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NATIONAL EVALUATION REPORT

Report No. NER-648

Issued September 1, 2002

DIVISION 06 – WOOD AND PLASTICS

Section 06070 – Wood Treatment

REPORT HOLDER:

OSMOSE, INC
1016 EVEREE INN ROAD
GRIFFIN, GEORGIA 30224-0249
800-241-0240
www.osmose.com

And Wholly Owned Subsidiary:

TIMBER SPECIALTIES CO.
9184 TWISS ROAD
CAMBELLVILLE, ONTARIO, CANADA L0P 1B0

EVALUATION SUBJECT:

**ADVANCE GUARD® brand BORATE PRESSURE
TREATED WOOD (Hi-bor brand Pressure
Treated Wood)**

LISTEES: Advance Guard brand

Arizona Pacific Wood Preserving, Inc.	Eloy, AZ
Pacific Wood Preserving	Bakersfield, CA
Nevada Wood Preserving	Silver Springs, NV
Pacific Wood Preserving	Sheridan, OR
L.L. Brewton Lumber Co., Inc.	Winfield, LA
Wood Protection Co.	Houston, TX
Great Southern Wood Preserving	Irvington, AL
Western Cleanwood Preservers, Ltd.	Surrey, British Columbia
Royal Pacific Industries, Inc.	McMinnville, OR
Maine Wood Treaters, Inc.	Mechanic Falls, ME
Thunderbolt Wood Treaters Co., Inc.	Riverbank, CA

LISTEES: Hi-Bor brand

Hawaii Planing Mill, Ltd.	Hilo, HI
Hilo Wood Treating	Hilo, HI
Honolulu Wood Treating Co., Ltd.	Kapolei, HI
Royal Pacific Industries, Inc.	McMinnville, OR

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1.0 SUBJECT

Advance Guard® brand Borate Pressure Treated Wood

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

Preservative-Treated Wood

3.0 DESCRIPTION

3.1 General

Advance Guard® brand Borate Pressure Treated Wood is a preservative-treated wood used for wood members that are required by the *Code* to be protected against decay or termites. The preservative is disodium octaborate tetrahydrate (DOT), a soluble sodium borate preservative that is pressure impregnated into lumber or plywood. The DOT preservative is listed in AWPA Standard P5, Standard for Waterborne Preservatives. The borate preservative is water soluble therefore the treated wood is limited to above ground use and shall be protected from exposure to liquid water.

3.2 AWPA Standards

Advance Guard® brand Borate Pressure Treated Wood (DOT) was evaluated for use under the following AWPA Standards:

AWPA C-1 All Timber Products-Preservative Treatment by Pressure Process

AWPA C-9 Plywood-Preservative Treatment by Pressure Process

AWPA C-31 Lumber Used Out of Contact With the Ground and Continuously Protected From Liquid Water-Treatment by Pressure Process

AWPA P-5 Standard for Waterborne Preservative

3.3 Minimum Retention and Wood Species

3.3.1 Lumber Above Ground Use: Southern Pine, Ponderosa Pine, Coastal Douglas Fir, Spruce-Pine-Fir, Red Pine and Hem-Fir.

3.3.2 Plywood Above Ground Use: Group 1 and 2 Plywood with Southern Pine, Hem-Fir or Douglas Fir face veneers.

3.3.3 Treatment: Minimum retention and penetration levels are specified in the approved quality control manual.

3.4 Corrosion

The corrosivity of Advance Guard® brand Borate Pressure Treated Wood has been evaluated in accordance with AWPA Standard E 12 for a variety of metals. The corrosion rates for carbon steel, galvanized steel, stainless steel, aluminum, red brass, and copper are not increased by Advanced Guard® chemicals when the treated wood products are used as recommended by the manufacturer and properly sized for the materials selected.

3.5 Quality Assurance

Treatment of materials is conducted in the facilities noted under Listees above with quality control inspections by Timber Products Inspection, Inc. NER-QA275.

