Technical Evaluation Report
TER 2010-01
No-Burn® Plus Fire Protected OSB and Lumber

No-Burn®, Inc.

Product:
No-Burn® Plus

Issue Date:
October 23, 2020
Revision Date:
October 23, 2020
Subject to Renewal:
July 1, 2022
1 PRODUCT EVALUATED

1.1 No-Burn® Plus

1.1.1 No-Burn® Plus is used as a treatment for oriented strand board (OSB) and lumber in limited interior, dry use conditions. It is a fire protective coating and is used as an alternative to fire retardant treated wood (FRTW).

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®

2.1.3 IFC—12, 15, 18: International Fire Code®

1 Building codes require data from valid research reports be obtained from approved sources. Agencies who are accredited through ISO/IEC 17065 have met the code requirements for approval by the building official. DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body—Accreditation #1131.

Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA—“certified once, accepted everywhere.”

Building official approval of a licensed registered design professional (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant jurisdiction. Therefore, the work of licensed RDPs is accepted by building officials, except when plan (i.e., peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the building official responds in writing stating the reasons for disapproval.

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit drjcertification.org or call us at 608-310-6748.

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.

3 All terms defined in the applicable building codes are italicized.
2.2 Standards and Referenced Documents

2.2.1 ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction
2.2.2 ASTM D3359: Standard Test Methods for Rating Adhesion by Tape Test
2.2.3 ASTM D4541: Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
2.2.4 ASTM D4585: Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation
2.2.5 ASTM D610: Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
2.2.6 ASTM E2768: Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)
2.2.7 ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
2.2.8 ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials
2.2.9 ASTM G1: Standard Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens
2.2.10 ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing
2.2.11 AWPA E12: Standard Method of Determining Corrosion of Metal in Contact with Treated Wood
2.2.12 NFPA 255: Standard Method of Test of Surface Burning Characteristics of Building Materials

3 PERFORMANCE EVALUATION

3.1 No-Burn® Plus has been evaluated to determine suitability to treat OSB and lumber used in above ground applications. The following scope has been evaluated:

3.1.1 Use where treated materials are left exposed in new or existing construction to achieve the reduced flame spread and smoke developed indices required by the code
3.1.2 Alternative to FRTW as required by IBC Section 2303.2 and IRC Section R317.3 and Section R317.4
3.1.3 Flame spread index and smoke developed index properties as required by IBC Section 2303.2 and Section 1402.5 and IRC Section R302.9 and Section R802.1.5
3.1.4 Performance of No-Burn® Plus over-coated with paint
3.1.5 Water resistance in accordance with ASTM D4585
3.1.6 Use in roofs/attics of structures for elevated temperature and humidity in accordance with IBC Section 2303.2.5.1 and IRC Section R802.1.5.6 for OSB and IBC Section 2303.2.5.2 and IRC Section R802.1.5.7 for lumber
3.1.7 Corrosion resistance of fasteners in contact with treated wood in accordance with IBC Section 2304.10.5 and IRC Section R317.3
3.1.8 Adhesion to the substrate in accordance with ASTM D3359

3.2 Use as a treatment for WSP and lumber species other than those listed in Section 4.5 is outside the scope of this TER.

3.3 Renewal or maintenance requirements for the treated products must follow manufacturer recommendations.

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

3.5 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 2015 IBC Section 1403.5
5 2012 IRC Section R802.1.3
6 2012 IRC Section R802.1.5.1
7 2012 IRC Section R802.1.5.2
8 2012 IBC Section 2304.9.5
4 PRODUCT DESCRIPTION AND MATERIALS

4.1 The label for the product evaluated in this TER is shown in Figure 1.

**FIGURE 1. NO-BURN® PLUS**

4.1 No-Burn® Plus is a water-based, liquid applied, intumescent coating. When exposed to elevated temperatures and flame, it expands and forms a protective char layer.

4.2 The product is packaged in either 5 gallon (18.9 liter) pails or 55 gallon (208 liter) drums.

4.3 No-Burn® Plus has a shelf life of two years when stored in unopened containers between 40°F (4.4°C) and 90°F (32.2°C) and kept out of direct sunlight.

4.4 No-Burn® Plus must be prepared with a power mixer (500-1500 RPM) or equivalent for a minimum of 5 minutes per container prior to application.

