

CHAPTER 4155
DEPARTMENT OF ENERGY AND ECONOMIC
DEVELOPMENT
THERMAL INSULATION STANDARDS

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4155.0100 AUTHORITY AND PURPOSE.

The commissioner is authorized by Minnesota Statutes, sections 325F.20, subdivision 1 and 325F.21, subdivisions 1 and 2 to establish standards for the product quality, safety, installation, and labeling of thermal insulation products, and establish test programs and procedures to ensure that standards established by this chapter shall be met.

Statutory Authority: *MS s 116J.03; 116J 10; 325F 20 to 325F.24*

History: *10 SR 1208*

4155.0110 APPLICABILITY.

Subpart 1. Residential products. This chapter applies to the following thermal insulation materials:

- A. cellulose fiber (loose fill and spray applied);
- B. mineral fiber (blankets, loose fill, board and spray applied);
- C. perlite (loose fill);
- D. polystyrene (board form, expanded and extruded);
- E. polyurethane and polyisocyanurate (board form and field applied),
- F. reflective foil;
- G. urea formaldehyde foam (field applied);
- H. vermiculite (loose fill); and
- I. other products advertising thermal resistance/R-values for use in residential buildings.

Subp. 2. Conduct. This chapter applies to the manufacture, distribution, sale, and application of residential insulation material within Minnesota. For the purpose of this chapter the sale of a building or appliance that contains installed insulating material is not considered the manufacturing and distribution of the insulating material.

Subp. 3. Affected parties. This chapter applies to all members of the insulation industry including:

- A. those who engage in the production and supply of materials from which insulation is made;
- B. those who promote the sale or use of insulation;
- C. manufacturers of insulation materials or component materials;
- D. jobbers, wholesalers, and retailers of insulation,
- E. contractors and applicators who sell and install residential insulation;

and

F. those engaged in the marketing of insulation who are, or who purport to act as, agents of manufacturers or suppliers of insulation.

Statutory Authority: *MS s 116J.03, 116J.10, 325F 20 to 325F.24*

History: *10 SR 1208*

4155.0120 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 the ASHRAE Handbook of Fundamentals or in ASTM C 168-80a, Standard Definitions of Terms Relating to Thermal Insulation Materials.

Subp. 2. **Application or installation.** "Application" or "installation" means placing insulation materials into a residential building system or structure for the purpose of increasing the thermal resistance of the building. Installation methods include, but are not limited to, pouring, laying, affixing by chemical bonding or mechanical devices, pneumatic blowing, or in situ foaming.

Subp. 3. **Approved laboratory.** "Approved laboratory" means any testing facility, including a facility owned or operated by a manufacturer, that has been approved by NVLAP to perform the required test.

Subp. 4. **ASHRAE.** "ASHRAE" means the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

Subp. 5. **ASTM.** "ASTM" means American Society for Testing and Materials or a specification or standard adopted by the American Society for Testing Materials.

Subp. 6. **CABO.** "CABO" means the One & Two Family Dwelling Code prepared by the Council of American Building Officials, (1983 Edition).

Subp. 7. **Commissioner.** "Commissioner" means the commissioner of the Minnesota Department of Energy and Economic Development.

Subp. 8. **CPSC.** "CPSC" means the United States Consumer Product Safety Commission or a standard issued for thermal insulation materials by that commission.

Subp. 9. **Department.** "Department" means the Minnesota Department of Energy and Economic Development.

Subp. 10. **Drainage.** "Drainage" means a water removal system for a residential building that meets the following conditions:

A. Drains are provided around foundations enclosing habitable or useable spaces, located below ground, that are subjected to ground water conditions. Drains are installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system. The top joints and perforations of drain tiles are protected with strips of building paper and the tiles are placed on two inches of crushed rock and covered with not less than six inches of the same material. (See, Section R-305. of CABO.)

B. The finish grade of soil next to the foundation wall has at least a one-half inch per foot slope away from the wall to a distance of five feet.

Subp. 11. **FS.** "FS" means a federal specification or test required by the General Services Administration that is used by federal agencies for the purchase of supplies.

Subp. 12. **FTC.** "FTC" means the United States Federal Trade Commission or a standard issued for thermal insulation materials by that commission.

Subp. 13. **Industry members.** "Industry members" means:

A. producers and suppliers of materials from which insulation is made who promote the sale or distribution of insulation;

B. manufacturers of insulation, jobbers, wholesalers, and retailers of insulation;

C. contractors and applicators who sell and install residential insulation; and

D. those engaged in the marketing of insulation who are, or who purport to act as, agents of manufacturers or suppliers of insulation.

