

WOOD-FIBER BLANKET INSULATION

(For Building Construction)

COMMERCIAL STANDARD CS160-49

Effective Date for New Production From October 15, 1949



A RECORDED VOLUNTARY STANDARD
OF THE TRADE

UNITED STATES DEPARTMENT OF COMMERCE

CHARLES SAWYER, Secretary

COMMODITY STANDARDS

Simplified Practice Recommendations and Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the National Bureau of Standards. The purpose of Simplified Practice Recommendations is to eliminate avoidable waste through the establishment of standards of practice for stock sizes and varieties of specific commodities that currently are in general production and demand. The purpose of Commercial Standards is to establish standard methods of test, rating, certification, and labeling of commodities, and to provide uniform bases for fair competition.

The adoption and use of a Simplified Practice Recommendation or Commercial Standard is voluntary. However, when reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, the provisions of the standard are enforceable through usual legal channels as a part of the sales contract.

A Simplified Practice Recommendation or Commercial Standard originates with the proponent industry. The sponsors may be manufacturers, distributors, or users of the specific product. One of these three elements of industry submits to the Commodity Standards Division the necessary data to be used as the basis for developing a standard of practice. The Division, by means of assembled conferences or letter referenda, or both, assists the sponsor group in arriving at a tentative standard of practice and thereafter refers it to the other elements of the same industry for approval or for constructive criticism that will be helpful in making any necessary adjustments. The regular procedure of the Division assures continuous servicing of each effective Simplified Practice Recommendation and Commercial Standard, through review and revision, whenever, in the opinion of the industry, changing conditions warrant such action. Simplified Practice Recommendations and Commercial Standards are printed and made available by the Department of Commerce through the Government Printing Office.

COMMERCIAL STANDARD FOR WOOD-FIBER BLANKET INSULATION

On June 1, 1949, a recommended commercial standard for wood-fiber blanket insulation, proposed by the Wood Fiber Blanket Institute and adjusted in accordance with suggestions from the industry, was circulated to manufacturers, distributors, and users for consideration and approval. Those concerned have since accepted and approved the standard as set forth herein.

Project Manager: J. W. MEDLEY, Commodity Standards Division, National Bureau of Standards.

Technical Adviser: H. E. ROBINSON, Building Technology Division, National Bureau of Standards.

COMMERCIAL STANDARD CS160-49

for

WOOD-FIBER BLANKET INSULATION

(FOR BUILDING CONSTRUCTION)

1. PURPOSE

1.1 This standard is offered for the common understanding of the wood-fiber blanket insulation industry. It establishes definite material and use performance criteria and methods of measurement for the same. It presents a basis on which performance guarantees may be made by the manufacturer to the prospective home owner, architect, and builder.

2. SCOPE

2.1 This standard provides minimum requirements for one grade of wood-fiber blanket insulation ranging from $\frac{1}{2}$ to 3 inches in thickness as made for building construction. It covers physical requirements and tests for thermal conductivity, density, flexibility, and flammability. It sets forth methods of sampling, packing, and labeling.

3. DEFINITION

3.1 The term "wood-fiber blanket insulation" is used to differentiate the specified product category from flexible blanket insulation structures containing other than wood-fiber insulating media, and from rigid and semirigid structural vegetable-fiber insulating boards.

4. DETAIL REQUIREMENTS

4.1 *Material*.—The insulating media shall be composed of clean wood fiber. The insulation shall be fabricated or treated in such a manner as to be resistant to casual wetting encountered prior to installation. It shall be resistant to mold and decay encountered under normal conditions of use.

4.2 *Thermal conductivity*.—Thermal conductivity (k) shall not exceed 0.28 Btu per hour per square foot for a temperature gradient of 1° F per inch of thickness at a mean temperature of 70° F.

4.3 *Density*.—The density of wood-fiber blanket insulation shall not exceed $4\frac{1}{4}$ lb per cubic foot, tested as described in paragraph 7.2.2.

4.4 *Flexibility*.—Wood-fiber blanket insulation shall be capable of being wrapped easily around a mandrel 3 in. in diameter without fracture to the liner or vapor barrier.

4.5 *Flammability*.—The wood-fiber material comprising the insulating media shall be so treated that it will cease flaming and smolder-

ing within 4 minutes, when tested as described in paragraphs 7.2.4.1 to 7.2.4.5.

5. SIZES

5.1 *Thickness.*—The nominal standard thicknesses are $\frac{1}{2}$ in., 1 in., 2 in. and 3 in. Special thicknesses are available.

