Commercial Standard 168-50

Polystyrene Plastic Wall Tiles, and Adhesives for Their Application

A RECORDED VOLUNTARY STANDARD OF THE TRADE

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Charles Sawyer, Secretary

U. S. DEPARTMENT OF COMMERCE

CHARLES SAWYER, Secretary

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Polystyrene Plastic Wall Tiles, and Adhesives for Their Application

[Effective July 15, 1950]

1. PURPOSE AND SCOPE

1.1 *Purpose.*—The purpose of this commercial standard is to establish a minimum standard of quality for polystyrene plastic wall tiles and for the adhesives used in their application, as a guide to producers, distributors, contractors, architects, installers, and users.

1.2 *Scope.*—This standard covers methods of test, materials, requirements for workmanship, tolerances, thickness, opacity, colorfastness, and other details of manufacture of polystyrene plastic tiles which should insure a satisfactory product for wall and/or ceiling installation in private and multiple-unit dwellings, and in commercial, industrial, and other types of buildings where a nonabsorbent, sanitary surface is desired. Requirements for the adhesive to be used for installing the tile are also included. A standard procedure and important considerations and materials in connection with the installation and maintenance are covered in the appendix.

2. MATERIALS

2.1 *Plastic compounds.*—The wall tiles shall be manufactured from a plastic conforming to the requirements of types 1, 2, or 3 in American Society for Testing Materials Tentative Specification D 703, for Polystyrene Molding Compounds. At the option of the manufacturer, fillers, pigments, and dyes may be added to produce colored wall tile.

2.2 *Composition of adhesives.*—The adhesives used in installing the tile shall be of any composition which will meet the requirements set forth herein. The adhesives shall contain not more than ½ of 1 percent of benzene or volatile chlorinated hydrocarbon solvents.

3. WALL TILE

3.1 Requirements for Tiles.

3.1.1 *Workmanship.*—The manufacture of the tile shall be in accordance with good commercial practice so as to produce tile meeting the requirements of this standard. The finished tile shall be free of flow marks, shrinks, warpage, blemishes, and other defects that may adversely affect its appearance and performance. The gates shall be neatly trimmed, in accordance with the best commercial practice, to produce a minimum blemish.

3.1.2 *Dimensional tolerances.*—The face size of the tiles in any shipment shall not vary one from the other, in any comparable dimension, more than by a negative tolerance of $\frac{1}{10}$ of 1 percent or

0.005 in., whichever is greater, and by a positive tolerance of $\frac{3}{10}$ of 1 percent or 0.010 in., whichever is greater.

3.1.3 *Thickness.*—The thickness of the plastic in tile shall be greater than 0.062 in. The lip on the tile shall extend at least 0.033 in. beyond the back of the tile.

3.1.4 *Opacity.*—Tiles in all colors, including mottled and white, shall show a contrast ratio of not less than 0.96 when tested in accordance with the procedure described in paragraph 3.2.2.

3.1.5 *Colorfastness.*—No appreciable change in color shall be observed after the tile has been exposed for 50 hours to the accelerated fading test described in paragraph 3.2.3.

3.1.6 *Heat deformation.*—The tile shall not deform when tested at a temperature of 71° C (160° F) in accordance with the procedure described in paragraph 3.2.4.

3.1.7 *Cyclic service test.*—See paragraph 4.1.10.

3.2 Methods of Test for Tile.

3.2.1 *Conditioning of test specimens.*—The test specimens shall be conditioned for 48 hours or more at 23° ±2° C (73.5° ±4° F) and 50 ±2 percent relative humidity, and tested at these conditions unless otherwise specified.

3.2.2 *Opacity.*—Two specimens of each color shall be selected at random and tested as follows: Photoelectric measurements of 45°, 0° luminous directional reflectance, with the equivalent of daylight illumination, shall be made on a reflectometer for tiles backed with white vitrolite (reflectance about 90 percent), and for the same tiles backed with black velvet (reflectance about 1 percent). The contrast ratio of each tile shall be computed as the ratio of the reflectance obtained with the velvet backing to that obtained with the vitrolite backing. The reflectances used shall be the mean of two measurements on the central area of each tile.

3.2.3 *Colorfastness.*—The colorfastness of the tile and grouting material shall be determined in accordance with American Society for Testing Materials Tentative Method of Test D 620. This method uses an S–1 sunlamp with the specimens exposed on a rotating table 7 inches below the bottom of the bulb.

3.2.4 *Heat deformation test.*—The specimen, loosely suspended in a wire basket, shall be immersed in a bath containing at least 1 gallon of water maintained at a temperature of 71° to 72° C (160° to 162° F) for a period of 2 minutes. The basket containing the specimen shall then be removed and allowed to hang in air for at least 5 minutes. The specimen shall then be removed from the basket and examined. The edges shall not deviate in any direction from a straight line by more than $\frac{1}{32}$ in., nor shall the face of the tile be changed from its original appearance. At least six specimens from each run or lot shall be tested. All six specimens shall meet the requirements. It is recommended that if possible the specimens be selected from different mold cavities.

3.2.5 *Cyclic service test.*—See paragraph 4.2.10.

4. ADHESIVES

4.1 Requirements for Adhesives.

4.1.1 *Tensile-shear strength.*—The average tensile-shear strength shall be not less than the following: (a) sufficient strength to keep

tiles from slipping on the vertical specimen and from separating from the under side of the horizontal specimen within 7 days after preparation of the specimens, when tested according to the procedure described in paragraph 4.2.1.1; (b) 1 psi 24 hours after preparation of the specimens when tested according to the procedure described in paragraph 4.2.1.2; (c) 10 psi 28 days after preparation of the specimens when tested according to the procedure described in paragraph 4.2.1.2.

4.1.2 *Effect of heat aging.*—The average tensile-shear strength shall be not less than 10 psi for specimens which have been heated at 65° C (149° F) in a circulating-air oven and tested in accordance with the procedure described in paragraph 4.2.2. The tensile-shear strength test shall be made in accordance with the procedure described in paragraph 4.2.1.2.

4.1.3 *Effect of moisture aging.*—The average tensile-shear strength shall be not less than 10 psi for specimens which have been immersed in water for 24 hours and tested in accordance with the procedure described in paragraph 4.2.3. The tensile-shear strength test shall be made in accordance with the procedure described in paragraph 4.2.1.2.

4.1.4 *Resistance to panel immersion.*—There shall be no visual slippage or separation when the specimen is tested in accordance with the procedure described in paragraph 4.2.4.

4.1.5 *Static loading.*—Tensile specimens shall withstand without failure a load of 0.25 psi for 28 days when tested in accordance with the procedure described in paragraph 4.2.5.

