



ICC Evaluation Service, LLC  
Western Regional Office  
3060 Saturn Street, Suite 100  
Brea, CA 92821  
t: 1.800.423.6587, ext. 1  
f: 562.695.4694  
www.icc-es.org

November 22, 2024

**TO: PARTIES INTERESTED IN FIBER-REINFORCED MAGNESIUM-OXIDE-BASED SHEETS**

**SUBJECT: Proposed Revisions to the Acceptance Criteria for Fiber-Reinforced Magnesium-Oxide-Based Sheets AC386-0225-R1-2 (WU/YM)**

**Hearing Information:**  
WebEx Event Meeting  
[Wednesday, February 19, 2025](#)  
8:00 am Pacific Standard Time  
Click the date above to register

Dear Colleague:

You are invited to comment on proposed revisions to AC386 which will be discussed at the Evaluation Committee hearing noted above.

The proposed revisions are outlined by the proponent in the attached letter dated November 8, 2024 by Jarrett Davis with Built Environments in conjunction with: Dr. Michal Porter with DuPont Building Solutions; Trevor Rajopa with Huber Engineered Woods; Ben Richardson with Huber Engineered Woods; and Eric Polzin, P.E. with NEXGEN Building Products. A mark up of AC386 Appendix A is attached.

Should the committee approve the proposed revisions to the criteria, the ICC-ES staff will recommend a mandatory compliance date of July 2026 which replaces the current compliance date of October 2025. This means that existing report holders, under this criteria, will need to show their compliance with the new provisions before the compliance date, or face mandated revisions or suspension or cancellation of their reports. Also, in order to ensure that ICC-ES has sufficient time to review data submittals, the ICC-ES staff will ask all existing report holders to submit data packages, showing compliance with the revised criteria, no later than February 2026. Data packages will need to be accompanied by an application for revision, along with appropriate fees.

You are invited to submit written comments on this or any other agenda item, or to attend the Evaluation Committee hearing and present your views in person. If you wish to contribute to the discussion, please note the following:

1. Regarding written comments and presentations:
  - a. You should submit these via e-mail to [es@icc-es.org](mailto:es@icc-es.org) by the applicable due date.
  - b. Comments are to be received by **December 18, 2024**. These written comments will be forwarded to the committee before the meeting, and will also be posted on the ICC-ES web

site shortly after the deadline for submission. Written comments that are not submitted by this deadline will not be considered at the meeting.

- c. Rebuttal comments, from the proponent noted in this letter, are to be received by **January 9, 2025**. They will be forwarded to the committee before the meeting, and will also be posted on the ICC-ES web site shortly after the deadline for submission. Written rebuttal comments that are not submitted by the deadline will not be considered at the meeting.
- d. If you want to make a visual presentation at the hearing, it must be received in PowerPoint format. The presentation is to be received by **January 24, 2025**. These will be forwarded to the committee before the meeting, and will also be posted on the ICC-ES web site after the deadline for submission. Presentations that are not submitted by the deadline cannot be presented at the meeting. **Note:** Videos will not be posted on the web site.

Presentations will be retained with other records of the meeting.

- e. ICC-ES will post to the web site, on **February 5, 2025**, memos by the ICC-ES staff, responding to the previously received public comments.
- f. If you miss the deadlines for submission of written comments and visual presentations, your verbal comments can be presented at the meeting.
- g. Proposed criteria, written public comments, visual presentations, and responses by ICC-ES staff for this agenda item are all available on our website.

2. Regarding verbal comments and presentations:

Please plan to speak for not more than ten minutes. As noted above, visuals are to be in PowerPoint format.

3. Keep in mind that all materials submitted for committee consideration are part of the public record and will not be treated as confidential. It is the presenter's responsibility to certify to ICC-ES staff that no materials infringe copyright.
4. Please do not communicate with committee members before the meeting about any items on the agenda.

We appreciate your interest in the work of the Evaluation Committee. If you have any questions, please contact me at (800) 423-6587, extension 5699, or Yamil Moya, at extension 3691. You may also reach us by e-mail at [es@icc-es.org](mailto:es@icc-es.org).

