



March 16, 2015

HTS Report #:	MNF508.003B.Doc
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Mr. Ron McNeil
 McNeil Technologies, Inc.
 P.O. Box 1200
 Destin, FL 32540

Customer Project Name:
 Customer Project No.:
 Date Sample Received: 3/02/15
 Date Sample Tested: 3/13/15


Four (4) samples of fiber glass plate were delivered to HTS' laboratory for testing. The samples were 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. Compressive strength, tensile strength, thickness measurements, flexural stress and flexural modulus of elasticity tests were performed on the sample. Five (5) specimens were cut and tested from each sample. The results summarized and reported below are averages of the five (5) specimens. A test report for each sample is attached.

SAMPLE ID	MANHOLE TO MANHOLE	COMPRESSIVE STRENGTH (psi)	STRENGTH @ BREAK (psi) ASTM D 638	ELONGATION @ BREAK (%) ASTM D 638	MAXIMUM FLEXURAL FIBER STRESS (psi) ASTM D 790	FLEXURAL MODULUS OF ELASTICITY (psi) ASTM D 790
4400	---	8371	11572	7.7	20523	591861
5600	---	9679	14639	8.9	25694	933619
6800	---	11123	17732	9.9	8842	1053551
11600	---	16524	20564	17.6	22546	1061031

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

MEASUREMENT OF THICKNESS FOR CURED IN PLACE PIPE LINER ASTM D 2122											
Sample ID	Manhole to Manhole									Combined Total Average/Specimen	
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	In	mm
4400	---	.155	.135	.138	.153	.137	.157	.144	.147	0.146	3.7
5600	---	.179	.188	.193	.197	.182	.168	.184	.190	0.185	4.7
6800	---	.221	.227	.223	.233	.229	.226	.222	.235	0.227	5.8
11600	---	.305	.325	.318	.310	.313	.308	.319	.320	0.315	8.0

Technician	E. Carrillo
Time	4 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.



Thursday, March 12, 2015

COMPRESSIVE PROPERTIES OF RIGID PLASTICS
 ASTM D695

INSTRON CORPORATION
 BLUEHILL V. 2.26 (4467)

OPERATOR NAME:
 E. CARRILLO

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

RATE (in/min)
 .05

SAMPLE ID:

TRIPLEX 4400 SERIES

	WIDTH (in)	THICKNESS (in)	GUAGE LENGTH (in)
1	0.571	0.159	1.0
2	0.570	0.148	1.0
3	0.574	0.153	1.0
4	0.575	0.152	1.0
5	0.575	0.152	1.0

	COMPRESSIVE STRENGTH (psi)
1	8770
2	7941
3	8106
4	8804
5	8232
Mean	8371
Minimum	7941
Maximum	8804
Standard Deviation	394



Thursday, March 12, 2015

COMPRESSIVE PROPERTIES OF RIGID PLASTICS
 ASTM D695

INSTRON CORPORATION
 BLUEHILL V. 2.26 (4467)

OPERATOR NAME:
 E. CARRILLO

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

RATE (in/min)
 .05

SAMPLE ID:

TRIPLEX 5600 SERIES

	WIDTH (in)	THICKNESS (in)	GUAGE LENGTH (in)
1	0.576	0.176	1.0
2	0.577	0.165	1.0
3	0.570	0.159	1.0
4	0.570	0.156	1.0
5	0.575	0.162	1.0

	COMPRESSIVE STRENGTH (psi)
1	9951
2	9851
3	9601
4	9407
5	9586
Mean	9679
Minimum	9407
Maximum	9951
Standard Deviation	219



Thursday, March 12, 2015

COMPRESSIVE PROPERTIES OF RIGID PLASTICS
ASTM D695

INSTRON CORPORATION
BLUEHILL V. 2.26 (4467)

OPERATOR NAME:
E. CARRILLO

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

RATE (in/min)
.05

SAMPLE ID:

TRIPLEX 6800 SERIES

	WIDTH (in)	THICKNESS (in)	GAUGE LENGTH (in)
1	0.575	0.240	1.0
2	0.574	0.232	1.0
3	0.578	0.240	1.0
4	0.570	0.231	1.0
5	0.569	0.242	1.0

	COMPRESSIVE STRENGTH (psi)
1	11250
2	11352
3	12419
4	9990
5	10604
Mean	11123
Minimum	9990
Maximum	12419
Standard Deviation	908



