



## Designation: C 846 – 94 (Reapproved 1999)

AMERICAN SOCIETY FOR TESTING AND MATERIALS  
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# Standard Practice for Application of Cellulosic Fiber Insulating Board for Wall Sheathing<sup>1</sup>

This standard is issued under the fixed designation C 846; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers the requirements for storing, handling, and application of cellulosic fiber insulating board products.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are provided for information only.

## 2. Referenced Documents

### 2.1 ASTM Standards:

C 208 Specification for Cellulosic Fiber Insulating Board<sup>2</sup>

D 1554 Definitions of Terms Relating to Wood-Base Fiber and Particle Panel Materials<sup>3</sup>

### 2.2 Voluntary Product Standard:

ANSI/AHA A194.1 Cellulosic Fiberboard<sup>4</sup>

### 2.3 Federal Specifications:

FF-N-105-B with Interim Amendment 4 Nails, Brads, Staples and Spikes: Wire Cut and Wrought<sup>5</sup>

UU-B-790-A Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)<sup>5</sup>

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *regular wall sheathing*—described in Definitions D 1554 and Specification C 208. It is 4 ft (1.22 m) wide with square-cut edges on all sides and 1/2 in. (12.7 mm) in thickness.

3.1.2 *structural wall sheathing*—described in Definitions D 1554 and Specification C 208. When installed in accordance

with Section 7, it is considered a structural sheathing providing adequate racking resistance. It is 4 ft (1.22 m) wide and 1/2 in. (12.7 mm) or 25/32 in. (19.8 mm) in thickness with square-cut edges on all sides.

3.1.3 *framing members*—those portions of the studs, headers, bracing, and blocking which serve to receive the sheathing. Framing members can be wood or metal.

3.1.4 *fasteners*—nails, staples, or screws used for application of the sheathing.

3.1.5 *vertical application*—sheathing applied with the long edges parallel to the studs.

3.1.6 *exterior finish*—the shingle, lap, or panel siding material, masonry veneer, or stucco applied over the sheathing as a protective, decorative exterior finish of the building.

## 4. Significance and Use

4.1 This standard provides recommendations for the installation in a safe and effective manner. Actual conditions may vary greatly, and additional care should be taken to ensure a safe and effective installation.

4.2 This standard presents requirements that are general in nature and considered practical. They are not intended as specific recommendations. The user should consult the manufacturer for recommended application methods and procedures.

4.3 This standard does not address the applicability of regulatory limitations. This is the responsibility of the user.

## 5. Materials

5.1 *Sheathing* shall conform to ANSI/AHA A194.1 and Specification C 208.

5.2 *Nails* for application of sheathing to wood framing shall conform to Federal Specification FF-N-105-B, including Interim Amendment 4, and shall be in accordance with Table 1.

5.3 *Staples* for application of 1/2-in. and 25/32-in. sheathing to wood framing shall meet the following requirements:

Gage	16
Thickness, min, in. (mm)	0.057 (1.45)
Width, min, in. (mm)	0.063 (1.59)
Length, min, in. (mm)	1 1/2 (38.1)
Crown, min, in. (mm)	7/16 (11.1)
Points	chisel point divergent point divergent chisel point

5.4 *Screws* for application of 1/2-in. and 25/32-in. sheathing on 14-gage (0.075-in.) (1.90-mm) to 20-gage (0.036-in.)

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee C-16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.22 on Organic and Nonhomogeneous Inorganic Thermal Insulations.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.06.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.10.

<sup>4</sup> Available from American Hardboard Assoc., 1210 W. Northwest Highway, Palatine, IL.

<sup>5</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.



**TABLE 1 Nail Dimensions**

Sheathing Thickness, in. (mm)		Galvanized Steel Roofing Nails	Common Nails
1/2 (12.7)	Gage	11	11 1/2 (6d)
	Length, min. in. (mm)	1 1/2 (38.1)	2 (50.8)
	Head diameter, min. in. (mm)	7/16 (11.1)	17/64 (6.75)
	Wire diameter, min. in. (mm)	0.120 (3.06) <sup>A</sup>	0.1130 (2.87)
25/32 (19.8)	Gage	11	10 1/4 (8d)
	Length, min. in. (mm)	1 3/4 (44.5)	2 1/2 (63.5)
	Head diameter, min. in. (mm)	7/16 (11.1)	9/32 (7.14)
	Wire diameter, min. in. (mm)	0.120 (3.06) <sup>A</sup>	0.131 (3.33)

<sup>A</sup>Prior to galvanizing.

