CHAPTER 7640
DEPARTMENT OF PUBLIC SERVICE
ENERGY DIVISION
THERMAL INSULATION STANDARDS

7640.0110 APPLICABILITY.

[For text of subps 1 to 3, see M.R.]

Subp. 4. **Prohibitions.** The prohibitions in this subpart apply to the installation and application of insulation.

A. Industry members may not install insulation in residential structures unless it conforms to the product quality standards and installation standards in this chapter.

[For text of items B to D, see M.R.]

Subp. 5. [Repealed, 14 SR 2633]

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982*

7640.0120 DEFINITIONS.

Subpart 1. **Applicability.** For the purposes of this chapter, the following definitions of terms apply. Technical, scientific, and engineering terms undefined by this part have the meanings given in ASTM C 168, Standard Definitions of Terms Relating to Thermal Insulation Materials.

[For text of subps 2 to 9, see M.R.]

Subp. 10. [Repealed, 13 SR 2982]

Subp. 11. **FTC.** "FTC" means the United States Federal Trade Commission, Code of Federal Regulations, title 16, part 460, or a standard issued for thermal insulation materials by that commission.

[For text of subps 12 to 16, see M.R.]

Subp. 17. **Manufacturer of insulation.** "Manufacturer of insulation" means:

A. an industry member who produces insulation materials in their final form for distribution or sale to intermediate and ultimate consumers;

B. an industry member who produces insulation materials or installation instructions for a product the manufacture of which is completed at the jobsite; or

C. an installer of an insulation product the manufacture of which is completed at the jobsite who prepares or modifies the product's installation instructions.

An applicator, contractor, or fabricator of insulation materials who installs, applies, or uses insulation materials for their intended uses and follows the manufacturer's installation instructions, without changing the thermal or physical properties of the insulation material is not a manufacturer of insulation.

[For text of subps 18 and 19, see M.R.]

Subp. 19a. **Quality assurance program.** "Quality assurance program" means the collective set of plans, activities, and events that are provided to ensure that the product or service will satisfy given needs. A quality assurance program must conform to "Generic Guidelines for Quality Systems," American National Standards Institute - American Society for Quality Control standard ANSI/ASQC Z-1.15-1979.

[For text of subp 20, see M.R.]

Subp. 20a. **Radiant barrier.** "Radiant barrier" means a building construct consisting of a low emittance surface bounded by an open air space.

Subp. 20b. **Reflective insulation.** "Reflective insulation" means a building construct consisting of a low emittance surface bounded by an enclosed air space.

[For text of subps 21 to 26, see M.R.]

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982; 14 SR 2633*

7640.0130 INSULATION MATERIALS STANDARDS.

[For text of subpart 1, see M.R.]

Subp. 2. **General testing requirements.** General testing requirements for regulated thermal insulation materials in this part are as follows:

[For text of item A, see M R.]

B. All regulated thermal insulation materials must be tested for compliance with the standards in this part as follows:

[For text of subitems (1) to (3), see M.R.]

(4) Testing for each type of insulation must be performed in accordance with the methods specified in subparts 3 to 8.

(5) Insulation must have flammability characteristics in accordance with the UBC, sections 1712 and 1713, for its intended uses.

C. All thermal performance tests must be conducted in accordance with this item, unless additional requirements are imposed within the body of a materials standard. Insulation's thermal performance must be stated in R-value.

(1) One of the following test methods must be used: ASTM C 177, ASTM C 236, ASTM C 518, ASTM C 976, or ASTM C 1114. Manufacturers shall select the appropriate test method for the material unless a specific method or procedure is referenced within a materials specification. Thermal conductivity measurements at mean temperatures other than 75 degrees Fahrenheit are not required.

(2) R-value testing must be performed at the insulation's representative thickness, and be consistent with the requirements of Code of Federal Regulations, title 16, part 460. Unit R per inch must be derived from R-value testing performed to its representative thickness.

(3) For foam plastic insulations that incorporate blowing agents other than air or pentane, R-value tests must be done on samples that have been treated to fully reflect the effect of aging on the product's R-value. If criteria for treating samples to reflect the effect of aging are not specified within a material specification, the samples must be treated for either 90 days at 140 ±2 degrees Fahrenheit (60 ±1 degree centigrade) or six months at ambient conditions prior to conditioning and thermal resistance testing. During treating, air circulation

must be provided so that all surfaces of the insulation are exposed to the surrounding environmental conditions.

