TEST REPORT

REPORT NUMBER: 3083303SAT – 004 REV1
ORIGINAL ISSUE DATE: February 21, 2008
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EVALUATION CENTER
Intertek Testing Services NA, Inc.
16015 Shady Falls Road
Elmendorf, TX 78112

RENDERED TO

Emmedue S.P.A.
Via Toniolo, 39/b
Z.I. Bellocchi
61032 Fano (PU), Italy

PRODUCT EVALUATED: 4' x 8' and 4' x 12' Single Panel PSM80 and PSM150 Wall Systems
EVALUATION PROPERTY: ICC – AC 15, Section 4.2.2.6, ASTM E 72 - 05, Section 11 (**Floor/Roof Flexural Load**)

Report of Testing 4' x 8' and 4' x 12' Single Polystyrene PSM80 and PSM150 panels for compliance with the applicable requirements of the following criteria: *ICC – AC 15, Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems, under the general guidelines of ASTM E 72 - 05, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*

1 Table of Contents

2 Introduction

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Emmedue S.P.A on 4' x 8' and 4' x 12' Single Polystyrene PSM80 and PSM150 structural wall panels. The test method consisted of the transverse-flexural load under third-point loading. Emmedue wall systems are based on a series of foam polystyrene panels and electro-welded steel wire meshes, whose shapes have been specially designed to apply structural plaster during panel installation (Ref, 1, p. 3). These systems are capable of multiple applications, such as quick installation and high thermal and sound capabilities (Ref 1, p. 3). The purpose of these tests is to evaluate flexural load structural applications according to Section 4.2.2.6 of ICC – AC 15, under the general guidelines of *ASTM E 72 - 05, Conducting Strength Tests of Panels for Building Construction*. The results of each test are presented in tabular and graphical form. In total, 12 specimens were tested under the above loading configuration to measure the deflection and failure characteristics of each of the wall systems. This evaluation began November 19, 2007 and was completed November 29, 2007.

NOTE: This report is only for the transverse floor/roof flexural tests performed. Refer to report numbers **3083303SAT - 001, - 002, - 003, - 005, - 006, - 007, and - 008** (designated **REV1, except 008**) for the rest of the testing completed for this project.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were randomly selected on July 1, 2007 by Intertek representative Matt Lansdowne, EIT, at the Emmedue S.P.A manufacturing facility, located at Via Toniolo 39/b, Z.I. Bellocchi, 61032 Fano (PU), Italy. Samples were received at Intertek – San Antonio on August 28, 2007.

The subject test specimens are traceable samples selected from the manufacturer's facility. Intertek selected the specimens and has verified the composition, manufacturing techniques and quality assurance procedures.

Refer to the Pre-Test Inspection Report, dated July 1 – 2, 2007, located in the Appendix.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The Emmedue Single Panel PSM80 and PSM150 consist of a foam polystyrene core reinforced with a galvanized steel wire mesh connected on both sides of the foam using corrugated steel bars. The steel bars and mesh are electro-welded together for strength. There are approximately 82 connectors per square meter of foam surface. Below is a list of specifications of the PSM80 and PSM150 panels (Ref 1, p. 7). The numbers below were converted from metric to inch-pounds from the Emmedue Operator's Handbook.

Galvanized Steel Wire Mesh

1) Longitudinal wires with diameter of 0.121 inches spaced every 2.56 inches
2) Transversal wires with diameter of 0.099 inches spaced every 2.56 inches

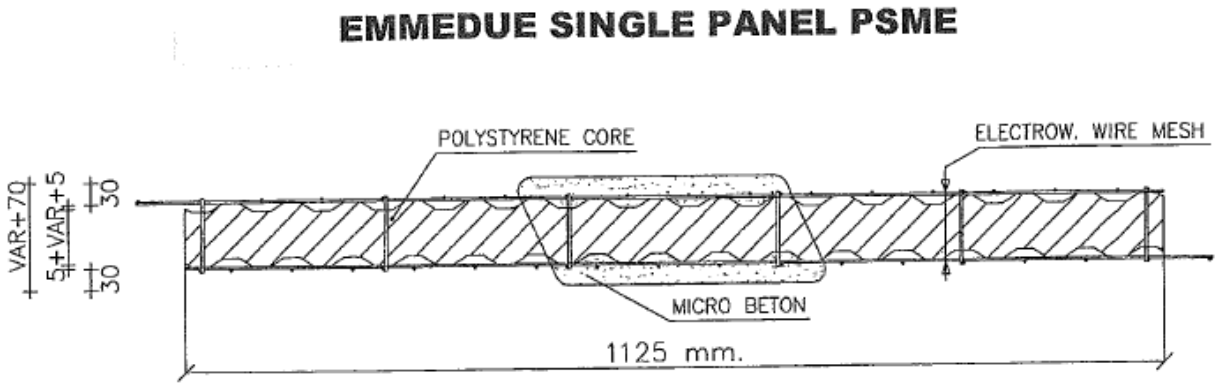


Figure 1: Emmedue Single Panel PSM80 and PSM150 Details (Ref. 1, p.7)

Polystyrene Slab Density: 15 Kg/m^3 (0.936 lb/ft^3)
Polystyrene Slab Thickness: 4" (PSM80) and 6" (PSM150)

The Emmedue building system comprises of different wall, floor, and roof arrangements that are finished on-site using sprayed mortar and concrete. Although different techniques exist for spray mortar, the mortar mix used for this project consisted of Portland® Cement, sand, and water. The client recommends an average quantity of plaster (or mortar) of about 1 inch sprayed per side. The recommended concrete thickness for floor/roof walls is approximately between 2" and 2 ½". These panels are generally used for buildings of no more than 4 stories high, in seismic areas, for floor slabs and covering slabs whose spans are 4 m (13.12 ft) at maximum (Ref. 1, p. 7).

For these tests, a mortar mix design was provided in order to meet the required wall structural plaster specifications. The mortar mixing ratio (by weight) was provided as followed:

Portland® Cement:	100 lbs
Sand:	280 lbs
Water:	5.0 gallons

The above numbers were provided by the client during sample construction. As indicated by the Emmedue Operator's Handbook (Ref. 1, p 27), the quantity of water should vary as humidity and temperature changes are observed. Accordingly, modifications to the mixing ratio were made as indicated by the weather conditions during mortar spraying. In all cases, the minimum compressive mortar strength (f'c) was 2500 psi at 28 days curing time. These results were verified by performing mortar cylinder core tests at 7 and 28 days as per ACI 506.2, for each batch made. Additional mortar cylinder core tests were also performed within 48 hours of the completion of each set of three full-scale tests, as per AC 15, Section 4.2.2.6.

From the mortar cylinder core testing results obtained, it was found that no mortar core was lower than 2500 psi at 28 days. Refer to report number **3083303SAT – 008** for a complete listing of all mortar core tests performed.

Both the PSM80 and PSM150 floor/roof panels were constructed with a concrete top and a sprayed mortar bottom. The nominal concrete thickness was between 2 inches and 2 ½ inches.

The nominal mortar thickness was approximately 1 inch. The concrete specifications were as followed:

Compressive Strength (f'c):	3500 psi at 28 days
Concrete slump:	5 inches (using an Abram's slump cone)
Aggregate size:	Nominal 3/8" pea gravel

The concrete was ordered through a local supplier. The mix design was also provided by the concrete supplier. A detailed copy of the concrete mix design used is located in the Appendix.

4 Testing and Evaluation Methods

4.1. Construction of Floor/Roof Assemblies

Twelve transverse floor/roof flexural samples were tested and all were constructed in the same manner. The floor/roof panel test matrix was as followed:

Panel Type	Size	No. of Tests
PSM80	**4' x 8'**	**3**
PSM80	**4' x 12'**	**3**
PSM150	**4' x 8'**	**3**
PSM150	**4' x 12'**	**3**

Construction of the 4' x 8' and 4' x 12' samples consisted the following:

1) Single Panel PSM80 and PSM150
2) 1/8" Rebar tie wire
3) 1x10 #1 yellow pine lumber cut down to 7 ½" wide for PSM80 panels
4) 1x10 #1 yellow pine lumber cut down to 9 ½" wide for PSM150 panels
5) #8 x 2" wood deck screws
6) Mortar mixture (Portland® Cement, sand, and water)

All of the samples had to be constructed at the Intertek-San Antonio facility. Panel assembly first consisted of constructing a wooden frame around the perimeter of the PSM80 panel using #8 x 2" wood deck screws and 1x10 #1 yellow pine lumber joists cut down to 7 ½" wide. The difference in thickness accounts for the two different thicknesses of mortar and concrete. The PSM150 panel frames were constructed in the same manner, however, the 1x10 #1 yellow pine was cut 9 ½" wide. The perimeter frame served two purposes: 1) as a support to assure that each wall was even and plumb before mortar spraying, and 2) as a guide for applied proper mortar thickness. For the 8 foot samples, the 1/8" rebar tire wire was installed 32" from the top and bottom around the panel and frame in order to hold the two pieces together. For the 12 foot samples, the rebar tie wire was installed at 48" from top and bottom. Refer to Figure 2 for more details.

Figure 2: Finished wood frames with 4' x 12' panels ready for spray mortar application

The samples were then sprayed with a mortar mixture of sand, water, and Portland® Cement on one side using a plaster sprayer provided by the client. Mortar specifications included sand particles with less than 0.20" size and a slump of 2", at the appropriate ratio (refer to Section 3.2, Sample and Assembly Description, for mixing ratio). The three ingredients were mixed using a concrete mixer. A compressor capable of adjustment was used in order to assure the client recommended 90 psi application pressure. Two layers of sprayed mortar were applied to one side until the desired mortar thickness of 1" (+/- ¼") was achieved. The samples were then smoothed out as much as possible using mortar trowels or any other straight smoothing device. Refer to Figures 3 and 4 for details.

Figures 3 and 4: Mortar mixing and spraying application on 4' x 12' assemblies, respectively

The sprayed mortar samples were allowed to cure for approximately 7 days. Once cured, the samples were flipped over and repositioned horizontally on the floor. This was done in order to prepare the samples for concrete pouring. All floor/roof flexural samples were poured on 10/3/07. The concrete was poured from the truck into wheel barrels which were then carted to the appropriate samples. The concrete was gravity poured and settled using a concrete vibrator. Once poured, the tops of the samples were smoothed out using a trowel (or some other type of smoothing device). The samples were then wetted down for a period of 24 hours in order to avoid accelerated curing of the concrete (which can lead to surface cracks). Refer to Figures 5 through 7 for details.

Figures 5 and 6: Floor/roof panels prepared for concrete pouring

Figure 7: Finished floor/roof panels with concrete wetted down

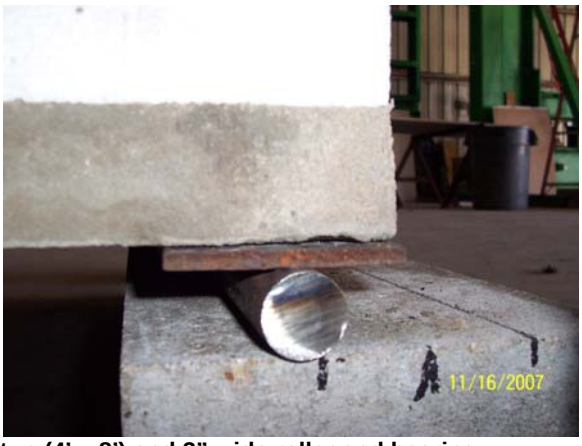
The samples were allowed to cure for at least 28 days prior to testing. All 12 floor/roof flexural sample configurations (4’ x 8’ and 4’ x 12’) tested were equal in construction techniques.

4.2. ICC-AC 15 and ASTM E 72 - 05 Testing Procedures

Transverse-Flexural Load Procedure (Third Point Loading)

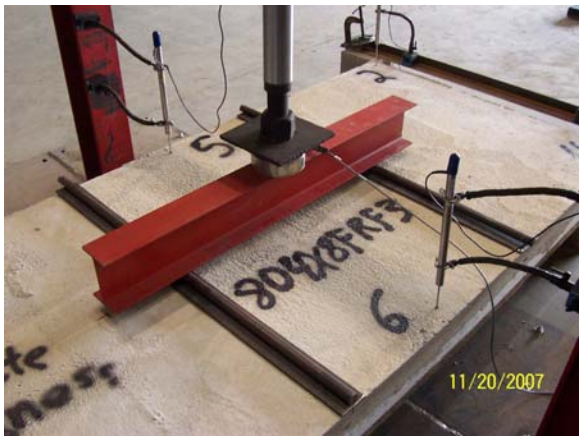
The test rig consisted of a steel rigid A-frame, specimen supports, steel support rollers and bearings, and a hydraulic cylinder. The setup procedure consisted of positioning concrete specimen supports at the given span length (L) for each specimen. These concrete supports were made of solid 7 ½" x 7 ½" x 15 ½" concrete blocks. A total of three concrete blocks were positioned at each end of the support span length. Once the blocks were laid out at the proper distance, two 1" diameter x 50" long steel rollers and two 3" wide x 50" long x ¼" thick steel bearing plates were positioned at the proper support span length (L) on top of each row of blocks. For the 8 foot samples, the support span was 93 inches and for the 12 foot samples, the support span was 141 inches.

Once the roller end bearings were positioned, the samples were carried and lifted in place using a forklift and lifting straps. Each sample was then lowered in place on top of the roller bearings. Adjustments were made accordingly to the sample and roller bearings in order to obtain the appropriate support span. All floor/roof flexural samples were tested with the concrete side up (loaded side). Refer to Figures 8 and 9 for details.



Figures 8 and 9: Floor/roof flexural test setup (4' x 8') and 3" wide roller end bearing

After adjusting the sample, the loading bearings were positioned on top of the sample. The purpose of these bearings was to evenly distribute the load through two points under third-point loading conditions. The bearings were positioned 31 inches apart for the 8 foot samples and 47 inches for the 12 foot samples. These two loading bearings were of the same specifications and materials as the end reaction bearings. A loading I-beam was then positioned perpendicular to the loading bearings exactly at the midpoint of the wall (24 inches in width). A calibrated load cell was then installed on top of the loading beam. The head of the hydraulic cylinder was then lowered until it touched the top of the load cell. This assured proper alignment of all the components, as well as holding the sample in place. Refer to Figures 10 and 11 for details.



Figures 10 and 11: Third-Point loading setup (top view) and top loading bearing location

The deflection measurement gauges consisted of six spring loaded 4" low voltage displacement transducers capable of 0.001 inch resolution. Transducer data is logged and stored via a data acquisition unit. The transducers are supported using mechanical adjustable arms with a magnetic base that connect to a rigid steel bar which are attached to two cinder blocks. The blocks rest on the concrete floor of the laboratory.

All testing was performed according to Section 4.2.2.6 of ICC – AC 15, under the general guidelines of ASTM E 72 - 05, Section 11 loading procedure. Once the specimen was properly installed on the frame, two linear transducers (with 0.001 inch resolution) were placed centrally along the lateral dimension of the specimen at opposite sides of the specimen along the short dimension (width) no more than 2" from the specimen edge. Four transducers were placed on each corner of the specimen at 1 ½" in from the side and at 1 ½" in from the end to measure the uplift as the specimen is loaded.

A pre-load (not to exceed 10% of the ultimate load) was applied to the specimen. With the pre-load applied to the specimen, an initial reading is made. All set load readings are taken at this pre-load reading, which is labeled as the "zero" mark. Once this measurement is made, the load is increased slightly which in turn applies an initial load to the specimen. The load is applied for 5 minutes during which time deflection measurements are made as a function of time (as soon as it is practical after initial loading and at the end of the 5 minute period). After the 5 minute period, the load is decreased to the "zero" load (a.k.a. the predetermined pre-load) for 5 minutes during which time deflection measurements are made as a function of time (as soon as it is practical after initial un-loading, and at the end of the 5 minute period). The process is repeated in increments of "n" of initial load (n = 2, 3, 4,…) until a predetermined number of data points is obtain to effectively plot a load-deflection curve. Once the appropriate number of points is reached, the instruments are removed and the test specimen is loaded to failure. Refer to Figure 12 for details.

Figure 12: Floor/roof flex test setup for 4' x 12' samples (overall view)

Refer to Appendix C for floor/roof flexural test photos.

4.2.1. ICC – AC 15 and ASTM E 72 - 05 Notes

These tests were performed in accordance to ICC- AC 15 and under the general guidelines of ASTM E72 – 05. As per ICC – AC 15, six specimens were tested, using two different configurations and/or heights. The tested specimens consisted of equal widths (4 feet), different thicknesses (7 ½" and 9 ½", as per PSM80 and PSM150 panel variations, respectively), and two different length configurations (8 feet and 12 feet).

