Designation: C1822 – 15

Standard Specification for Insulating Covers on Accessible Lavatory Piping[1]

This standard is issued under the fixed designation C1822; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers insulating covers for use on exposed drain and water supply piping under accessible lavatories and sinks. The insulating covers shall have thermal insulating properties to protect people with disabilities from burns and physical harm from contact with exposed water supply and waste piping under accessible lavatories and sinks. Insulating covers shall be removable and reusable.

1.2 Included are criteria for classifying removable and reusable protective covers on exposed drain and water supply piping under lavatories and sinks and requirements and test methods for materials and workmanship. Methods of marking are also given.

1.3 The products covered by this specification are intended for use on water supply and drain or waste piping under lavatories and sinks only.

1.4 The values stated in inch-pound units shall be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 This specification does not establish the criteria required in the design of the equipment over which removable insulating covers are used, nor does this specification establish or recommend the applicability of removable insulating covers over all surfaces.

1.6 This standard does not apply to shrouds under lavatories and sinks.

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

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C168 Terminology Relating to Thermal Insulation

C177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

C1045 Practice for Calculating Thermal Transmission Properties Under Steady-State Conditions

D570 Test Method for Water Absorption of Plastics

D635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

E84 Test Method for Surface Burning Characteristics of Building Materials

G21 Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

2.2 *Department of Justice Document:*[3]

2010 Americans with Disabilities Act Standard for Accessible Design Section 606.5

2.3 *ICC/ANSI Standard:*[4]

A117.1 Standard for Accessible and Usable Buildings and Facilities, Section 606.6

2.4 *ASME Standard:*[5]

A112 18.9 Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures

3. Terminology

3.1 For definitions of terms used in this specification, refer to Terminology C168.

3.2 *Definitions of Terms Specific to This Standard:*

[1] This specification is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.40 on Insulation Systems.

Current edition approved Oct. 1, 2015. Published October 2015. DOI: 10.1520/C1822-15.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the U.S. Department of Justice, 950 Pennsylvania Ave., NW Washington, DC, 20530-0001, www.ada.gov.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, http://www.asme.org.

3.2.1 *accessible*—able to be accessed or approached by a wheelchair or by people with disabilities.

3.2.2 *accessible lavatory or sink*—lavatories or sinks installed to provide access for wheelchairs and people with disabilities.

3.2.3 *insulating cover*—material or assembly of materials that is applied over piping to provide thermal protection from hot and cold temperatures, and physical protection from bruising, abrasion, and cutting from sharp, hard, or abrasive surfaces.

3.2.4 *lavatory*—a fixed washbasin used for personal hygiene that requires a water supply and discharges wastewater to the drainage systems.

3.2.5 *removable and reusable*—an insulating cover which can be installed and then removed and reinstalled for maintenance and cleaning.

3.2.6 *shrouds*—a cover under a lavatory or sink that is attached to a cabinet or wall and not to piping.

3.2.7 *sink*—a fixed bowl or basin for general uses that requires a water supply and discharges wastewater to the drainage system.

3.2.8 *tepid water*—domestic water with temperature between 60 to 100°F (15.6 to 37.8°C).

3.2.9 *waste piping*—piping and pipe fittings under lavatories or sinks that drain waste water.

3.2.10 *water supply*—piping and pipe fitting that distributes potable water to a lavatory or sink.

4. Significance and Use

4.1 Accessibility design standards require water supplies and drain pipes under lavatories and sink are to be insulated or otherwise configured to protect people with disabilities from contact with exposed pipes. No sharp or abrasive surfaces are allowed under lavatories or sinks.

4.2 People in wheelchairs and people with physical disabilities are part of the most at risk group for scalding, severe reaction, bruising and cuts from exposed piping under lavatories and sinks. These groups, which also include young children, the elderly, and the infirm sometimes require different safety regulation due to but not limited to slower reaction time, physical disabilities, mobility impairments; and medical conditions which can increase exposure contact time and increased vulnerability to severe reaction, discomfort, burns, bruises, abrasions, and cuts of the skin.

4.3 This specification is intended to cover products which will satisfy the requirements of the Americans with Disabilities Act 4.19.4, the Department of Justice: 2010 Americans with Disabilities Act Standard for Accessible Design Section 606.5, ICC/ANSI A117.1 2012 (Standard for Accessible and Usable Buildings and Facilities - for Persons with Physical Disabilities) section 606.6 (Exposed Pipes and Surfaces).

