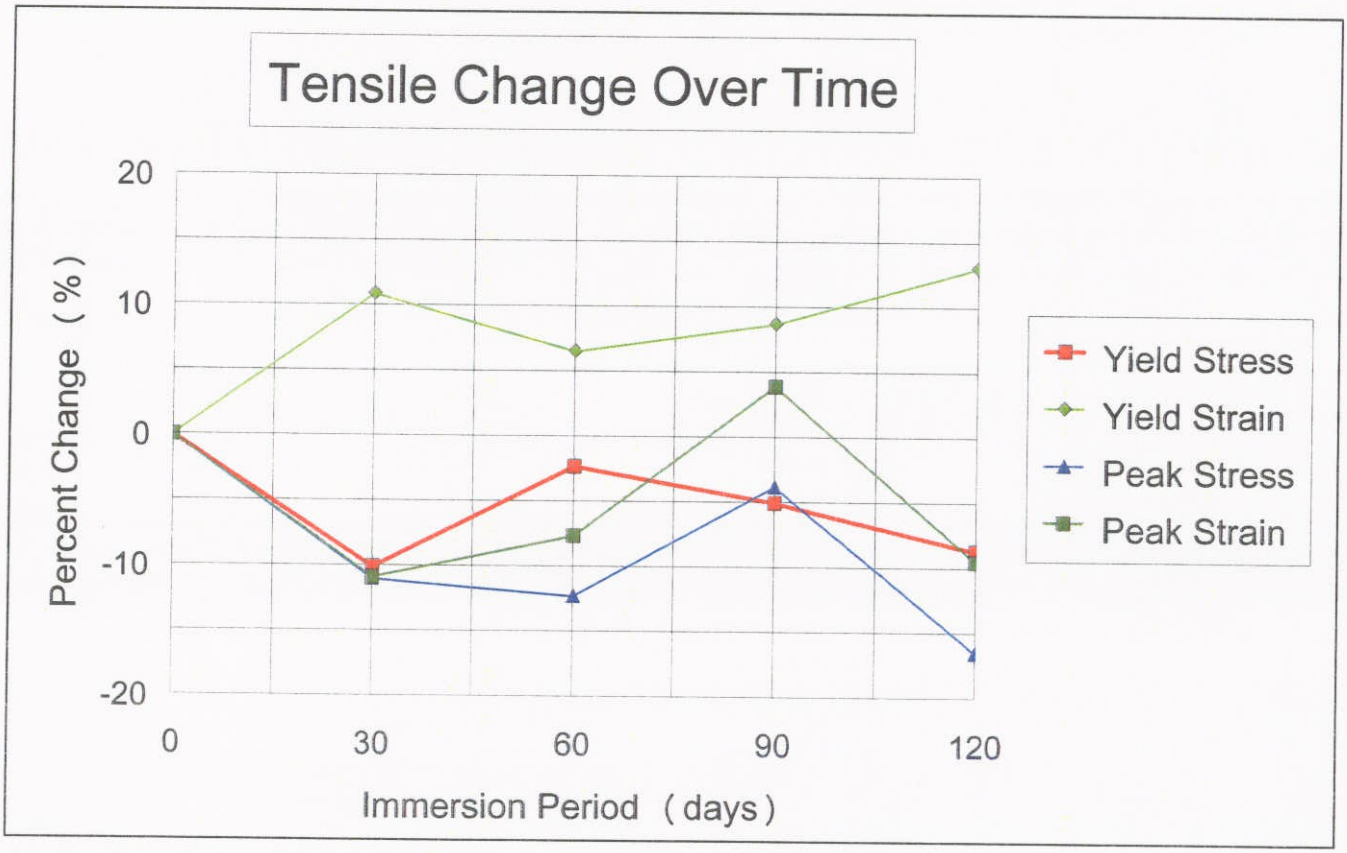
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	93	97	88	93	86	91.4	3.93
Yield Strain	%	18	19	18	23	22	20.0	2.10
Peak Stress	lb/in	148	136	188	200	152	164.8	24.71
Peak Strain	%	462	410	596	611	496	515.0	77.42

JLT *Laboratories, Inc.*

Summary of Test Results
HDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	101130132 - HDPE	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	103.2	92.8	-10.08	100.8	-2.33	98.0	-5.04	94.2	-8.72
Yield Strain	18.4	20.4	10.87	19.6	6.52	20.0	8.70	20.8	13.04
Peak Stress	188.8	168.0	-11.02	165.6	-12.29	181.6	-3.81	157.6	-16.53
Peak Strain	532.2	474.2	-10.90	491.4	-7.67	552.8	3.87	481.4	-9.55



JLT Laboratories, Inc.

Tensile Test Results

HDPE - 50° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
Baseline Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	102	102	105	103	104	103.2	1.17
Yield Strain	%	18	18	19	19	18	18.4	0.49
Peak Stress	lb/in	160	220	176	192	196	188.8	25.37
Peak Strain	%	184	683	557	613	624	532.2	178.64

JLT *Laboratories, Inc.*

Tensile Test Results

HDPE - 50° Celcius

JLT

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	97	94	93	91	89	92.8	2.71
Yield Strain	%	21	19	21	19	22	20.4	1.20
Peak Stress	lb/in	164	192	168	168	148	168.0	12.36
Peak Strain	%	331	576	513	505	446	474.2	82.61

JLT *Laboratories, Inc.*

Tensile Test Results
HDPE - 50° Celcius

JLT

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	98	101	101	101	103	100.8	1.60
Yield Strain	%	21	20	18	19	20	19.6	1.02
Peak Stress	lb/in	140	120	176	196	196	165.6	23.17
Peak Strain	%	443	351	528	574	561	491.4	83.74

JLT *Laboratories, Inc.*

Tensile Test Results
HDPE - 50° Celcius

JLT

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 101130132 - HDPE
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	97	100	97	98	98	98.0	1.10
Yield Strain	%	20	18	21	21	20	20.0	1.10
Peak Stress	lb/in	216	172	168	164	188	181.6	21.75
Peak Strain	%	663	522	516	502	561	552.8	58.47

JLT *Laboratories, Inc.*

Tensile Test Results

HDPE - 50° Celcius

Client:	Parsons
Project:	Honeywell
Material:	GSE 40 mil Smooth
Sample ID:	101130132 - HDPE
	120 Day Testing

Job No.:	09LR1826.01
Date:	05/15/2009
Tested By:	RL/AM/MLB
Checked By:	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	95	96	97	89	94	94.2	2.79
Yield Strain	%	22	20	21	21	20	20.8	0.75
Peak Stress	lb/in	188	168	148	144	140	157.6	16.33
Peak Strain	%	572	501	448	464	422	481.4	52.04

JLT Laboratories, Inc.

Summary of Test Results

PROPERTY CHANGE (ASTM D-5747)

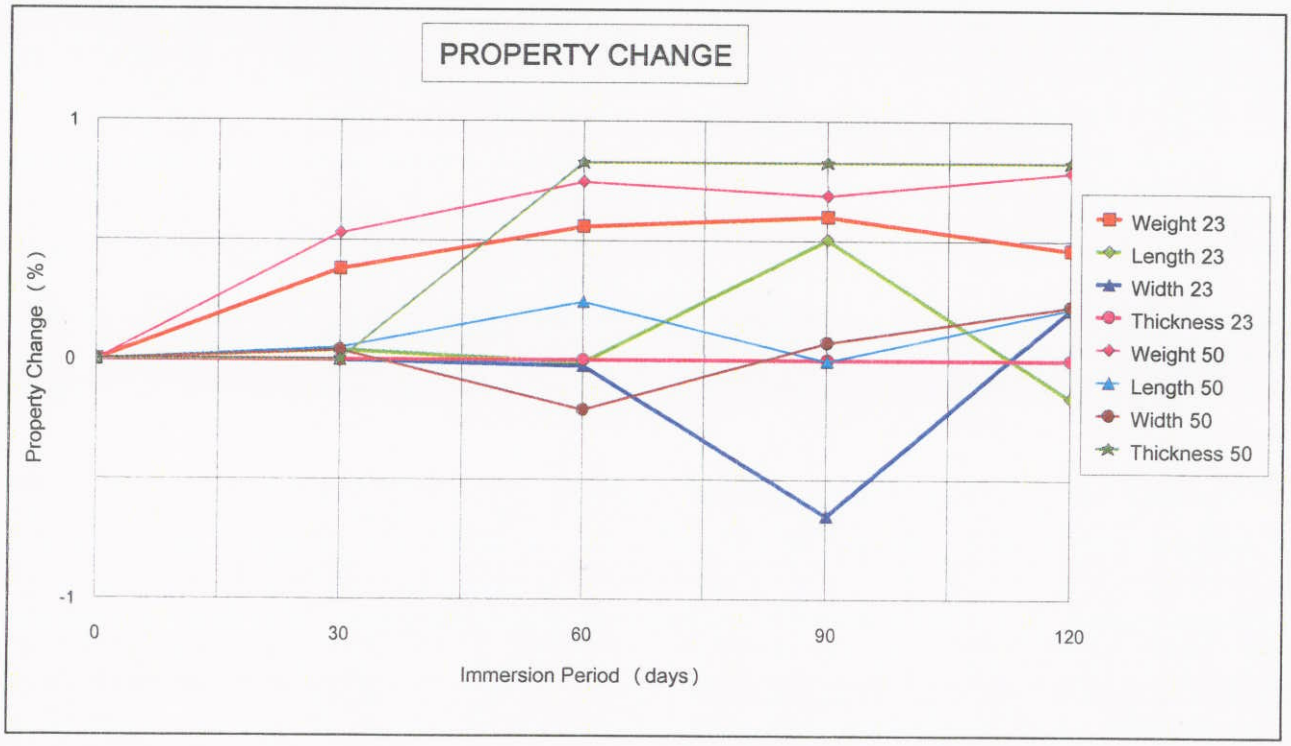
Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB

23° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	8.5775	8.6102	0.38	8.63	0.56	8.63	0.60	8.62	0.46
Length, in	4.8562	4.8577	0.03	4.86	-0.01	4.88	0.50	4.85	-0.16
Width, in	2.8250	2.8262	0.04	2.82	-0.02	2.81	-0.65	2.83	0.21
Thickness, mils	41	41	0.00	40.67	0.00	40.67	0.00	40.67	0.00

50° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	7.6216	7.6620	0.53	7.68	0.75	7.67	0.69	7.68	0.79
Length, in	4.8562	4.8587	0.05	4.87	0.24	4.86	-0.00	4.87	0.22
Width, in	2.5017	2.5027	0.04	2.50	-0.21	2.50	0.07	2.51	0.23
Thickness, mils	40	40	0.00	40.67	0.83	40.67	0.83	40.67	0.83



JLT Laboratories, Inc.

Property Change

ASTM D-5747, paragraphs 11.1 & 11.2

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	GSE 40 mil Smooth	Tested By:	RL/AM/MLB
Sample ID:	104143221 - LLDPE	Checked By:	JB
	120 Day Testing		

23° C

PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	7.7665	9.0903	8.9948	8.6172	0.6028
Length	in	4.6190	4.9805	4.9460	4.8485	0.1629
Width	in	2.6690	2.9130	2.9110	2.8310	0.1146
Thickness	mils	40	41	41	40.7	0.4714

50° C

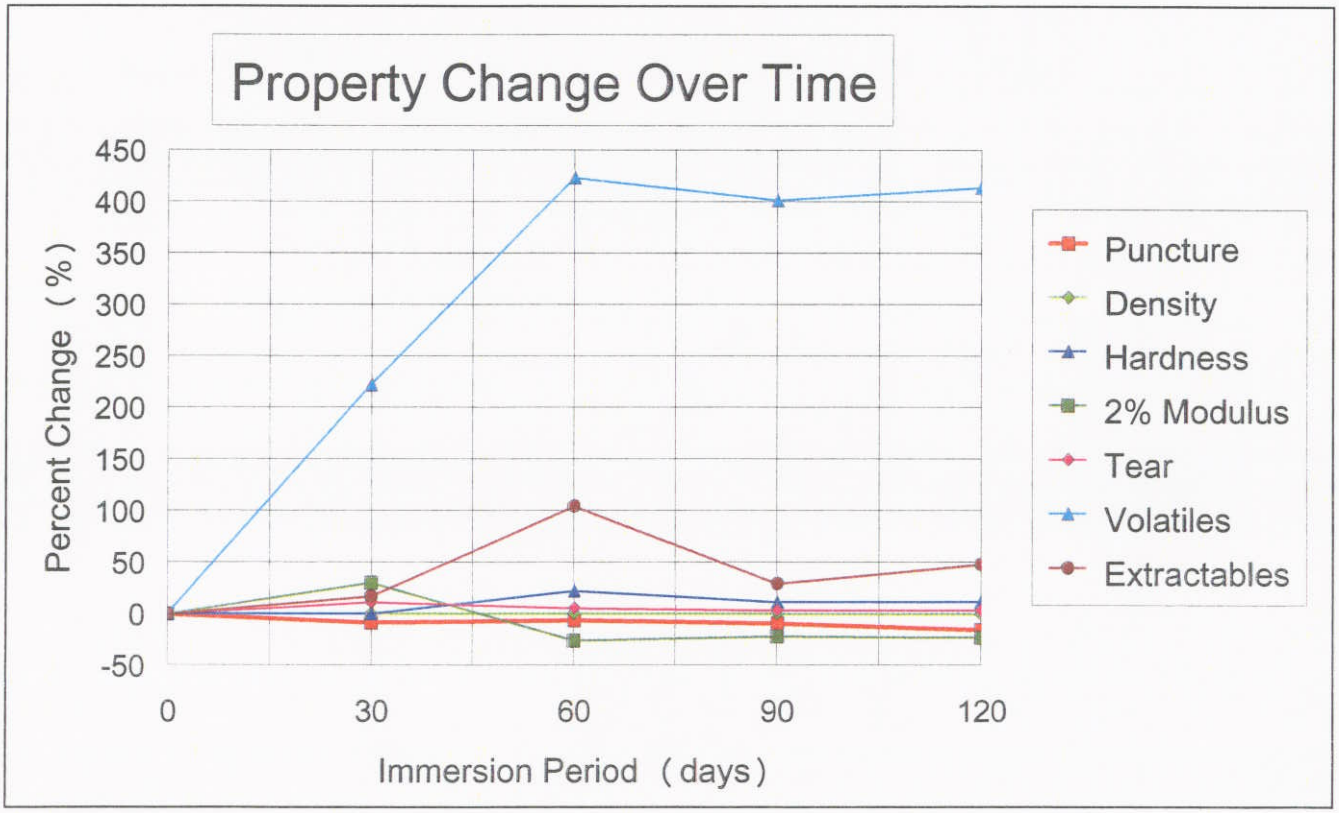
PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	8.4800	7.5752	6.9893	7.6815	0.6132
Length	in	5.2615	4.8345	4.5040	4.8667	0.3101
Width	in	2.5355	2.4930	2.4935	2.5073	0.0199
Thickness	mils	41	41	40	40.7	0.4714

JLT Laboratories, Inc.

