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To: ICC-ES Evaluation Committee

From: Will Utsey, P.E. and Alex Collins

Date: 2/5/2025

Subject: Proposed Revisions to the Acceptance Criteria for Fiber-Reinforced Magnesium-Oxide-Based Sheets AC386-0225-R1-1 (WU/AC)

MEMO

The proposed revisions were outlined in the letter dated November 8, 2024, by Eric Polzin, P.E. (NEXGEN Building Products) and Ben Richardson (Huber Engineered Woods) which was attached with the ICC-ES letter dated November 22, 2024 and posted on the ICC-ES website. In summary, the proposed revisions include:

- Adding Section 3.6 to address “Fastener Withdrawal and Lateral Capacity for Direct Attachment of Cladding” to MgO wall sheathing.
- Adding Section 3.7 to address “Reference Lateral Design Values” for fasteners installed into MgO sheets when recognition is sought for using the yield mode equations in the NDS.
- Adding Section 3.8 to address “Allowable Bearing Stress of MgO Sheets” when the use is
- related to use as structural flooring and/or underlayment.

Public comments were received from Phillip Line, P.E. (American Wood Council) in a letter dated December 18, 2024.

Eric Polzin, P.E. (NEXGEN Building Products) and Ben Richardson (Huber Engineered Woods) provided a rebuttal letter dated January 9, 2025 indicating general agreement with Phillip Line, P.E. (American Wood Council) public comments. As a result, a revised draft of the acceptance criteria is attached with changes shown in red.

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ACCEPTANCE CRITERIA FOR FIBER-REINFORCED MAGNESIUM-OXIDE-BASED SHEETS

AC386

Proposed November 2024

Revised February 2025

Compliance Date - October 2025

(Editorially Revised October 2024)

Previously approved October 2023, July 2023, February 2023, February 2021, April 2019, October 2007

(Previously editorially revised August 2021, May 2021, February 2016)

PREFACE

Evaluation reports issued by ICC Evaluation Service, LLC (ICC-ES), are based upon performance features of the International family of codes, and may include other codes, as applicable.

For alternative materials, design and methods of construction and equipment, see Section 104.2.3 of the 2024 *International Building Code*® (IBC), Section R104.2.2 of the 2024 *International Residential Code*® (IRC), Section 104.11 of the 2021 IBC and earlier editions, and Section R104.11 of the 2021 IRC and earlier editions.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. ICC-ES retains the right to refuse to issue or renew any evaluation report, if the applicable product, material, or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause injury or unreasonable damage.

Acceptance criteria are developed for use solely by ICC-ES for purposes of issuing ICC-ES evaluation reports

ACCEPTANCE CRITERIA FOR FIBER-REINFORCED MAGNESIUM-OXIDE-BASED SHEETS (AC386)

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for fiber-reinforced magnesium-oxide-based interior substrate sheets to be the subject of an ICC Evaluation Service, LLC (ICC-ES), evaluation report under the 2024 *International Building Code*® (IBC) and the 2024 *International Residential Code*® (IRC). Bases of evaluation are 2024 IBC Section 104.2.3 and 2024 IRC Section R104.2.2. For the applicable sections of earlier editions of the IBC and IRC, see Table 3 of this criteria.

The reason for the development of this criteria is that the code does not provide guidance for evaluating fiber-reinforced magnesium-oxide-based substrate sheets that are used as sheathings in walls, roofs, floors, or as backer boards for adhered veneers.

1.2 Scope: This criteria is applicable to mechanically attached, fiber-reinforced, magnesium-oxide-based substrate sheets complying with the physical property requirements described in Section 3.1 of this criteria. End use application of the substrate sheets is evaluated by testing and conditions of acceptance in accordance with the applicable ICC-ES acceptance criteria outlined in Section 3.2. Evaluation for use in fire-resistance rated construction or use as a noncombustible material is outlined in Sections 3.3 through 3.5 of this criteria. The substrate sheets are suitable for decoration with paint, wallpaper, resilient flooring, ceramic tile, natural stone or dimensional stone veneers on floors and walls in interior dry areas. The substrate sheets are limited to use on interior surfaces as defined in IBC Section 202 and may not be used in wet areas as defined in IBC Section 2509. Under the IRC, the substrate sheets may not be used in showers.

Evaluation is limited to Type V construction unless the substrate sheets comply with Section 3.4~~6~~ or Section 3.5 of this criteria.

1.3 Codes and Referenced Standards: For the applicable editions of the referenced standards, see Table 2 of this criteria.

1.3.1 2024, 2021, 2018, 2015, 2012, 2009 and 2006 *International Building Code*® (IBC), International Code Council.

1.3.2 2024, 2021, 2018, 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC), International Code Council.

1.3.3 ASTM C473, Test Method for Physical Testing of Gypsum Panel Products, ASTM International.

1.3.4 ASTM C666 Test Method for Resistance of Concrete to Rapid Freezing and Thawing, ASTM International.

1.3.5 ASTM C1185 Test Methods for Sampling and Testing Non-asbestos Fiber-cement Flat Sheet, Roofing and Siding Shingles, and Clapboards, ASTM International.

1.3.6 ASTM C1186 Standard Specification for Flat Fiber-Cement Sheets.

1.3.7 ASTM C1396 Standard Specification for Gypsum Wallboard, ASTM International.

1.3.8 ASTM D143-23 Standard Test Methods for Small Clear Specimens of Timber, ASTM International.

1.3.9 ASTM D1037 Test Methods for Evaluating Properties of Wood-base Fiber and Particle Panel Materials, ASTM International.

1.3.10 ASTM D1761-20 Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials, ASTM International.

1.3.11 ASTM D2394 Methods for Simulated Service Testing of Wood and Wood-base Finish Flooring, ASTM International.

1.3.12 ASTM D2915-17(2022) Standard Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products, ASTM International.

1.3.13 ASTM D5764-24 Standard Test Method for Evaluating Dowel-Bearing Strength of Wood and Wood-Based Products, ASTM International.

1.3.14 ASTM E84 Test Methods for Surface Burning Characteristics of Building Materials, ASTM International.

1.3.15 ASTM E119 Test Methods for Fire Tests of Building Construction and Materials, ASTM International.

1.3.16 ASTM E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C, ASTM International.

1.3.17 ASTM E455 Standard Test Method for Static Load Testing of Framed Floor or Roof Diaphragm Constructions for Buildings, ASTM International.

