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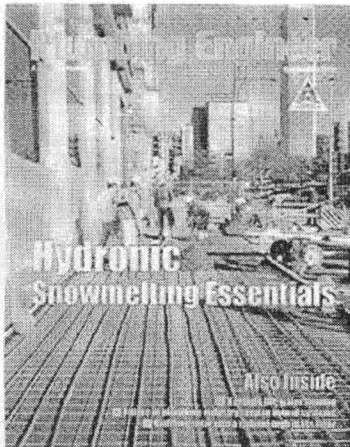
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## Code Update

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### Code requirements for barrier-free fixture traps and supply covers

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There seems to be some confusion over code requirements for insulated covers for barrier free fixture traps and fixture supplies. We will begin by explaining why they are required, and we will examine the history of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for Buildings and Facilities.

#### History of the Americans with Disabilities Act (ADA) and ANSI A117.1

In 1959, the President's Committee on Employment of the Physically Handicapped and the National Society for Crippled Children co-sponsored the development of ANSI A117.1, the first national standard for accessibility. The technical provisions of ANSI A117.1 were intended for "the design and construction of new buildings and facilities," as well as for "the remodeling, alteration and rehabilitation of existing buildings." These provisions described how features should be designed and installed and included the requirements for exposed pipes and surfaces at barrier-free fixtures.

ANSI A117.1 was first published in 1961 and reaffirmed without changes in 1971. A completely new and more comprehensive version was published in 1980 and later editions were published in 1986, 1992, 1998 and 2003. The next revision, the 2008 edition, is due out soon.

The technical information in ANSI A117.1 was originally largely based on the science dealing with measurement of the size, weight and proportions of the human body, ergonomics and human performance data. The standard did not include scoping provisions, which describe where accessibility is appropriate, when it is required and what features of a building, facility or site must be accessible.

A117.1 has served as the basis for most of the accessibility standards subsequently adopted by federal and state governments. Until it was included in a 1990 federal law titled the Americans with Disabilities Act (ADA), it was a voluntary standard. The technical requirements of the standard were quickly referenced in the model building codes and by several state and local agencies that regulate the design and construction of buildings.

The ADA is the landmark civil rights law that utilized ANSI A117.1 to help identify and prohibit discrimination on the basis of disability. The ADA prohibits discrimination in employment, telecommunications, transportation, access to facilities and programs provided by state and local government entities and access to the goods and services provided by places of public accommodation, such as lodging, health and recreation facilities. People who design and construct buildings and facilities are responsible under the ADA to make them accessible to and usable by people with disabilities.

In 1987, the Council of American Building Officials (CABO) was the umbrella organization for BOCA, ICBO and SBCCI and assumed the position of secretariat, or permanent administrator, for CABO/ANSI A117.1 and began to develop the standard with language more compatible with the model building code format and language. Recently, the International Code Council (ICC) became secretariat of the standard, and it became known as ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities. This allows compatibility and correlation of the document with a model building code.

The International Building Code (IBC) Chapter 1101.2 states:

**1101.2 Design.** "Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1."

This means that materials used for accessible products need to comply with the building code or referenced code. The standard has the following language:

**606.5 Exposed Pipes and Surfaces.** "Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks."

This is very similar to the ADAAG language, but those guidelines do not specifically address hot water pipes. The language in ANSI A117.1 is intended to protect wheelchair-bound people from being injured

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from contact with sharp edges under the sink or fixture or by contact with a hot or cold water supply pipe. This is especially important, as paralyzed or disabled people in wheelchairs tend to bruise more easily. An adult weighing 180 to 200 pounds could incur a pretty serious injury if he or she rolls up to a sink and bangs a knee or leg on a tailpiece, because the knee has to stop the forward momentum of the wheelchair and the weight of an adult body.

Section 310 of the International Plumbing Code (IPC) addresses washroom and toilet room requirements. Paragraph 310.3 of this section states:

**310.3 Interior finish.** "Interior finish surfaces of toilet rooms shall comply with the International Building Code."

The plumbing code language requires compliance of these products with the building code requirements. The IBC makes several references to requirements for flame and smoke spread requirements for these insulating or protective coverings in public restrooms. ASTM E-84 is the flame and smoke test for exposed materials in public bathrooms. IBC section 803 covers interior finishes and states

**803.8 Insulation.** "Thermal and acoustical insulation shall comply with Section 719."

IBC section 719, Thermal and Sound-Insulating Materials, has several sections that deal with insulating materials, and they all reference the ASTM E-84 flame and smoke spread test with the following language:

**719.1 General.** "Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the International Mechanical Code."

**719.3 Exposed installation.** "Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450."

**719.7 Insulation and covering on pipe and tubing.** "Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450."

Exception: "Insulation and covering on pipe and tubing installed in plenums shall comply with the International Mechanical Code."