5. Classification

5.1 Removable and reusable insulating covers covered by this specification are classified into four types based upon the fire performance as follows:

5.1.1 *Type I*—Test Method E84 Flame spread/smoke developed indices of ≤25/450.

5.1.2 *Type II*—Test Method E84 Flame spread/smoke developed indices of ≤200/450.

5.1.3 *Type III*—Test Method D635 Rate of Burning, maximum 1 in. (25 mm).

5.1.4 *Type IV*—No fire performance determined or required.

6. Materials and Manufacture

6.1 Insulating cover material shall be suitable for molding or constructed into final required shapes. If rolls or sheets are used, they shall be formed to fit the cylindrical surface to which they are to be applied.

6.2 The insulating cover for tailpiece and drain pipe sections shall be constructed to allow separation into pieces or to be cut to remove excess material to fit piping configuration.

6.3 The insulating cover shall consist of one or more pieces. Component pieces shall be bonded, welded, extruded, or molded together. Adhesive construction is not permitted.

6.4 The insulating cover shall be constructed to create air baffles between the material and the piping.

7. Material Application Requirements

7.1 The insulating cover shall be in a form suitable for application to cylindrical surfaces of exposed drain and water supply piping.

7.2 The insulating cover and fasteners shall not create any sharp or abrasive exterior surfaces.

8. Performance Requirements and Physical Properties

8.1 The insulating cover shall conform to the requirements shown in Table 1.

8.2 *Exterior Surface Thermal Transfer Test:*

8.2.1 Test shall be conducted at a room temperature of 73.4 ± 3.6°F (23 ± 2°C), inside a draft shield. The draft shield shall be 30 in. (76 cm) wide by 30 in. (76 cm) high by 24 in. (61 cm) deep, closed on the top, back and sides, and that is set onto a surface like a benchtop or floor that closes off the bottom, leaving only the front open. This shield simulates an accessible sink in an alcove. Pipe slots will allow hot water pipes to enter and test sample to be positioned 15 in. above the floor (see Appendix X1). For testing, one (1) sample of each P-trap assembly (includes tailpiece and waste arm), stop and supply riser shall have a sample insulating cover installed in accordance with the manufacturer's instructions.

8.2.2 Insulating cover fitting more than one size piping shall use the largest size of the insulating device for testing.

8.2.3 Using water tight connections between water heater tank and P-trap, supply stops, supply riser, and waste fitting, maintain water temperature within P-trap, supply stops, riser, and fixture waste fitting at 140 ± 2°F (60 ± 1.1°C) for a period of 300 minutes. Use thermocouple attached to outside wall of P-trap, stop, and supply insulation cover. Record the temperature at three different locations to determine the hottest area. Record the temperature every 15 minutes over the length of the test.

TABLE 1 Insulating Cover Materials and Performance Requirements

NOTE 1—This specification is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under the actual fire conditions.

NOTE 2—The physical properties and performance requirements of this specification are determined at specific laboratory conditions and do not purport to address the performance at other conditions. It is the responsibility of the user to assure suitability of the material under field conditions.

Property	Type I	Type II	Type III	Type IV
Apparent material thermal conductivity max ≤Btu·in/hr·ft^2·°F (W/m-K) at a mean temperature of 75°F (24°C)	1.3 (0.19)	1.3 (0.19)	1.3 (0.19)	1.3 (0.19)
Material max calculated thermal effusivity: Btu/ft^2·°F·h^{½} (J/m^2·K·s^{½})	2.4 (820)	2.4 (820)	2.4 (820)	2.4 (820)
Flame Spread Index	≤25	>25 to ≤200	N/A[A]	N/A
Smoke Developed Index, max	450	450	N/A	N/A
Rate of Burning, max, inch (mm)	N/A	N/A	1 (25)	N/A
Density, max lb/ft^3 (kg/m^3)	87 (1400)	87 (1400)	87 (1400)	87 (1400)
Water Absorption, max, % by weight	30	30	30	30
Fungi Growth at four weeks, max	1	1	1	1
Finished Product Min./Max. Surface Temperature °F (°C)	68 (20) 95 (35)			
Finished Product Exposure/Weatherability	No cracking, checking, crazing, erosion, or chalking observed on the surface when observed at 5× magnification at 48 hours			
Finished Product Surface Deflection and Load	No signs of cracks or voids, after 5 minutes outside surface shall have no indentations			

[A]N/A = not applicable.