4.1.6 *Simulated aging.*—When tested in accordance with the procedure described in paragraph 4.2.6, the adhesive shall exhibit a minimum shear strength of 10 psi.

4.1.7 *Wetting.*—The adhesive shall be considered to "wet" satisfactorily, or spread easily on the surface of the tile, if it meets the requirements of the test procedure described in paragraph 4.2.7.

4.1.8 *Heat resistance.*—There shall be no visible slip or movement of tile at or below 60° C (140° F) when bonded panels are tested as described in paragraph 4.2.8.

4.1.9 *Shrinkage.*—The maximum shrinkage in the center of the mounted tiles shall be not greater than 0.015 in. when they are tested in accordance with the procedure described in paragraph 4.2.9.

4.1.10 *Cyclic service test.*—There shall be no visible slip or movement of the tiles, warping or cracking of the tiles, or loosening of the bond when a test panel is prepared and tested in accordance with the procedure described in paragraph 4.2.10.

4.1.11 *Chemical attack.*—Visible chemical attack (noticeable, for example, as small erupted pin points or craters, bulging surface "out of flat," or soft, bubbly, or crazed surface) shall not occur on the exposed surface of the tiles when tested in accordance with the procedure described in paragraph 4.2.11.

4.1.12 *Mildew resistance.*—A disk of the adhesive shall not support growth of mildew when tested in accordance with the procedure described in paragraph 4.2.12.

4.1.13 *Grouting in joints.*—Any composition used between the tiles as a grouting material shall show no appreciable change in color after exposure for 50 hours to the accelerated fading test described in paragraph 3.2.3. Neither shall appreciable change in color take place after immersion in water for 7 days at 23° C (73.5° F).

4.2.1 *Tensile-shear strength.*

4.2.1.1 The panels for the slippage test shall consist of ¾-in., 5-ply exterior grade Douglas fir plywood, approximately 14 in. by 14 in., on which shall be mounted three field tiles which have been applied according to the adhesive manufacturer's recommendation, except that the tiles shall be unpointed or ungrouted. The three field tiles shall be mounted, unsupported, in a straight horizontal row in the center of the board while the board is in a vertical position. A suitable marking shall be made on the tile and the plywood by which any slippage can be noted after 7 days.

A simulated ceiling surface composed of ¾-in., 5-ply exterior grade Douglas fir plywood, on which nine field tiles are applied in accordance with the adhesive manufacturer's recommendations, shall be prepared. These tiles shall be visually examined for separation from the panel after 7 days.

4.2.1.2 The tensile-shear strength test shall be made with a single lap-jointed specimen. The specimen is prepared by bonding, with the adhesive, a strip of polystyrene wall tile, 1 in. wide by 4 in. long, to a plywood strip (¾-in., 5-ply exterior grade Douglas fir plywood) of the same size. The polystyrene strip shall overlap the plywood for an area of 2 sq. in. The specimen shall be broken in a suitable tensile testing machine (such as a Scott Model J–2) at a rate of jaw separation of 2 in. per minute. The specimens shall be held in the grips so that the outer 1.5 in. of each end are in contact with the jaws and so that the long axis of the test specimen shall coincide with the direction of applied force through the center line of the grip assembly. Separate blocks, the thickness of the adherents, shall be used in the grips to insure that the adhesive bond is loaded in shear and not in cleavage. Ten such specimens shall be used to obtain each average tensile-shear strength value. The method of test is similar to the American Society for Testing Materials Tentative Method of Test D 1002, for Strength Properties of Adhesives in Shear by Tension Loading (Metal to Metal).

4.2.2 *Effect of heat aging.*—Ten tensile-shear-strength specimens shall be prepared from ¾-in. 5-ply exterior grade Douglas fir plywood, and shall be aged at 23° ±2° C (73.5° ±4° F) and 50 ±2 percent relative humidity, for 21 days. The specimens shall then be aged in a circulating-air oven, at 65° ±2° C (149° ±4° F) and a relative humidity of less than 10 percent, for 7 days. The specimens shall be conditioned to temperature equilibrium, by allowing them to stand at 23° ±2° C (73.5° ±4° F) for 1 hour, and then tested immediately.

4.2.3 *Effect of moisture aging.*—Ten tensile-shear-strength specimens shall be prepared from ¾-in., 5-ply exterior grade Douglas fir plywood, and shall be aged at 23° ±2° C (73.5° ±4° F) and 50 percent ±2 percent relative humidity, for 21 days. The specimens shall be immersed in water at 23° ±2° C (73.5° ±4° F) for 24 hours. After conditioning according to paragraph 3.2.1, the assemblies shall be tested according to paragraph 4.2.1.2.

4.2.4 *Panel immersion test.*—A simulated wall section 10 in. by 10 in., composed of ¾-in., 5-ply exterior grade Douglas fir plywood, on which four field tile mounted to form a square approximately 8½ in. on a side are applied in accordance with the adhesive manufacturer's

recommendations, shall be prepared, except that the tile shall be unpointed and ungrouted. This assembly shall then be conditioned for 21 days at room temperature. The assembly shall then be immersed and held in a vertical position in water at 23° ±2° C (73.5° ±4° F) for 7 days, and visual examination of slippage or separation shall be noted.

4.2.5 *Static load test.*—An inverted field tile shall be fastened to a surface by means of five screws. The exposed surface of the tile shall be bonded with the adhesive to a plywood disk ½ in. thick, and with a diameter equal to the diagonal of the tile. This disk shall be fastened with an adhesive according to the adhesive manufacturer's recommendations. A screw hook shall then be located exactly in the center of the plywood disk; the specimen shall then be conditioned for 3 days at room temperature, after which the assembly shall be inverted to simulate a ceiling installation, and weights shall be added to the hook to bring the total load to 0.25 psi, including the plywood disk and hook. The adhesive shall be considered as failing if any separation from the back of the tile is noted within 28 days.

4.2.6 *Simulated-aging test.*—The specimen shall be prepared by bonding with the adhesive a strip of polystyrene wall tile, 1 in. wide by 4¼ in. long, to paper-covered plasterboard ⅜ in. by 4 in. by 4 in., as illustrated in figure 1, below. The adhesive shall be applied according to the manufacturer's recommendations. The assemblies shall be allowed to dry 1 week at room temperature and then shall be placed in a circulating-air oven at 50° ±2° C (122° ±4° F) for a period of 90 days. After conditioning according to paragraph 3.2.1 the assemblies shall be tested according to paragraph 4.2.1.2.