Yours very truly,



Will Utsey  
Regional Vice President of Engineering

WU/Is

Encl.

cc: Evaluation Committee



**BUILT ENVIRONMENTS**

651-439-9396 (P) • 651-204-2247 (F) • WWW.BUILT-ENVIRONMENTS.COM  
9600 PLOOF ROAD BUILDING 9 • LELAND, NORTH CAROLINA 28451

---

November 8, 2024

Will Utsey, P. E.  
ICC Evaluation Service, LLC  
900 Montclair Road, Suite A  
Birmingham, Alabama 35213

RE: AC386 Appendix A Revision Support Letter

Mr. Utsey,

The proposed revision to *AC386: Acceptance Criteria for Fiber-Reinforced Magnesium-Oxide Based Sheets* pertains to updates regarding Appendix A to the criteria. These changes are being proposed by several members of the MgO industry that were also proponents of the addition of the Appendix prior. All members of the workgroup are jointly signing this letter of revision and submittal. The proposed changes are focused on the following items: removal of benchmark materials due to conformity issues, an additional requirement of all testing passing a baseline test, more closely aligning the test duration to the standard, and stating an absolute maximum corrosion rating for the test procedure. A more thorough justification for each change and/or adjustment can be found in the following narrative of each section.

**Removal of benchmark materials:** In the current publication, MgO is compared to CCA treated plywood. Due to the nature in production of CCA plywood, there are a variety of ways a manufacturer can produce CCA plywood. Those variables make the continuous reproduction of the testing within different approved laboratories across the market difficult to remain within the precision and bias. CCA plywood is also no longer the prominent method of creating a treated plywood material for more earth friendly favorable measures. It has been correlated through testing, that MgO alone to the acceptance criteria of corrosion limits is sufficient to demonstrate use of the material within these condition types as stated within AWWA E12.

**Instituting a Baseline Test:** In the current edition, a manufacturer can choose to test materials for any exposure condition of 1, 2, or 3. Should a material pass exposure condition 3, then the material would be approved for use in all conditions of use, 1, 2, and 3. However, through research and testing, it has been found that some materials that pass Exposure Condition 3 may not have passed Exposure Condition 1 due to the chemical makeup of the material and Exposure Condition 3 applies a moisture spray to the material. It is being proposed with this revision that all manufacturers shall need to pass Exposure Condition 1 prior to advancing to Exposure Condition 2 or 3 to eliminate the excess liquid spray being applied to the test coupon. A manufacturer would then have the option to add additional testing of Exposure Condition 2 or 3 should they desire. If, however, the manufacturer does test Exposure Condition 3, then that would allow the material to be used within Exposure Condition 2

applications. This would not be an additional cost burden to the manufacturer as the total time limit of the test is being reduced to correlate more closely with AWPA E12 as further discussed within the next segment.

**Test Duration Time Changes:** It is being proposed to reduce the test limits to 366 +/-6 hours which more closely aligns with the original instructions of AWPA E12 Section 7.0 which states that longer durations to 720 hours are only required to differentiate between the corrosion rates of coupons in contact with wood treated with test preservative treatments as compared to reference treatments. Further, it has been found through testing that extending the test to 720 hours, double the proposed 366-hour mark, may reduce the corrosion build up of a test coupon due to the test metal developing an artificial insulation layer on the metal from corrosion. Since the removal of CCA plywood is being proposed, an appropriate time duration of the test procedure should then be accounted for within the procedure. This reduction in testing timeframe further reduces the cost burden of a report holder with additional testing of performing both Exposure Condition 1 (Baseline) and an additional Exposure Condition should it be desired.

**Maximum Corrosion Rating Limits:** In removing the CCA plywood comparison, there is no need to utilize the allowable corrosion tables of AWPA E12 Section 11 or AWPA U1 use tables. Rather it is being proposed to set the maximum corrosion rate for any exposure condition, 1-3, to be at 20 mils/year or less. This limit corresponds to the Acceptable Limits of AWPA E12 standard for use in UC1 Interior Dry, UC2 Interior Damp, UC3A Above Ground Protected, UC3B Above Ground Exposed, and UC4C Ground Contact. The corrosion limit of 20 mil/year outlined in AWPA E12 is the most stringent performance requirement in the test standard, and it is used to determine whether or not a product is suitable for the most extreme use cases and exposures defined in the AWPA standards.

The workgroup feels that these changes to AC386 Appendix A would be beneficial to the users and specifiers of Magnesium-Oxide based sheets, while further aligning with known test measures and procedures. Should you have any further questions, please do not hesitate to contact any member of the working group.

Kind Regards,

*Jarrett B. Davis*

Jarrett B. Davis AMB, CGP, CDT, LEED AP BD+C  
Principal Building Scientist

cc: Work group members:

Dr. Michal Porter  
DuPont Building Solutions

Trevor Rajopa  
Huber Engineered Woods

Eric Polzin, PE  
NEXGEN Building Products

Ben Richardson  
Huber Engineered Woods

## ICC EVALUATION SERVICE, LLC, RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE

### 1.0 PURPOSE

The purpose of the Evaluation Committee is to review and approve acceptance criteria on which evaluation reports may be based.

