DrJ CERTIFICATION

Technical Evaluation Report™

TER 2010-01

No-Burn® Plus Fire Protected OSB and Lumber

No-Burn®, Inc.

Product:

No-Burn® Plus Fire Protected OSB and Lumber

Issue Date:

October 23, 2020

Revision Date:

September 20, 2023

Subject to Renewal:

July 1, 2024

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 05 73 - Fire Retardant Wood Treatment of Wood Products

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 80 00 - Fire and Smoke Protection

SECTION: 07 82 00 - Board Fire Protection

DIVISION: 09 00 00 - FINISHES

SECTION: 09 23 82 - Fire Protected Gypsum Plastering

SECTION: 09 96 43 - Fire-Retardant Coatings

SECTION: 09 96 46 - Intumescent Painting

1 Innovative Product Evaluated[1,2]

1.1 No-Burn® Plus Fire Protected OSB and Lumber

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).

1.1.2 No-Burn® Plus is used as part of a 2-hour fire-rated load bearing wall assembly.

1.1.3 No-Burn® Plus is used as part of an I-joist floor assembly.

[1] For more information, visit drjcertification.org or call us at 608-310-6748.

[2] **Federal Regulation Definition.** 24 CFR 3280.2 "Listed or certified" means included in a list published by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner. **International Building Code (IBC) Definition of Listed.** Equipment, materials, products or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose Listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. **IBC Definition of Labeled**. Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

2 Applicable Codes and Standards[3,4]

2.1 *Codes*

2.1.1 *IBC—15, 18, 21: International Building Code®*

2.1.2 *IRC—15, 18, 21: International Residential Code®*

2.1.3 *IFC—15, 18, 21: International Fire Code®*

2.1.4 *IMC-15, 18, 21: International Mechanical Code®*

2.2 *Standards and Referenced Documents*

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

2.2.2 *ASTM D610: Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces*

2.2.3 *ASTM D3359: Standard Test Methods for Rating Adhesion by Tape Test*

2.2.4 *ASTM D4541: Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers*

2.2.5 *ASTM D4585: Standard Practice for Testing Water Resistance of Coatings Using Controlled Condensation*

2.2.6 *ASTM D8391: Standard Specification for Demonstrating Equivalent Fire Performance for Wood-Based Floor Framing Members to Unprotected 2 by 10 Dimension Lumber or Equal-Sized Structural Composite Lumber*

2.2.7 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

2.2.8 *ASTM E96: Standard Test Methods for Gravimetric Determination of Water Vapor Transmission of Materials*

2.2.9 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

2.2.10 *ASTM E2768: Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)*

2.2.11 *ASTM G1: Standard Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens*

2.2.12 *ASTM G85: Standard Practice for Modified Salt Spray (Fog) Testing*

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

2.2.14 *IAPMO EC 017: Evaluation Criteria for Field-Applied Fire Protective Coatings*

2.2.15 *NFPA 255: Standard Method of Test of Surface Burning Characteristics of Building Materials*

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[3] This Listing is a code defined research report, which is also known as a duly authenticated report, provided by an approved agency (see IBC Section 1703.1) and/or an approved source (see IBC Section 1703.4.2). An approved agency is "approved" when it is ANAB accredited. DrJ Engineering, LLC (DrJ) is listed in the ANAB directory). A professional engineer is "approved" as an approved source when that professional engineer is properly licensed to transact engineering commerce. Where sealed by a professional engineer, it is also a duly authenticated report certified by an approved source. (i.e., Registered Design Professional). DrJ is an ANAB accredited product certification body.

[4] Unless otherwise noted, all references in this Listing are from the 2021 version of the codes and the standards referenced therein. This material, product, design, service and/or method of construction also complies with the 2000-2021 versions of the referenced codes and the standards referenced therein.

3 Performance Evaluation

3.1 Tests, testing, test reports, research reports, duly authenticated reports and related engineering evaluations are defined as intellectual property and/or trade secrets and protected by Defend Trade Secrets Act 2018 (DTSA).[5]

3.2 Testing and/or inspections conducted for this TER were performed an ISO/IEC 17025 accredited testing laboratory,[6] an ISO/IEC 17020 accredited inspection body,[7] which are internationally recognized accreditations through International Accreditation Forum (IAF), and/or a licensed Registered Design Professional (RDP).

3.3 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:

3.3.1 Use as part of a 2-hour fire-rated wall assembly tested in accordance with ASTM E119, and in accordance with IBC Section 703.2, IBC Section 602.1, IBC Section 704.10 and IBC Section 705.5.

3.3.2 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.

3.3.3 Alternative to FRTW as required by IBC Section 2303.2, IRC Section R317.3 and IRC Section R317.4.

3.3.4 Flame spread index and smoke developed index properties as required by IBC Section 2303.2, IBC Section 1402.5,[8] IRC Section R302.9, IRC Section R802.1.5 and IMC Section 602.2.