Summary of Test Results
LLDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	94.5	86.5	-8.43	88.6	-6.22	85.6	-9.40	79.6	-15.71
Density	0.931	0.932	0.07	0.931	-0.04	0.931	0.00	0.928	-0.32
Hardness	9	9	0.00	11	22.22	10	11.11	10	11.11
2% Modulus	22000	28600	30.00	16300	-25.91	17138	-22.10	16896	-23.20
Tear	27.2	30.2	11.03	28.6	5.15	28.0	2.94	28.0	2.94
Volatiles	0.1340	0.4315	221.89	0.7014	423.31	0.6719	401.23	0.6885	413.66
Extractables	0.3461	0.4045	16.87	0.7062	104.05	0.4468	29.09	0.5117	47.85



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

LLDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB
	120 Day Testing		

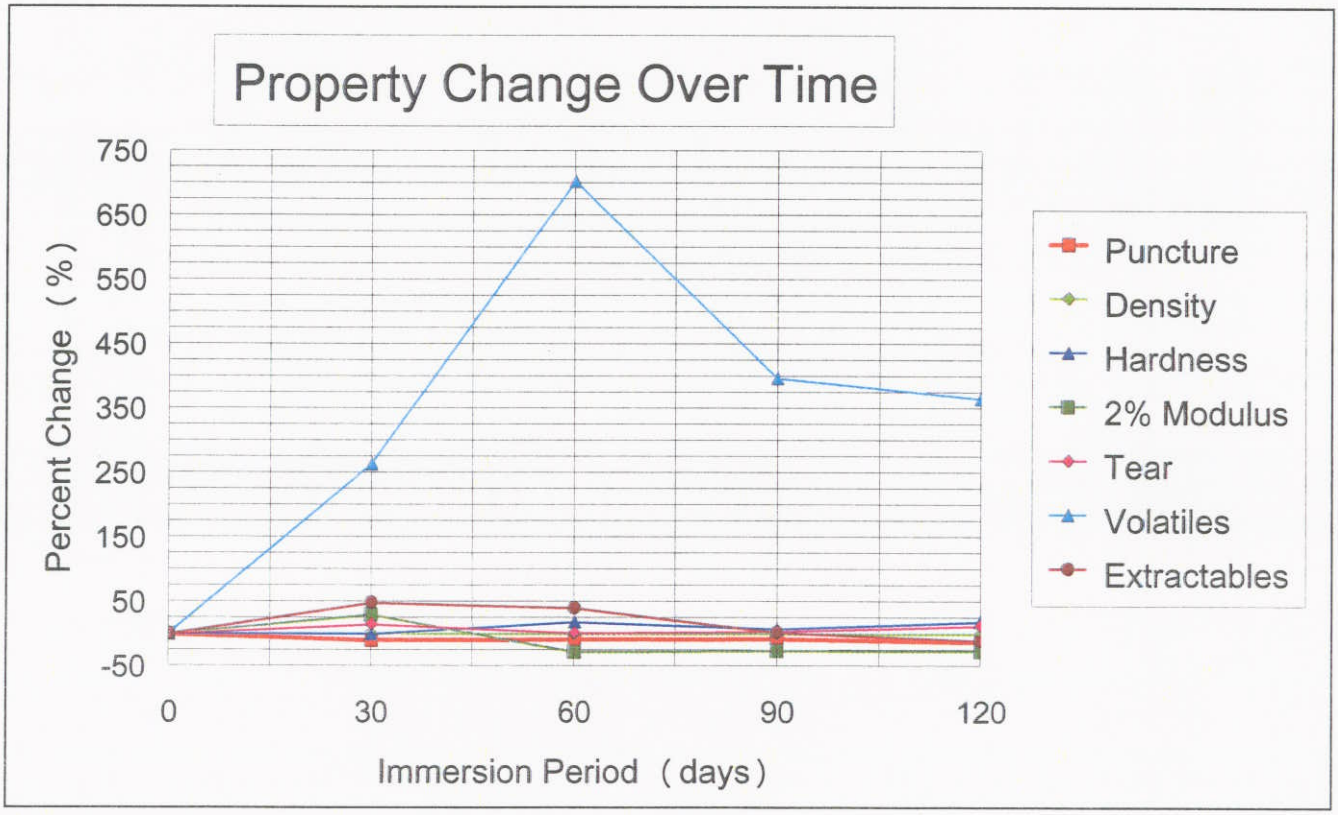
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	78.6	80.3	80.1	81.2	78.0	79.6	1.1706
Density	gr/cucm	0.93	0.93	0.93			0.93	0.0005
Hardness		9	10	11			10	0.8165
2% Secant Modulus	psi	16920	16850	17160	16540	17010	16896	206.0
Tear (MD Only)	lbs	29	28	28	30	25	28.0	1.6733
Volatiles	%	0.6311	0.7459				0.6885	0.0574
Extractables	%	0.5355	0.4879				0.5117	0.0238

JLT *Laboratories, Inc.*

Summary of Test Results
LLDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	94.5	85.3	-9.72	86.2	-8.81	87.1	-7.77	82.4	-12.81
Density	0.931	0.932	0.07	0.931	0.00	0.931	-0.07	0.927	-0.47
Hardness	9	9	0.00	11	18.52	10	7.41	11	18.52
2% Modulus	22000	28500	29.55	15800	-28.18	16188	-26.42	16020	-27.18
Tear	27.2	31.2	14.71	27.6	1.47	28.2	3.68	30.6	12.50
Volatiles	0.1340	0.4870	263.29	1.0762	702.87	0.6659	396.76	0.6229	364.68
Extractables	0.3461	0.5112	47.70	0.4840	39.85	0.3527	1.91	0.3077	-11.11



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

LLDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB
	120 Day Testing		

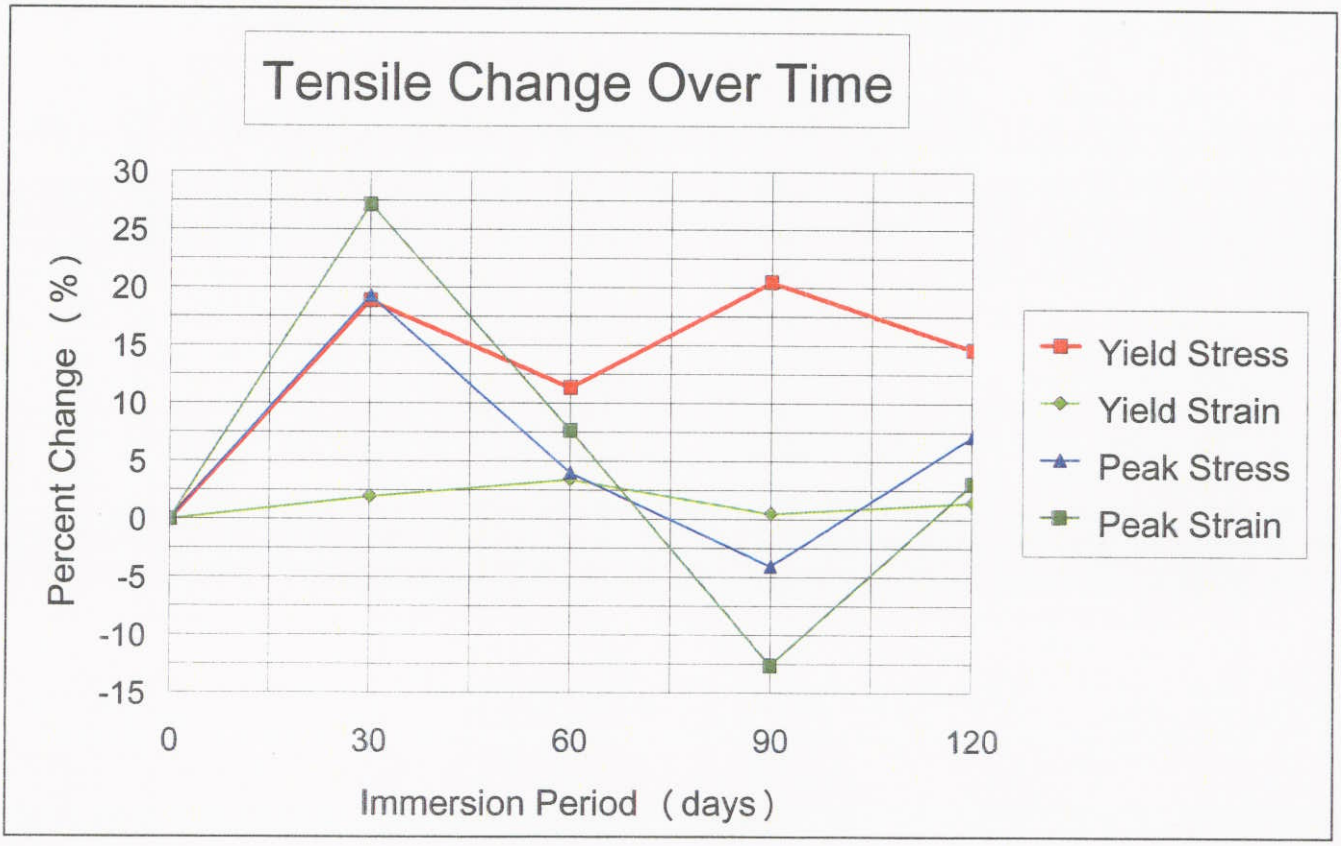
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	79.5	83.6	85.0	80.5	83.3	82.4	2.0508
Density	gr/cucm	0.93	0.93	0.93			0.93	0.0000
Hardness		11	10	11			11	0.4714
2% Secant Modulus	psi	15640	16210	16360	16110	15780	16020	269.0
Tear (MD Only)	lbs	31	31	32	32	27	30.6	1.8547
Volatiles	%	0.6609	0.5848				0.6229	0.0381
Extractables	%	0.2754	0.3399				0.3077	0.0323

JLT Laboratories, Inc.

Summary of Test Results
LLDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	61.4	73.0	18.89	68.4	11.40	74.0	20.52	70.4	14.66
Yield Strain	40.8	41.6	1.96	42.2	3.43	41.0	0.49	41.4	1.47
Peak Stress	178.4	212.8	19.28	185.6	4.04	171.2	-4.04	191.2	7.17
Peak Strain	703.6	894.8	27.17	757.6	7.67	614.8	-12.62	725.2	3.07



JLT Laboratories, Inc.

Tensile Test Results

LLDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	02/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB
	Baseline Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	62	63	61	62	59	61.4	1.36
Yield Strain	%	42	41	43	40	38	40.8	1.72
Peak Stress	lb/in	180	152	200	164	196	178.4	19.69
Peak Strain	%	747	516	899	567	789	703.6	142.28

JLT *Laboratories, Inc.*

Tensile Test Results

LLDPE - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	02/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB
	30 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	74	74	72	72	73	73.0	0.89
Yield Strain	%	44	44	41	41	38	41.6	2.24
Peak Stress	lb/in	164	252	216	212	220	212.8	36.12
Peak Strain	%	592	979	995	984	924	894.8	153.38

JLT *Laboratories, Inc.*

Tensile Test Results
LLDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	69	70	68	68	67	68.4	1.02
Yield Strain	%	41	44	41	41	44	42.2	1.47
Peak Stress	lb/in	192	196	184	176	180	185.6	4.99
Peak Strain	%	795	794	724	735	740	757.6	30.57

JLT *Laboratories, Inc.*

Tensile Test Results
LLDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	75	75	72	75	73	74.0	1.26
Yield Strain	%	41	41	41	41	41	41.0	0.00
Peak Stress	lb/in	192	196	128	172	168	171.2	31.16
Peak Strain	%	685	708	484	601	596	614.8	79.08

JLT *Laboratories, Inc.*

Tensile Test Results
LLDPE - 23° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
120 Day Testing

Job No.: 09LR1826.01
Date: 05/15/2009
Tested By: RL/AM/MLB
Checked By: JB

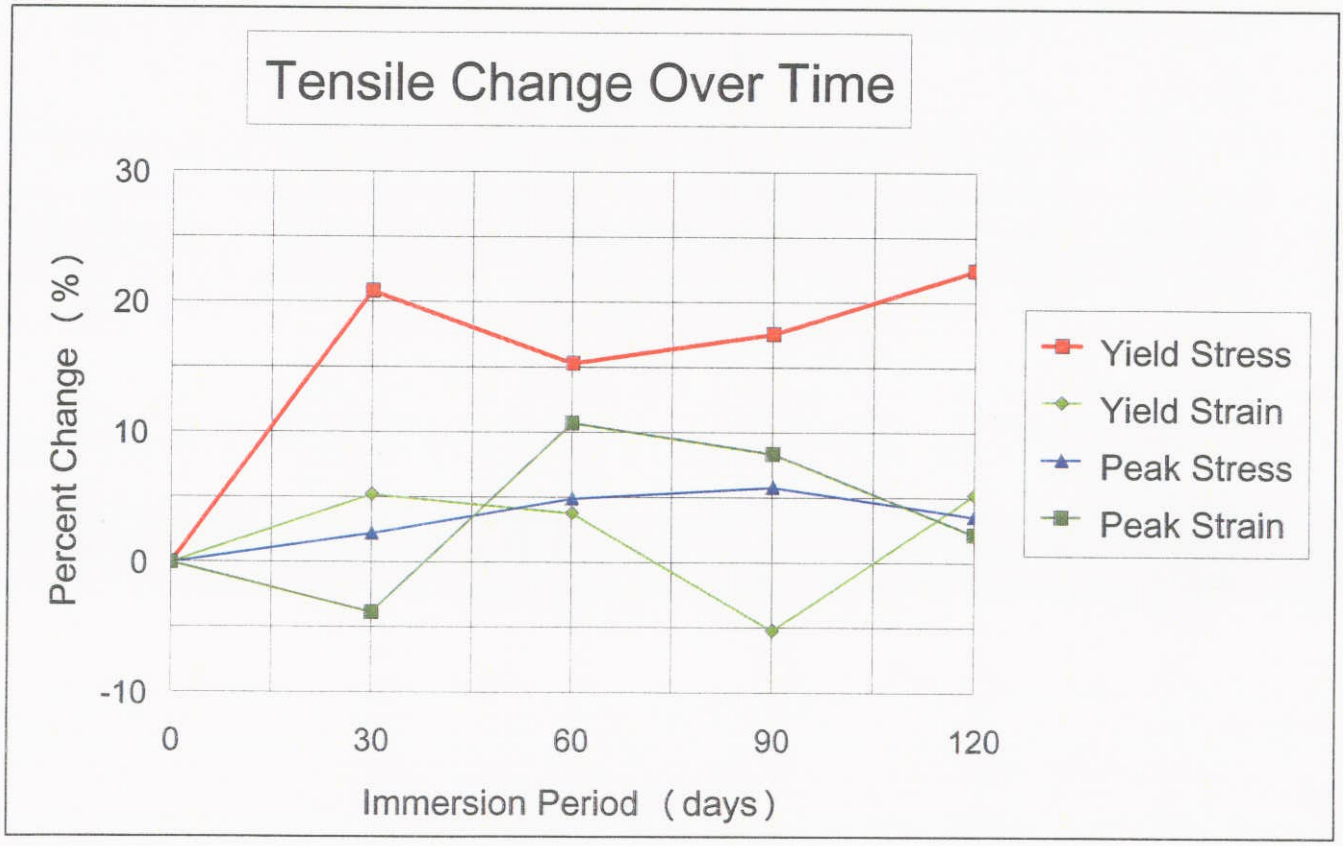
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	75	70	69	70	68	70.4	2.42
Yield Strain	%	44	44	41	40	38	41.4	2.33
Peak Stress	lb/in	184	208	200	192	172	191.2	12.50
Peak Strain	%	695	749	777	733	672	725.2	37.56

JLT Laboratories, Inc.