5.2 *Width.*—The standard widths are suitable for framing members spaced 16 in., 20 in., 24 in., 32 in., and 48 in. on centers. Special widths are available.

6. TOLERANCES

6.1 *Thickness.*—The thickness shall be not less than 85 percent of the nominal thickness.

6.2 *Thickness variation.*—The thickness variation shall be not greater than 25 percent as calculated in paragraph 7.2.1 (b).

7. METHOD OF SAMPLING AND TESTING

7.1 Sampling.

(a) A test sample for the flammability test shall consist of 10 test pieces, each at least 33 in. by 14 in. in size. At least one test piece shall be taken at random from each 1,000 sq ft or less of each ordered thickness, from lots offered for delivery of not over 10,000 sq ft; and one test piece from each one-tenth of the lot when material of any thickness offered for delivery exceeds 10,000 sq ft.

(b) A test sample for tests other than flammability testing shall consist of three test pieces. One test piece shall be taken from each of three different rolls or packages chosen at random from the lot. Each test piece shall be 12 linear feet of material of manufactured width. One test piece shall be taken from the outside of one roll or package, one from the center of the contents of the second roll or package, and one from the inside of the third roll or package. In case of compressed products, a sufficient length shall be taken to expand to 12 ft. The three test pieces shall be spread upon a flat surface at normal atmospheric conditions. If the sample is to be transported elsewhere for testing, it shall be carefully packaged in a rigid box to avoid folding, rolling, compression, or other physical distortion; if necessary, 12-ft lengths may be cut into 3-ft lengths for this purpose.

7.2 Testing.

7.2.1 Thickness and thickness variation.

(a) Cut one test specimen 12 in. by 12 in. from each test piece. The thickness measurement shall then be made by placing each of the three test specimens horizontally between two flat rigid plates. The upper plate shall be the same size as the test specimen and shall weigh approximately 0.7 lb per sq ft ($\frac{1}{4}$ -in. 3-ply Douglas fir plywood). The thickness in inches of each test specimen shall be defined as the average of thicknesses taken at the midpoint of the four sides. The average of the thickness values obtained from the three test specimens shall constitute the thickness.

(b) Thickness variation in percentage shall be calculated by the following formula:

$$\text{Thickness variation} = \frac{R}{T} \times 100,$$

where R =maximum test specimen thickness minus minimum test specimen thickness (in inches),

T =average of the thickness determinations (in inches).

7.2.2 *Density*.—The density shall be determined by weighing the three 1-foot-square test specimens used for the thickness determination, and shall be computed by the following formula:

$$D = \frac{12W}{T},$$

where W =weight of the three test specimens in pounds,

T =average total thickness of the three test specimens as determined under paragraph 7.2.1 (a),

D =density in pounds per cubic foot.

7.2.3 *Thermal conductivity (k)*.

(a) Test specimens shall be cut to fit the individual hot plate. Two test specimens shall be taken immediately adjacent to each other from midway between the edges of any portion of each test piece.

(b) The thermal conductivity shall be determined by the guarded hot-plate test procedure as specified under ASTM "Standard Method of Test for Thermal Conductivity of Materials by Means of the Guarded Hot Plate," C177-45. The average value of the three test pieces shall constitute the thermal conductivity.

(c) Extreme care shall be used in both the preparation of the test specimens and placement of test specimens within the apparatus. Since the specimens are taken adjacent to each other to provide uniformity within respective pairs of specimens, great care must be exercised to prevent crushing or splitting in process of cutting to size. When surface irregularities such as deep wrinkles are observed, sufficient tension shall be applied so as to permit good plane contact with the plates of the apparatus. The compression of the test specimens within the test apparatus shall be just sufficient to secure good plane contact between surfaces. The thickness of the specimen as tested shall be defined by means of suitable stops or hardwood spacers so as to exhibit a variation of not more than plus or minus one hundredth part of an inch (± 0.01 inch) at four equi-spaced peripheral points on each test specimen.

7.2.4 *Flammability*.