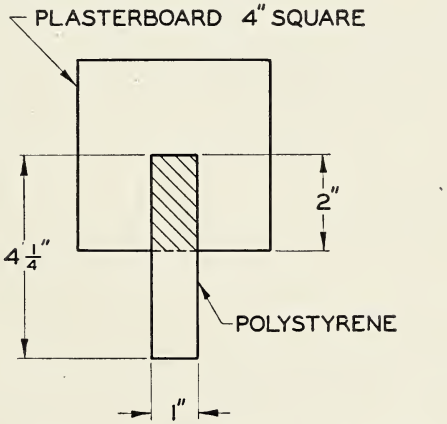

FIGURE 1. *Tensile-shear test specimen for simulated-aging test*

4.2.7 *Wetting test.*—A small gob of adhesive shall be pressed gently against a test surface and then, by reversing the pressure on the spatula, the gob shall be lifted from the surface. The stain and adhering adhesive shall be examined to observe whether failure occurs in cohesion or adhesion. The adhesive is considered "wetting" the surface if failure is in cohesion. Surfaces to be tested shall be polystyrene, plasterboard, plywood, Masonite, bare plaster, painted plaster, and concrete.

4.2.8 *Heat resistance test.*—A sheet of ¾-in., 5-ply exterior grade Douglas fir plywood 15 in. by 20 in. shall be coated with adhesive by

trowel, and three rows of four tiles per row shall be installed in accordance with the procedure recommended by the manufacturer. After 3 days of aging at room temperature, heat shall be applied to the assembly by placing it in a vertical position in a circulating-air oven at 60° ±2° C (140° ±4° F) and maintaining the temperature for 6 hours. While the assembly is heating, the tile shall be examined at intervals to determine if the tile slips or warps under its own weight. If slippage or warpage is observed, the temperatures of adhesive and tile face shall be recorded. If the tile slips or warps at a temperature below 60° ±2° C (140° ±4° F), the adhesive or the tile shall be considered to be unsatisfactory. This test is to simulate the installation of tile over walls containing hot-air ducts.

4.2.9 *Shrinkage test.*—The test panel shall be a piece of flat 5-ply exterior grade Douglas fir plywood measuring approximately ¾ in. by 14 in. by 14 in. The adhesive under test shall be applied to this panel according to the recommendations of the manufacturer. Nine flat unribbed tiles, measuring 4¼ in. by 4¼ in., and having a thickness of 0.065 in. (±0.003 in.) and a cavity depth of 0.035 in. (±0.002 in.), shall be mounted on this panel according to recommended procedure, and the assembly shall be allowed to dry for 90 days in a circulating-air oven held at 50° ±2° C (122° ±4° F). After removing from the oven the assembly shall be brought to standard conditions and the maximum "cupping" of the tiles (or deflection from "flat") shall be determined in both diagonal directions on each tile by use of the test instrument shown in figure 2 below.

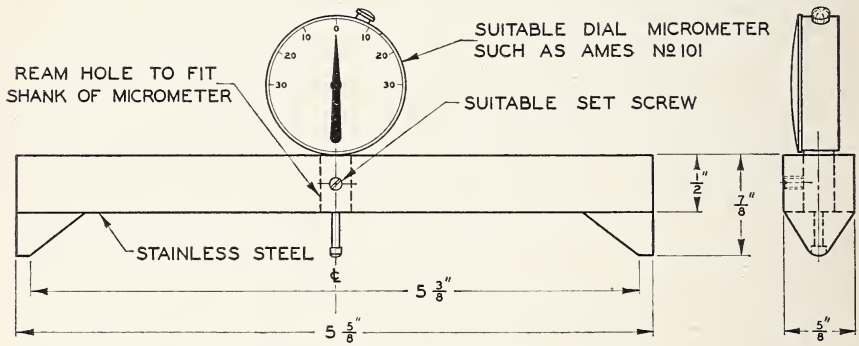

FIGURE 2. *Instrument for testing shrinkage.*

NOTE.—A zero reading on the micrometer must be obtained on a flat surface before attempting to measure deflection of tiles.

4.2.10 *Cyclic service test.*—The test panel shall be made by bonding 16 polystyrene plastic tiles, in a 4 by 4 pattern, to a piece of 5-ply exterior grade Douglas fir plywood, 18 in. by 18 in. by ¾ in. thick; the adhesive to be applied in accordance with the directions given by the manufacturer. The test panel shall be aged for 14 days at room conditions and then subjected to five cycles of the following set of conditions:

Period, hours	*Temperature,* °C	(°F)	*Relative humidity, percent*
2	60	(140)	88
2	0	(32)	(ca) 100
2	60	(140)	10
2	60	(140)	88
16	60	(140)	10

The tile shall not warp or crack, and the bond between the plywood and the tile shall not fail.

4.2.11 *Chemical attack.*—The test panel shall consist of tile bonded to a piece of plate glass measuring approximately 5 in. by 14 in. The adhesive under test shall be applied to the panel according to the recommendations of the manufacturer. Three unribbed tiles measuring 4¼ in. by 4¼ in., and having a thickness of 0.065 in. (±0.003 in.) and a cavity depth of 0.035 in. (±0.002 in.), shall be mounted on this panel and a "grout" shall be applied around the outside of the three butted tiles (in order to simulate practical use where air circulation under each tile is reduced to a minimum by the sealing action of adjacent tiles). The assembly shall be allowed to dry for 90 days in a circulating-air oven held at 50° ±2° C (122° ±4° F). After removal from the oven, careful visual examination of the exposed surface of each tile shall be made.

4.2.12 *Mildew resistance.*—The test specimen is prepared by drying a disk of the adhesive on a glass plate at 50° C (122° F) until it is of such consistency that it can be lifted from the plate and handled.

4.2.12.1 *Test apparatus.*—The apparatus for the mildew test shall be as follows:

(a) *Autoclave.*—The autoclave shall be capable of being operated at a steam pressure of 15 psi and an exhaust temperature of 121° C (249.8° F) for sterilization of media and test specimens.

(b) *Leaching.*—The leaching apparatus shall consist of as many quart jars as are necessary. Tap water shall be delivered to the bottoms of the jars at a rate of flow to give five changes per hour. The water shall be maintained at 27° to 30° C (80.6° to 86° F), and pH shall be as close to neutral as practicable, in the range of 6.0 to 8.0. The leaching period shall be 24 hours.

(c) *Petri dishes.*—10-cm-diameter petri dishes shall be used.

(d) *Room.*—A dust-free sterile room shall be maintained for inoculating the specimens. In addition, sterilamps or antiseptic sprays may be used to maintain sterile conditions.

(e) *Incubator.*—A room or cabinet shall be maintained at a temperature of 28° to 30° C (82.4° to 86° F) and a relative humidity of 85 to 95 percent for incubating the specimens after inoculation.

