Technical Evaluation Report
TER 1703-14
Eco D-Fence™ III Treated Fence Picket Protection

Eco Building Products, Inc.

Product:
Eco D-Fence™ III Treated Fence Picket Protection

Issue Date:
May 16, 2017
Revision Date:
June 28, 2019
Subject to Renewal:
July 1, 2020
COMPANY INFORMATION:

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ADDITIONAL LISTEES:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 83 - Shop-Applied Wood Coating
SECTION: 06 11 00 - Wood Framing

1 PRODUCT EVALUATED

1.1 Eco D-Fence™ III Treated Fence Picket Protection

2 APPLICABLE CODES AND STANDARDS

2.1 Codes

2.1.1 IBC—12, 15, 18: International Building Code®

2.1.2 IRC—12, 15, 18: International Residential Code®

2.2 Standards and Referenced Documents

2.2.1 ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction

2.2.2 ASTM D198: Standard Test Methods of Static Tests of Lumber in Structural Sizes

2.2.3 ASTM D3273: Standard Test Method For Resistance To Growth Of Mold On The Surface Of Interior Coatings In An Environmental Chamber

2.2.4 ASTM D4587: Standard Practice For Fluorescent UV-Condensation Exposures Of Paint And Related Coatings

2.2.5 ASTM D5590: Standard Test Method For Determining The Resistance Of Paint Films And Related Coatings To Fungal Defacement By Accelerated Four-Week Agar Plate Assay

1 Building codes require data from valid research reports be obtained from approved sources. An approved agency, which is an approved source, is defined as “an established and recognized agency that is regularly engaged in...furnishing product certification where such agency has been approved.” Being approved, defined as “acceptable to the building official,” is accomplished via accreditation using ISO/IEC 17065 evaluation procedures meeting code requirements of independence, adequate equipment, and experienced personnel. DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation, DrJ certification can be used to obtain product approval in any country that is an IAF MLA Signatory and covered by an IAF MLA Evaluation per the Purpose of the MLA – “certified once, accepted everywhere.” Manufacturers can go to jurisdictions in any IAF MLA Signatory Country and have their products readily approved by authorities having jurisdiction using DrJ's ANSI accreditation.

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, see drjcertification.org.

2 Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., ASCE 7, NDS, ASTM). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein. As required by code, where this TER is not approved, the building official shall respond in writing stating the reasons this TER was not approved. For any variations in state and local codes, see Section 8.

3 All terms defined in the applicable building codes are italicized.
2.2.6 AWPA E1: Laboratory Methods for Evaluating the Termite Resistance of Wood-based Materials: Choice and No-choice Tests

2.2.7 AWPA E10: Laboratory Method for Evaluating the Decay Resistance of Wood-Based Materials Against Pure Basidiomycete Cultures: Soil/Block Test

2.2.8 AWPA E12: Standard Method of Determining Corrosion of Metal in Contact with Treated Wood

2.2.9 AWPA E21: Standard Field Test Method for the Evaluation of Wood Preservatives to be Used for Interior Applications (UC1 and UC2); Full-size Commodity Termite Test

2.2.10 AWPA M4: Standard for the Care of Preservative-Treated Wood Products

2.2.11 AWPA U1: Use Category System: User Specification for Treated Wood

3 PERFORMANCE EVALUATION

3.1 Eco D-Fence™ III has been evaluated to determine its suitability to treat fence picket wood products used in above ground applications where they are required by code to provide the following:

3.1.1 Preservative-treated wood as required by IBC Section 2303.1.9, and IRC Section R317 and Section R318.

3.1.2 Resistance to fungal decay as required by IBC Section 2304.124 and IRC Section R317.

3.1.3 Inhibition of mold growth in accordance with ASTM D3273 and D5590.

3.1.4 Protection from subterranean termites (including Formosan) where required by IBC Section 2304.12.2 and IRC Section R318.

3.1.5 Flexure (MOR/MOE) of solid sawn lumber after treating in accordance with ASTM D198.

3.2 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

3.3 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ’s professional scope of work.

4 PRODUCT DESCRIPTION AND MATERIALS

4.1 The product evaluated in this TER is shown in Figure 1, and an example of the product stamp is shown in Figure 2.

*Figure 1. Eco D-Fence™ III Product*
4.2 Eco D-Fence™ III is a factory applied wood protection treatment that uses disodium octaborate tetrahydrate (DOT), Biocides, pre-stain concentrate, and a water repellant additive to treat wood fence pickets.

4.3 The wood products covered in this TER include:
   4.3.1 Dimensional wood fence pickets and timber species including mixed Southern Pine, Spruce Pine Fir, Hem-Fir, and Doug-Fir.