3.3.5 Performance of No-Burn® Plus over-coated with paint.

3.3.6 Performance for use in floor assemblies providing equivalent fire performance to 2x 10 untreated floor assemblies in accordance with IRC Section R302.13, Exception 4.

3.3.7 Water resistance in accordance with ASTM D4585.

3.3.8 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.

3.3.9 Corrosion resistance of fasteners in contact with treated wood in accordance with IBC Section 2304.10.6[9] and IRC Section R317.3.

3.3.10 Adhesion to the substrate in accordance with ASTM D3359.

3.4 Use as a treatment for wood structural panels (WSP) and lumber species other than those listed in Section 4.6 is outside the scope of this TER.

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

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[5] https://www.law.cornell.edu/uscode/text/18/part-I/chapter-90. Given our professional duty to inform, please be aware that whoever, with intent to convert a trade secret (TS), that is related to a product or service used in or intended for use in interstate or foreign commerce, to the economic benefit of anyone other than the owner thereof, and intending or knowing that the offense will, injure any owner of that trade secret, knowingly without authorization copies, duplicates, sketches, draws, photographs, downloads, uploads, alters, destroys, photocopies, replicates, transmits, delivers, sends, mails, communicates, or conveys such information; shall be fined under this title or imprisoned not more than 10 years, or both. Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. As the National Society of Professional Engineers states, “Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve.” Therefore, to protect intellectual property (IP) and TS, and to achieve compliance with public records and trade secret legislation, requires approval through the use of Listings, certified reports, technical evaluation reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

[6] Internationally recognized accreditations are performed by members of the International Accreditation Forum (IAF). Accreditation Body and Regional Accreditation Group Members of IAF are admitted to the IAF MLA only after a stringent evaluation of their operations by a peer evaluation team, which is charged to ensure that the applicant complies fully with both international standards and IAF requirements. Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope.

[7] Ibid.

[8] 2015 IBC Section 1403.5

[9] 2018 IBC Section 2304.10.5

3.6 Any building code and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ Engineering, LLC (DrJ), an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDPs / approved sources. DrJ is qualified[10] to practice product and code compliance services within its scope of accreditation and engineering expertise, respectively.

3.7 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope, which are also its areas of professional engineering competence.