According to AC 15, Section 4.2.2.6, three mortar cylinder cores shall be tested within 48 hours of the completion of each set of full-scale tests. This procedure was performed for each set of constructed samples, in addition to 7 and 28 day mortar cores for each batch of mortar mixed. For example, if a set of samples required two applications of sprayed mortar on one side, then six mortar cylinder cores were made for each batch of sprayed mortar (tested at 7 and 28 days for each batch). Accordingly, since these specimens also contained concrete, three concrete cylinder cores were also tested within the 48 hour window (at the same time as the mortar cores). Concrete cylinder cores were tested under the general guidelines of *ASTM C 39, Compressive Strength of Cylindrical Concrete Specimens.*

The mortar cores were made under the general guidelines of *ACI 506.2 – 95, Specification for Shotcrete*. Under the ACI 506.2 code, Section 1.6.1.1, the preparation of the shotcrete mortar cylinder core panels was to be made according to *ASTM C 1140, Preparing and Testing Specimens from Shotcrete Test Panels*. According to ASTM C 1140, Section 5, "…the forms for making shotcrete mortar cores shall be made of wood or steel construction and sufficiently rigid to prevent dislodging of the shotcrete through vibration or deformation." The forms were constructed of 1x6 #1 yellow pine lumber, 2x4 #2 yellow pine lumber, ¾" plywood, and #8 x 1 ½" wood deck screws. The interior dimensions of the forms constructed were **24" wide x 24" long x 3 ½" deep**, as indicated in Section 5 of ASTM C 1140. One form was constructed for

each time a new batch of mortar was made. From each form, a total of approximately 25 cores could be made at one time. Refer to Figure 13 for details.

Figure 13: Wooden form for mortar core sampling

Once the wooden form was made, the mortar was sprayed into the form until it covered the entire 3 ½" depth. The mortar was allowed to settle naturally with no help of any mechanical means (concrete vibrator, mixing rod, etc.). The top of the form was then smoothed out with a trowel (or any other suitable straight smoothing device) and was then moved indoors and allowed to cure for a minimum of 24 hours. Each sprayed form was properly labeled and sealed using plastic sheathing and shrink wrap to maintain the proper moisture. Refer to Figures 14 through 19 for details.

Figures 14 and 15: Application of sprayed mortar into wooden forms

Figures 16 and 17: Smoothing of mortar in wooden form

Figures 18 and 19: Mortar form labeling and sealing with plastic sheathing

After a minimum curing time of 24 hours, the forms were transported to an outside core testing facility and cored for the number of samples indicated. Coring was made using a specialized coring drill with a diamond bit. Once the samples were cored, they were properly labeled, measured, weighed, sulfur capped, and stored in a 100% humidity moisture room until tested.

The concrete cylinders were prepared on site by a qualified field technician from an outside concrete laboratory. Slump and temperature measurements were taken from the concrete as it was delivered by the supplier. 4" x 8" cylinders were made on site for each concrete pour, tested at 7 and 28 days for quality assurance. The standards involved in testing the concrete cylinders include (but are not limited to) *ASTM C 31, C 192, and C 617*.

Refer to Figures 20 through 27 for more details.

Figure 20: Drilling of mortar cores

Figure 21: Mortar cores after drilling

Figures 22 and 23: Labeling, weighing, and sulfur capping of mortar cores

Figures 24 and 25: Cylinder core testing machine and placement of mortar core into apparatus

Figures 26 and 27: 4x8 concrete cylinder setup and failure mode

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

Floor/Roof Flexural Test Results

In total, 12 floor/roof flexural tests were performed. Below is a list of the test parameters:

Wall lengths:	96.0 inches and 144 inches
Wall width:	48.0 inches
Nominal wall thicknesses:	7.5 inches (PSM80) and 9.5 inches (PSM150)
Initial pre-load:	Approx 1130 lbs (stand-by pressure of hydraulic pump)
Support Span (L):	93 inches (8 foot wall) and 141 inches (12 foot wall)
End Bearings:	3.0 inches
Load Bearings:	3.0 inches

The results obtained for the floor/roof flexural tests are tabulated as followed:

Specimen ID	Date Tested	Age of Wall (days)	*Ultimate Load (lbs)	Average (lbs)	Average within 15%?	Allowable Load (lbs)
80_4X8FRF1	11/19/07	50	*10110	9823	YES	9823
80_4X8FRF2	11/19/07	50	*9520			
80_4X8FRF3	11/20/07	51	*9840			
80_4X12FRF1	11/27/07	55	*5730	5593	YES	5593
80_4X12FRF2	11/27/07	55	*5600			
80_4X12FRF3	11/28/07	56	*5450			
150_4X8FRF1	11/20/07	51	*12240	11717	YES	11717
150_4X8FRF2	11/21/07	52	*11890			
150_4X8FRF3	11/21/07	52	*11020			
150_4X12FRF1	11/28/07	56	*7160	6770	YES	6770
150_4X12FRF2	11/28/07	56	*6680			
150_4X12FRF3	11/29/07	57	*6470			

***NOTE:** The loads reported are for the hydraulic cylinder only and **DO NOT** take account for the weight of each specimen. All floor/roof flexural tests were performed in the horizontal position.

The Allowable Load for each set of three samples was calculated under the guidelines of AC 15, Section 4.3, Paragraph 2, which states the following:

"The average maximum strength from each set of tests may be the average ultimate value, provided the ultimate value for each test is within 15 percent of the average. Otherwise, the lowest ultimate value shall be used."

Refer to Appendix A for Load vs. Deflection curves for all floor/roof flexural tests.

Transverse testing was performed according to Section 4.2.2.6 of ICC – AC 15, under the general guidelines of Section 11 of ASTM E 72-05. Each of the targeted deflection loads (L/360, L/240, L/180, L/120) were calculated by dividing the support span (L) by each load increment. The mid-span mean for each specimen was calculated by subtracting the average of the outer four dials from the lateral (middle) dials:

Mid-Span Mean = Average Lateral (Middle) Dials – Average Outer Dials

The Stiffness (EI) for each specimen was calculated from the maximum deflection equation of a simply-supported beam under third-point loading conditions. The maximum deflection used in the calculation was the maximum deflection recorded at the last target load obtained.

Stiffness EI = [23 * P * (L^3)] / (648 * Max Deflection)

Statistical analysis calculations were computed using the linear regression analysis method included in Microsoft Excel® (command “LINEST”).

A CD copy of all the assembly, setup, and test photos will be provided to the client.

6 Conclusion

Intertek Testing Services NA, Inc. (Intertek) has conducted testing for Emmedue S.P.A on 4' x 8' and 4' x 12' Single Polystyrene PSM80 and PSM150 structural wall panels. The test method consisted of the transverse-flexural load under third-point loading. The purpose of these tests was to evaluate flexural load structural applications according to Section 4.2.2.6 of ICC – AC 15, under the general guidelines of *ASTM E 72 - 05, Conducting Strength Tests of Panels for Building Construction*. The results of each test were presented in tabular and graphical form. In total, 12 specimens were tested under the above loading configuration to measure the deflection and failure characteristics of each of the wall systems. This evaluation began November 19, 2007 and was completed November 29, 2007.

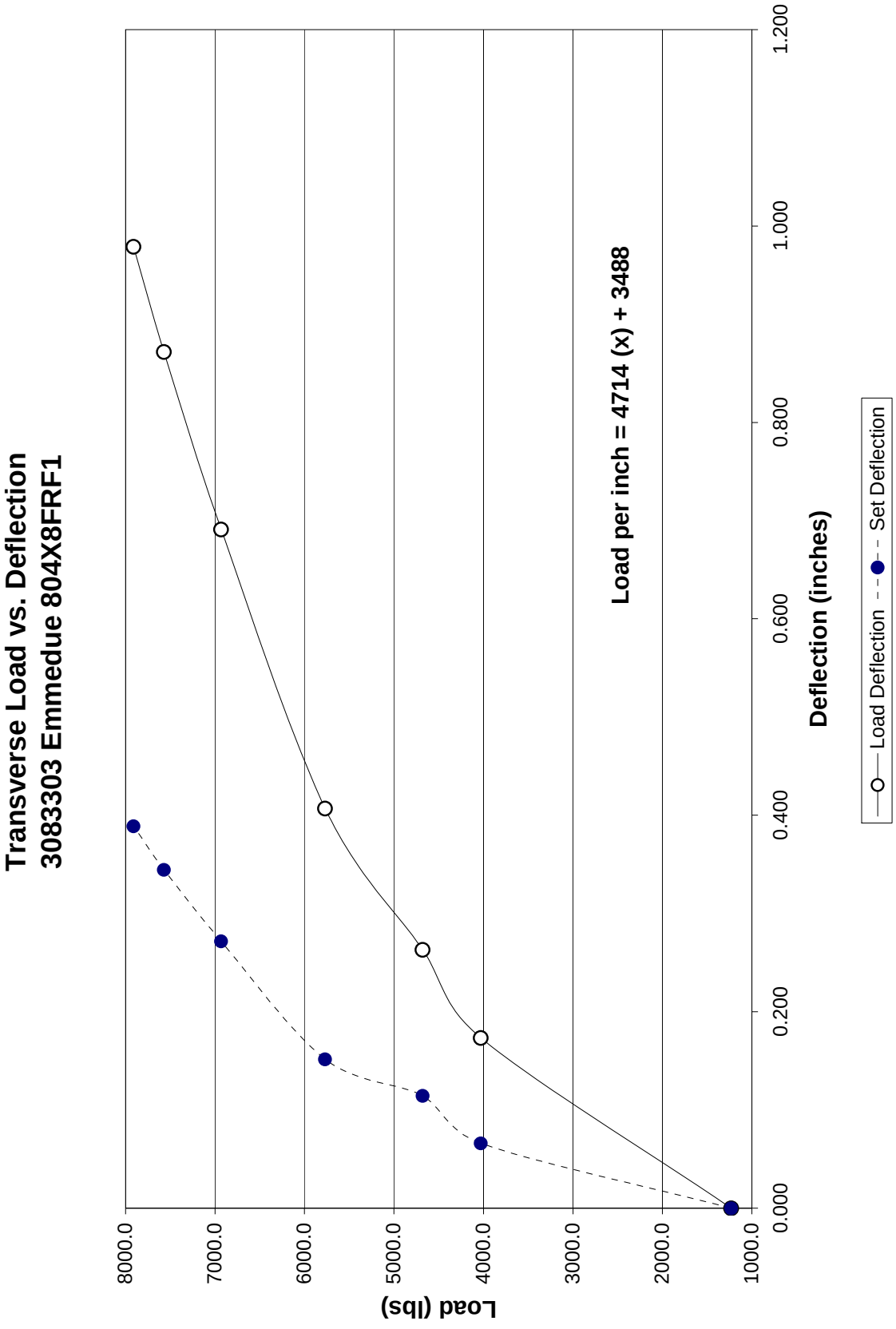
The conclusions of this test report may be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

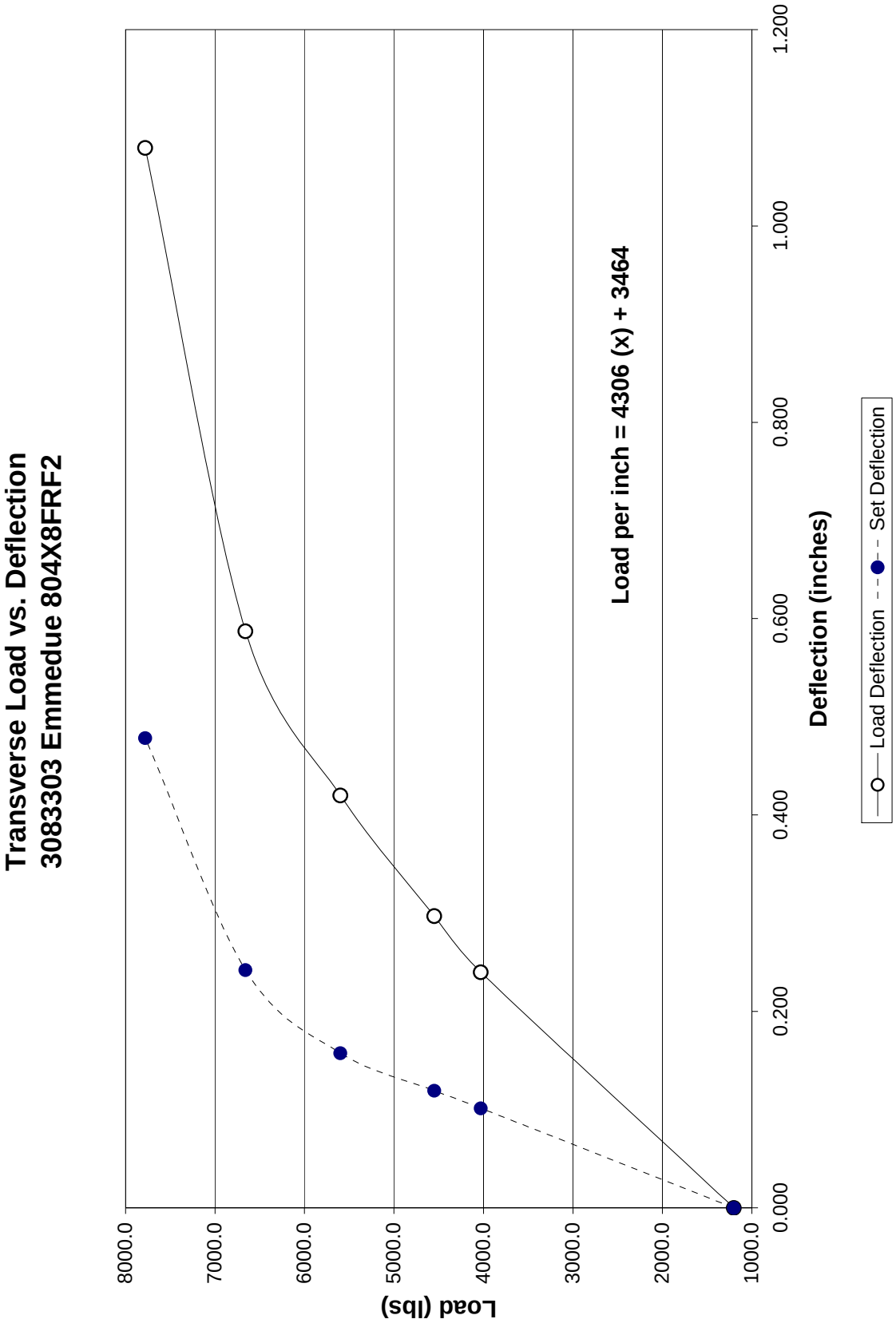
INTERTEK TESTING SERVICES NA, INC

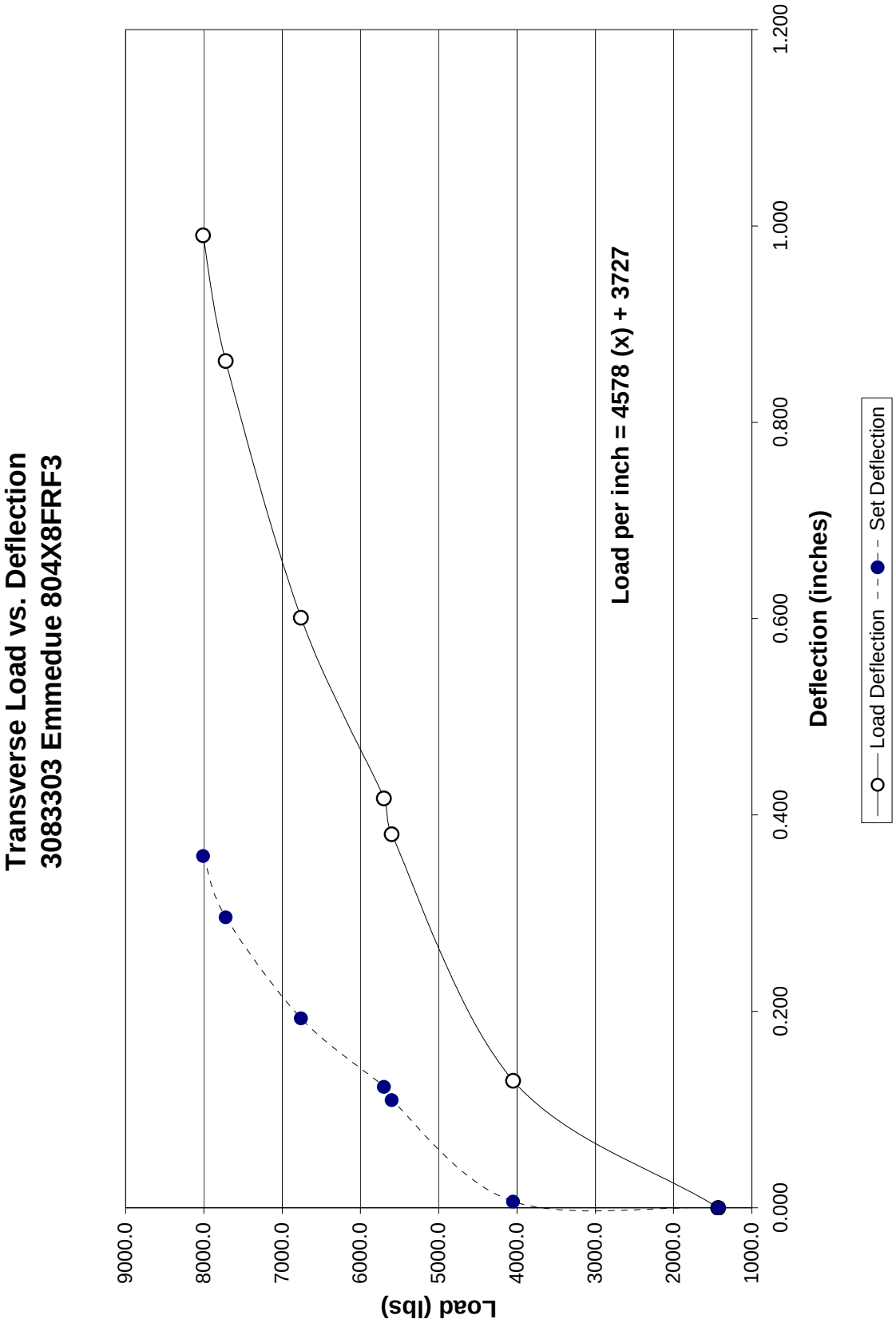
Reported by: _____
Victor M. Burgos
Test Engineer