### 2.0 MEMBERSHIP

**2.1** The Evaluation Committee has a membership of not fewer than nine, with one of the members named by the ICC-ES president each year to serve as the chairperson–moderator.

**2.2** All members of the committee shall be representatives of a body enforcing regulations related to the built environment.

**2.3** Persons are appointed to the committee by the ICC-ES president, from among individuals who have formally applied for membership.

**2.4** The ICC-ES Board of Managers, using simple majority vote, shall ratify the nominations of the president.

**2.5** Committee membership is for one year, coinciding with the calendar year. Members may be renominated and reappointed.

**2.6** In the event that a member is unable to attend a committee meeting or complete a term on the committee, the ICC-ES president may appoint a replacement to fill in at the meeting or for the remainder of the member's term. Any replacement appointed for only one meeting must have prior experience as a member of the Evaluation Committee. Appointments under this section (Section 2.6) are subject to ratification as noted in Section 2.4.

### 3.0 MEETINGS

**3.1** The Evaluation Committee shall schedule meetings that are open to the public in discharging its duties under Section 1.0, subject to Section 3.0.

**3.2** All scheduled meetings shall be publicly announced. There shall be three to six meetings per year (as necessary).

**3.3** More than half of the Evaluation Committee members, counting the chairperson, shall constitute a quorum. A majority vote of members present is required on any action. To avoid any tie vote, the chairperson may choose to exercise or not exercise, as necessary, their right to vote.

**3.4** In the absence of the chairperson–moderator, Evaluation Committee members present shall elect an alternate chairperson from the committee for that meeting. The alternate chairperson shall be counted as a voting committee member for purposes of maintaining a committee quorum and to cast a tie-breaking vote of the committee.

**3.5** Minutes shall be kept and shall be the official record of each meeting.

**3.6** An electronic record of meetings may be made by ICC-ES if deemed necessary; no other audio, video, electronic recordings of the meetings will be permitted. Visual aids (including, but not limited to, charts, slides, videos, or presentation software) viewed at meetings shall be permitted only if the presenter provides ICC-ES before the presentation with a copy of the visual aid in a medium which can be retained by ICC-ES with its record of the meeting and which can also be provided to interested parties requesting a copy.

**3.7** Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members regarding agenda items. All written communications and submissions regarding agenda items must be delivered to ICC-ES and shall be considered nonconfidential and available for discussion in open session of an Evaluation Committee meeting. Such materials will be posted on the ICC-ES web site ([www.icc-es.org](http://www.icc-es.org)) prior to the meeting. Comments and submissions not meeting the following deadlines will not be considered at the meeting:

- Initial comments on agenda items shall be submitted at least 28 days before the scheduled meeting.
- A rebuttal comment period shall follow, whereby rebuttal comments to the initial comments may be submitted by the proponent at least 21 days before the scheduled meeting.
- Those planning on giving a visual presentation at the meeting must submit their presentation, in PowerPoint format only, at least 10 days before the scheduled meeting.

The committee reserves the right to refuse recognition of communications which do not comply with the provisions of this section.

### 4.0 CLOSED SESSIONS

Evaluation Committee meetings shall be open except that at the discretion of the chairperson, staff counsel may be necessary. Also, matters related to clients or potential clients covered by confidentiality requirements of ICC-ES Rules of Procedure for Evaluation Reports are discussed only during closed meetings.

### 5.0 ACCEPTANCE CRITERIA

**5.1** Acceptance criteria are established by the committee to provide a basis for issuing ICC-ES evaluation reports on products and systems under codes referenced in Section 2.0 of the Rules of Procedure for Evaluation Reports. They also clarify conditions of acceptance for products and systems specifically regulated by the codes.

Acceptance criteria may involve a product, material, or method of construction. Consideration of any acceptance criteria must be in conjunction with a current and valid application for an ICC-ES evaluation report, an existing ICC-ES evaluation report, or as otherwise determined by the ICC-ES President.

**EXCEPTIONS:** The following acceptance criteria are controlled by the ICC-ES executive staff and are not subject to committee approval:

- The Acceptance Criteria for Quality Documentation (AC10)
- The Acceptance Criteria for Test Reports (AC85)
- The Acceptance Criteria for Inspections and Inspection Agencies (AC304)

## 5.2 Procedure:

**5.2.1** Proposed acceptance criteria shall be developed by the ICC-ES staff and discussed in open session with the Evaluation Committee during a scheduled meeting, except as permitted in Section 4.0 of these rules.