3.8 Any regulation specific issues not addressed in this section are outside the scope of this TER.

4 Product Description and Materials

4.1 The innovative product evaluated in this TER is shown in Figure 1.

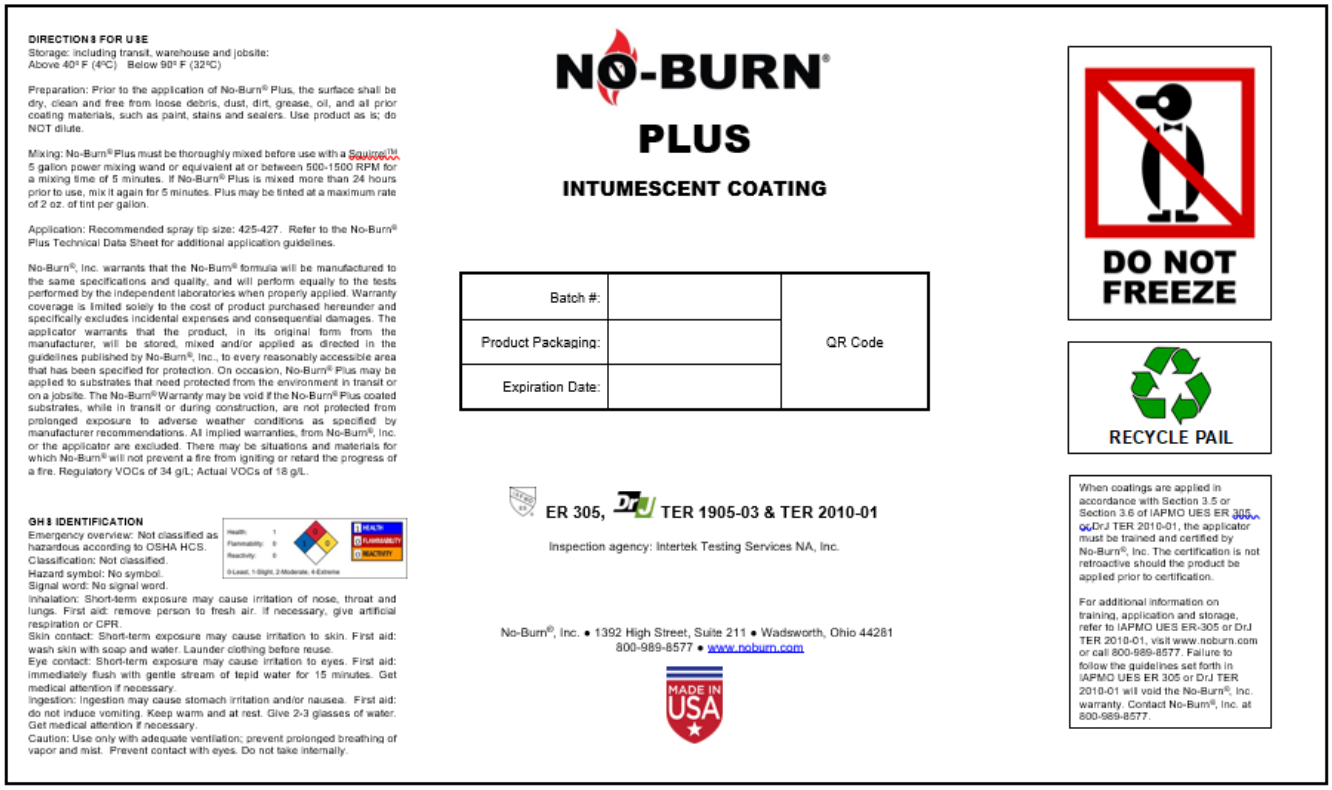

Figure 1. No-Burn® Plus

4.2 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.

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

4.4 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.

4.5 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.

4.6 The substrates covered in this TER include the following:

4.6.1 Douglas Fir (DF)

[10] Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

4.6.2 Laminated Strand Lumber (LSL)

4.6.3 Laminated Veneer Lumber (LVL)

4.6.4 Oriented Strand Board (OSB)

4.6.5 Southern Yellow Pine (SYP)

4.6.6 Huber Engineered Woods ZIP SYSTEM® (ZIP SYSTEM)

4.7 No-Burn® Plus protected OSB and lumber is acceptable for use in the following AWPA[11] Use Categories:

4.7.1 UC1 – Interior construction – millwork and finishing

4.7.2 UC2 – Interior construction – interior beams, timbers, flooring, framing, millwork, and sill plates

4.8 Minimum coverage rates are specified in Table 1, Table 3, Table 4, and Table 5.

Table 1. Surface Burn Characteristics Minimum Coverage Rates

Product	Substrate	Application Rate	Maximum Moisture Content (%)
No-Burn® Plus	DF	6 mils wet (4 mils dry) 275 sq. ft. per gallon	19
	LSL	10 mils wet (6 mils dry) 160 sq. ft. per gallon	16
	LVL	10 mils wet (6 mils dry) 160 sq. ft. per gallon	16
	OSB	8 mils wet (5 mils dry) 200 sq. ft. per gallon	16
	SYP	10 mils wet (6 mils dry) 160 sq. ft. per gallon	19
	ZIP SYSTEM	10 mils wet (6 mils dry) 160 sq. ft. per gallon	N/A
SI: 1 in = 25.4 mm			

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, inclusive of Huber Engineered Wood ZIP SYSTEM® sheathing, and the creation of a fire resistance rated wall assembly when applied to framing and the inside face of exterior 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.

[11] 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, fire resistance, durability, and safety. Therefore, No-Burn®, Inc. fire protective coating treated wood 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 IBC Section 104.11 for methods of obtaining "Alternative Materials Approval" via Building Official Authority.

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 2302.1[12] 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 Performance*

5.5.1 *Flame Spread and Smoke Developed Indexes:*

5.5.1.1 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, IBC Section 803.1.2,[13] IRC Section R802.1.5, IRC Section R302.9 and IMC Section 602.2 in accordance with ASTM E84 extended 20 minutes and ASTM E2768 (Table 2).

Table 2. Surface Burn Characteristics[1,2,3]

Product	Substrate	Flame Spread	Smoke Developed
No-Burn® Plus	DF	≤ 25	≤ 50
	LSL		
	LVL		
	OSB		
	SYP		
	ZIP SYSTEM®		

1. Tested in accordance with ASTM E84, extended 20 minutes 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.

[12] 2015 IBC Section 2301.2

[13] 2015 IBC Section 803.1.1

5.5.2 *Fire Resistance*

5.5.2.1 2-Hour Fire Resistance

5.5.2.2 The No-Burn® Plus coated load bearing wall assembly described in Figure 2 and Table 2 met the requirements for a 120-minute fire resistance rating when tested in accordance with ASTM E119, and in accordance with IBC Section 703.2, IBC Section 602.1, IBC Section 704.10 and IBC Section 705.5.