1.3.18 ANSI A118.1 Standard Specifications for Dry-set Portland Cement Mortar, American National Standards Institute.

1.3.19 ANSI A118.4 Standard Specifications for Latex–Portland Cement Mortar, American National Standards Institute.

1.3.20 ICC-ES Acceptance Criteria for Nails (AC116).

1.3.21 ICC-ES Acceptance Criteria for Dowel-Type Threaded Fasteners Used in Wood (AC233).

1.3.22 ICC-ES Acceptance Criteria for Proprietary Sheathing Attached to Wood Light-Frame Wall Construction Use as Braced Wall Panels under the IRC (AC269.1).

1.3.23 ICC-ES Acceptance Criteria for Structural Cementitious Floor and Roof Sheathing Panels (AC318).

1.3.24 ICC-ES Acceptance Criteria for Horizontal Diaphragms Consisting of Structural Cementitious Sheathing Panels Attached to Cold-Formed Steel Framing (AC319).

1.3.25 ICC-ES Acceptance Criteria for Fiber-reinforced Cement Sheet Structural Floor Sheathing (AC367).

1.3.26 ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets Used as Wall Sheathing and Floor Underlayment (AC376).

1.3.27 ICC-ES Acceptance Criteria for Reinforced Cementitious Interior Substrate Sheets Used in Wet and Dry Areas (AC378).

1.3.28 ISO 21930-2017, Sustainability in Buildings and Civil Engineering Works – Core Rules for Environmental

product Declarations of Construction Products and Services, International Organization of Standardization (ISO).

1.3.29 UL 263, Fire Tests of Building Construction and Materials, UL LLC.

1.3.30 UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, UL LLC.

1.4 Definitions:

1.4.1 Fiber-reinforced Magnesium-oxide-based Sheets: Fiber-reinforced magnesium-oxide-based sheets are sheet products consisting of a proprietary composition of magnesium oxychloride cement or magnesium oxysulfate cement that is reinforced by a fibermat or fiber scrim made of organic or inorganic fibers. The sheets may contain proprietary additives and have factory-applied coatings. The sheets are manufactured in various lengths and widths, and in thicknesses from $^1/_4$ to 1 inch (6.3 to 25.4 mm).

1.4.2 Wet Areas: Shower and public toilet areas, as defined in IBC Section 2509.1.

1.4.3 Dry Areas: All areas not included in the definition under Section 1.4.2 of this criteria.

1.4.4 Fastening System: A fastening system is defined as a method to mechanically attach the sheathing or single floor grade sheets to framing.

1.4.5 Span Rating: The recommended maximum center-to-center spacing in inches (mm) of floor or roof framing used to support the sheets for the specified end use under normal use conditions.

1.4.6 Single Floor Grade: Sheets used as a combination subfloor and underlayment installed with edge treatment, blocking or covered with one of the materials described in Footnote c of Table 2304.8(3) of the IBC, or footnote j of IRC Table R503.2.1.1(1), as applicable.

1.4.7 Sheathing Grade: Sheets used as sheathing that require a separate underlayment installed on top of the sheets.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, thickness, size and the manufacturing process.

2.1.2 Installation Instructions: Installation details and limitations, fastening methods, joint treatments, and face treatments.

2.1.3 Packaging and Identification: Product identification shall be in accordance with the product identification provisions of the ICC-ES Rules of Procedure for Evaluation Reports and shall include the evaluation report number.

2.1.4 Field Preparation: A description of the methods of field-cutting, application and finishing.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Products for testing under this criteria shall be sampled in accordance with Sections 3.1, 3.3 and 3.4 of AC85.

2.5 Qualification Test Plan: A qualification test plan shall be submitted to and approved by ICC-ES staff prior to any testing being conducted.

3.0 TEST AND PERFORMANCE REQUIREMENTS

Reports of tests shall be submitted in accordance with the following requirements, which are also summarized in Table 1:

3.1 Physical Properties: The following physical properties are applicable for all applications of MgO sheets evaluated under this criteria, unless noted otherwise:

3.1.1 Flexural Strength: Testing in accordance with ASTM C1185, with conditions of acceptance of 580 psi (4000 kPa) minimum average flexural strength, both wet and dry.

3.1.2 Freeze/Thaw Cycling: When testing sheathing for non-roof applications in accordance with ASTM C666, Procedure B, the test samples shall show no disintegration following 25 cycles. A minimum of 5 specimens shall be tested.

3.1.3 Dimensions and Tolerances: Testing in accordance with ASTM C1185 with conditions of acceptance as noted in Section 7 of ASTM C1186.

3.1.4 Moisture Movement: When tested in accordance with ASTM C1185, linear variation with change in moisture content shall be stated as the percentage change in length based on a relative humidity change from 30 to 90 percent. Sampling for tests shall be in accordance with Section 4 of ASTM C1185.

3.1.5 Water Absorption: When testing sheathing for non-roof applications in accordance with Section 9 of ASTM C1185, the water absorption shall be reported as the percentage increase in weight of dry specimens following submersion for a period of 48 hours. Sampling for tests shall be in accordance with Section 4 of ASTM C1185.

3.1.6 Compression Indentation: When tested in accordance with ASTM D2394, samples shall show a value greater than 1250 psi (8620 kPa) at less than 0.05 inch (1.3 mm). A minimum of 5 specimens shall be tested.

3.1.7 Nail-head Pull Through: The substrate sheets shall have a minimum thickness of $^1/_4$-inch-thick (6 mm) and shall have a minimum saturated nail-head pull-through resistance of 90 lbf (400 N) when tested in accordance with ASTM D1037 utilizing a roofing nail with a 0.375-inch-diameter (10 mm) head and a shank diameter of 0.121 inch (3 mm). Substrate sheets having thicknesses greater than $^1/_4$ inch (6 mm), shall meet the nail-head pull-through resistance of this criteria [90 lbf (400 N)]. A minimum of 5 specimens shall be tested.

3.1.8 Falling Ball Impact: When tested in accordance with ASTM D1037, samples shall show no damage to top or bottom surfaces at a 12-inch (305 mm) drop. A minimum of 5 specimens shall be tested.

3.1.9 Shear Bond Strength:

3.1.9.1 Dry-set Portland Cement: The substrate sheets shall be tested in accordance with ANSI A 118.1, using test specimens consisting of the substrate sheet adhered to substrate sheet, and shall demonstrate a minimum shear bond strength at seven-day curing of 50 psi (345 kPa). A minimum of 5 specimens shall be tested.

3.1.9.2 Latex-Portland Cement Mortar: The substrate sheets shall be tested in accordance with ANSI A 118.4, using test specimens consisting of the substrate sheet adhered to substrate sheet, and shall demonstrate a minimum shear bond strength at seven-day curing of 50 psi (345 kPa). A minimum of 5 specimens shall be tested.