4.4 Eco D-Fence™ III provides a minimum DOT loading of 0.0072 g/in² (minimum application rate) and a minimum total coating coverage of 0.054 g/in².

4.5 Eco D-Fence™ III protected products are acceptable for use in the following AWPA Use Categories: 5
   4.5.1 UC1 Interior/Dry construction: millwork and finishing
   4.5.2 UC2 Interior/Damp construction: interior beams, timbers, flooring, framing, millwork, and sill plates
   4.5.3 UC3A Above Ground (Exterior) Protected: coated millwork, siding, fence pickets, and trim in a vertical state

4.6 Eco D-Fence™ III incorporates a stain available currently in seven colors and other additives, which provide a protective coating to the treated lumber. Additional coating is permitted but is not required.

4.7 Eco D-Fence™ III wood protection treatment is supplied by Eco Building Products, Inc. and is used by the additional listee(s) above to treat wood fence pickets in accordance with the manufacturer’s requirements.

5 APPLICATIONS

5.1 Eco D-Fence™ III is a preservative and protective treatment for fence pickets.
   5.1.1 Applications include, but are not limited to, use as fence pickets in a vertically installed state.
   5.1.2 Use in above ground applications exposed to all weather cycles, including intermittent wetting and in direct contact with concrete or masonry is approved.

5.2 Products protected by Eco D-Fence™ III meet the requirements of ASTM D3279 and ASTM D5590 where protection against decay is required.

5.3 Products protected by Eco D-Fence™ III meet the requirements of AWPA E1 where protection against termite attack is required.

5.4 Field cuts, notches, or bored holes must be site treated in accordance with the manufacturer’s instructions and AWPA M4 in accordance with IRC Section R317.1.1 and Section R318.1.2.

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5 These are AWPA designated wood preservation systems and retentions (pressure impregnation processes only) that have been determined to be effective in protecting wood products under specified exposure conditions. The use of Eco Red Shield™ protective wood treatments, while purposely not included in the AWPA’s specification, satisfies and complies with the intent of the building code and is a treated material equivalent in quality, strength, effectiveness, durability, and safety. Therefore, Eco Red Shield™ protective wood treatment treated articles are deemed to be non-AWPA standardized; however, the intent of the building code has been satisfied and is adequately supported by third-party verified data and accredited testing protocols. See IRC Section 104.11 for methods of obtaining “Alternative Materials Approval” via building official authority.
5.5 Design

5.5.1 Allowable design stresses for Eco D-Fence™ III protected products for dry conditions of use are the same as the wood product before treatment.

5.5.2 Because Eco D-Fence™ III is a topically applied treatment—not a pressure treatment—the wood is not incised. Therefore, the NDS Section 4.3.8 Incising Factor is not applicable.

5.5.3 Duration of load design stress increase shall be in accordance with NDS Section 2.3.2.

5.5.4 The design provisions for wood construction noted in IBC Section 2302.16 and IRC Section R301.1.3 apply to Eco D-Fence™ III protected products unless otherwise noted in this report.

5.5.5 Connections:

5.5.5.1 Lateral loads for nails, screws, and bolts, and withdrawal loads for nails and screws installed in Eco D-Fence™ III protected products shall be in accordance with NDS using the species specific gravity.

5.5.6 Fasteners:

5.5.6.1 Fasteners used with Eco D-Fence™ III protected products shall be stainless steel, aluminum, hot dipped galvanized or electro-galvanized in accordance with IBC Section 2304.10.57 and IRC Section R317.3.

5.5.7 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

6 INSTALLATION

6.1 Products treated with Eco D-Fence™ III shall be installed in accordance with the applicable code, the approved construction documents, this TER, the manufacturer’s instructions and standard framing practice as applied to solid-sawn lumber, as applicable.

6.2 In the event of a conflict between any of the above and this TER, the more restrictive shall govern.

7 TEST ENGINEERING SUBSTANTIATING DATA

7.1 Test reports and data support the following properties:

7.1.1 Fungal decay in accordance with AWPA E10 by the Wood Durability Lab (WDL) at the LSU Agricultural Center.

7.1.2 Mold growth inhibition in accordance with ASTM D3273 and D5590 by Siva Microbiological Solutions.

7.1.3 Termite resistance in accordance with AWPA E1 by the Wood Durability Lab (WDL) at the LSU Agricultural Center.

7.1.4 Reaction with metals in accordance with AWPA E12 by the Wood Durability Lab (WDL) at the LSU Agricultural Center.

7.1.5 Flexure (MOR/MOE) of LVL/EWP in accordance with ASTM D198 by the Wood Durability Lab (WDL) at the LSU Agricultural Center.

7.1.6 Termite resistance in accordance with AWPA E21 by the Wood Durability Lab at LSU Agricultural Center – 2nd year assessment.