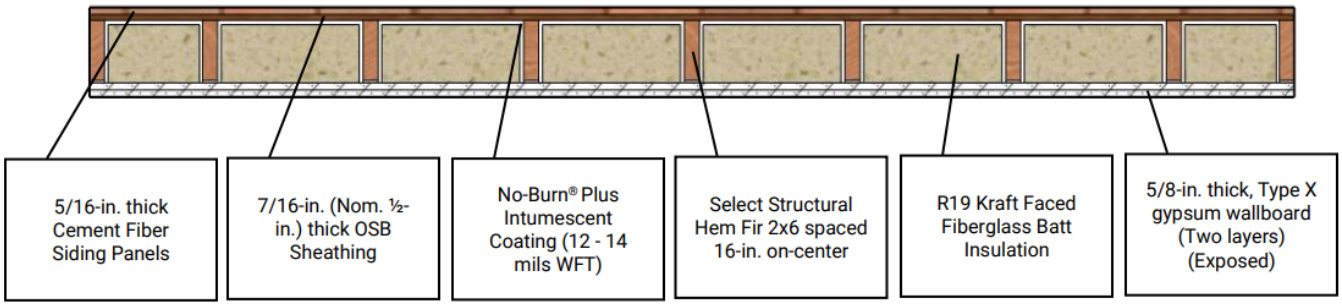

Figure 2. No-Burn® Plus 120 minute Fire Resistance Rated Wall Assembly

5.5.2.3 Prior to installation of the insulation, No-Burn® Plus was applied at a wet film thickness of 12 – 14 mils to the three exposed sides of the studs and blocking and to the sheathing.

Table 3. No-Burn® Plus 120-Minute Fire Resistance Rated Wall Assembly Detail[1]

Wall Component		Fastening Schedule
Interior Sheathing	$^5/_8$ inch thick Type X gypsum Wallboard, two layers	#6 x $1^5/_8$ in, coarse thread, bugle head drywall screw, 8:12 spacing
Insulation	R19 Kraft faced fiberglass batt	T50 x ½ in crown staples, 8 in o.c. spacing
No-Burn® Plus	12 – 14 mil wet film thickness	N/A
Framing	2x6 HF/DF/SYP 16 in o.c., double top plate, single bottom plate, blocking installed 24 in edge-to-center from the bottom plate and double top plate	3in x 0.131 in smooth shank framing nails
Exterior Sheathing	$^7/_{16}$ in OSB	$2^3/_8$ in x 0.113 in ring shank exterior nail, 6:12 spacing
Exterior Cladding	$^5/_{16}$ in thick fiber cement siding panels	$2^3/_8$ in x 0.113 in ring shank exterior nail, 8:12 spacing

SI: 1 lb = 4.45 N

1. Wall assembly tested in accordance with ASTM E119.
2. No-Burn® Plus may be over coated with paint.

5.5.3 *Equivalent Fire Resistance for Engineered Wood Framing:*

5.5.3.1 I-Joist floor assemblies utilizing No-Burn® Plus applied on both sides of the I-joist and the underside of the $^{23}/_{32}$ inch thick tongue and groove oriented strand board (OSB) subfloor after floor assembly installation have been tested for equivalence to nominal 2 x 10 dimension lumber as permitted by IRC Section R302.13, exception 4. Construction must be in accordance with Table 4 and IRC Table R602.3(1).

Table 4. I-Joist and Underfloor Coated Fire Resistance[1]

I-Joist Type	Minimum Design Values							No-Burn® Plus Application
	Maximum Moisture Content	Minimum Depth (in)	Flange Depth and Width (in)	Web Thickness (in)	Vertical Shear (lbs)	Moment (ft-lbs)	EI x 10^6 (in^2-lbs)	
Solid Sawn Flange	16%	$9^1/_2$	$1^1/_2$ x 2	$^3/_8$	1475	2725	170	15 mils wet (9 mils dry) 107 sq. ft. per gallon
Structural Composite Lumber Flange			$1^1/_8$ x 2					
		$11^7/_8$	$1^1/_8$ x 1 ¼		1625	3025	260	

1. Tested in accordance with ASTM D8391, ASTM E119 and IAPMO EC 017.
2. No-Burn® Plus may be over coated with paint.

5.5.3.2 I-Joist floor assemblies utilizing No-Burn® Plus applied on both sides of the I-joist only after floor assembly installation have been tested for equivalence to nominal 2 x 10 dimension lumber as permitted by IRC Section R302.13, exception 4. Construction must be in accordance with Table 5 and IRC Table R602.3(1).

Table 5. I-Joist Coated Fire Resistance[1]

I-Joist Type	Minimum Design Values							No-Burn® Plus Application
	Maximum Moisture Content	Minimum Depth (in)	Flange Depth and Width (in)	Web Thickness (in)	Vertical Shear (lbs)	Moment (ft-lbs)	EI x 10^6 (in^2-lbs)	
Solid Sawn Flange	16%	$9^1/_2$	$1^1/_2$ x $2^1/_2$	$^3/_8$	1185	2800	198	23 mils wet (14 mils dry) 70 sq. ft. per gallon
Structural Composite Lumber Flange		$11^7/_8$	$1^1/_8$ x $1^3/_4$		1625	3025	260	

1. Tested in accordance with ASTM D8391, ASTM E119 and IAPMO EC 017.
2. 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 6. No-Burn® Plus protected OSB or lumber is a Class III vapor retarder in accordance with IBC Section 202.