3.1.10 Humidified Deflection: Testing in accordance with ASTM C473. Conditions of acceptance are as described in Section 5.1.2 of ASTM C1396. For use as ceiling boards, the sheets shall have a maximum humidified deflection of $^{5}/_{16}$ inch (7.9 mm), when used as ceiling finish (textured or painted), or 0.0639 inch (1.62 mm), when used as a base for tile.

3.1.11 Flame-Spread Characteristics: The substrate sheets shall be tested in accordance with ASTM E84 or UL 723 and shall be Class A interior finish materials.

3.1.12 Corrosion Effects: The sheets shall be evaluated for corrosion effects in accordance with Appendix A of this criteria. The appropriate end use exposure test conditions shall be selected with consideration of the end use applications evaluated in accordance with Section 3.2 of this criteria (i.e., if the panels are evaluated for use as roof sheathing in accordance with Section 3.2.2.2, corrosion effects must be evaluated per the requirements of End Use Severity Rating 2 and/or 3 as outlined in Table A2, as applicable).

3.2 End Use Applications: At least one of the following optional end use applications shall be included in the evaluation:

3.2.1 Use as Structural Floor Sheathing Attached to Wood Framing (Optional): For use as structural floor sheathing attached to wood framing, testing and conditions of acceptance shall be in accordance with Sections 3.2 through 3.4 and 3.6 of AC367.

3.2.2 Use as Structural Floor and Roof Sheathing Attached to Cold-formed Steel Framing (Optional):

3.2.2.1 Floor Sheathing: For use as structural floor sheathing, testing and conditions of acceptance in accordance with AC318 Sections A5.2.1 through A5.2.3. Allowable uniform loads shall be determined in accordance with AC318 Sections 3.3.1 for floor sheathing.

3.2.2.2 Roof Sheathing: For use as structural roof sheathing, testing and conditions of acceptance in accordance with AC318 Sections A5.2.1 through A5.2.4, A5.3.2, A5.3.3, A5.4, A5.8, A5.10 and A5.11. Allowable uniform loads shall be determined in accordance with AC318 Sections 3.3.2 for roof sheathing.

3.2.2.3 Diaphragms: When used as structural sheathing in horizontal diaphragms constructed with cold-formed steel framing, testing and analysis shall be in accordance with Sections 3.2, 3.4 and 3.5 of AC319.

When used as structural sheathing in horizontal diaphragms constructed with wood framing, testing shall be in accordance with Section 3.4 of AC319 where the test method is based on ASTM E455; and analysis shall be in accordance with Section 3.5 of AC319 with the exception that the allowable strength shall be determined using a safety factor of 3.

3.2.3 Use as Wall and Ceiling Sheathing or Floor Underlayment (Optional): For use as wall and ceiling sheathing or floor underlayment, testing and conditions of acceptance shall be in accordance with Sections 3.4 and 3.6 through 3.8 of AC376.

3.2.4 Use as a Substrate in Interior Areas (Optional): For use as a substrate in interior areas, testing and conditions of acceptance shall be in accordance with Sections 3.2, 3.3, 3.5 and 3.6 of AC378.

3.2.5 Use as Braced Wall Panels (Optional): If the evaluation includes the uses outlined in Section 3.2.3 or 3.2.4 of this criteria, the sheets may also be evaluated for use as braced wall panels in accordance with AC269.1.

3.3 Fire-resistance-rated Construction (Optional): For use in fire-resistance-rated construction, tests shall be conducted in accordance with ASTM E119 or UL 263.

3.4 Noncombustible Construction (Optional): For use as a noncombustible material in Types I, II, III and IV construction under the IBC, the material must be shown to be noncombustible in accordance with ASTM E136.

3.5 Use as an Alternative to Fire-Retardant Treated Wood Structural Panels In Non-Weather Exposed Areas (Optional): For use as an alternative to fire-retardant treated wood structural panels in non-weather exposed applications, the material shall be tested in accordance with the modified ASTM E84 or UL723 procedure outlined in IBC Section 2303.2 and shall meet the conditions of acceptance outlined in IBC Section 2303.2; the material shall also demonstrate compliance with the associated end use(s) outlined in Section 3.2, as applicable. When evaluated in accordance with this section, the evaluation report shall include the limitation outlined in Section 5.7.

Note: If products are shown to comply with Section 3.4, compliance with this section is not needed.

3.5.1 Exterior wall sheathing in buildings of Type I and II construction as described in IBC Section 603.1, Item 1 Subsection 1.2.

3.5.2 Wall sheathing for exterior walls for Type III construction with a two-hour rating or less (IBC Section 602.3 and Tables 601 and 705.5).

3.6 Fastener Withdrawal Design Values and Lateral Design Values for Direct Attachment of Cladding [Max. Cladding Weight ≤ 10 psf (48.8 kg/m^2); maximum thickness $^{5}/_{8}$- inch (15.9 mm)] (Optional): Evaluation for use as wall sheathing in accordance with Section 3.2.3 of this criteria must be conducted prior to utilizing this section. When direct attachment of lightweight cladding without intermediate materials between the cladding and the sheathing (such as continuous exterior insulation) is to be evaluated, withdrawal and lateral capacity testing of fasteners (commodity nails, commodity screws, proprietary nails, or proprietary screws) shall be performed in accordance with Sections 3.6.5, and 3.6.6. Samples, including sample size, fabrication, and conditioning shall be in accordance with Sections 3.6.1 through 3.6.4. The ASD reference withdrawal and lateral design values shall be determined in accordance with Section 3.6.7.

3.6.1 Magnesium-Oxide Sheet Requirements: Prior to testing, sheets should be conditioned to equilibrium per ASTM C1185 Section 5.2.3.1.

3.6.2 Sample Size: A minimum number of specimens shall be tested for each exposure condition to achieve a precision of 5 percent at a 75 percent confidence interval (determined in accordance with ASTM D2915, Equation 1), with a minimum sample size of 15 specimens and a maximum sample size of 40 specimens. There is an implied maximum limit on the Coefficient of Variation (COV) of 27 percent. If 40 specimens are tested with a COV above

27 percent, the product has failed the test. Alternatively, a minimum of 10 specimens may be tested, provided a precision of 5 percent at a 95 percent confidence interval is achieved. In this case, there is no limit on the maximum sample size.

3.6.3 Fastener Installation: The use of pilot holes and/or predrilled holes for installation of the fasteners shall be in accordance with the manufacturer's instructions. When splitting is observed during fastener installation or testing, the installation method shall be adjusted as needed to preclude splitting, and installation or testing shall be repeated with no splitting observed. The installation method (use of pilot holes / pre-drilling, if applicable) shall be included in the evaluation report.