7.2.4.1 *Apparatus*.—A rectangular frame with interior dimensions of 12 in. in width by 30 in. in height is constructed of 2-in. by 4-in. lumber and provided with means for supporting itself vertically, as shown in figure 1. On one face of the frame an incombustible board, such as $\frac{3}{8}$ -in. cement-asbestos board, is fastened, leaving an aperture 2 in. high and the width of the frame at the bottom, and 1 in. high and the width of the frame at the top, to provide ingress and egress for air and combustion gases. The opposite face of the frame is provided with a removable backing board set in pivots at the bottom edge and arranged with hooks on each side so that the insulation sample may be held evenly against this frame and so that this backing board is quickly detachable. All parts of the frame to be exposed to fire are preferably coated with a fire-resisting compound, such as borax-boric acid mixture. A small removable trough 6 in. long, 1 in. wide, and $\frac{1}{4}$ in. deep, made from 0.03-in. thick sheet steel, is placed on the lower horizontal

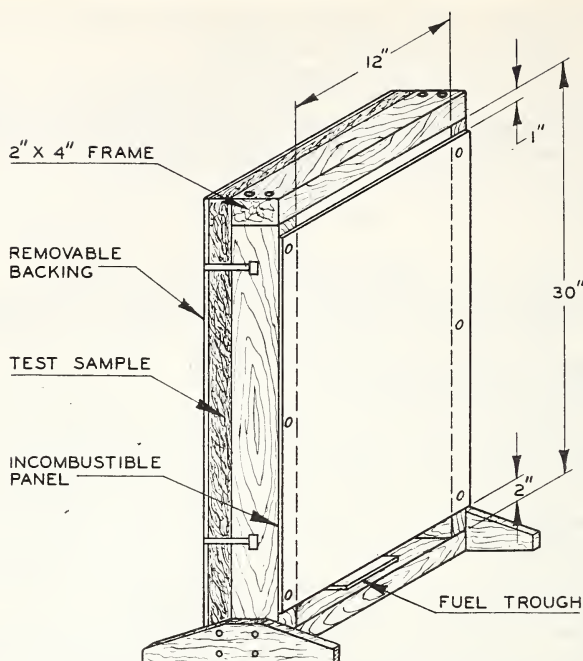


FIGURE 1. Test apparatus for flammability.

member of the frame, centered with respect to the width of the frame, and with the edge of the trough against the surface of the insulation blanket to be tested. The apparatus shall then be carefully leveled.

7.2.4.2 *Preparation of sample.*—Any inflammable liner or vapor barrier shall be removed from the surface to be exposed to the flame. Extreme care shall be exercised in the removal of the liner or vapor barrier from the insulating material. The liner or vapor barrier shall not be carelessly pulled off, but removed with a minimum of damage to the insulating material by carefully rolling it back upon itself.

7.2.4.3 *Conditioning of sample.*—Samples shall be held under normal conditions of approximately 80° F dry bulb temperature, and 70° F wet bulb temperature for a period of not less than 24 hours.

7.2.4.4 *Procedure.*—Nonleaded gasoline in an amount of 6 cc is measured by a pipette into the metal trough, and the fuel immediately ignited with a match. Upon consumption of the fuel, a stop watch is started, and immediately the removable backing and specimen shall be removed from the frame by slowly rotating the backing board on the pivots at the bottom edge; then carefully place same in a horizontal position with the tested specimen on top. This operation shall be completed within 10 seconds. By visual observation it is determined when any flaming, glowing, or smoldering has ceased. The time from the consumption of the fuel to the cessation of flaming, glowing, or smoldering is measured to the nearest second.

7.2.4.5 *Criteria.*—For the material to satisfactorily pass the flammability test, the average time from the consumption of the

gasoline to the cessation of flaming, glowing, or smoldering, for the 10 samples tested, shall not be more than 4 minutes.

8. PACKING AND LABELING

8.1 *Packing*.—Wood-fiber blanket insulation shall be packaged in such a manner as to insure its arrival at the place of application in an undamaged condition.

8.2 *Labeling*.—It is recommended that each roll or package of wood-fiber blanket insulation be marked with the name of the manufacturer or his brand name, also the thickness, width, length, and coverage in square feet of the insulation contained therein.

8.2.1 In order that purchasers may be assured of obtaining wood-fiber blanket insulation conforming to the requirements of this standard, it is recommended that products complying therewith bear a certificate, label, or imprint containing the following wording:

This wood-fiber blanket insulation complies with all requirements of Commercial Standard CS160-49, as developed by the trade under the procedure of the National Bureau of Standards and issued by the United States Department of Commerce.

(Name of manufacturer)

9. EFFECTIVE DATE

9.1 Having been passed through the regular procedure of the Commodity Standards Division, and approved by the acceptors hereinafter listed, this commercial standard was issued by the United States Department of Commerce, effective from October 15, 1949.

Edwin W. Ely,
Chief, Commodity Standards Division.

