

# TECO TESTED®

86305 College View Road - Eugene, OR 97405 - Phone: (541) 746-8271 - Fax: (541) 747-1630

A COMPLETE REVIEW OF THE PROJECT REPORT IS REQUIRED  
Please call if there are any questions.

Structural-Use Panels Test Report  
on  
**3/4 7ply 7layer MDO AMESCIA PLYWOOD**  
from  
**MADEIREIRA THOMASI S.A. #247**

TECO Project: #00-66

- ✓ Report represents final project-testing
- ✓ All reported qualification test results PASSED

Comments:

Report Dates:

<u>Progress</u>	<u>Final</u>	<u>Mill Spec. Rev.</u>	<u>Opt. Qual.</u>	<u>Re-Qual.</u>
	7/14/00			

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**TECO CORPORATION**  
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APPENDIX A

**PFS/TECO MILL SPECIFICATION FORM**

INITIAL  REVISION  RE-QUAL.  OPTIONAL  
Confidential Information DATE: July 14, 2000

**A. Specification:**

1. **Company Name, Mill Location and Number:**  
Macedira Thomasi S.A., Curitiba, Brazil  
Mill #247
2. **General Product Description:**  
3/4 7ply 7layer (G-1 Rated) MDO Amescla Plywood
3. **End Use and Span Rating:**
4. **Thickness:**  
Trademark 3/4 Control 0.733 (inch).
5. **Modifications to Application Recommendations:**

**B. Manufacturing:**

1. **Raw Material:**
  - a. **Wood Species:**  
Amescla from Brazil
  - b. **Veneer grade and thickness used:**  
A=Nominal 1/10 Face, D=Nominal 1/10 Core, D=Nominal 1/10 Center,  
and C=Nominal 1/10 Back as per PS 1-95.
2. **Panel Constructions Qualified (specific constructions if veneer or percentage of each layer if layered):**  
7ply 7layer
3. **Panel Size:**  
Nominal 48-in.-by-96-in. submitted
4.  **Special Considerations:**  
Close attention to controlling panel thickness, density, bending stiffness-strength, stability, and durability properties.

C. Properties:

The applicable Control (Avg.) values are intended for Quarterly Re-examination and Quality Assurance criteria\*. Due to the affect of specimens size, related standard deviation and probability of tentative qualification, the mill quality control criteria must be based on qualification average values (bending) until Re-examination and Assurance data indicates otherwise.

1. Mechanical

<i>ALONG</i>	<i>ACROSS</i>
<u>Major Panel Axis</u>	<u>Major Panel Axis</u>
ASTM PROCEDURE	ASTM PROCEDURE
<u>3043</u>	<u>3043</u>

a. Stiffness:

Panel	Average	<u>450.091</u>	<u>286.251</u>
	Minimum	<u>442.989*</u>	<u>273.380*</u>

b. Strength:

<u>Major Panel Axis</u>	<u>Major Panel Axis</u>
ASTM PROCEDURE	ASTM PROCEDURE
<u>3043</u>	<u>3043</u>

Panel	Average	<u>4.815</u>	<u>3.101</u>
	Control	<u>3.339*</u>	<u>2.348*</u>

2. Physical

a. Density: (BENDING Specimen)  
 Panel Average 33.3 (lb/ft<sup>3</sup>) with \_\_\_\_\_ Average Thickness

b. Moisture content: As per 2.7 and 2.4.3 of Structural-Use Panels Performance Stds.

Average 5.6 (% OD wt.)  
 Maximum 18.0\* (% OD wt.)

c. Linear expansion: As per 2.4.1 of Structural-Use Panels Performance Standards.

Panel	Average	_____	Average	_____	(6" x 24" spec.)
	Maximum	<u>.50*</u>	Maximum	<u>.50*</u>	(Percent from OD to VPS)

3. Adhesive Bond

a. Moisture Cycled Breaking Load:

Panel	<u>1" x 5" Spec. - lbs</u>			<u>1" x 5" Spec. - lbs</u>		
Core	<u>Dry</u>	<u>Single Cycle</u>	<u>Six Cycle</u>	<u>Dry</u>	<u>Single Cycle</u>	<u>Six Cycle</u>
Avg.	_____	_____	_____	_____	_____	_____
CI (Cont.)	_____	_____*	_____	_____	_____*	_____
S1.8 (Cont.)	_____	_____*	_____*	_____	_____*	_____*

Manufacturer's Signature \_\_\_\_\_ Date \_\_\_\_\_

Note: A complete review of the project report is required.



