ICBO Evaluation Service, Inc.
A subsidiary corporation of the International Conference of Building Officials

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ACCEPTANCE CRITERIA FOR ALUMINUM SIDING

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PREFACE

Evaluation reports issued by the ICBO Evaluation Service, Inc. (ICBO ES), are based upon performance features of the Uniform Building Code,™ Uniform Mechanical Code, Uniform Plumbing Code and related codes. Section 105 of the Uniform Building Code is the primary charging section upon which evaluation reports are issued. Section 105 reads as follows:

> The provisions of this code are not intended to prevent the use of any material or method of construction not specifically prescribed by this code, provided any alternate has been approved and its use authorized by the building official.
>
> The building official may approve any such alternate, provided he finds that the proposed design is satisfactory and complies with the provisions of this code and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in suitability, strength, effectiveness, fire resistance, durability, safety and sanitation.
>
> The building official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.

The attached acceptance criteria for the general code sections noted have been issued to provide all interested parties with guidelines on implementing performance features of the codes. The attached acceptance criteria were developed and adopted following public hearings conducted by the Evaluation Committee. These criteria may be revised from time to time as the need dictates.

ICBO ES may consider alternate criteria, provided the proponent submits valid data demonstrating that the alternate criteria are at least equivalent to the attached criteria and otherwise meet the applicable performance requirements of the codes. Notwithstanding that a material, type or method of construction, or equipment, meets the attached acceptance criteria, or it can be demonstrated that valid alternate criteria are equivalent and otherwise meet the applicable performance requirements of the codes, if the material, product, system or equipment is such that either unusual care with its installation or use must be exercised for satisfactory performance, or malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use thereof, ICBO ES retains the right to refuse to issue or renew an evaluation report.

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ACCEPTANCE CRITERIA FOR ALUMINUM SIDING

I. INTRODUCTION:

The purpose of this document is to establish the minimum performance criteria under which aluminum siding can be recognized in an ICBO ES evaluation report under the 1988 Uniform Building Code and 1990 Accumulative Supplement herein after identified as "the code." This criteria is applicable to aluminum siding panels, soffits, fascia and accessories for attachment to exterior wall surfaces.

II. BASIC INFORMATION:

The following information is necessary:

A. General information on the manufacturing process.

B. Dimensioned drawings and details noting thickness, size, configuration, fastener locations and installation instructions for each type.

C. Method of packaging and product identification.

D. Method of field cutting, trimming or forming and treatment of cut edges, if any.

III. **MATERIALS:** The siding must be manufactured from aluminum with the minimum mechanical properties of Alloy Series 3XXX or 5XXX as designated in U.B.C. Standard No. 28-1 and have a minimum ultimate tensile strength of 20,000 psi. Siding and soffits must be accurately formed with tolerances of $\pm\ 1/32$ inch for widths, $\pm\ 1/4$ inch for lengths and $\pm$ 2 degrees for end squareness.

Fasteners must be alloy 6061 aluminum siding nails with a minimum ultimate tensile strength of 63,000 psi. Nails must penetrate a minimum $3/4$ inch into solid lumber or a minimum $1/2$ inch into plywood, excluding point. Nails for siding, soffits and fascia must have a shank diameter of 0.120 inch minimum and a head diameter of 0.3125 inch minimum. Trim nails must have a minimum shank diameter of 0.099 inch and a minimum head diameter of 0.1875 inch. Other fasteners may be used, provided they have equivalent resistance to corrosion and satisfy Section IV Performance Requirements.

Fuel content of foam plastic used as siding backerboards is limited to 2,000 BTU per square foot maximum when tested in accordance with U.B.C. Standard No. 17-2. Maximum thickness of the backerboard material is $1/2$ inch, provided it is separated from the interior of the building by not less than 2 inches of mineral fiber insulation or equivalent in lieu of the thermal barrier, or when it is applied as residing over existing wall construction.

Fiber board siding backerboards are limited to $3/8$ inch maximum thickness with a maximum water absorption by volume of 10 percent and a pH value of 6.5 to 7.5.

