



**City of Twin Falls
Building Safety Department**

Alternative Materials Determination

MATERIAL REVIEWED:

Thermo-Ply® Structural Sheathing: High Structural Grade (Blue and Blue AMG)
Manufactured by OX Engineered Products, LLC

**DETERMINATION:
Not Approved**

The City of Twin Falls, Building Official (Building Official) received a request to allow the use of Thermo-Ply® structural sheathing (Material) for exterior wall structural sheathing as an Alternative Material under the 2018 International Building Code (IBC) and 2018 International Residential Code (IRC), section 104.11. The Building Official also received inquiries that certain suppliers in the area would like to know if the Material is authorized to be used in Twin Falls.

The Building Official reviewed brochures from OX Engineered Products (OX), Technical Evaluation Reports (TER) from DrJ Engineering, LLC, UL Evaluation Reports (UL) from UL, LLC, and Product Advisories from APA – The Engineered Wood Association (APA). The Building Official was unable to find sufficient research reports and corresponding analysis to substantiate approving the Material. Further, research reports and analysis contained in the APA advisories suggest that the Material does not meet IRC or IBC standards.¹

In short, the actual performance testing methods and corresponding results and analysis utilized for the TER reports must be provided before the Material can be approved.

APPLICABLE RULES AND REGULATIONS

- 2018 International Building Code
- 2018 International Residential Code

IBC & IRC Section 104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

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

IBC Section 104.11.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

IBC Section 104.11.1 & IRC Section 104.11.1 Tests. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made without expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved agency*. Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

¹ It is noted that ABA has a perceived, if not real, interest in discrediting OX products.

IBC & IRC. APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests, furnishing inspection services or furnishing product certification where such agency has been approved by the building official.

IBC. APPROVED FABRICATOR. An established and qualified person, firm or corporation *approved* by the *building official* pursuant to Chapter 17 of this code.

IBC & IRC. APPROVED SOURCE. An independent person, firm or corporation, ***approved by the building official***, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

NEW MATERIALS IBC SECTION 1702.1 General. New building materials, equipment, appliances, systems or methods of construction not provided for in this code, and any material of questioned suitability proposed for use in the construction of a building or structure, **shall be subjected to the tests prescribed in this chapter and in the approved rules to determine character, quality and limitations of use.**

IBC SECTION 1703.1 Approved agency. An approved agency shall provide all information as necessary for the *building official* to determine that the agency meets the applicable requirements specified in Sections 1703.1.1 through 1703.1.3.

IBC SECTION 1703.1.1 Independence. An *approved agency* shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall disclose to the *building official* and the *registered design professional in responsible charge* possible conflicts of interest so that objectivity can be confirmed.

IBC SECTION 1703.1.2 Equipment. An *approved agency* shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

IBC SECTION 1703.1.3 Personnel. An *approved agency* shall employ experienced personnel educated in conducting, supervising and evaluating tests and *special inspections*.

IBC SECTION 1703.4 Performance. Specific information consisting of test reports conducted by an *approved agency* in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the *building official* to determine that the product, material or assembly meets the applicable code requirements.

IBC SECTION 1703.4.1 Research and investigation. Sufficient technical data shall be submitted to the *building official* to substantiate the proposed use of any product, material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the *building official* shall approve the use of the product, material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the owner or the owner's authorized agent.

IBC SECTION 1703.4.2 Research reports. Supporting data, where necessary to assist in the approval of products, materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved sources*.

IBC SECTION 1703.5 Labeling. Products, materials or assemblies required to be *labeled* shall be *labeled* in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.4.

IBC SECTION 1703.5.1 Testing. An *approved agency* shall test a representative sample of the product, material or assembly being *labeled* to the relevant standard or standards. The *approved agency* shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.

IBC SECTION 1703.5.2 Inspection and identification. The *approved agency* shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The inspection shall verify that the labeled product, material or assembly is representative of the product, material or assembly tested.

IBC SECTION 1703.5.3 Label information. The *label* shall contain the manufacturer's identification, model number, serial number or definitive information describing the performance characteristics of the product, material or assembly and the *approved agency's* identification.