4.5 The substrates covered in this TER include the following:

4.5.1 Douglas Fir (DF)
4.5.2 Laminated Strand Lumber (LSL)
4.5.3 Laminated Veneer Lumber (LVL)
4.5.4 Oriented Strand Board (OSB)
4.5.5 Southern Yellow Pine (SYP)

4.6 No-Burn® Plus protected OSB and lumber is acceptable for use in the following AWPA® Use Categories:

4.6.1 UC1 – Interior construction – millwork and finishing
4.6.2 UC2 – Interior construction – interior beams, timbers, flooring, framing, millwork, and sill plates

---

9 These are AWPA designated wood preservation systems and retentions (pressure impregnation processes only) which have been determined to be effective in protecting wood products under specified exposure conditions. The use of No-Burn® Plus fire protective coating, while purposely not included in the AWPA’s specification, satisfies and complies with the intent of the building code and is an equivalent treated material in quality, strength, effectiveness, durability, and safety. Therefore, No-Burn®, Inc. fire protective coating treated wood products 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 IBC Section 104.11 for methods of obtaining “Alternative Materials Approval” via Building Official Authority.
4.7 Minimum coverage rates are specified in Table 1.

<table>
<thead>
<tr>
<th>Product</th>
<th>Substrate</th>
<th>Application Rate</th>
<th>Maximum Moisture Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-Burn® Plus</td>
<td>DF</td>
<td>6 mils wet (4 mils dry) 275 sq. ft. per gallon</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>LSL</td>
<td>10 mils wet (6 mils dry) 160 sq. ft. per gallon</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>LVL</td>
<td>10 mils wet (6 mils dry) 160 sq. ft. per gallon</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>OSB</td>
<td>8 mils wet (5 mils dry) 200 sq. ft. per gallon</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>SYP</td>
<td>10 mils wet (6 mils dry) 160 sq. ft. per gallon</td>
<td>19</td>
</tr>
</tbody>
</table>

5 APPLICATIONS

5.1 No-Burn® Plus is a protective coating for OSB and lumber used in floor, wall, roof, and ceiling framing.

5.1.1 Applications include but are not limited to fire inhibition treatment for beams, columns, headers, joists, studs, and sheathing.

5.2 No-Burn® Plus protected OSB or lumber is suitable for above ground applications not subject to contact with liquid water.

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

5.4 Design

5.4.1 Allowable design stresses for No-Burn® Plus protected OSB and lumber for dry conditions of use are the same as the wood product before treatment in accordance with IBC Section 2303.2.5.

5.4.2 Since No-Burn® Plus is a topically applied coating treatment, not a pressure treatment, the wood is not incised. Therefore, the Incising Factor (NDS Section 4.3.8) is not applicable.

5.4.3 Maximum duration of load design stress increase shall not exceed 1.6. Duration of load design stress increase equal to or less than 1.6 shall be in accordance with NDS Section 2.3.4.

5.4.4 The design provisions for wood construction noted in IBC Section 2302.110 and IRC Section R301.1.3 apply to No-Burn® Plus protected OSB or lumber unless otherwise noted in this TER.

5.4.5 Connections:

5.4.5.1 Lateral loads for nails, screws, bolts, and withdrawal loads for nails and screws installed in No-Burn® Plus protected OSB or lumber shall be in accordance with NDS using the species specific gravity.

5.5 Fire Resistance Properties

5.5.1 OSB or lumber protected by No-Burn® Plus meet the requirements where surface burning and smoke developed index values are required to be tested in accordance with IBC Section 2303.2 and Section 803.1.211 and IRC Section R802.1.512 and Section R302.9 in accordance with ASTM E84 extended 20 minutes and ASTM E2768 (Table 2).

---

10 2015 IBC Section 2301.2
11 2015 IBC Section 803.1.1
12 2012 IRC Section R802.1.3
TABLE 2. SURFACE BURN CHARACTERISTICS$^{1,2,3}$

<table>
<thead>
<tr>
<th>Product</th>
<th>Substrate</th>
<th>Flame Spread</th>
<th>Smoke Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-Burn® Plus</td>
<td>DF</td>
<td>≤ 25</td>
<td>≤ 450</td>
</tr>
<tr>
<td></td>
<td>LSL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LVL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SYP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Tested in accordance with ASTM E84 and ASTM E2768
2. The flame front did not progress more than 10.5 feet beyond the centerline of the burners at any time during the test.
3. No-Burn® Plus may be over coated with paint.