Summary of Test Results
LLDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	61.4	74.2	20.85	70.8	15.31	72.2	17.59	75.2	22.48
Yield Strain	42.2	44.4	5.21	43.8	3.79	40.0	-5.21	44.4	5.21
Peak Stress	178.4	182.4	2.24	187.2	4.93	188.8	5.83	184.8	3.59
Peak Strain	703.6	676.6	-3.84	779.0	10.72	762.4	8.36	719.0	2.19



JLT Laboratories, Inc.

Tensile Test Results

LLDPE - 50° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
Baseline Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	62	63	61	62	59	61.4	1.36
Yield Strain	%	42	43	41	42	43	42.2	0.75
Peak Stress	lb/in	180	152	200	164	196	178.4	19.69
Peak Strain	%	747	516	899	567	789	703.6	142.28

JLT *Laboratories, Inc.*

Tensile Test Results

LLDPE - 50° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	74	75	74	74	74	74.2	0.40
Yield Strain	%	46	44	44	44	44	44.4	0.80
Peak Stress	lb/in	168	212	120	200	212	182.4	37.57
Peak Strain	%	613	772	467	732	799	676.6	122.58

JLT *Laboratories, Inc.*

Tensile Test Results
LLDPE - 50° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	72	71	71	70	70	70.8	0.75
Yield Strain	%	46	44	41	44	44	43.8	1.60
Peak Stress	lb/in	176	200	208	168	184	187.2	13.60
Peak Strain	%	695	888	1012	624	676	779.0	146.87

JLT *Laboratories, Inc.*

Tensile Test Results

LLDPE - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	04/15/2009
Material:	GSE 40 mil Smooth	**Tested By:**	RL/AM/MLB
Sample ID:	104143221 - LLDPE	**Checked By:**	JB
	90 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	73	73	72	72	71	72.2	0.75
Yield Strain	%	39	38	41	41	41	40.0	1.26
Peak Stress	lb/in	188	200	176	200	180	188.8	9.80
Peak Strain	%	729	812	680	816	775	762.4	51.76

JLT *Laboratories, Inc.*

Tensile Test Results
LLDPE - 50° Celcius

Client: Parsons
Project: Honeywell
Material: GSE 40 mil Smooth
Sample ID: 104143221 - LLDPE
120 Day Testing

Job No.: 09LR1826.01
Date: 05/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	84	80	72	71	69	75.2	5.78
Yield Strain	%	38	46	46	46	46	44.4	3.20
Peak Stress	lb/in	204	192	148	196	184	184.8	19.50
Peak Strain	%	863	719	563	757	693	719.0	97.15

JLT Laboratories, Inc.

Summary of Test Results

PROPERTY CHANGE (ASTM D-5747)

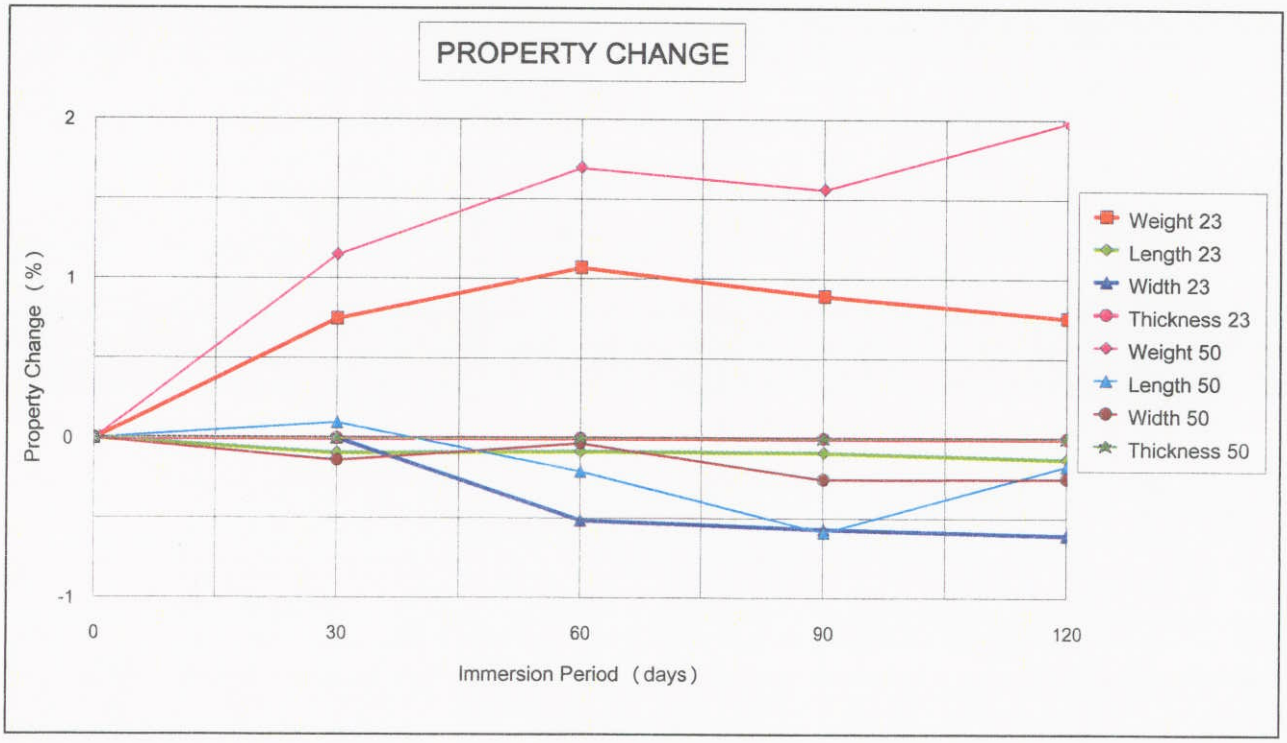
Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB

23° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	11.1493	11.2330	0.75	11.27	1.07	11.25	0.89	11.23	0.76
Length, in	5.3462	5.3507	0.08	5.34	-0.08	5.34	-0.09	5.34	-0.13
Width, in	2.8922	2.8895	-0.09	2.88	-0.51	2.88	-0.57	2.87	-0.61
Thickness, mils	44	44	0.00	44.33	0.00	44.33	0.00	44.33	0.00

50° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	10.4059	10.5256	1.15	10.58	1.70	10.57	1.56	10.61	1.99
Length, in	5.3895	5.3948	0.10	5.38	-0.21	5.36	-0.59	5.38	-0.17
Width, in	2.9427	2.9387	-0.14	2.94	-0.03	2.94	-0.25	2.94	-0.25
Thickness, mils	40	40	0.00	40.33	0.00	40.33	0.00	40.33	0.00



JLT Laboratories, Inc.

Property Change

ASTM D-5747, paragraphs 11.1 & 11.2

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB
	120 Day Testing		

23° C

PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	11.0203	11.6313	11.0494	11.2337	0.2814
Length	in	5.2635	5.4075	5.3470	5.3393	0.0590
Width	in	2.8675	2.8985	2.8580	2.8747	0.0173
Thickness	mils	44	45	44	44.3	0.4714

50° C

PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	11.0615	10.3916	10.3843	10.6125	0.3175
Length	in	5.4455	5.3705	5.3250	5.3803	0.0497
Width	in	2.8975	2.9885	2.9200	2.9353	0.0387
Thickness	mils	43	39	39	40.3	1.8856

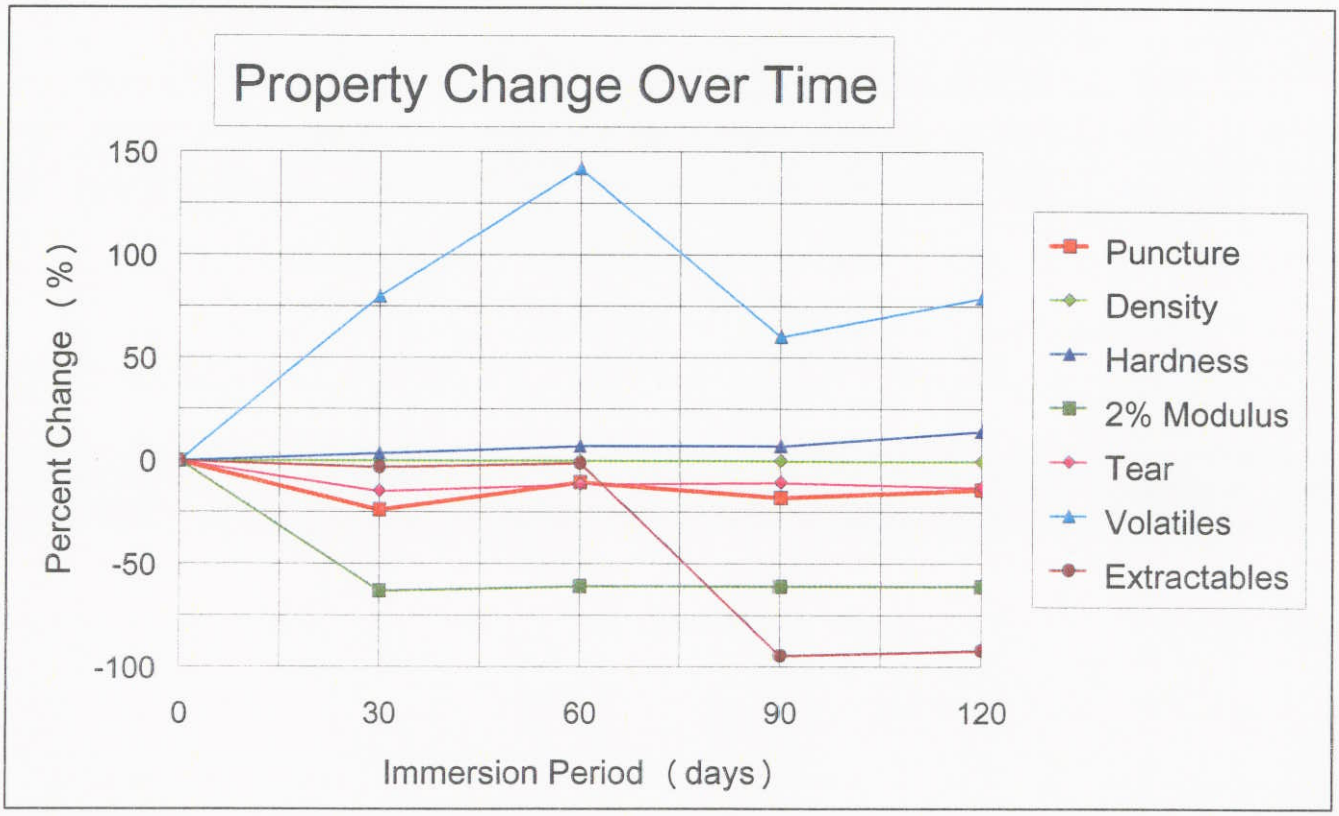
JLT *Laboratories, Inc.*

Summary of Test Results

Polypropylene - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	73.7	56.3	-23.66	66.0	-10.50	60.5	-17.91	63.4	-13.97
Density	0.910	0.911	0.11	0.910	0.07	0.908	-0.18	0.906	-0.44
Hardness	9	10	3.57	10	7.14	10	7.14	11	14.29
2% Modulus	27000	10000	-62.96	10600	-60.74	10558	-60.90	10524	-61.02
Tear	24.6	21.0	-14.63	21.8	-11.38	22.0	-10.57	21.4	-13.01
Volatiles	0.3802	0.6838	79.88	0.9197	141.94	0.6089	60.16	0.6806	79.03
Extractables	24.2593	23.5016	-3.12	23.9529	-1.26	1.3578	-94.40	1.9722	-91.87



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

Polypropylene - 23° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	Polypropylene	Tested By:	RL/AM/MLB
Sample ID:	Polypropylene	Checked By:	JB
	120 Day Testing		