### AS RECEIVED PANEL DIMENSION TOLERANCES

*Madeira Thomasi S.A.*

00-66

Mill#: 247                      Product: 3/4 7ply 7layer MDO AMESLA  
Tested By: JM & McB            Test Procedures: PS-2  
Date: 6/27/2000

Panel No.	Width (ins.)	Length (ins.)	Straightness (ins.)	Squareness (ins.)
1	1/16	1/16	0	0
2	1/16	1/16	0	0
3	1/16	1/16	0	0
4	1/16	1/16	0	1/16
5	1/16	1/16	0	0
6	1/16	1/16	0	0
7	1/16	1/16	0	0
8	1/16	1/16	0	1/16
9	1/16	1/16	0	0
10	1/16	1/16	0	0
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
Avg. *	1/16	1/16	0	0
Criteria:	+0 -1/8	+0 -1/8	1/16	1/64 per linear ft.

\*Tolerance measurements averaged to nearest 1/16 of an inch.

NOTES: A complete review of the project report is required.



## PANEL THICKNESS RESULTS

*Madeiraira Thomasi S.A.*

*00-66*

Mill#: 247      Product: 3/4 7ply 7layer MDO AMESLA  
Tested By: JM & McB      Test Procedures: PS-2  
Date: 6/27/2000

Panel No.	Measurement Location				Average
	1	2	3	4	
1	0.766	0.725	0.759	0.763	0.753
2	0.736	0.756	0.773	0.754	0.755
3	0.752	0.761	0.748	0.760	0.755
4	0.730	0.734	0.724	0.742	0.733
5	0.764	0.750	0.713	0.756	0.746
6	0.758	0.761	0.754	0.769	0.761
7	0.771	0.764	0.755	0.762	0.763
8	0.763	0.785	0.791	0.772	0.778
9	0.764	0.746	0.723	0.753	0.747
10	0.761	0.749	0.750	0.765	0.756
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Nominal: 0.750  
Permitted Maximum: 0.781  
Permitted Minimum: 0.733  
Actual Grand Avg.: 0.755

Minimum control is larger of  $-1/32''$  of nominal (trademark) or minimum individual panel average.  
NOTES: A complete review of the project report is required.

Madeiraira Thomasi - Shear Through Thickness Test Results: 3/4-inch plywood panels

SHEAR-THROUGH-THICKNESS RESULTS - PAR. ORIENTATION (3/4-INCH PANELS)

Sample ID	Width (in)	Length (in)	Thick. (in)	Pmax (lbf)	Slope	F <sub>v,t<sub>v</sub></sub> (lb/in)	G <sub>v,t<sub>v</sub></sub> (lb/in)
1	16.000	24.000	0.756	18541	2.575050E-06	734	61535
2	16.000	24.032	0.772	21170	2.345740E-06	820	66062
3	16.000	24.000	0.768	23383	2.121520E-06	912	73522
4	16.000	24.032	0.766	21056	2.180870E-06	822	71613
5	16.000	24.000	0.762	21966	2.220580E-06	863	70795
6	16.000	24.032	0.762	20497	2.310750E-06	804	67942
7	16.000	24.032	0.738	21401	2.230250E-06	867	72684
8	16.000	24.032	0.755	23204	2.039890E-06	919	77677
9	16.000	24.032	0.742	20534	2.272780E-06	828	70939
10	16.000	24.032	0.776	31907	2.172100E-06	1230	70975
Average						880	70308
Max.						1230	77677
Min.						734	61535
St. Dev.						134	4392
COV.						0.1524	0.0625

SHEAR-THROUGH-THICKNESS RESULTS - PERP. ORIENTATION (23/32-INCH PANELS)