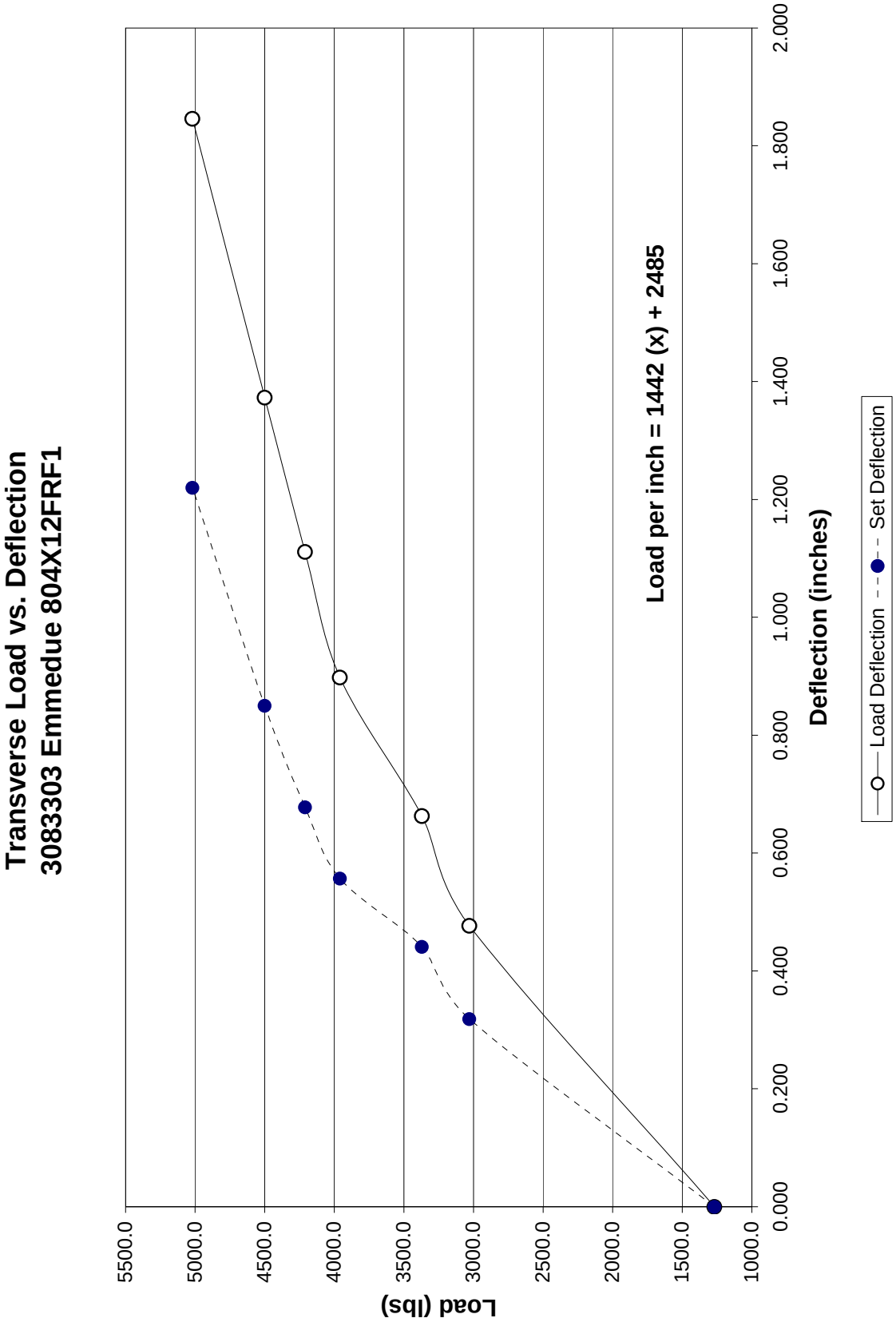
Reviewed by: _____
Michael E. Luna, M.S.
General Manager

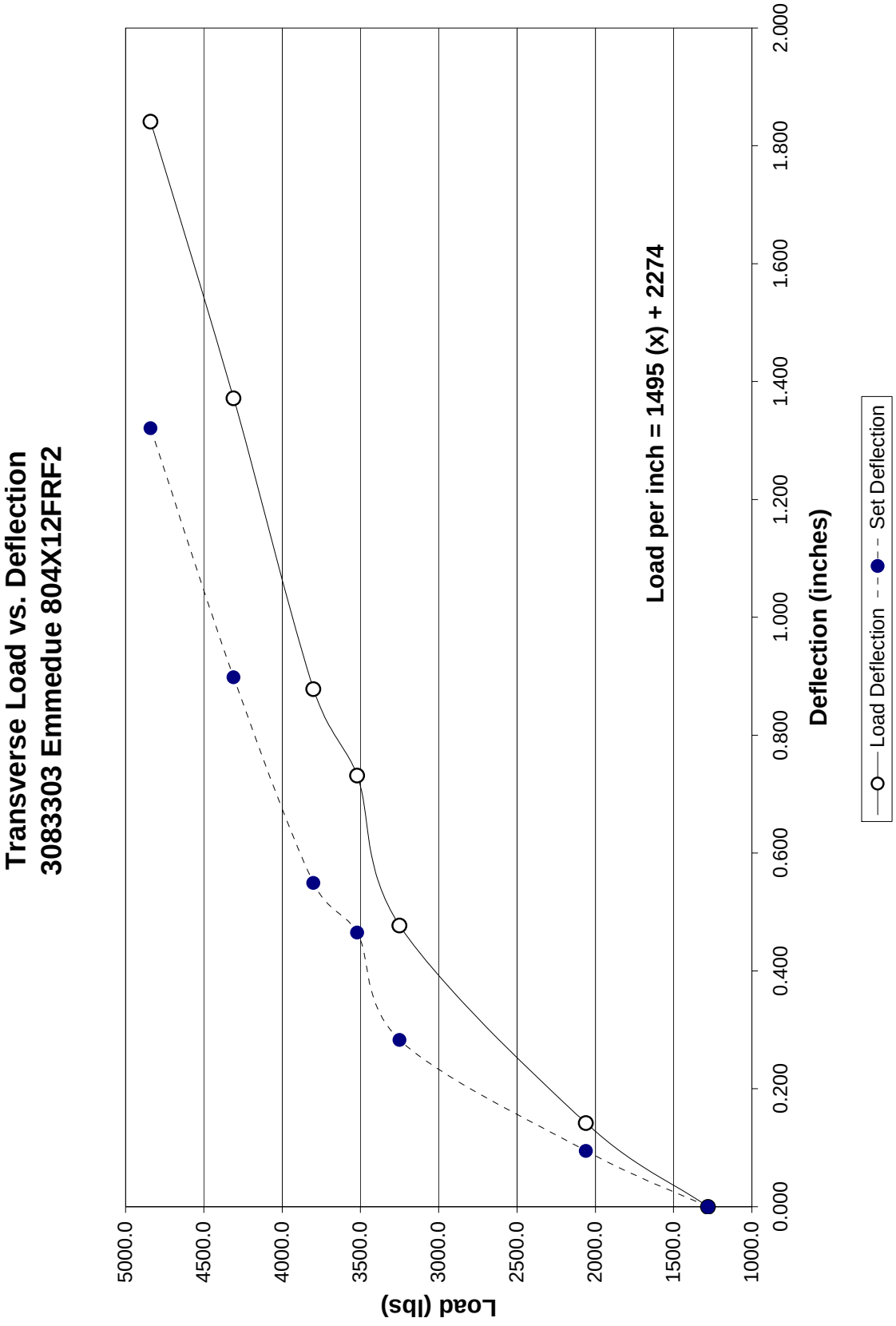
APPENDIX A
Graphs

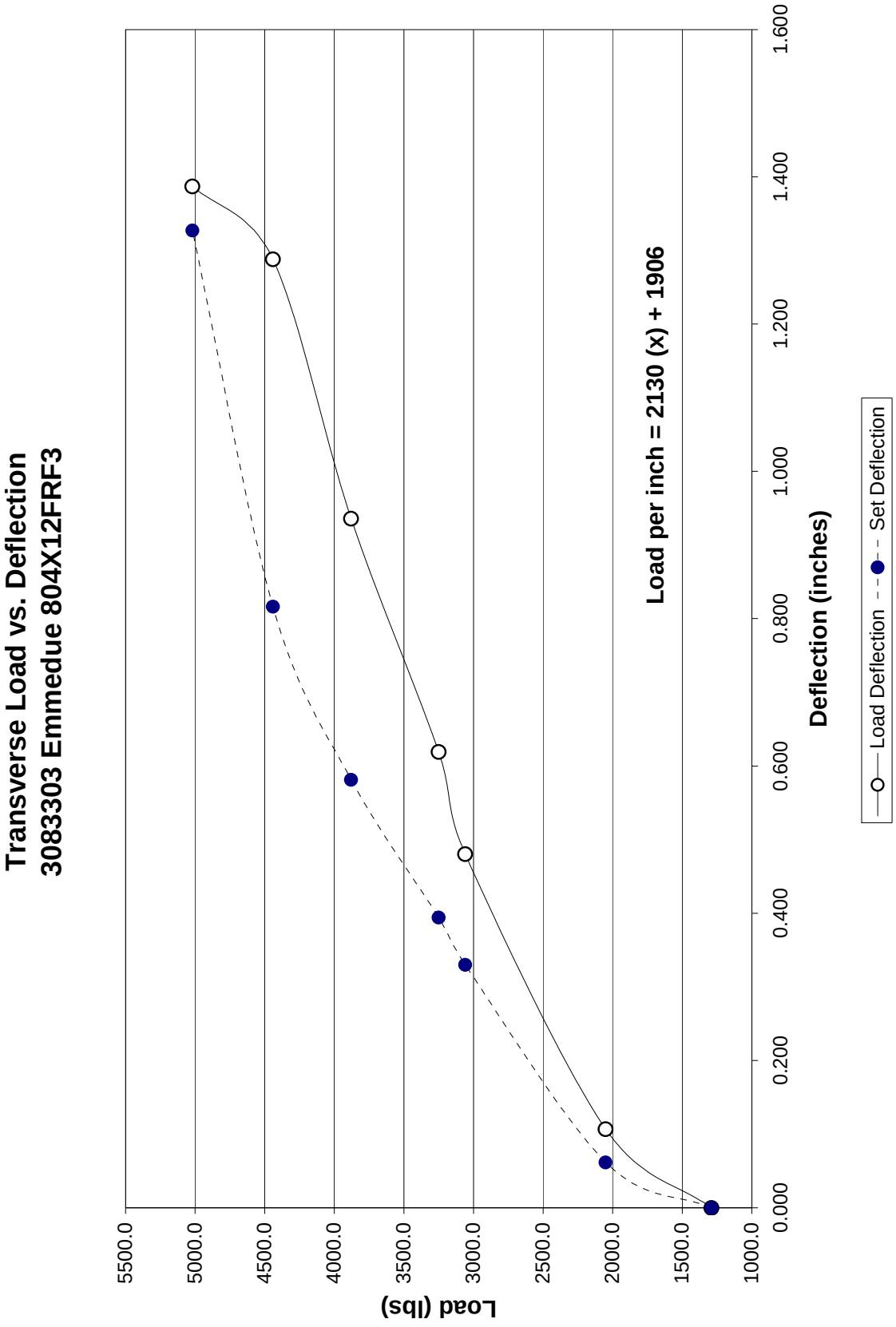

Transverse Load vs. Deflection
3083303 Emmedue 804X8FRF1
Load per inch = 4714 (x) + 3488
Load (lbs)
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
Deflection (inches)
Load Deflection
Set Deflection

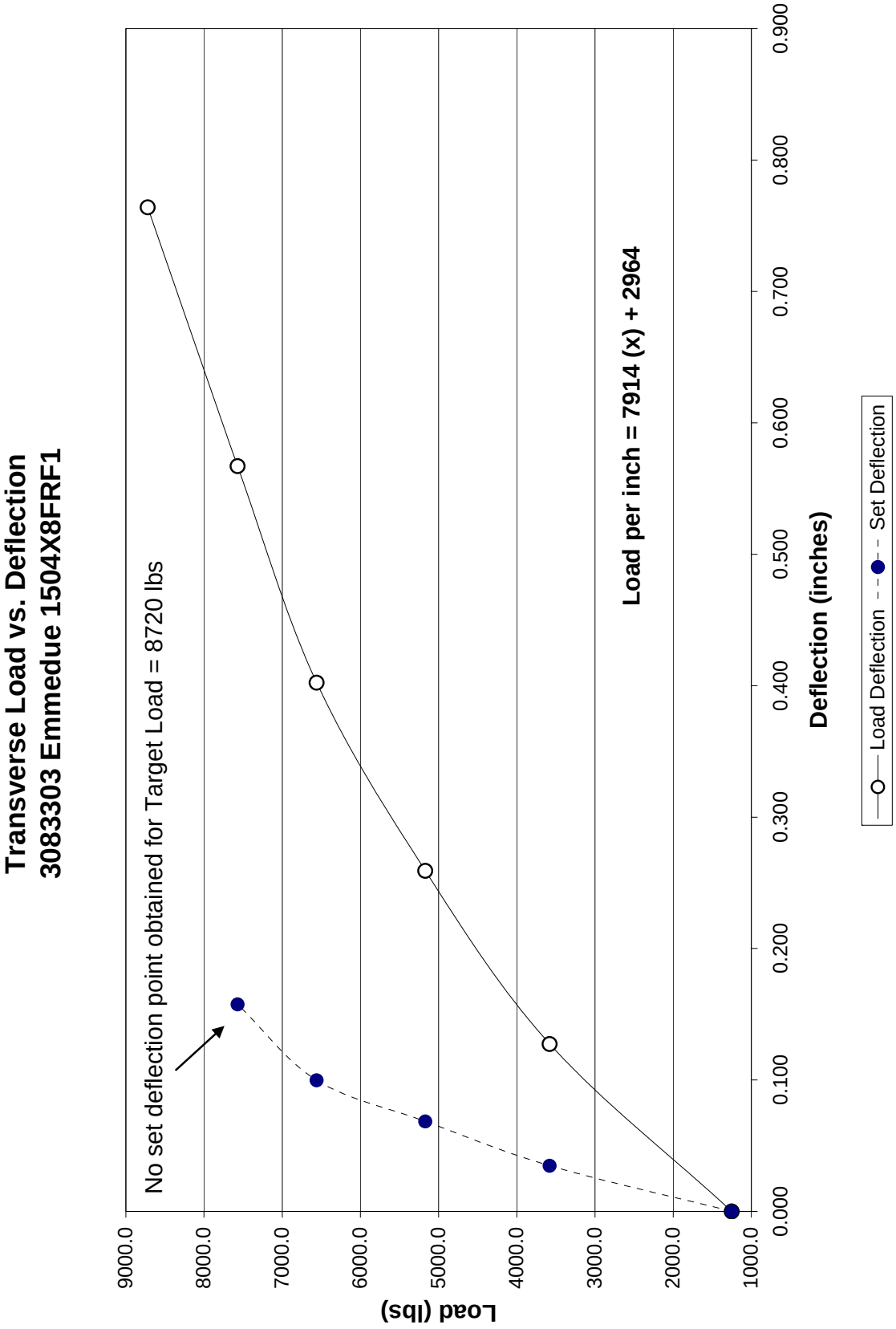

Transverse Load vs. Deflection
3083303 Emmedue 804X8FRF2
Load per inch = 4306 (x) + 3464
Load (lbs)
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
Deflection (inches)
Load Deflection
Set Deflection