Table 6. Vapor Permeance[1]

Product	Permeance (perm)
No-Burn® Plus	5.06
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 2303.2.5.1 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.

5.8 *Fastener Corrosion*

5.8.1 Fasteners used with No-Burn® Plus protected OSB or lumber shall be in accordance with IBC Section 2304.10.6[14] 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.

5.10 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science, and fire science.

6 Installation

6.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this TER and the applicable building code.

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

6.3 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.

6.4 *Installation Procedure*

6.4.1 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.

6.4.2 No-Burn® Plus is white in color.

6.4.3 Thickness measurements using a wet film thickness gauge shall be taken, at a minimum, once every 100 ft^2 (9.29 m^2) of surface area during the application of each coat.

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

[14] 2018 IBC Section 2304.10.5

6.4.5 Apply No-Burn® Plus only to the substrates listed in Section 4.6

6.4.5.1 No-Burn® Plus is also permitted to be used with Hem-Fir studs as permitted in Table 3 for use in a 2-hour fire rated assembly.

6.4.6 No significant lag shall exist between application of No-Burn® Plus and installation of weather protection.

6.4.7 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.

6.4.8 Apply the coating at the rate specified in Table 1, Table 3, Table 4, or Table 5 as determined by the application.

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

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

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

7 Substantiating Data

7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

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 Fire resistance testing in accordance with ASTM E119.

7.1.5 Vapor transmission testing in accordance with ASTM E96.

7.1.6 Water resistance and durability testing in accordance with ASTM D4585.

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

7.1.8 CPVC compatibility testing.

7.1.9 Equivalent Fire Performance for Engineered Wood Framing in accordance with ASTM D8391, ASTM E119 and EC 017.

7.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies (i.e., ANAB accredited agencies), approved sources (i.e., RDPs), and/or professional engineering regulations. Accuracy of external test data and resulting analysis is relied upon.

7.3 Where pertinent, testing and/or engineering analysis is based upon provisions that have been codified into law through state or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ's engineering practice may use a code-adopted provision as the control sample. A control sample versus a test sample establishes a product as being equivalent to the code-adopted provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

7.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this TER, may be dependent upon published design properties by others.

7.5 Testing and engineering analysis: The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[15]

7.6 Where additional condition of use and/or code compliance information is required, please search for No-Burn® Plus Fire Protected OSB and Lumber on the DrJ Certification website.

8 Findings

8.1 As delineated in Section 3, No-Burn® Plus Fire Protected OSB and Lumber has performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.

8.2 When used and installed in accordance with this TER and the manufacturer installation instructions, No-Burn® Plus Fire Protected OSB and Lumber shall be approved for the following applications:

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

8.2.2 The No-Burn® Plus coated load bearing wall assembly described in Figure 2 and Table 3 meet the requirements for a 120-minute fire resistance rating when tested in accordance with ASTM E119, and in accordance with IBC Section 703.2, IBC Section 602.1, IBC Section 704.10 and IBC Section 705.5.

8.2.3 No-Burn® Plus coated I-joist assemblies in Section 5.5.3.1 and Section 5.5.3.2 meet the requirements for fire resistance when tested in accordance with ASTM D8391, ASTM E119, IAPMO EC 017, and in accordance with IRC Section R302.13, Exception 4.

8.2.4 OSB and lumber protected with No-Burn® Plus meet the requirements where surface burning characteristics are required to be tested in accordance with ASTM E84 extended 20 minutes, ASTM E2768, and NFPA 255, and in accordance with IBC Section 2303.2, IBC Section 803.1.2,[16] IRC Section R802.1.5 and IRC Section R302.9.

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

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

8.2.7 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 for OSB and IBC Section 2303.2.5.2 and IRC Section R802.1.5.7 for lumber.

8.2.8 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 2304.10.6[17] and IRC Section R317.3.

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

8.2.10 No-Burn® Plus protected floor systems built in accordance with Section 5.5.3 of this TER provide equivalent Fire Performance for Engineered Wood Framing in accordance with ASTM D8391, ASTM E119 and EC 017.

8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from No-Burn®, Inc.

[15] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition.

[16] 2015 IBC Section 803.1.1

[17] 2018 IBC Section 2304.10.5

8.4 IBC Section 104.11 (IRC Section R104.11 and IFC Section 104.10[18] are similar) in pertinent part 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. 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.

8.5 **Approved**:[19] Building codes require that the building official shall accept duly authenticated reports[20] or research reports[21] from approved agencies and/or approved sources (i.e., licensed RDP) with respect to the quality and manner of use of new products, materials, designs, services, assemblies, or methods of construction.