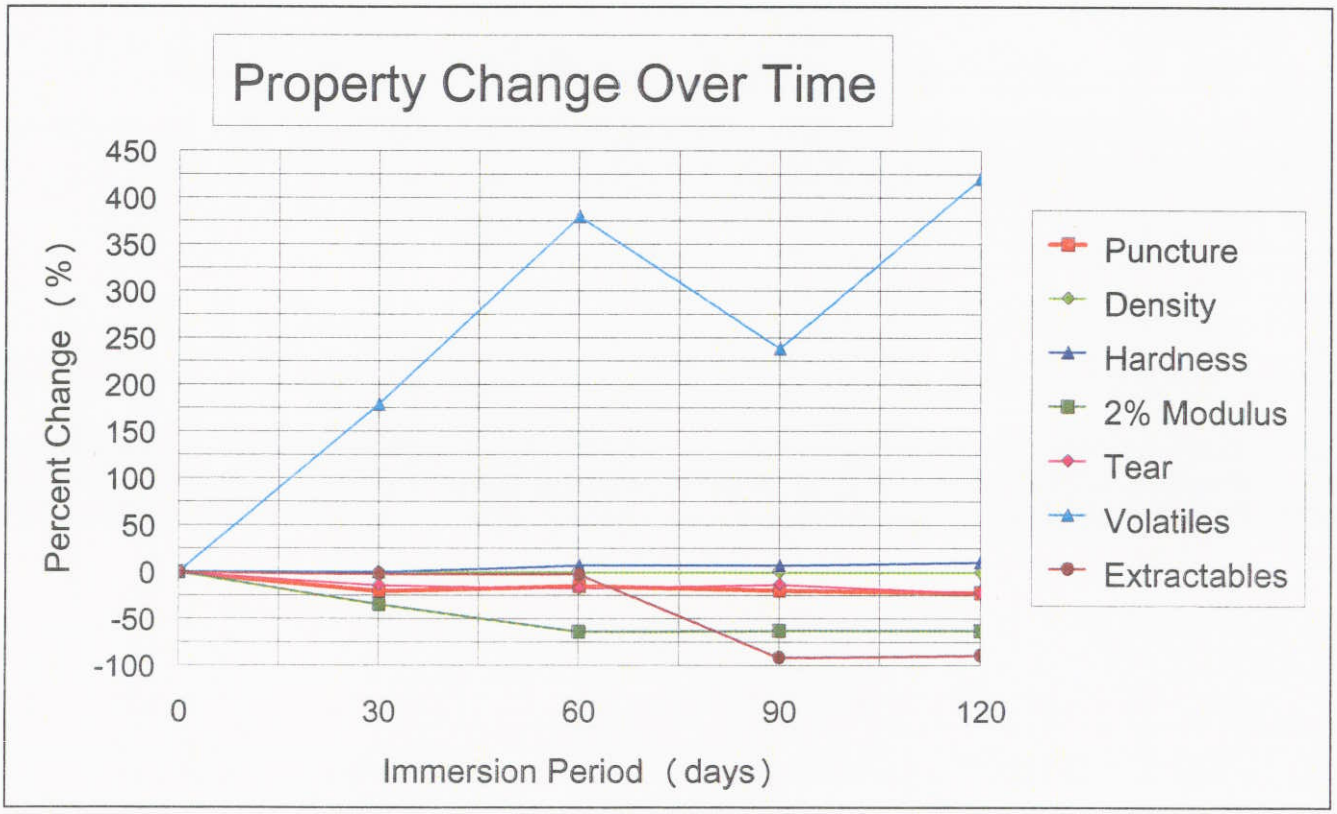
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	59.6	67.7	61.5	65.1	63.2	63.4	2.8096
Density	gr/cucm	0.91	0.91	0.91			0.91	0.0005
Hardness		11	11	10			11	0.4714
2% Secant Modulus	psi	10490	10520	10480	10520	10610	10524	45.9
Tear (MD Only)	lbs	21	22	21	22	21	21.4	0.4899
Volatiles	%	0.6599	0.7013				0.6806	0.0207
Extractables	%	2.0262	1.9182				1.9722	0.0540

JLT *Laboratories, Inc.*

Summary of Test Results
Polypropylene - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	73.7	59.1	-19.83	62.8	-14.81	59.5	-19.29	57.6	-21.89
Density	0.910	0.910	0.00	0.910	0.00	0.907	-0.29	0.905	-0.51
Hardness	9	9	0.00	10	7.14	10	7.14	10	10.71
2% Modulus	27000	17700	-34.44	9800	-63.70	10068	-62.71	10042	-62.81
Tear	24.6	21.2	-13.82	20.4	-17.07	21.4	-13.01	19.2	-21.95
Volatiles	0.3802	1.0608	179.04	1.8251	380.09	1.2863	238.34	1.9792	420.62
Extractables	24.2593	23.7521	-2.09	23.6336	-2.58	2.1139	-91.29	2.7495	-88.67



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

Polypropylene - 50° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	Polypropylene	Tested By:	RL/AM/MLB
Sample ID:	Polypropylene	Checked By:	JB
	120 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	63.3	61.6	57.3	48.0	57.7	57.6	5.3056
Density	gr/cucm	0.91	0.91	0.91			0.91	0.0000
Hardness		10	11	10			10	0.4714
2% Secant Modulus	psi	10060	10130	10210	9890	9920	10042	121.9
Tear (MD Only)	lbs	20	19	18	19	20	19.2	0.7483
Volatiles	%	1.7454	2.2130				1.9792	0.2338
Extractables	%	2.5277	2.9713				2.7495	0.2218

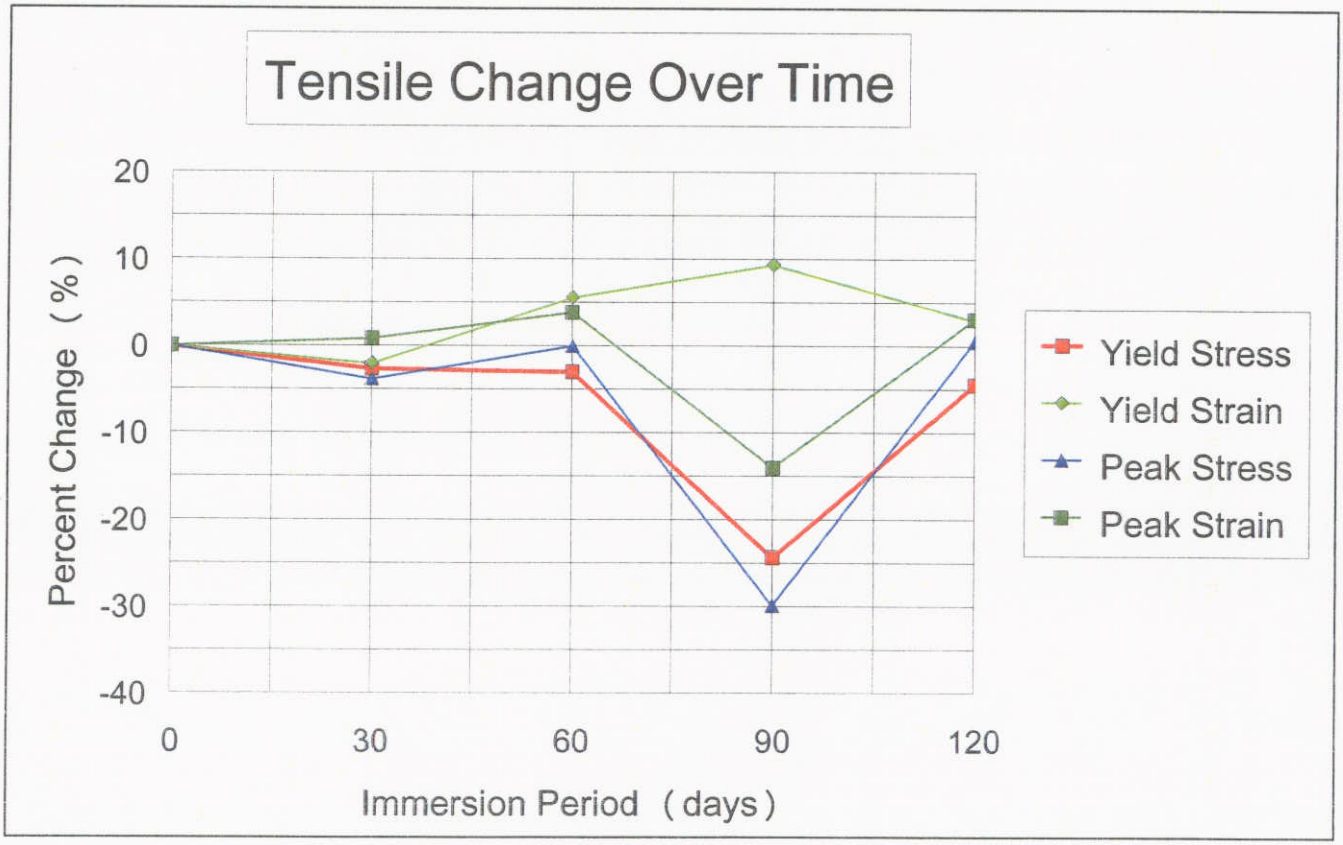
JLT Laboratories, Inc.

Summary of Test Results

Polypropylene - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	53.4	52.0	-2.62	51.8	-3.00	40.4	-24.34	51.0	-4.49
Yield Strain	68.4	67.0	-2.05	72.2	5.56	74.8	9.36	70.4	2.92
Peak Stress	147.2	141.6	-3.80	147.2	0.00	103.2	-29.89	148.0	0.54
Peak Strain	688.6	694.4	0.84	715.2	3.86	591.8	-14.06	709.8	3.08



JLT Laboratories, Inc.

Tensile Test Results

Polypropylene - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	02/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB
	Baseline Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	55	56	53	53	50	53.4	2.06
Yield Strain	%	72	72	64	72	62	68.4	4.45
Peak Stress	lb/in	152	144	160	144	136	147.2	6.53
Peak Strain	%	748	644	737	671	643	688.6	45.28

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 23° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	52	52	53	51	52	52.0	0.63
Yield Strain	%	67	69	66	66	67	67.0	1.10
Peak Stress	lb/in	140	148	144	132	144	141.6	3.27
Peak Strain	%	688	713	704	652	715	694.4	23.24

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 23° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	52	52	52	52	51	51.8	0.40
Yield Strain	%	77	77	64	74	69	72.2	5.04
Peak Stress	lb/in	148	152	136	144	156	147.2	6.80
Peak Strain	%	711	756	659	695	755	715.2	36.97

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 23° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	41	41	40	40	40	40.4	0.49
Yield Strain	%	79	79	67	77	72	74.8	4.66
Peak Stress	lb/in	100	104	104	104	104	103.2	1.89
Peak Strain	%	577	587	608	595	592	591.8	10.15

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 23° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
120 Day Testing

Job No.: 09LR1826.01
Date: 05/15/2009
Tested By: RL/AM/MLB
Checked By: JB

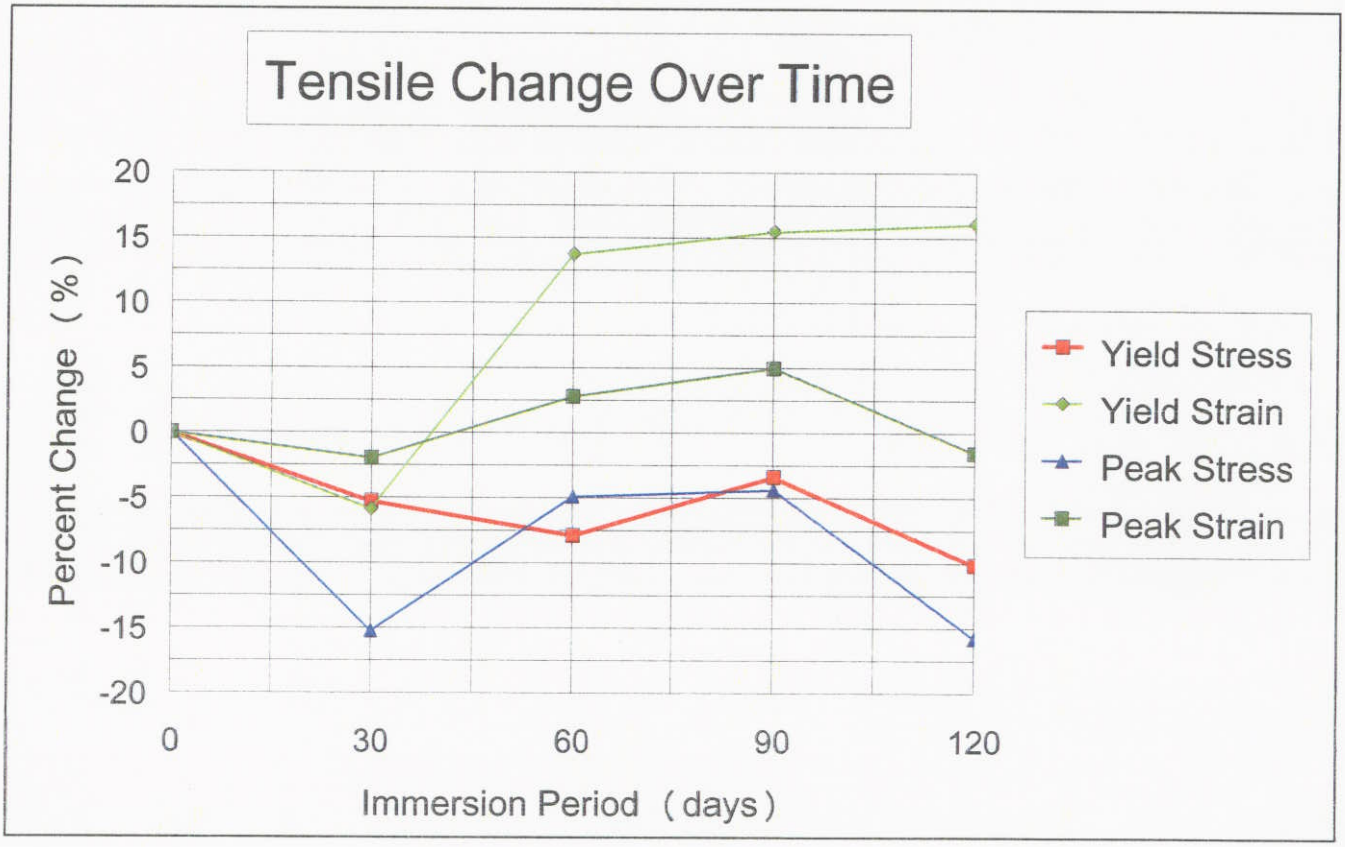
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	51	51	54	49	50	51.0	1.67
Yield Strain	%	67	72	72	77	64	70.4	4.50
Peak Stress	lb/in	148	152	124	164	152	148.0	13.15
Peak Strain	%	756	741	604	687	761	709.8	59.06

JLT Laboratories, Inc.

Summary of Test Results
Polypropylene - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	53.4	50.6	-5.24	49.2	-7.87	51.6	-3.37	48.0	-10.11
Yield Strain	68.4	64.4	-5.85	77.8	13.74	79.0	15.50	79.4	16.08
Peak Stress	147.2	124.8	-15.22	140.0	-4.89	140.8	-4.35	124.0	-15.76
Peak Strain	688.6	675.2	-1.95	707.8	2.79	723.0	5.00	678.0	-1.54



JLT Laboratories, Inc.

