

HURRICANE ENGINEERING & TESTING, INC.

Computer Controlled Product Testing & Design,
.....Wind Load Analysis

ASTM E 72-05

Strength Test of Panels for Building Construction Transverse Load-Horizontal Specimen & Concentrated Load Test

December 15, 2005

REPORT NUMBER: **HETI-05-2035**

MANUFACTURER: Elite Aluminum Corporation.
4650 Lyons Technology Parkway, Coconut Creek, FL. 33073.

TEST LOCATION: Hurricane Engineering & Testing, Inc.
6120 NW 97th Avenue, Miami, Florida 33178

FBPE Certificate of Authorization Number: 6905

LAB. CERTIFICATION No.: 04-0816.01 (MIAMI-DADE COUNTY, FLORIDA)

FBC ORGANIZATION No: TST1691

PRODUCT: **4" Thick Sandwich Aluminum-Foam Panel**

PRODUCT SIZE: 48" wide x 80" long x 4" deep, and 1/2" OSB TOP and **0.024"** thick
Aluminum bottom skin.

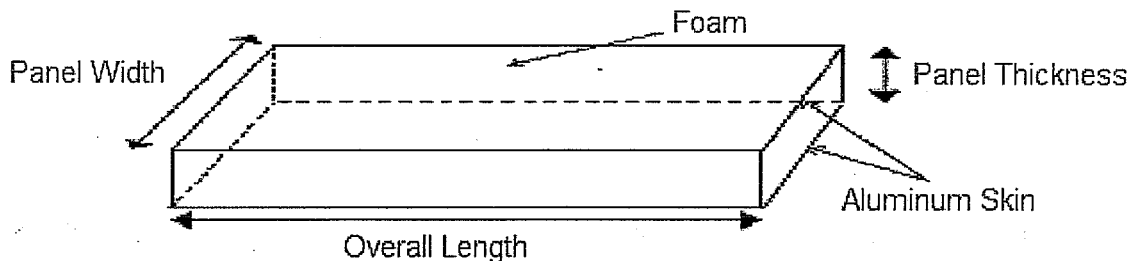
DRAWING TITLE: PT-OSB/FM-001 by Elite Aluminum Corporation , dated 1/17/06.

PRODUCT DESCRIPTION: Insulated Foam panel with **0.024"** aluminum skin on both sides
(Reference Material Tensile Test Report No. HETI-06-T502)

TEST WITNESSED BY: Syed Waqar Ali, Ph. D. (HETI)

Dr. Nasreen K. Ali, E.I. (HETI)

WITNESSING ENGINEER: Mrs. Ivonne Ghia, P.E. (HETI)

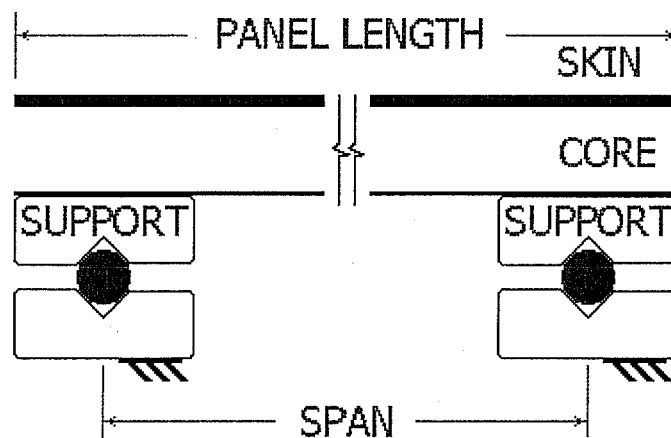


Product Description

- Each sample consisted of an upper layer of ½" **Oriented Strand Board (OSB)** and lower aluminum facing and a core. The aluminum weight was 0.3125 lbs per squared foot. The measurement was performed with a 0.0125 lbs accuracy scale on a 1 squared foot sheet paint was removed. The paint thickness was 0.75 MIL.
- Actual panel width: 48"
- Nominal panel width 48"
- Span: 76"
- Panel length 80"
- Panel depth 4"
- Top or Upper Facing: ½" ADVANTECH OSB by HUBER
- Bottom or Lower Facing: 0.024" nominal (0.0214" actual without paint and embossed) baked enamel finish 3105H154 Aluminum
- Core density: 0.91 lbs/ft³
- Core composition Expanded Polystyrene (EPS).
- Core thickness: 3.50" (prior to fabrication)
- Edge construction: roll formed
- Additional reinforcement: none.
- Adhesive ISOGRIP SP 2020 by Ashland Specialty

Test Procedure

- Symmetrical Assembly.
- Apparatus: Tested as per ASTM E 72 - 05 Section 11.3.1.1 Uniformly distributed loading by vacuum pump acting below the specimen, a 2 mil plastic sheathing above the specimen and an airtight chamber as per section 11.3.1.3 of ASTM E 72 - 05. The pressure was read with a water column manometer and a pressure transducer.
- Supports: The samples were supported by rollers as per diagram below:



Long side profile

- Deflection Gage: The deflection was measured using linear variable differential transformers (LVDT).