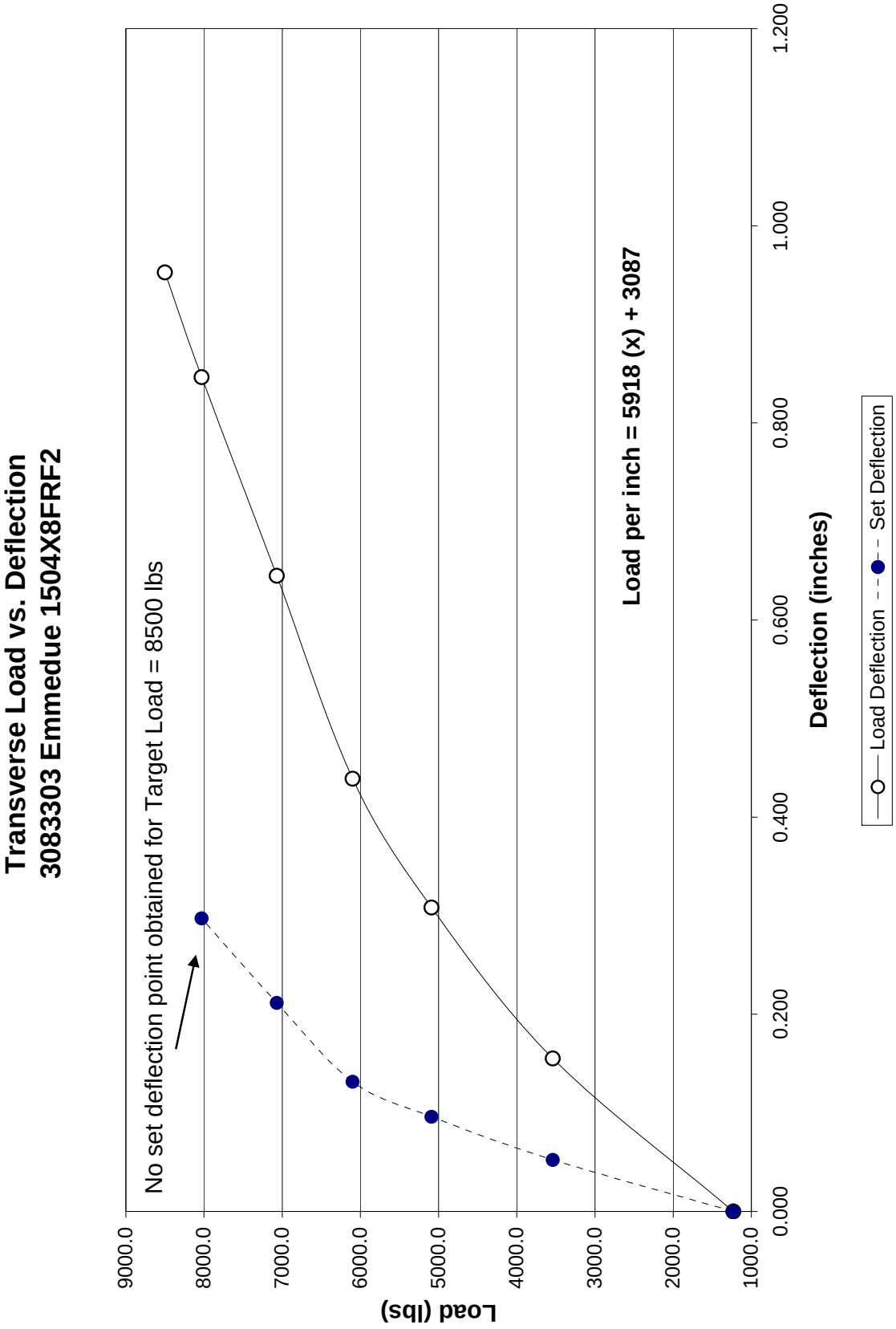

Transverse Load vs. Deflection
3083303 Emmedue 804X8FRF3
Load per inch = 4578 (x) + 3727
Load (lbs)
9000.0
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
Deflection (inches)
Load Deflection
Set Deflection

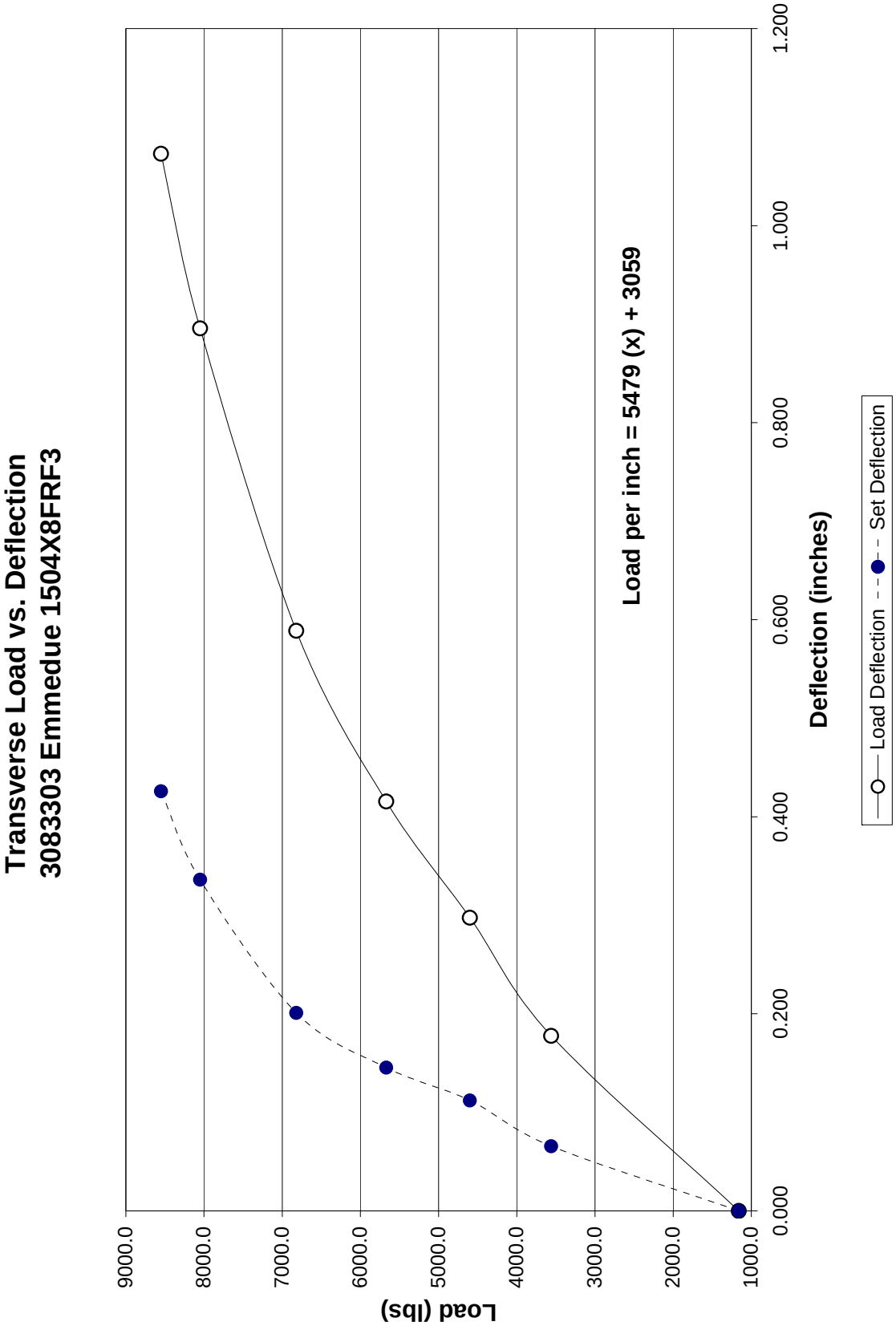

Transverse Load vs. Deflection
3083303 Emmedue 804X12FRF1
Load per inch = 1442 (x) + 2485
Load (lbs)
5500.0
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
Deflection (inches)
Load Deflection
Set Deflection

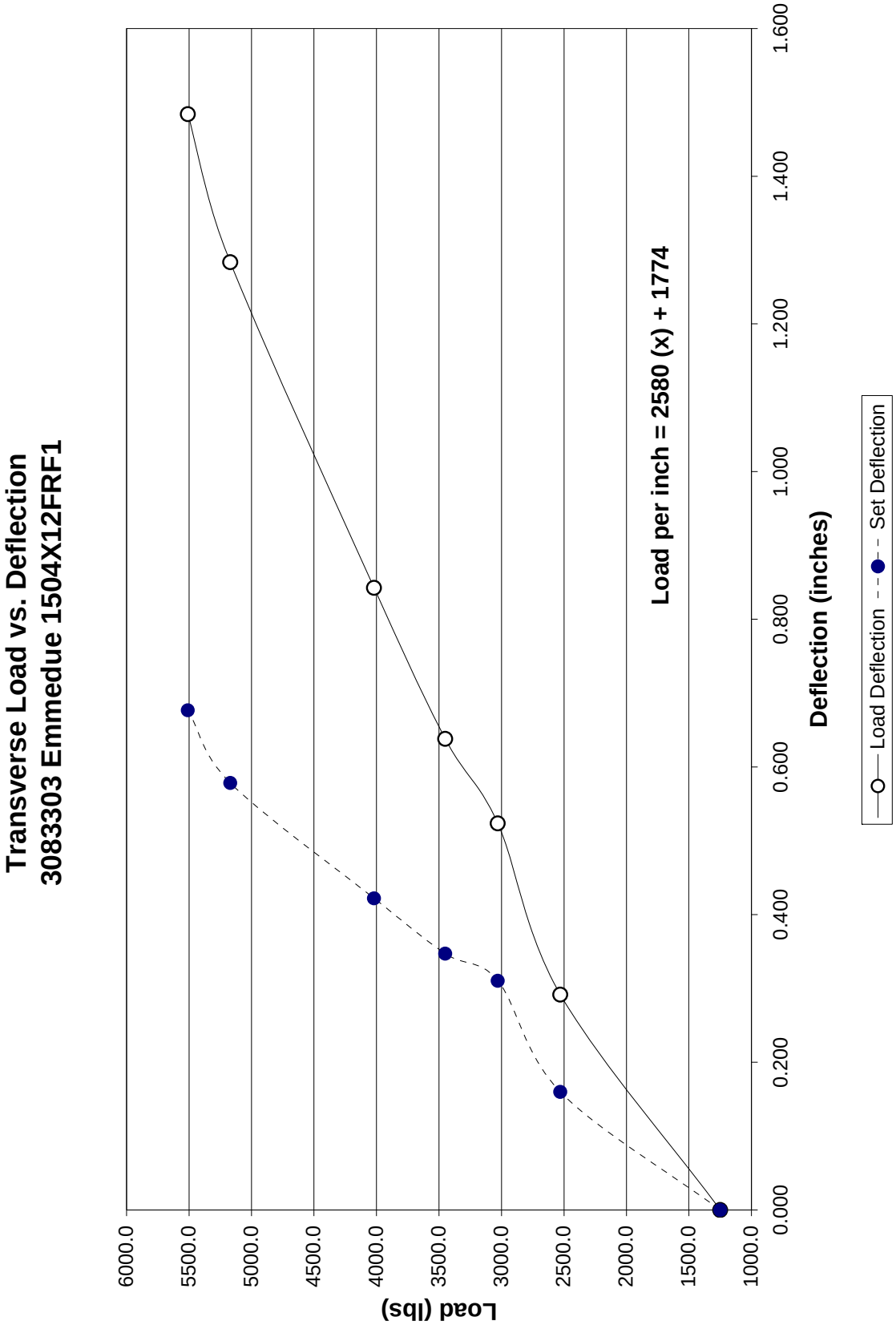

Transverse Load vs. Deflection
3083303 Emmedue 804X12FRF2
Load per inch = 1495 (x) + 2274
Load (lbs)
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
Deflection (inches)
Load Deflection
Set Deflection

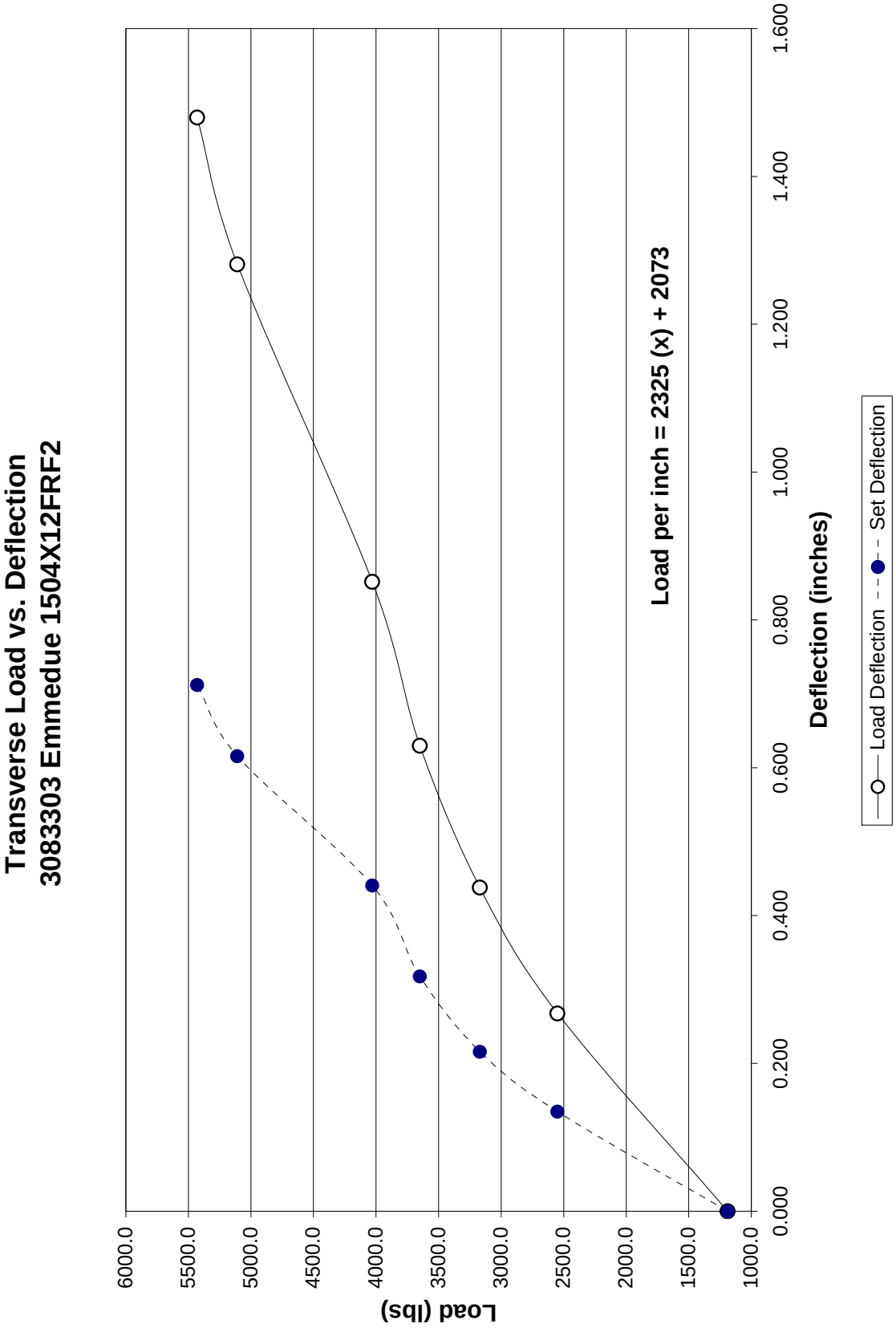

Transverse Load vs. Deflection
3083303 Emmedue 804X12FRF3
Load per inch = 2130 (x) + 1906
Load (lbs)
5500.0
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
Deflection (inches)
Load Deflection
Set Deflection

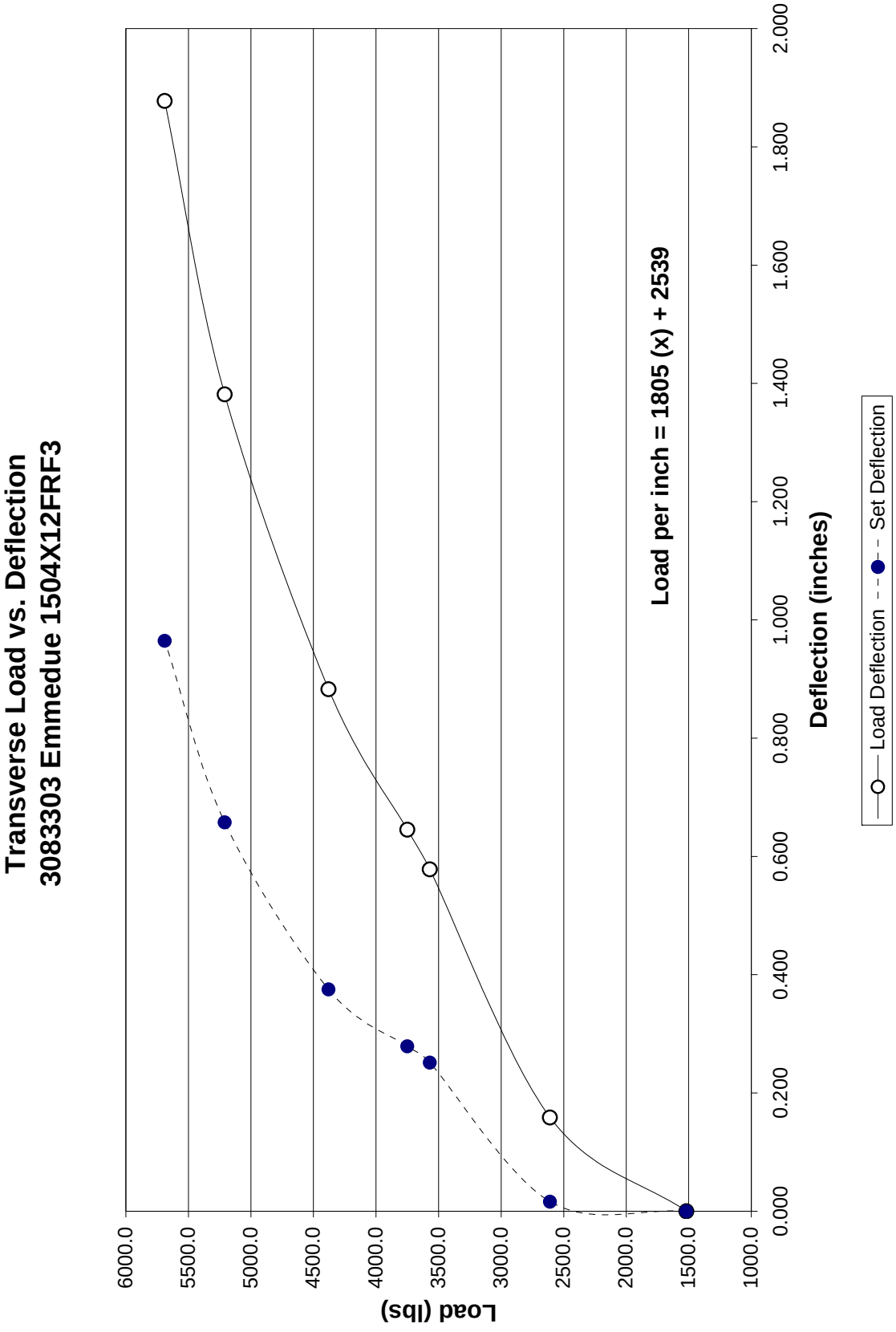

Transverse Load vs. Deflection
3083303 Emmedue 1504X8FRF1
No set deflection point obtained for Target Load = 8720 lbs
Load per inch = 7914 (x) + 2964
Load (lbs)
9000.0
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
0.900
Deflection (inches)
Load Deflection
Set Deflection


