



# ICBO Evaluation Service, Inc.

A subsidiary corporation of the International Conference of Building Officials

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## ACCEPTANCE CRITERIA FOR NONPAPER-FACED FIBER-REINFORCED GYPSUM PANELS USED AS AN ALTERNATE TO GYPSUM BOARD

AC158

October 1999  
(Effective November 1, 1999)

### PREFACE

Evaluation reports issued by ICBO Evaluation Service, Inc. (ICBO ES), are based upon performance features of the *Uniform Building Code*<sup>™</sup>, *ICBO Uniform Mechanical Code*<sup>™</sup> and related codes. Section 104.2.8 of the *Uniform Building Code* is the primary charging section upon which evaluation reports are issued. Section 104.2.8 reads as follows:

The provisions of this code are not intended to prevent the use of any material, alternate design 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 the building official 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 has been issued to provide all interested parties with guidelines on implementing performance features of the codes. The criteria was developed and adopted following public hearings conducted by the Evaluation Committee and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from a previous edition, solid vertical lines (■) in the outer margin within the criteria indicate a technical change or addition from the previous edition. Deletion indicators (◆) are provided in the outer margins where a paragraph or item has been deleted if the deletion resulted from a technical change. This criteria may be further revised 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 that 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 in 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 NONPAPER-FACED FIBER-REINFORCED GYPSUM PANELS USED AS AN ALTERNATE TO GYPSUM BOARD

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this acceptance criteria is to establish the basis by which non-paper-faced fiber-reinforced gypsum panels can be recognized in an ICBO Evaluation Service, Inc. (ICBO ES), evaluation report for use as gypsum board, in any type of construction, on vertical and horizontal assemblies recognized in the code. Basis of recognition is Section 104.2.8 of the 1997 *Uniform Building Code*<sup>TM</sup> (UBC).

**1.2 Scope:** The fiber-reinforced gypsum panel can be recognized as an alternate to the type of gypsum board specified, including those used in noncombustible construction, provided the required data from the tests described in Section 4.0 are submitted. The specific type of gypsum board is to be determined and identified from Section 4.1, 4.2 or 4.3.

**1.2.1** Data showing compliance with the requirements for at least one of the specific types of gypsum board in Section 4.1, 4.2 or 4.3, and compliance with Sections 4.4 through 4.6, must be submitted.

**1.2.2** For recognition of the fiber-reinforced gypsum panel as an alternate to a Type "X" gypsum board, data in compliance with Sections 4.4 through 4.6 and Section 4.8 must be submitted.

**1.2.3** For recognition for use in noncombustible construction, data in compliance with Sections 4.4 through 4.6 and Section 4.9 must be submitted.

**1.2.4** For recognition for use in a shear resistance assembly, data in compliance with Section 4.7 must be submitted.

## 2.0 DEFINITIONS

**2.1 Fiber-reinforced Gypsum Panel:** Panels, without paper facings, consisting of a proprietary composition of gypsum and a percentage of organic or inorganic fibers, manufactured in 1/2- and 5/8-inch (12.7 and 15.9 mm) thicknesses and in various widths and lengths. Additives to the panel composition are permitted in order to provide additional water resistance or to optimize other performance characteristics. Factory-applied coatings may be applied to the panel to optimize performance characteristics.

**2.2 Gypsum Board:** As used in this acceptance criteria, "gypsum board" encompasses gypsum sheathing board, gypsum wallboard, and water-resistant gypsum backing board.

**2.2.1 Gypsum Sheathing Board:** Gypsum core panel complying with ASTM C 79-92 and used as specified in Chapter 25 of the UBC.

**2.2.2 Gypsum Wallboard:** Gypsum core panel complying with ASTM C 36-97 and used as specified in Chapter 25 of the UBC.

**2.2.3 Water-resistant Gypsum Backing Board:** Gypsum core panel complying with ASTM C 630-92 and used as specified in Chapter 25 of the UBC.

**2.3 Fastening System:** The method used to attach the panel to the framing. The system can include nails, staples, screws or adhesives.

## 3.0 BASIC INFORMATION

**3.1 General:** The following information must be submitted:

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

**3.1.2 Installation Instructions:** Installation details on requirements and limitations, fastening methods, joint treatments, and face treatments.

**3.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the panel. Identification must include the evaluation report number and the name or logo of the quality control agency.

**3.1.4 Field Preparation:** A description of the methods of field cutting, preparation and finishing.

**3.2 Testing Laboratories:** Testing laboratories must comply with the ICBO ES Acceptance Criteria for Laboratory Accreditation (AC89).

**3.3 Test Reports and Product Sampling:** Test reports and test specimen sampling must comply with the ICBO ES Acceptance Criteria for Test Reports and Product Sampling (AC85). Products for testing must be sampled in accordance with Section 6.1 of AC85.