Test Results

Sample I

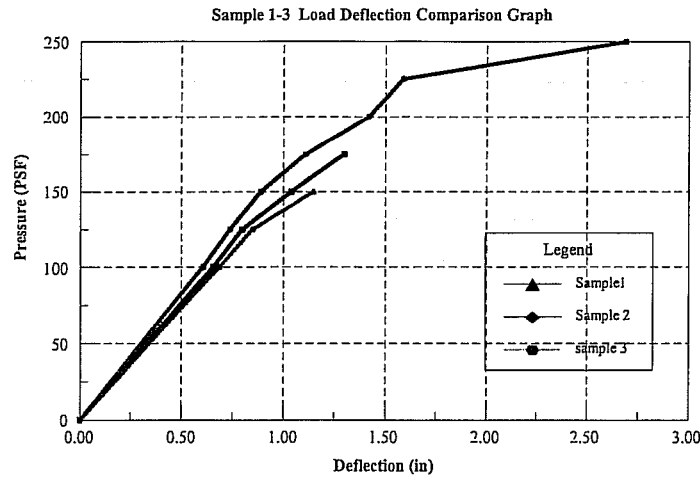
	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.61	0.000	100	300
Load	125	0.74	0.000	100	300
Load	150	0.89	0.012	99	300
Load	175	1.11	0.035	97	300
Load	200	1.42	0.139	90	300
Load	225	1.59	0.185	88	300
Load	250	2.69	0.659	76	300
Failure Load	Test stopped after recovery was less than 80%.				

Sample II

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.66	0.00	100	300
Load	125	0.80	0.00	100	300
Load	150	1.04	0.046	96	300
Load	175	1.30	0.081	94	300
Failure Load	Failed at 197 PSF, right end shear failure				

Sample III

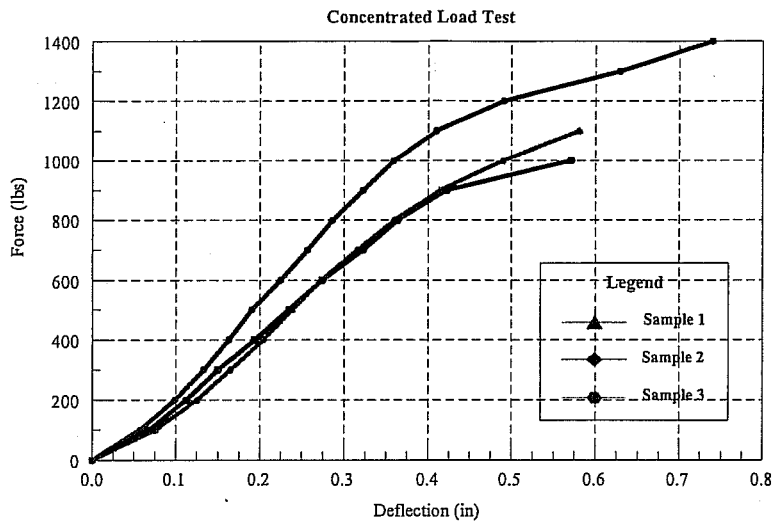
	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.69	0.000	100	300
Load	125	0.85	0.023	97	300
Load	150	1.15	0.092	92	300
Failure Load	Failed at 168 PSF, left end shear failure				



Concentrated Load Test

Force (lbs)	Sample 1 Deflection (in)	Sample 2 Deflection (in)	Sample 3 Deflection (in)	Duration (Sec)
0.0	0.000	0.0	0.0	0
100	0.057	0.067	0.076	60
200	0.099	0.112	0.125	60
300	0.133	0.150	0.165	60
400	0.163	0.194	0.204	60
500	0.191	0.235	0.239	60
600	0.225	0.274	0.273	60
700	0.257	0.323	0.316	60
800	0.287	0.364	0.360	60
900	0.323	0.422	0.415	60
1000	0.359	0.571	0.490	60
1100	0.410	-	0.581	60
1200	0.491	-	-	60
1300	0.629	-	-	60
1400	0.740	-	-	60
Failure Load	Failed at 1480	Failed at 1098	Failed at 1198	

Note: Failed status indicates that 1" diameter round bar used to apply concentrated load ruptured and penetrated the OSB board. Reference Group 05-2061.