Transverse Load vs. Deflection
3083303 Emmedue 1504X8FRF2
No set deflection point obtained for Target Load = 8500 lbs
Load per inch = 5918 (x) + 3087
Load (lbs)
9000.0
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
Deflection (inches)
Load Deflection
Set Deflection


Transverse Load vs. Deflection
3083303 Emmedue 1504X8FRF3
Load per inch = 5479 (x) + 3059
Load (lbs)
9000.0
8000.0
7000.0
6000.0
5000.0
4000.0
3000.0
2000.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
Deflection (inches)
Load Deflection
Set Deflection


Transverse Load vs. Deflection
3083303 Emmedue 1504X12FRF1
Load per inch = 2580 (x) + 1774
Load (lbs)
6000.0
5500.0
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
Deflection (inches)
Load Deflection
Set Deflection


Transverse Load vs. Deflection
3083303 Emmedue 1504X12FRF2
Load per inch = 2325 (x) + 2073
Load (lbs)
6000.0
5500.0
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
Deflection (inches)
Load Deflection
Set Deflection


Transverse Load vs. Deflection
3083303 Emmedue 1504X12FRF3
Load (lbs)
6000.0
5500.0
5000.0
4500.0
4000.0
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600
1.800
2.000
Deflection (inches)
Load per inch = 1805 (x) + 2539
Load Deflection
Set Deflection

APPENDIX B
Test Data

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/19/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X8FRF1**
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1230
Age of Wall: 50 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1230	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
4030	immed.	0.005	0.007	0.001	0.002	0.148	0.141	**0.141**
4030	~5min	0.005	0.008	0.001	0.002	0.182	0.172	**0.173**
1420	immed.	0.002	0.006	0.000	0.001	0.073	0.070	**0.069**
1410	~5min	0.003	0.006	0.001	0.001	0.070	0.068	**0.066**
4700	immed.	0.005	0.010	0.000	0.002	0.266	0.252	**0.255**
4680	~5min	0.004	0.010	0.000	0.002	0.274	0.260	**0.263**
1410	immed.	0.002	0.009	0.000	0.001	0.125	0.118	**0.119**
1390	~5min	0.002	0.008	0.000	0.000	0.120	0.114	**0.114**
5780	immed.	0.005	0.012	0.000	0.003	0.402	0.386	**0.389**
5770	~5min	0.005	0.012	0.000	0.003	0.420	0.404	**0.407**
1430	immed.	0.002	0.008	0.000	0.001	0.168	0.160	**0.161**
1410	~5min	0.003	0.009	0.000	0.002	0.159	0.151	**0.152**
6930	immed.	0.006	0.013	-0.004	0.005	0.664	0.650	**0.652**
6930	~5min	0.006	0.014	-0.004	0.004	0.708	0.684	**0.691**
1460	immed.	0.004	0.010	-0.004	0.004	0.305	0.288	**0.293**
1410	~5min	0.004	0.011	-0.003	0.004	0.284	0.268	**0.272**
7590	immed.	0.005	0.015	-0.005	0.007	0.848	0.814	**0.826**
7570	~5min	0.005	0.016	-0.005	0.007	0.896	0.859	**0.872**
1440	immed.	0.004	0.014	-0.004	0.004	0.380	0.360	**0.366**
1400	~5min	0.004	0.014	-0.004	0.004	0.359	0.339	**0.345**
7930	immed.	0.006	0.018	-0.008	0.006	0.960	0.920	**0.935**
7910	~5min	0.005	0.018	-0.010	0.006	1.004	0.963	**0.979**
1470	immed.	0.004	0.016	-0.004	0.004	0.435	0.412	**0.419**
1410	~5min	0.004	0.016	-0.005	0.004	0.405	0.382	**0.389**

ULTIMATE FAILURE DATA		
8160	Hold 2 min	Some popping heard, no visible damage
8560	Hold 2 min	No change, no visible damage
9120	Hold 2 min	No change, no visible damage
9730	Hold 2 min	Cracking and popping heard between 15 and 20 seconds into load, no visible damage
10110	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 35 seconds into holding load Complete horizontal shear failure approximately 41 inches from left bearing end (concrete, mortar, wire mesh) Horizontal failure is categorized as the length of the panel width (4 ft) Cracks visible from RHS bearing end up to 30" on mortar underneath wall No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 4030 lbs, some popping heard approx 2.5 minutes into load, no visible damage present
*At Load = 6930 lbs, some cracking and popping heard while taking wall to this load. Crack formation on mortar (lower side) at right end bearing location (photos taken). No additional visible damage present
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions
*Ruben Caputo, Emmedue consultant, present during testing

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1230.0	4920.0	0.000	0.0000	0.000
4030.0	16120.0	0.173	0.0144	0.066
4680.0	18720.0	0.263	0.0219	0.114
5770.0	23080.0	0.407	0.0339	0.152
6930.0	27720.0	0.691	0.0576	0.272
7570.0	30280.0	0.872	0.0727	0.345
7910.0	31640.0	0.979	0.0816	0.389

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

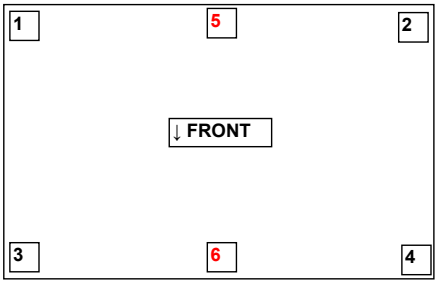
Stiffness (Flexural Rigidity) EI (lbs-ft^2]	**954607**
Max Load (lbs)	**10110**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X8FRF1
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	7.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	7141.52
L/ 180	5923.80
L/ 240	5314.94
L/ 360	4706.08



Linear Regression Analysis

4713.76477	3488.35588
357.424824	228.933238
0.97751884	265.288039
173.926753	4
12240572.4	281510.974

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 4713.76 + 3488.36

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/19/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X8FRF2**
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1200
Age of Wall: 50 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1200	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
3960	immed.	-0.002	0.015	0.012	0.010	0.221	0.227	**0.215**
4030	~5min	-0.002	0.016	0.012	0.011	0.246	0.252	**0.240**
1350	immed.	-0.002	0.010	0.008	0.005	0.110	0.112	**0.106**
1340	~5min	-0.001	0.010	0.008	0.006	0.106	0.108	**0.102**
4540	immed.	-0.002	0.013	0.010	0.010	0.290	0.296	**0.285**
4550	~5min	-0.002	0.014	0.011	0.010	0.302	0.308	**0.297**
1360	immed.	-0.002	0.010	0.008	0.006	0.129	0.131	**0.124**
1340	~5min	-0.002	0.010	0.008	0.006	0.124	0.126	**0.119**
5620	immed.	-0.002	0.018	0.014	0.012	0.410	0.416	**0.402**
5600	~5min	-0.002	0.018	0.014	0.013	0.429	0.433	**0.420**
1400	immed.	-0.002	0.010	0.010	0.008	0.175	0.176	**0.169**
1360	~5min	-0.002	0.011	0.010	0.007	0.163	0.165	**0.158**
6660	immed.	-0.002	0.024	0.016	0.017	0.543	0.548	**0.532**
6660	~5min	-0.004	0.026	0.020	0.022	0.605	0.601	**0.587**
1420	immed.	-0.003	0.014	0.010	0.004	0.268	0.264	**0.260**
1380	~5min	-0.003	0.014	0.010	0.005	0.250	0.247	**0.242**
7780	immed.	-0.004	0.031	0.024	0.022	0.949	0.915	**0.914**
7780	~5min	-0.005	0.029	0.026	0.020	1.113	1.081	**1.080**
1470	immed.	-0.005	0.016	0.012	0.003	0.538	0.502	**0.514**
1380	~5min	-0.004	0.016	0.011	0.002	0.502	0.468	**0.479**

ULTIMATE FAILURE DATA		
8120	Hold 2 min	Some cracking and popping heard, no visible damage
8610	Hold 2 min	No change, no visible damage
9100	Hold 2 min	No change, no visible damage
9520	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 10 seconds into holding load Complete horizontal shear failure approximately 38 inches from left bearing end (concrete, mortar, wire mesh) Horizontal failure is categorized as the length of the panel width (4 ft) Cracks visible from LHS bearing end between 30" and 48" on mortar underneath wall No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3960 lbs, some popping heard approx, no visible damage present
*At Load = 6660 lbs, popping heard approx. 1:20 into load, surface crack on bottom left mortar side (photos)
*At Load = 7780 lbs, additional cracking and popping heard. Wall continuing to deflect passing L/100
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions
*Ruben Caputo, Emmedue consultant, present during testing

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1200.0	4800.0	0.000	0.0000	0.000
4030.0	16120.0	0.240	0.0200	0.102
4550.0	18200.0	0.297	0.0248	0.119
5600.0	22400.0	0.420	0.0350	0.158
6660.0	26640.0	0.587	0.0489	0.242
7780.0	31120.0	1.080	0.0900	0.479

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

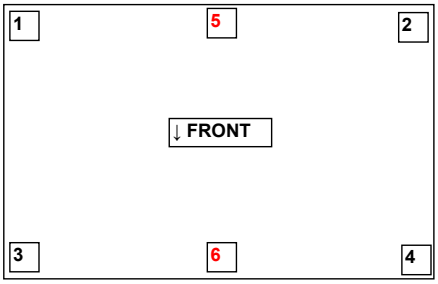
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**790809**
Max Load (lbs)	**9520**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X8FRF2
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	7.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	6801.24
L/ 180	5688.80
L/ 240	5132.59
L/ 360	4576.37



Linear Regression Analysis

4306.21023	3463.92862
820.37588	496.689984
0.90180911	553.686706
27.5527335	3
8446813.09	919706.907

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 4306.21 + 3463.93

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/20/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X8FRF3**
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1430
Age of Wall: 51 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	**Time**	**Trans 1 (in.)**	**Trans 2 (in.)**	**Trans 3 (in.)**	**Trans 4 (in.)**	**Trans 5 (in.)**	**Trans 6 (in.)**	**Midspan Mean (in.)**
1430	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
4060	immed.	0.018	0.000	0.000	0.020	0.130	0.138	**0.125**
4050	~5min	0.018	0.001	0.000	0.020	0.136	0.143	**0.129**
1440	immed.	0.002	0.000	0.000	0.003	0.009	0.010	**0.009**
1440	~5min	0.002	0.000	0.000	0.002	0.007	0.008	**0.006**
5610	immed.	0.026	-0.001	0.002	0.026	0.350	0.357	**0.340**
5600	~5min	0.028	-0.001	0.002	0.026	0.393	0.396	**0.381**
1440	immed.	0.010	-0.002	-0.003	0.019	0.118	0.128	**0.117**
1430	~5min	0.009	-0.001	-0.003	0.019	0.111	0.120	**0.110**
5720	immed.	0.026	-0.001	-0.002	0.020	0.412	0.416	**0.403**
5700	~5min	0.026	-0.002	-0.002	0.020	0.424	0.431	**0.417**
1460	immed.	0.011	-0.001	-0.005	0.019	0.130	0.145	**0.131**
1440	~5min	0.011	-0.001	-0.005	0.019	0.122	0.137	**0.123**
6720	immed.	0.030	-0.002	-0.001	0.021	0.555	0.564	**0.547**
6760	~5min	0.032	-0.002	0.000	0.023	0.608	0.620	**0.601**
1520	immed.	0.017	-0.004	-0.008	0.023	0.210	0.231	**0.213**
1440	~5min	0.016	-0.004	-0.008	0.024	0.189	0.211	**0.193**
7730	immed.	0.030	-0.010	-0.006	0.024	0.807	0.820	**0.804**
7720	~5min	0.030	-0.010	-0.007	0.023	0.868	0.875	**0.863**
1480	immed.	0.018	-0.013	-0.012	0.024	0.310	0.328	**0.315**
1440	~5min	0.018	-0.013	-0.013	0.024	0.291	0.309	**0.296**
8010	immed.	0.023	-0.013	-0.008	0.024	0.968	0.946	**0.950**
8010	~5min	0.023	-0.012	-0.006	0.024	1.010	0.985	**0.991**
1510	immed.	0.014	-0.013	-0.010	0.024	0.394	0.380	**0.383**
1440	~5min	0.013	-0.014	-0.012	0.024	0.368	0.355	**0.358**

ULTIMATE FAILURE DATA		
8590	Hold 2 min	Some popping heard, no visible damage
9140	Hold 2 min	No change, no visible damage
9600	Hold 2 min	No change, no visible damage
9840	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 5 seconds into holding load Complete horizontal shear failure approximately 43 inches from left bearing end (concrete, mortar, wire mesh) Horizontal failure is categorized as the length of the panel width (4 ft) Cracks visible from LHS bearing end between 30" and 52" on mortar underneath wall No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 5600 lbs, some popping and cracking heard, wall settling at this load (deflections more apparent)
*At Load = 6760 lbs, some cracking and popping heard approx. 20 seconds into load, second pop at 1:15
No visible damage present
*At Load = 8010 lbs, pop heard. Two cracks visible at lower midspan, approx 8" apart (photos taken)
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions
*Ruben Caputo, Emmedue consultant, present during testing

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1430.0	5720.0	0.000	0.0000	0.000
4050.0	16200.0	0.129	0.0108	0.006
5600.0	22400.0	0.381	0.0317	0.110
5700.0	22800.0	0.417	0.0348	0.123
6760.0	27040.0	0.601	0.0501	0.193
7720.0	30880.0	0.863	0.0719	0.296
8010.0	32040.0	0.991	0.0825	0.358

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

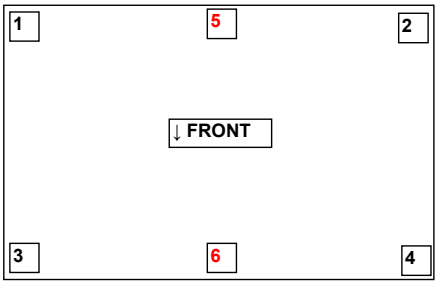
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**916400**
Max Load (lbs)	**9840**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X8FRF3
Product: Single Polystyrene PSM80 4' x 8' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	7.500

Deflection Limit (L/x)	Load (lbs-in)
L/ 120	7274.89
L/ 180	6092.18
L/ 240	5500.82
L/ 360	4909.46



Linear Regression Analysis

4578.26	3726.74085
339.459367	215.66647
0.9784827	243.964449
181.896906	4
10826258.7	238074.61

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 4578.26 + 3726.74

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/27/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X12FRF1**
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1270
Age of Wall: 55 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1270	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2930	immed.	0.005	0.002	0.000	0.012	0.306	0.292	**0.294**
3030	~5min	0.008	0.003	0.000	0.016	0.494	0.473	**0.477**
1570	immed.	0.006	0.001	0.000	0.014	0.332	0.320	**0.321**
1570	~5min	0.005	0.002	0.000	0.014	0.330	0.318	**0.319**
3340	immed.	0.008	0.003	-0.002	0.018	0.597	0.577	**0.580**
3370	~5min	0.009	-0.002	-0.002	0.020	0.680	0.659	**0.663**
1580	immed.	0.008	-0.005	-0.002	0.017	0.459	0.446	**0.448**
1570	~5min	0.008	-0.005	-0.002	0.017	0.452	0.439	**0.441**
3870	immed.	0.010	-0.001	-0.001	0.022	0.843	0.821	**0.824**
3960	~5min	0.010	-0.001	-0.002	0.024	0.918	0.893	**0.898**
1660	immed.	0.008	-0.004	-0.002	0.020	0.595	0.579	**0.581**
1570	~5min	0.008	-0.005	-0.002	0.020	0.570	0.555	**0.557**
4140	immed.	0.010	-0.002	-0.001	0.025	0.988	0.961	**0.967**
4210	~5min	0.011	0.000	-0.001	0.027	1.135	1.106	**1.111**
1630	immed.	0.009	-0.005	-0.001	0.022	0.709	0.698	**0.697**
1570	~5min	0.010	-0.006	-0.002	0.022	0.690	0.679	**0.678**
4530	immed.	0.012	-0.003	-0.002	0.028	1.264	1.233	**1.240**
4500	~5min	0.012	-0.004	-0.002	0.028	1.400	1.364	**1.373**
1640	immed.	0.013	-0.006	-0.002	0.025	0.888	0.868	**0.870**
1580	~5min	0.013	-0.006	-0.002	0.025	0.866	0.848	**0.850**
4880	immed.	0.014	-0.003	-0.003	0.030	1.600	1.559	**1.570**
5020	~5min	0.015	-0.004	-0.012	0.032	1.857	1.851	**1.846**
1650	immed.	0.012	-0.008	-0.014	0.027	1.256	1.237	**1.242**
1590	~5min	0.013	-0.008	-0.013	0.026	1.234	1.216	**1.220**