Sample ID	Width (in)	Length (in)	Thick. (in)	Pmax (lbf)	Slope	F <sub>v,t<sub>v</sub></sub> (lb/in)	G <sub>v,t<sub>v</sub></sub> (lb/in)
1	16.000	24.000	0.757	22209	2.217780E-06	878	71325
2	16.000	24.000	0.745	21907	2.212520E-06	881	72675
3	16.000	24.032	0.785	23016	2.062600E-06	877	73886
4	16.000	24.032	0.761	21825	2.229520E-06	858	70510
5	16.000	24.032	0.756	21252	2.286000E-06	841	69223
6	16.000	24.032	0.728	21713	2.180290E-06	892	75371
7	16.000	24.032	0.722	21557	2.189870E-06	893	75665
8	16.000	24.032	0.754	22630	2.070330E-06	898	76637
9	16.000	24.032	0.751	22807	2.073580E-06	908	76822
10	16.000	24.032	0.733	20008	2.535250E-06	816	64376
Average						874	72649
Max.						908	76822
Min.						816	64376
St. Dev.						28	3914
COV.						0.0323	0.0539

Results Prepared on 7/14/00 by Dave DeVallance (TECO Corporation - Madison, WI)

Madeiraira Thomasi - Planar Shear Test Results: 3/4-inch plywood panels

PLANAR SHEAR RESULTS - PARALLEL ORIENTATION (3/4-INCH PANELS)

Sample ID	Width (in)	Length (in)	Thick. (in)	Pmax (lbf)	Slope	Gt (lb/in)	Fs (lb/ft)
1	6.000	18.064	0.704	25225	2.507006E-07	18622	1338
2	5.969	18.032	0.725	35982	2.092052E-07	23142	1922
3	5.969	18.032	0.748	37550	2.741101E-07	18223	2006
4	5.969	18.032	0.729	38915	2.353417E-07	20685	2079
5	5.969	18.064	0.717	37089	9.748701E-08	49027	1978
6	5.969	18.064	0.680	32675	2.022852E-07	22408	1742
7	6.000	18.064	0.709	40741	2.378252E-07	19770	2161
8	5.969	18.064	0.716	41423	2.501112E-07	19083	2209
9	5.969	18.032	0.706	39164	2.243416E-07	21015	2092
10	5.969	18.064	0.710	37779	1.526953E-07	30995	2015
<b>Average</b>						24297	1954
Max.						49027	2209
Min.						18223	1338
St. Dev.						9440	253
COV.						0.3885	0.1293

PLANAR SHEAR RESULTS - PERPENDICULAR ORIENTATION (23/32-INCH PANELS)

Sample ID	Width (in)	Length (in)	Thick. (in)	Pmax (lbf)	Slope	Gt (lb/in)	Fs (lb/ft)
1	6.000	18.032	0.718	30629	3.464849E-07	13766.48	1628
2	5.969	18.032	0.683	27124	2.556331E-07	17841.69	1449
3	6.000	18.032	0.751	37390	1.991313E-07	25054.35	1987
4	6.000	18.032	0.717	27865	2.140245E-07	22255.55	1481
5	5.969	18.064	0.715	36715	2.638730E-07	18062.32	1958
6	5.969	18.064	0.717	41239	1.635410E-07	29225.02	2199
7	5.969	18.064	0.686	38299	1.770028E-07	25834.87	2042
8	5.969	18.032	0.715	38314	1.469447E-07	32492.6	2047
9	5.969	18.032	0.719	20363	1.863363E-07	25767	1088
10	5.969	18.064	0.709	31157	1.982947E-07	23834.03	1662
<b>Average</b>						23413	1754
Max.						32493	2199
Min.						13766	1088
St. Dev.						5623	349
COV.						0.2402	0.1992

Results Prepared on 7/14/00 by Dave DeVallance (TECO Corporation - Madison, WI)



### Bending Stiffness & Strength

Client: Thomas S.A. #247  
 Product: 3/4 7ply 7layer MDO AMESCLA

Pass Fail

Received Date: 6/21/2000  
 Print Date: 6/30/2000  
 Test Date: 6/28/2000  
 Tested By: DLT  
 Test Type: Group Rating  
 Test Span: 28"