10. HISTORY OF THE PROJECT

10.1 On March 1, 1943, the Kimberly-Clark Corporation, after consulting other interested manufacturers, requested the cooperation of the National Bureau of Standards in the establishment of a commercial standard for wood-fiber blanket insulation for building construction. A draft of the proposed standard was submitted on October 13, 1944, to producers for comment. This draft was reviewed in detail and adjusted at a conference held in Chicago on November 14, 1944. On January 4, 1945, the revised draft was circulated to manufacturers, testing laboratories, Government agencies and to distributor and consumer organizations for comment. The standard was then adjusted to represent the composite views of all interested groups, and the recommended standard was circulated on June 1, 1945, to the trade for consideration and acceptance.

10.2 The recommended standard was subsequently revised as to requirements and test for fire-resistance, and circulated on June 23, 1947, to interested organizations for their review and comment. This draft was further adjusted in accordance with the constructive suggestions received, and submitted on June 1, 1949, to the trade for consideration and acceptance. Following acceptance by a

satisfactory majority, the standard was promulgated on September 15, 1949, as Commercial Standard CS160-49, effective for new production from October 15, 1949.

11. STANDING COMMITTEE

11.1 The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Each organization nominated its own representative. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, National Bureau of Standards, which acts as secretary for the committee.

LEONARD E. PASEK, Kimberly-Clark Corp., Neenah, Wis. (Chairman).

GEORGE M. SYVERSEN, Masonite Corp., 111 West Washington Street, Chicago 2, Ill.

DAVE B. ANDERSON, Wood Conversion Co., St. Paul, Minn.

JOSEPH A. IGOE, Igoe Bros., Inc., 73 Metropolitan Avenue, Brooklyn, N. Y.

National Association of Purchasing Agents invited to appoint a representative.

HARRY H. STEIDLE, Prefabricated Home Manufacturers' Institute, 908 20th Street NW., Washington 6, D. C.

CLARENCE H. WICK, Wick, Hilgers & Scott, 909 Spalding Building, Portland 4, Oreg. (representing the American Institute of Architects).

C. T. SLUDER, Federal Housing Administration, 1001 Vermont Avenue NW., Washington 25, D. C.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date_____

Commodity Standards Division,
National Bureau of Standards,
Washington 25, D. C.

Gentlemen:

We believe that the Commercial Standard CS160-49 constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production ¹ distribution ¹ purchase ¹ testing ¹

of wood-fiber blanket insulation. We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer_____

(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer_____

Organization_____

(Fill in exactly as it should be listed)

Street address_____

City, zone, and State_____

¹ Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

(Out on this line)

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, testing, or purchase of wood-fiber blanket insulation. In accepting the standard they reserved the right to depart therefrom as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

ASSOCIATIONS

(General Support)

American Association of Engineers, Chicago, Ill.	National Association of Home Builders, Washington, D. C.
American Institute of Architects, Spokane, Wash.	National Roofing Contractors' Association, Chicago, Ill.
American Specification Institute, Chicago, Ill.	Ohio Association of Retail Lumber Dealers, The, Xenia, Ohio.
Carolina Lumber & Building Supply Association, Charlotte, N. C.	Prefabricated Home Manufacturers' Institute, Washington, D. C.
Dairymen's League Co-operative Association, Inc., New York, N. Y.	Southwestern Lumbermen's Association, Kansas City, Mo.
Greater New York Lumber Industries, Inc., New York, N. Y.	Wood Fiber Blanket Institute, Chicago, Ill.
Insulation Board Institute, Chicago, Ill.	

