

HTS, Inc. Consultants
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Excellence in Engineering, Consulting, Testing and Inspection

August 3, 2005

HTS Report #:	OTIS05F42.001A.Doc
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Mr. Tim Back
 Otis
 5767 Beckridge
 Cincinnati, OH 45247

Customer Project Name:
 Customer Project #:
 Date Sample Received: 7/28/05
 Date Sample Tested: 8/01/05

1 plate sample 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, tensile modulus, 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
1	1542	1999	7.64	3110.1	117,788

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
1	.290	.272	.287	.325	.293	.266	.294	.284	0.289	7.3

Technician	K. Phouangsavanh
Time	2 hrs

Sincerely,

Larry L. McMichael
 Larry L. McMichael *LP*
 Vice President

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

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August 3, 2005

HTS Report #:	OTIS05F42.001B.Doc
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Mr. Tim Back
 Otis
 5767 Beckridge
 Cincinnati, OH 45247

Customer Project Name:
 Customer Project #:
 Lab Temperature: 71 °F
 Lab Humidity: 50 %

The following 1 plate sample was delivered to our laboratory on 7/28/05.

SAMPLES RECEIVED					
	Sample ID	Mat'l Type		Sample ID	Mat'l Type
1	1	Plate	6		
2			7		
3			8		
4			9		
5			10		

The sample was performed in accordance with the following test methods. The test results are summarized on the subsequent pages. It should be noted. The test specimens and test sample used for this work are believed to be representative of the material produced under this designation. However, these results are indicative only of the specimens that were actually tested. HTS, Inc. neither accepts responsibility for nor makes claims to the final use and purpose of the material.

TESTING PERFORMED	TESTING PERFORMED
ASTM D 2240 - Durometer Hardness	

Sincerely,

Larry L. McMichael
 Larry L. McMichael
 Vice President

DUROMETER HARDNESS – ASTM D 2240

Temperature (°F): 71 Humidity (%): 50 Date Tested: 8/01/05
Landauer Durometer – Type D Time Measured: 1 second
Thickness (in): .289 No. of Plied Pieces: 1

Sample ID	Spec. #	Hardness Value
1	1	76
	2	76
	3	74
	4	74
	5	74
	Avg.	74.8

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
 Series IX Automated Materials Testing System 6.06
 Test Date: 29 Jul 2005

Operator name: K. PHOUANGSAVANH

Sample Identification: 4P42-1-1
 Interface Type: 42/43/4400 Series
 Machine Parameters of test:

Sample Type: AGTM

Sample Rate (pts/sec): 10.000
 Crosshead Speed (in/min): .1100

Humidity (%): 50
 Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.54500	.55700	.55000	.55300	.55500
Depth (in)	.28100	.28300	.28500	.28700	.29200
span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: SAMPLE# 1

Specimen Number	Displment	Strain	Load	Stress	Modulus
	at Yield (in)	at Yield (in/in)	at Yield (lbs)	at Yield (psi)	Of Elasticity (psi)
1	.3991	.0421	22.6	3148.2	114644
2	.3228	.0343	21.0	2823.2	121771
3	.3948	.0422	22.6	3032.7	114816
4	.4326	.0466	24.9	3285.2	125346
5	.4133	.0453	25.7	3261.1	113360
Mean:	.3925	.0421	23.4	3110.1	117788.
Standard Deviation:	.0417	.0048	1.9	189.2	5504.
Minimum:	.3228	.0343	21.0	2823.2	112360.
Maximum:	.4326	.0466	25.7	3285.2	125346.

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Excellence in Engineering, Consulting, Testing and Inspection
 COMPRESSIVE PROPERTIES OF RIGID PLASTICS (ASTM D695)

Test type: Compressive

Instron Corporation
 Series IX Automated Materials Testing System 6.05
 Test Date: 01 Aug 2005

Operator name: K. PHOUANGAVANH

Sample Type: ASTM

Sample Identification: 5P42-1C1
 Interface Type: 42/43/4400 Series
 Machine Parameters of test:

Sample Rate (pts/sec): 10.000
 Crosshead Speed (in/min): .0500

Humidity (%): 50
 Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.51700	.51400	.51200	.51600	.51700
Thickness (in)	.25200	.27400	.26700	.26700	.26500
Spec gauge len (in)	4.0700	4.0700	4.0400	4.0400	4.0500
Platen Separ. (in)	1.8000	1.8000	1.8000	1.8000	1.8000

Out of 5 specimens, 0 excluded.
 Sample comments: SAMPLE# 1

Specimen Number	Compres. Strength (psi)
1	1660.
2	1578.
3	1500.
4	1535.
5	1434.
Mean:	1542.
Standard Deviation:	85.