TECO Sample Numbers: 00-66-1 - 00-66-10

Test Procedure: PS-2

Specimen Size: 48" x 48"

M Arm Length: 6.25"

Test Span: 28"

Spec.No	Thickness	M.C. (%)	Density Thickness	Density	Stiffness	Strength	Production Date
1	0.757	5.7	0.752	33.4	⊥ 222,649 // 452,669	⊥ 2,462	
2	0.760	5.9	0.763	34.3	⊥ 299,844 // 480,794	// 4,939	
3	0.766	5.7	0.769	31.5	⊥ 243,367 // 437,423	⊥ 2,348	
4	0.766	5.7	0.765	32.4	⊥ 244,149 // 470,299	// 2,691	
5	0.773	5.8	0.780	33.8	⊥ 347,428 // 486,146	⊥ 3,684	
6	0.773	5.3	0.779	33.6	⊥ 260,343 // 429,268	// 5,367	
7	0.766	5.7	0.765	32.4	⊥ 244,149 // 470,299	⊥ 2,691	
8	0.764	5.2	0.765	32.6	⊥ 271,660 // 488,299	// 5,028	
9	0.765	5.5	0.769	32.2	⊥ 263,550 // 429,263	⊥ 2,952	
10	0.759	5.6	0.758	33.8	⊥ 249,212 // 459,133	// 5,372	
11	0.749	5.4	0.759	33.4	⊥ 323,314 // 435,179	⊥ 3,866	
12	0.747	5.5	0.763	34.1	⊥ 370,546 // 467,012	// 5,198	
13	0.734	5.5	0.742	33.3	⊥ 348,523 // 415,809	⊥ 3,170	
14	0.726	5.5	0.742	33.3	⊥ 334,416 // 421,072	// 5,242	
15	0.760	5.1	0.728	34.0	⊥ 317,903 // 420,284	⊥ 3,639	
16	0.760	5.6	0.760	33.3	⊥ 282,294 // 417,562	// 4,844	
17	0.743	5.3	0.767	34.7	⊥ 300,495 // 441,108	⊥ 2,808	
18	0.755	5.9	0.756	32.8	⊥ 303,942 // 448,215	// 4,227	
19	0.760	5.7	0.757	33.2	⊥ 263,811 // 456,828	⊥ 3,386	
20	0.745	6.6	0.757	33.8	⊥ 233,430 // 475,165	// 5,247	
⊥ Avg	0.757	5.5	0.759	33.2	286,251	3,101	
S	0.012	0.2	0.015	0.9	43,306	533	
// Avg	0.755	5.7	0.761	33.4	450,091	4,815	
S	0.013	0.4	0.009	0.6	23,915	820	
Mill Specifications				Control / Minimum	⊥ 273,380 // 442,989	⊥ 2,348 // 3,339	

Notes: Odd Number specimens are ⊥ and even numbered are // to long panel directions for M results, I and Z calculations based on actual full panel thickness and D is constant. A complete review of the project report is required. These results are intended for Q.A. purposes only and not design use.





### DEAD WEIGHT STIFFNESS TEST DATA FORM

Madeiraira Thomasi S.A.

00-66

MIN. THICKNESS: 0.733  
SPAN: 84 1/32  
PRE-LOAD: 19.578 lbs  
LOAD: 20.103 lbs  
PRODUCT: 3/4 7ply 7layer MDO AMESLA

PANEL	THICKNESS MEASUREMENTS					D <sub>1</sub>	D <sub>2</sub>	D <sub>2</sub> -D <sub>1</sub> = D	EI
	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	AVG.				
1						0.485	0.626	0.141	440,553
2						0.345	0.480	0.135	460,133
3						0.271	0.423	0.152	408,671
4						0.153	0.295	0.142	437,451
5						0.100	0.238	0.138	450,130
6						0.248	0.385	0.137	453,416
7						0.146	0.285	0.139	446,892
8						0.011	0.149	0.138	450,130
9						0.324	0.455	0.131	474,183
10						0.319	0.470	0.151	411,377
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

AVG. 443,294

Lab Technician(s): DLH, JM, McB  
EI = 62118/D<sub>2</sub>-D<sub>1</sub>

Target EI: 450,000