For each selected fastener, the fastener must be embedded through the full thickness of the Magnesium Oxide sheet plus $^1/_4$-inch (6.4 mm), at a minimum, unless otherwise noted in the manufacturer's instructions.

3.6.4 Sample Conditioning: For each selected fastener, a full set of testing shall be conducted on specimens in the equilibrium condition and in the wet / re-dry condition. The wet / re-dry condition shall be achieved by continuously wetting one side of the panel (with the fastener installed) for three days followed by drying. The moisture content at the time of testing of the wet/redry condition shall be within +/- 3% of the equilibrium conditioned samples.

3.6.5 Withdrawal Load Testing: Fastener withdrawal strength shall be tested in general accordance with ASTM D1761 and this section.

3.6.6 Lateral Capacity Testing: Lateral resistance test shall be conducted in accordance with ASTM D1761 procedures in both the machine direction and the cross-machine direction of the MgO specimens. The lateral resistance tests shall be conducted utilizing the Magnesium Oxide sheet as the main member, and a 22-gauge steel [minimum thickness 0.0299-inch (0.759 mm)] side member with a minimum tensile yield strength (fy) of 33 ksi (227.5 Mpa). Testing shall be conducted with a 1-inch (25.4 mm) edge distance on both the main member and side member.

Note: The intent of the use of a steel side member is to induce bearing failure in the MgO Sheet. In the event that the steel side member fails prior to bearing failure in the MgO sheet, an alternative side member thickness may be used upon approval from ICC-ES.

3.6.7 Determination of Reference Design Values: Reference withdrawal and lateral design values shall be determined in accordance with Sections 3.6.7.1 and 3.6.7.2. No adjustment factors for load duration may be applied to the reference withdrawal and lateral design values. The reference withdrawal and design lateral values for each fastener evaluated must be included in the evaluation report.

3.6.7.1 Reference Withdrawal Design Values: The condition (equilibrium or wet / re-dry) that produces the lowest average ultimate withdrawal capacities in accordance with Section 3.6.5 shall be used as the "average maximum test value" purposes of determining the reference design value in accordance with this section. The ASD reference withdrawal design value shall be determined by dividing the average maximum test value by a factor of 5.0.

3.6.7.2 Reference Lateral Design Values: The condition (equilibrium or wet / re-dry) and direction (machine direction vs cross-machine direction) that produces the lowest average ultimate lateral capacities in accordance with Section 3.6.6 shall be used as the "average maximum test value" for the purposes of determining the reference lateral design value in accordance with this section. The ASD reference lateral design value shall be determined by dividing the average maximum test value by a factor of 5.0; the maximum ASD reference lateral design value shall not exceed 20lbf.

3.7 Reference Lateral Design Values (Optional): When recognition is sought for using the yield mode equations in the NDS with magnesium-oxide sheets, dowel bearing strength shall be determined in accordance with Sections 3.7.1 and 3.7.2, and the reference lateral design value shall be calculated in accordance with the NDS. Dowel diameters used for calculation and testing shall be in accordance with Section 12.3.7 of the NDS. The calculated reference lateral design value shall be assessed by confirmatory connection testing and evaluation in accordance with Sections 3.3.1.1 and 4.1 of AC116 for nails and Sections 3.4 and 4.2.4 of AC233 for screws. The dowel bearing strength for each combination of fastener and panel thickness evaluated shall be included in the test report.

Alternatively, the ASD reference lateral value may be derived from connection testing in accordance with Sections 3.7.1 and 3.7.3.

3.7.1 Sample Conditioning: For each selected fastener, a full set of testing shall be conducted on specimens in the equilibrium condition and in the wet / re-dry condition. The wet / re-dry condition shall be achieved by continuously wetting one side of the panel (with the fastener installed) for three days followed by drying. The moisture content at the time of testing of the wet/redry condition shall be within +/- 3% of the equilibrium conditioned samples.

3.7.2 Dowel Bearing Strength: Dowel bearing strength shall be tested in general accordance with ASTM D5764 and this section. Prior to testing, specimens should be conditioned in accordance with Section 3.7.1. A minimum of 15 specimens are required for each fastener diameter to be evaluated in both the machine direction and the cross-machine direction of the specimens. Dowel bearing strength shall be derived from Section 11 of ASTM D5764.

The evaluation report shall include the average dowel bearing strength for each evaluated combination of fastener, panel thickness, orientation and conditioning.

3.7.3 Testing Only: In lieu of dowel bearing testing, testing and analysis for the ASD reference lateral design value shall be in accordance with Sections 3.3.1.3 and 4.1 of AC116 for nails or Sections 3.4.2 and 4.2.4 of AC233 for screws.

3.8 Allowable Bearing Stress of MgO Sheet (Optional): The bearing stress of fiber-reinforced magnesium oxide-based sheets evaluated for use as structural floor sheathing and/or underlayment shall be based on tests conducted in accordance with this section. The allowable bearing stress results shall be reported in the Evaluation Report.

3.8.1 Conditioning Requirements: Prior to testing, sheets should be conditioned to equilibrium per ASTM C1185 Section 5.2.3.1. A full set of testing shall be conducted on specimens in the equilibrium condition and in the wet / re-dry condition. The wet / re-dry condition shall

be achieved by continuously wetting one side of the panel for three days followed by drying. The moisture content at the time of testing of the wet/redry condition shall be within +/- 3% of the equilibrium conditioned samples.

3.8.2 Sample Size: A minimum number of specimens shall be tested for each exposure condition to achieve a precision of 5 percent at a 75 percent confidence interval (determined in accordance with ASTM D2915, Equation 1), with a minimum sample size of 15 specimens and a maximum sample size of 40 specimens. There is an implied maximum limit on the Coefficient of Variation (COV) of 27 percent. If 40 specimens are tested with a COV above 27 percent, the product has failed the test. Alternatively, a minimum of 10 specimens may be tested, provided a precision of 5 percent at a 95 percent confidence interval is achieved. In this case, there is no limit on the maximum sample size.

3.8.3 Test Method: Testing shall be conducted in accordance with Section 12 of ASTM D143, modified as follows: the tests shall be made on 2 in. wide by 6 in. long specimens for each thickness of magnesium oxide sheet. The specimens shall be centered in the test fixture and placed such that the load is applied perpendicular to the face of the specimen. The allowable total bearing stress ($F_{c\perp}$) shall be derived from the average bearing stress measured at the proportional limit divided by a standard adjustment factor of 1.67.