5.6 Water Vapor Transmission

5.6.1 No-Burn® Plus is vapor permeable and has the vapor permeance shown in Table 3. No-Burn® Plus protected OSB or lumber is a Class III vapor retarder in accordance with IBC Section 202.

TABLE 3. VAPOR PERMEANCE$^1$

<table>
<thead>
<tr>
<th>Product</th>
<th>Permeance (perm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-Burn® Plus</td>
<td>5.06</td>
</tr>
</tbody>
</table>

1. Tested in accordance with ASTM E96

5.7 Water Resistance and Durability

5.7.1 No-Burn® Plus does not chip, peel, crack, blister, or delaminate when exposed to high temperature and humidity conditions in accordance with ASTM D4585.

5.7.2 No-Burn® Plus is approved for use in roofs/attics of structures for elevated temperature and humidity in accordance with IBC Section 2303.2.5.2 and IRC Section R802.1.5.7$^{14}$ for lumber.

5.8 Fastener Corrosion

5.8.1 Fasteners used with No-Burn® Plus protected OSB or lumber shall be in accordance with IBC Section 2304.10.5$^{15}$ and IRC Section R317.3.

5.8.2 Common steel, red brass, and aluminum fasteners are approved for use in substrates protected by No-Burn® Plus in accordance with ASTM D610, ASTM G1, ASTM G85, and AWPA E12.

5.9 Chlorinated Polyvinyl Chloride (CPVC) Compatibility

5.9.1 No-Burn® Plus has been tested and found to be compatible with CPVC, causing no detrimental effects. Therefore, No-Burn® Plus is approved for use in long-term contact with CPVC.

6 INSTALLATION

6.1 No-Burn® Plus shall be applied to the substrates in accordance with this TER and the No-Burn®, Inc. instructions by applicators certified by No-Burn®, Inc.

6.2 In the event of a conflict between the manufacturer’s installation instructions and this TER, the more restrictive shall govern.

$^{13}$ 2012 IRC Section R802.1.3.5.1
$^{14}$ 2012 IRC Section R802.1.3.5.2
$^{15}$ 2012 IBC Section 2304.9.5
6.3 Installation Procedure

6.3.1 The substrates that the No-Burn® Plus is applied to shall be clean, dry, and free from loose dirt, debris, grease, oil, or any other materials that would inhibit proper adhesion of No-Burn® Plus, including, but not limited to, any paints, stains, or sealants.

6.3.2 No-Burn® Plus is white in color.

6.3.3 Thickness measurements using a wet film thickness gauge shall be taken, at a minimum, once every 100 ft² (9.29 m²) of surface area during the application of each coat.

6.3.4 The dry mil thickness will be 0.6 to 0.7 times the wet mil thickness.

6.3.5 Apply No-Burn® Plus only to the substrates listed in Section 4.5 in accordance with the assembly selected.

6.3.6 Substrates shall be fully installed prior to application. No significant lag shall exist between application of No-Burn® Plus and installation of weather protection.

6.3.7 Both the substrate surface and the ambient temperature shall be maintained between 40°F (4.4°C) and 100°F (37.7°C) immediately before and during application. Minimum cure time is 24 hours.

6.3.8 Apply the coating at the rate specified in Table 1.

6.3.9 Coating may be applied via roller, brush, or spraying equipment.

6.3.10 After curing, the coating may be over-coated with latex paint per the paint manufacturer’s instructions.

6.3.11 The installation certificate provided in Appendix A shall be completed by the certified applicator and submitted to No-Burn®, Inc. and other interested parties.

7 TEST ENGINEERING SUBSTANTIATING DATA

7.1 All testing performed by ISO/IEC 17025 accredited labs within their scope of accreditation:

7.1.1 Coating thickness measurements

7.1.2 Adhesion testing in accordance with ASTM D4541 and ASTM D3359

7.1.3 Flame spread index and smoke developed index in accordance with ASTM E84, ASTM E2768, and NFPA 255

7.1.4 Vapor transmission testing in accordance with ASTM E96

7.1.5 Water resistance and durability testing in accordance with ASTM D4585

7.1.6 Corrosion testing in accordance with ASTM D610, ASTM G1, ASTM G85, and AWPA E12

7.1.7 CPVC compatibility testing

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.