**5.2.2** Proposed acceptance criteria shall be available to interested parties at least 30 days before discussion at the committee meeting.

**5.2.3** The committee shall be informed of all pertinent written communications received by ICC-ES.

**5.2.4** Attendees at Evaluation Committee meetings shall have the opportunity to speak on acceptance criteria listed on the meeting agenda, to provide information to committee members. In the interest of fairness, each speaker requesting to testify on a proposed acceptance criteria or proposed changes to an existing acceptance criteria will be given the same amount of time, as follows:

- a. A 10-minute time limit applies to speakers giving their first testimony on any item, which applies to both verbal testimony and/or visual presentations.
- b. A 5-minute time limit applies to speakers returning to the microphone to offer additional testimony and/or to rebut testimony given by others.
- c. A 2-minute time limit applies to speakers offering testimony on the staff recommendation to criteria.

Should a company have multiple speakers, the speaker time limits above apply the company, in that multiple speakers from the same company shall share the testimony time, i.e., multiple speakers from the same company shall not each get their own testimony times. Time limits do not include time needed to answer questions from the staff and/or committee members. The chairperson-moderator shall have limited authority to modify time limitations on testimony. The chairperson-moderator shall also have the authority to adjust time limits as necessary in order to get through the hearing agenda.

An automatic timing device shall keep time for testimony and shall provide the time remaining to the speaker testifying. Interruptions during testimony will not be tolerated. It is the responsibility of the chairperson-moderator to maintain decorum and order during all testimony.

**5.3** Approval of any action on an acceptance criteria shall be as specified in Section 3.3 of these rules. Possible actions made by the Evaluation Committee include:

Approval; Approval with Revisions; Disapproval; or Further Study. The Evaluation Committee must give the reason(s) for any Disapproval or Further Study actions with specific recommendations.

**5.4** Actions of the Evaluation Committee may be appealed in accordance with the ICC-ES Rules of Procedure for Appeal of Acceptance Criteria or the ICC-ES Rules of Procedure for Appeals of Evaluation Committee Technical Decisions.

## 6.0 COMMITTEE BALLOTING FOR ACCEPTANCE CRITERIA

**6.1** Acceptance criteria may be revised without a public hearing following a 30-day public comment period and a majority vote for approval by the Evaluation Committee (i.e., alternative criteria development process), when at the discretion of the ICC-ES executive staff, the subject is a revision that requires formal action by the Evaluation Committee.

**6.2** Negative votes must be based upon one or more of the following, for the ballots to be considered valid and require resolution:

- a. *Lack of clarity:* There is insufficient explanation of the scope of the acceptance criteria or insufficient description of the intended use of the product or system; or the acceptance criteria is so unclear as to be unacceptable. (The areas where greater clarity is required must be specifically identified.)
- b. *Insufficiency:* The criteria is insufficient for proper evaluation of the product or system. (The provisions of the criteria that are in question must be specifically identified.)
- c. *The subject of the acceptance criteria is not within the scope of the applicable codes:* A report issued by ICC-ES is intended to provide a basis for approval under the codes. If the subject of the acceptance criteria is not regulated by the codes, there is no basis for issuing a report, or a criteria. (Specifics must be provided concerning the inapplicability of the code.)
- d. *The subject of the acceptance criteria needs to be discussed in public hearings.* The committee member requests additional input from other committee members, staff or industry.

**6.3** An Evaluation Committee member, in voting on an acceptance criteria, may only cast the following ballots:

- Approved
- Approved with Comments
- Negative: Do Not Proceed

## 7.0 COMMITTEE COMMUNICATION

Direct communication between committee members, and between committee members and an applicant or concerned party, with regard to the processing of a particular acceptance criteria or evaluation report, shall take place only in a public hearing of the Evaluation Committee. Accordingly:

**7.1** Committee members receiving an electronic ballot should respond only to the sender (ICC-ES staff). Committee members who wish to discuss a particular

**ICC EVALUATION SERVICE, LLC, RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE**

matter with other committee members, before reaching a decision, should ballot accordingly and bring the matter to the attention of ICC-ES staff, so the issue can be placed on the agenda of a future committee meeting.

**7.2** Committee members who are contacted by an applicant or concerned party on a particular matter that will be brought to the committee will refrain from private communication and will encourage the applicant or

concerned party to forward their concerns through the ICC-ES staff in writing, and/or make their concerns known by addressing the committee at a public hearing, so that their concerns can receive the attention of all committee members.■

*Revised May 2024*

## Proposed Compliance Date of July 2026

### 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:

**A2.1** ASTM A123-17, Standard Specification for Zinc (Hot-dip Galvanized) Coatings on Iron and Steel Products, ASTM International.