[For text of subitems (4) to (6), see M.R.]

D. Manufacturers shall have a quality assurance program in place for all regulated thermal insulation products. A quality assurance program must be in place for installers of products whose manufacture is completed at the jobsite.

Manufacturers and other industry members must maintain an in-house quality assurance program in order for products to meet the required standards.

If a manufactured product fails to meet those required standards, the department shall notify the industry member to pursue corrective measures.

Subp. 3. **Cellulose insulation.**

A. Cellulose fiber in loose-fill form must meet the following requirements:

(1) The product must comply with ASTM C 739, Standard Specification for Cellulosic Fiber (wood-base) Loose-Fill Thermal Insulation or the United States Consumer Product Safety Commission Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209 subpart B.

(2) All manufacturers shall contract with an approved laboratory for a follow-up agreement to accomplish the following:

(a) The laboratory shall conduct unannounced inspections.

(b) The inspections must be:

(i) monthly, if production is 350,000 pounds or more per month; or

(ii) quarterly, if production is less than 350,000 pounds per month.

(c) The inspector shall conduct tests on a sample at the plant laboratory for settled density, smoldering combustion, critical radiant flux, and corrosiveness (ph).

(d) The inspector shall examine the manufacturer's quality assurance program.

[For text of subitem (3), see M.R.]

B. Cellulose fiber spray-applied must meet the following requirements:

[For text of subitems (1) and (2), see M.R.]

(3) Determination of thermal performance must be in accordance with subpart 2, item C, at the test defined density of the material. R value testing must be performed at a thickness of material of two inches, unless the material is designed for use at a lesser maximum thickness and the material is so designated on the label or label notice by the manufacturer. It must then be tested at the maximum thickness of suggested use.

(4) Density must be determined in accordance with ASTM E 605. The density established by this test must be used in the preparation of manufacturer's installation guidelines and in the determination of thermal performance.

(5) Critical radiant flux and smoldering combustion must be in accordance with ASTM C 739, or the CPSC Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209.

(6) Moisture absorption must be determined in accordance with section 14 of ASTM C 553. Moisture absorption must not exceed 15 percent by weight.

(7) The product must have a minimum adhesive/cohesive bond

strength per unit area of five times the weight of the material under the test plate when tested in accordance with ASTM E 736.

Exception: Testing and compliance with bond strength criteria are not required of products that are intended only for installation in enclosed cavities, and the product is identified as intended only for those installations.

(8) Corrosion must be in accordance with ASTM C 739, or the CPSC Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209. If the product in loose-fill form meets the criteria for corrosion, then a test of the product in spray-applied form is unnecessary.

(9) Odor emission must be in accordance with ASTM C 739, or the CPSC Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209. If the product in loose-fill form meets the criteria for odor emission, then a test of the product in spray-applied form is unnecessary.

(10) Fungi resistance must be in accordance with ASTM C 739, or the CPSC Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209. If the product in loose-fill form meets the criteria for fungi resistance, then a test of the product in spray-applied form is unnecessary.

Subp. 4. **Mineral fiber insulation.**

A. Mineral fiber in loose fill form must comply with ASTM C 764, Standard Specification for Mineral Fiber Loose Fill Thermal Insulation.

B. Mineral fiber in batts and blankets form must comply with ASTM C 665, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

C. Mineral fiber in board form must meet the following requirements:

(1) The basic material must be made from mineral substances such as rock, slag, or glass processed from a molten state into a fibrous form. Insulation must be composed of mineral fibers with water resistant binder added and formed into flat rectangular units. Insulation boards must be uniform in quality and free from defects, such as broken edges, splits, or loose materials which would impair the intended use.

(2) Thermal performance and surface burning characteristics must be determined in accordance with subpart 2.

D. Spray applied mineral fiber must comply with ASTM C 1014, Standard Specification for Spray Applied Mineral Fiber Thermal or Acoustical Insulation.

Subp. 5. **Foam plastic insulation.**

A. Molded expanded polystyrene insulation must comply with ASTM C 578, Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation and the accompanying Supplementary Requirements.

B. Extruded Polystyrene must comply with ASTM C 578, Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation and the accompanying Supplementary Requirements.

C. Unfaced polyurethane and polyisocyanurate in board form must comply with ASTM C 591, Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation.