7.2 Some information contained herein is the result of testing and/or data analysis by other sources which conform to IBC Section 1703 and relevant professional engineering law. DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.

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6 2015 IBC Section 2301.2
7 2012 IBC Section 2304.9.5
7.3 Where appropriate, DrJ’s analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS®*, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

8.1 When used in accordance with the manufacturer’s installation instructions and this TER, Eco D-Fence™ III protected products comply with, or provide a suitable alternative to, the requirements of *IBC* Chapter 23 and *IRC* Chapters 5, 6, and 8 as follows:

8.1.1 Eco D-Fence™ III protection does not affect the allowable design stresses for lumber, OSB, Plywood, LVL, GLB, and PSL.

8.1.2 Use in direct contact with concrete or masonry is approved.

8.1.3 Eco D-Fence™ III protected products are suitable for above ground applications exposed to all weather cycles, including intermittent wetting.

8.1.4 When used in exterior applications, products treated with Eco D-Fence™ III must be installed in a vertical application.

8.1.5 Mold growth inhibition is in accordance with *ASTM D3273* and *D5590*.

8.1.6 Products protected with Eco D-Fence™ III meet the requirements of *IBC* Section 2304.12.5 and *IRC* Section R317 where protection against decay is required.

8.1.7 Products protected with Eco D-Fence™ III meet the requirements of *IBC* Section 2304.12.5 and *IRC* Section R318 where protection against termite attack is required.

8.2 *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.9 are similar) states:

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not approved, the building official shall respond in writing, stating the reasons the alternative was not approved.

8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.

8.3.1 No known variations

9 CONDITIONS OF USE

9.1 Eco D-Fence™ III complies with the treatment required for engineered or solid sawn lumber as permitted by the codes listed in Section 2, subject to the following conditions:

9.1.1 The service conditions for Eco D-Fence™ III are any above ground application exposed to all weather cycles, including intermittent wetting.

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8 *2012 IBC Section 2304.11*

9 *2012 IBC Section 2304.11*
9.1.2 Fastener design values shall be determined using the specific gravity of the lumber species used in the treated product.

9.1.3 Cutting and notching of Eco D-Fence™ III preservative treated products is permitted where allowed by the applicable building code, the manufacturer’s recommendations, this TER, or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.

9.1.3.1 Field cuts, notches, or bored holes must be site treated in accordance with the manufacturer’s instructions and AWPA M4 in accordance with IRC Sections R317.1.1 and R318.1.2.

9.1.4 Duration of load increases shall be in accordance with the limitations of the applicable building code for sawn lumber, but not greater than 1.6.

9.1.5 Eco D-Fence™ III wood protection treatment is provided by the listees on page 2 of this TER with quality control inspections by an approved third-party quality control inspection agency.

9.1.6 Products treated with Eco D-Fence™ III shall be kept free from prolonged exposure to soil, vegetation, leaf litter, or other debris that may build up along the fence line.

9.1.7 Products treated with Eco D-Fence™ III shall be installed with a 6” clearance between the ground and the bottom of the picket and shall not be installed in direct contact with permeable materials that are installed in direct contact with the ground.

9.1.8 Products treated with Eco D-Fence™ III shall not be installed in direct contact with non-durable, untreated wood or older construction showing evidence of decay.

9.1.9 Products treated with Eco D-Fence™ III shall be protected from frequent or recurrent wetting such as from watering systems. Exposure to incidental wetting from typical rainfall is approved.

9.1.10 Use in tropical climate zones is not approved.

9.2 Where required by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.3 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

9.4 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., owner or registered design professional).

9.5 At a minimum, this product shall be installed per Section 6 of this TER.

9.6 This product is manufactured under a third-party quality control program in accordance with IBC Section 104.4 and 110.4 and IRC Section R104.4 and R109.2.

9.7 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the owner or the owner’s authorized agent. Therefore, the TER shall be reviewed for code compliance by the building official for acceptance.

9.8 The use of this TER is dependent on the manufacturer’s in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer’s instructions, the building official’s inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

10.1 Products treated with Eco D-Fence™ III described in this TER are identified by a label on the material itself or the packaging material bearing the manufacturer’s name, product name, TER number, quality assurance agency name, and other information to confirm code compliance.
10.2 Products treated with Eco D-Fence™ III shall be identified with “D-Fence” or “Premium Treated Picket” on the label or otherwise marked on the product.

10.2.1 For an example of acceptable product stamp, see Figure 2.

10.3 When intended for use where Formosan subterranean termites are a concern, the label shall identify the product as suitable for this application as part of the product marking.

10.4 Additional technical information can be found at www.ecob.net.

11 REVIEW SCHEDULE

11.1 This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjcertification.org.

11.2 For information on the current status of this TER, contact DrJ Certification.