Tensile Test Results

Polypropylene - 50° Celcius

Client:	Parsons
Project:	Honeywell
Material:	Polypropylene
Sample ID:	Polypropylene
	Baseline Testing

Job No.:	09LR1826.01
Date:	02/15/2009
Tested By:	RL/AM/MLB
Checked By:	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	55	56	53	53	50	53.4	2.06
Yield Strain	%	72	72	64	72	62	68.4	4.45
Peak Stress	lb/in	152	144	160	144	136	147.2	6.53
Peak Strain	%	748	644	737	671	643	688.6	45.28

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 50° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	51	51	50	52	49	50.6	1.02
Yield Strain	%	67	66	62	63	64	64.4	1.85
Peak Stress	lb/in	120	132	124	128	120	124.8	4.99
Peak Strain	%	607	645	728	781	615	675.2	68.07

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	03/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene	**Checked By:**	JB
	60 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	48	49	51	50	48	49.2	1.17
Yield Strain	%	77	74	78	81	79	77.8	2.32
Peak Stress	lb/in	140	144	136	128	152	140.0	3.27
Peak Strain	%	736	739	671	641	752	707.8	43.68

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 50° Celcius

Client: Parsons
Project: Honeywell
Material: Polypropylene
Sample ID: Polypropylene
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	52	52	52	51	51	51.6	0.49
Yield Strain	%	77	79	72	80	87	79.0	4.86
Peak Stress	lb/in	136	152	136	136	144	140.8	7.54
Peak Strain	%	775	781	689	665	705	723.0	46.72

JLT *Laboratories, Inc.*

Tensile Test Results

Polypropylene - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	Polypropylene	**Tested By:**	RL/AM/MLB
Sample ID:	Polypropylene 120 Day Testing	**Checked By:**	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	53	46	47	47	47	48.0	2.53
Yield Strain	%	90	79	74	85	69	79.4	7.50
Peak Stress	lb/in	140	112	124	124	120	124.0	9.12
Peak Strain	%	688	643	701	695	663	678.0	21.76

JLT *Laboratories, Inc.*

Summary of Test Results

PROPERTY CHANGE (ASTM D-5747)

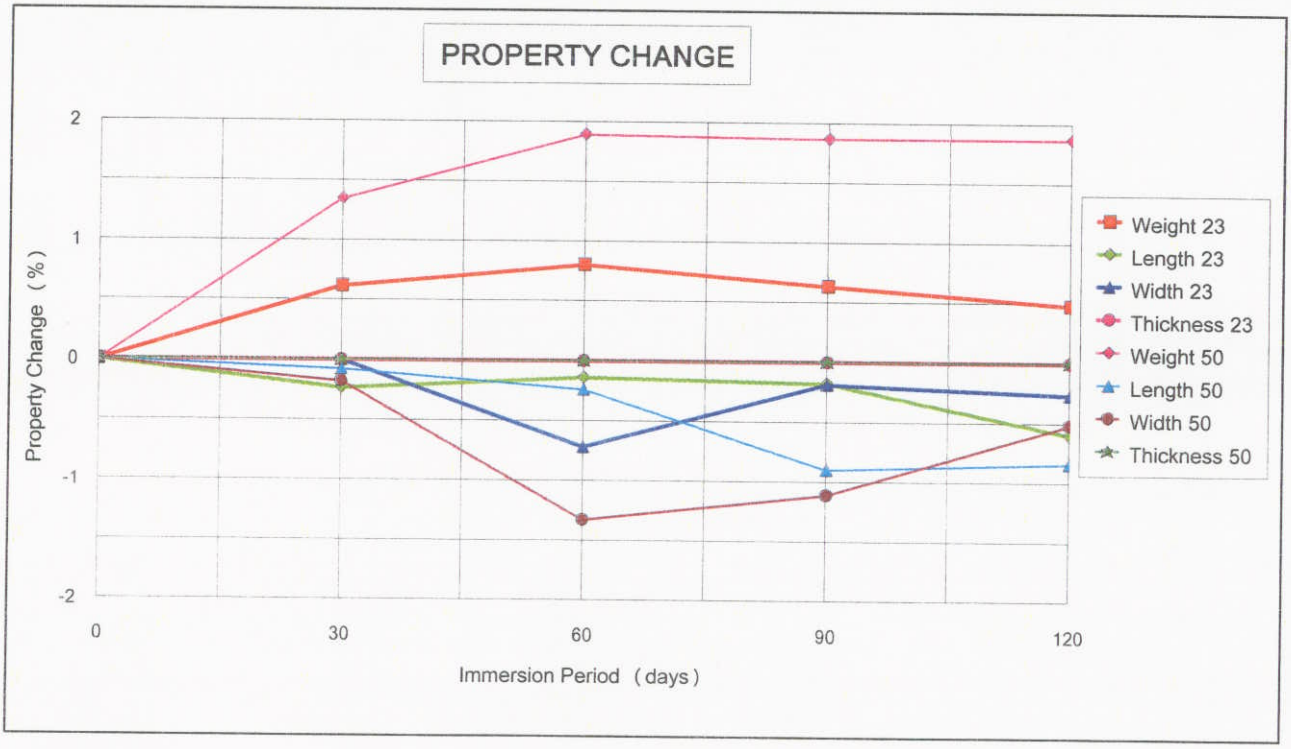
Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	EPDM	Tested By:	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	Checked By:	JB

23° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	11.8718	11.9453	0.62	11.97	0.81	11.95	0.63	11.93	0.48
Length, in	5.2212	5.2223	0.02	5.21	-0.14	5.21	-0.18	5.19	-0.60
Width, in	2.5860	2.5800	-0.23	2.57	-0.72	2.58	-0.19	2.58	-0.26
Thickness, mils	43	43	0.00	42.67	0.00	42.67	0.00	42.67	0.00

50° Celcius

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Weight, gr	14.7763	14.9759	1.35	15.06	1.90	15.05	1.87	15.05	1.87
Length, in	5.5427	5.5385	-0.08	5.53	-0.24	5.49	-0.90	5.50	-0.84
Width, in	3.0300	3.0246	-0.18	2.99	-1.33	3.00	-1.11	3.01	-0.52
Thickness, mils	42	42	0.00	42.00	0.00	42.00	0.00	42.00	0.00



JLT Laboratories, Inc.

Property Change

ASTM D-5747, paragraphs 11.1 & 11.2

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	EPDM	**Tested By:**	RL/AM/MLB
Sample ID:	AZ12347 - EPDM 120 Day Testing	**Checked By:**	JB

23° C

PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	11.3564	11.0042	13.4263	11.9290	1.0685
Length	in	4.9310	5.1425	5.4965	5.1900	0.2333
Width	in	2.5655	2.4440	2.7280	2.5792	0.1163
Thickness	mils	42	43	43	42.7	0.4714

50° C

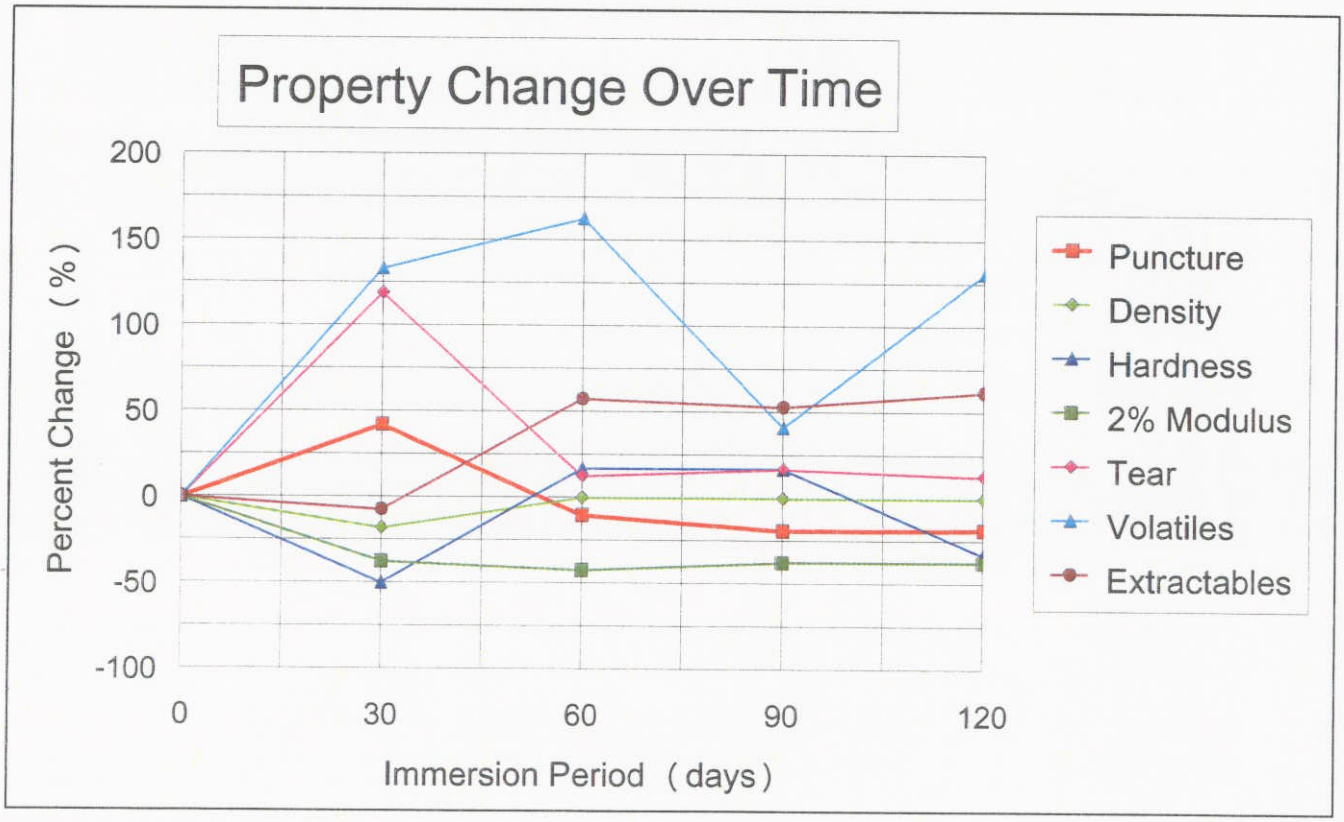
PROPERTY ID	UNIT	REPLICATE			AVERAGE	STANDARD DEVIATION
		1	2	3		
Weight	grams	14.7860	15.2103	15.1628	15.0530	0.1898
Length	in	5.4550	5.5380	5.4955	5.4962	0.0339
Width	in	2.9865	3.0230	3.0335	3.0143	0.0201
Thickness	mils	42	42	42	42.0	0.0000

JLT *Laboratories, Inc.*

Summary of Test Results
EPDM - 23° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	EPDM	Tested By:	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	Checked By:	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	39.6	56.3	42.26	35.4	-10.41	32.0	-19.11	32.2	-18.66
Density	1.112	0.911	-18.08	1.110	-0.18	1.107	-0.39	1.105	-0.57
Hardness	2	1	-50.00	2	16.67	2	16.67	1	-33.33
2% Modulus	16000	10000	-37.50	9200	-42.50	9970	-37.69	9994	-37.54
Tear	9.6	21.0	118.75	10.8	12.50	11.2	16.67	10.8	12.50
Volatiles	0.4929	1.1493	133.15	1.2931	162.33	0.6942	40.83	1.1374	130.74
Extractables	1.5058	1.3953	-7.34	2.3699	57.38	2.3017	52.85	2.4331	61.58



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

EPDM - 23° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	EPDM	Tested By:	RL/AM/MLB
Sample ID:	AZ12347 - EPDM 120 Day Testing	Checked By:	JB

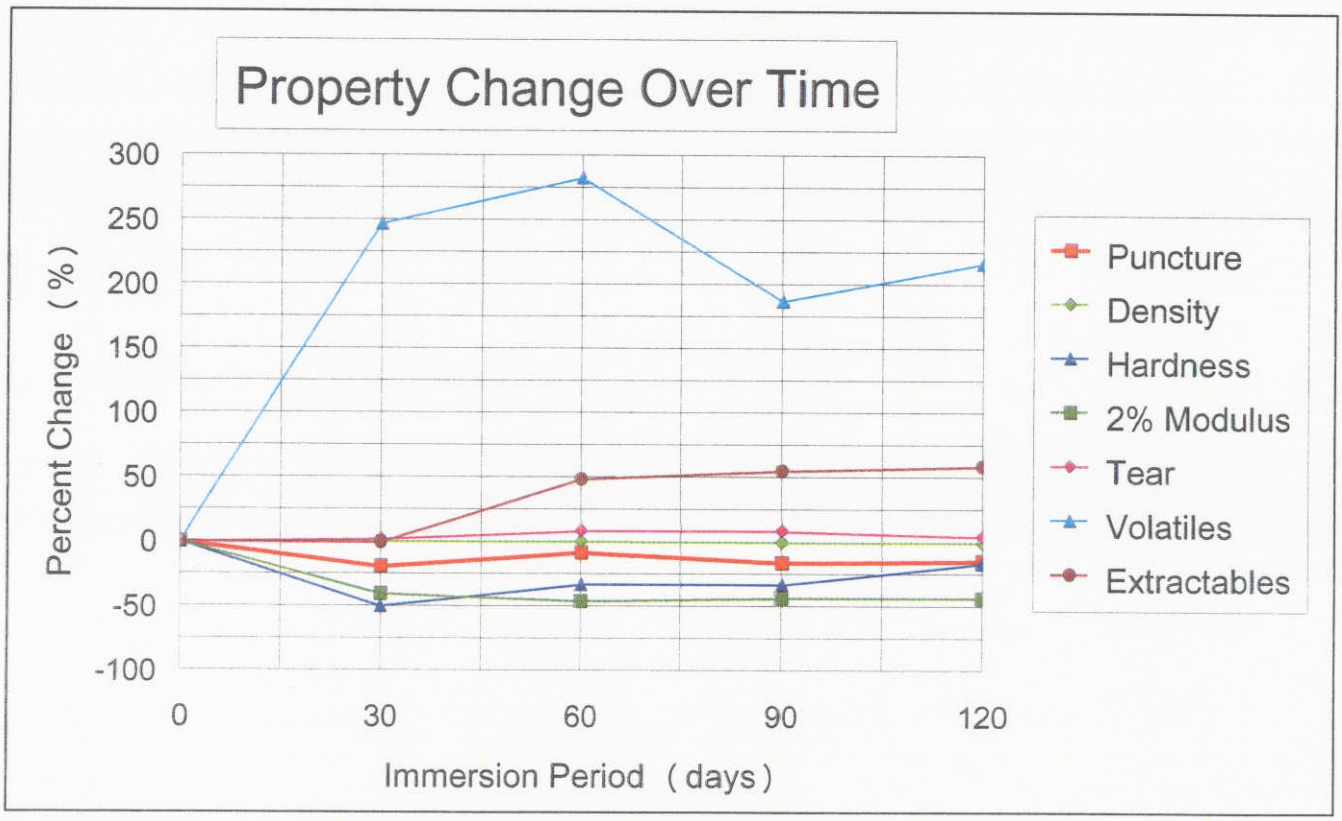
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	32.7	30.7	31.6	32.5	33.4	32.2	0.9368
Density	gr/cucm	1.11	1.11	1.11			1.11	0.0005
Hardness		1	2	1			1	0.4714
2% Secant Modulus	psi	10200	9980	9920	9850	10020	9994	117.9
Tear (MD Only)	lbs	11	11	10	11	11	10.8	0.4000
Volatiles	%	1.2873	0.9875				1.1374	0.1499
Extractables	%	2.4551	2.4110				2.4331	0.0221

JLT *Laboratories, Inc.*

Summary of Test Results
EPDM - 50° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	EPDM	Tested By:	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	Checked By:	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture	39.6	31.9	-19.31	36.2	-8.49	33.1	-16.23	33.7	-14.71
Density	1.112	1.110	-0.15	1.110	-0.12	1.107	-0.39	1.104	-0.72
Hardness	2	1	-50.00	1	-33.33	1	-33.33	2	-16.67
2% Modulus	1600	950	-40.63	860	-46.25	898	-43.88	898	-43.88
Tear	9.6	9.8	2.08	10.4	8.33	10.4	8.33	10.0	4.17
Volatiles	0.6279	2.1780	246.85	2.4	282.57	1.8011	186.82	1.9855	216.19
Extractables	1.5058	1.4933	-0.83	2.2334	48.31	2.3321	54.87	2.3891	58.66



JLT Laboratories, Inc.