IV. PERFORMANCE REQUIREMENTS:

A. **Tensile Strength:** Minimum ultimate tensile strength of the aluminum used to form the siding is 20,000 psi.

B. **Windload Resistance:** Recognition may be granted for use in areas, subject to a maximum basic wind speed of 80 mph on structures a maximum of 40 feet in height in Exposure C zones, provided the proponent can verify, in writing, that he has investigated and determined that his product will perform satisfactorily when installed under these conditions and providing the siding does not exceed the limits of Table No. I. Recognition beyond these limits will require full-scale wind-load resistance tests. Allowable wind load will be based upon the average ultimate test load divided by a safety factor of 2. Wind loads are determined in accordance with Section 2311 of the code.

TABLE NO. I

	MINIMUM THICKNESS ($\pm$0.002 Inch) (Inches)	MAXIMUM PANEL WIDTH (Inches)	MAXIMUM FLAT AREA (Inches)
Unbacked Siding	0.024	18	10
Unbacked Siding	0.019	10	8
Backed Siding	0.019	18	10

During the wind test, maximum allowable soffit deflection at ultimate test load shall be 1.0 inch per foot of soffit length. After removal of load, there shall be no permanent set greater than 0.25 inch for the total length of the soffit. An unloaded soffit assembly, in its normal installed position cannot sag more than 0.08 inches per foot and not more than 0.25 inches over its total unsupported soffit length.

C. **Impact Resistance:** The siding must have a minimum failure energy level of 2 inch pound force per mil thickness when tested as outlined in Section V, paragraph C. Failure is signified by presence of a punched hole, split, shatter or tear created in the target area that is clearly visible to the naked eye when the tested sample is held up to the light.

V. TESTING AND REPORTING:

A. Sampling, preparation of test specimens and conduct of tests must be by an ICBO ES recognized independent testing agency. As an alternate, specimen preparation and testing may be conducted by the proponent, provided a testing agency or qualified independent consultant specifically recognized by ICBO ES, certifies that sampling, preparation of test specimens, testing, calibration of instruments and reporting of test results comply with accepted procedures. The test report must be prepared by the independent testing agency. The testing agency or independent consultant must draw samples from production and test in accordance with Section V, paragraphs C, D and E.

B. Test reports must include the following:

1. Description of preparation of test specimens and complete descriptive information, as applicable, on the product such as aluminum alloy, thicknesses, exposures, etc.

2. Description of test procedures.

3. Test observations, including description of panels after completion of tests.

4. Statement on passing or failing, where applicable.

5. Photographic record of tests.

6. Verification that the products tested are representative of production.

C. **Tensile Test:** Minimum tensile strength must be justified for the aluminum alloy by testing in accordance with Test Method B of ASTM 557. Specimens must be cut from coated aluminum. A minimum of three samples must be tested for each alloy and temper.

D. **Windload Resistance:** Resistance to positive and negative wind pressures must be justified for the siding as installed when tested in accordance with Procedure A of ASTM E 330-84. Test panels shall be three stud spaces wide by four siding panels high and installed per siding manufacturer's installation instructions. At least three positive and three negative load tests must be conducted on the thinnest ungrooved siding with the greatest exposure (i.e., single 10 inch) and the thinnest grooved siding with the greatest overall exposure (i.e., double 6 inch) for each type of siding for which recognition is sought.

Exception: For installations over solid sheathing, in lieu of positive load tests, a statement may be provided justifying resistance to positive wind loads.

Soffits shall be tested in a manner similar to siding panels but with assemblies a minimum of 4 feet wide by the maximum installed length. Test assemblies shall be representative of installation instructions. Deflections shall be measured within a tolerance of 0.01 inch.

E. **Impact Strength:** Siding shall be tested for impact resistance in accordance with Procedure A of ASTM D 4226-85 "Impact Resistance of Rigid PVC Building Products" except that testing will be done on aluminum siding. The H.25 impactor head shall be used. Specimens should be long enough to provide sufficient room for a minimum of five impacts on minimum 4-inch centers. No target area shall be impacted more than once. Any siding insulation or backing must be removed prior to testing. The target area must be flat as opposed to ridges or valleys.

F. **Installation:** The siding is limited to use over solid sheathing complying with Chapter 25 of the Uniform Building Code or supporting systems tested with the siding such as studs or furring strips. Weather protection in accordance with Section 1707 of the 1988 Uniform Building Code is required.