The International Mechanical Code (IMC) requires all exposed surfaces in HVAC return air plenums to meet flame spread and smoke generation requirements of 25/50. The International Building Code (IBC) has the following definition:

"PLASTIC, APPROVED. Any thermoplastic, thermosetting or reinforced thermosetting plastic material that conforms to combustibility classifications specified in the section applicable to the application and plastic type."

So what is the big deal? Well, it appears there is confusion among manufacturers as to flame and smoke spread requirements for insulated trap covers for barrier free fixtures. Many of these trap covers are imports. There may also be some domestic manufacturers that do not meet the codes' requirements. An increasing number of plumbing and building inspectors have been enforcing the codes, which has caused some manufacturers to begin proposing code changes to change the requirements or to lower the limits so that their products will not have to be modified with a self-extinguishing chemical in the plastic resin.

The problem is that these manufacturers are proposing a change to the plumbing code, although these products are clearly covered by the building code. A code change dealing with fire restive materials would create a conflict between the building code and the plumbing code, and it would lower the bar for fire safety.

Many plastic trap covers are not self-extinguishing; they produce large quantities of toxic, acrid smoke. In most cases, these fires are limited to the toilet room, but, in some cases, they have resulted in major loss fires. In practically every case, a facility must be shut down for the day or for several days while it is cleaned and decontaminated.

**Flame spread/smoke developed ratings**

Insulation flame spread/smoke developed ratings are determined by the codes. The International Building Code (IBC), Section 719 and NFPA 5000 Building Construction and Safety Code both require the maximum ratings to be 25 flame spread index and 450 smoke-development index. If the pipe insulation is exposed in an air plenum, the smoke-developed index is limited to 50.

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During the recent IPC hearings in Palm Springs, California, the IPC committee reaffirmed that fixture trap and supply covers should meet ASTM E-84 flame and smoke testing standards, the applicable standards for barrier free fixtures insulated covers as covered in the building code and that ASTM E-84 should apply, with a 25 flame spread index and a 450 smoke-developed index.



The IPC committee disapproved a proposed code change that included language to utilize ASTM D635 as a fire test. ASTM D635 specifically states that it is for polymeric plastics for parts and components inside devices and that, within the IBC, it is limited to light-transmitting products only (fluorescent light panels). The standard is not applicable to plastics used in other building applications, and it does not address smoke generation.

The Steiner tunnel fire test method for surface flame spread and smoke development remains the traditional test used to assess fire performance of interior finish materials. Developed by Al Steiner for testing building materials such as wood or gypsum board at Underwriters Laboratories in 1944 the Steiner tunnel test has been standardized by the major North American standards writing organizations and widely adopted by every North American building and fire code.

In the test, a specimen 24 ft. x 1ft. 10 in. x 6 in. thick (7.3 m x 0.56 m, up to 0.15 m thick), either in one unbroken length or in separate sections joined end to end, is mounted face downwards so as to form the roof of a horizontal tunnel 12 in. (305 mm) high. The fire source (two gas burners) ignites the sample from below with an 89-kilowatt intensity, and the combustion products are carried away by a controlled linear air velocity of exactly 240 ft./min. (73 m/min.)

The normal output is a flame-spread index (FSI) and a smoke-developed index (SDI). Flame spread is assessed visually by the progression of the flame front, while measurements of optical smoke density at the tunnel outlet determine the smoke obscuration. This information is used to plot time-based graphs of flame-spread distance and of optical density. FSI and SDI are then calculated based on the ratio between the areas under the curves for the material being tested and those for a cementitious board (assigned FSI and SDI values of 0) and for red oak flooring (assigned FSI and SDI values of 100).

In recent years, new measuring techniques have been developed to describe the hazards from fire-generated particles in the smoke. These new techniques use smoke release rate data from the burning material to estimate the light obscuration in a fire-affected room. New instrumentation has recently been added to the Steiner tunnel test for measuring the smoke release rate.



Plumbing designers and engineers need to select ADA fixture trap and supply materials based on the recognized industry standard, ASTM E-84. Just recently, the IAPMO Standards Committee voted eight to nothing to have the ASTM E-84 25 language added to the Product Standard PS 94-2001a Product Standard for P-Trap, Supply Stop and Riser Insulated Protectors. The IAPMO Plumbing Product Standards Committee also added requirements for labeling required by other agencies. The IBC and the NFPA both require the ASTM E-84 standard to be used as the basis for flame and smoke development for pipe insulation and equipment covering.

There was a comment that in other countries, such as Canada, or in developing nations that do not have flame spread and smoke development requirements in their building codes, the language in the standard should remain voluntary in the IAPMO PS 94-2001a. For use in just about every jurisdiction in the United States, the ASTM E-84 listing and labeling requirement should apply because of the requirements in the model building codes (IBC and NFPA 5000).

I hope this clears up some of the confusion regarding ADA-compliant trap covers.

*Ron George specializes in plumbing, piping, fire protection and hvac design. He also provides plumbing/mechanical code and product standard consulting services and forensic investigations of mechanical system failures.*



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