Bearing stress at the proportional limit for each specimen shall be calculated using the following equation:

$$F_{c\perp y} = \frac{P_{pl}}{A}$$

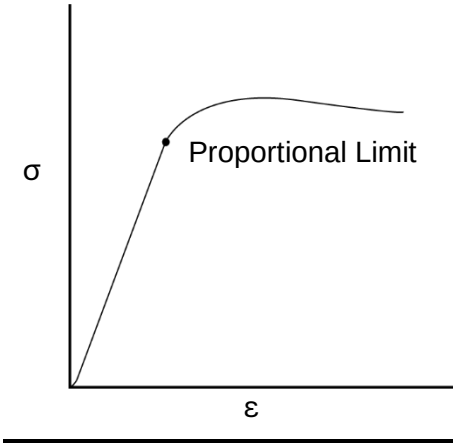
Where:

P_{pl} = load at proportional limit[1] (lbf)

$F_{c\perp y}$ = bearing stress at proportional limit (psi)[1]

A = bearing area under metal loading block (in.^{2})

[1] Proportional Limit is defined as a point on the stress-strain curve where the material transitions from a linear relationship to a non-linear relationship (see figure below).



4.0 QUALITY CONTROL

4.1 The products shall be manufactured under an approved quality control program with inspections by ICC-ES or by a properly accredited inspection agency that has a contractual relationship with ICC-ES.

4.2 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

4.3 A qualifying inspection shall be conducted at each manufacturing facility when required by the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

5.0 EVALUATION REPORT REQUIREMENTS

5.1 The evaluation report shall include a statement that support framing shall be designed for a maximum allowable assembly deflection of L/360 under seismic or wind loads for exterior or interior walls; or live loads for ceilings supported by floor framing; or live, seismic, or wind loads for ceilings supported by roof framing.

5.2 When used as a structural floor sheathing attached to wood framing, the evaluation report shall include information required in Section 6.0 of AC367.

5.3 When used as a structural floor or roof sheathing attached to cold-formed steel framing, the evaluation report shall include information required in Section 5.0 of AC318.

5.4 When used as a structural sheathing in horizontal diaphragms constructed with cold-formed steel framing, the evaluation report shall include information required in Section 4.0 of AC319.

5.5 When used as roof sheathing, an approved roof covering in accordance with the IBC or IRC, as applicable, is required.

5.6 When used as a substrate in interior dry areas, the evaluation report shall include information required in Section 6.0 of AC378.

5.7 If compliance with Section 3.5 is shown, the evaluation report shall include a statement similar to the following: MgO sheets may be used in non-weather exposed locations where fire-retardant treated wood structural panels are allowed in the applicable codes for the same end uses noted in the evaluation report.

5.8 The evaluation report shall include a condition of use that the substrate sheets are limited to use on interior surfaces as defined in IBC Section 202.

5.9 The evaluation report shall include a list of the metals and associated end uses evaluated for corrosion effects in accordance with Appendix A of this criteria. If the evaluation does not include wet areas, the evaluation report shall include a condition of use that the MgO sheets must not be used in wet areas as defined in IBC Section 2509; under the IRC, the substrate sheets must not be used in showers.

5.10 If compliance with Section 3.6 is shown, the evaluation report shall include the following statements:

5.10.1 Direct attachment of cladding to the Magnesium Oxide sheet is limited to claddings with a maximum weight 10 psf (48.8 kg/m^2) and maximum thickness of $^5/_8$-inch (15.9 mm).

5.10.2 The cladding must be attached directly to the sheathing; other than thin membranes, such as water-resistive barriers, no intermediate materials between the cladding and sheathing such as continuous insulation are permitted.

5.10.3 No adjustment factors for load duration may be applied to the reference withdrawal and lateral values.

5.10.4 Utilization of the allowable fastener withdrawal and lateral capacities for design of cladding attachment, including consideration of resistance to wind and gravity loads, must be performed by a registered design professional, and is outside of the scope of this report.

5.11 If compliance with Section 3.7 is shown for use of the NDS yield mode equations, the evaluation report shall include the following statement: the end and edge distances used for determination of dowel bearing strength and use of the NDS yield mode equations was 2-inches; end and edge distances less than 2-inches are outside of the scope of this report. Fastener spacing shall not be less than 2-inches.

5.12 If compliance with Section 3.8 is shown, the evaluation report shall include the following statement: the allowable bearing stress of the underlying construction must not be exceeded.

6.0 ENVIRONMENTAL PRODUCT DECLARATION (Optional)

Environmental impacts shall be assessed via an Environmental Product Declaration (EPD) based on a Life Cycle Assessment (LCA). The LCA and EPD shall be conducted in accordance with ISO 21930 and the appropriate Product Category Rule(s) for the product type.■