4.0 INSTALLATION

4.1 General

Advance Guard® brand Borate Pressure Treated Wood is installed as preservative-treated lumber and plywood in accordance with the requirements of the applicable *Code*.

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The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation.

The instructions within this report govern if there are any conflicts between the manufacturer's published installation instructions and this report.

4.2 Applications

Advance Guard® brand Borate Pressure Treated Wood is permitted in locations that are required by the applicable *Code* to be decay or termite resistant. The treated wood members are listed for use in above ground applications where it is continuously protected from liquid water.

Locations requiring preservative-treated wood for decay or termite resistance are listed in:

Section 2304.11	<i>International Building Code</i>
Section 2304	<i>Standard Building Code</i>
Section 2311	<i>BOCA National Building Code</i>
Section 2306	<i>Uniform Building Code™</i>
Sections R323, R324	<i>International Residential Code</i>
Sections 322, 323	<i>International One and Two Family Dwelling Code.</i>

4.3 Fasteners

The fasteners used with the product shall be carbon steel, galvanized steel, stainless steel, copper, and silicon bronze.

4.4 Protection from Water

The borate preservative in Advance Guard® brand Borate Pressure Treated Wood is water soluble and the treated wood shall be protected from rain and snow.

Advance Guard® brand Borate Pressure Treated wood used in weather protected exterior applications shall be continuously protected from direct wetting with a minimum of one coat primer and two coats finish paint.

4.5 Structural

The maximum load duration factor allowed for structural members pressure-treated with sodium borate (DOT) shall be 1.6 in accordance with section 2.3 of the **AFPA, National Design Specification for Wood Construction.**

5.0 IDENTIFICATION

Each piece of Advance Guard® brand Borate Pressure Treated Wood lumber and plywood shall be labeled with the manufacturer's name/and or trademark, address, the product name, grade mark, third-party inspection label Timber Products Inspection, Inc. NER-QA275, and this National Evaluation Service evaluation report number, NER-648. Sample Labels see [Figure 1](#) of this report.

6.0 EVIDENCE SUBMITTED

6.1 American Wood-Preserves' Association (AWPA) Standards:

- AWPA Commodity Standards C1-00, C9-00, C31-99
- AWPA Preservative Standard P5-01

6.2 AWPA Reports of Treatments Subcommittees:

- Report of Subcommittee T-2, Lumber and Timber, 1991.
- Report of Subcommittee T-2, Lumber and Timber, 1994.