4.2.12.2 *Test medium.*—The culture medium shall have the following composition:

Ammonium nitrate	3.0 g.
Potassium dihydrogen orthophosphate	2.5 g.
Potassium monohydrogen orthophosphate	2.0 g.
Magnesium sulphate—7 molecules water of crystallization	2.0 g.
Agar	20.0 g.
Distilled water to make	1,000.0 ml.
Sucrose	30.0 g.

Adjust pH to between 6.4 and 6.8 with HCl or NaOH, if necessary.

4.2.12.3 *Organism.*—The organism used shall be *Aspergillus niger*, USDA 215–4247 (ATCC 6275).

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4.2.12.4 *Preparation of culture plates.*—The culture medium in flasks shall be sterilized in the autoclave for 20 minutes at a steam pressure of 15 psi and an exhaust temperature of 121° C (249.8° F). About 20 ml of the hot, sterile agar medium shall be poured into sterile petri dishes under aseptic conditions. The plates shall be covered and left undisturbed until the agar medium has hardened.

4.2.12.5 *Inoculum.*—Scrapings from a ripe fruiting culture of *Aspergillus niger* (10 to 14 days old), which completely cover a 10-cm petri dish or equivalent surface, shall be added to an Erlenmeyer flask containing 100 ml of sterile water. The transfer shall be made with a sterile loop made from nicrome, platinum, or tungsten wire. The black spore clusters shall be shaken in the flask with sterile glass beads until the tiny spores can be seen to go into suspension. Other equally satisfactory procedures for forming a suspension may be used.

The test medium for growing the *Aspergillus niger* shall be as described in paragraph 4.2.12.2.

4.2.12.6 *Inoculation of mycelial mats.*—The hardened agar medium shall be inoculated by first loading a sterile camel's hair brush with spores from the inoculum and then brushing the surfaces of the sterile agar medium uniformly.

4.2.12.7 *Incubation of mycelial mats.*—The inoculated medium in petri dishes shall be incubated for a period of 42 to 48 hours, or until the white mycelium is evident over the entire surface of the agar medium at 28° to 30° C (82° to 86° F), and at a relative humidity of 85 to 95 percent.

4.2.12.8 *Incubation of specimens.*—Specimens shall be wetted thoroughly with water and laid on the mycelial mats, then further incubated at 28° to 30° C (82° to 86° F) and at a relative humidity of 85 to 95 percent, for 14 days. *Do not use a wetting agent.*

4.2.12.9 *Results.*—Satisfactory specimens shall show no growth of *Aspergillus niger.*

5. IDENTIFICATION

5.1 *Labels and literature.*—In order that purchasers may be assured that the plastic tiles and adhesive purchased actually comply with all requirements of this commercial standard, it is recommended that manufacturers include the following statement in conjunction with their name and address on labels, invoices, sales literature, etc.:

> These (this) _____ comply (complies) with Commercial
> (trade name of tiles or adhesive)
> Standard CS168–50, as developed by the trade, under the procedure of the Commodity Standards Division, and issued by the U. S. Department of Commerce.

5.1.1 The following abbreviated statement is suggested when available space on labels is insufficient for the full statement:

> Complies with CS168–50, as developed by the trade, and issued by the U. S. Department of Commerce.

5.2 *Hallmark.*—Polystyrene plastic wall tile and adhesive containers may carry the following hallmark to indicate compliance with this commercial standard:

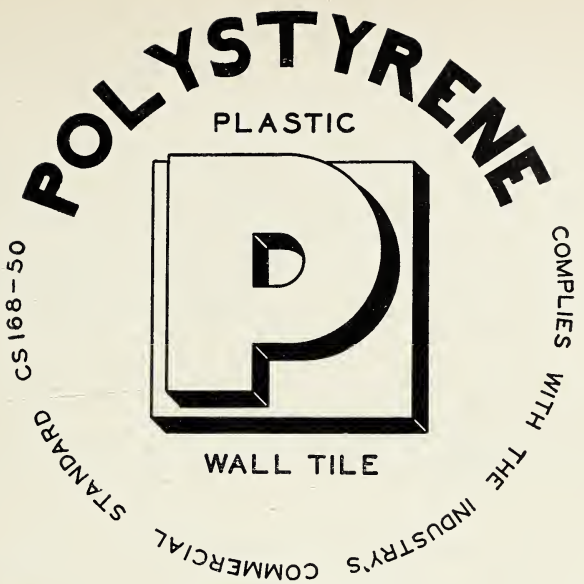

FIGURE 3. *Hallmark.*

6. EFFECTIVE DATE

6.1 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 July 15, 1950.

EDWIN W. ELY,
Chief, Commodity Standards Division.

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7. HISTORY OF PROJECT

7.1 In October 1947 manufacturers of polystyrene plastic wall titles, through the Plastic Wall Tile Manufacturers Institute and the Society of the Plastics Industry, requested the assistance of the Commodity Standards Division of the National Bureau of Standards in establishing a commercial standard for their product. The phenomenal boom in building construction had created an active market for plastic wall tiles, and the very rapid growth of this comparatively new industry emphasized the need for a standard as a guide to those contemplating the use of such tile. Producers, too, felt the need for a standard by which to control the quality of their expanding production.

7.2 With a view to developing a commercial standard for polystyrene plastic wall tiles and the adhesives used in their application, representatives of the molders and of the raw material producers met several times during 1948 and 1949 with representatives of the National Bureau of Standards to discuss the various requirements to be included in the standard.

7.3 The preliminary draft that was evolved from these discussions and from laboratory tests of the materials was circulated to leading manufacturers, Government agencies, and others concerned for their

advance review and comment. Some helpful suggestions were received as a result. These were included in the adjusted draft of the recommended standard sent on November 29, 1949, to manufacturers, distributors, contractors, architects, installers, and users, for their consideration and approval.

7.4 Written acceptances representing adequate support by manufacturers, distributors, and users resulted from this circularization, together with a few additional suggestions for modification of the standard. After careful consideration of these suggestions by the proponents, certain adjustments were made in the standard with the general concurrence of the acceptors. On June 15, 1950, an announcement was issued that the standard, designated CS168–50, had been approved for promulgation and publication, effective from July 15, 1950.

Project Manager: W. E. Braithwaite, Commodity Standards Division, Office of Industry and Commerce.

Technical Adviser: Frank W. Reinhart, Organic and Fibrous Materials Division, National Bureau of Standards.

8. STANDING COMMITTEE

8.1 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. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, Office of Industry and Commerce, U. S. Department of Commerce, which acts as secretary for the committee.