## 4.0 TEST AND PERFORMANCE REQUIREMENTS

**4.1 Fiber-reinforced Gypsum Panels Used as an Alternate to Gypsum Wallboard:** Physical properties, dimensions and permissible variations must be determined in accordance with the requirements referenced for Item 1 of Table 1.

**4.2 Fiber-reinforced Gypsum Panels Used as an Alternate to Gypsum Sheathing:** Physical properties, dimensions and permissible variations must be determined in accordance with the requirements referenced for Item 2 of Table 1.

**4.3 Fiber-reinforced Gypsum Panels Used as an Alternate to Water-resistant Gypsum Backing Board:** Physical properties, dimensions and permissible variations must be determined in accordance with the requirements referenced for Item 3 of Table 1.

**4.4 Flame Spread:** The flame-spread index must be in accordance with the requirements referenced for Item 4 of Table 1.

**4.5 Smoke Developed:** The smoke-developed index must be in accordance with the requirements referenced for Item 5 of Table 1.

**4.6 Thermal Barrier:** The thermal barrier rating must be in accordance with the requirements referenced for Item 6 of Table 1.

**4.7 Shear Resistance:** Shear resistance of the fiber-reinforced gypsum panel must be determined in accordance with the requirements referenced for Item 7 of Table 1. Testing must be performed on a minimum of three fiber-reinforced gypsum panels. Steel-framed assemblies must be 8 feet (2438 mm) in height and 8 feet (2438 mm) in width. Wood-framed assemblies must be as described in Section 2513 of the UBC. Recognition will be limited to the specific type of gypsum board and assembly tested. The reported shear values from the tests must be compared to, and must be equal to or greater than, those specified in the code for the specific assembly.

**4.7.1 Steel-framed Wall Assemblies:** Test assemblies are to be framed as described in Table 22-VIII-B of Chapter 22 of the UBC. The nominal shear values must be the lesser of the average ultimate load of the three test assemblies without applying a factor of safety, and the average load at which 1/2-inch (12.7 mm) in-plane displacement occurs.

**4.7.2 Wood-framed Assemblies:** Wood-framed assemblies must be framed as described in Section 2513 and

Table 25-1 of Chapter 25 of the UBC. The allowable shear load must be the lesser of the lowest ultimate load divided by a safety factor of 3.0, and the average load at which  $\frac{1}{8}$ -inch (3.2 mm) net deflection occurs.

**4.8 Fire Resistance:** The fire resistance testing for fire-resistant assemblies utilizing fiber-reinforced gypsum panels must provide Type “X” classification of the panel when tested in accordance with Item 8 of Table 1. The testing for Type “X” classification must be conducted on both wood and steel stud assemblies in accordance with ASTM C 36-97. The assemblies must be framed in accordance with Section 4.2 of ASTM C 36-97 for wood-framed assemblies and in accordance with Section X1.1.1 of ASTM C 36-97 for steel-stud assemblies.

**4.9 Full-scale Fire Performance:** Full-scale fire performance must be in accordance with Item 9 of Table 1. Full-scale

fire performance testing of the materials must be done in accordance with UBC Standard 26-3. The room must be instrumented so as to provide measurements of maximum heat-release rate (HRR), total heat released, and total smoke generation. The maximum HRR, total heat released and total smoke generated must be measured in accordance with UL 1715 (1997).

## 5.0 QUALITY CONTROL

**5.1** The panels must be manufactured under an approved quality control program with inspections by a quality control agency accredited by ICBO ES.

**5.2** A quality control manual complying with the ICBO ES Acceptance Criteria for Quality Control Manuals (AC10) must be submitted.

**TABLE 1—TEST AND PERFORMANCE REQUIREMENTS**

NO.	ITEM	TEST METHOD	REQUIREMENT
1	Standard Specification for Gypsum Wallboard	ASTM C 36	As specified in ASTM C 36-97
2	Standard Specification for Gypsum Sheathing	ASTM C 79	As specified in ASTM C 79-92
3	Standard Specification for Water-resistant Gypsum Backing Board	ASTM C 630	As specified in ASTM C 630-92
4	Flame Spread	UBC Standard 8-1	25 or less
5	Smoke Developed	UBC Standard 8-1	450 or less
6	Thermal Barrier Rating	UBC Standard 26-2	15 minutes or greater
7	Shear Resistance	ASTM E 72	Steel-framed wall assemblies: Ultimate capacity as specified in Table 22-VIII-B of the UBC, or greater.  Wood-framed assemblies: The allowable capacities are determined in accordance with Section 2513 of the UBC and are as specified in Table 25-1 of the UBC, or greater.
8	Fire Resistance	UBC Standard 7-1	As specified for “Type X” board in ASTM C 36-97
9	Full-scale Fire Performance	UBC Standard 26-3 (See Section 4.9)	Fiber-reinforced gypsum panels are in compliance with UBC Standard 26-3. Maximum Heat Release Rate, Total Heat Released, and smoke generation are to be equal to or less than those of the specific type of gypsum board.