(0.91mm) steel studs shall meet the following requirements:

Head type	bugle head
Head diameter, min. in. (mm)	5/16 (7.94)
Length, min. in. (mm)	1 1/4 (31.8)
Major diameter, in. (mm)	9/64 (3.57)
Minor diameter, in. (mm)	7/64 (2.78)
Point	drill point

5.5 *Framing Members* shall be of such size and quality as to be structurally adequate for the type of building being constructed.

5.5.1 Stud spacing shall be 16 in. (0.41 m) or 24 in. (0.61 m) on center depending on code requirements.

## 6. Storage

6.1 Sheathing shall be stored flat, and supported and protected from direct contact with the ground. Sheathing shall not be stored in a heated warehouse and shall be allowed to come to equilibrium at job site conditions prior to application. Sheathing should be protected from rain prior to installation.

## 7. Application (see Table 2)

7.1 *Vertical Application* (see Fig. 1)—Apply 4-ft (1.22-m) wide by 1/2-in. (12.7-mm) or by 25/32-in. (19.8-mm) sheathing vertically with long edges parallel to the vertical studs. Center all joints over the framing members with a 1/8-in. (3.18-mm) gap between edges. Leave a 1/8-in. gap at doors, windows, and horizontal joints. Sheathing should extend from sill to plate. If not, headers for adequate nailing should be provided at all horizontal joints. Apply fasteners for 1/2-in. or 25/32-in. material using roofing nails, common nails (5.2) or staples (5.3) for wood framing and screws (5.4) for metal framing. Apply fasteners to intermediate framing members first. For wood

framing, space fasteners 6 in. (152 mm) (Note 1) on center. Apply perimeter fasteners 3 in. (76 mm) (Note 1) on center and a minimum of 3/8 in. (9.5 mm) from the edge. Apply staples (5.3) vertically with the crown parallel to the framing member. Drive fasteners flush with the sheathing surface, but do not countersink. For metal framing, space the fasteners 5 in. (127 mm) around the perimeter of the sheets and 10 in. (254 mm) into intermediate framing.

NOTE 1—When bracing strength is provided separately, intermediate fasteners may be 8 in. (203 mm) on center and perimeter fasteners 4 in. (102 mm) on center.

## 8. General Recommendations for Installing Exterior Finishes Over Sheathing

8.1 *Regular and Structural Wall Sheathing*—Fasten furring strips, stucco bases, etc., through the sheathing to the framing.

8.1.1 *Horizontal Lap Siding*—Apply directly over the sheathing and fasten to each stud. Nails must be long enough to penetrate the wood framing members at least 1 in. (25.4 mm) in accordance with the manufacturer's recommendations. All joints of siding should fall on the center of framing members.

8.1.2 *Vertical Wood Board Siding*—Fasten vertical siding and batten strips (if used) to horizontal members spaced not over 24 in. (0.61 m) on center. Nails must penetrate the wood blocking not less than 1 in. (25.4 mm).

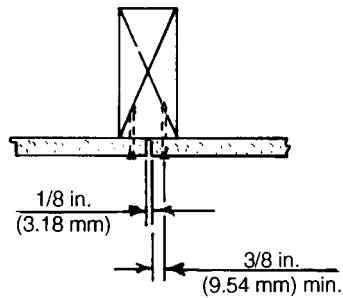
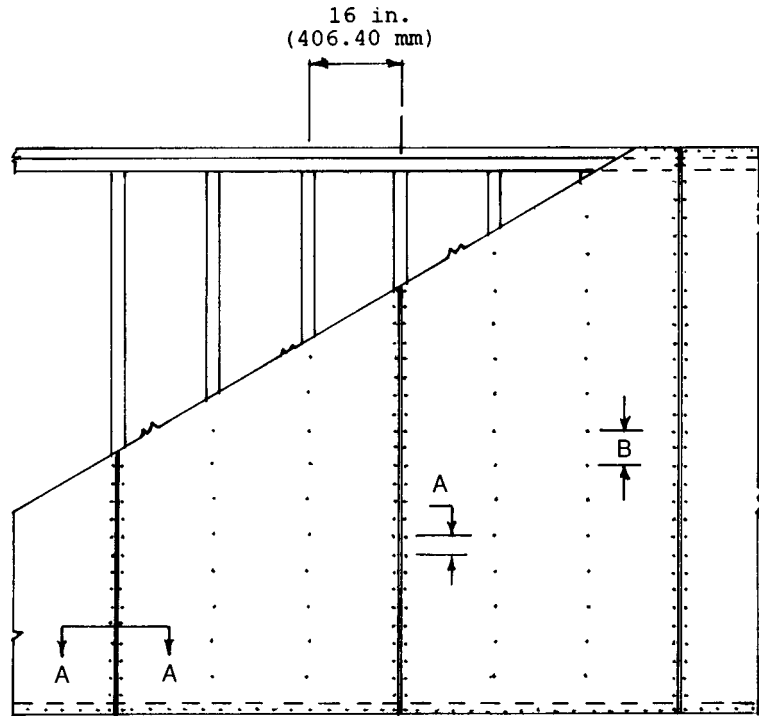
8.1.3 *Mineral Fiber Shingles*—Use 3/8-in. (9.5-mm) by 3 1/2-in. (88.9-mm) or larger wood furring strips as nailing base secured to each stud. Nails must be long enough to penetrate 1 in. (25.4 mm) into the wood framing in accordance with the manufacturer's recommendations.