8.2.4 Maximum surface temperature of the exterior surface of the insulating cover shall not rise above 95°F (35°C).

8.3 *Surface Deflection and Load Test*—With a ½ in. (12.7 mm) diameter metal rod, apply a 10 lb (4.5 kg 44.5 N) force at a right angle against the outside surface of cover. Hold force in place for ten seconds.

8.3.1 The outside surface shall not crack or show signs of voids. After the load is removed for five minutes, the outside surface shall have no indentations where the load was applied.

9. Dimensions and Permissible Variations

9.1 *Thickness*—The minimum thickness of insulating covers shall be 3.175 mm.

10. Form and Installation

10.1 The insulating cover shall be manufactured in a form suitable for application to cylindrical surfaces and to cover either 1¼ in. (32 mm), 1½ in. (38 mm), or 2 in. (50.8 mm) multiple sizes of P-traps and vertical and horizontal waste piping.

10.2 The insulating cover shall be manufactured in a form suitable for application to cylindrical surfaces and to cover water supply piping and stop valve.

10.3 The insulating cover shall fasten in place over drain piping, P-trap, and water supplies and shall be attached by mechanical fasteners and or continuous hook and loop fastener.

10.4 Fastening shall withstand dislodgement of insulating cover from physical contact and maintenance.

10.5 Insulating cover shall be removable and re-usable and after re-assembly shall meet the requirements of this specification.

10.6 Fasteners shall not have, or create, sharp or abrasive surface.

10.7 There shall be no attachment by cable tie fasteners, adhesives, or adhesive tapes.

11. Workmanship, Finish, and Appearance

11.1 There shall be no defects in materials or workmanship that will adversely affect the required performance of the insulating cover.

11.2 There shall be no defects that adversely affect the appearance of the insulating cover.

12. Test Methods

12.1 *Apparent Material Thermal Conductivity*—Determine in accordance with Test Method C177, in accordance with Practice C177 using the small temperature differences indicated in Practice C1045, Table 3. The test specimens shall be conditioned at 73 ± 4°F (23 ± 2°C) and 50 ± 5 % relative humidity for 24 ± 1 hour prior to testing. The apparent thermal conductivity of the material for all specimens tested shall not average greater than the maximum value identified in Table 1. The apparent thermal conductivity of individual specimens tested shall not be greater than 120 % of the maximum value identified in Table 1.

12.2 *Water Absorption*—Determine in accordance with Test Method D570.

12.3 *Surface Burning Characteristics*—Determine flame spread index and smoke developed index in accordance with Test Method E84.

12.4 *Rate of Burning*—Determine in accordance with Test Method D635 using the HB (Horizontal Burning) orientation. Flame front shall not pass the 1 in. (25 mm) reference mark.

12.5 *Fungi Growth*—Determine in accordance with Test Method G21. Specimen exterior surface shall have zero to one growth on surfaces at four weeks.

12.6 Water temperature of 65°F and pH maintained between 6.0 and 8.0 pH.

12.7 Surface Deflection and Load Test.

12.8 No signs of cracks or voids; after five minutes outside surface shall have no indentations.

13. Product Marking

13.1 Insulating cover shall be permanently marked or labeled.

13.2 Insulating cover shall be legibly marked as follows:

13.2.1 The manufacturer's name or trademark and address.

13.2.2 Model number, Standard and Type.

13.2.3 Country of Origin.

13.2.4 Performance standard if required.

14. Packaging and Package Marking

14.1 Unless otherwise specified, the material shall be supplied in the manufacturer's standard commercial package.

14.2 *Marking*—Unless otherwise specified, each container shall be plainly marked with the manufacturer's name, the product name, trademark, Standard and Type, and the manufacturer's address, the size or size range of application with dimensions or volumes, or both, expressed in units agreed upon by the supplier and customer.