Conclusion

The samples were tested as in accordance with ASTM E 72-05. The Comparison Graph reflects the last test run where failure occurred for each sample.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

STATEMENT OF INDEPENDENCE

The Hurricane Engineering & Testing, Inc., does not have, nor does it intend to acquire or will acquire, a financial interest in any company manufacturing or distributing products tested or labeled by the Hurricane Engineering & Testing, Inc. Hurricane Engineering & Testing, Inc., is not owned, operated or controlled by any company manufacturing or distributing products it tests or labels.

Dr. Nasreen K. Ali
Vice President

Ivonne Ghia, P.E.
Resident Engineer

01/23/06

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Computer Controlled Product Testing & Design,
.....Wind Load Analysis

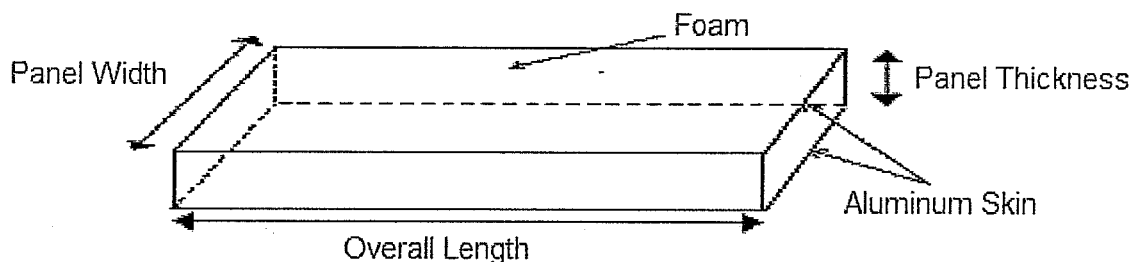
ASTM E 72-05 Strength Test of Panels for Building Construction Transverse Load Test – Horizontal Specimen

December 15, 2005

REPORT NUMBER: **HETI-05-2028**
MANUFACTURER: Elite Aluminum Corporation.
4650 Lyons Technology Parkway, Coconut Creek, FL. 33073.
TEST LOCATION: Hurricane Engineering & Testing, Inc.
6120 NW 97th Avenue, Miami, Florida 33178

FBPE Certificate of Authorization Number: 6905
LAB. CERTIFICATION No.: 04-0816.01 (MIAMI-DADE COUNTY, FLORIDA)
FBC ORGANIZATION No: TST1691

PRODUCT: **4" Thick Sandwich Aluminum-Foam Panel**
PRODUCT SIZE: 48" wide x 222" long x 4" deep, and ½" OSB TOP and **0.024"** thick Aluminum bottom skin.
DRAWING TITLE: PT-OSB/FM-002 by Elite Aluminum Corporation , dated 1/17/06.
PRODUCT DESCRIPTION: Insulated Foam panel with **0.024"** aluminum skin on both sides (Reference Material Tensile Test Report No. HETI-06-T502)
TEST WITNESSED BY: Syed Waqar Ali, Ph. D. (HETI)
Dr. Nasreen K. Ali, E.I. (HETI)
WITNESSING ENGINEER: Mrs. Ivonne Ghia, P.E. (HETI)

