Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report No: 1510-01

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TechWood TW4400 Fire Retardant and Preservative Treated Wood Protection

Trade Secret Report Holder:

Chemical Technologies Holding Corporation

20533 Biscayne Blvd Ste 4-629
Aventura, FL 33180-1529
Phone: 772-242-8939
Website: www.techwoodtreatments.com
Email: info@chemtechholding.com

Additional Listees:

Chemical Technologies Holding Inc
7397 Commercial Cir Ste 1
Fort Pierce, FL 34951-4119

K&K Industries Inc
8518 E 550N
Montgomery, IN 47558
Website: www.kktruss.com

Wood Treatment Services of Virginia LLC
17320 Washington Hwy
Doswell, VA 23047

Rehkemper & Son Inc
17817 St Rose Rd
Breese, IL 62230

Turnkey Lumber Inc
179 NH Route 12N
Fitzwilliam, NH 03447

Empire Building Materials Inc
35550 Frontage R
Bozeman, MT 59715

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

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

Section: 06 17 00 - Shop-Fabricated Structural Wood

Section: 06 11 00 - Wood Framing

1 Innovative Product Evaluated[1]

1.1 TechWood 4400 (TW4400)

1.1.1 This product is intended for use when fire retardant treated lumber is required by the applicable code.

2 Product Description and Materials

2.1 The innovative product evaluated in this report is shown in **Figure 1** and **Figure 2**.

Figure 1. TechWood 4400 (TW4400) Product

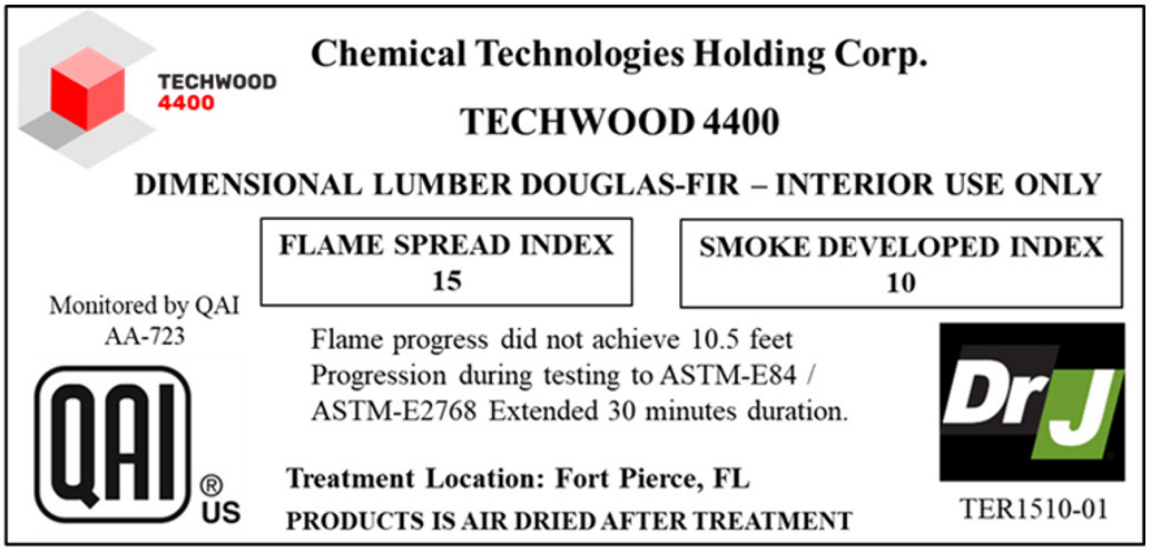

Figure 2. Example of Acceptable TechWood 4400 (TW4400) Product Stamp

2.2 TechWood 4400 is a factory treated wood protection that uses a proprietary formulation of Disodium Octaborate Tetrahydrate (DOT), biocides for mold abatement, and fire-retardant additives to permanently impregnate various wood substrates.

2.2.1 TechWood 4400 is not a coating application as the term coating is used in the context of its use in IBC Chapter 2, and is not a paint or stain pursuant to IBC Chapter 2, where there is no contextual definition.