Exception: Aged R-value must be 5.6 per inch or greater at 75 degrees Fahrenheit.

[For text of item D, see M.R.]

E. Field applied urea formaldehyde foam must meet the following requirements:

(1) The product must comply with ASTM C 951, Standard Specification for Urea Formaldehyde Based, Foam in Place Insulation.

[For text of subitem (2), see M.R.]

F. Spray applied urethane must comply with ASTM C 1029, Standard Specification for Spray Applied Rigid Polyurethane Thermal Insulation.

G. Rigid cellular phenolic insulation must comply with ASTM C 1126, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.

H. Foam plastic insulation that conforms to all requirements of ICBO Evaluation Service Acceptance Criteria for Foam Plastic for the intended application meets the requirements of part 7640.0130.

Subp. 6. **Perlite and vermiculite insulation.**

A. Perlite loose fill insulation must meet the following requirements:

(1) The product must comply with ASTM C 549, Standard Specification for Perlite Loose Fill Insulation.

[For text of subitem (2), see M.R.]

B. Vermiculite in loose fill form must meet the following requirements:

(1) The product must comply with ASTM C 516, Standard Specification for Vermiculite Loose Fill Thermal Insulation.

[For text of subitem (2), see M.R.]

Subp. 7. **Reflective foil insulation.**

A. The following requirements apply to reflective foil insulation:

(1) Specimens for tests must consist of pieces of insulation cut to approximately three by six inches, suspended in a vertical position and heated to a temperature of 180 degrees Fahrenheit (plus or minus five degrees Fahrenheit) for at least five hours. At the end of the heating period, the tester shall examine the reflective surfaces to determine whether the adhesive has bled through the surface or whether delamination has occurred.

(2) Except for radiant barrier products, thermal performance for single or multiple sheet sections must be determined according to ASTM C 976 or ASTM C 236. The test panel must consist of a panel using a wooden frame of two-by-six inch boards 16 inches apart and at least 24 inches long, covered with a minimum of 1/2-inch gypsum wallboard or 1/2-inch plywood on each side. For tests in the vertical position, the test panel must be at least seven feet high at a mean temperature of 75 degrees Fahrenheit, with a temperature differential of 30 degrees Fahrenheit. The resultant thermal performance must be based upon the insulation and the associated air spaces.

(3) Layers of insulation composed of unsupported foil that is exposed must have a minimum thickness of 0.0004 inch. Unsupported foil that is sandwiched in multilayer sheet must have a minimum thickness of 0.00035 inch. Foil bonded to kraft paper must have a minimum thickness of 0.00025 inch.

(4) Adhesive used in bonding must be waterproof and show no sign of bleeding when tested in accordance with the test procedure identified in section V, part A, of the ICBO Evaluation Service Acceptance Criteria for Reflective Foil Insulation, June 1987, section V, part A, for adhesive bleeding requirements. Bleeding at cut edges may be disregarded.

(5) Foil must be folded in accordance with TAPPI Standard No. 512-OM86, and the folded edge smoothed using a light finger pressure. The finished insulation must not crack when folded to 180 degree bend at a temperature of 70 degrees Fahrenheit (plus or minus two degrees Fahrenheit) and a relative humidity of 50 percent (plus or minus five percent).

(6) Reflective foil insulation that conforms to all requirements of ICBO Evaluation Service Acceptance Criteria for Reflective Foil Insulation, June

1987 (with the exception that thermal performance must be tested in accordance with item B, C, or D), meets the Minnesota testing standards in this subpart.

B. Reflective insulation systems with more than one sheet must be tested according to ASTM C 976 or ASTM C 236 to determine the thermal performance for heat flow in horizontal, upward, and downward directions. The tested thermal performance in the heat-flow direction or directions of the intended application must be labeled on the material. The manufacturer shall test once in each direction of intended application; except that, for products labeled with only one heat-flow direction, the manufacturer shall test two samples in that direction. The tests must be done at a mean temperature of 75 degrees Fahrenheit, with a temperature differential of 30 degrees Fahrenheit.

C. A single sheet reflective insulation system must be tested according to ASTM E 408 to determine its emissivity. To get the R-value for the measured emissivity and a specific air space and direction of heat flow, Table 2 in chapter 22 of the ASHRAE Handbook of Fundamentals must be used. The R-value shown for 50 degrees Fahrenheit must be used, with a temperature differential of 30 degrees Fahrenheit.