ULTIMATE FAILURE DATA

5450 0	Hold 2 min	Popping heard, wall inspected, no visual damage 0

5730	**Panel Failure** Wall no longer able to hold load. Failure occurred approx 10 - 15 seconds into holding load Complete horizontal shear failure approximately 63 inches from right bearing end (concrete, mortar, wire mesh) Horizontal shear failure is described as the complete break along the panel 4 ft width Wall failed suddenly at target load (no slow deflection until failure) No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3030 lbs, several pops heard while taking wall to this load, no visible damage present
*At Load = 3370 lbs, two pops heard while taking wall to this load, no visible damage
*At Load = 3960 lbs, load had to be slightly adjusted. Load stabalized after 1 minute
*At Load = 4210 lbs, additional popping heard approx 1.5 minutes into load, no visual damage
*At Load = 4500 lbs, Transducer 4 showing more deflection than others, no visual damage present at location
*At Load = 5020 lbs, pops heard approx 30 seconds into load, no visual damage
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1270.0	5080.0	0.000	0.0000	0.000
3030.0	12120.0	0.477	0.0397	0.319
3370.0	13480.0	0.663	0.0553	0.441
3960.0	15840.0	0.898	0.0748	0.557
4210.0	16840.0	1.111	0.0926	0.678
4500.0	18000.0	1.373	0.1144	0.850
5020.0	20080.0	1.846	0.1539	1.220

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

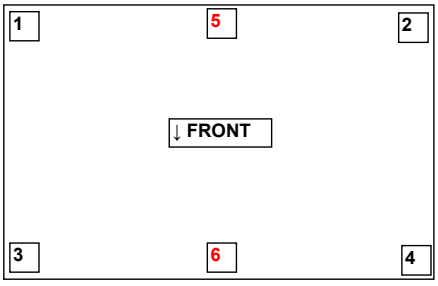
Stiffness (Flexural Rigidity) EI (lbs-ft^2]	**539544**
Max Load (lbs)	**5730**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X12FRF1
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	7.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	4178.70
L/ 180	3614.05
L/ 240	3331.73
L/ 360	3049.41



Linear Regression Analysis

1441.64346	2484.76755
134.682565	155.543172
0.96626631	150.12909
114.575819	4
2582395.03	90154.9749

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 1441.64 + 2484.77

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/27/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X12FRF2**
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1280
Age of Wall: 55 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1280	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2050	immed.	0.002	0.000	-0.001	0.006	0.099	0.097	**0.096**
2060	~5min	0.002	0.000	-0.001	0.009	0.150	0.140	**0.142**
1510	immed.	0.003	0.000	-0.001	0.010	0.108	0.096	**0.099**
1450	~5min	0.002	0.000	-0.001	0.009	0.103	0.092	**0.095**
3220	immed.	0.003	-0.001	-0.001	0.014	0.424	0.397	**0.407**
3250	~5min	0.004	-0.001	0.000	0.016	0.496	0.467	**0.477**
1570	immed.	0.004	-0.002	-0.001	0.016	0.310	0.292	**0.297**
1510	~5min	0.004	-0.002	0.000	0.016	0.297	0.278	**0.283**
3590	immed.	0.008	-0.008	-0.002	0.018	0.695	0.676	**0.682**
3520	~5min	0.008	-0.009	-0.002	0.018	0.743	0.728	**0.732**
1590	immed.	0.008	-0.008	-0.002	0.018	0.492	0.482	**0.483**
1520	~5min	0.008	-0.009	-0.002	0.018	0.474	0.464	**0.465**
3800	immed.	0.008	-0.008	-0.002	0.020	0.817	0.802	**0.805**
3800	~5min	0.008	-0.011	-0.002	0.020	0.893	0.872	**0.878**
1570	immed.	0.009	-0.012	-0.004	0.020	0.577	0.561	**0.566**
1510	~5min	0.009	-0.012	-0.004	0.020	0.561	0.545	**0.550**
4360	immed.	0.011	-0.019	-0.007	0.020	1.271	1.243	**1.256**
4310	~5min	0.012	-0.022	-0.010	0.020	1.388	1.356	**1.372**
1660	immed.	0.012	-0.022	-0.015	0.020	0.949	0.928	**0.940**
1520	~5min	0.012	-0.022	-0.016	0.020	0.906	0.888	**0.899**
4790	immed.	0.010	-0.026	-0.014	0.020	1.808	1.654	**1.734**
4840	~5min	0.005	-0.028	-0.014	0.019	2.004	1.670	**1.841**
1660	immed.	0.006	-0.021	-0.017	0.020	1.378	1.338	**1.361**
1530	~5min	0.006	-0.021	-0.017	0.020	1.338	1.299	**1.321**

ULTIMATE FAILURE DATA		
5040	Hold 2 min	No cracks or pops, no visible damage
0		0
5600	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 38 seconds into holding load Complete horizontal shear failure approximately 82 inches from right bearing end (concrete, mortar, wire mesh) Horizontal shear failure is described as the complete break along the panel 4 ft width Wall failed suddenly at target load (no slow deflection until failure) No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3520 lbs, one loud pop heard, wall settled. Transducers 5 & 6 showed significant movement at approximately 1:20 into load. No visible damage present
*At Load = 4310 lbs, additional pop heard. Crack formation on lower RHS mortar, approx 55" - 58" from the right end. Photos taken. The crack was found the be larger underneath wall at Transducer 5 location
*At Load = 4840 lbs, one loud pop heard, no visual damage
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1280.0	5120.0	0.000	0.0000	0.000
2060.0	8240.0	0.142	0.0119	0.095
3250.0	13000.0	0.477	0.0398	0.283
3520.0	14080.0	0.732	0.0610	0.465
3800.0	15200.0	0.878	0.0732	0.550
4310.0	17240.0	1.372	0.1143	0.899
4840.0	19360.0	1.841	0.1534	1.321

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

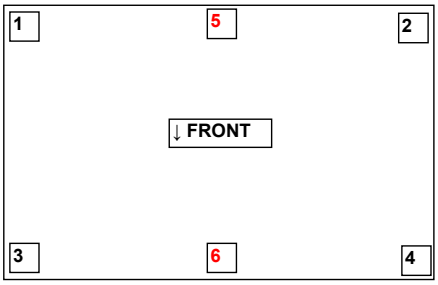
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**560856**
Max Load (lbs)	**5600**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X12FRF2
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	7.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	4030.28
L/ 180	3444.89
L/ 240	3152.20
L/ 360	2859.50



Linear Regression Analysis

1494.61196	2274.11294
216.600381	231.061885
0.92250227	297.77995
47.6144175	4
4222108.41	354691.594

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 1494.61 + 2274.11

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/28/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_804X12FRF3**
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1290
Age of Wall: 56 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	7.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	**Time**	**Trans 1 (in.)**	**Trans 2 (in.)**	**Trans 3 (in.)**	**Trans 4 (in.)**	**Trans 5 (in.)**	**Trans 6 (in.)**	**Midspan Mean (in.)**
1290	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2030	immed.	0.000	0.001	0.005	0.001	0.081	0.090	**0.084**
2050	~5min	0.000	0.001	0.005	0.003	0.103	0.116	**0.107**
1510	immed.	0.000	0.001	0.005	0.003	0.062	0.072	**0.065**
1500	~5min	0.000	0.002	0.004	0.003	0.059	0.069	**0.062**
3190	immed.	0.000	0.007	0.009	0.011	0.400	0.425	**0.406**
3060	~5min	0.000	0.008	0.009	0.015	0.479	0.498	**0.481**
1600	immed.	-0.001	0.007	0.007	0.015	0.341	0.356	**0.341**
1550	~5min	-0.001	0.006	0.007	0.015	0.330	0.344	**0.330**
3220	immed.	-0.001	0.007	0.008	0.015	0.604	0.621	**0.605**
3250	~5min	-0.001	0.007	0.007	0.015	0.617	0.636	**0.619**
1660	immed.	-0.001	0.004	0.006	0.015	0.412	0.426	**0.412**
1580	~5min	-0.001	0.004	0.006	0.015	0.394	0.408	**0.394**
3840	immed.	-0.002	0.010	0.006	0.020	0.865	0.886	**0.867**
3880	~5min	-0.002	0.009	0.016	0.020	0.932	0.962	**0.936**
1690	immed.	-0.002	0.004	0.018	0.020	0.605	0.630	**0.607**
1590	~5min	-0.003	0.004	0.017	0.020	0.579	0.603	**0.582**
4400	immed.	-0.003	0.006	0.022	0.020	1.173	1.212	**1.181**
4440	~5min	-0.005	0.004	0.022	0.023	1.276	1.322	**1.288**
1720	immed.	-0.006	-0.004	0.023	0.023	0.844	0.872	**0.849**
1620	~5min	-0.006	-0.004	0.022	0.023	0.812	0.838	**0.817**
4760	immed.	-0.006	0.000	0.023	0.023	1.361	1.424	**1.382**
5020	~5min	-0.008	0.000	0.021	0.025	1.364	1.430	**1.387**
1760	immed.	-0.010	-0.010	0.017	0.026	1.334	1.382	**1.352**
1620	~5min	-0.010	-0.011	0.017	0.026	1.312	1.354	**1.327**

ULTIMATE FAILURE DATA		
5220	Hold 2 min	No cracks or pops, no visible damage
5290	Hold 2 min	No change, no visible damage
5450	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 5 seconds into holding load Complete horizontal shear failure approximately 58.5 inches from right bearing end (concrete, mortar, wire mesh) Horizontal shear failure is described as the complete break along the panel 4 ft width Wall failed suddenly at target load (no slow deflection until failure) No additional visible damage present

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3060 lbs, popping heard, wall settling, movement on all Transducers. No visible damage
*At Load = 3250 lbs, crack formation underneath wall (tension side) close to midspan. Photos taken
*At Load = 3880 lbs, two loud pops heard. Crack formation underneath wall becoming larger, approx 68" - 69" from right end (close to midspan of wall). Photos taken
*At Load = 4440 lbs, pop heard at 2:25 into load, movement on all Transducers. Midspan mortar crack growing
*At Load = 5020 lbs, cracks and pops heard 1 minute into load. Midspan crack increasing in size (separation)
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1290.0	5160.0	0.000	0.0000	0.000
2050.0	8200.0	0.107	0.0089	0.062
3060.0	12240.0	0.481	0.0401	0.330
3250.0	13000.0	0.619	0.0516	0.394
3880.0	15520.0	0.936	0.0780	0.582
4440.0	17760.0	1.288	0.1073	0.817
5020.0	20080.0	1.387	0.1156	1.327

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

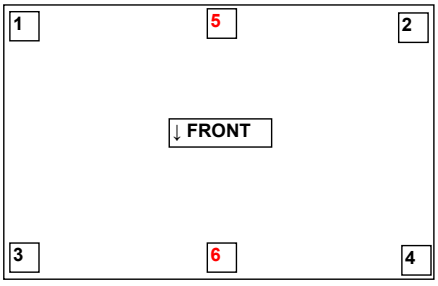
Stiffness (Flexural Rigidity) EI (lbs-ft^2]	**1061043**
Max Load (lbs)	**5450**

Intertek

Client: Emmedue S.P.A
Project No: M2_804X12FRF3
Product: Single Polystyrene PSM80 4' x 12' x 7.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	7.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	4409.04
L/ 180	3574.70
L/ 240	3157.53
L/ 360	2740.37



Linear Regression Analysis

2130.21898	1906.02982
139.183122	128.142331
0.98321075	153.522984
234.247709	4
5521056.11	94277.227

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 2130.22 + 1906.03

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/20/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X8FRF1**
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1250
Age of Wall: 51 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1250	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
3560	immed.	0.009	0.013	0.005	0.006	0.130	0.125	**0.119**
3580	~5min	0.009	0.013	0.005	0.005	0.138	0.133	**0.127**
1380	immed.	0.003	0.010	0.004	0.005	0.043	0.041	**0.036**
1370	~5min	0.003	0.010	0.004	0.005	0.041	0.039	**0.035**
5140	immed.	0.016	0.015	0.009	0.006	0.250	0.248	**0.238**
5170	~5min	0.016	0.016	0.009	0.006	0.272	0.270	**0.259**
1400	immed.	0.009	0.011	0.005	0.006	0.082	0.082	**0.074**
1370	~5min	0.008	0.011	0.005	0.006	0.076	0.076	**0.069**
6560	immed.	0.022	0.016	0.012	0.009	0.400	0.396	**0.383**
6560	~5min	0.023	0.016	0.013	0.008	0.420	0.415	**0.402**
1400	immed.	0.013	0.012	0.005	0.006	0.119	0.118	**0.110**
1370	~5min	0.012	0.012	0.006	0.006	0.110	0.108	**0.100**
7580	immed.	0.029	0.018	0.017	0.010	0.548	0.536	**0.523**
7570	~5min	0.030	0.018	0.027	0.010	0.592	0.584	**0.567**
1410	immed.	0.016	0.010	0.016	0.007	0.184	0.180	**0.170**
1370	~5min	0.015	0.010	0.014	0.007	0.171	0.168	**0.158**
8740	immed.	0.176	0.010	0.188	0.006	0.860	0.836	**0.753**
8720	~5min	0.238	0.009	0.251	0.006	0.903	0.877	**0.764**
0	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
0	~5min	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**

ULTIMATE FAILURE DATA

8780	Hold 2 min	Crack getting larger, no additional visible damage
10030	Hold 2 min	Some cracking and popping heard 1:00 into load, no additional visible damage
12240	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 10 seconds into holding load Horizontal shear failure approximately 31 inches from right bearing end (concrete and mortar breaks) Wall not fully separated from wire mesh and foam core. Left end bearing mortar/foam crushing 9" - 10" from end. Right end bearing mortar/foam crushing approx 6" from end. Foam core at both end bearing locations began to squish down first, the mortar breaks then followed

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 7570 lbs, pop heard while taking wall to this load, no visual damage present
*At Load = 8720 lbs, wall slipped off roller reaction end bearings. Test was stopped.
Wall was repositioned and last load target obtained was repeated on 11/21/07. However, due to testing on the previous day, a mortar crack 9.5" - 10" from the left end bearing was found, fully extending the width of the wall. Crack formed when wall specimen slipped off roller bearings the previous day. Photos taken prior to retesting. Load vs. deflection readings were recorded, however deflections were high due to wall damage. Transducers were removed after the set load reading and wall was taken to Ultimate Failure.
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions
*Ruben Caputo, Emmedue consultant, was present on 11/20/07

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1250.0	5000.0	0.000	0.0000	0.000
3580.0	14320.0	0.127	0.0106	0.035
5170.0	20680.0	0.259	0.0216	0.069
6560.0	26240.0	0.402	0.0335	0.100
7570.0	30280.0	0.567	0.0473	0.158
8720.0	34880.0	0.764	0.0637	0.000

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

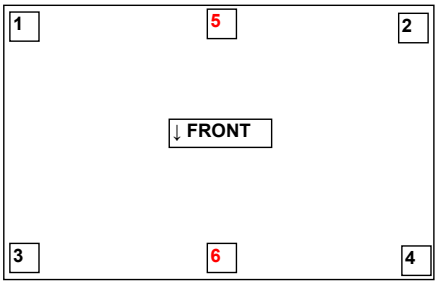
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**2053764**
Max Load (lbs)	**12240**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X8FRF1
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	9.500

Deflection Limit (L/x)	Load (lbs-in)
L/ 120	9097.55
L/ 180	7053.06
L/ 240	6030.82
L/ 360	5008.57



Linear Regression Analysis

7914.15636	2964.08114
767.70693	368.299829
0.97254554	385.158951
106.271872	3
15765157.7	445042.253