IBC SECTION 1703.5.4 Method of labeling. Information required to be permanently identified on the product, material or assembly shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

Determination:

I have included the pertinent IBC & IRC code sections above for determining the use of products, materials or assemblies as currently adopted by the City of Twin Falls. The following are the specific requirements and pertinent areas that **will not permit the Building Official from approving the ThermoPly structural sheathing as submitted:**

- Submit an Alternative Materials, design and methods of construction request for the specific materials to be utilized with testing as prescribed by the IBC & IRC for Building Official determination. Refer to IBC & IRC SECTION [A] 104.11 **Alternative materials, design and methods of construction and equipment.**
- Product **performance testing** per IBC section 1703.4 along with appropriate research and investigation reports per IBC section 1703.4.1 have not be satisfied. Performance testing with research reports is necessary to determine the actual strength characteristics for this product to be utilized in the construction industry. TER 1004-02 lacks the necessary International Code Council ES or ER reports to include independent testing of published design values for wind and lateral loads as

specified within the Dr J certification. Refer to **TER 1004-02** and IBC Sections, 1609.1.1. and 1703.4. *The Dr J certifications and noted Technical Evaluation reports provided refer to the proper testing as currently prescribed by the International Building Codes however no such testing and research reports of published values has been provided.* The performance characteristics of the materials to be utilized as indicated is in question and with conflicting testing available by APA, this product is **hereby not approved** for use for any load bearing or lateral loading condition as currently prescribed within the Code. Please refer to IBC sections 1703.4, 1703.4.1 and 1703.4.2.

- The fire rated details as specified in TER 1510-04 reference multiple UL designs on page 3 item 3.1.1 however there are no listed tested assemblies that indicate the use of this specific material within the approved tested, and listed designs within the UL directory that is referenced. **Therefore, the Building Official for the City of Twin Falls would require the appropriate fire rated detailing with the specific materials to be utilized clearly indicated along with an approved Idaho State Fire Protection Engineers wet stamp of approval.**

REFERENCE MATERIALS/DATA UTILIZED IN THIS EVALUATION:

- ❖ ICC Evaluation Service Inc prepared report ESR-1122 for ThermoPly (Blue) and ThermoPly (Red) on November 1st 2008 with it being subject to re-examination in one year. This report used the 2006 IBC and IRC and is no longer valid for consideration of use with the current adopted code bodies. See Conditions of Use as noted in ESR-1122.
- ❖ Please refer to **APA SP-1186C, SP-1172** where the design properties published by the flexible sheathing manufacturers raise a question related to the safety and reliability of the structure designed with these products. It was noted by APA that published values within the Dr J certification had overstated the lateral load capacities in a range between 15% and 34% on average under monotonic (Wind) loading. This is equivalent to a maximum reduction in the ultimate wind pressure (V_{ult}) from 32 pounds per square foot to 21 pounds per square foot, which represents approximately a 30 miles per hour reduction in the ultimate wind speed that can be resisted by the structure. Typical Failure modes along with referenced Dr. J (TER) technical evaluation reports can be verified on form number SP-1186C, 2000 APA.

A product approval is required in IDAHO for this material to be utilized in construction especially in occupied buildings or buildings of multiple floor levels. The use of Thermo ply structural sheathing is hereby not approved for use in any occupied structure until such time proper testing by an accredited agency **approved by the building official** has been reviewed and approved. Since it is an engineer's obligation to ensure products exposed to high wind or lateral forces do not become unsafe structures or contribute to wind borne debris, the evaluation report combined with an engineer's stamp of approval create another issue for this product. I have forwarded this to the City of Twin Falls attorney for review.

Along with testing (and sometimes even without), an engineering 'rational analysis' can be performed on any product not required to meet the requirements for protection of the building envelope to demonstrate compliance. When testing is part of the evaluation, the evaluation must consider multiple specimens, structural limitations of use, the method of testing, and quality control. When testing is not required, that evaluation must consider all failure modes and their respective required factors of safety when determining a rated safe load limit. DrJ Certifications of this product reviewed does not meet this intent.

SIGNATURE: Matthew Long C.B.O

DATE: May 5, 2021