TABLE 1—TESTING FOR PHYSICAL PROPERTIES AND END USES

PHYSICAL PROPERTY REQUIREMENTS FOR ANY USE (AC386 Section 3.1)[1,2]		**SUMMARY OF TESTING FOR EACH END USE (Minimum of One End Use Must be Selected)**					
		Structural Floor Sheathing – Attached to Wood Framing (AC386 Section 3.2.1)	**Structural Floor Sheathing – Attached to Cold-formed Steel Framing (AC386 Sections 3.2.2.1 and 3.2.2.3)**	**Structural Roof Sheathing - Attached to Cold-formed Steel Framing (AC386 Sections 3.2.2.2 and 3.2.2.3)**		**Use as Wall and Ceiling Sheathing or Floor Underlayment (AC386 Section 3.2.3)**	**Use as a Substrate in Interior Areas (AC386 Section 3.2.4)**
AC386 Section 3.1.1 – Flexural Strength	AC386 Section 3.1.7 – Nail-Head Pull Through	AC367 Section 3.2 – Concentrated Static and Impact Load Tests	AC318 Section A5.2.1 – Concentrated Loads	AC318 Section A5.2.1 – Concentrated Loads	AC318 Section A5.4 – Panel Freeze/Thaw Resistance	AC376 Section 3.4 – Types I-IV Construction (Optional)	AC378 Section 3.2 – Resistance to Transverse Loads
AC386 Section 3.1.2 – Freeze-Thaw Cycling	AC386 Section 3.1.8 – Falling Ball Impact	AC367 Section 3.3 – Transverse Uniform Load Tests	AC318 Section A5.2.2 - Uniform Loads	AC318 Section A5.2.2 - Uniform Loads	AC318 Section A5.8 – Long Term Durability (Warm Water)	AC376 Section 3.6 – Racking Shear Resistance per AC269.2 (Optional)	AC378 Section 3.3 – Racking Shear Resistance per AC269.2 (Optional)
AC386 Section 3.1.3 – Dimensions and Tolerances	AC386 Section 3.1.9 – Shear Bond Strength	AC367 Section 3.4 – Fastener Holding	AC318 Section A5.2.3 – Fastener Holding	AC318 Section A5.2.3 – Fastener Holding	AC318 Section A5.10 – Density	AC376 Section 3.7 – Exterior Wall Sheathing Resistance to Transverse Loads	AC378 Section 3.6 – Ceiling Applications (Optional)
AC386 Section 3.1.4 – Moisture Movement	AC386 Section 3.1.10 - Humidified Deflection	AC367 Section 3.6 – Diaphragm (Optional)	AC318 Section 3.3.1 – Allowable Uniform Load for Floor Sheathing	AC318 Section A5.2.4 – Flexural Strength	AC318 Section A5.11 – Heat/Rain – Roof Sheathing	AC376 Section 3.8 – Ceiling Applications (Optional)	
AC386 Section 3.1.5 – Water Absorption	AC386 Section 3.1.11 – Flame Spread Characteristics	AC386 Section 3.7 – Reference Lateral Design Values (Optional)	AC319 3.2, 3.4, and 3.5 Diaphragms (Optional)	AC318 Section A5.3.2 – Thickness Swell	AC318 Section 3.3.2 – Allowable Uniform Load for Roof Sheathing	AC386 Section 3.2.5 – Use as Braced Wall Panel per AC269.1 (Optional)	
AC386 Section 3.1.6 – Compression Indentation	AC386 Section 3.1.12 – Corrosion Effects	AC386 Section 3.8 – Allowable Bearing Stress (Optional)	AC386 Section 3.7 – Reference Lateral Design Values (Optional)	AC318 Section A5.3.3 – Water Absorption	AC319 3.2, 3.4, and 3.5 Diaphragms (optional)	AC386 Section 3.6 – Fastener Capacities for Direct Attachment of Lightweight Cladding (Optional)	
			AC386 Section 3.8 – Allowable Bearing Stress (Optional)			AC386 Section 3.7 – Reference Lateral Design Values (Optional)	
						AC386 Section 3.8 – Allowable Bearing Stress (Optional)	

[1] Freeze-thaw cycling in accordance with Section 3.1.2 of AC386 is not required for sheets evaluated for use as roof sheathing. Panel Freeze-Thaw Resistance testing for sheets evaluated for use as roof sheathing shall be in accordance with Section A5.4 of AC318.

[2] Water absorption testing in accordance with Section 3.1.5 of AC386 is not required for sheets evaluated for use as roof sheathing. Water absorption testing for sheets evaluated for use as roof sheathing shall be in accordance with Section A5.3.3 of AC318.

TABLE 2 – REFERENCED STANDARDS

STANDARD	DATE OF STANDARD						
	2024 IBC, IRC	**2021 IBC, IRC**	**2018 IBC, IRC**	**2015 IBC, IRC**	**2012 IBC, IRC**	**2009 IBC, IRC**	**2006 IBC, IRC**
ASTM C473	19	17	15	12	07	06a	03
ASTM C666[1]	97						
ASTM C1185[1]	08(2012)					08	03
ASTM C1186	08(2016)		08(2012)		08	07	02
ASTM C1396	17		14a	13	06a		02
ASTM D143[1]	23						
ASTM D1037[1]	06a						99
ASTM D1761[1]	20						
ASTM D2915[1]	17(2022)						
ASTM D2394[1]	99						83
ASTM D5764	24						
ASTM E119	20	18b	16	12a	08a	07	00
ASTM E136	22	19	16	12	00	04	99
ASTM E84	21a	18b	16	13a	09	07	04
ASTM E455	19						
ANSI A118.1	19	18	16	99			
ANSI A118.4	19	18	16	99			
UL 263	11[2]	11[3]	11[4]	11	03[5]	03	--
UL 723	18		08[6]	08[7]	08	--	--

[1]Not referenced in the IBC or IRC
[2]UL 263-2011 with Revisions through August 2021
[3]UL 263-2011 with Revisions through March 2018
[4]UL 263-2011 with Revisions through June 2015
[5]UL 263-2003 with Revisions through October 2007
[6]UL 723-2008 with Revisions through August 2013
[7]UL 723-2008 with Revisions through September 2010

TABLE 3 – REFERENCED SECTIONS OF THE IBC and IRC

2024 IBC	**2021 IBC**	**2018 IBC**	**2015 IBC**	**2012 IBC**	**2009 IBC**	**2006 IBC**
104.2.3	104.11					
Section 202			Section 2502			
Table 601						
Table 705.5		Table 602				
Section 602.3						
Section 2509						
Section 2509.1						
Section 2302						
Footnote c of Table 2304.8(3)			Footnote d of Table 2304.8(3)	Footnote d of Table 2304.7(3)		
2024 IRC	**2021 IRC**	**2018 IRC**	**2015 IRC**	**2012 IRC**	**2009 IRC**	**2006 IRC**
R104.2.2	R104.11					
Footnote j of IRC Table R503.2.1.1(1)						

APPENDIX A – EVALUATION OF CORROSION EFFECTS OF MAGNESIUM-OXIDE-BASED SHEETS

A1.0 INTRODUCTION

A1.1 Purpose: The purpose of this appendix is to provide requirements for evaluating the corrosion effects of magnesium-oxide based sheets (MgO sheets) in contact with common construction metals.

This appendix is needed since the code does not provide applicable test methods and performance requirements for determining corrosion effects of proprietary MgO sheets.

A1.2 Scope: This appendix is used to evaluate corrosion effects of MgO sheets via comparison to the corrosion effects of preservative treated plywood. The criteria is intended to address MgO sheet compatibility with common construction metals, including fasteners used for attachment of the MgO sheets and metals in contact with the surfaces of the MgO sheets. Test results have comparative value and are not correlated to exposure time in a natural environment.

A2.0 REFERENCED STANDARDS SPECIFICALLY APPLICABLE TO THIS APPENDIX: For the applicable editions of the referenced standards, see Table A3 of this criteria.

A2.1 ASTM A123, Standard Specification for Zinc (Hot-dip Galvanized) Coatings on Iron and Steel Products, ASTM International.

A2.2 ASTM A653, Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-Dip Process, ASTM International.

A2.3 ASTM A792, Specification for Steel Sheet, 55% Aluminum-zinc Alloy-coated by the Hot-dip Process, ASTM International.

A2.4 ASTM A875, Standard Specification for Steel Sheet, Zinc-5%, Aluminum Alloy-coated by the Hot-dip Process, ASTM International

A2.5 ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM International.

A2.6 ASTM B370, Standard Specification for Copper Sheet and Strip for Building Construction, ASTM International.