Sherwood L. Young, Acting Chairman

Representing plastic materials producers:

Wm. C. Austin, Bakelite Division, Union Carbide & Carbon Corp., 30 East Forty-second Street, New York, N. Y.
Sanford E. Glick, Monsanto Chemical Co., Springfield, Mass.
E. Y. Wolford, Koppers Co., Inc., Koppers Building, Pittsburgh, Pa.
Earl E. Ziegler, The Dow Chemical Co., Midland, Mich.

Representing plastic tile molders:

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C. J. Luster, Lincoln Plastics Corp., Fourteenth and Burgess Streets, Cambridge, Ohio.
Sherwood L. Young, C. F. Church Manufacturing Co., Monson, Mass.

Representing adhesive manufacturers:

G. C. McCarten, Macco Chemical Co., 6600 Union Avenue, Cleveland, Ohio.
A. J. Slosser, Armstrong Cork Co., Lancaster, Pa.

Representing distributors of tile:

Marshall H. Field, V & M Manufacturing Co., 1225 Brighton Road, Pittsburgh, Pa.
Alan M. Pinsky, Pinsky Floor Covering Co., Inc., Merchandise Mart, Chicago, Ill.

Representing contractors and architects:

L. V. Lacy, Sordoni Construction Co., Inc., 45 Owen Street, Forty Fort, Wilkes-Barre, Pa. (representing Associated General Contractors of America, Inc.).
John K. Ruff, 100 West Twenty-second Street, Baltimore 18, Md. (representing Associated General Contractors of America, Inc.).

Stanley J. Goldstein, 1131 Dudley Drive, Shreveport, La. (representing American Institute of Architects).
Leo Provost, 61 Amherst Street, Manchester, N. H. (representing American Institute of Architects).

APPENDIX

Installation and maintenance.—The following instructions on installation and maintenance should be followed in order to insure best results with plastic tiles and adhesives conforming to this commercial standard:

(1) *Installation.*

(a) *Temperature.*—Polystyrene wall tiles and adhesives should not be installed at temperatures less than 21° C (70° F). The room temperature should also be not less than 21° C (70° F).

(b) *Condition of adhesives.*—All adhesives should be clean and thoroughly mixed to a uniform composition.

(c) *Condition of wall.*—All adhesives should be installed over plaster, wood, plywood, concrete, cement, wallboard, or any wall surface that is structurally solid. The walls should be straight, even, clean, dry, and free from high or low spots. All corners should be square and plumb. Wallpaper, linoleum, and oilcloth should be removed and the old adhesive washed off the wall before the tiles are installed. Improperly bonded paint, lacquer, and enamel should be removed before the tiles are installed. Water-soluble paint surfaces should first be removed. Tiles should not be installed over any surface of wall through which moisture may penetrate unless the wall is treated with an adequate moisture barrier.

(d) *Job layout.*—Where possible, all installations should be planned so that the joint lines will be level at wainscot height. When tiles are applied to ceilings, start at the center of the ceiling and work out in all directions.

(e) *Water.*—The tiles should be installed in a manner to prevent water from getting into the supporting surface in back of the tile. This requires adequate sealing particularly around sinks, wash bowls, bathtubs, shower bases, etc.

(f) *Heat.*—Hot-air ducts, chimneys, registers, radiators, heaters, stoves, etc., should be shielded or insulated in such a manner that the wall tile temperature shall not exceed 60° C (140° F). Tiles should not be installed when hot water or air will cause the temperature of the installed tiles to exceed 60° C (140° F).

(g) *Cutting.*—The tiles should be cut by guillotine-type cutters, coarse-tooth hacksaws, coping saws, or power-driven cutting tools. The tiles should not be cut with scissors, metal shears, or knives, or by scribing and cracking.

(h) *Application of adhesive.*—The adhesive should be combed onto the walls with a wavy motion by using a specially notched trowel. The coating of adhesive should be of such thickness that when the tile is pressed firmly against the wall the ridges of adhesive formed by the notched trowel will flatten and contact at least 60 percent of the back of the tile. All tiles should be pressed firmly into position to insure good adhesion.

(i) *Joints.*—The tiles should be laid in such a manner that they are not set tightly edge to edge. There should be a slight space of at least 0.005 in. between each tile, or 0.001 in. per inch of tile face, whichever is greater.

(j) *Wall fixtures.*—Towel bars, soap holders, paper holders, pull bars, tooth-brush holders, etc., should be of the types that are inset in the wall or fastened directly to the subconstruction. Accessories should not be fastened to the plastic wall tile.

(k) *Finishing.*—Excessive adhesive should be removed from the face of the tile with a suitable cleaner before it dries. It is recommended that the surface of the plastic tile be coated with a suitable destaticizer and/or wax.

(2) *Maintenance.*

(a) *Cleaners.*—Suitable cleaners should not etch, mar, or otherwise attack the plastic or the dried adhesive. They should not leave any residual film that detracts from the appearance of the tile. Warm, soapy water is the best cleaning agent for polystyrene wall tile after installation. Abrasive cleaners, gasoline, paint thinners, turpentine, carbon tetrachloride, or similar cleaning agents should be avoided.

(b) *Waxes.*—If waxes are used they should not etch, mar, or otherwise attack the plastic or the dried adhesive. They should withstand a minimum of 10 cold-water rinses and 5 warm, soapy-water washes. Most paste waxes and all oil-base waxes will attack the tile and should be avoided.

(c) *Plastics.*—Where vinyl-type plastic curtains are used, they should not be in prolonged contact with polystyrene wall tiles.

(d) *Insecticides.*—Direct contact of the tiles with insecticides should be avoided.

(3) *Flammability.*

(a) Polystyrene-tiled walls do not contribute any more to the fire hazard of structures in which they are located than the woodwork, wall covering, or the paint on which they are often mounted, or in fact than the furniture, floor coverings, or window hangings in common use. It is true that exposed edges of tile can be made to burn if held in an open flame. When ignited, polystyrene is rated as a "slow burning" plastic according to American Society for Testing Materials Method of Test D 635–44. However, it is known that polystyrene tile, molded and mounted as decorative wall coverings according to these specifications, do not constitute a greater fire hazard than other well-known organic building materials, such as wood and paint.

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,
Office of Industry and Commerce,
U. S. Department of Commerce,
Washington 25, D. C.

Gentlemen:

We believe that the Commercial Standard 168–50 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 polystyrene plastic wall tiles, and/or adhesives for their application.

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.

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 of 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 polystyrene plastic wall tiles and/or adhesives for their application. In accepting the standard, they reserved the right to depart from it 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)

Non-ceramic Tile Association of America, Chicago, Ill.
Society of the Plastics Industry, Inc., New York, N. Y.