15. Keywords

15.1 accessible; Americans with Disability Act (ADA); bruises; burns; cover; insulating; lavatory; pipe; removable; reusable; sinks; thermal

APPENDIX

X1. EXTERIOR SURFACE THERMAL TRANSFER TEST DRAFT SHIELD MATERIALS

X1.1 Specific material choices and framing are optional, as long as they hold shape and block airflow. Wood framing and plywood covering will make a durable but heavy draft Shield. Corrugated cardboard stapled to light wood framing will make an inexpensive and light draft Shield, but unless the cardboard is coated with a penetrating resin, such as an epoxy or polyurethane varnish, it will not endure.

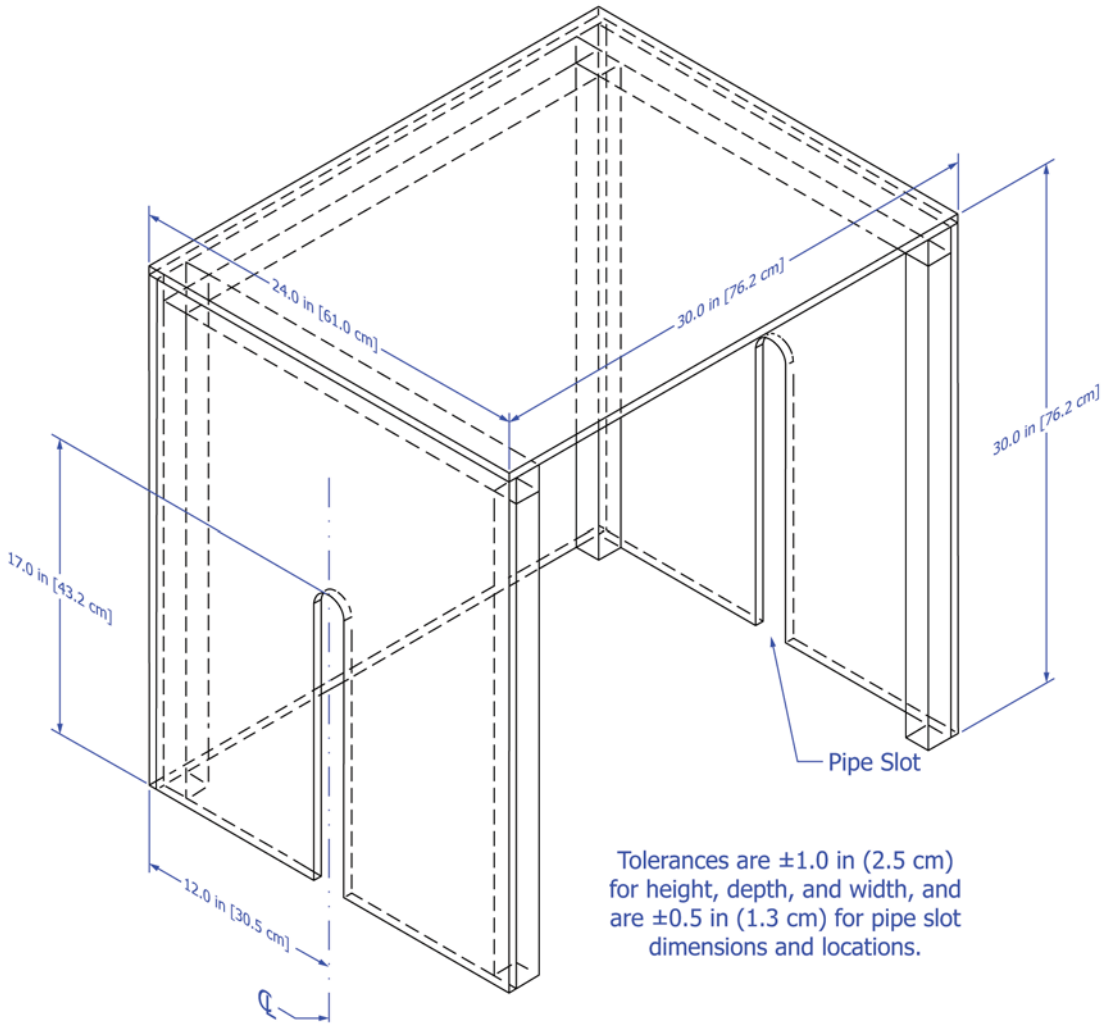

FIG. X1.1 Exterior Surface Thermal Transfer Test Draft Shield Dimensions