6.3 Technical information on Advance Guard brand Borate Pressure Treated Wood:

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- 6.3.1** Laboratory tests, Soil Block AWPA E 10, termite resistance, fungus and decay resistance:
- Soil Block Testing, AWPA M10 (replaced by E 10), test fungus *Poria placent* Timber Products Inspection, July 30, 1990, signed by Eugene Chiu.
 - Soil Block Testing, AWPA M10 (replaced by E 10), test fungus *Gloeophyllum trabeum*, Timber Products Inspection, November 16, 1989, signed by Eugene Chiu.
 - Soil Block Testing, AWPA M10 (replaced by E 10), test fungus *Lentinus lepideus*, Timber Products Inspection, November 16, 1989, signed by Eugene Chiu.
 - Test report, Laboratory evaluation of DOT (Tim-Bor) as a wood preservative against Formosan and Eastern Subterranean Termites (Isoptera: Rhinotermitidae), two studies conducted a no-choice feeding bioassay and a choice feeding bioassay, Ft. Lauderdale Research and Education Center, University of Florida, Institute of Food and Agricultural Sciences, 7/9/89, signed by Nan-Yao Su and Rudolf H. Scheffrahn.
 - Test report, Laboratory tests Resistance of Douglas Fir Heartwood pressure treated with D.O.T. (disodium octaborate) to the Formosan termites, ASTM D 3345 modified, Department of Entomology University of Hawaii, October 3, 1989, Minoru Tamashiro and Robin T. Yamamoto.
 - Test report, Laboratory tests Effect of D.O.T. (disodium octaborate) on the Formosan termites, test procedures used treated filter paper fed to termites and soil treatment method using a mixture of clay, sand and mansand (basaltic rock ground to sand size) treated with D.O.T., Department of Entomology University of Hawaii, November 4, 1988, Minoru Tamashiro and Robin T. Yamamoto.
 - Test report, efficacy of DOT to Brown-rot and White-Rot fungi by laboratory bioassays, ASTM D 1413, Mississippi Forest Products Laboratory, Mississippi State University, November 17, 1989, signed by Terry L. Amburgey and S.V. Parikh.
- 6.3.2** Field Tests Termites: Reports prepared by J. Kenneth Grace, Professor & Entomologist, University of Hawaii at Manoa, cover letter September 7, 2001:
- Termite Resistance of Borate-treated lumber in a three-year Above-Ground Field Test in Hawaii, IRG/WP 00-30236, May 2000.
 - Sequential Exposure of Borate Treated douglas-fir to Multiple Formosan Subterranean Termite colonies in a 40 week Field Test, IRG/WP 93-10006, May 1993, field tests Hawaii
 - Repeated exposure of borate-treated douglas-fir lumber to Formosan subterranean termites in an accelerated field test, Forest Products Journal, Vol 44, No.1, January 1994. 10 week aboveground field tests Hawaii.
 - Resistance of borate-treated douglas-fir to the Formosan subterranean termite, Forest Products Journal, Vol 42, No.2, February 1992. Toxicity testing, laboratory tests of treated wood, field tests of treated wood, Hawaii.
- 6.3.3** Preservative Permanence
- Borate Loss due to Condensation or Flooding from Borate-Treated Sill plates, Forintek Canada Corp., Contract No. 2000-2615, April 2000, signed by tony Byrne, Adam McRobbie and Jean Cook.
 - Five-year Inspection and analysis of Borate-Treated L-Joints, Forintek Canada corp., Contract No. 99-2561, August 1999.
- 6.3.4** Effects on Wood Properties
- Effect of Pressure Treatment on the Mechanical Properties of Southern Pine Lumber, Timber Products Inspection, TP Project No. 99-089, February 7, 2000, signed by Walter W. Boyles. Tested for bending MOR and MOE under ASTM D 198, Tension parallel to grain under ASTM D 198, Compression parallel to grain under ASTM D 143, Compression perpendicular to grain under ASTM D 143, moisture content and specific gravity. .
- 6.3.5** Corrosivity
- Corrosivity of Borate Treated Wood, AWPA E 12, January 17, 2000, School of Forestry and Wood Products Michigan Technological University.

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6.3.6 Treatment Testing for C1, C9, C31

- Douglas Fir Lumber and Plywood pressure treated with DOT, Certification by Timber Products Inspection, Boring Sample Reports, 12/18/90. AWPA C1.
- Ponderosa Pine, Lumber pressure treated with DOT, Certification by Timber Products Inspection, Boring Sample Reports, 1997. AWPA C31.
- Western Spruce-Pine-Fir lumber treated with DOT, Treatment trials by U.S. Borax with Independent study by Forintek Canada Corp. 1997, AWPA C 31.
- Coastal Douglas-Fir lumber treated with DOT, Treatment trials 1995 through 1997 at Pacific Wood Preserving in Bakersfield CA; 1996 Royal Pacific McMinnville, OR, and 1995 through 1997 at MidPac Lumber Co., Oahu, HI with Boring Sample Reports and Penetration Results Reports by Timber Products Inspection, AWPA C 31.

- 6.4** Osmose Advance Guard Borate Pressure Treated Wood Quality Control Manual, Standards AG1-01 and AG2-01, Plant Operations Manual, November 2001. Signed by Osmose, Inc., Licensed Producers and Timber Products Inspection, Inc. (TPI).
- Advance Guard® Standard AG1-01, Lumber, Printed November, 2001.
 - Advance Guard® Standard AG2-01, Plywood, Printed November, 2001.