FIRMS AND OTHER INTERESTS

A-1 Plastic Molders, Inc., Chicago, Ill.
AAA Plastic Tile Co., Miami, Fla.
Acorn Plastic Engineers, Inc., Erie, Pa.
Adhesive "Plastite" Mastic Co., Chicago, Ill.
Adhesives, Inc., Plainfield, N. J.
Alo-Tile Manufacturing Co., Detroit, Mich.
American Plumbing Supply Co., Milwaukee, Wis.
American Resinous Chemicals Corp., Peabody, Mass.
Andersen's, Ellsworth, Kans.
Arabol Manufacturing Co., New York, N. Y., and San Francisco, Calif.
Armstrong Co., Detroit, Mich.
Armstrong Cork Co., Lancaster, Pa.
Atlas Tile Engineering Co., Berwyn, Ill.
B. B. Chemical Co., Cambridge, Mass.
Bakelite Corp., New York, N. Y.
Beacon Plastic & Metal Products, Inc., New York, N. Y.
Beau-Tile Corp., Lynbrook, N. Y.
Beauty Style Tile Corp., Jamaica, N. Y.
Bisceglia, Jos., & Sons, Inc., Harrison, N. Y. (General support).
Bloxolite Company of America, Division of Hachmeister, Inc., Pittsburgh, Pa.
Borden Co., Chemical Division, New York, N. Y.
Braden Glass & Mirror Works, Bethlehem, Pa.
Brooks Glue Co., Inc., Canton, Mass.
Bruene, A., & Co., Newark, N. J.
Building & Maintenance Co., Denver, Colo.
Building Specialty Distributors, Inc., Charlotte, N. C.
Burkhard Bros., Syracuse, N. Y.
Burt, Lauren, Inc., Denver, Colo.
Buslow, Robert S., Tile Contractor, Astoria, L. I., N. Y.
C. C. & S. Plastic Arts, Inc., Austin, Tex.
Cambria Construction Co., Johnstown, Pa.
Canadian General-Tower, Ltd., Galt, Ont., Canada.
Cantrell, W. E., Co., Inc., Oklahoma City, Okla.
Carter Tile & Specialty Co., Bluefield, W. Va.
Central of Georgia Railway Co., Savannah, Ga.
Central Service Bureau, New Haven, Conn.
Central Tile Co., Inc., Miami, Fla.
Cermak Tile Co., Inc., Cleveland, Ohio.
Church, C. F., Manufacturing Co., Monson, Mass.
Cleveland Plastics, Inc., Cleveland, Ohio.
Clinton Builders Supply Co., Syracuse, N. Y.
Continental Can Co., Inc., Plastics Division, Cambridge, Ohio.
Croxton Bros. Tile Co., Alton, Ill.
Detroit Plastic Molding Co., St. Clair Shores, Mich.
Dolphin Paint & Varnish Co., Toledo, Ohio.
Dow Chemical Co., Midland, Mich.
Drakenfeld, B. F., & Co., New York, N. Y.
Esselen Research Division, United States Testing Co., Inc., Boston, Mass.
Evansville Rubber & Supply Co., Inc., Evansville, Ind.
Eyerman, Edward, & Son, Wilkes-Barre, Pa.
Falls Dealer Supply Co., Sheboygan Falls, Wis.
Felt Products Manufacturing Co., Chicago, Ill.
Fenwick Construction Co., Bridgeport, Conn.
Findley, F. G., Co., Milwaukee, Wis.
Fink Construction Co., Buffalo, N. Y.
Flooring Distributors, Inc., Atlanta, Ga.
Foster, Benjamin, Co., Philadelphia, Pa.
Fuller, H. B., Company of California, San Francisco, Calif.
Grand Rapids Research & Testing Laboratories, Grand Rapids, Mich.
Granite State Construction Co. (Tile Division), Manchester, N. H.
Great Western Supply, Inc., Seattle, Wash.
Greater Detroit Home Supply Co., Detroit, Mich.
Grootenboer, D. H., Williamsport, Pa.
Hansen Supply Co., New London, Conn.
Harwich Lumber Co., Inc., Harwich, Mass.
Hayes Adhesives Co., St. Louis, Mo.
Helmus, Herb, Hardware Corp., Brooklyn, N. Y.
Hibner & Co., Fairview, N. J.
Holden & Martin Lumber Co., Brattleboro, Vt.
Hospital Bureau of Standards & Supplies, Inc., New York, N. Y.
Household Distributors, Charlotte, N. C.
Household Roofing & Insulation Co., Hartford, Conn.
Johnson Bros. Furniture Co., Junction City, Kans
Johnson, Flooring & Wall Contractor, Boonville Mo.
Jolley Supply Co., Miami, Okla.
KenJohn Co., Pleasantville, N. Y.
Kennedy, D. J., Co., Pittsburgh, Pa.
Kuhlman Plastics Co., Inc., Kansas City, Mo.
Letourneau, Joseph J., & Son, Rochester, N. H.
Lincoln Plastics Corp., Cambridge, Ohio.
Lynch, H. F., Lumber Co., West Springfield, Mass.
Macco Chemical Co., Cleveland, Ohio.
Magic Chemical Co., Brockton, Mass.
Makielski, S. J., Charlottesville, Va.
Makray Manufacturing Co., Chicago, Ill.
Martinsburg (W. Va.), City of.
Master Plastic Molding Corp., St. Louis, Mo.
Mastro Plastics Corp., New York, N. Y.
McArdle & Walsh, Inc., Baltimore, Md.
McCormick & Mead Cabinet Shop, Drumright, Okla.
McGee's Tile & Kitchen Co., Amsterdam, N. Y.
Meridian Plastics, Inc., Byesville, Ohio.
Mid West Tile Co., Chicago, Ill.
Miles Plumbing & Heating Co., Inc., Brockton, Mass.
Milwaukee Tile & Supply Co., Inc., Milwaukee, Wis.
Minnesota Mining & Manufacturing Co., Detroit, Mich.
Modern Cabinet Shop, Jewett City, Conn.
Mohawk Distributing Co., Kansas City, Mo.
Monsanto Chemical Co., Springfield, Mass.
Moreau, J. J., & Son, Inc., Manchester, N. H.
Motor City Plastics Co., Hazel Park, Mich.
Nalle Plastics, Inc., Austin, Tex.
National Research Council, Division of Building Research, Ottawa, Ontario, Canada.
Nevada Building Materials, Inc., Reno, Nev.
New England Spectrochemical Laboratories, Ipswich, Mass.
Nisser, E. G., & Sons, Contractors & Distributors, Des Moines, Iowa.
Ohio Mastic Co., Cleveland, Ohio.
Ohio Valley Builders Supply Corp., Parkersburg, W. Va.
Paraffine Cos., Inc., San Francisco, Calif.
Peek, G. M., De Land, Fla.
Penn Sales Co., Philadelphia, Pa.
Permalastic Products Co., Ferndale, Mich.
Plastic Engineering, Inc., Cleveland, Ohio.
Plastic Molded Products Co., Chicago, Ill.