FIRMS AND OTHER INTERESTS

Adams, Franklin O., Tampa, Fla.	Cram & Ferguson, Boston, Mass.
Andrews, Jones, Biscoe & Goodell, Boston, Mass.	Crowell & Lancaster, Bangor, Maine.
Armour Research Foundation, Chicago, Ill.	Darby, Bogner & Associates, Milwaukee, Wis.
Arrington Lumber, Norfolk, Va.	Dearstine, J. C., Lumber Co., Schenectady, N. Y.
Baldridge, J. C., Lumber Co., Albuquerque, N. Mex.	DeJarnette, Charles W., Des Moines, Iowa. (General support.)
Barthmaier, Eugene V., Philadelphia, Pa.	Detroit, City of, City Engineer's Office, Detroit, Mich.
Baumer, Herbert, Columbus, Ohio.	Detroit Edison Co., The, Detroit, Mich.
Baxter, C. B., & Co., Kansas City, Mo.	Detroit Testing Laboratory, Detroit, Mich.
Berger, F. E., & R. L. Kelley, Champaign, Ill.	Dickerson Lumber Co., Huntington, W. Va.
Beuttler, Wm., Sioux City, Iowa.	Dix Lumber Co., Cambridge, Mass.
Bishop, Horatio W., La Mesa, Calif. (General support.)	Eckroth Laboratories, Inc., Brooklyn, N. Y.
Boehm, George A., New York, N. Y.	Fetzer & Fetzer, Salt Lake City, Utah.
Botsford Lumber Co., Winona, Minn.	Flannagan, Eric G., Henderson, N. C.
Bovard, William R., Kansas City, Mo. (General support.)	Florida, University of, School of Forestry, Gainesville, Fla. (General support.)
Bowser-Morner Testing Laboratories, Dayton, Ohio.	Fort Wayne Builders' Supply Co., Fort Wayne, Ind.
Brazer, Clarence W., New York, N. Y.	Furer, Wm. C., Honolulu, T. H.
Brazier & Brust, Milwaukee, Wis.	GBH-Way Homes, Inc., Walnut, Ill.
Bucky, Fred W., Jr., Jacksonville, Fla.	General Millwork Corp., Utica, N. Y.
Building Supplies Corp., Norfolk, Va.	Gloekler Refrigerator Co., Erie, Pa.
Bush Insulation Co., Inc., Huntington Station, L. I., N. Y.	Harnischfeger Corp., Houses Division, Port Washington, Wis.
Cameron Lumber Co., Inc., Newburgh, N. Y.	Harrison-Martin Lumber Co., Grand Island, Nebr.
Camlet, J. Thomas, Passaic, N. J.	Haxby, Bissell & Belair, Minneapolis, Minn.
Cannon & Mullen, Salt Lake City, Utah.	Heidritter Lumber Corp., Elizabeth, N. J.
Carhart Lumber Co., Wayne, Nebr.	Herron, James H., Co., The, Cleveland, Ohio
Cellarius, Charles F., Cincinnati, Ohio.	Hinkley, John, & Son Co., Hyannis, Mass.
Charlottesville Lumber Co., Inc., Charlottesville, Va.	Hoffmann Lumber Co., Pittsburgh, Pa.
Chase Lumber Co., Payson, Utah.	Holden, McLaughlin & Associates, New York, N. Y.
Cincinnati Butchers Supply Co., The, Cincinnati, Ohio.	Houston Ready-Cut House Co., Houston, Tex.
Coe Manufacturing Co., New York, N. Y. (General support.)	Huber-Lanetot Housewrecking Corp., Buffalo, N. Y.
Conrad & Cummings, Binghamton, N. Y.	Irving, J. S., Co., Westfield, N. J.
	Jergens, Andrew, Co., The, Cincinnati, Ohio
	Kansas State College, Department of Architecture, Manhattan, Kans.