D. Radiant barrier products must meet the requirements of the United States Federal Trade Commission in Code of Federal Regulations, title 16, part 460.5(b) and (c).

If the R-value listed on the Federal Trade Commission fact sheet is not that for a radiant barrier, the Federal Trade Commission fact sheet must also include the following statement: "These R-values are not for a radiant barrier and are likely to differ when the product is installed as a radiant barrier."

Subp. 8. **Other insulation.** Insulation other than insulation specified in subparts 1 to 7 must comply with the requirements in items A to F.

A. Thermal performance and surface burning characteristics must be determined in accordance with subpart 2.

B. Water or moisture absorption must be determined according to one of the following methods:

(1) ASTM C 272;

(2) ASTM C 553, section 14;

(3) ASTM C 739, section 12; or

(4) ASTM D 2842.

C. If the material is foam in place, a test of the shrinkage using ASTM C 951-83, section 8.5 must be used.

D. If the material contains formaldehyde, a formaldehyde content test is necessary.

E. The product must not produce a detectable odor that is classified as objectionable and strong or very strong by two or more panel members when tested in accordance with ASTM C 739, section 13.

F. The manufacturer shall provide a statement that the insulation and its intended uses are safe and effective and do not pose a threat to human health. The manufacturer shall disclose any known or reasonably suspected attributes of the product that will adversely affect its safety or effectiveness.

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982; 14 SR 2633*

7640.0140 REQUIREMENTS FOR INSULATION FOR SPECIAL APPLICATIONS.

Subpart 1. **Physical requirements for insulation materials designed for exterior, underground use.**

A. The insulation, installed according to the manufacturer's recommen-

dations, must be in service tested at either a testing facility or an actual house for a period of one continuous year. The testing environment must have historical winter weather conditions no less than 8,000 Fahrenheit heating degree days, and soil conditions with drainage characteristics classified as poor in Table 7-4 of the Building Foundation Design Handbook. The purpose of the testing must be to determine aged R-value performance.

Exception: In-service testing is not necessary if the manufacturer demonstrates that a product of the same material specification with equal or less durability in this application has been successfully in-service tested. The manufacturer shall demonstrate the equal or less durability test by comparing laboratory test results of the physical characteristics listed in item B, clauses (1) to (4).

B. The manufacturer shall demonstrate that the product will exhibit less than a ten percent loss in R-value contained in the FTC fact sheet filed under part 7640.0150, subpart 2, item E, when installed underground and the combined effect of assumed conditions on the following physical characteristics are considered:

[For text of subitems (1) and (2), see M R.]

(3) soil compatibility; and

(4) compressive strength.

The manufacturer shall state the assumed conditions in the initial report filed according to part 7640.0150, subpart 2.

C. An association may conduct tests and prepare a filing for exterior below grade application of a type of product on behalf of its constituency. The association shall conduct testing according to subpart 1, item A, on at least three specimens of the product. The association shall demonstrate that the manufacturers' products for which the tests and filing would apply are representative of the tests and filing performed by the association.

D. Mineral fiber board for exterior below ground application must be manufactured to facilitate downward drainage.

Subp. 2. **Requirements for installation instructions for underground use.** Written instructions on underground use of insulation must contain instructions or information for vertical and, if recommended, horizontal application regarding:

A. application techniques;

B. if required for the insulation, drainage, as specified in section R-305 of the CABO One & Two Family Dwelling Code;

C. if required for the insulation, waterproofing or dampproofing, as specified in section R-306 of the CABO One & Two Family Dwelling Code;

D. chemical resistance information;

E. ambient temperature range permitted during application; and

F. backfill techniques and backfill materials for prevention of damage to the insulation material and below grade protective coating.

Subp. 3. **Installation requirements for exterior above ground and underground use.**

A. Insulation extending above grade must be covered with an exterior wall finish to protect the insulation from deterioration due to sunlight, and physical abuse.

B. Polyurethane or polyisocyanurate application must have a protective coating applied to its exterior surface below ground. The type of protective coating and method of application must be in accordance with the insulation manufacturer's instructions and recommendations.

C. Mineral fiber foundation insulation must include exterior drainage, as defined in part 7640.0120.

Subp. 4. **Pipe insulation, duct wrap insulation, and water heater blanket insulation.** Pipe insulation, duct wrap insulation, and water heater blanket insulation must meet the standards of part 4155.0130, including the flammability requirements for insulation in part 4155.0130, subpart 2, item B, clause (6). Water heater blanket products must meet the flammability requirements of flame spread 50 and smoke developed 100, when tested in accordance with ASTM standard E84-84, Revision A, Surface Burning Characteristics of Building Materials.