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 7914.16 + 2964.08

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/21/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X8FRF2**
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1230
Age of Wall: 52 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1230	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
3530	immed.	0.002	0.010	0.000	0.002	0.154	0.140	**0.144**
3540	~5min	0.003	0.010	-0.001	0.002	0.166	0.151	**0.155**
1390	immed.	0.000	0.007	-0.001	0.001	0.062	0.052	**0.055**
1370	~5min	0.000	0.006	-0.002	0.000	0.058	0.049	**0.052**
5090	immed.	0.004	0.019	-0.003	0.004	0.304	0.281	**0.287**
5090	~5min	0.005	0.020	-0.003	0.004	0.328	0.302	**0.308**
1400	immed.	0.001	0.010	-0.004	0.002	0.111	0.100	**0.103**
1370	~5min	0.001	0.010	-0.003	0.002	0.104	0.093	**0.096**
6060	immed.	0.007	0.025	-0.004	0.006	0.425	0.401	**0.405**
6100	~5min	0.008	0.026	-0.006	0.008	0.456	0.440	**0.439**
1410	immed.	0.002	0.014	-0.005	0.003	0.153	0.146	**0.146**
1360	~5min	0.001	0.013	-0.005	0.003	0.138	0.131	**0.132**
7060	immed.	0.012	0.056	-0.010	0.009	0.582	0.555	**0.552**
7070	~5min	0.012	0.082	-0.014	0.060	0.687	0.673	**0.645**
1420	immed.	0.003	0.050	-0.012	0.035	0.253	0.244	**0.230**
1360	~5min	0.003	0.049	-0.013	0.034	0.234	0.226	**0.212**
8030	immed.	0.014	0.125	-0.018	0.120	0.836	0.827	**0.771**
8030	~5min	0.016	0.179	-0.020	0.166	0.936	0.928	**0.847**
1430	immed.	0.004	0.210	-0.025	0.186	0.423	0.414	**0.324**
1370	~5min	0.004	0.204	-0.025	0.180	0.393	0.384	**0.297**
8520	immed.	0.020	0.428	-0.029	0.367	1.146	1.124	**0.939**
8500	~5min	0.019	0.499	-0.032	0.440	1.197	1.172	**0.953**
0	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
0	~5min	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**

ULTIMATE FAILURE DATA		
9030	Hold 2 min	No change, no visible damage
10060	Hold 2 min	Some cracking and popping heard 1:10 into load, no additional visible damage
11890	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 15 seconds into holding load Horizontal shear failure approximately 31 inches from right bearing end (concrete and mortar breaks) Wall not fully separated from wire mesh and foam core. Left end bearing mortar/foam crushing 9" from end. Right end bearing mortar/foam crushing approx 10" from end. Foam core at both end bearing locations began to squish down first, the mortar breaks then followed

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 7070 lbs, Transducers 2 & 4 (RHS end) showing movement due to foam crushing. Popping and cracking heard at 1:25 and 1:50 into load.
*At Load = 8030 lbs, Transducers 2 & 4 (RHS end) showing significant movement due to foam crushing approx 9" to 10" from right bearing end. Mortar crack formation at this location (photos taken)
*At Load = 8500 lbs, approximately 30 seconds into load, the end bearing crushing at right end of wall extended Wall shifted to right side and loading beam slipped off. Wall was repositioned, transducers were removed, and wall was taken to Ultimate Failure.
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1230.0	4920.0	0.000	0.0000	0.000
3540.0	14160.0	0.155	0.0129	0.052
5090.0	20360.0	0.308	0.0257	0.096
6100.0	24400.0	0.439	0.0366	0.132
7070.0	28280.0	0.645	0.0538	0.212
8030.0	32120.0	0.847	0.0705	0.297
8500.0	34000.0	0.953	0.0794	0.000

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

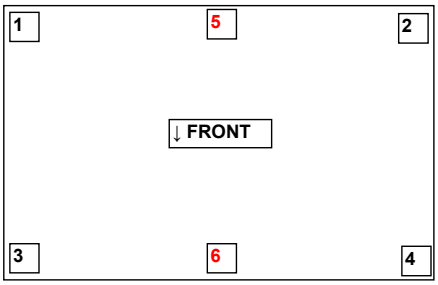
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**1231415**
Max Load (lbs)	**11890**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X8FRF2
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	9.500

Deflection Limit (L/x)	Load (lbs-in)
L/ 120	7673.50
L/ 180	6144.71
L/ 240	5380.32
L/ 360	4615.93



Linear Regression Analysis

5917.88937	3087.13738
508.969487	318.693857
0.97126266	354.585323
135.19175	4
16997760.3	502923.006

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 5917.89 + 3087.14

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/21/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X8FRF3**
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 32.00
Pre-Load (lbs) 1160
Age of Wall: 52 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 31 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.0	8.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1160	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
3550	immed.	0.003	0.008	0.000	0.011	0.173	0.174	**0.168**
3560	~5min	0.004	0.009	0.000	0.012	0.183	0.185	**0.178**
1310	immed.	0.002	0.006	-0.001	0.008	0.072	0.074	**0.070**
1310	~5min	0.002	0.006	0.000	0.007	0.071	0.067	**0.066**
4620	immed.	0.007	0.018	-0.001	0.018	0.303	0.291	**0.286**
4600	~5min	0.007	0.017	-0.001	0.019	0.314	0.302	**0.298**
1350	immed.	0.002	0.006	-0.001	0.014	0.126	0.119	**0.118**
1330	~5min	0.002	0.006	-0.002	0.013	0.121	0.113	**0.112**
5660	immed.	0.010	0.016	-0.001	0.022	0.413	0.398	**0.394**
5670	~5min	0.010	0.016	-0.002	0.023	0.436	0.419	**0.416**
1380	immed.	0.004	0.007	-0.001	0.017	0.168	0.160	**0.157**
1330	~5min	0.004	0.006	-0.001	0.017	0.156	0.148	**0.146**
6800	immed.	0.016	0.024	-0.004	0.028	0.571	0.542	**0.541**
6820	~5min	0.017	0.028	-0.004	0.030	0.624	0.590	**0.589**
1390	immed.	0.005	0.014	-0.004	0.020	0.236	0.218	**0.218**
1330	~5min	0.005	0.013	-0.005	0.020	0.218	0.200	**0.201**
8030	immed.	0.019	0.040	-0.007	0.032	0.828	0.799	**0.793**
8050	~5min	0.019	0.046	-0.007	0.033	0.933	0.904	**0.896**
1390	immed.	0.005	0.027	-0.009	0.022	0.388	0.364	**0.365**
1330	~5min	0.005	0.026	-0.009	0.020	0.359	0.335	**0.336**
8520	immed.	0.018	0.050	-0.009	0.031	1.030	0.990	**0.988**
8550	~5min	0.018	0.055	-0.009	0.032	1.120	1.074	**1.073**
1390	immed.	0.000	0.033	-0.012	0.022	0.481	0.450	**0.455**
1350	~5min	-0.001	0.032	-0.012	0.022	0.452	0.420	**0.426**

ULTIMATE FAILURE DATA		
9130	Hold 2 min	Some popping heard, cracks increasing in size, no new additional damage
9650	Hold 2 min	Crack heard 1:17 into load, both end bearings beginning to crack at mortar (lower) locations
11020	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 22 seconds into holding load Horizontal shear failure approximately 31 inches from left bearing end (concrete and mortar breaks) Wall not fully separated from wire mesh and foam core. Left end bearing mortar/foam crushing 6.5" from end. Right end bearing mortar/foam crushing approx 4" - 6" from end. Foam core at both end bearing locations began to squish down first, the mortar breaks followed

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 5670 lbs, Transducers 2 & 4 (RHS end) showing movement due to foam crushing
*At Load = 8050 lbs, One loud crack and pop heard, large crack formation on RHS end bearing mortar (lower). Photos taken, no additional visible damage present
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1160.0	4640.0	0.000	0.0000	0.000
3560.0	14240.0	0.178	0.0148	0.066
4600.0	18400.0	0.298	0.0248	0.112
5670.0	22680.0	0.416	0.0346	0.146
6820.0	27280.0	0.589	0.0491	0.201
8050.0	32200.0	0.896	0.0747	0.336
8550.0	34200.0	1.073	0.0894	0.426

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

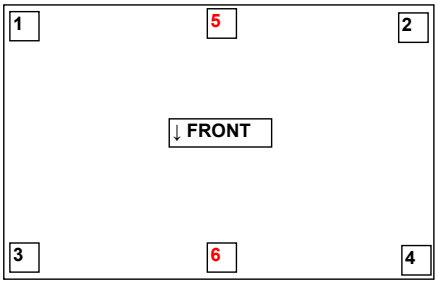
Stiffness (Flexural Rigidity) EI (lbs-ft^2]	**1012421**
Max Load (lbs)	**11020**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X8FRF3
Product: Single Polystyrene PSM150 4' x 8' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
93	7.750	4.00	8.00	9.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	7305.28
L/ 180	5889.81
L/ 240	5182.07
L/ 360	4474.33



Linear Regression Analysis

5479.25608	3058.85694
566.735215	372.619861
0.95896269	443.123274
93.4722717	4
18354050.4	785432.944

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 5479.26 + 3058.86

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/28/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X12FRF1**
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1250
Age of Wall: 56 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1250	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2520	immed.	0.002	0.000	0.014	0.003	0.270	0.263	**0.261**
2530	~5min	0.002	0.000	0.014	0.004	0.299	0.294	**0.292**
1530	immed.	0.002	0.000	0.014	0.003	0.171	0.168	**0.165**
1510	~5min	0.002	0.001	0.015	0.004	0.166	0.164	**0.160**
2990	immed.	0.000	-0.002	0.023	0.004	0.503	0.491	**0.491**
3030	~5min	0.001	-0.002	0.023	0.004	0.538	0.523	**0.524**
1620	immed.	0.000	-0.002	0.023	0.002	0.340	0.330	**0.330**
1530	~5min	0.000	-0.002	0.023	0.002	0.321	0.311	**0.311**
3430	immed.	0.000	-0.002	0.023	0.005	0.626	0.610	**0.612**
3450	~5min	0.000	-0.002	0.023	0.005	0.653	0.637	**0.638**
1600	immed.	0.000	-0.002	0.023	0.003	0.375	0.366	**0.364**
1520	~5min	0.000	-0.002	0.023	0.003	0.358	0.348	**0.347**
4010	immed.	0.002	-0.003	0.030	0.007	0.830	0.811	**0.812**
4020	~5min	0.002	-0.003	0.030	0.007	0.860	0.842	**0.843**
1600	immed.	0.000	-0.002	0.028	0.004	0.460	0.447	**0.446**
1530	~5min	0.000	-0.002	0.029	0.004	0.436	0.424	**0.422**
5170	immed.	0.010	-0.002	0.032	0.011	1.227	1.200	**1.201**
5170	~5min	0.013	-0.002	0.056	0.054	1.307	1.320	**1.284**
1630	immed.	0.009	-0.002	0.053	0.048	0.635	0.655	**0.618**
1540	~5min	0.008	-0.002	0.053	0.047	0.595	0.615	**0.578**
5510	immed.	0.023	-0.002	0.080	0.058	1.441	1.463	**1.412**
5510	~5min	0.064	-0.001	0.130	0.061	1.535	1.560	**1.484**
1660	immed.	0.062	-0.001	0.125	0.054	0.772	0.804	**0.728**
1530	~5min	0.060	0.000	0.122	0.053	0.720	0.751	**0.677**

ULTIMATE FAILURE DATA

6010	Hold 2 min	Wall deflecting more, pops and cracks heard, no additional visible damage
6610	Hold 2 min	Cracks heard 32 seconds into load, both end bearings beginning to crack at mortar (lower) locations
7160	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 24 seconds into holding load Complete horizontal shear failure approximately 66.5 inches from right bearing end (concrete, mortar, wire mesh) Left end bearing mortar/foam crushing approximately 6" - 9" from end. No additional crusing at right end bearing Foam core at left end bearing location began to squish down first, then the mortar breaks followed

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3030 lbs, several pops heard while taking wall to this load, no visible damage present
*At Load = 4020 lbs, one pop heard, no visible damage
*At Load = 5170 lbs, Transducers 3 & 4 showed significant movement after two pops heard approx 2:10 into load
Wall inspected, no visible damage
*At Load = 5510 lbs, crushing of concrete, mortar, and foam core at Transducer 3 and 4 location. Photos taken
At Transducer 3 location, foam squishing and mortar beginning to crack. At Transducer 4 location, concrete
crack formation 16" from end of wall, foam showing evidence of squishing.
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under
third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1250.0	5000.0	0.000	0.0000	0.000
2530.0	10120.0	0.292	0.0243	0.160
3030.0	12120.0	0.524	0.0437	0.311
3450.0	13800.0	0.638	0.0532	0.347
4020.0	16080.0	0.843	0.0702	0.422
5170.0	20680.0	1.284	0.1070	0.578
5510.0	22040.0	1.484	0.1237	0.677

Note: Transducers 1 through 4 measured the outer deflections.
Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

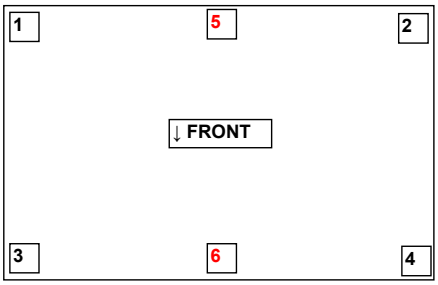
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**1200867**
Max Load (lbs)	**7160**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X12FRF1
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	9.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	4805.42
L/ 180	3795.04
L/ 240	3289.84
L/ 360	2784.65



Linear Regression Analysis

2579.69936	1774.27142
85.7795611	80.8309641
0.99559675	88.0304702
904.420823	4
7008685.88	30997.4547

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 2579.70 + 1774.27

Intertek

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/28/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X12FRF2**
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1190
Age of Wall: 56 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1190	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2530	immed.	0.003	0.006	0.006	0.030	0.259	0.256	**0.247**
2550	~5min	0.004	0.010	0.006	0.031	0.283	0.278	**0.268**
1480	immed.	0.003	0.009	0.006	0.026	0.158	0.152	**0.143**
1430	~5min	0.003	0.009	0.006	0.026	0.149	0.143	**0.135**
3150	immed.	0.007	0.014	0.008	0.034	0.426	0.416	**0.406**
3170	~5min	0.006	0.016	0.008	0.034	0.460	0.448	**0.438**
1520	immed.	0.004	0.015	0.007	0.029	0.252	0.240	**0.232**
1440	~5min	0.003	0.014	0.006	0.028	0.235	0.222	**0.216**
3640	immed.	0.009	0.020	0.010	0.038	0.609	0.596	**0.583**
3650	~5min	0.010	0.020	0.010	0.038	0.655	0.644	**0.630**
1570	immed.	0.006	0.017	0.007	0.030	0.365	0.353	**0.344**
1460	~5min	0.005	0.017	0.006	0.030	0.338	0.326	**0.318**
4020	immed.	0.012	0.023	0.008	0.039	0.827	0.805	**0.796**
4030	~5min	0.013	0.023	0.009	0.040	0.883	0.863	**0.852**
1570	immed.	0.009	0.018	0.005	0.032	0.498	0.481	**0.473**
1460	~5min	0.008	0.018	0.004	0.032	0.464	0.448	**0.441**
5100	immed.	0.015	0.104	0.004	0.056	1.264	1.200	**1.187**
5110	~5min	0.015	0.170	0.004	0.081	1.395	1.302	**1.281**
1590	immed.	0.015	0.150	-0.001	0.072	0.757	0.679	**0.659**
1480	~5min	0.015	0.147	0.000	0.070	0.711	0.636	**0.616**
5420	immed.	0.021	0.216	0.002	0.098	1.550	1.438	**1.410**
5430	~5min	0.021	0.262	0.002	0.115	1.644	1.516	**1.480**
1610	immed.	0.021	0.255	-0.002	0.122	0.915	0.800	**0.759**
1500	~5min	0.021	0.250	-0.001	0.119	0.866	0.753	**0.712**

ULTIMATE FAILURE DATA

6250 0	Hold 2 min	Transducer 2 location crushing, popping and cracking heard. Crack formation at that location extending the entire panel width (all the way to Transducer 4 location)
6680	**Panel Failure**	Wall no longer able to hold load. Failure occurred approx 8 seconds into holding load Complete horizontal shear failure approximately 80 inches from right bearing end (concrete, mortar, wire mesh) Right end bearing mortar/foam crushing approximately 9" from end. No additional crushing on left end bearing concrete/foam/mortar. Foam core at right end bearing location began to squish down first, then the mortar breaks followed

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 2550 lbs, one loud pop heard, Transducer 4 picking up movement, no visible damage or slippage
*At Load = 3170 lbs, Transducers 2 and 4 showing movement, no visible damage
*At Load = 4030 lbs, cracking and popping heard approx 1:05 into load, no visible damage
*At Load = 5110 lbs, crushing of foam core at Transducer 2 location. Photos taken
At same location, mortar beginning to crack underneath wall, approx 16" - 18" away from right bearing end
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1190.0	4760.0	0.000	0.0000	0.000
2550.0	10200.0	0.268	0.0223	0.135
3170.0	12680.0	0.438	0.0365	0.216
3650.0	14600.0	0.630	0.0525	0.318
4030.0	16120.0	0.852	0.0710	0.441
5110.0	20440.0	1.281	0.1068	0.616
5430.0	21720.0	1.480	0.1233	0.712

Note: Transducers 1 through 4 measured the outer deflections. Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

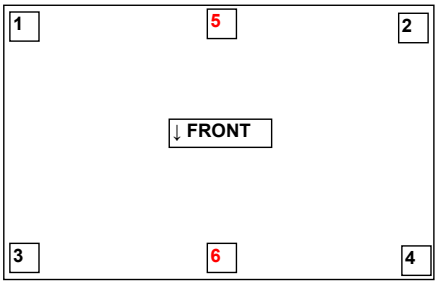
Stiffness (Flexural Rigidity) EI (lbs-ft^2)	**1085571**
Max Load (lbs)	**6680**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X12FRF2
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		**Panel**		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	9.500