- Keich & O'Brien, Warren, Ohio.
 Kennedy Lumber Co., Trenton, N. J.
 Kimberly-Clark Corp., Neenah, Wis.
 Kyle, Herbert S., Charleston, W. Va.
 Latenser, John, & Sons, Omaha, Nebr.
 Law, Law, Potter & Nystrom, Madison, Wis.
 Levy, Will, St. Louis, Mo.
 Lingo Lumber Co., Dallas, Tex.
 Loeb, Laurence M., White Plains, N. Y.
 Los Angeles, City of, Los Angeles, Calif.
 Lyman-Hawkins Lumber Co., Akron, Ohio
 Mann & Co., Hutchinson, Kans.
 Markland, M. B., Contracting Co., Atlantic City, N. J.
 Marr, Charles J., New Philadelphia, Ohio
 Marshall Wright Lumber Co., Ionia, Mich.
 Martin, Edgar, Chicago, Ill.
 Mason, George D., & Co., Detroit, Mich.
 Mason Lumber Co., Jacksonville, Fla.
 Masonite Corp., Chicago, Ill.
 Massena & duPont, Wilmington, Del.
 Metropolitan Millwork Co., Brooklyn, N. Y.
 Michigan Wholesalers, Inc., Jackson, Mich.
 Mid-West Lumber Co., Mankato, Kans.
 Midwest Lumber Co., Dubuque, Iowa
 Miller & Vrydagh, Terre Haute, Ind.
 Minnesota & Ontario Paper Co., Minneapolis, Minn. (General support.)
 Moline, City of, Moline, Ill.
 Moore Dry Dock Co., Oakland, Calif.
 Mooser, William, San Francisco, Calif.
 Morgan, David H., Philadelphia, Pa.
 Morrison-Merrill & Co., Salt Lake City, Utah.
 Muhlenberg Bros., Reading, Pa.
 New Hampshire, University of, College of Technology, Durham, N. H.
 New York Testing Laboratories, Inc., New York, N. Y.
 O & N Lumber Co., Menomonie, Wis.
 Officer, Gwynn, Lafayette, Calif.
 Patzig Testing Laboratories, Des Moines, Iowa
 Peace Woodwork Co., Inc., Cincinnati, Ohio.
 Pehrson, G. A., & Associates, Spokane, Wash.
 Pemberton Lumber & Millwork Corp., Pemberton, N. J.
 Pittsburgh Testing Laboratory, Pittsburgh, Pa.
 Pollock Lumber & Supply Co., Fort Myers, Fla.
 Rensselaer Polytechnic Institute, Department of Architecture, Troy, N. Y.
 Resnikoff, Abraham, New York, N. Y.
 Richardson-Phelps Lumber Co., Grinnell, Iowa.
 Robert & Co. Associates, Inc., Atlanta, Ga.
 Rock Hill Lumber Co., Rock Hill, S. C.
 Rolfe Building Material Co., Inc., New Brunswick, N. J.
 Schaeffer, Hooton & Wilson, Bloomington, Ill.
 Schwenger-Klein, Inc., Cleveland, Ohio.
 Scruggs-Guhleman Lumber Co., Jefferson City, Mo.
 Sears, Roebuck & Co., Chicago, Ill.
 Skyline Lumber Co., Inc., Roanoke, Va.
 Solie Lumber Co., Janesville, Wis.
 Southern Mill & Manufacturing Co., Tulsa, Okla.
 Springer, B. F., Supply Co., Milwaukee, Wis.
 Spruce Falls Power & Paper Co., Ltd., New York, N. Y.
 Standard Lumber Co., Spokane, Wash.
 Staub & Rather, Houston, Tex.
 Stevens, John Calvin, Portland, Maine.
 Stoetzel, Ralph, Chicago, Ill.
 Streeter, Daniel D., Brooklyn, N. Y.
 Suwannee Wood Preservers, Inc., Live Oak, Fla.
 Sweet's Catalog Service, New York, N. Y. (General support.)
 Taylor, Ellery Kirke, Haddonfield, N. J.
 Taylor, Ellis Wing, Los Angeles, Calif.
 Temple, Seth J., Arthur Temple, Davenport, Iowa.
 Texas Technological College, Department of Architecture, Lubbock, Tex. (General support.)
 Thal, Nelson E., Toledo, Ohio.
 Thorne, Henry Calder, Ithaca, N. Y.
 Twining Laboratories, The, Fresno, Calif.
 Uniflow Manufacturing Co., Erie, Pa.
 United States Testing Co., Inc., Hoboken, N. J.
 Velde Lumber Co., Pekin, Ill.
 Virginia Polytechnic Institute, Blacksburg, Va. (General support.)
 Wabash Railroad Co., St. Louis, Mo.
 Walsh, Louis A., Waterbury, Conn.
 Welch, Carroll E., Huntington, N. Y.
 West, Albert E., Boston, Mass.
 West Lumber Co., Atlanta, Ga.
 Western Electric Co., Inc., New York, N. Y.
 Wick, Clarence H., Portland, Oreg. (General support.)
 Wilbur Warehouse & Sales Co., West Allis, Wis.
 Willatsen, Andrew, Seattle, Wash.
 Wood Conversion Co., St. Paul, Minn.
 Wood Lumber Co., Birmingham, Ala.
 Wood, Edward J., & Son, Clarksburg, W. Va.
 Wright & Wright, Detroit, Mich. (General support.)
 Zimmerman, A. C., Los Angeles, Calif.

UNITED STATES GOVERNMENT

- Agriculture, U. S. Department of, U. S. Forest Service, Missoula, Mont.
 Federal Works Agency, Public Buildings Administration, Washington, D. C. (General support.)
 Interior, U. S. Department of, Bureau of Indian Affairs, Washington, D. C.