Subp. 14. **Insulation.** "Insulation" means thermal insulation, a material or assembly of materials designed to provide resistance to heat flow in residential building structures, including but not limited to mineral fibrous, mineral cellular, organic fibrous, organic and plastic cellular and reflective materials, whether in loose-fill, flexible, rigid, or semirigid form. Any material advertised for use in residential buildings as having a thermal resistance R-value, except windows and doors, shall be considered as insulation for purposes of this chapter.

Subp. 15. **Intermediate consumer of insulation materials.** "Intermediate consumer of insulation materials" means a purchaser of insulation materials who resells or otherwise transfers possession of insulation materials to an ultimate consumer.

Subp. 16. **Label.** "Label" means written, printed, or graphic matter attached to or inscribed upon an article or its container.

Subp. 17. **Label notice.** "Label notice" means a written or printed statement accompanying the sale of an insulation product that contains information equivalent to that of a label; a label notice is used where no label is affixed to the insulation material or where a notice is otherwise required by this chapter.

Subp. 18. **Manufacturer of insulation.** "Manufacturer of insulation" means an industry member who produces insulation materials in their final form for distribution or sale to intermediate and ultimate consumers or who is a urea-formaldehyde foam or spray-urethane foam insulation manufacturer of the component resins and catalysts used for in situ foaming.

Subp. 19. **Materials standard.** "Materials standard" means a standard or specification of product quality and safety for regulated thermal insulation materials adopted or proposed by the department.

Subp. 20. **NVLAP.** "NVLAP" means the United States Department of Commerce National Voluntary Laboratory Accreditation Program

Subp. 21. **Polyurethane.** "Polyurethane" means a cellular plastic derived from urethane, isocyanurate, resins, or any combination of these. For purposes of this chapter, polyurethane includes products labeled polyisocyanurate.

Subp. 22. **R or R-value.** "R or R-value" means the measure of resistance to heat flow through a material or assembly of materials. It may be stated as the reciprocal of the heat flow through a material expressed in British thermal units per hour, per square foot, per degree Fahrenheit. R-value indicates "thermal performance."

Subp. 23. **Representative thickness.** "Representative thickness" means a thickness of insulating material at which the thermal performance per inch will vary no more than plus or minus two percent with increases in thickness.

Subp. 24. **Residential building.** "Residential building" means a low-rise residential structure, including detached one- and two-family dwellings, lodging houses, and multiple-family buildings not more than three stories in height and their accessory structures.

Subp. 25. **Thermal performance.** "Thermal performance" means the tested thermal conductivity, thermal conductance, or thermal resistance (R-value), as appropriate, of an insulating material.

Subp. 26. **Ultimate consumer of insulation.** "Ultimate consumer of insulation" means the final purchaser of insulation for installation within a residential building.

Subp. 27. **Urea formaldehyde foam.** "Urea formaldehyde foam" means a cellular plastic insulation material generated in a continuous stream by mixing the components which are a urea formaldehyde resin, air, and a foaming agent.

Subp. 28. **UBC.** "UBC" means the Uniform Building Code, authored by the International Conference of Building Officials.

Statutory Authority: *MS s 116J 03; 116J.10; 325F.20 to 325F.24*

History: *10 SR 1208*

4155.0130 INSULATION MATERIALS STANDARDS.

Subpart 1. **Scope.** This part sets forth standards for the product quality and safety of thermal insulation materials specified herein, as well as minimum procedures for the testing and reporting of insulation materials under these standards. Regulated thermal insulation materials that do not demonstrate by tests conformance to these standards shall not be sold, used, distributed, or installed in Minnesota by an industry member. Performance tests for insulation materials must meet or exceed the requirements of this part.

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

A. All regulated thermal insulation materials shall be tested for compliance with the standards set forth in this part within 120 days of the effective date of this chapter. Testing procedures are as follows:

(1) Testing shall, at a minimum, be performed annually and the testing shall be completed prior to June 1 of every year. Annual tests shall be performed at least ten months apart.

(2) Until 120 days after the effective date of this chapter, testing shall be performed only at a testing laboratory possessing the appropriate equipment, facilities, and qualified personnel necessary to perform testing required by parts 4155.0130 to 4155.0150. Tests performed in the 1985 calendar year are acceptable.

(3) After 120 days following adoption of this chapter, all testing shall be performed by laboratories approved and accredited by NVLAP to perform the required tests. In the event that the NVLAP program is temporarily delayed in accrediting a laboratory or is not capable of accrediting a test or tests, a testing laboratory possessing the appropriate equipment, facilities, and qualified personnel to perform the required testing is acceptable.