7.0 CONDITIONS OF USE

The National Evaluation Service Committee finds that the Advance Guard® brand Borate Pressure Treated Wood lumber and plywood as described in this report complies with or is a suitable alternate to that specified in the *2000 International Building Code*® with the *2002 Accumulative Supplement*, the *2000 International Residential Code*® for *One- and Two-Family Dwellings* with the *2002 Accumulative Supplement*, the *BOCA National Building Code/1999*, the *1999 Standard Building Code*®, the *1997 Uniform Building Code*™, and the *1998 International One and Two Family Dwelling Code* subject to the following conditions:

- 7.1** This Evaluation Report and the manufacturer's published installation instructions, when required by the code official, shall be submitted at the time of permit application.
- 7.2** Installation complies with this report and the applicable *Code*.
- 7.3** The treatment process complies with this report and Osmose Quality Control Standards and Procedures for Advanced Guard® brand Borate Pressure Treated Wood products.
- 7.4** The treatment process is carried out at the manufacturing facilities of the listees noted in this report, under a quality control program with inspections by an NES listed independent, third party quality assurance agency.
- 7.5** Advance Guard® brand Borate Pressure Treated Wood shall not be exposed to the weather or direct wetting and shall be continuously protected from liquid water.
- 7.6** Advanced Guard® brand Borate Pressure Treated Wood shall not be used in contact with the ground.
- 7.7** Exposure to precipitation during shipping, storage or installation shall be avoided. If material does become wet, it shall be replaced or permitted to dry (maximum 19% MC for lumber and 18% MC for plywood) prior to covering or enclosure by wallboard or other construction materials.
- 7.8** The product is limited to the wood species, minimum retention values, type of wood member (lumber, plywood) and above ground use noted under Section 3.3 above.
- 7.9** Advance Guard® brand Borate Pressure Treated Wood shall not be used to treat LVL, OSB, or FRTW wood products.
- 7.10** Surface treatment of field cuts shall be in accordance with the manufacturer's recommendations.
- 7.11** Retention levels in treated lumber and plywood is required to be greater for protection against Formosan termites and these wood products shall be labeled/identified for this use.
- 7.12** In areas where a soil treatment/barrier termiticide treatment is required by the applicable *Code* or local authority, Advanced Guard® brand Borate Pressure Treated Wood is used only as supplemental protection from termites and is not a replacement for required treatments or barriers.
- 7.13** This report is subject to periodic re-examination. For information on the current status of this report, consult the [NES Product Evaluation Listing](#) or contact the [NES](#).

Figure 1. Typical Advance Guard brand borate pressure Treated Stamp Design (0.42 DOT)



	<p>ABOVE GROUND USE, CONTINUOUSLY PROTECTED FROM LIQUID WATER</p>
<p>ABC Wood Preservers Hometown, USA NER-XXX TP MONITORED STD AGI-00 (NER QA-XXX)</p>	<p>0.28B₂O₃ (0.42 DOT)</p>
<p>SBX</p>	
<p>THIS RETENTION IS SUITABLE FOR EXPOSURE TO FORMOSAN TERMITES</p>	
<p>J F M A M J J A S O N D 2001</p>	

Figure 2. Typical Advance Guard brand borate pressure Treated Stamp Design (0.25 DOT)

	<p>ABOVE GROUND USE, CONTINUOUSLY PROTECTED FROM LIQUID WATER</p>
<p>ABC Wood Preservers Hometown, USA NER-XXX TP MONITORED STD AB2-00 (NER QA-XXX)</p>	<p>0.17B₂O₃ (0.25 DOT)</p>
<p>SBX</p>	
<p>THIS RETENTION IS NOT SUITABLE FOR EXPOSURE TO FORMOSAN TERMITES</p>	
<p>J F M A M J J A S O N D 2001</p>	

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