Plastic Research & Testing Laboratory, New York, N. Y.
Plastic Tile Company of America, Cleveland, Ohio.
Plastic Tile & Cabinet Co., Cincinnati, Ohio.
Polymer Industries, Inc., Brooklyn, N. Y., and Astoria, L. I., N. Y.
Puerto Rico Industrial Development Co., San Juan, P. R.
Rankin-Fisher, Inc., Orlando, Fla.
Raup Tile & Cabinet Co., Indianapolis, Ind.
Rodd, Major L., & Son, Concord, N. H.
Rogers & Herr Neckar, Philadelphia, Pa.
Roofing & Siding Products, Inc., Bound Brook, N. J.
Ross, L. J., Co., St. Louis, Mo.
Ruggeri, Sam, Brooklyn, N. Y. (General support).
S & W Moulding Co., Columbus, Ohio.
Scallon Roofing Co., Norwalk, Conn.
Schaeffer, Hooton & Wilson, Architects, Bloomington, Ill.
Schoger's Floor Covering Store, Anderson, Ind.
Scott-Marquardt Co., Inc., Buffalo, N. Y.
Sears, Roebuck & Co., Chicago, Ill.
Selck, Walter E., & Co., Chicago, Ill.
Shepherd, J. H., Son & Co., Elyria, Ohio.
Shunk's Plastic Shop, Joplin, Mo.
Singer & Gold, Beaver Falls, Pa.
Sterling Supply Co., Columbus, Ohio.
Stevens, John Calvin, 2d, Portland, Maine.
Stevens, John Howard, Portland, Maine.
Stylon Corp., Boston, Mass., and Washington, D. C.
Styrene Plastic Products, Kansas City, Mo.
Styron Bri-Tile Company of New York, New York, N. Y.
Styron Bri-Tile of Washington, Washington, D. C.
Sun-Rite Co., Kansas City, Mo.
Superior Plastics Division, Commonwealth Plastics, Inc., Chicago, Ill.
Technical Industries, Pasadena, Calif.
Templar Oil Products Co., Inc., South River, N. J.
Tile Rite Co., Cleveland, Ohio.
Triangle Distributing Co., Manchester, N. H.
Triangle Roofing & Supply Co., Cincinnati, Ohio.
Tripart Merchandise Co., New York, N. Y.
Turner, A. K., & Co., Detroit, Mich.
Turner, Inc., Dickinson, N. Dak.
U. S. Testing Co., Inc., Hoboken, N. J.
Versa-Tile Co., Melrose, Mass.
Wall, H. B., & Sons, Springfield, Mo.
Washington Inselbric Store, Washington, Pa.
Webster Tile Co., Webster Groves, Mo.
Werner Bros. Co., Jersey City, N. J.
White & Shauger, Inc., Paterson, N. J.
Williamson, F. S., Bay City, Mich.
Wilross Products Co., Hawthorne, N. J.
Witmer, Maurice E., Portsmouth, N. H.
Yardley Plastics Co., Columbus, Ohio.

UNITED STATES GOVERNMENT

U. S. Department of Agriculture, Division of Purchase, Sales and Traffic.
U. S. Department of the Army.

COMMERCIAL STANDARDS

CS No.

0–40. Commercia standards and their value to business.
1–42. Clinical thermometers.
2–30. Mopsticks.
3–40. Stoddard solvent.
4–29. Staple porcelain (all-clay) plumbing fixtures.
5–46. Pipe nipples; brass, copper, steel and wrought-iron.
6–31. Wrought-iron pipe nipples. Superseded by CS5–46.
7–29. Standard weight malleable iron or steel screwed unions.
8–41. Gage blanks.
9–33. Builders' template hardware.
10–29. Brass pipe nipples. Superseded by CS5–46.
11–41. Moisture regains of cotton yarns.
12–48. Fuel oils.
13–44. Dress patterns.
14–51. Boys' sport and dress shirt (woven fabrics) size measurements.
15–46. Men's pajama sizes (made from woven fabrics).
16–29. Wallpaper.
17–47. Diamond core drill fittings.
18–29. Hickory golf shafts.
19–32. Foundry patterns of wood.
20–49. Vitreous china plumbing fixtures.
21–39. Interchangeable ground-glass joints, stopcocks, and stoppers.
22–40. Builders' hardware (nontemplate).
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.
28–46. Cotton fabric tents, tarpaulins and covers.
29–31. Staple seats for water-closet bowls.
30–31. (Withdrawn.)
31–38. Wood shingles.
32–31. Cotton cloth for rubber and pyroxylin coating.
33–43. Knit underwear (exclusive of rayon).
34–31. Bag, case, and strap leather.
35–49. Hardwood plywood.
36–33. Fourdrinier wire cloth.
37–31. Steel bone plates and screws.
38–32. Hospital rubber sheeting.
39–37. (Withdrawn.)
40–32. Surgeons' rubber gloves.
41–32. Surgeons' latex gloves.
42–49. Structural fiber insulating board.
43–32. Grading of sulphonated oils.
44–32. Apple wraps.

CS No.

45–48. Douglas fir plywood.
46–49. Hosiery lengths and sizes.
47–34. Marking of gold-filled and rolled-gold-plate articles other than watchcases.
48–40. Domestic burners for Pennsylvania anthracite (underfeed type).
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.
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.
57–40. Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings.
58–36. Woven elastic fabrics for use in overalls (overall elastic webbing).
59–44. Textiles—testing and reporting.
60–48. Hardwood dimension lumber.
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.
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) (published with CS71–41).
71–41. Phenolic disinfectant (soluble type) (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.
74–39. Solid hardwood wall paneling.
75–42. Automatic mechanical draft oil burners designed for domestic installations.
76–39. Hardwood interior trim and molding.
77–48. Enameled cast-iron plumbing fixtures.
78–40. Ground-and-polished lenses for sun glasse (published with CS79–40).

CS No.