Deflection Limit (L/x)	**Load (lbs-in)**
L/ 120	4804.35
L/ 180	3893.75
L/ 240	3438.44
L/ 360	2983.14



Linear Regression Analysis

2324.94972	2072.53647
105.767216	98.6255104
0.99178978	112.728762
483.197843	4
6140368.9	50831.0953

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 2324.95 + 2072.54

Test: **Transverse Flexural Load - Specimen Horizontal**
Project #: **3083303**
Date: 11/29/2007
Eng. Initials:
Client: **Emmedue S.P.A**
Product ID: **M2_1504X12FRF3**
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Eng/Tech(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Wall Area (in^2): 48.00
Pre-Load (lbs) 1520
Age of Wall: 57 days (at test date)
Load Method: Third-Point Loading
Bearing Type: 1 inch diameter steel rollers resting on 3 inch wide steel bearing plates (1/4" thick), located on all four points
For third-point loading, bearings were spaced out 47 inches apart

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.0	12.0	9.500

		Outer Corner Measurements				Lateral Measurements		
Piston Load (lbs)	Time	Trans 1 (in.)	Trans 2 (in.)	Trans 3 (in.)	Trans 4 (in.)	Trans 5 (in.)	Trans 6 (in.)	Midspan Mean (in.)
1520	immed.	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
2590	immed.	0.001	-0.001	0.002	0.020	0.140	0.155	**0.142**
2610	~5min	0.001	-0.001	0.005	0.022	0.156	0.175	**0.159**
1580	immed.	0.001	-0.002	0.005	0.014	0.029	0.035	**0.028**
1530	~5min	0.001	-0.002	0.005	0.014	0.018	0.022	**0.016**
3550	immed.	-0.001	-0.006	0.017	0.047	0.469	0.519	**0.480**
3570	~5min	-0.003	-0.006	0.019	0.048	0.571	0.615	**0.578**
1630	immed.	-0.002	-0.006	0.019	0.034	0.272	0.300	**0.274**
1560	~5min	-0.002	-0.006	0.019	0.034	0.250	0.276	**0.251**
3740	immed.	-0.002	-0.006	0.020	0.056	0.613	0.663	**0.621**
3750	~5min	-0.002	-0.005	0.022	0.057	0.638	0.689	**0.646**
1660	immed.	-0.001	-0.006	0.022	0.039	0.308	0.343	**0.312**
1560	~5min	-0.001	-0.006	0.021	0.038	0.276	0.309	**0.279**
4350	immed.	-0.002	-0.006	0.024	0.064	0.802	0.864	**0.813**
4380	~5min	0.000	-0.003	0.026	0.068	0.871	0.940	**0.883**
1690	immed.	0.000	-0.005	0.026	0.047	0.418	0.462	**0.423**
1550	~5min	0.001	-0.005	0.026	0.047	0.372	0.413	**0.375**
5210	immed.	-0.003	0.001	0.029	0.092	1.230	1.317	**1.244**
5210	~5min	-0.005	0.002	0.031	0.096	1.366	1.458	**1.382**
1690	immed.	-0.002	-0.002	0.029	0.070	0.707	0.774	**0.717**
1570	~5min	0.000	-0.002	0.029	0.067	0.648	0.714	**0.658**
5690	immed.	-0.008	0.004	0.034	0.105	1.700	1.800	**1.716**
5690	~5min	-0.010	0.004	0.039	0.105	1.856	1.969	**1.878**
1650	immed.	-0.005	-0.001	0.038	0.077	1.002	1.080	**1.014**
1560	~5min	-0.004	-0.002	0.038	0.077	0.955	1.029	**0.965**

ULTIMATE FAILURE DATA		
6130	Hold 2 min	Popping heard while taking wall to this load. No additional visible damage present
6470	**Panel Failure**	Wall no longer able to hold load. Failure occurred while taking wall into next target load (6500 lbs). Complete horizontal shear failure approximately 76 inches from right bearing end (concrete, mortar, wire mesh) No end bearing crusing present on either side No additional visible damage 0

Additional Notes: *The loads reported are the piston force only and **DO NOT** take account the weight of each wall specimen
*All floor/roof walls were tested with the concrete side up (compression side)
*At Load = 3570 lbs, 4 to 5 pops heard during the first 10 seconds into load. Additional popping at 3 minutes
No visible damage present
*At Load = 4380 lbs, pop heard 1 minute into load, mortar crack found (under wall) approx 59.5" from left end
*At Load = 5210 lbs, cracking and popping heard. Concrete crack found between concrete and foam approx
15" long from right end (at Transducer 4 location). Foam break approx 3" down at right end of wall.
At same location, Transducer 4 showing movement.
*Positive numbers indicate transducers extending **outward**; Negative numbers indicate transducers extending **inward**
*The wall stiffness (EI) was calculated from the maximum deflection equation of a simply supported beam under
third-point loading conditions

Load (lbs)	Load (lbs-ft)	Load Defl. (in)	Load Defl. (ft)	Set Defl. (in)
1520.0	6080.0	0.000	0.0000	0.000
2610.0	10440.0	0.159	0.0132	0.016
3570.0	14280.0	0.578	0.0482	0.251
3750.0	15000.0	0.646	0.0538	0.279
4380.0	17520.0	0.883	0.0736	0.375
5210.0	20840.0	1.382	0.1151	0.658
5690.0	22760.0	1.878	0.1565	0.965

Note: Transducers 1 through 4 measured the outer deflections.
Transducers 5 through 6 measured the lateral deflections.

Transducer 1: Upper left
Transducer 2: Upper right
Transducer 3: Lower left
Transducer 4: Lower right
Transducer 5: Midspan top
Transducer 6: Midspan bottom

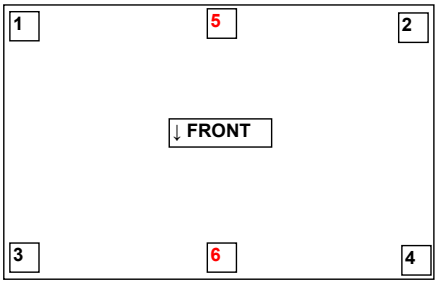
Stiffness (Flexural Rigidity) EI (lbs-ft^2]	**664263**
Max Load (lbs)	**6470**

Intertek

Client: Emmedue S.P.A
Project No: M2_1504X12FRF3
Product: Single Polystyrene PSM150 4' x 12' x 9.5" Floor/Roof Flexural Wall Panel (Nominal 2.5" of concrete, 1.0" of mortar)
Technician(s): V. Burgos, Intertek San Antonio
Test Method(s): ICC-AC 15 - Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems
Section 4.2.2.6 Floor or Roof Panel Flexural Tests in accordance with the general guidelines of ASTM E 72-05
Load achieved within 1 minute

Support Span		Panel		
(in)	(ft)	Width (ft)	Length (ft)	Thickness (in)
141	11.750	4.00	12.00	9.500

Deflection Limit (L/x)	Load (lbs-in)
L/ 120	4660.54
L/ 180	3953.52
L/ 240	3600.00
L/ 360	3246.49



Linear Regression Analysis

1805.17227	2539.46404
161.289564	174.09427
0.96905547	222.512672
125.263565	4
6202035.78	198047.558

Equation of Best Fit Line

Load (lbs-in) = Defl. (in) x 1805.17 + 2539.46

APPENDIX C

Test Photographs

Note: Only a small number of photos were selected for this report. A CD copy of all the project photos will be provided to the client

80_4X8FRF3 (Setup and Failure Modes)

Figure 1A: Rear view of wall

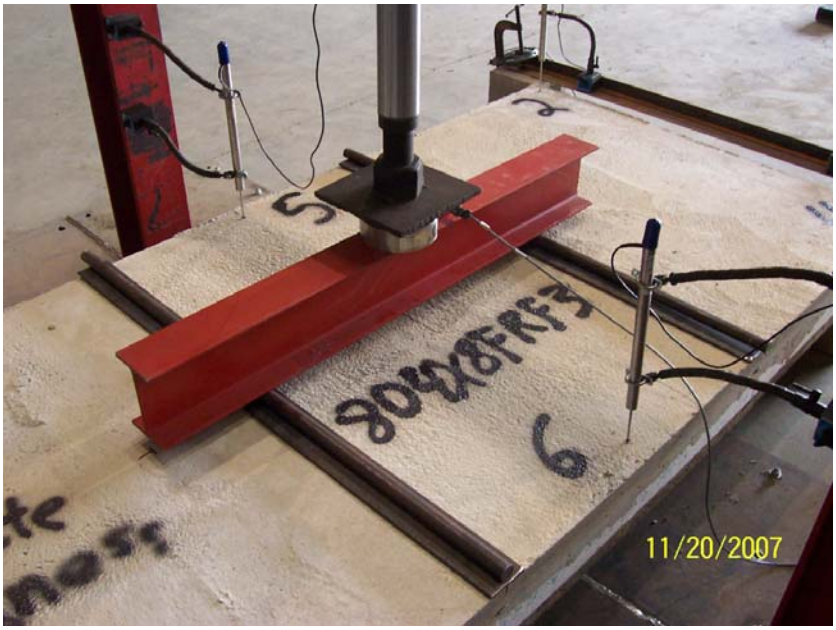


Figure 2A: Transverse-flexural transducer locations

Figure 3A: 80_4X8FRF3 Failure mode

Figure 4A: 80_4X8FRF3 Failure mode (close-up)

150_4X12FRF3 (Setup and Failure Modes)

Figure 5A: 150_4X12FRF3 Setup

Figures 6A: Lateral transducer setup

Figure 7A: 150_4X12FRF3 Failure mode

Figure 8A: Failure mode (close-up)

Intertek ETL SEMKO

PRE-TEST INSPECTION REPORT

Inspection Date: July 1-2, 2007 Intertek Inspector: Matt Lansdowne, EIT

Inspector's Tel: (604) 520 - 3321 Inspector's Email: matt.lansdowne@intertek.com

Product Name: Emmedue Structurally Insulated Panels

Project #: 3083303 Production Lot #: 07/01-02/07 # of Samples: See back page

General Instruction(s): Please complete ALL sections of this report. When information is not applicable, indicate "NA" and provide an explanation. Installation Instructions and MSDS sheets are required. Attach to this form, other product information, which is critical for follow-up inspections and ongoing certification. Please use the enclosed page for manufacturer's shipment.

	Owner/Distributor	Manufacturer (If Different From Owner/Distributor)
Company Name:	**Emmedue S.P.A.**	**SAME AS OWNER**
Address:	Via Toniolo 39/b Z.I. Bellocchi 61032 Fano (PU) Italy	
Tel:	(0039) 0721 855650 / 1	Fax:
Email:	(0039) 0721 854030	
Contact Person:	Omero Bassotti	

FORMULATION (attach material specification sheet(s) or "Certificate of Analysis")

Material	Approved Supplier(s)	Specification	% Content
EPS	ISOPAK Adratica Spa	15AE (It. Gov. Standard)	No Grind
EPS	Sulpol		
Steel Coil	MEttallurgica Ledrense	2.4mm diam., 3.00mm diam., 2.50mm diam.	3.0mm Yield 793 N/mm2 2.5mm Yield 712N/mm2
Adhesive	DA.FO.TEC	ABATECK D40/R	Use to join under length EPS panels

MANUFACTURING PROCESS (attach flowchart and/or details)

EPS and Steel Coil received, COA inspected to ensure quality, moved into inventory. Hotwires are set to Dimension using automated system, operator checks manually to ensure. EPS cut to size. Metal wire is Checked COA and diam. (calibrated caliper), monthly yield, ultimate, and elongation checked with calibrated tensile equipment. Steel wire loaded in to automated system. Unrolled and straightened, passed through welder that joins vertical and horizontal steel columns in preset grid pattern. Steel grid and EPS block taken To automated joiner. The EPS has steel grid laid on bottom surface and top surface. Joiner welds two grid Surfaces together. Inspector verifies welds are present . If > 3% welds missing, manual welding done.

PRODUCT DESCRIPTION: See Next Page

OTHER COMMENTS

Emmedue buys completed component parts. Uses proprietary automated equipment to cut and weld

Components together forming completed EPS Steel Grid System. This system is taken onsite, where Customers follow Emmedue installation instructions to apply shot crete exterior facings.

Intertek Testing Services NA Ltd.
Inspector: Matt Lansdowne, EIT
Email: matt.lansdowne@intertek.com

Phone: (604) 520-3321 ext. 112

EMMEDUE TEST SAMPLE SIZES
July 1-2, 2007

Type of test	Normative	Type of panel	Lengths	Height	Final thickness	Quantity of tests
Load Bearing Wall	ASMT E 119	PSM 80	10'	10'	6"	2
Floor/Roof Fire Test	ASMT E 119	PSM 80	10'	10'	6"	2
Wall Compression	AC15 4.2.2.2	PSM 80	4'	8'	6"	5
	ASTM E 72	PSM 80	4'	14'	6"	5
Wall Flexural	AC15 4.2.2.3	PSM 80	4'	8'	6"	5
	ASTM E 72	PSM 80	4'	14'	6"	4
Wall Flexural-Compression	AC15 4.2.2.4	PSM 80	4'	8'	6"	5
	ASTM E 72	PSM 80	4'	14'	6"	5
Wall Shear	AC15 4.2.2.5	PSM 80	8'	8'	6"	5
	ASTM E 72	PSM 80	8'	14'	6"	4
Floor/Roof Flexural	AC15 4.2.2.6 ASTM E 455	PSM 80	4'	8'	7"	5
		PSM 80	4'	12'	7"	6
		PSM 150	4'	8'	9.5"	6
		PSM 150	4'	12'	9.5"	6
Floor/Roof Diaphragm	AC15 4.2.2.7	PSM 80	4'	8'	6"	5
	ASTM E 455	PSM 80	4'	12'	6"	5
					Total panel	75

2/07/07.

ALAMO CONCRETE PRODUCTS, Ltd

Mix design report

CERTIFICATE NO :

Mix design No. :	**3135371**	**Client :**	
Plant :	**Alamo Concrete Products, Ltd.**	**Project :**	
Compressive Strength :	3 500 psi at 28 Day	w/c Ratio :	0.55
Nominal size :	# 8 (3/8")	Slump :	4.00 ± 1.00 in
Usage :		Slump with SuperP :	
Placement :		Air :	0.0 to 0.0 %

Constituents

Material - Type - Supplier - City	F.M.	Sp. Gr.	Abs.	Qty SSD	Volume
Stone & Sand					
3/8" Limestone - # 8 (3/8") - Alamo Concrete Products, Ltd.		2.580		1780 lb	11.05 ft³
Mfg Sand ACP - 0.39 in - Alamo Concrete Products , San Antonio		2.610	2.50	1079 lb	6.62 ft³
Silica Sand - 0.39 in - Alamo Concrete Products, Ltd.		2.630		466 lb	2.84 ft³
Cement & Additive					
Portland - Type I/II LA - Alamo Cement , San Antonio		3.150		376 lb	1.91 ft³
510 - Fly Ash Class C - - Boral , Decly		2.720		94 lb	0.55 ft³
Water					
Standard water - Standard water - Not defined		1.000		258 lb	4.13 ft³
Air					0.00 ft³
Admixture & Others constituants					
961A - WRDA 35 - ASTM C 494 Type A (Winter) - W.R. Grace , Houston		1.000		11.28 oz	0.01 ft³
960A - Daratard 17 - ASTM C 494 Type D (Summer) - W.R. Grace , Houston		1.000		9.40 oz	0.01 ft³
		Total		4053 lb	27.10 ft³

Unit Weight : 149.6 lb/ft³ Total mix cost :

Remarks :

Prepared by : Chris G. Slate, Technical Services Director	Approved by :
Date : 06/06/2007	Date : 06/06/2007

List of Calibrated Instrumentation Used for Testing

Description	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
Load Cell	41A	1100639	4/17/07	4/17/08
LVDT	JEC-AG	L9233000	3/1/07	3/1/08
LVDT	JEC-AG	L9233400	3/1/07	3/1/08
LVDT	JEC-AG	L9300600	3/1/07	3/1/08
LVDT	JEC-AG	L9300700	3/1/07	3/1/08
LVDT	JEC-AG	L9301000	3/1/07	3/1/08
LVDT	JEC-AG	L9301100	3/1/07	3/1/08
LVDT	JEC-AG	L9233500	3/1/07	3/1/08
DAQ Cart	N/A	99LE004	5/27/07	11/27/08
DAQ Cart Recalibration	N/A	99LE004	11/27/07	5/27/08
Stopwatch	14-649-9	61809410	8/15/07	8/15/08
3000 psi pressure gauge	N/A	298967	5/18/07	5/18/08

REFERENCES

1) Emmedue Advanced Building Systems Operator's Manual, Rev. 02 or 3/19/2004, pp. 2-7, 15-16.
2) Acceptance Criteria for Sandwich Panels, ICC – AC 04, Effective July 1, 2007, Section 4.4.1, p. 5.
3) Acceptance Criteria for Concrete Floor, Roof and Wall Systems and Concrete Masonry Wall Systems, ICC – AC 15, Effective July 1, 2007.

REVISION SUMMARY

DATE	SUMMARY
January 5, 2009	Section 3.2 (Sample and Assembly Description); galvanized steel wire mesh diameters changed to 0.099 inches (transverse) and 0.121 inches (longitudinal)
February 20, 2008	Original Report Issue Date