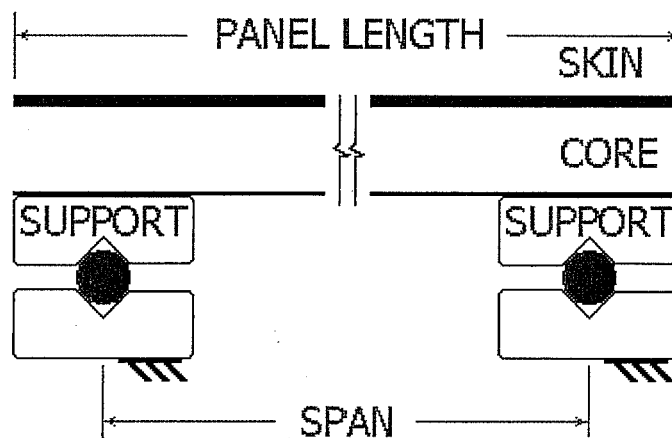


Product Description

- Each sample consisted of an upper layer of ½" **Oriented Strand Board (OSB)** and lower aluminum facing and a core. The aluminum weight was 0.3125 lbs per squared foot. The measurement was performed with a 0.0125 lbs accuracy scale on a 1 squared foot sheet paint was removed. The paint thickness was 0.75 MIL.
- Actual panel width: 48"
- Nominal panel width 48"
- Span: 218"
- Panel length 222"
- Panel depth 4"
- Top or Upper Facing: ½" ADVANTECH OSB by HUBER
- Bottom or Lower Facing: 0.024" nominal (0.0214" actual without paint and embossed) baked enamel finish 3105H154 Aluminum
- Core density: 0.91 lbs/ft³
- Core composition Expanded Polystyrene (EPS).
- Core thickness: 3.50" (prior to fabrication)
- Edge construction: roll formed
- Additional reinforcement: none.
- Adhesive ISOGRIP SP 2020 by Ashland Specialty

Test Procedure

- Symmetrical Assembly.
- Apparatus: Tested as per ASTM E 72 - 05 Section 11.3.1.1 Uniformly distributed loading by vacuum pump acting below the specimen, a 2 mil plastic sheathing above the specimen and an airtight chamber as per section 11.3.1.3 of ASTM E 72 - 05. The pressure was read with a water column manometer and a pressure transducer.
- Supports: The samples were supported by rollers as per diagram below:



Long side profile

- Deflection Gage: The deflection was measured using linear variable differential transformers (LVDT).

Test Results

Sample I

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.16	0.000	100	300
Load	20	2.29	0.000	100	300
Load	30	3.83	0.092	98	300
Load	40	5.27	0.197	96	300
Failure Load	Failed at 50 PSF, left end shear failure				

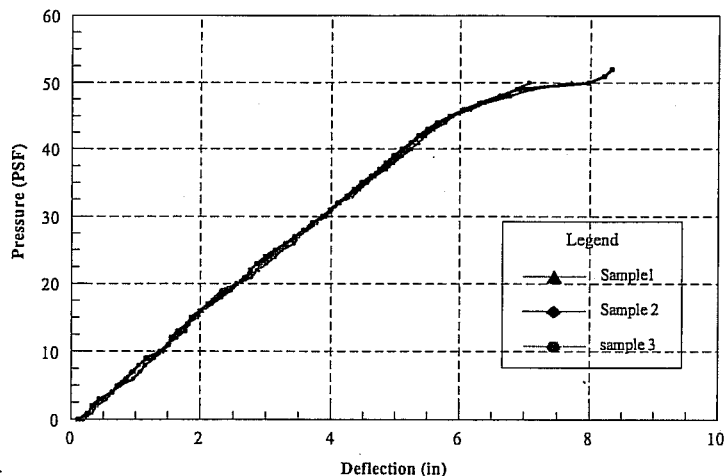
Sample II

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.37	0.023	98	300
Load	20	2.37	0.035	99	300
Load	30	3.78	0.139	96	300
Load	40	5.73	0.601	90	300
Load	50	8.30	1.977	76	
Failure Load	Test stopped after recovery reached less than 80%.				

Sample III

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.31	0.023	98	300
Load	20	2.45	0.035	99	300
Load	30	3.74	0.116	97	300
Load	40	5.75	0.566	90	
Load	50	8.19	1.826	78	
Failure Load	Test stopped after recovery reached less than 80%.				

Sample 1-3 Load Deflection Comparison Graph



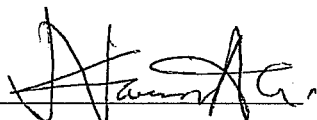
Conclusion

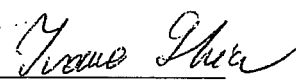
The samples were tested as in accordance with ASTM E 72-05. The Comparison Graph reflects the last test run where failure occurred for each sample.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

STATEMENT OF INDEPENDENCE

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 Dr. Nasreen K. Ali
 Vice President


 Ivonne Ghia, P.E. 01/23/06
 Resident Engineer

HURRICANE ENGINEERING & TESTING, INC.

Computer Controlled Product Testing & Design,
.....Wind Load Analysis

ASTM E 72-05

Strength Test of Panels for Building Construction Transverse Load-Horizontal Specimen & Concentrated Load Test

December 15, 2005

REPORT NUMBER: **HETI-05-2034**

MANUFACTURER: Elite Aluminum Corporation.
4650 Lyons Technology Parkway, Coconut Creek, FL. 33073.