Pipe insulation does not have to be listed with an R-value. If the R-value is not identified on the label, it does not need to be tested. If the R-value is identified, it must be supported by test results as identified in part 7640.0130, subpart 2, item C.

Statutory Authority: *MS s 325F.20; 325F 21*

History: *13 SR 2982; 14 SR 2633*

7640.0150 REPORTING REQUIREMENTS.

Subpart 1. **Applicability.** This subpart identifies all industry members to whom subparts 2 and 3 apply.

[For text of items A and B, see M.R.]

C. An industry member that intends to sell an insulation product manufactured by another industry member under its own trade or brand name, desires to be listed as the manufacturer, and does not alter physical properties of the insulation product, shall file an initial report. The filing insulation member can comply with subpart 2, item F, by certifying that the product is the same as when it was previously filed.

D. Insulation products identified in part 7640.0130, subparts 3 to 8 that are composed of the identical material, for example the same chemical make-up, composition, or physical properties, but that have different dimensional characteristics, such as width, length, or thickness, need not undergo additional testing by the same manufacturer once the initial similar product meets the necessary requirements.

Subp. 2. **Initial report.** An industry member shall file an initial report at least 30 days before offering for sale in the state any new products, significant changes to a product already filed, or changes to product installation instructions to a product already filed.

The initial report must include the following:

[For text of items A to E, see M.R.]

F. results of initial tests, as required by part 7640.0130, identifying tests performed, name of laboratory, testing dates, and test results. The report for "other" insulation products regulated by part 7640.0130, subpart 8, must also include the products' Material Safety Data Sheet;

[For text of items G to I, see M.R.]

Subp. 3. **Annual filing requirement.**

[For text item A, see M.R.]

B. For each product, the report must include:

[For text of subitems (1) and (2), see M.R.]

(3) certification that the product has not undergone significant changes since the initial report was filed;

(4) identification of and changes in information that may have changed from the initial or previous annual report, including product brand

names, product literature, Federal Trade Commission fact sheet, product usage, or discontinuation of manufacture; and

(5) a list of three, or as many as available if less than three, Minnesota purchasers or customers of the product. The department shall maintain this information with the strictest confidence.

[For text of item C, see M.R.]

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982; 14 SR 2633*

7640.0160 APPLICATION AND INSTALLATION STANDARDS.

Subpart 1. **Applicability.** Industry members, including industry members who offer insulation installation services for new and existing residential buildings, shall comply with this part.

An installer of an insulation the manufacture of which is completed at the jobsite who significantly alters the manufacturer's installation instructions becomes a manufacturer for the purpose of Minnesota Rules, chapter 7640.

Subp. 2. **Application and inspection.**

A. Industry members installing insulation shall follow manufacturer's written application instructions.

B. When installing insulation in attic areas, the installer shall locate flush and recessed light fixtures, and other heat producing appurtenances, and shall comply with National Electrical Code, section 410-66, subsections A and B.

C. Installation of cellulosic and mineral fiber in loose-fill form must be in conformance with ASTM standard C 1015, including part 7.7.2.

D. Installation of reflective insulation must be in conformance with ASTM standard C 727.

E. Installers of urea formaldehyde foam insulation shall conform with Minnesota Statutes, section 325F.18, and Minnesota Rules, parts 4620.1600 to 4620.2100.

F. State and local agencies using appropriated federal funds and persons contracting with state or local agencies with respect to work performed under the contracts shall comply with Code of Federal Regulations, title 40, part 248, Guideline for Federal Procurement of Building Products Containing Recovered Materials.

Subp. 3. **Manufacturer's installation or application instructions.** Manufacturers shall provide installation and application instructions that comply with this subpart:

[For text of items A and B, see M.R.]

C. Installation instructions for products whose manufacture is completed at the jobsite must address the quality assurance program required by part 7640.0130, subpart 2, item D; ambient temperature during application; and actions necessary to facilitate curing or drying.

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982; 14 SR 2633*

7640.0170 PRODUCT INFORMATION.

Subpart 1. **Generally.** Insulation used or offered for sale in Minnesota must meet the requirements of the United States Federal Trade Commission in Code of Federal Regulations, title 16, part 460.