2.3 The wood products covered in this report include:

2.3.1 Kiln Dried or Green dimensional lumber and timber species up to thirty percent (30%) moisture content, including:

2.3.1.1 Spruce-Pine-Fir (SPF)

2.3.1.2 Hem-Fir (HF)

2.3.1.3 Douglas Fir (DF)

2.3.1.4 Southern Pine (SP)

2.3.1.5 Glued Laminated Beams (GLB) manufactured from Douglas Fir

2.3.1.6 Southern Pine (SP) Plywood

2.3.1.7 DF Laminated Veneer Lumber (LVL)

2.4 TechWood 4400 products have 4-fold protection against mold, fungal, termite, and fire. For SPF, HF, and DF lumber, DF LVL, and DF GLB, this is a one-step treatment process with the final retention rate of the products listed in **Table 1**. For SP lumber, SP plywood panels undergo a two-step treatment process of FRC12 (fire protection) and then TW2200 (mold, fungal, termite, and fire protection) with the final retention rate of the products listed in **Table 1**. The combination of both FRC12 and TW2200 comprise the TW4400 product.

Table 1. Retention Levels for TechWood 4400 products

Product	Wood Products Covered	Final Retention Level
TW4400 Fire Retardant and Preservative Treated Wood Protection	SPF, HF, DF Lumber	11.5 g/ft^2
	SP Lumber	23 g/ft^2(FRC12) + 11.5 g/ft^2 (TW2200)
	SP Plywood	57.6 g/ft^2(FRC12) + 11.5 g/ft^2 (TW2200)
	DF LVL	36.4 g/ft^2
	DF GLB	11.5 g/ft^2

2.5 TechWood 4400 protected products are acceptable for use in the following AWPA Use Categories:

2.5.1 UC1 – Interior/Dry – millwork and finishing

2.5.2 UC2 – Interior/Damp – interior beams, timbers, flooring, framing, millwork and sill plates

2.5.3 UC3A – Above Ground (Exterior) Protected – coated millwork, siding and trim

2.6 TechWood 4400 wood protection treatment is supplied by Chemical Technologies Holding Corporation and is used by the additional listees at the top of this report, to treat wood members in accordance with the manufacturer requirements.

2.7 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[2]

3.1 New Materials[3] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[4] The design strength and permissible stresses shall be established by tests[5] and/or engineering analysis.[6]

3.2 Duly authenticated reports[7] and research reports[8] are test reports and related engineering evaluations that are written by an approved agency[9] and/or an approved source.[10]

3.2.1 These reports utilize intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secretes under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[11]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[12]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[13] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[14] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[15] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[16]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[17] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[18] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[19]

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[20]

4.1 *Local, State and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, Texas Department of Insurance, and Wichita.[21]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[22]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[23] and Part 3280[24] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Standards*

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

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

4.2.3 *ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber*

4.2.4 *ASTM D4587: Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings*

4.2.5 *ASTM D5116: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products*

4.2.6 *ASTM D5197: Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)*

4.2.7 *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*

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

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

4.2.10 *AWPA A3: Standard Methods for Determining Penetration of Preservatives and Fire Retardants*

4.2.11 *AWPA E1: Laboratory Methods for Evaluating the Termite Resistance of Wood-based Materials: Choice and No-choice Tests*

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

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

4.2.14 *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*

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

4.2.16 *AWPA U1: Use Category System: User Specification for Treated Wood*

4.2.17 *DOC PS 1: Structural Plywood*

4.2.18 *DOC PS 2: Performance Standard for Wood-Based Structural-Use Panels*

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

4.2.20 *UBC 8-1: Surface Burning Characteristics of Building Materials*

4.2.21 *UL 723: Test for Surface Burning Characteristics of Building Materials*

4.2.22 *UL 2818: GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes, and Furnishings*

4.3 *Regulations*

4.3.1 *IBC –18, 21, 24: International Building Code®*

4.3.2 *IRC –18, 21, 24: International Residential Code®*

4.3.3 *CBC—19, 22: California Building Code[25] (Title 24, Part 2)*

4.3.4 *CRC – 19, 22: California Residential Code[25] (Title 24, Part 2.5)*

5 Listed[26]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (i.e., CBI), an approved agency (i.e., CBI and DrJ), and/or and approved source (i.e., DrJ), or other organization(s) concerned with product evaluation (i.e., DrJ), that maintains periodic inspection (i.e., CBI) 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.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 TechWood 4400 is a protective treatment, as justified by the QAI Listing B1053-1, for floor, wall, and roof structural members for:

6.1.1 SPF, HF, DF, and SP solid sawn lumber, GLB, LVL, and Plywood.

6.1.2 DF GLBDF LVL; SP Plywood; or other species as delineated by QAI Listing B1053-1.

6.2 Structural applications include, but are not limited to, use as beams, columns, headers, joists, rafters, wall studs, chords, and webs of trusses.

6.3 Use as sill plates in direct contact with concrete or masonry is approved.

6.4 TechWood 4400 protected wood products are suitable for aboveground applications not subject to contact with liquid water.

6.4.1 When used in exterior applications, products treated with TW4400 must be protected from direct wetting. **A minimum of one coat of primer and two coats of exterior grade finish paint, or equivalent, shall be used**.

6.5 Products protected by TechWood 4400 meet the requirements of IBC Section 2304.12 and IRC Section R304,[27] where protection against decay is required.

6.6 Products protected by TechWood 4400 meet the requirements of IBC Section 2304.12 and IRC Section R305,[28] where protection against termite attack is required.

6.7 Products protected by TechWood 4400 meet the requirements where surface burning and smoke developed index values are required to be tested by IBC Section 2303.2, IRC Section R302.9, and 2021 IRC Section R802.1.5, in accordance with ASTM E84 extended 20 minutes, UL 723 extended 20 minutes, NFPA 255 extended 20 minutes, UBC 8-1 extended 20 minutes, and ASTM E2768 as follows for SPF, HF, DF, and SP lumber products. **Table 2** identifies the flame spread index and smoke developed index for these lumber species. In addition, QAI has tested TechWood 4400, where the QAI Listing B1053-1 supports TechWood 4400 meeting the requirements for the surface burning and smoke developed index values for floor, wall, and roof structural members as defined in **Table 2**.

Table 2. Surface Burn Characteristics[1]

Lumber Species	Flame Spread Index	Smoke Developed Index
SPF	≤ 25	≤ 450
HF	≤ 25	≤ 450
DF	≤ 25	≤ 450
DF GLB	≤ 25	≤ 450
DF LVL	≤ 25	≤ 450
SP	≤ 25	≤ 450
SP Plywood	≤ 25	≤ 450

1. TechWood 4400 applied at minimum 11.5 g/ft^2.

6.8 Field cuts, notches, or bored holes must be site-treated in accordance with the manufacturer instructions and AWPA M4, in accordance with IRC Section R304.1.1[29] and IRC Section R305.1.2.[30]

6.9 *Design*

6.9.1 Allowable design stresses for TechWood 4400 protected products for dry conditions of use are the same as the wood product before treatment.

6.9.2 TechWood 4400 is a factory treated wood protection that uses Disodium Octaborate Tetrahydrate (DOT), biocides for mold abatement, and fire-retardant additives to permanently impregnate members by zero to low pressure chemical delivery.

6.9.2.1 Because the wood is not incised, the NDS Incising Factor in NDS Section 4.3.8 is not applicable.

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

6.9.4 Unless otherwise noted in this report, the design provisions for wood construction noted in IBC Section 2302.1 and IRC Section R301.1.3 apply to TechWood 4400 protected products.

6.9.5 *Connections:*

6.9.5.1 Lateral loads for nails, screws, and bolts, as well as withdrawal loads for nails and screws installed in TW4400 protected products, shall be in accordance with the NDS using the published values of each lumber grade and species or Engineered Wood Product (EWP).

6.9.6 *Fasteners:*

6.9.6.1 Fasteners used with TechWood 4400 protected products shall be in accordance with IBC Section 2304.10.5 and IRC Section R304.3,[31] except that aluminum fasteners are permitted when the products are used in interior applications.

6.10 The exception noted in IBC Section 2304.10.6.1 allows plain carbon steel fasteners, including nuts and washers, in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment.

6.11 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.