Geomembrane Conformance Test Results

EPDM - 50° Celcius

Client:	Parsons	Job No.:	09LR1826.01
Project:	Honeywell	Date:	05/15/2009
Material:	EPDM	Tested By:	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	Checked By:	JB
	120 Day Testing		

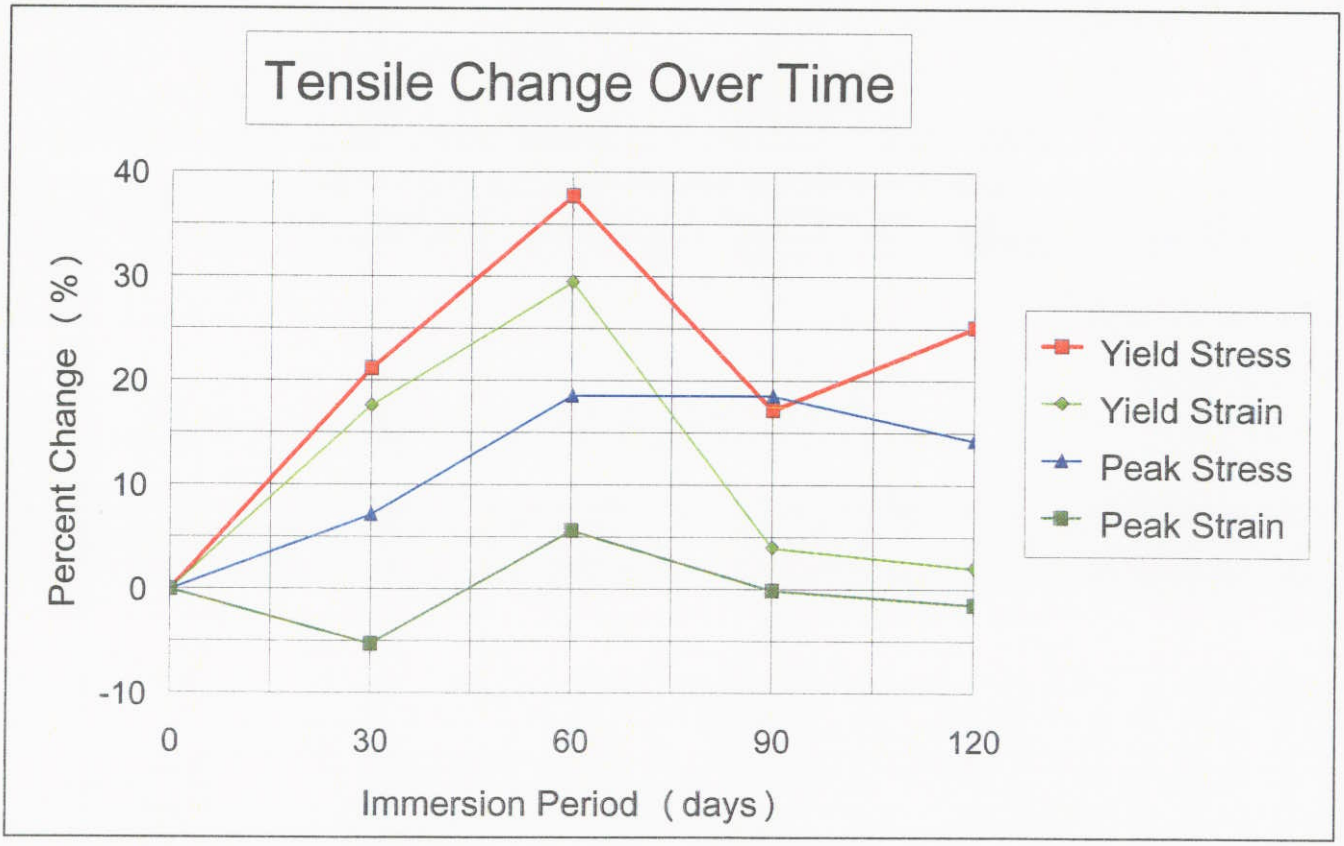
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture Resistance	lbs	33.2	32.5	32.7	34.3	36.0	33.7	1.2909
Density	gr/cucm	1.10	1.10	1.10			1.10	0.0005
Hardness		2	1	2			2	0.4714
2% Secant Modulus	psi	910	880	910	920	870	898	19.4
Tear (MD Only)	lbs	10	10	10	10	10	10.0	0.0000
Volatiles	%	1.9570	2.0140				1.9855	0.0285
Extractables	%	2.3807	2.3975				2.3891	0.0084

JLT Laboratories, Inc.

Summary of Test Results
EPDM - 23° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	EPDM	**Tested By:**	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	30.2	36.6	21.19	41.6	37.75	35.4	17.22	37.8	25.17
Yield Strain	348.8	410.2	17.60	451.6	29.47	362.8	4.01	356.0	2.06
Peak Stress	56.0	60.0	7.14	66.4	18.57	66.4	18.57	64.0	14.29
Peak Strain	433.2	410.4	-5.26	457.6	5.63	432.8	-0.09	426.8	-1.48



JLT Laboratories, Inc.

Tensile Test Results

EPDM - 23° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
Baseline Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	30	30	27	29	35	30.2	2.64
Yield Strain	%	328	327	330	351	408	348.8	30.89
Peak Stress	lb/in	56	56	56	56	56	56.0	0.00
Peak Strain	%	427	434	447	456	402	433.2	18.56

JLT *Laboratories, Inc.*

Tensile Test Results

EPDM - 23° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	38	37	38	35	35	36.6	1.36
Yield Strain	%	418	413	413	392	415	410.2	9.28
Peak Stress	lb/in	60	64	60	60	56	60.0	1.89
Peak Strain	%	441	391	316	465	439	410.4	52.96

JLT *Laboratories, Inc.*

Tensile Test Results

EPDM - 23° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	41	44	46	39	38	41.6	3.01
Yield Strain	%	440	446	420	475	477	451.6	21.71
Peak Stress	lb/in	68	64	68	64	68	66.4	1.89
Peak Strain	%	471	455	444	427	491	457.6	22.01

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 23° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	33	38	36	37	33	35.4	2.06
Yield Strain	%	333	387	377	355	362	362.8	18.64
Peak Stress	lb/in	64	64	68	68	68	66.4	1.96
Peak Strain	%	467	341	460	455	441	432.8	46.68

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 23° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
120 Day Testing

Job No.: 09LR1826.01
Date: 05/15/2009
Tested By: RL/AM/MLB
Checked By: JB

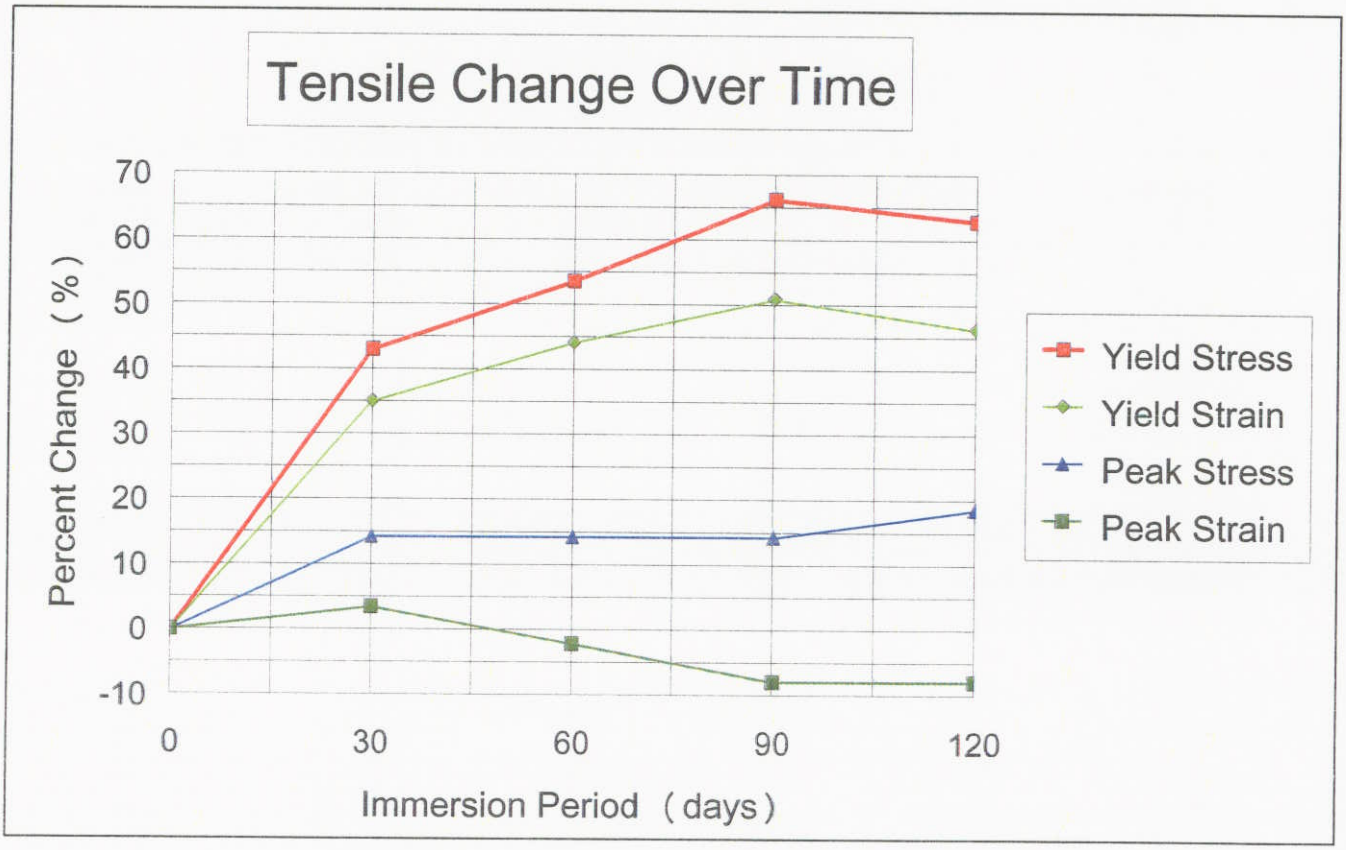
PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	48	49	30	30	32	37.8	8.77
Yield Strain	%	492	315	290	308	375	356.0	73.75
Peak Stress	lb/in	68	64	64	60	64	64.0	2.53
Peak Strain	%	433	399	469	428	405	426.8	24.77

JLT *Laboratories, Inc.*

Summary of Test Results
EPDM - 50° Celcius

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	EPDM	**Tested By:**	RL/AM/MLB
Sample ID:	AZ12347 - EPDM	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield Stress	30.2	43.2	43.05	46.4	53.64	50.2	66.23	49.2	62.91
Yield Strain	348.8	471.0	35.03	502.8	44.15	526.4	50.92	510.4	46.33
Peak Stress	56.0	64.0	14.29	64.0	14.29	64.0	14.29	66.4	18.57
Peak Strain	433.2	448.4	3.51	424.0	-2.12	399.0	-7.89	399.0	-7.89



JLT Laboratories, Inc.

Tensile Test Results

EPDM - 50° Celcius

Client:	Parsons
Project:	Honeywell
Material:	EPDM
Sample ID:	AZ12347 - EPDM
	Baseline Testing

Job No.:	09LR1826.01
Date:	02/15/2009
Tested By:	RL/AM/MLB
Checked By:	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	30	30	27	29	35	30.2	2.64
Yield Strain	%	328	327	330	351	408	348.8	30.89
Peak Stress	lb/in	56	56	56	56	56	56.0	0.00
Peak Strain	%	427	434	447	456	402	433.2	18.56

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 50° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
30 Day Testing

Job No.: 09LR1826.01
Date: 02/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	42	44	45	45	40	43.2	1.94
Yield Strain	%	477	462	481	480	455	471.0	10.53
Peak Stress	lb/in	64	64	64	64	64	64.0	0.00
Peak Strain	%	441	411	467	463	460	448.4	20.72

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 50° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
60 Day Testing

Job No.: 09LR1826.01
Date: 03/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	45	51	44	47	45	46.4	2.50
Yield Strain	%	469	564	477	489	515	502.8	34.33
Peak Stress	lb/in	64	64	68	64	60	64.0	1.89
Peak Strain	%	435	433	444	408	400	424.0	16.94

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 50° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
90 Day Testing

Job No.: 09LR1826.01
Date: 04/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	47	52	50	53	49	50.2	2.14
Yield Strain	%	498	554	515	577	488	526.4	33.86
Peak Stress	lb/in	68	60	64	60	68	64.0	3.58
Peak Strain	%	448	369	387	376	415	399.0	29.09

JLT *Laboratories, Inc.*

Tensile Test Results
EPDM - 50° Celcius

Client: Parsons
Project: Honeywell
Material: EPDM
Sample ID: AZ12347 - EPDM
120 Day Testing

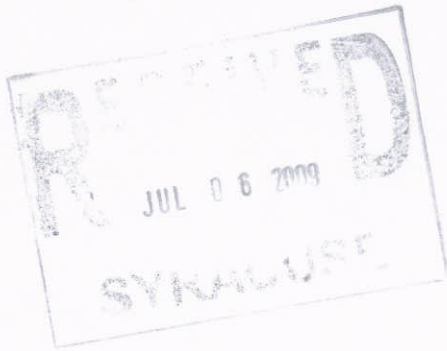
Job No.: 09LR1826.01
Date: 05/15/2009
Tested By: RL/AM/MLB
Checked By: JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Yield Stress	lb/in	44	55	47	46	54	49.2	4.45
Yield Strain	%	431	579	482	522	538	510.4	50.42
Peak Stress	lb/in	72	68	64	68	60	66.4	4.08
Peak Strain	%	420	389	403	415	368	399.0	18.84

JLT *Laboratories, Inc.*

JLT LABORATORIES, INC.
GEOTECHNICAL, GEOSYNTHETIC AND MATERIALS TESTING AND RESEARCH

June 29, 2009
09LR1826.01



Parsons
290 Elwood Davis Road
Suite 312
Liverpool, NY 13088

Attn: David Steele

RE: COMPATIBILITY TEST RESULTS
GEOTUBE FABRIC & SEWING THREAD WITH SOLVAY WASTE
HONEYWELL PROJECT
PO NO. 444853.00001.00

Dear Mr. Steele:

Similar to the geomembrane samples, the TenCate Geotube fabric and the sewing thread used to sew the fabric were also subject to immersion testing in the Solvay waste. A virgin sample of each material was taken from the samples and subject to the following baseline tests:

Fabric -	Puncture	ASTM D-4833
	Trap Tear	ASTM D-4533
	Grab Strength	ASTM D-4632
	AOS	ASTM D-4751
	Permittivity	ASTM D-4491
Thread -	Tensile Strength	ASTM D-5446

Samples of the material were then placed in two tanks of Solvay waste at 23°C and 50°C, respectively. At 30, 60, 90 and 120 days, coupons were removed, cleaned and tested for the same properties as the baseline tests. The average results were compared to the average baseline test results and the percent change computed. The percent change vs immersion time was plotted as shown on the attached data sheets. An evaluation of the results are described herein.