COMMERCIAL STANDARDS

CS No.	Item
0-40.	Commercial standards and their value to business (third edition).
1-42.	Clinical thermometers (third edition).
2-30.	Mopsticks.
3-40.	Stoddard solvent (third edition).
4-29.	Staple porcelain (all-clay) plumbing fixtures.
5-46.	Pipe nipples, brass, copper, steel, and wrought iron (second edition).
6-31.	Wrought-iron pipe nipples (second edition). Superseded by CS5-46.
7-29.	Standard weight malleable iron or steel screwed unions.
8-41.	Gage blanks (third edition).
9-33.	Builders' template hardware (second edition).
10-29.	Brass pipe nipples. Superseded by CS5-46.
11-41.	Moisture regains of cotton yarns (second edition).
12-48.	Fuel oils (sixth edition).
13-44.	Dress patterns (fourth edition).
14-43.	Boys' button-on waists, shirts, junior and sport shirts (made from woven fabrics) (third edition).
15-46.	Men's pajama sizes (made from woven fabrics) (third edition).
16-29.	Wall paper.
17-47.	Diamond core drill fittings (fourth edition).
18-29.	Hickory golf shafts.
19-32.	Foundry patterns of wood (second edition).
20-47.	Staple vitreous china plumbing fixtures (fourth edition).
21-39.	Interchangeable ground-glass joints, stop-cocks, and stoppers (fourth edition).
22-40.	Builders' hardware (nontemplate) (second edition).
23-30.	Feldspar.
24-43.	Screw threads and tap-drill sizes.
25-30.	Special screw threads. Superseded by CS24-43.
26-30.	Aromatic red cedar closet lining.
27-36.	Mirrors (second edition).
28-46.	Cotton fabric tents, tarpaulins and covers (second edition).
29-31.	Staple seats for water-closet bowls.
30-31.	Colors for sanitary ware. (Withdrawn as commercial standard, March 15, 1948.)
31-38.	Wood shingles (fourth edition).
32-31.	Cotton cloth for rubber and pyroxylin coating.
33-43.	Knit underwear (exclusive of rayon) (second edition).
34-31.	Bag, case, and strap leather.
35-49.	Hardwood plywood (fourth edition).
36-33.	Fourdriner wire cloth (second edition).
37-31.	Steel bone plates and screws.
38-32.	Hospital rubber sheeting.
39-37.	Wool and part wool blankets (second edition). (Withdrawn as commercial standard, July 14, 1941.)
40-32.	Surgeons' rubber gloves.
41-32.	Surgeons' latex gloves.
42-49.	Structural fiber insulating board (fourth edition).
43-32.	Grading of sulphonated oils.
44-32.	Apple wraps.
45-48.	Douglas fir plywood (eighth edition).
46-49.	Hosiery lengths and sizes (fourth edition).
47-34.	Marking of gold-filled and rolled-gold-plate articles other than watchcases.
48-40.	Domestic burners for Pennsylvania anthracite (underfeed type) (second edition).
49-34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50-34.	Binders board for bookbinding and other purposes.
51-35.	Marking articles made of silver in combination with gold.

CS No.	Item
52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53-35.	Colors and finishes for cast stone.
54-35.	Mattresses for hospitals.
55-35.	Mattresses for institutions.
56-49.	Oak flooring (third edition).
57-40.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
58-36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
59-44.	Textiles—testing and reporting (fourth edition).
60-48.	Hardwood dimension lumber (second edition).
61-37.	Wood-slat venetian blinds.
62-38.	Colors for kitchen accessories.
63-38.	Colors for bathroom accessories.
64-37.	Walnut veneers.
65-43.	Methods of analysis and of reporting fiber composition of textile products (second edition).
66-38.	Marking of articles made wholly or in part of platinum.
67-38.	Marking articles made of karat gold.
68-38.	Liquid hypochlorite disinfectant, deodorant, and germicide.
69-38.	Pine oil disinfectant.
70-41.	Phenolic disinfectant (emulsifying type) (second edition) (published with CS71-41).
71-41.	Phenolic disinfectant (soluble type) (second edition) (published with CS70-41).
72-38.	Household insecticide (liquid spray type).
73-48.	Old growth Douglas fir, Sitka spruce, and Western hemlock standard stock doors (fourth edition).
74-39.	Solid hardwood wall paneling.
75-42.	Automatic mechanical draft oil burners designed for domestic installations (second edition).
76-39.	Hardwood interior trim and molding.
77-48.	Enameled cast-iron plumbing fixtures (second edition).
78-40.	Ground-and-polished lenses for sun glasses (second edition) (published with CS79-40).
79-40.	Blown, drawn, and dropped lenses for sun glasses (second edition) (published with CS78-40).
80-41.	Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81-41.	Adverse-weather lamps for vehicles (after market).
82-41.	Inner-controlled spotlamps for vehicles (after market).
83-41.	Clearance, marker, and identification lamps for vehicles (after market).
84-41.	Electric tail lamps for vehicles (after market).
85-41.	Electric license-plate lamps for vehicles (after market).
86-41.	Electric stop lamps for vehicles (after market).
87-41.	Red electric warning lanterns.
88-41.	Liquid burning flares.
89-40.	Hardwood stair treads and risers.
90-49.	Power cranes and shovels.
91-41.	Factory-fitted Douglas fir entrance doors.
92-41.	Cedar, cypress, and redwood tank stock lumber.
93-41.	Portable electric drills (exclusive of high frequency).
94-41.	Calking lead.
95-41.	Lead pipe.