7 Certified Performance[32]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[33]

7.2 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.[34]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 TechWood 4400 has been evaluated to determine its suitability to treat structural wood products used in above ground applications where they are required by code to provide the following:

8.1.1 Preservative-treated wood as required by IBC Section 2303.1.9, IRC Section R304,[35] and IRC Section R305.[36]

8.1.2 Fungal decay resistance where required by IBC Section 2304.12 and IRC Section R304.[37]

8.1.3 Mold growth inhibition in accordance with ASTM D5590 and ASTM D3273.

8.1.4 Protection from subterranean termites (including Formosan) where required by IBC Section 2304.12 and IRC Section R305.[38]

8.1.5 Flame spread index and smoke developed index properties where required by IBC Section 2303.2, IRC Section R302.9, and 2021 IRC Section R802.1.5.

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

8.1.7 Low emissions of Volatile Organic Compounds (VOC) in compliance with UL 2818 for indoor commercial, educational, residential, and healthcare environments. Tested in accordance to ASTM D5116 and ASTM D5197. Meets California 01350 limits for formaldehyde emissions.

8.2 Any building code, regulation and/or accepted engineering evaluations (i.e., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[39] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[40] respectively.

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

8.4 Any regulation specific issues not addressed in this section are outside the scope of this report.

9 Installation

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

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.3 Products treated with TechWood 4400 shall be installed in accordance with the applicable code, the approved construction documents, this report, the manufacturer instructions, and standard framing practice as applied to solid sawn SPF, HF, DF, and SP lumber, DF GLB, DF LVL, SP Plywood, or other species as justified by the QAI Listing B1053-1 for floor, wall and roof structural members. In the event of a conflict between any of the above and this report, the more restrictive shall govern.

10 Substantiating Data

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

10.1.1 Flame spread index and smoke developed index testing in accordance with ASTM E84, UL 723, NFPA 255, UBC 8-1, and/or ASTM E2768.

10.1.2 Fungal decay testing in accordance with AWPA E10.

10.1.3 Mold growth inhibition testing in accordance with ASTM D5590 and ASTM D3273.

10.1.4 Termite resistance testing in accordance with AWPA E1.

10.1.5 Reaction with metals testing in accordance with AWPA E12.

10.1.6 Flexure (MOR/MOE) testing of LVL/EWP in accordance with ASTM D198.

10.1.7 VOC emissions testing in accordance with ASTM D5116 and ASTM D5197.

10.1.7.1 Low emissions of VOC in compliance with UL 2818 for indoor commercial, educational, residential, and healthcare environments meets California 01350 limits for formaldehyde emissions.

10.2 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.3 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.4 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, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.5 *Testing and Engineering Analysis*

10.5.1 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.[41]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for TechWood 4400 on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, TechWood 4400 has performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, TechWood 4400 shall be approved for the following applications:

11.2.1 TechWood 4400 protection does not affect the allowable design stresses allowed for untreated lumber as applied to solid sawn lumber.

11.2.2 Use as sill plates in direct contact with concrete or masonry is approved.

11.2.3 TechWood 4400 protected products are suitable for above ground applications not subject to continuous contact with liquid water.

11.2.4 When used in exterior applications, products treated with TechWood 4400 must be protected from direct wetting. Flashing required for horizontal applications. A minimum of one coat of primer and two coats of finish paint or equivalent shall be used.

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

11.2.6 Products protected with TechWood 4400 meet the requirements of IBC Section 2304.12 and IRC Section R304,[42] where protection against decay is required.

11.2.7 Products protected with TechWood 4400 meet the requirements of IBC Section 2304.12 and IRC Section R305,[43] where protection against termites is required.

11.2.8 SPF, HF, DF, and SP lumber products protected with TechWood 4400 meet the requirements where surface burning characteristics are required to be tested by IBC Section 2303.2, IRC Section R302.9, and 2021 IRC Section R802.1.5 in accordance with ASTM E84 extended 20 minutes, UL 723 extended 20 minutes, NFPA 255 extended 20 minutes, UBC 8-1 extended 20 minutes, and ASTM E2768 as noted in **Table 2**.

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Chemical Technologies Holding Corporation.