TenCate Geotube

Prior to testing, the immersed coupons were washed to remove the excess Solvay waste and rinsed to clean the holes in the fabric. If there holes were not cleaned, AOS and Permittivity testing would not yield any meaningful results since the holes would be completely blocked. The ends of the thread were simply wiped with a moist towel to fit in the clamps.

Puncture
Puncture results varied from +34% to -26%. This is typical with a coarse woven fabric because it depends on where the puncture needle is seated on the fabric. If the needle aligns with a strand, the results are higher. If the needle aligns at a woven junction, the results are lower. Per the test procedure, the alignment is random in the test unit.

Trap Tear
Trap Tear values generally decreased by about 25% and remained relatively consistent after 30 days.

Grab Strength
Grab Strength decreased by about 10+% and remained essentially consistent after 30 days.

AOS
This value ranged from an AOS of 40 to an AOS of 50. Essentially, there was no significant change in AOS over the 120 day period. Prior to testing, the fabric was washed to remove the encrusted Solvay waste that blocked the holes.

Permittivity
The baseline values average was 0.4 sec^{-1}. Over the 120 day test period, the value varied for 0.4 sec^{-1} to 0.3 sec^{-1} terminating at about 0.35 sec^{-1}. Essentially, there was no meaningful change in Permittivity.

TenCate Fabric Summary

The results indicate no significant deterioration of the fabric. In fact, AOS and Permittivity values were essentially the same throughout the test period.

TenCate Sewing Thread

Since the most important property is the Tensile Strength of the thread used to sew the geotubes, we only performed Tensile Strength per ASTM D-5446. This test was designed to determine the Tensile Strength of thread used for inflatable materials. Since the Geotubes will be filled or inflated with waste, we deemed this an appropriate test.

Again, a sample of the virgin thread was tested for Strength and the average computed as the baseline value. Samples of the thread were immersed in the Solvay waste in 23°C and 50°C tanks. At 30, 60, 60 and 120 days, samples were removed and tested. The average value was computed and the percent difference plotted vs exposure time.

The data plot shows a general increase in Strength vs Time. This is mostly likely attributed to the fact that the thread was encased in Solvay waste when it was tested.

TenCate Sewing Thread Summary

Both the TenCate fabric and sewing thread performed well when exposed to the Solvay waste for 120 days. There is no evidence in these tests to suggest the waste adversely effected the fabric or the thread.

We appreciate the opportunity to provide our services and look forward to working with you again. Should you have any questions, comments or require additional information, please do not hesitate to call. Thank you.

Sincerely,

JLT LABORATORIES, INC.

John Boschuk, Jr., P.E.
President

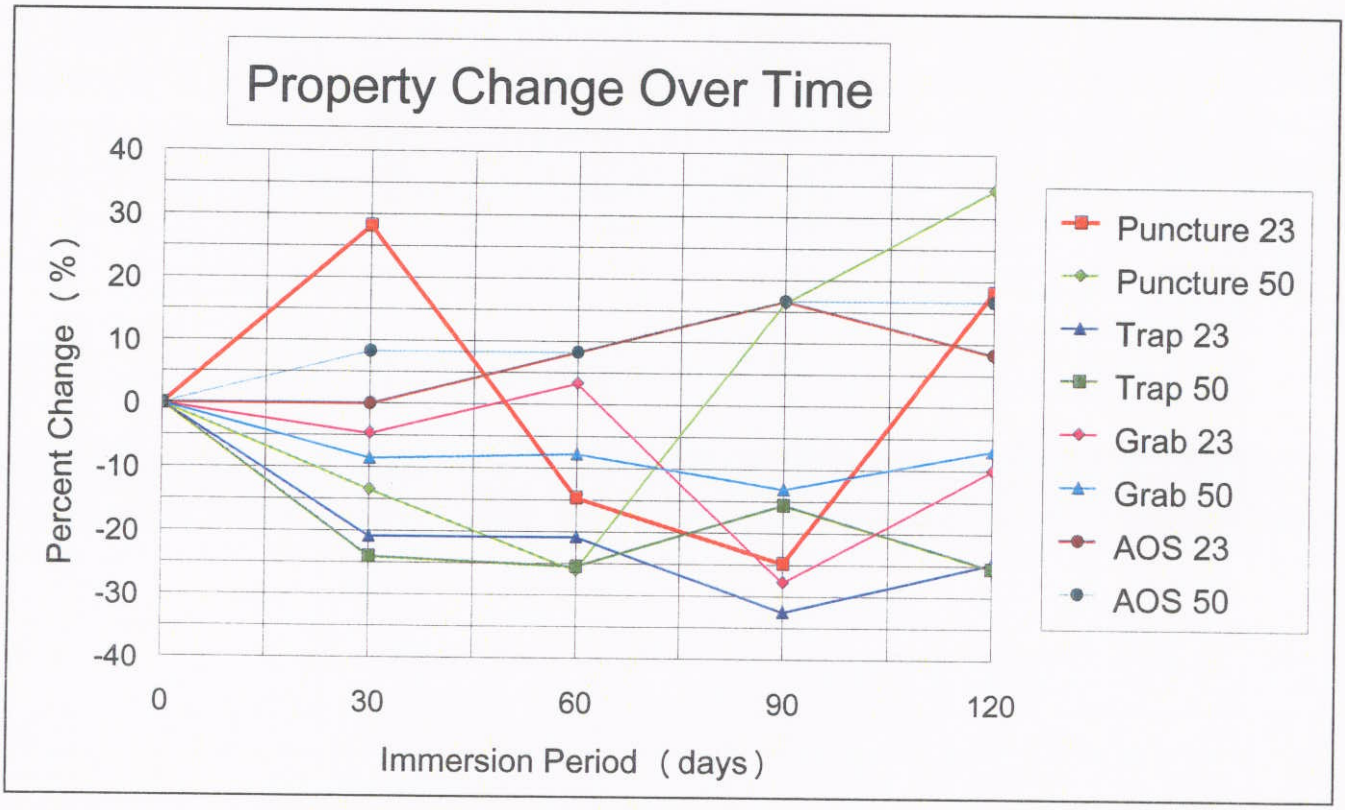
cc: Martin A. Switzer

Enclosures
JB/mlb
\wp10\letter\09122
Inv# 3828

Summary of Test Results
TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Puncture 23°C	159.8	204.9	28.23	136.6	-14.55	120.4	-24.70	189.0	18.26
Puncture 50°C	159.8	138.4	-13.40	118.2	-26.02	186.1	16.44	214.8	34.40
Trap Tear 23°C	312.1	247.2	-20.79	247.4	-20.73	211.0	-32.38	235.1	-24.66
Trap Tear 50°C	312.1	237.2	-23.99	232.8	-25.40	263.7	-15.51	232.8	-25.40
Grab 23°C	307	292	-4.63	317	3.39	222	-27.70	276	-9.98
Grab 50°C	307	280	-8.55	283	-7.70	267	-13.02	286	-6.88
AOS 23°C	40	40	0.00	43	8.33	47	16.67	43	8.33
AOS 50°C	40	43	8.33	43	8.33	47	16.67	47	16.67



JLT Laboratories, Inc.

GeoTube Conformance Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	03/31/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB
	Baseline Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture 23°C	lbs	158.2	157.8	151.7	167.2	164.2	159.8	5.4090
Puncture 50°C	lbs	158.2	157.8	151.7	167.2	164.2	159.8	5.4090
Trap Tear 23°C	lbs	308.1	297.5	286.2	347.5	321.2	312.1	21.1468
Trap Tear 50°C	lbs	308.1	297.5	286.2	347.5	321.2	312.1	21.1468
Grab 23°C	lbs	332	321	299	287	294	307	17.0482
Grab 50°C	lbs	332	321	299	287	294	307	17.0482
AOS 23°C		40	40	40			40	0.0000
AOS 50°C		40	40	40			40	0.0000

JLT *Laboratories, Inc.*

GeoTube Conformance Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	03/31/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB
	30 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture 23°C	lbs	146.2	458.5	128.7	154.3	137.0	204.9	127.0715
Puncture 50°C	lbs	127.0	132.0	155.0	142.7	135.3	138.4	9.7425
Trap Tear 23°C	lbs	296.8	295.0	213.1	230.6	200.6	247.2	40.8777
Trap Tear 50°C	lbs	203.1	222.5	294.3	230.6	235.6	237.2	30.6119
Grab 23°C	lbs	322	300	272	288	280	292	17.4539
Grab 50°C	lbs	278	231	295	304	294	280	26.0814
AOS 23°C		40	40	40			40	0.0000
AOS 50°C		40	50	40			43	4.7140

JLT *Laboratories, Inc.*

GeoTube Conformance Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	03/31/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB
	60 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture 23°C	lbs	126.5	149.3	133.9			136.6	9.4971
Puncture 50°C	lbs	112.6	110.5	131.6			118.2	9.4905
Trap Tear 23°C	lbs	240.6	250.4	251.2			247.4	4.8194
Trap Tear 50°C	lbs	225.6	233.1	239.8			232.8	5.8002
Grab 23°C	lbs	332	329	290			317	19.1311
Grab 50°C	lbs	268	294	287			283	10.9848
AOS 23°C		40	40	50			43	4.7140
AOS 50°C		40	50	40			43	4.7140

JLT *Laboratories, Inc.*

GeoTube Conformance Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	04/28/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB
	90 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture 23°C	lbs	122.1	118.6				120.4	1.7500
Puncture 50°C	lbs	146.1	226.1				186.1	40.0000
Trap Tear 23°C	lbs	177.5	238.1	217.5			211.0	25.1589
Trap Tear 50°C	lbs	224.3	215.0	351.8			263.7	62.4117
Grab 23°C	lbs	264	192	209			222	30.7282
Grab 50°C	lbs	337	229	234			267	49.7750
AOS 23°C		40	50	50			47	4.7140
AOS 50°C		40	50	50			47	4.7140

JLT *Laboratories, Inc.*

GeoTube Conformance Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB
	120 Day Testing		

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Puncture 23°C	lbs	160.5	175.8	231.7	188.0		189.0	30.6020
Puncture 50°C	229.8	240.1	149.1	255.2			214.8	46.8641
Trap Tear 23°C	lbs	244.3	256.8	204.3			235.1	22.3917
Trap Tear 50°C	lbs	256.7	213.7	228.1			232.8	17.8709
Grab 23°C	lbs	272	280				276	4.0000
Grab 50°C	lbs	241	330				286	44.5000
AOS 23°C		40	50	40			43	4.7140
AOS 50°C		40	50	50			47	4.7140

JLT *Laboratories, Inc.*

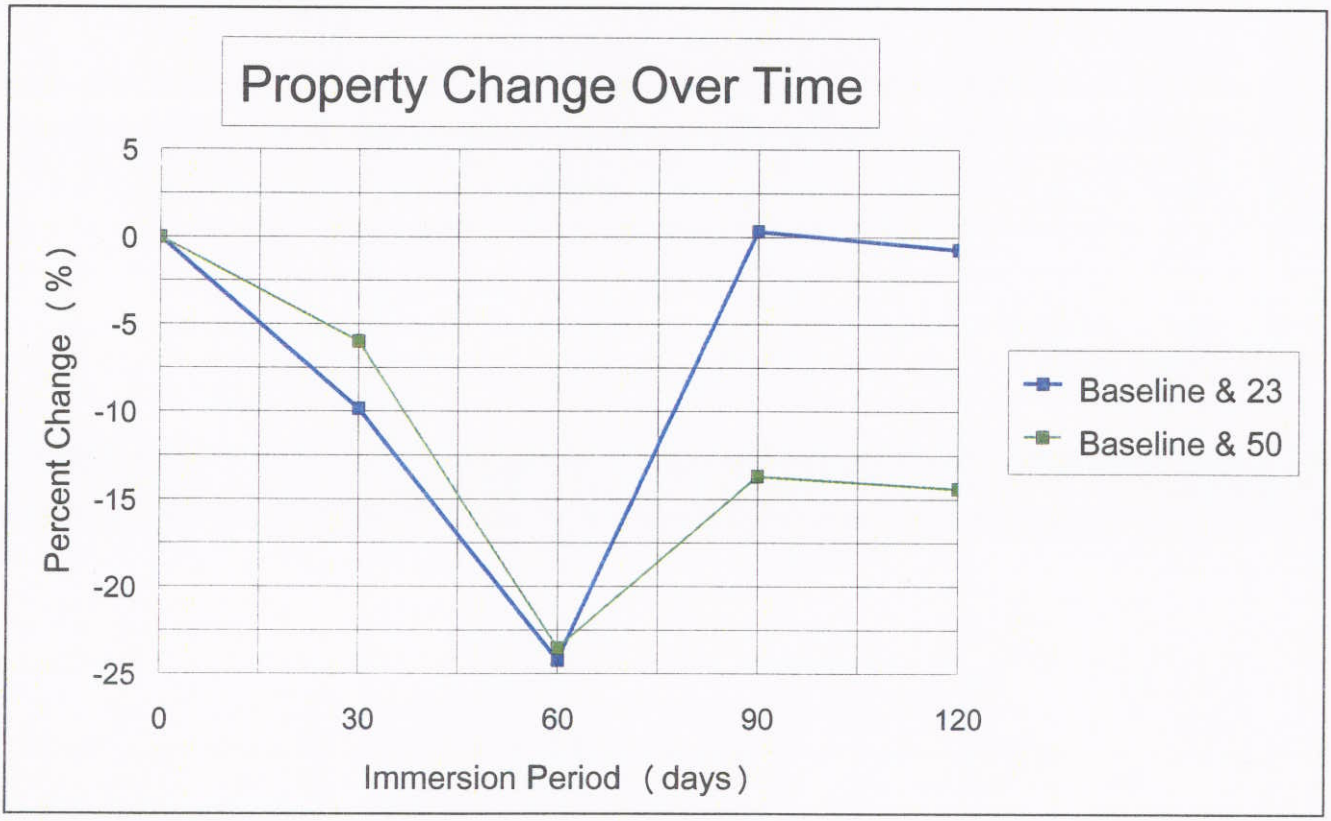
Summary Permittivity of Test Results

TenCate GeoTube

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	05/15/2009
Material:	GT 500 Woven Geotextile	**Tested By:**	RL/AM/MLB
Sample ID:	Geotextile - GeoTube	**Checked By:**	JB

TEST	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
READING	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Baseline & 23°C	28.5	25.7	-9.82	21.6	-24.21	28.6	0.35	28.3	-0.70
Baseline & 50°C	28.5	26.8	-5.96	21.8	-23.51	24.6	-13.68	24.4	-14.39

Note: At 60 days, the coupons were only soaked and rinsed but not cleaned with a soft brush, like the other samples.



