



# Product Test Summaries

## Nichiha Fiber Cement Products

### Sierra Premium™ Boards

#### Sierra Premium Certifications

##### Test Summaries

Certifications	1
ASTM C 1185	2
ASTM E 84	3
ASTM E 228	4
ASTM E 330	5
Wood, 16" o.c OSB	

Nichiha Sierra Premium boards shall meet or exceed requirements of the following:

1. ICC Evaluation Service, Inc. (ICC-ES) Report No. ESR-1694.

For a copy of complete testing and certification documentation, please call Nichiha Technical Department toll free at 1.866.424.4421.

## ASTM C 1185 Physical Properties Tests

**Date Of Test:** November, 2001

**Test Agency:** RADCO, Inc., Listing & Testing Division (Resources, Applications, Designs and Controls, Inc.)  
3220 East 59th Street, Long Beach, CA 90805

**Test Method:** ASTM C 1185 Durability tests including linear variations with change in moisture content, water tightness, wet flexural strength, freeze/thaw, warm water, and heat/rain.

**Test Specimen:** Nichiha SierraPremium™ Fiber Cement Boards

**Specimen Specifications:** *Thickness:* 12mm (nominal 1/2").  
*Width:* Various.  
*Length:* Various.

**Test Procedure:** The test was performed in accordance to ASTM requirements.

**Test Results:** The test results show the Nichiha SierraPremium™ Fiber Cement Boards successfully comply with the requirements specified in the ICC-ES Acceptance Criteria for Fiber Cement for use.

Property	Test Result	Requirement
Linear Variation with change in moisture content	Linear change: 0.098%	Maximum linear change: 3.0%
Water Tightness	No formation of water droplets on underside of the board.	No formation of water droplets on underside of the board.
Flexural Strength Dry Wet Freeze/Thaw (Rf) Warm Water (Rw)	1527 1450 1495 (0.98) 1459 (0.94)	580 580 80 Report Value
Water Absorption (%)	16.53	Report Value
Moisture Content (%)	4.8	Report Value
Freeze/Thaw	No cracks or delamination after 50 cycles.	No cracks or delamination after 50 cycles if freeze/thaw.
Warm Water Resistance	No cracks or delamination after 56 days of warm water conditioning.	No signs of cracks or delamination after 56 days of warm water conditioning.
Heat/Rain Resistance	No damage, cracking or structural failure should be present on the surface of the tested sheets after 25 cycles of heat and rain.	No damage, cracking or structural failure were present on the surface of the tested sheets after 25 cycles of heat and rain.

## ASTM E 84 Surface Burning Characteristics

**Date Of Test:** November, 2001

**Test Agency:** RADCO, Inc., Listing & Testing Division (Resources, Applications, Designs and Controls, Inc.)  
3220 East 59th Street, Long Beach, CA 90805

**Test Method:** ASTM E 84 Standard test method for surface burning characteristics of building materials, sometimes referred to as the Steiner Tunnel test.

**Test Specimen:** Nichiha SierraPremium™ Fiber Cement Boards

**Specimen** *Thickness:* 12mm (nominal 1/2").

**Specifications:** *Width:* Various.

*Length:* Various.

**Test Procedure:** The boards were physically self-supporting and required no additional sample preparation. Each board measuring 9 inches in width and 96 inches in length were placed end-to-end on the ledges of the tunnel to mark up the 25 feet test sample.

Testing was performed in accordance with ASTM requirements.

### Test Results:

Test Sample	Maximum Flame Spread (ft.)	Smoke Density
Nichiha SierraPremium™ Fiber Cement Boards	0	0

## ASTM E 228 Physical Properties Tests

**Date Of Test:** January, 2002

**Test Agency:** RADCO, Inc., Listing & Testing Division (Resources, Applications, Designs and Controls, Inc.)  
3220 East 59th Street, Long Beach, CA 90805

**Test Method:** ASTM E 228 Test measuring mean coefficient of linear thermal expansion.

**Test Specimen:** Nichiha SierraPremium™ Fiber Cement Boards

**Specimen** *Thickness:* 12mm (nominal 1/2").

**Specifications:** *Width:* Various.

*Length:* Various.

**Test Procedure:** The test was performed in accordance to ASTM requirements.

**Test Results:** The test results show the Nichiha SierraPremium™ Fiber Cement Boards successfully comply with the requirements specified in the ICC-ES Acceptance Criteria for Fiber Cement for use.

Property	Test Result	Requirement
Mean Coefficient of Linear Thermal Expansion	Maximum $3.55 \times 10^{-6}$ in./in./F	Maximum $1.0 \times 10^{-5}$ in./in./F

## ASTM E 330 Positive & Negative Transverse Load Tests - Wood Frame, 16" o.c.– OSB Sheathing

- Date Of Test:** August, 2001
- Test Agency:** RADCO, Inc., Listing & Testing Division (Resources, Applications, Designs and Controls, Inc.)  
3220 East 59th Street, Long Beach, CA 90805
- Test Method:** ASTM E 330 Standard test method for structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
- Test Specimen:** Nichiha Sierra Premium™ Fiber Cement Boards.
- Specimen Specifications:** *Thickness:* 12mm (nominal 1/2").  
*Width:* 9 inches.  
*Length:* 8 feet.
- Test Panel Structure:** *Support Frame:* 4 feet (1,219mm) in width x 8 feet (2,438mm) in height frames were constructed from 2x4 nominal stud grade (38mm x 76mm) Spruce-Pine-Fir (SPF) placed on 16" o.c.  
*Frame Cover (Sheathing):* 7/16 inch (11mm) Oriented Strand Board (OSB) sheathing was fastened to the frames using 8d nails at 12 inch (305mm) on center in the field and on the perimeter.  
*Nichiha Board:* At each stud, one (1) 6d nail was used to fasten the Sierra Premium board.
- Test Procedure:**
- The panels were tested both in the positive and negative direction. In the positive direction the pressure was uniformly applied to the panels. In the negative direction the pressure was uniformly applied to the back of the studs and the OSB sheathing.
  - The load was applied by evacuating the air below the test specimen using a vacuum pump. The applied load was measured with a digital manometer capable of reading in 0.1 inch (2.54mm) increments of water column.
  - Deflections were taken using digital dial indicators capable of reading in 0.0001 inch (0.00254mm) increments. Deflection readings were taken at five locations.
  - The loads were applied in increments so that a minimum of six load increments were obtained. The load was held at each load increment for 30 seconds, and then released to zero. Deflection readings were taken at each load increment, and after the load was released (set).
- Test Result:**
- The ultimate loads achieved in each board and the allowable load is shown below.
  - Mode of Failure: In all specimens tested, failure occurred in the frame. The nails used to fasten the bottom plate to the studs withdrew.

### Load vs. Deflection

Specimen	Positive Load	Negative Load
1	156.52	152.88
2	153.40	157.04
3	133.12	161.02
Average	147.68	156.98
Allowable Load	49.23	52.33

**Nichiha USA, Inc.**  
 6659 Peachtree Industrial Boulevard, Suite AA, Norcross GA 30092  
 Toll Free: 1.86 NICHIIHA 1 (1.866.424.4421)  
 Phone: 770.805.9466 Fax: 770.805.9467  
 nichiha.com