CS No.	Item	CS No.	Item
96-41.	Lead traps and bends.	129-47.	Materials for safety wearing apparel (second edition).
97-42.	Electric supplementary driving and passing lamps for vehicles (after market).	130-46.	Color materials for art education in schools.
98-42.	Artists' oil paints.	131-46.	Industrial mineral wool products, all types—testing and reporting.
99-42.	Gas floor furnaces—gravity circulating type.	132-46.	Hardware cloth.
100-47.	Porcelain-enameled steel utensils (third edition).	133-46.	Woven wire netting.
101-43.	Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.	134-46.	Cast aluminum cooking utensils (metal composition).
102- .	(Reserved for Diesel and fuel-oil engines).	135-46.	Men's shirt sizes (exclusive of work shirts).
103-48.	Rayon jacquard velour (with or without other decorative yarn) (second edition).	136-46.	Blankets for hospitals (wool, and wool and cotton).
104-49.	Warm-air furnaces equipped with vaporizing type oil burners (third edition).	137-46.	Size measurements for men's and boys' shorts (woven fabrics).
105-48.	Mineral wool insulation for low temperatures (second edition).	138-47.	Insect wire screening.
106-44.	Boys' pajama sizes (woven fabrics) (second edition).	139-47.	Work gloves.
107-45.	Commercial electric-refrigeration condensing units (second edition). (Withdrawn as commercial standard September 4, 1947).	140-47.	Testing and rating convectors.
108-43.	Treading automobile and truck tires.	141-47.	Sine bars, blocks, plates, and fixtures.
109-44.	Solid-fuel-burning forced-air furnaces.	142-47.	Automotive lifts.
110-43.	Tire repairs—vulcanized (passenger, truck, and bus tires).	143-47.	Standard strength and extra strength perforated clay pipe.
111-43.	Earthenware (vitreous-glazed) plumbing fixtures.	144-47.	Formed metal porcelain enameled sanitary ware.
112-43.	Homogeneous fiber wallboard.	145-47.	Testing and rating hand-fired hot-water-supply boilers.
113-44.	Oil-burning floor furnaces equipped with vaporizing pot-type burners.	146-47.	Gowns for hospital patients.
114-43.	Hospital sheeting for mattress protection.	147-47.	Colors for molded urea plastics.
115-44.	Porcelain-enameled tanks for domestic use.	148-48.	Men's circular flat and rib knit rayon underwear.
116-44.	Bituminized-fiber drain and sewer pipe.	149-48.	Utility-type house dress sizes.
117-49.	Mineral wool insulation for heated industrial equipment (second edition).	150-48.	Hot-rolled rail steel bars (produced from T-section rails).
118-44.	Marking of jewelry and novelties of silver.	151-48.	Body measurements for the sizing of apparel for infants, babies, toddlers, and children (for the knit underwear industry).
(E) 119-45. ¹	Dial indicators (for linear measurements).	152-48.	Copper naphthenate wood-preservative.
120-48.	Standard stock ponderosa pine doors (third edition).	153-48.	Body measurements for the sizing of apparel for girls (for the knit underwear industry).
121-45.	Women's slip sizes (woven fabrics).	154- .	(Reserved for wire rope.)
122-45.	Western hemlock plywood.	155-49.	Body measurements for the sizing of apparel for boys (for the knit underwear industry).
123-49.	Grading of diamond powder (second edition). (E) 124-45. ¹	156-49.	Colors for polystyrene plastics.
125-47.	Prefabricated homes (second edition).	157-49.	Ponderosa pine and sugar pine plywood.
126-45.	Tank mounted air compressors.	158-49.	Model forms for girls' apparel.
127-45.	Self-contained mechanically refrigerated drinking water coolers.	159-49.	Sun-glass lenses made of ground and polished plate glass, thereafter thermally curved.
128-45.	Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).	160-49.	Wood-fiber blanket insulation (for building construction).
		161-49.	"Standard Grade" hot-dipped galvanized ware.
		162-49.	Tufted bedspreads.
		163-49.	Standard stock ponderosa pine windows, sash, and screens.

¹ Where "(E)" precedes the CS number it indicates an emergency commercial standard, drafted under war conditions with a view toward early revision.

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice may secure copies of the above standards, while the supply lasts, by addressing the Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