11.3.1 IBC Section 2303.2.3 in pertinent part states:

> **2303.2.3 Other Means During Manufacture.** For wood products impregnated with chemicals by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

11.3.2 See **Appendix A - Impregnation Testing**.

11.4 IBC Section 104.2.3 (IRC Section R104.2.2 and IFC Section 104.2.3[44] are similar) in pertinent part state:

> **104.2.3 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 is not specifically prohibited by this code and has been approved.

11.5 **Approved:**[45] Building regulations require that the building official shall accept duly authenticated reports.[46]

11.5.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.5.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.5.3 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. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.6 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.7 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[47]

12 Conditions of Use

12.1 Material properties shall not fall outside the boundaries defined in **Section 6**.

12.2 As defined in **Section 6**, 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.

12.3 Cutting and notching of products treated with TechWood 4400 is permitted where allowed by the applicable building code, the manufacturer recommendations, this report, or where the effects of such alterations are specifically considered in the design of the member by an RDP.

12.3.1 Field cuts, notches, or bored holes must be site-treated in accordance with the manufacturer instructions and AWPA M4 in accordance with IRC Section R304.1.1[48] and IRC Section R305.1.2.[49]

12.3.2 The service conditions for TW4400 are any above ground application not subject to exposure to liquid water, unless painted in accordance with **Section 6.4.1**.

12.3.3 Fastener design values shall be determined using the specific gravity of the lumber species used in the treated product.

12.3.4 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.

12.4 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:

12.4.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.4.2 This report and the installation instructions shall be submitted at the time of permit application.

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

12.4.4 At a minimum, this innovative product shall be installed per **Section 9**.

12.4.5 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.4.6 This innovative product has an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.4.7 The application of this innovative product in the context of this report 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.

12.5 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or 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 104.2.3,"* all of IBC Section 104, and IBC Section 105.3.

12.6 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.7 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 TechWood 4400 (TW4400), as listed in **Section 1.1** is identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.techwoodtreatments.com.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

Appendix A – Impregnation Testing
Chemical Impregnation in Treated Wood

1. Chemical impregnation in treated wood by the proprietary application process and procedures recommended for TechWood 4400 (TW4400) by Chemical Technologies Holding Corporation.

   1.1. TW4400 is a factory treated wood protection that uses a proprietary formulation of Disodium Octaborate Tetrahydrate (DOT), biocides for mold abatement, and fire-retardant additives to permanently impregnate members by zero to low-pressure chemical delivery.

   1.2. The results of the proprietary application process and procedures are found in Figure 1, below.

   1.3. The photos show the penetration of borate and phosphorous chemicals into regular framing lumber tested at two-week and four-week periods after initial treatment.

   1.4. Both two-part tracing reagents cause color dye reactions showing the chemicals penetration depth of $^{3}/_{16}$" – $^{9}/_{32}$" with both boron and phosphorus chemicals.