8.1.4 *Plywood and Hardboard Panel and Siding*—Apply

**TABLE 2 Fastener Spacing**

Sheathing	Framing	Fastener Spacing, in. (mm) on Center	
		Intermediate Framing	Perimeter Framing
1/2 or 25/32 in. by 4 ft by 8 ft or 9 ft (12.7 or 19.8 mm by 1.22 m by 2.44 m or 2.74 m)	wood	6 (152)	3 (76)
1/2 or 25/32 in. by 4 ft by 8 ft or 9 ft (19.8 or 12.7 mm by 1.22 m by 2.44 m or 2.74 m)	metal	10 (254)	5 (127)
With separate bracing: 1/2 in. by 4 ft by 8 ft or 9 ft (12.7 mm by 1.22 m by 2.44 m or 2.74 m)	}wood	8 (203)	4 (102)
25/32 in. by 4 ft by 8 ft or 9 ft (19.8 mm by 1.22 m by 2.44 m or 2.74 m)			

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**SECT. A-A**

**Fastener Spacing**

	Nails, in. (mm)	Staples, in. (mm)	Screws, in. (mm)
A <sup>A</sup>	3 (76.20)	3 (76.20)	5 (127.00)
B <sup>A</sup>	6 (152.40)	6 (152.40)	10 (254.00)

<sup>A</sup>A = spacing on edges  
<sup>B</sup>B = spacing in field

**FIG. 1 Vertical Application**

directly over the sheathing and fasten to each framing member. Nails must be long enough to penetrate the wood framing members at least 1 in. (25.4 mm) in accordance with the manufacturer's recommendations.

8.1.5 *Wood Shingles*—Apply furring strips (nominal 1 by 2 in.) or larger horizontally over the sheathing and secure to each stud. Nails must be long enough to penetrate at least 1 in. (25.4

mm) into the wood framing. Space the furring strips the same distance, center to center, as the weather exposure of the shingles. Nail shingles to the furring strips in accordance with the shingle manufacturer's specifications.

8.1.6 *Stucco*—Cover the entire sheathing surface with a continuous layer of asphalt-impregnated, water-repellent paper weighing at least 10 lb/100 ft<sup>2</sup> (0.49 kg/m<sup>2</sup>). An alternative is

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Class D building paper meeting Federal Specification UU-B-790-A or an equivalent weather resistant barrier. Do not use a vapor barrier such as coated roofing membrane. Head and side laps should be at least 4 in. (101.6 mm). Self-furring metal lath stucco bases (3.4 lb/yd<sup>2</sup>) (1.84 kg/m<sup>2</sup>) or equivalent may be applied directly over the building paper. If necessary, use strips of wood lath to make certain that there is at least  $\frac{3}{8}$  in. (9.5 mm) of clear space between the stucco base and the sheathing. Non-furring stucco bases such as diamond mesh metal lath should be nailed to nominal 1 by 2-in. wood furring strips applied vertically over the studs. All nailing of both furring strips and stucco base should be done with nails or staples that

are long enough to extend through the sheathing and at least 1 in. (25.4 mm) into the wood framing.

8.1.7 *Masonry Veneer*—Attach metal ties for masonry veneer over the sheathing with nails that penetrate at least  $\frac{3}{4}$  in. (19.0 mm) into the wood framing members. At least 1 in. (25.4 mm) of clear space should be left between the sheathing and the back of the veneer.

**9. Keywords**

9.1 cellulosic fiberboard; cellulosic fiber insulating board; fiberboard; insulating board; structural wall sheathing; regular wall sheathing; wall sheathing

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