



January 25, 2018

<b>HTS Report #:</b>	<b>PLIF810.001.doc</b>
Mr. Rishi Vasudeva Perma-Liner Industries 13000 Automobile Boulevard, Suite 300 Clearwater, FL 33762	Customer Project Name: Customer Project No.: P.O.#: 18723 Date Sample Received: 12/28/17 Date Sample Tested: 1/22/18

One (1) sample of cured-in-place pipe was delivered to HTS' laboratory for testing. The sample was tested in accordance with ASTM D695, ASTM D638 Type II, and ASTM D790 Method I Procedure A. A Support Span-to-Depth Ratio of 16 to 1 was used as specified in the test standard ASTM D790. Thickness measurements, compressive strength, tensile strength, flexural stress and flexural modulus of elasticity tests were performed on the sample. Five (5) specimens were cut and tested from the sample. The results summarized and reported below are averages of the five (5) specimens. A test report for the sample is attached.

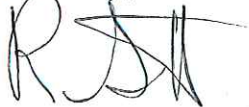
SAMPLE ID	COMPRESSIVE STRENGTH (psi) ASTM D 695	TENSILE STRENGTH (psi) ASTM D 638	TENSILE ELONGATION (%) ASTM D 638	FLEXURAL STRENGTH (psi) ASTM D 790	FLEXURAL MODULUS (psi) ASTM D 790
---	13,522	25,757	8.4	47,103	1,785,233

The following table contains the thickness measurements for each individual specimen tested.

MEASUREMENT OF THICKNESS FOR PIPE ASTM D 2122										
Sample ID	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Combined Total Average/Specimen	
									in	mm
---	.151	.148	.160	.150	.180	.188	.167	.171	0.164	4.2

Technician	E. Carrillo
Time	2 hrs

Sincerely,

  
 Rick Eastwood KP  
 Vice President

This test report relates only to the items tested and shall not be reproduced except in full without approval of HTS, Inc.



Monday, January 22, 2018

COMPRESSIVE PROPERTIES OF RIGID PLASTICS  
ASTM D695

INSTRON CORPORATION  
BLUEHILL V. 2.26

OPERATOR NAME:  
E. CARRILLO

TEMPERATURE (F) / HUMIDITY (%)  
71 / 50

RATE (in/min)  
.05

SAMPLE ID:

	WIDTH (in)	THICKNESS (in)	GAUGE LENGTH (in)
1	0.577	0.198	1.1
2	0.585	0.205	1.0
3	0.572	0.198	1.0
4	0.565	0.199	1.0
5	0.567	0.180	1.0

	COMPRESSIVE STRENGTH (psi)
1	12607
2	15278
3	13844
4	13108
5	12773
Mean	13522
Minimum	12607
Maximum	15278
Standard Deviation	1091



Monday, January 22, 2018

TENSILE PROPERTIES OF PLASTICS  
ASTM D638  
TYPE II

INSTRON CORPORATION  
BLUEHILL V. 2.26.

OPERATOR NAME:  
E. Carrillo

TEMPERATURE (F) / HUMIDITY (%)  
71 / 50

RATE (in/min)  
.2

SAMPLE ID:

	WIDTH (in)	THICKNESS (in)	GAGE LENGTH (in)	GRIP DISTANCE (in)
1	0.265	0.157	2.0	5.3
2	0.250	0.155	2.0	5.3
3	0.255	0.147	2.0	5.3
4	0.269	0.158	2.0	5.3
5	0.268	0.153	2.0	5.3

	TENSILE STRENGTH @ MAX (psi)	ELONGATION @ MAX (%)
1	23917	8.5
2	27052	8.9
3	24565	7.3
4	26138	8.5
5	27111	8.9
Mean	25757	8.4
Standard Deviation	1455	0.6
Minimum	23917	7.3
Maximum	27111	8.9



Monday, January 22, 2018

FLEXURAL PROPERTIES OF PLASTICS  
 ASTM D790  
 3 POINT BEND

INSTRON CORPORATION  
 BLUEHILL V. 2.26.

OPERATOR NAME:  
 E. CARRILLO

TEMPERATURE (F) / HUMIDITY (%)  
 71 / 50

RATE (in/min)  
 .067

SAMPLE ID:

	WIDTH (in)	THICKNESS (in)	SUPPORT SPAN (in)
1	0.571	0.148	2.5
2	0.571	0.149	2.5
3	0.565	0.150	2.5
4	0.568	0.150	2.5
5	0.558	0.152	2.5

	STRAIN @ MAX (in/in)	MAXIMUM LOAD (lbf)	FLEXURAL STRENGTH (psi)	FLEXURAL MODULUS (psi)
1	0.0239	143.6	43048	1838811
2	0.0290	161.3	47703	1796610
3	0.0334	173.5	51183	1818463
4	0.0325	169.6	49762	1763134
5	0.0283	150.6	43817	1709148
Mean	0.0294	159.7	47103	1785233
Standard Deviation	0.0038	12.6	3582	50945
Minimum	0.0239	143.6	43048	1709148
Maximum	0.0334	173.5	51183	1838811