TEST LOCATION: Hurricane Engineering & Testing, Inc.
6120 NW 97th Avenue, Miami, Florida 33178

FBPE Certificate of Authorization Number: 6905

LAB. CERTIFICATION No.: 04-0816.01 (MIAMI-DADE COUNTY, FLORIDA)

FBC ORGANIZATION No: TST1691

PRODUCT: **4" Thick Sandwich Aluminum-Foam Panel**

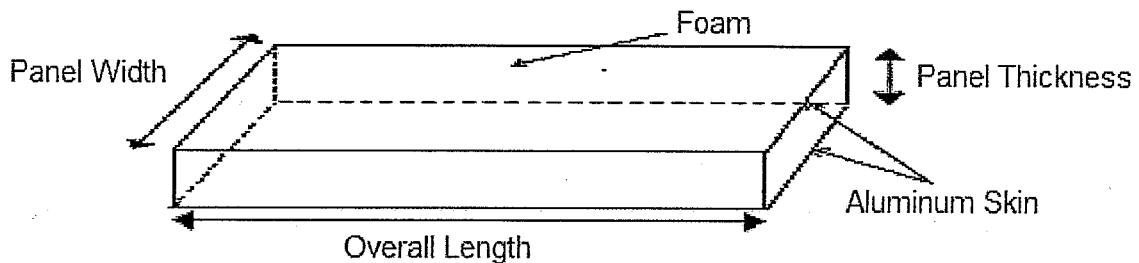
PRODUCT SIZE: 48" wide x 80" long x 4" deep, and 1/2" OSB TOP and 0.030" thick Aluminum bottom skin.

DRAWING TITLE: PT-OSB/FM-005 by Elite Aluminum Corporation, dated 1/17/06.

PRODUCT DESCRIPTION: Insulated Foam panel with 0.030" aluminum skin on both sides
(Reference Material Tensile Test Report No. HETI-06-T516)

TEST WITNESSED BY: Syed Waqar Ali, Ph. D. (HETI)
Dr. Nasreen K. Ali, E.I. (HETI)

WITNESSING ENGINEER: Mrs. Ivonne Ghia, P.E. (HETI)

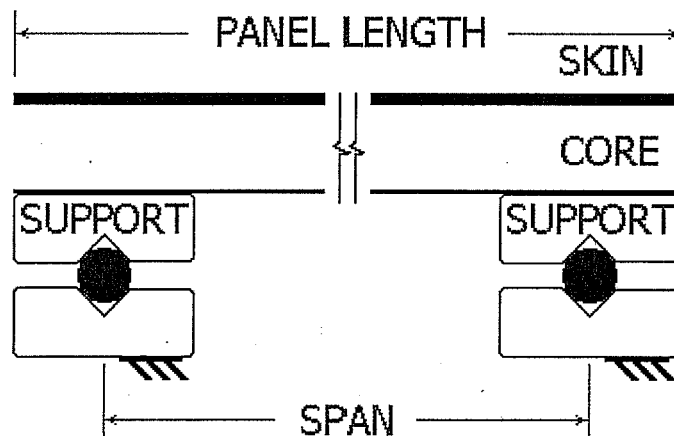


Product Description

- Each sample consisted of an upper layer of ½" **Oriented Strand Board (OSB)** and lower aluminum facing and a core. The aluminum weight was 0.408 lbs per squared foot. The measurement was performed with a 0.0125 lbs accuracy scale on a 1 squared foot sheet paint was removed. The paint thickness was 0.75 MIL.
- Actual panel width: 48"
- Nominal panel width 48"
- Span: 76"
- Panel length 80"
- Panel depth 4"
- Top or Upper Facing: ½" ADVANTECH OSB by HUBER
- Bottom or Lower Facing: 0.032" nominal (0.027" actual without paint and embossed) baked enamel finish 3105H154 Aluminum
- Core density: 0.91 lbs/ft³
- Core composition Expanded Polystyrene (EPS).
- Core thickness: 3.50" (prior to fabrication)
- Edge construction: roll formed
- Additional reinforcement: none.
- Adhesive ISOGRIIP SP 2020 by Ashland Specialty

Test Procedure

- Symmetrical Assembly.
- Apparatus: Tested as per ASTM E 72 - 05 Section 11.3.1.1 Uniformly distributed loading by vacuum pump acting below the specimen, a 2 mil plastic sheathing above the specimen and an airtight chamber as per section 11.3.1.3 of ASTM E 72 - 05. The pressure was read with a water column manometer and a pressure transducer.
- Supports: The samples were supported by rollers as per diagram below:



Long side profile

- Deflection Gage: The deflection was measured using linear variable differential transformers (LVDT).