A2.7 ASTM C1185, Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.

A2.8 ASTM D4442, Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials, ASTM International.

A2.9 ASTM D4444, Standard Test Method for Laboratory Standardization and Calibration of Hand-Held Moisture Meters, ASTM International.

A2.10 ASTM D610, Standard Test method for Evaluating Degree of Rusting on painted Steel Surfaces, ASTM International.

A2.11 AWPA E12©, Standard Method of Determining Corrosion of Metals in contact with Treated Wood, American Wood Protection Association.

A2.12 AWPA P23©, Standard for Chromated Copper Arsenate Type C (CCA-C), American Wood Protection Association.

A2.13 AWPA U1©, Use Category System: User Specification for Treated Wood, American Wood Protection Association.

A2.14 DOC PS1, Structural Plywood, U.S. Department of Commerce

A2.15 ICC-ES Acceptance Criteria for Fiber-Reinforced Magnesium-Oxide-Based Sheets with a Factory-Bonded Water-Resistive Overlay Membrane (AC530).

A3.0 DEFINITIONS SPECIFICALLY APPLICABLE TO THIS APPENDIX:

A3.1 Coastal Region: Areas within 3,000 feet (915 m) of the shoreline of a body of saltwater.

A3.2 Test Assemblies:

A3.2.1 Benchmark Test Assembly: The combination of plywood treated with the benchmark chemical specified in Section A5.0 and hot-dip galvanized steel coupons (ASTM A123, average 1 oz/ft^2 per side).

A3.2.2 Alternative Test Assembly: The combination of MgO sheets and metal coupons of the type being evaluated.

A3.2.2.1 Uncoated MgO Sheets: For MgO sheets that do not have a coating or surface treatment on either side, one set of samples for each combination of exposure condition described in Section A6.5, MgO sheet, and coupon shall be tested.

A3.2.2.2 Coated MgO Sheets: For the purposes of this section, coated MgO sheets are those which have a coating or surface treatment, other than those intended for weather resistance as addressed in AC530.

A3.2.2.2.1 Sheets Coated on One Side: For sheets that are coated on one side, two sets of samples for each combination of exposure condition described in Section A6.5, MgO sheet, and coupon shall be tested. Both the coated and uncoated side shall be tested in contact with the metal coupons unless it can be established that one side (coated or uncoated) is a worst case scenario. If it can be established that one side is a worst case scenario, then this side can be used for validation of both sides.

A3.2.2.2.2 Sheets Coated on Both Sides: For sheets that are coated on both sides, one set of samples for each combination of exposure condition described in Section A6.5, MgO sheet, and coupon shall be tested.

A4.0 BASIC INFORMATION

A4.1 See Section 2.0, as applicable.

A4.2 Product Sampling: MgO sheets shall be sampled in accordance with Section 3.1 of AC85. Wood test members and metal coupons shall be sampled in accordance with Section 3.2 of AC85 and Section A5.0.

A5.0 TEST MATERIAL REQUIREMENTS

1. A minimum of five plywood sheets treated with the benchmark treatment chemical, shall be sampled and prepared following AWPA E12. The sheets shall be sized to accommodate coupons to be tested. The thickness of the treated plywood shall be less than or equal to the MgO sheets being evaluated. The plywood sheets shall comply with DOC PS1 and shall be identified in accordance with IBC Sections 2303.1.5 and 2303.1.9.1.
2. A minimum of five proprietary MgO based sheets sampled in accordance with Section A4.2 shall be prepared following AWPA E12 for each type of coupon to be evaluated. The sheets shall be sized to accommodate coupons to be tested. The MgO sheets used in testing shall be the maximum thickness to be included in the evaluation report for each formulation and end use as applicable.
3. The benchmark treatment chemical shall be chromated copper arsenate (CCA), Type C, oxide formulation complying with AWPA P23. The minimum retention rate shall be 0.4 pcf (6.4 kg/m^3). NOTE: Plywood treated with preservatives known to have lesser corrosion effects may be used in lieu of CCA because the comparison would be more conservative.
4. Treatment chemical retention and penetration shall be verified by using AWPA test methods and representative specimens of treated wood cut from the wood test members.
5. Any type of metal may be evaluated if a standard coupon can be obtained which is representative of the metal composition and surface treatment, as applicable. Suggested metals to be tested are galvanized steel, stainless steel, aluminum (2024-T3 or 5154-0 alloys), copper (ASTM B370) and any other metals that are representative of fasteners, coatings and metals to be specified by the report applicant. For evaluation of corrosion effects on galvanized cold-formed steel, guidance is given in the table A1. Actual coating weights of materials tested shall be verified to be within %10 of the minimum coating weight specified in the applicable standard. Testing with the minimum coating weight designated in Table A1 will also qualify use of heavier coating weights. Coupons shall be 1 inch by 2 inches (25.4 mm x 50.8 mm) in accordance with AWPA E12 and shall have a minimum thickness of 16 gauge [54 mils, 0.0538 inch (1.37 mm)] and a maximum thickness of 14 gauge [75 mils, 0.0747 inch (1.90 mm)].

TABLE A1—MINIMUM COATING WEIGHTS FOR COMMON GALVANIZED STEEL MATERIALS

Coating Type:	Applicable Standard	Minimum Coating Weight Designation for Testing, Imperial (SI)	Coating Weight Designations Qualified by Extension, Imperial (SI)
Zinc	ASTM A653	G40 (Z120)	G60 (Z180), G90 (Z275)
Zinc Iron	ASTM A653	A60 (ZF180)	
55% Al-Zinc	ASTM A792	AZ50 (AZM150)	
Zinc-5%	ASTM A875	GF30 (ZGF90)	GF45 (ZGF135)

6. Exposure tests shall include both benchmark and alternative assemblies.

A6.0 TEST METHODS AND REQUIREMENTS

A6.1 Testing Scope: Testing shall be performed for the most severe application for which evaluation is being sought. Tests for a defined application are applicable to the same metal / MgO Sheet combination at lower application levels. Table A1 shall be used to establish the exposure test requirements for each application level.

A6.2 Test Method: Testing shall include exposure of metal coupons to treated wood in accordance with the general size and assembly methods of AWPA E12. The initial moisture condition of the material shall be in accordance with the following:

A6.2.1 Benchmark Plywood: The moisture content of the test members shall be recorded when the test assemblies are placed in the chamber and when they are removed from the chamber. The beginning and final moisture contents of the test members shall be determined by using calibrated moisture meters in accordance with ASTM D4444 or by oven-drying methods in accordance with ASTM D4442. For chemical treatments carried in water, the initial moisture content of the test member shall not be less than 15 percent (oven-dry basis); and for treatments applied dry, the test member shall be conditioned to equilibrium moisture content at not less than 90ºF (32ºC) and 90 percent relative humidity.