Friday, March 13, 2015

COMPRESSIVE PROPERTIES OF RIGID PLASTICS
ASTM D695

INSTRON CORPORATION
BLUEHILL V. 2.26 (4467)

OPERATOR NAME:
K. PHOUANGSAVANH

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

RATE (in/min)
.05

SAMPLE ID:

TRIPLEX 11600 SERIES

	WIDTH (in)	THICKNESS (in)	GUAGE LENGTH (in)
1	0.570	0.317	1.0
2	0.564	0.294	1.0
3	0.571	0.303	1.0
4	0.572	0.290	1.0
5	0.571	0.284	1.0

	COMPRESSIVE STRENGTH (psi)
1	15716
2	17230
3	16178
4	16574
5	16920
Mean	16524
Minimum	15716
Maximum	17230
Standard Deviation	598



Thursday, March 12, 2015

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:
TRIPLEX 4400 SERIES

	WIDTH (in)	THICKNESS (in)	GAGE LENGTH (in)	GRIP DISTANCE (in)
1	0.245	0.160	2.0	5.3
2	0.270	0.151	2.0	5.3
3	0.262	0.152	2.0	5.3
4	0.261	0.152	2.0	5.3
5	0.256	0.132	2.0	5.3

	TENSILE STRENGTH @ MAX (psi)	ELONGATION @ MAX (%)
1	12041	8.5
2	11777	7.9
3	10402	7.0
4	11081	7.2
5	12559	8.1
Mean	11572	7.7
Standard Deviation	843	0.7
Minimum	10402	7.0
Maximum	12559	8.5



Thursday, March 12, 2015

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:
TRIPLEX 5600 SERIES

	WIDTH (in)	THICKNESS (in)	GAGE LENGTH (in)	GRIP DISTANCE (in)
1	0.255	0.190	2.0	5.3
2	0.264	0.186	2.0	5.3
3	0.234	0.181	2.0	5.3
4	0.249	0.188	2.0	5.3
5	0.270	0.193	2.0	5.3

	TENSILE STRENGTH @ MAX (psi)	ELONGATION @ MAX (%)
1	13355	8.0
2	15500	9.1
3	14577	8.1
4	14627	9.2
5	15134	9.9
Mean	14639	8.9
Standard Deviation	812	0.8
Minimum	13355	8.0
Maximum	15500	9.9



Thursday, March 12, 2015

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:
TRIPLEX 6800 SERIES

	WIDTH (in)	THICKNESS (in)	GAGE LENGTH (in)	GRIP DISTANCE (in)
1	0.243	0.232	2.0	5.3
2	0.263	0.232	2.0	5.3
3	0.235	0.232	2.0	5.3
4	0.264	0.226	2.0	5.3
5	0.278	0.219	2.0	5.3

	TENSILE STRENGTH @ MAX (psi)	ELONGATION @ MAX (%)
1	16012	9.0
2	19252	10.7
3	17667	9.4
4	18784	10.6
5	16945	9.7
Mean	17732	9.9
Standard Deviation	1322	0.8
Minimum	16012	9.0
Maximum	19252	10.7



Thursday, March 12, 2015

TENSILE PROPERTIES OF PLASTICS
 ASTM D638
 TYPE III

INSTRON CORPORATION
 BLUEHILL V. 2.26.

OPERATOR NAME:
 E. Carrillo

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

RATE (in/min)
 .2

SAMPLE ID:

TRIPLEX 11600 SERIES

	WIDTH (in)	THICKNESS (in)	GAGE LENGTH (in)	GRIP DISTANCE (in)
1	0.772	0.313	2.0	4.5
2	0.745	0.321	2.0	4.5
3	0.771	0.309	2.0	4.5
4	0.781	0.315	2.0	4.5
5	0.778	0.310	2.0	4.5

	TENSILE STRENGTH @ MAX (psi)	ELONGATION @ MAX (%)
1	21459	17.7
2	20433	18.1
3	21043	17.6
4	20628	18.2
5	19255	16.6
Mean	20564	17.6
Standard Deviation	831	0.6
Minimum	19255	16.6
Maximum	21459	18.2



Thursday, March 12, 2015

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)
 .053

SAMPLE ID:

TRIPLEX 4400 SERIES

	WIDTH (in)	THICKNESS (in)	SUPPORT SPAN (in)
1	0.560	0.135	2.0
2	0.572	0.137	2.0
3	0.567	0.150	2.0
4	0.571	0.153	2.0
5	0.568	0.155	2.0

	STRAIN @ MAX (in/in)	MAXIMUM LOAD (lbf)	FLEXURAL STRENGTH (psi)	FLEXURAL MODULUS (psi)
1	0.0388	71.2	20916	587237
2	0.0343	74.1	20693	639435
3	0.0382	89.9	21132	583306
4	0.0371	91.3	20488	588870
5	0.0362	88.2	19384	560456
Mean	0.0369	82.9	20523	591861
Standard Deviation	0.0018	9.5	680	28953
Minimum	0.0343	71.2	19384	560456
Maximum	0.0388	91.3	21132	639435



Friday, March 06, 2015

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)
 .080

SAMPLE ID:

TRIPLEX 5600 SERIES

	WIDTH (in)	THICKNESS (in)	SUPPORT SPAN (in)
1	0.563	0.182	3.0
2	0.570	0.191	3.0
3	0.566	0.195	3.0
4	0.569	0.195	3.0
5	0.561	0.175	3.0

	STRAIN @ MAX (in/in)	MAXIMUM LOAD (lbf)	FLEXURAL STRENGTH (psi)	FLEXURAL MODULUS (psi)
1	0.0293	107.3	25893	988134
2	0.0309	115.2	24933	901550
3	0.0325	114.6	23963	851920
4	0.0325	127.8	26573	916303
5	0.0288	103.5	27110	1010186
Mean	0.0308	113.7	25694	933619
Standard Deviation	0.0017	9.3	1264	64880
Minimum	0.0288	103.5	23963	851920
Maximum	0.0325	127.8	27110	1010186

F508-3-2.is_flex



Thursday, March 12, 2015

FLEXURAL PROPERTIES OF PLASTICS
 ASTM D790
 3 POINT BEND

INSTRON CORPORATION
 BLUEHILL V. 2.26 (#4411)

OPERATOR NAME:
 E. CARRILLO

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

RATE (in/min)
 .093

SAMPLE ID:

TRIPLEX 6800 SERIES

	WIDTH (in)	THICKNESS (in)	SUPPORT SPAN (in)
1	0.574	0.221	3.5
2	0.570	0.223	3.5
3	0.574	0.225	3.5
4	0.570	0.226	3.5
5	0.571	0.221	3.5

	STRAIN @ MAX (in/in)	MAXIMUM LOAD (lbf)	FLEXURAL STRENGTH (psi)	FLEXURAL MODULUS (psi)
1	0.0094	49.4	9245	1098477
2	0.0086	43.8	8104	1053434
3	0.0096	48.5	8756	1054380
4	0.0102	48.2	8691	979339
5	0.0095	50.0	9413	1082123
Mean	0.0095	48.0	8842	1053551
Standard Deviation	0.0006	2.5	515	45670
Minimum	0.0086	43.8	8104	979339
Maximum	0.0102	50.0	9413	1098477



Thursday, March 12, 2015

FLEXURAL PROPERTIES OF PLASTICS
 ASTM D790
 3 POINT BEND

INSTRON CORPORATION
 BLUEHILL V. 2.26 (#4411)

OPERATOR NAME:
 E. CARRILLO

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

RATE (in/min)
 .133

SAMPLE ID:

TRIPLEX 11600 SERIES

	WIDTH (in)	THICKNESS (in)	SUPPORT SPAN (in)
1	0.567	0.305	5.0
2	0.566	0.306	5.0
3	0.573	0.310	5.0
4	0.570	0.319	5.0
5	0.558	0.325	5.0

	STRAIN @ MAX (in/in)	MAXIMUM LOAD (lbf)	FLEXURAL STRENGTH (psi)	FLEXURAL MODULUS (psi)
1	0.0275	167.4	23805	956789
2	0.0209	159.7	22599	1160807
3	0.0221	172.0	23427	1147677
4	0.0221	168.5	21788	1057244
5	0.0251	165.9	21112	982638
Mean	0.0235	166.7	22546	1061031
Standard Deviation	0.0027	4.5	1118	92856
Minimum	0.0209	159.7	21112	956789
Maximum	0.0275	172.0	23805	1160807

F508-3-4.is_flex