Test Results

Sample I

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.56	0.000	100	300
Load	125	0.62	0.000	100	300
Load	150	0.76	0.000	100	300
Load	175	0.97	0.035	96.4	300
Load	200	1.18	0.081	93.1	300
Failure Load	Failed at 224 PSF, Edge Shear failure.				

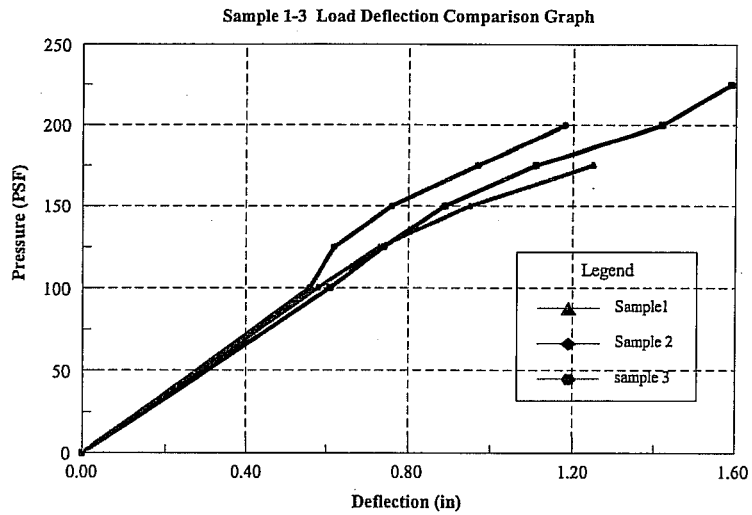
Sample II

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.61	0.000	100	300
Load	125	0.74	0.000	100	300
Load	150	0.89	0.000	100	300
Load	175	1.11	0.000	100	300
Load	200	1.42	0.000	100	300
Load	225	1.59	0.185	88.4	300
Failure Load	Test stopped after exceeding $1.5*(L/80)$ deflection criteria.				

Sample III

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	100	0.58	0.000	100	300
Load	125	0.73	0.000	100	300
Load	150	0.95	0.035	96.4	300
Load	175	1.25	0.116	90.8	300
Failure Load	Failed at 199 PSF, Edge Shear failure.				

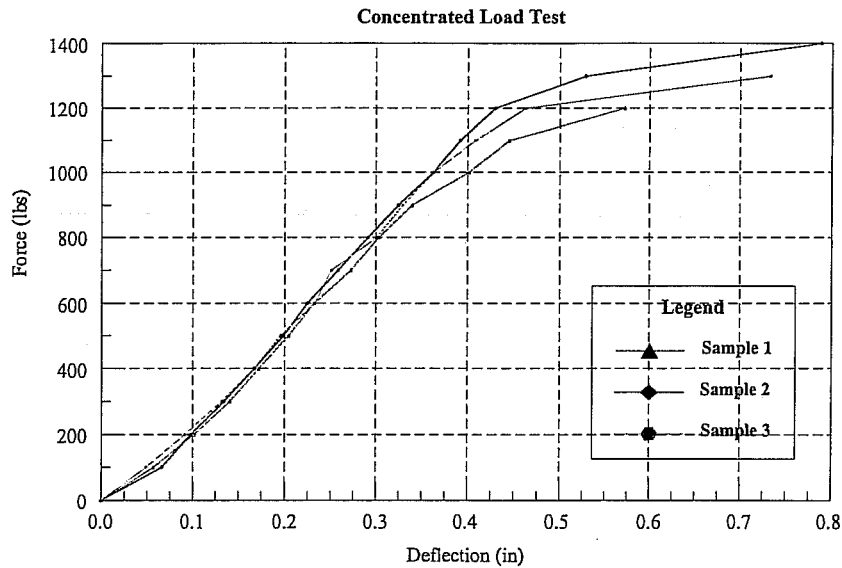
Sample
II & III



Concentrated Load Test

Force (lbs)	Sample 1 Deflection (in)	Sample 2 Deflection (in)	Sample 3 Deflection (in)	Duration (Sec)
0.0	0.000	0.0	0.0	0
100	0.057	0.067	0.049	60
200	0.101	0.098	0.092	60
300	0.140	0.135	0.132	60
400	0.172	0.168	0.168	60
500	0.205	0.200	0.196	60
600	0.232	0.225	0.233	60
700	0.272	0.259	0.252	60
800	0.303	0.292	0.301	60
900	0.339	0.325	0.330	60
1000	0.401	0.363	0.364	60
1100	0.444	0.392	0.408	60
1200	0.572	0.430	0.463	60
1300	-	0.529	0.734	60
1400	-	0.789	-	60
Failure Load	Failed at 1333	Failed at 1398	Failed at 1404	

Note: Failed status indicates that 1" diameter round bar used to apply concentrated load ruptured and penetrated the OSB board. Reference Group 05-2043.