A6.2.2 Proprietary MgO Sheets: Prior to testing, sheets should be conditioned to equilibrium per ASTM C1185 5.2.3.1. For Exposure Condition 1 only (Section A6.5.1) the test member shall be initially conditioned to equilibrium moisture content at not less than 90ºF (32ºC) and 90 percent relative humidity. Equilibrium moisture content should be verified by recording less than 0.2% wt. change in a 24-hour period. No sweating or leaching should be observed during this equilibration.

A6.3 Number of Coupons: A minimum of ten (10) coupons per metal type given in Section A5.0 shall be exposed to the proprietary MgO sheet with an equal number of hot-dip galvanized coupons exposed to the benchmark wood treatment.

A6.4 Coupon Measurements: Each coupon shall be weighed to a precision of 0.5 percent, and the thickness measured at a precision of 1 percent.

A6.5 Exposure Testing Conditions:

A6.5.1 Exposure Condition 1—: The test specimens shall be exposed to a steady state environment of not less than 90°F (32°C) and 90-percent relative humidity. The test duration shall be a minimum of 720 hours.

A6.5.2 Exposure Condition 2—: Water-spray testing shall be performed in accordance with ASTM B117 for a period of 720 hours, except distilled water (Type IV) shall be used in place of salt water.

A6.5.32 Exposure Condition 3—: Water-spray testing shall be performed in accordance with ASTM B117 for a period of 720 hours, with salt water.

A6.6 Coupon Removal and Cleaning: When the tests are terminated, the metal coupons shall be removed by opening the plywood or MgO sheet test specimen, followed by careful separation of the metal coupon from the wood or MgO sheet test member. If coating is lost by adhesion to the test members, the loss shall be noted in the report.

Coupons shall be cleaned in accordance with AWPA E12 Section 8.

A7.0 ASSESSMENT OF RESULTS

A7.1 Assessment of Coupons: Both contact surfaces of the metal coupons shall be evaluated according to AWPA E12-20, section 9.0. Hot-dip galvanized coupons from the benchmark assemblies shall serve as a test control and shall be evaluated in the same manner.

A7.2 Comparisons to Benchmarks:

1. Corrosion ratings for all coupons shall be summarized by treatment using summary statistics, mean, standard deviation, and coefficient of variation.
2. Corrosion ratings of the benchmark materials and the alternative materials shall be compared using a one-tail t-test to assess equality of corrosion performance. The significance level shall be 0.05 for comparisons and inferences.
3. For statistical tests where equality is rejected: If the mean corrosion rating of the alternative is better than that of the benchmark, the inference is that the corrosion resistance exceeds that of the benchmark; if the mean corrosion rating of the alternative is not as good as that of the benchmark, the inference is that the corrosion resistance is less than that of the benchmark.
4. The statistical results shall be combined with assessment of functional differences, that is, severe but not statistically equivalent corrosion conditions may be not functionally different and shall be subject to interpretation.
5. A corrosion rating relative to the benchmark assembly shall be calculated and reported for each alternative assembly and shall be a ratio of the mean corrosion rating of the alternative assembly to the benchmark assembly.
6. Data and information from other documented assessment methods may be considered as supplemental documentation for comparison to visual assessment. Examples of other assessment methods are weight loss of samples, x-ray analysis, tension test results, etc.

A8.0 EVALUATION REPORT REQUIREMENTS

The evaluation report shall include a description of the intended end uses in accordance with Table A2. The evaluation report shall also include the corrosion rating for each alternative assembly as determined in accordance with Section A7.2, Item 5.

TABLE A2—EXPOSURE TEST CONDITIONS BASED ON END USE

END USE SEVERITY RATING	END USE	DESCRIPTION	APPLICABLE EXPOSURE TESTING REQUIREMENTS
1	Interior Walls	Walls that do not fall under the definition of "Exterior Walls" that are fully contained within the conditioned interior space, outside of wet areas.	A6.5.1
	Interior Floors	Floors fully contained within the conditioned interior space, outside of wet areas.	
2	Exterior Walls in Non-Coastal Regions	Walls, meeting the definition in Section 202 of the IBC, including fire-resistance rated walls located more than 3,000 feet from the shoreline of a body of saltwater. The MgO sheets shall be covered by the weather-resistive envelope.	A6.5.2*
	Roof Sheathing in Non-Coastal Regions	Roof sheathing in structures located more than 3,000 feet from the shoreline of a body of saltwater. The MgO sheets shall be covered by an approved roof covering.	
	Interior Wet Areas	Areas defined in IBC Section 2509	
3	Exterior Walls in Coastal Regions	Walls meeting the definition in Section 202 of the IBC, including fire-resistance rated walls, in structures located less than 3,000 feet from the shoreline of a body of saltwater. The MgO sheets shall be protected by the weather-resistive envelope	A6.5.3**
	Roof Sheathing in Coastal Regions	Roof sheathing in structures located less than 3,000 feet from the shoreline of a body of saltwater. The MgO sheets shall be covered by an approved roof covering.	

* Successful passing of A6.5.2 also qualifies for A6.5.1 for the same metal / MgO Sheet combination

** Successful passing of A6.5.3 also qualified for A6.5.1 and A6.5.2 for the same metal / MgO Sheet combination

TABLE A3 – REFERENCED STANDARDS in Appendix A

STANDARD	DATE OF STANDARD						
	2024 IBC, IRC	2021 IBC, IRC	2018 IBC, IRC	2015 IBC, IRC	2012 IBC, IRC	2009 IBC, IRC	2006 IBC, IRC
ASTM A123[1]	17						
ASTM A653	20	17	15	11	08	07	04a
ASTM A792	21a	10(2015)		10	08	06a	03
ASTM A875	21	13			06		02a
ASTM B117[1]	19						
ASTM B370	12(2019)	12			09	03	
ASTM C1185[1]	08(2016)						
ASTM D4442[1]	20						
ASTM D4444[1]	13(2018)						
ASTM D610[1]	08(2019)						
AWPA E12[1]	20						
AWPA P23[1]	14(R2020)						
AWPA U1	23	20	16	14	11	07	04

[1]Not referenced in the IBC

TABLE A4 – REFERENCED SECTIONS OF THE IBC in Appendix A

2024 IBC	2021 IBC	2018 IBC	2015 IBC	2012 IBC	2009 IBC	2006 IBC
Section 2303.1.5				Section 2303.1.4		
Section 2303.1.9.1				Section 2303.1.8.1		