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 and installed in accordance with this TER and the manufacturer’s installation instructions, the product(s) listed in Section 1.1 is (are) approved for the following:

8.1.1 No-Burn® Plus protection does not affect the allowable design stresses allowed for untreated OSB and lumber.

8.1.2 OSB and lumber protected with No-Burn® Plus meet the requirements where surface burning characteristics are required to be tested by IBC Section 2303.2 and Section 803.1.2\(^\text{16}\) and IRC Section R802.1.5\(^\text{17}\) and Section R302.9 in accordance with ASTM E84 extended 20 minutes, ASTM E2768, and NFPA 255.

8.1.3 No-Burn® Plus meets the required water vapor transmission properties for a Class III vapor retarder.

8.1.4 No-Burn® Plus protected OSB and lumber meet the water resistance requirements of ASTM D4585.

8.1.5 No-Burn® Plus protected OSB and lumber meet the requirements for use in roofs/attics of structures for elevated temperature and humidity in accordance with IBC Section 2303.2.5.1 and IRC Section R802.1.5.6\(^\text{18}\) for OSB and IBC Section 2303.2.5.2 and IRC Section R802.1.5.7\(^\text{19}\) for lumber.

8.1.6 The corrosion rate of steel, red brass, and aluminum fasteners is not increased by the use of No-Burn® Plus treated OSB and lumber and use of other fasteners is in accordance with IBC Section 2304.10.5\(^\text{20}\) and IRC Section R317.3.

8.1.7 The degradation rate of CPVC is not increased by long-term contact with No-Burn® Plus protected OSB and lumber.

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 TER, they are listed here.

8.3.1 No known variations

9 CONDITIONS OF USE

9.1 For field-applied applications, the certified applicator shall provide documentation that the application rate meets the requirements listed in Table 1.

9.2 An installation certificate provided in Appendix A shall be completed by the certified applicator and submitted to No-Burn®, Inc. and other interested parties.

9.3 Application is limited to DF, LSL, LVL, OSB, and SYP.

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

---

\(^{16}\) 2015 IBC Section 803.1.1
\(^{17}\) 2012 IRC Section R802.1.3
\(^{18}\) 2012 IRC Section R802.1.3.5.1
\(^{19}\) 2012 IRC Section R802.1.3.5.2
\(^{20}\) 2012 IBC Section 2304.9.5
9.5 OSB and lumber treated with No-Burn® Plus shall be installed in accordance with the applicable code, the approved construction documents, this TER, and the manufacturer's installation instructions. If there is a conflict between this report and the manufacturer's instructions, the more restrictive shall govern.

9.6 No-Burn® Plus complies with, or is a suitable alternative to, the treatment required for DF, LSL, LVL, OSB, and SYP as permitted by the codes listed in Section 2, subject to the following conditions:

9.6.1 No-Burn® Plus protected OSB and lumber is suitable for above ground applications not subject to continuous contact with liquid water.

9.6.2 Fastener design values shall be determined using the specific gravity of the OSB or lumber species used in the coated product.

9.7 Cutting and notching of No-Burn® Plus coated OSB or lumber 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.

9.8 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.

9.9 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.

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

9.11 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).

9.12 Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

9.13 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.

9.14 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.

9.15 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 The product(s) listed in Section 1.1 are identified by a label on the containers bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.

10.2 The application certificate (Appendix A) shall be completed by the certified applicator and submitted to interested parties upon request.

10.3 Example of the product label for No-Burn® Plus is shown in Figure 1.

10.4 Additional technical information can be found at www.noburn.com.

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.
APPENDIX A

NO-BURN® PRODUCT APPLICATION CERTIFICATE

LOCATION OF BUILDING:

<table>
<thead>
<tr>
<th>Address</th>
<th>Lot #</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
</table>

DESCRIPTION AND USE OF BUILDING:


Certified Applicator Name | Company | Certified Applicator Number

<table>
<thead>
<tr>
<th>Moisture Meter Reading (Max % Noted in Table 1)</th>
<th>Temp Reading (°F)</th>
<th>Describe Area Treated</th>
<th>Size of Area Treated (Surface Area, Sq. Ft.)</th>
<th>Product Applied</th>
<th>Substrate (Noted in Table 1)</th>
<th>Qty. (Wet film thickness)</th>
<th>Date Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Certified Applicator Signature | Date of Service