Subp. 2. **False and misleading statements.** Any false, misleading, or unsubstantiated statements in a sales presentation, or on any label, product literature,

or product intended for the purchaser, as identified in Minnesota Statutes, sections 325F.22, 325F.67, and 325F.69, subdivision 1, are subject to the state's remedies provided in Minnesota Statutes, sections 325F.24 and 325F.70.

Subp. 3. **Labeling for insulation products with follow-up programs.** Insulation products with a follow-up program must carry the label of the laboratory indicating that a follow-up program is being conducted.

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982*

7640.0180 INCORPORATIONS BY REFERENCE AND CITATIONS.

[For text of subpart 1, see M.R.]

Subp. 2. **ASTM.** The following ASTM standards are incorporated by reference:

A. ASTM C 168-88a, Standard Definitions of Terms Relating to Thermal Insulation Materials.

B. ASTM C 177-85, Standard Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus.

C. ASTM C 236-87, Standard Test Method for Steady State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.

D. ASTM C 272-53 (reapproved 1980), Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.

E. ASTM C 516-80 (reapproved 1985), Standard Specification for Vermiculite Loose-Fill Thermal Insulation.

F. ASTM C 518-85, Standard Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

G. ASTM C 549-81 (reapproved 86), Standard Specification for Perlite Loose Fill Insulation.

H. ASTM C 553-70 (reapproved 1977), Standard Specification for Mineral Fiber Blanket and Felt Insulation (Industrial Type).

I. ASTM C 578-87A, Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation.

J. ASTM C 591-85, Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation.

K. ASTM C 665-88, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

L. ASTM C 727-72 (reapproved 1978), Standard Recommended Practice for Use of Reflective Insulation in Building Constructions.

M. ASTM C 739-88, Standard Specification for Cellulosic Fiber (wood-base) Loose-Fill Thermal Insulation.

N. ASTM C 764-88, Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.

O. ASTM C 951-83, Standard Specification for Urea-Formaldehyde-Based, Foam in Place Insulation.

P. ASTM C 976-82, Standard Test Method for Thermal Performance of Building Assemblies by Means of a Calibrated Hot Box.

Q. ASTM C 1014-88, Standard Specification for Spray-Applied Mineral Fiber Thermal or Acoustical Insulation.

R. ASTM C 1015-84, Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation.

S. ASTM C 1029-85, Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.

T. ASTM C 1114-89, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Thin-Heater Apparatus.

U. ASTM C 1126-89, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.

V. ASTM D 2842-69 (reapproved 1975), Standard Test Method for Water Absorption of Rigid Cellular Plastics.

W. ASTM E 84-84 Revision A, Surface Burning Characteristics of Building Materials.

X. ASTM E 408-71 (reapproved 1985), Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection Meter Techniques.

Y. ASTM E 605-77 (reapproved 1982), Thickness and Density of Sprayed Fire-Resistive Material Applied to Structural Members.

Z. ASTM E 736-86, Test for Cohesion/Adhesion of Sprayed Fire Resistive Materials Applied to Structural Members.

Subp. 2a. **Standards.** The following American National Standards Institute - American Society for Quality Control standard is incorporated by reference:

ANSI/ASQC standard Z-1.15-1979: Generic Guidelines for Quality Systems.

Subp. 3. **Other incorporation and citations.** The following non ASTM standards are also incorporated by reference:

A. ASHRAE Handbook of Fundamentals, (1989 Edition) by the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., chapter 22, tables 1 and 2.

[For text of item B, see M.R.]

C. Code of Federal Regulations, title 16, part 460, Labelmg and Advertising of Home Insulation.

[For text of items D to H, see M.R.]

I. ICBO Evaluation Service Acceptance Criteria for Foam Plastic, October, 1982.

J. TAPPI Standard No. 512-OM86 by the Technical Association of the Pulp and Paper Industry.

K. Code of Federal Regulations, title 40, part 248, Guideline for Federal Procurement of Building Insulation Products Containing Recovered Materials.

L. Underground Space Center, University of Minnesota; Building Foundation Design Handbook; Prepared for Oak Ridge National Laboratory; May 1988, Table 7-4.

[For text of subp 4, see M.R.]

Statutory Authority: *MS s 325F.20; 325F.21*

History: *13 SR 2982; 14 SR 2633*