**A2.2** ASTM A653-17, Specification for Steel Sheet, Zinc-coated Galvanized or Zinc-iron Alloy-coated Galvannealed by the Hot-Dip Process, ASTM International.

**A2.3** ASTM A792-15, Specification for Steel Sheet, 55% Aluminum-zinc Alloy-coated by the Hot-dip Process, ASTM International.

**A2.4** ASTM A875-13, Standard Specification for Steel Sheet, Zinc-5%, Aluminum Alloy-coated by the Hot-dip Process, ASTM International

**A2.5** ASTM B117-19, Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM International.

**A2.6** ASTM B370-12(2019), Standard Specification for Copper Sheet and Strip for Building Construction, ASTM International.

**A2.7** ASTM C1185-08 (2016), Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.

**A2.8** ASTM D4442-20, Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials, ASTM International.

**A2.9** ASTM D4444-13(2018), Standard Test Method for Laboratory Standardization and Calibration of Hand-Held Moisture Meters, ASTM International.

**A2.10** ASTM D610-08(2019), Standard Test method for Evaluating Degree of Rusting on painted Steel Surfaces, ASTM International.

**A2.11** AWPA E12-20<sup>®</sup>, Standard Method of Determining Corrosion of Metals in contact with Treated Wood, American Wood Protection Association.

**A2.12** AWPA P23-14(R2020)<sup>®</sup>, Standard for Chromated Copper Arsenate Type C (CCA-C), American Wood Protection Association.

**A2.13** AWPA U1-20<sup>®</sup>, Use Category System: User Specification for Treated Wood, American Wood Protection Association.

**A2.14** 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<sup>2</sup> 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.

**A3.2.12.2 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 AC 530.

**A3.2.2.1.2 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.



**A3.2.12.2.2 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 AC 85. ~~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/m³). 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. Coupon dimensions shall be in accordance with section 2.1 of AWPA E12, 4 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 MgO sandwich assemblies.~~

**A6.0 TEST METHODS AND REQUIREMENTS**

**A6.1 Testing Scope:** Testing shall be performed using, at a minimum, Baseline Condition 1. If the criteria for passing Baseline Condition 1 is met as defined in Section A7.1, additional testing may be conducted using Exposure Condition 2 or Exposure Condition 3. ~~for the most severe application for which evaluation is being sought after the baseline of Condition 1.~~ 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 MgO sheets in accordance with the general size and 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 90°F (32°C) and 90 percent relative humidity.~~

**A6.2.12 Proprietary MgO Sheets:** Prior to testing, MgO 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 90°F (32°C) 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, or requested by manufacturer, 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 Coupon Assembly:** The test units shall be assembled by placing a metal coupon between two MgO sheets and securing each with two 6 mm nylon bolts (20 thread per inch). A 6 mm flat nylon washer is placed under the bolt head and nut, which is then tightened. The bolts should be tightened alternately to ensure that uniform clamping pressure is applied to the MgO pieces and metal. Alternate tightening should be continued until 7 +/-1 pounds of torque is reached or the nut slips on the threads of the bolt.

**A6.65 Exposure Testing Conditions:**

**A6.65.1 Exposure Baseline 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 366 +/- 6720 hours.

**A6.65.2 Exposure Condition 2—:** Water-spray testing shall be performed in accordance with ASTM B117 for a period of 366 +/- 6720 hours, except distilled water (Type IV) shall be used in place of salt water.

**A6.6.35.32 Exposure Condition 3—:** Water-spray testing shall be performed in accordance with ASTM B117 for a period of 366 +/- 6 720 hours, with salt water.

**A6.76 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 AWWA E12 Section 8.

**A7.0 ASSESSMENT OF RESULTS**

**A7.1 Assessment of Coupons for All Conditions:** Both contact surfaces of the metal coupons shall be evaluated according to AWWA E12-20, section 9.0. Criteria for passing shall be 20 mil/year or less. ~~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 as passing, 20 mil/year or less, for each metal type as tested that is approved for use within each use application, should they differ.

**TABLE A2—EXPOSURE TEST CONDITIONS BASED ON END USE**

<b>END USE SEVERITY RATING</b>	<b>END USE</b>	<b>DESCRIPTION</b>	<b>APPLICABLE EXPOSURE TESTING REQUIREMENTS</b>
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