Conclusion

The samples were tested as in accordance with ASTM E 72-05. The Comparison Graph reflects the last test run where failure occurred for each sample.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

STATEMENT OF INDEPENDENCE

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Dr. Nasreen K. Ali
Vice President

Ivonne Ghia, P.E.
Resident Engineer
01/23/06

HURRICANE ENGINEERING & TESTING, INC.

Computer Controlled Product Testing & Design,
.....Wind Load Analysis

ASTM E 72-05 Strength Test of Panels for Building Construction Transverse Load Test – Horizontal Specimen

December 15, 2005

REPORT NUMBER: **HETI-05-2027**

MANUFACTURER: Elite Aluminum Corporation.
4650 Lyons Technology Parkway, Coconut Creek, FL. 33073.

TEST LOCATION: Hurricane Engineering & Testing, Inc.
6120 NW 97th Avenue, Miami, Florida 33178

FBPE Certificate of Authorization Number: 6905

LAB. CERTIFICATION No.: 04-0816.01 (MIAMI-DADE COUNTY, FLORIDA)

FBC ORGANIZATION No: TST1691

PRODUCT: **4" Thick Sandwich Aluminum-Foam Panel**

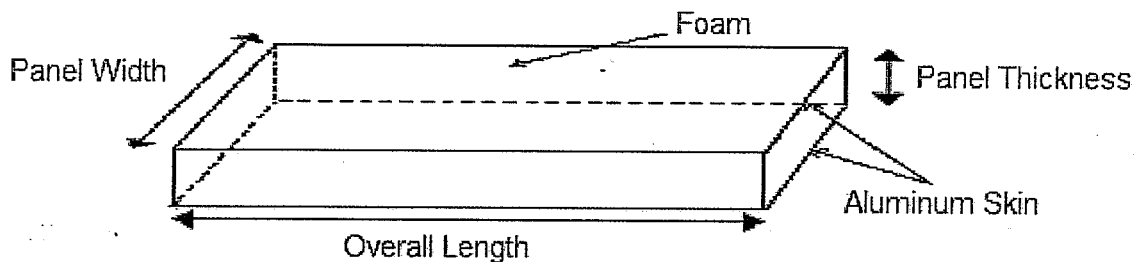
PRODUCT SIZE: 48" wide x 246" long x 4" deep, and ½" OSB TOP and **0.030"** thick Aluminum bottom skin.

DRAWING TITLE: PT-OSB/FM-006 by Elite Aluminum Corporation , dated 1/17/06.

PRODUCT DESCRIPTION: Insulated Foam panel with **0.030"** aluminum skin on both sides
(Reference Material Tensile Test Report No. HETI-06-T516)

TEST WITNESSED BY: Syed Waqar Ali, Ph. D. (HETI)
Dr. Nasreen K. Ali, E.I. (HETI)

WITNESSING ENGINEER: Mrs. Ivonne Ghia, P.E. (HETI)