8.5.1 Acceptability of an approved agency, by a building official, is performed by verifying that the agency is accredited by a recognized accreditation body of the International Accreditation Forum (IAF).

8.5.2 Acceptability of a licensed RDP, by a building official, is performed by verifying that the RDP and/or their business entity is listed by the licensing board of the relevant jurisdiction.

8.5.3 Federal law, Title 18 US Code Section 242, requires that where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved, as denial without written reason deprives a protected right to free and fair competition in the marketplace.

8.6 DrJ is an engineering company, employs RDPs and is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131.

8.7 Through ANAB accreditation and the IAF Multilateral Agreements, this TER 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*." IAF specifically says, "*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope*."[22]

9 Conditions of Use

9.1 Material properties shall not fall outside the boundaries defined in Section 3.

9.2 As defined in Section 3, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

9.3 For field-applied applications, the certified applicator shall provide documentation that the application rate meets the requirements listed in Table 1, Table 3, Table 4, or Table 5 as applicable.

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

9.5 Application is limited to the substrates listed in Table 1, Table 3, Table 4, and Table 5.

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

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[18] 2018 IFC Section 104.9

[19] Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[20] https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1707.1

[21] https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1703.4.2

[22] https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise

9.7 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 installation instructions. If there is a conflict between this report and the manufacturer instructions, the more restrictive shall govern.

9.8 No-Burn® Plus complies with, or is a suitable alternative to, the treatment required for engineered wood as permitted by the codes listed in Section 2, subject to the following conditions:

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

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

9.9 Cutting and notching of No-Burn® Plus coated OSB or lumber is permitted where allowed by the applicable building code, the manufacturer recommendations, this TER, or where the effects of such alterations are specifically considered in the design of the member by an RDP.

9.10 When No-Burn® Plus is used on I-joists as shown in Section 5.5.3, it must be applied before the installation of other components such as electrical or plumbing equipment.

9.11 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.

9.12 When required by adopted legislation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:

9.12.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when requirements of adopted legislation are met.

9.12.2 This TER and the installation instructions shall be submitted at the time of permit application.

9.12.3 This innovative product has an internal quality control program and a third-party quality assurance program.

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

9.12.5 The review of this TER, by the AHJ, shall be in compliance with IBC Section 104 and IBC Section 105.4.

9.12.6 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.4, IBC Section 110.4, IBC Section 1703, IRC Section R104.4 and IRC Section R109.2.

9.12.7 The application of this innovative product in the context of this TER is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2 and any other regulatory requirements that may apply.

9.13 The approval of this TER by the AHJ shall comply with IBC Section 1707.1, where legislation states in pertinent part, "*the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11*", all of IBC Section 104, and IBC Section 105.4.

9.14 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 (i.e., owner or RDP).

9.15 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.

10 Identification

10.1 The innovative product listed in Section 1.1 is identified by a label on the board or packaging material bearing the manufacturer name, product name, TER number, and other information to confirm code compliance.

10.2 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, visit drjcertification.org.

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

12 Approved for Use Pursuant to US and International Legislation Defined in Appendix A

12.1 No-Burn® Plus Fire Protected OSB and Lumber are included in this TER published by an approved agency that is concerned with evaluation of products or services, maintains periodic inspection of the production of listed materials or periodic evaluation of services, and whose TER Listing states either that the material, product, or service meets identified standards or has been tested and found suitable for a specified purpose. This TER meets the legislative intent and definition of being acceptable to the AHJ.

Appendix A

1 Legislation that Authorizes AHJ Approval

1.1 **Fair Competition**: State legislatures have adopted Federal regulations for the examination and approval of building code referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:

1.1.1 Advance Innovation,

1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, and

1.1.3 Benefit consumers through lower prices, better quality, and greater choice.

1.2 **Adopted Legislation**: The following local, state, and federal regulations affirmatively authorize No-Burn® Plus Fire Protected OSB and Lumber to be approved by AHJs, delegates of building departments, and/or delegates of an agency of the federal government:

1.2.1 Interstate commerce is governed by the Federal Department of Justice to encourage the use of innovative products, materials, designs, services, assemblies and/or methods of construction. The goal is to "protect economic freedom and opportunity by promoting free and fair competition in the marketplace."

1.2.2 Title 18 US Code Section 242 affirms and regulates the right of individuals and businesses to freely and fairly have new products, materials, designs, services, assemblies and/or methods of construction approved for use in commerce. Disapproval of alternatives shall be based upon non-conformance with respect to specific provisions of adopted legislation, and shall be provided in writing stating the reasons why the alternative was not approved, with reference to the specific legislation violated.

1.2.3 The federal government and each state have a public records act. In addition, each state also has legislation that mimics the federal Defend Trade Secrets Act 2018 (DTSA).