   1.5. This demonstrates that TW4400 treatment provides permanent protection to all surfaces of the wood product.

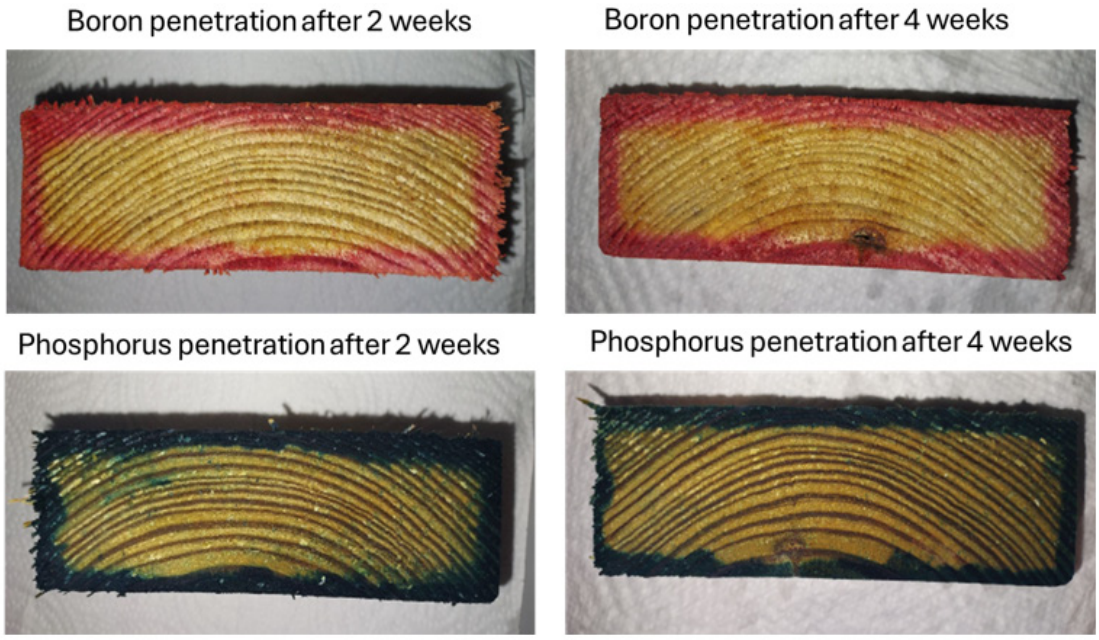

Figure 1. Dye reaction method shows chemical penetration in wood substrate. Red color indicates borate penetration, while dark blue color indicates phosphates penetration following AWPA A3-05 Standard Methods for Determining Penetration of Preservatives and Fire Retardants.

Issue Date: November 19, 2020
Subject to Renewal: June 1, 2026

CBC and CRC Supplement to Report Number 1510-01

REPORT HOLDER: Chemical Technologies Holding Corporation

1 Evaluation Subject

1.1 TechWood 4400 (TW4400)

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show TechWood 4400 recognized in Report Number 1510-01 has also been evaluated for compliance with the codes listed below.

2.2 *Applicable Code Editions*

2.2.1 *CBC—19, 22: California Building Code (Title 24, Part 2)*

2.2.2 *CRC—19, 22: California Residential Code (Title 24, Part 2.5)*

3 Conclusions

3.1 TechWood 4400, described in Report Number 1510-01, complies with the CBC and CRC and is subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the CBC and CRC applicable to this report, they are listed here:

3.2.1 CBC Section 104.6 replaces IBC Section 104.4.

3.2.2 CBC Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.3 CBC Section 1707.1 replaces IBC Section 1707.1.

3.2.4 CBC Section 2303.2.2 replaces IBC Section 2303.2.3.

3.2.5 CBC Section 2306.3 replaces IBC Section 2306.3.

3.2.6 CRC Section R104.6 replaces IRC Section R104.4.

3.2.7 CRC Section R104.11 replaces IRC Section R104.2.2.

3.2.8 CRC Section R301.1.3 replaces IRC Section R301.1.3.

3.2.9 CRC Section R317 replaces IRC Section R304.

3.2.10 CRC Section R317.1.1 replaces IRC Section R304.1.1.

3.2.11 CRC Section R317.3 replaces IRC Section R304.3.

3.2.12 CRC Section R318 replaces IRC Section R305.

3.2.13 CRC Section R318.1.2 replaces IRC Section R305.1.2.

4 Conditions of Use

4.1 TechWood 4400, described in Report Number 1510-01, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1510-01.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of CBC and CRC, as applicable.

Notes

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

2 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

3 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

4 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

5 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

6 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

8 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

11 https://www.law.cornell.edu/uscode/text/18/1832 (b) 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. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

12 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

13 https://www.cbitest.com/accreditation/

14 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

15 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

17 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

18 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

19 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

20 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

21 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

22 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

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

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

25 All references to the CBC and CRC are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the California Supplement at the end of this report.

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

27 2021 IRC Section R317

28 2021 IRC Section R318

29 2021 IRC Section R317.1.1

30 2021 IRC Section R318.1.2

31 2021 IRC Section R317.3

32 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

[33] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

[34] https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

[35] 2021 IRC Section R317

[36] 2021 IRC Section R318

[37] 2021 IRC Section R317

[38] 2021 IRC Section R318

[39] 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.

[40] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

[41] See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

[42] 2021 IRC Section R317

[43] 2021 IRC Section R318

[44] 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

[45] 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 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

[46] https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

[47] Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.

[48] 2021 IRC Section R317.1.1

[49] 2021 IRC Section R318.1.2