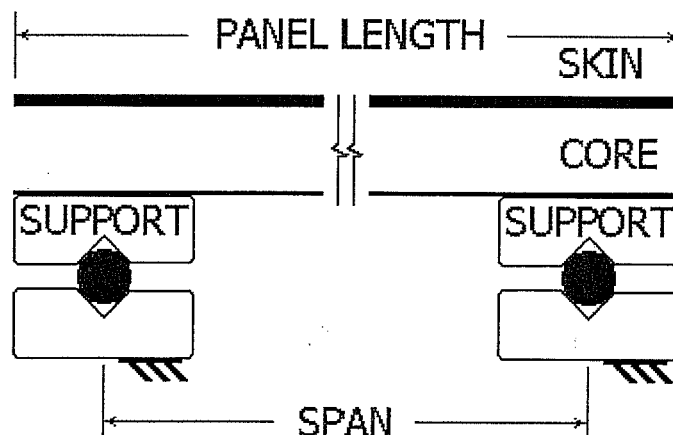


Product Description

- Each sample consisted of an upper layer of ½" **Oriented Strand Board (OSB)** and lower **aluminum facing** and a **core**. The aluminum weight was 0.408 lbs per squared foot. The measurement was performed with a 0.0125 lbs accuracy scale on a 1 squared foot sheet paint was removed. The paint thickness was 0.75 MIL.
- Actual panel width: 48"
- Nominal panel width 48"
- Span: 242"
- Panel length 246"
- Panel depth 4"
- Top or Upper Facing: ½" ADVANTECH OSB by HUBER
- Bottom or Lower Facing: 0.032" nominal (0.027" actual without paint and embossed) baked enamel finish 3105H154 Aluminum
- Core density: 0.091 lbs/ft³
- Core composition Expanded Polystyrene (EPS).
- Core thickness: 3.50" (prior to fabrication)
- Edge construction: roll formed
- Additional reinforcement: none.
- Adhesive ISOGRIIP SP 2020 by Ashland Specialty

Test Procedure

- Symmetrical Assembly.
- Apparatus: Tested as per ASTM E 72 - 05 Section 11.3.1.1 Uniformly distributed loading by vacuum pump acting below the specimen, a 2 mil plastic sheathing above the specimen and an airtight chamber as per section 11.3.1.3 of ASTM E 72 - 05. The pressure was read with a water column manometer and a pressure transducer.
- Supports: The samples were supported by rollers as per diagram below:



Long side profile

- Deflection Gage: The deflection was measured using linear variable differential transformers (LVDT).

Test Results

Sample I

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.42	0.00	100	300
Load	20	3.03	0.023	99.2	300
Load	30	4.67	0.127	97.3	300
Load	40	6.25	0.312	95.0	300
Load	50	7.61	0.659	91.3	300
Failure Load	Test stopped after deflection exceeded $1.5*(L/80)$ deflection criteria				

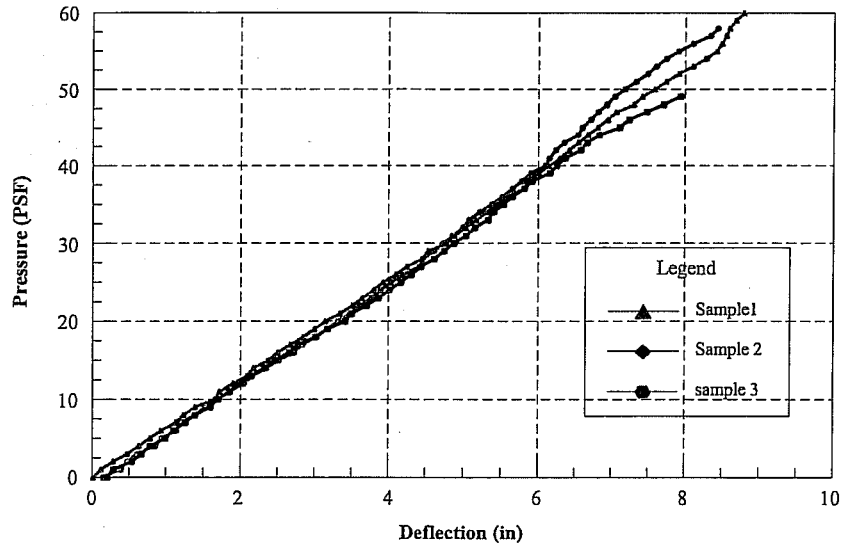
Sample II

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.41	0.000	100	300
Load	20	2.94	0.058	98.3	300
Load	30	4.67	0.069	98.5	300
Load	40	6.48	0.381	93.9	300
Load	50	7.48	0.289	96.1	300
Load	60	8.07	0.486	94.0	300
Failure Load	Test stopped after deflection exceeded $1.5*(L/80)$ deflection criteria				

Sample III

	Pressure (psf)	AVG Center Deflection (inches)	Set (inches)	Recovery (%)	Duration (seconds)
Starting Load	0.0	0.00	0.000	100	300
Load	10	1.46	0.023	98.4	300
Load	20	3.23	0.069	97.9	300
Load	30	4.69	0.162	96.6	300
Load	40	6.37	0.381	94.0	300
Load	50	8.44	1.006	88.1	300
Load	60	9.06	1.029	88.6	300
Failure Load	Test stopped after deflection exceeded $1.5*(L/80)$ deflection criteria				

Sample 1-3 Load Deflection Comparison Graph



Conclusion

The samples were tested as in accordance with ASTM E 72-05. The Comparison Graph reflects the last test run where failure occurred for each sample.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

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Vice President

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Resident Engineer

01/23/06