

installed in closed cavities, such as walls. Sections 460.5(b), (c), and (d) of the Rule require that manufacturers of traditional reflective insulation products use specific test procedures to determine the R-values of their products, and that manufacturers and other sellers disclose R-values to consumers for specific applications. 64 FR at 48038–39. Section 460.5(c) of the Rule requires the use of ASTM E 408 for single sheet systems. For reflective systems with more than one sheet, section 460.5(b) requires ASTM C 236 and ASTM C 976.

A relatively new ASTM procedure (ASTM C 1371–97, “Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers”) can be used to measure the emissivity (*i.e.*, its power to radiate heat) of single-sheet reflective insulations. The ANPR solicited comments on this and other tests for single-sheet products, and asked whether it should require industry members to measure the emissivity by only one procedure to ensure that emissivity measurements are accurate and reliable.

The Commission indicated that it planned to amend the Rule to require that R-values for traditional multi-sheet reflective insulations be tested according to ASTM C 236–89 (1993) or ASTM C 976–90 in a test panel constructed according to ASTM C 1224–93, and under the test conditions specified in ASTM C 1224–93, and that the R-values be calculated according to the formula specified in ASTM C 1224–93 from the results of those R-value tests. *Id.* at 48039.

Comments

Most of the comments supported the Commission’s proposed changes. For determining single sheet emissivity, PIMA supported C 1371 as discussed by the Commission and suggested that the Rule incorporate ASTM C 835.⁷⁸ NAIMA stated that ASTM E 408, which is currently required by the Rule, provides accurate emissivity results, but recommended that the sample tested reveal the effect of aging on the product’s emissivity. NAIMA indicated that it would not oppose adoption of alternative tests so long as they were as accurate as E 408. It maintained that the proposed tests are necessary because the results reflect the impact of aging, dusting, and corrosion.⁷⁹

PIMA supported the Commission’s proposal for determining the R-value of multi-sheet reflective insulations.⁸⁰ AFS pointed out that ASTM C 1363, “Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus” has replaced C 236, C 976, C 177, and C 518 mentioned currently in C 1224.⁸¹ NAIMA further explained that ASTM C 1363 was developed to combine the requirements of ASTM C 236 and C 976 into a common test procedure. NAIMA indicated that any test apparatus meeting the existing C 236 and C 976 standards could meet the new standard. NAIMA also stated that ASTM C 1363 includes information from the applicable International Organization for Standardization (“ISO”) standard so that conforming to ASTM C 1363 also conforms to the ISO Hot Box standard.⁸²

Discussion

To reflect new procedures as discussed above, the Commission proposes to amend the Rule to reorganize sections 460.5(b), (c), and (d) to require in proposed section 460.5(b) that single sheet systems of aluminum foil (*i.e.*, reflective material) be tested with ASTM C 1371–98, “Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers” or E 408 (as currently required). ASTM C 1371 tests the emissivity of the foil. To get the R-value for a specific emissivity level, air space, and direction of heat flow, the amendment would direct industry members to use the tables in the most recent edition of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers’ (“ASHRAE”) Handbook, if the product is intended for applications that meet the conditions specified in the tables. Industry members would have to use the R-value for 50° F, with a temperature differential of 30° F.

In proposed section 460.5(c), the Commission proposes to state that aluminum foil systems with more than one sheet, and single sheet systems of aluminum foil (*i.e.*, reflective insulation) that are intended for applications that do not meet the conditions specified in the tables in the most recent edition of the ASHRAE Handbook, must be tested with ASTM C 1363–97, “Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus,” in a test panel constructed according to ASTM C 1224–99,

“Standard Specification for Reflective Insulation for Building Applications,” and under the test conditions specified in ASTM C 1224–99. To get the R-value from the results of those tests, the amendment would require the use of the formula specified in ASTM C 1224–99. The tests must be done at a mean temperature of 75° F, with a temperature differential of 30° F.

Finally, the Commission plans to amend section 460.5(d)(1) to insert a reference to ASTM C 1363–97, “Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box,” in place of ASTM C 236–89 (Reapproved 1993), “Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box,” and ASTM C 976–90, “Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box.”

The Commission believes that these changes are appropriate because they account for recent improvements in the applicable test procedures. The Commission solicits comments on this proposal, particularly on any issues related to the accuracy, reliability, and consistency of the procedures for measuring emissivity; the costs of conducting the procedures; and whether the Commission should require that emissivity be measured by only one procedure to ensure that measurements of emissivity are accurate and reliable.

b. Radiant Barrier Products

Background

Radiant barrier reflective insulations are installed in attics facing the attic’s open airspace. Although they are covered by the Rule, R-value claims are not appropriate for them because no generally accepted test procedure exists to determine the R-value of a radiant barrier reflective insulation installed in an open attic. Sellers who make energy-saving claims for radiant barrier insulations must nevertheless have a reasonable basis for the claims under section 460.19(a) of the Rule.

The ANPR noted that ASTM had issued a new standard—ASTM C 1340–96—for evaluating the thermal performance of low-emittance foils used in residential attics to reduce radiative transport across the attic air space. The Commission solicited comments concerning the specific type of performance for radiant barrier products that the standard measures; how the standard may be used to substantiate energy-saving or other performance claims for radiant barrier insulations; the types of installations of radiant

⁷⁸ PIMA (3), p. 7. “Standard Test Method for Total Hemispherical Emittance of Surfaces From 20 to 1400 Degrees C” (ASTM C 835–95).

⁷⁹ NAIMA (9), p. 21.

⁸⁰ PIMA (3), p. 7.

⁸¹ AFS (14), p. 1.

⁸² NAIMA (9), pp. 21–22.