1.2.3.1 Compliance with public records and trade secret legislation requires approval through the use of listings, certified reports, Technical Evaluation Reports, duly authenticated reports and/or research reports prepared by approved agencies and/or approved sources.

1.2.4 For new materials[23] that are not specifically provided for in any building code, the design strengths and permissible stresses shall be established by tests, where suitable load tests simulate the actual loads and conditions of application that occur.

1.2.5 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design using accepted engineering practice.[24]

1.2.6 The commerce of approved sources (i.e., registered PEs) is regulated by professional engineering legislation. Professional engineering commerce shall always be approved by AHJs, except where there is evidence, provided in writing, that specific legislation has been violated by an individual registered PE.

1.2.7 The AHJ shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in IBC Section 104.11.[25]

[23] https://up.codes/viewer/wyoming/ibc-2021/chapter/17/special-inspections-and-tests#1706.2

[24] IBC 2021, Section 1706.1 Conformance to Standards

[25] IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General

1.3 **Approved**[26] **by Los Angeles**: The Los Angeles Municipal Code (LAMC) states in pertinent part that the provisions of LAMC are not intended to prevent the use of any material, device, or method of construction not specifically prescribed by LAMC. The Department shall use Part III, Recognized Standards in addition to Part II, Uniform Building Code Standards of Division 35, Article 1, Chapter IX of the LAMC in evaluation of products for approval where such standard exists for the product or the material and may use other approved standards, which apply. Whenever tests or certificates of any material or fabricated assembly are required by Chapter IX of the LAMC, such tests or certification shall be made by a testing agency approved by the Superintendent of Building to conduct such tests or provide such certifications. The testing agency shall publish the scope and limitation(s) of the listed material or fabricated assembly.[27] The Superintendent of Building roster of approved testing agencies is provided by the Los Angeles Department of Building and Safety (LADBS). The Center for Building Innovation (CBI) Certificate of Approval License is TA24945. Tests and certifications found in a CBI Listing are LAMC approved. In addition, the Superintendent of Building shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the California Building Code (CBC) Section 1707.1.[28]

1.4 **Approved by Chicago**: The Municipal Code of Chicago (MCC) states in pertinent part that an Approved Agency is a Nationally Recognized Testing Laboratory (NRTL) acting within its recognized scope and/or a certification body accredited by the American National Standards Institute (ANSI) acting within its accredited scope. Construction materials and test procedures shall conform to the applicable standards listed in the MCC. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material, service, design, assembly and/or method of construction not specifically provided for in the MCC. This technical data shall consist of research reports from approved sources (i.e., MCC defined Approved Agencies).

1.5 **Approved by New York City**: The NYC Building Code 2022 (NYCBC) states in pertinent part that an approved agency shall be deemed[29] an approved testing agency via ISO/IEC 17025 accreditation, an approved inspection agency via ISO/IEC 17020 accreditation, and an approved product evaluation agency via ISO/IEC 17065 accreditation. Accrediting agencies, other than federal agencies, must be members of an internationally recognized cooperation of laboratory and inspection accreditation bodies subject to a mutual recognition agreement[30] (i.e., ANAB, International Accreditation Forum (IAF), etc.).

1.6 **Approved by Florida**: Statewide approval of products, methods, or systems of construction shall be approved, without further evaluation, by 1) A certification mark or listing of an approved certification agency, 2) A test report from an approved testing laboratory, 3) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, from an approved product evaluation entity; 4) A product evaluation report based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a professional engineer or architect, licensed in Florida. For local product approval, products or systems of construction shall demonstrate compliance with the structural wind load requirements of the Florida Building Code (FBC) through one of the following methods; 1) A certification mark, listing, or label from a commission-approved certification agency indicating that the product complies with the code; 2) A test report from a commission-approved testing laboratory indicating that the product tested complies with the code; 3) A product-evaluation report based upon testing, comparative or rational analysis, or a combination thereof, from a commission-approved product evaluation entity which indicates that the product evaluated complies with the code; 4) A product-evaluation report or certification based upon testing or comparative or rational analysis, or a combination thereof, developed and signed and sealed by a Florida professional engineer or Florida registered architect, which indicates that the product complies with the code; 5) A statewide product approval issued by the Florida Building Commission. The Florida Department of Business and Professional Regulation (DBPR) website provides a listing of companies certified as a Product Evaluation Agency (i.e., EVLMiami 13692), a Product Certification Agency (i.e., CER10642), and as a Florida Registered Engineer (i.e., ANE13741).

[26] See Section 8 for the distilled building code definition of **Approved**

[27] Los Angeles Municipal Code, SEC. 98.0503. TESTING AGENCIES

[28] https://up.codes/viewer/california/ca-building-code-2022/chapter/17/special-inspections-and-tests#1707.1

[29] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

[30] New York City, The Rules of the City of New York, § 101-07 Approved Agencies

1.7 **Approved by Miami-Dade County (i.e., Notice of Acceptance [NOA])**: A Florida statewide approval is an NOA. An NOA is a Florida local product approval. By Florida law, Miami-Dade County shall accept the statewide and local Florida Product Approval as provided for in Florida legislation 553.842 and 553.8425.