79–40. Blown, drawn, and dropped lenses for sun glasses (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.
93–50. Portable electric drills (exclusive of high frequency).
94–41. Calking lead.
95–41. Lead pipe.
96–41. Lead traps and bends.
97–42. Electric supplementary driving and passing lamps for vehicles (after market).
98–42. Artists' oil paints.
99–42. Gas floor furnaces—gravity circulating type.
100–47. Porcelain-enameled steel utensils.
101–43. Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
102– . (Reserved for "Diesel and fuel-oil engines").
103–48. Rayon jacquard velour (with or without other decorative yarn).
104–49. Warm-air furnaces equipped with vaporizing-type oil burners.
105–48. Mineral wool insulation for low temperatures.
106–44. Boys' pajama sizes (woven fabrics).
107–45. (Withdrawn.)
108–43. Treading automobile and truck tires.
109–44. Solid-fuel-burning forced-air furnaces.
110–43. Tire repairs—vulcanized (passenger, truck, and bus tires).
111–43. Earthenware (vitreous-glazed) plumbing fixtures.
112–43. Homogeneous fiber wallboard.
113–44. Oil-burning floor furnaces equipped with vaporizing pot-type burners.
114–43. Hospital sheeting for mattress protection.
115–44. Porcelain-enameled tanks for domestic use.
116–44. Bituminized-fibre drain and sewer pipe.
117–49. Mineral wool insulation for heated industrial equipment.
118–44. Marking of jewelry and novelties of silver.
(E) 119–45.[1] Dial indicators (for linear measurements).
120–48. Standard stock ponderosa pine doors.
121–45. Women's slip sizes (woven fabrics).
122–49. Western softwood plywood.
123–49. Grading of diamond powder.
(E) 124–45.[1] Master disks.
125–47. Prefabricated homes.
126–45. Tank-mounted air compressors.

CS No.

127–45. Self-contained mechanically refrigerated drinking water coolers.
128–49. Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).
129–47. Materials for safety wearing apparel.
130–46. Color materials for art education in schools.
131–46. Industrial mineral wool products, all types—testing and reporting.
132–46. Hardware cloth.
133–46. Woven wire netting.
134–46. Cast aluminum cooking utensils (metal composition).
135–46. Men's shirt sizes (exclusive of work shirts).
136–46. Blankets for hospitals (wool, and wool and cotton.)
137–46. Size measurements for men's and boys' shorts (woven fabrics).
138–49. Insect wire screening.
139–47. Work gloves.
140–47. Testing and rating convectors.
141–47. Sine bars, blocks, plates, and fixtures.
142–47. Automotive lifts.
143–47. Standard strength and extra strength perforated clay pipe.
144–47. Formed metal porcelain enameled sanitary ware.
145–47. Testing and rating hand-fired hot water supply boilers.
146–47. Gowns for hospital patients.
147–47. Colors for molded urea plastics.
148–50. Men's circular flat and rib knit rayon underwear.
149–48. Utility type house dress sizes.
150–48. Hot rolled rail steel bars (produced from Tee-section rails).
151–48. Body measurements for the sizing of apparel for infants, babies, toddlers, and children (for the knit underwear industry).
152–48. Copper naphthenate wood-preservative (spray, brush, dip application).
153–48. Body measurements for the sizing of apparel for girls (for the knit underwear industry).
154– . (Reserved for "wire rope.")
155–50. Body measurements for the sizing of boys' apparel (knit underwear, shirts, trousers).
156–49. Colors for polystyrene plastics.
157–49. Ponderosa pine and sugar pine plywood.
158–49. Model forms for girls' apparel.
159–49. Sun glass lenses made of ground and polished plate glass, thereafter thermally curved.
160–49. Wood-fiber blanket insulation (for building construction).
161–49. "Standard grade" hot-dipped galvanized ware (coated after fabrication).
162–49. Tufted bedspreads.
163–49. Standard stock ponderosa pine windows, sash, and screens.
164– . (Reserved for "concrete mixers.")
165–50. Zinc naphthenate wood-preservative (spray, brush, dip application).
166–50. Size measurements for men's work trousers.
167–50. Automotive and general service copper tube.
168–50. Polystyrene plastic wall tiles, and adhesives for their application.
169–50. Galvanized ware fabricated from *pregalvanized* steel sheets.
170–50. Cotton flour-bag (sack) towels.
171–50. Hardwood veneered doors.
172–50. Brass trim for water-closet bowls, tanks, and urinals (dimensional standards).

[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, Office of Industry and Commerce, U. S. Department of Commerce, Washington 25, D. C.

U. S. DEPARTMENT OF COMMERCE

FIELD SERVICE

Albuquerque, N. Mex., 203 West Gold Avenue.

Atlanta 3, Ga., 50 Whitehall Street SW.

Baltimore 2, Md., 103 South Gay Street.

Boston 9, Mass., 1800 Customhouse.

Buffalo 3, N. Y., 117 Ellicott Street.

Butte, Mont., 14 West Granite Street.

Charleston 3, S. C., 18 Broad Street.

Cheyenne, Wyo., 206 Federal Office Building.

Chicago 4, Ill., 332 South Michigan Avenue.

Cincinnati 2, Ohio, 105 West Fourth Street.

Cleveland 14, Ohio, 925 Euclid Avenue.

Dallas 2, Tex., 1114 Commerce Street.

Denver 2, Colo., 828 Seventeenth Street.

Detroit 26, Mich., 230 West Fort Street.

El Paso, Tex., 206 United States Courthouse Building.

Hartford 1, Conn., 135 High Street.

Houston 14, Tex., 602 Federal Office Building.

Jacksonville 1, Fla., 311 West Monroe Street.

Kansas City 6, Mo., 911 Walnut Street.

Los Angeles 12, Calif., 312 North Spring Street.

Louisville 2, Ky., 631 Federal Building.

Memphis 3, Tenn., 229 Federal Building.

Miami 32, Fla., 36 Northeast First Street.

Milwaukee 2, Wis., 517 East Wisconsin Avenue.

Minneapolis 1, Minn., 401 Second Avenue South.

Mobile 10, Ala., 109–113 St. Joseph Street.

New Orleans 12, La., 333 St. Charles Avenue.

New York 4, N. Y., 42 Broadway.

Oklahoma City 2, Okla., 102 Northwest Third Street.

Omaha 2, Nebr., 1319 Farnam Street.

Philadelphia 6, Pa., 437 Chestnut Street.

Phoenix, Ariz., 234 North Central Avenue.

Pittsburgh 19, Pa., 700 Grant Street.

Portland 4, Oreg., 520 Southwest Morrison Street.

Providence 3, R. I., 24 Weybossett Street.

Reno, Nev., 118 West Second Street.

Richmond 19, Va., 801 East Broad Street.

St. Louis 1, Mo., 1114 Market Street.

Salt Lake City 1, Utah, 350 South Main Street.

San Francisco 11, Calif., 555 Battery Street.

Savannah, Ga., 125–129 Bull Street.

Seattle 4, Wash., 909 First Avenue.

For local telephone listing, consult section devoted to United States Government

U. S. GOVERNMENT PRINTING OFFICE: 1951