JLT Laboratories, Inc.

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons		**Job No.:**	09LR1826.01
Project:	Honeywell Site		**Report Date :**	03/30/09
Material:	Geotextile - GT500		**Technician:**	RL
Sample ID:	Supplied Sample		**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate	BASLEINE	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft			

HEAD ACROSS SPECIMEN:	**5.08 cm**		**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0**	**Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
Baseline	1	1305.6	15.31	28.5	0.400
	2	1324.6	15.50	28.6	0.401
	3	1311.6	15.32	28.6	0.402
	4	1320.6	15.50	28.5	0.400
	5	1313.7	15.41	28.5	0.400
			Average :	28.5	0.400

JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons		**Job No.:**	09LR1826.01
Project:	Honeywell Site		**Report Date :**	03/30/09
Material:	Geotextile - GT500		**Technician:**	RL
Sample ID:	Supplied Sample		**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate	30 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft	MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**		**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0**	**Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
23 Degrees C Replicate 1	1	1124.2	15.40	24.4	0.343
	2	1127.9	15.47	24.4	0.342
	3	1130.7	15.44	24.5	0.344
	4	1132.1	15.59	24.3	0.341
	5	1125.0	15.46	24.3	0.341
23 Degrees C Replicate 2	1	1256.6	15.47	27.1	0.381
	2	1272.8	15.72	27.1	0.380
	3	1244.2	15.37	27.0	0.380
	4	1250.2	15.43	27.1	0.380
	4	1252.3	15.50	27.0	0.379
			Average :	25.7	0.361

JLT Laboratories, Inc.

938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons		**Job No.:**	09LR1826.01
Project:	Honeywell Site		**Report Date :**	03/30/09
Material:	Geotextile - GT500		**Technician:**	RL
Sample ID:	Supplied Sample		**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate	30 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV			

HEAD ACROSS SPECIMEN:	**5.08 cm**		**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0**	**Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
50 Degrees C Replicate 1	1	1141.5	15.25	25.0	0.351
	2	1150.1	15.35	25.0	0.352
	3	1159.0	15.32	25.3	0.355
	4	1157.8	15.34	25.2	0.354
	5	1162.0	15.47	25.1	0.352
50 Degrees C Replicate 2	1	1305.6	15.31	28.5	0.400
	2	1324.6	15.50	28.6	0.401
	3	1311.6	15.32	28.6	0.402
	4	1312.2	15.50	28.3	0.397
	4	1313.4	15.41	28.5	0.400
			Average :	26.8	0.376

JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell Site	**Report Date :**	03/30/09
Material:	Geotextile - GT500	**Technician:**	RL
Sample ID:	Supplied Sample	**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate 60 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**	**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0 Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
23 Degrees C Replicate 1	1	1205.5	18.50	21.8	0.306
	2	1208.0	18.46	21.9	0.307
	3	1196.7	18.50	21.6	0.303
	4	1203.3	18.60	21.6	0.304
	5	1196.4	18.43	21.7	0.305
23 Degrees C Replicate 2	1	1060.2	16.44	21.5	0.303
	2	1181.2	18.32	21.5	0.303
	3	1061.2	16.50	21.5	0.302
	4	1054.7	16.47	21.4	0.300
	4	1073.4	16.56	21.7	0.304
			Average :	21.6	0.304

JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell Site	**Report Date :**	03/30/09
Material:	Geotextile - GT500	**Technician:**	RL
Sample ID:	Supplied Sample	**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate 60 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**	**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0 Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
50 Degrees C Replicate 1	1	1287.1	19.38	22.2	0.312
	2	1310.2	19.47	22.5	0.316
	3	1301.2	19.43	22.4	0.314
	4	1300.8	19.38	22.4	0.315
	5	1306.5	19.34	22.6	0.317
50 Degrees C Replicate 2	1	1230.0	19.34	21.2	0.298
	2	1233.3	19.44	21.2	0.298
	3	1239.3	19.50	21.2	0.298
	4	1226.8	19.28	21.3	0.299
	4	1230.7	19.28	21.3	0.299
			Average :	21.8	0.307

JLT Laboratories, Inc. 938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons		**Job No.:**	09LR1826.01
Project:	Honeywell Site		**Report Date :**	06/29/09
Material:	Geotextile - GT500		**Technician:**	RL
Sample ID:	Supplied Sample		**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate	90 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV			

HEAD ACROSS SPECIMEN:	**5.08 cm**		**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0**	**Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
23 Degrees C Replicate 1	1	1314.0	15.26	28.8	0.404
	2	1319.0	15.31	28.8	0.404
	3	1318.0	15.29	28.8	0.404
	4	1321.0	15.33	28.8	0.404
	5	1323.0	15.37	28.8	0.404
23 Degrees C Replicate 2	1	1312.0	15.46	28.4	0.398
	2	1309.0	15.39	28.4	0.399
	3	1312.0	15.42	28.4	0.399
	4	1315.0	15.47	28.4	0.399
	4	1319.0	15.57	28.3	0.397
			Average :	28.6	0.401

JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons		**Job No.:**	09LR1826.01
Project:	Honeywell Site		**Report Date :**	06/29/09
Material:	Geotextile - GT500		**Technician:**	RL
Sample ID:	Supplied Sample		**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate	90 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft	MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**		**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0**	**Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
50 Degrees C Replicate 1	1	1277.0	17.44	24.5	0.344
	2	1279.0	17.45	24.5	0.344
	3	1275.0	17.41	24.5	0.344
	4	1281.0	17.52	24.4	0.343
	5	1282.0	17.53	24.4	0.343
50 Degrees C Replicate 2	1	1288.0	17.39	24.7	0.348
	2	1294.0	17.42	24.8	0.349
	3	1295.0	17.43	24.8	0.349
	4	1289.0	17.39	24.8	0.348
	4	1297.0	17.44	24.8	0.349
			Average :	24.6	0.346

JLT Laboratories, Inc.

938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell Site	**Report Date :**	06/29/09
Material:	Geotextile - GT500	**Technician:**	RL
Sample ID:	Supplied Sample	**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate 120 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**	**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0 Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
23 Degrees C Replicate 1	1	1314.0	15.45	28.4	0.399
	2	1316.0	15.51	28.3	0.398
	3	1315.0	15.49	28.4	0.398
	4	1315.0	15.47	28.4	0.399
	5	1317.0	15.51	28.4	0.398
23 Degrees C Replicate 2	1	1312.0	15.52	28.2	0.397
	2	1312.0	15.51	28.3	0.397
	3	1309.0	15.44	28.3	0.398
	4	1313.0	15.53	28.2	0.397
	4	1312.0	15.49	28.3	0.397
			Average :	28.3	0.398

JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

PERMITTIVITY OF GEOTEXTILES

CONSTANT HEAD METHOD

ASTM D-4491 (Also meets D2434 Criteria for permeability)

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell Site	**Report Date :**	06/29/09
Material:	Geotextile - GT500	**Technician:**	RL
Sample ID:	Supplied Sample	**Machine:**	JLT-CHPTV-1
Manufacturer:	TenCate 120 DAYS	**Chk'd By :**	JB
Spec Value:	20 gpm/sq ft MARV		

HEAD ACROSS SPECIMEN:	**5.08 cm**	**SAMP. AREA:**	**44.096 cm^2**
WATER TEMPERATURE:	**18.0 Degrees C**	**TEMP CORR.**	**1.0510**

COUPON	REPLICATE	FLOW cm^3	TIME sec	FLOW gal/min/ft^2	PERMITTIVITY sec-1
50 Degrees C Replicate 1	1	1246.0	17.54	23.7	0.333
	2	1241.0	17.50	23.7	0.333
	3	1235.0	17.49	23.6	0.331
	4	1251.0	17.56	23.8	0.334
	5	1250.0	17.55	23.8	0.334
50 Degrees C Replicate 2	1	1301.0	17.39	25.0	0.351
	2	1305.0	17.42	25.0	0.351
	3	1318.0	17.46	25.2	0.354
	4	1311.0	17.53	25.0	0.351
	4	1310.0	17.49	25.0	0.351
			Average :	24.4	0.342

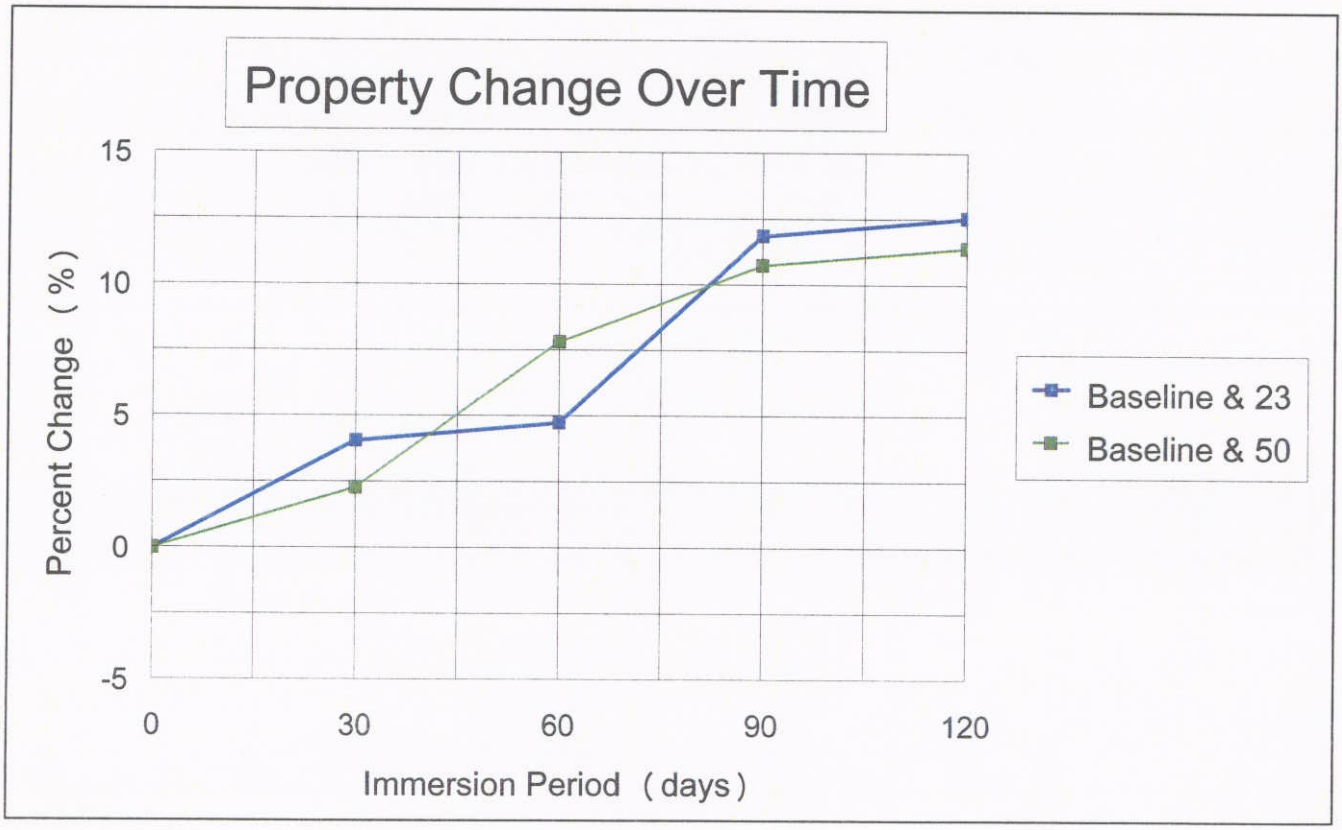
JLT Laboratories, Inc.
938 S. Central Avenue, Canonsburg, PA 15317 * Tel: (724) 746-4441 / Fax: (724) 745-4261

Summary of Test Results

Sewing Thread

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	06/15/2009
Material:	Sewing Thread	**Tested By:**	RL/AM/MLB
Sample ID:	TenCate Sewing Thread	**Checked By:**	JB

TEST READING	Baseline	30-Day Immersion		60-Day Immersion		90-Day Immersion		120-Day Immersion	
	Average	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Baseline & 23°C	59.0	61.4	4.07	61.8	4.75	66.0	11.86	66.4	12.54
Baseline & 50°C	61.4	62.8	2.28	66.2	7.82	68.0	10.75	68.4	11.40



JLT Laboratories, Inc.

Sewing Thread Test Results

Client:	Parsons	**Job No.:**	09LR1826.01
Project:	Honeywell	**Date:**	06/15/2009
Material:	Sewing Thread	**Tested By:**	RL/AM/MLB
Sample ID:	TenCate Sewing Thread	**Checked By:**	JB

PARAMETER	UNITS	REPLICATE No.					AVERAGE	STANDARD DEVIATION
		1	2	3	4	5		
Baseline	lbs	58	56	62	59	60	59.0	2.0000
30 Days 23°C	lbs	58	69	61	64	55	61.4	4.8415
30 Days 50°C	lbs	69	69	58	55	63	62.8	5.6710
60 Days 23°C	lbs	66	60	61	60	62	61.8	2.2271
60 Days 50°C	lbs	70	60	66	66	69	66.2	3.4871
90 Days 23°C	lbs	65	67	69	65	64	66.0	1.7889
90 Days 50°C	lbs	68	68	70	69	65	68.0	1.6733
120 Days 23°C	lbs	65	67	67	65	68	66.4	1.2000
120 Days 50°C	lbs	66	68	69	69	70	68.4	1.3565

JLT *Laboratories, Inc.*