1.8 **Approved by New Jersey**: Pursuant to Building Code 2018 of New Jersey in IBC Section 1707.1 General,[31] it states: "In the absence of approved rules or other approved standards, the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in the administrative provisions of the Uniform Construction Code (N.J.A.C. 5:23)".[32] Furthermore N.J.A.C 5:23-3.7 states: Municipal approvals of alternative materials, equipment, or methods of construction. **(a) Approvals**: Alternative materials, equipment, or methods of construction shall be approved by the appropriate subcode official provided the proposed design is satisfactory and that the materials, equipment, or methods of construction are suitable for the intended use and are at least the equivalent in quality, strength, effectiveness, fire resistance, durability and safety of those conforming with the requirements of the regulations. 1. A field evaluation label and report or letter issued by a nationally recognized testing laboratory verifying that the specific material, equipment, or method of construction meets the identified standards or has been tested and found to be suitable for the intended use, shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. 2. Reports of engineering findings issued by nationally recognized evaluation service programs, such as, but not limited to, the Building Officials and Code Administrators (BOCA), the International Conference of Building Officials (ICBO), the Southern Building Code Congress International (SBCCI), the International Code Council (ICC), and the National Evaluation Service, Inc., shall be accepted by the appropriate subcode official as meeting the requirements of (a) above. The New Jersey Department of Community Affairs has confirmed that technical evaluation reports, from any accredited entity listed by ANAB, meets the requirements of item 2 given that the listed entities are no longer in existence and/or do not provide "reports of engineering findings".

1.9 **Approved by the Code of Federal Regulations Manufactured Home Construction and Safety Standards**: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[33] and Part 3280,[34] the Department encourages innovation and the use of new technology in manufactured homes. The design and construction of a manufactured home shall conform with the provisions of Part 3282 and Part 3280 where key approval provisions in mandatory language follow: 1) "All construction methods shall be in conformance with accepted engineering practices"; 2) "The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate the actual loads and conditions of application that occur."; and 3) "The design stresses of all materials shall conform to accepted engineering practice."

1.10 **Approval by US, Local, and State Jurisdictions in General**: In all other local and state jurisdictions, the adopted building code legislation states in pertinent part that:

1.10.1 For new materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests.[35]

1.10.2 For innovative alternative products, materials, designs, services and/or methods of construction, in the absence of approved rules or other approved standards…the building official shall accept duly authenticated reports (i.e., listing and/or research report) from approved agencies with respect to the quality and manner of use of new materials or assemblies.[36] A building official approved agency is deemed to be approved via certification from an accreditation body that is listed by the International Accreditation Forum[37] or equivalent.

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[31] https://up.codes/viewer/new_jersey/ibc-2018/chapter/17/special-inspections-and-tests#1707.1

[32] https://www.nj.gov/dca/divisions/codes/codreg/ucc.html

[33] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

[34] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[35] IBC 2021, Section 1706 Design Strengths of Materials, 1706.2 New Materials. Adopted law pursuant to IBC model code language 1706.2.

[36] IBC 2021, Section 1707 Alternative Test Procedure, 1707.1 General. Adopted law pursuant to IBC model code language 1707.1.

[37] Please see the ANAB directory for building official approved agencies.

1.10.3 The design strengths and permissible stresses of any structural material…shall conform to the specifications and methods of design of accepted engineering practice performed by an approved source.[38] An approved source is defined as a PE subject to professional engineering laws, where a research and/or a technical evaluation report certified by a PE, shall be approved.

1.11 **Approval by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements:

1.11.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,

1.11.2 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

1.11.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.

1.11.4 **Approved**: The purpose of the IAF MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories to the MLA, and subsequently acceptance of accredited certification and validation/verification statements in many markets based on one accreditation for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.

[38] IBC 2021, Section 1706 Design Strengths of Materials, Section 1706.1 Conformance to Standards Adopted law pursuant to IBC model code language 1706.1.

Appendix B

NO-BURN® PRODUCT APPLICATION CERTIFICATE

LOCATION OF BUILDING:

Address **Lot #** **City** **State** **Zip**

DESCRIPTION AND USE OF BUILDING:

Certified Applicator Name **Company** **Certified Applicator Number**

Moisture Meter Reading (Max % Noted in Table 1 & Table 3)	**Temp Reading** (°F)	**Describe Area Treated**	**Size of Area Treated** (Surface Area, Sq. Ft.)	**Product Applied**	**Substrate** (Noted in Table 1 & Table 3)	**Qty.** (Wet film thickness)	**Date Applied**

Certified Applicator Signature **Date of Service**