(4) The thermal insulation material chosen for testing shall be representative of material produced by the manufacturer during normal production runs.

(5) Manufacturers without NVLAP approved testing facilities shall contract with an approved laboratory to conduct an annual surprise on-site inspection of the manufacturer's production facilities for the following two purposes:

(a) to take random samples of insulation from the manufacturer's assembly or process system for testing under this chapter; and

(b) to evaluate testing techniques and make recommendations for improvement if the insulation fails to meet the assigned testing standards.

(6) Testing for each type of insulation shall be performed in accordance with the methods specified in subparts 3 to 15.

B. Each manufacturer of insulation must submit an annual report to the department on or before June 1 of each year. The report must be addressed to the Energy Division, Department of Energy and Economic Development, Attention: Insulation Standards Program, 900 American Center Building, 150 East Kellogg Boulevard, Saint Paul, MN 55101. The report must contain the following information:

(1) the name and address of the testing laboratory;

(2) the name and address of the manufacturer;

(3) the nature of the business relationship between the manufacturer and the testing laboratory; for example, contractual for the purpose of testing, subsidiary, or in-house;

(4) the specific tests performed by the laboratory;

(5) the date of testing;

- (6) a list of uniform product groups tested together,
- (7) a statement that each product meets or exceeds the test standards required by parts 4155.0100 to 4155.0180, and
- (8) the testing laboratory's NVLAP certification history.

C. Additional testing information shall be made available as follows:

(1) Upon the request of the commissioner, the manufacturer, a representative of the manufacturer, or the testing laboratory shall provide all applicable information pertaining to the testing program. The information shall include test procedures and protocols, test equipment specifications and calibrations, the qualifications of test laboratory personnel exclusive of personal identifiers, full test data, and proof of NVLAP certification.

(2) Upon the written request of intermediate and ultimate consumers of insulation the manufacturer shall make available a current certification of conformance to applicable test standards

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

(1) The following ASTM test methods shall be used: ASTM C 177-76, ASTM C 236-80, ASTM C 518-76, or ASTM C 976-82. Manufacturers shall select the appropriate test method for the material unless a specific method or procedure is referenced within a materials specification.

(2) R-value testing shall be performed at the insulation's representative thickness, and be consistent with the requirements of the United States Federal Trade Commission.

(3) Unit R per inch shall be derived from R-value testing performed to its representative thickness, as specified in subitem (2).

(4) Except as otherwise provided within a materials standard, the thermal performance test results shall be the average of the values obtained from at least three tests.

(5) Thermal performance as measured by test shall not be more than ten percent below the stated or claimed thermal performance of the insulation material.

Subp. 3. Cellulose fiber in loose-fill form. The following requirements apply to cellulose fiber in loose-fill form:

A. The product shall comply with ASTM C 739-84, Standard Specification for Cellulosic Fiber (wood-base) Loose-Fill Thermal Insulation in conjunction with the CPSC Interim Safety Standard for Cellulose Insulation, Federal Register, volume 44, pages 39966-39982 (July 6, 1979). When a CPSC test is performed, the ASTM C 739-84 test need not be repeated.

B. All manufacturers shall contract with an independent NVLAP approved laboratory for the following two purposes:

(1) The laboratory shall pick up three unopened bags of manufacturer's cellulose from the marketplace for annual testing under this chapter

(2) The laboratory shall conduct a minimum of one in-plant inspection every two months. The inspection shall be unannounced, and the inspector shall conduct tests in the plant laboratory, on a sample taken from the marketplace, for settled density, smoldering combustion, critical radiant flux, corrosiveness (ph), and starch.

C. The department shall be immediately notified by the manufacturer of any failure to meet test standards.

Subp. 4. Cellulose fiber spray applied. The following requirements apply to cellulose fiber spray:

A. The basic material shall consist of virgin or recycled wood-based cellulosic fiber. It may be made from related paper or paperboard stock, stock that does not contain contaminated materials and extraneous foreign materials, such as metals and glass, that could be retained in the finished product. Suitable chemicals may be introduced to improve flame resistance, processing, adhesive and cohesive qualities, and handling characteristics. The added chemicals shall not create a health hazard.

The basic material shall be processed into a form suitable for installation by pneumatic conveying equipment and simultaneous mixing with water or adhesive at the spray nozzle.

B. All testing shall be performed on applied spray cellulose.

C. Determination of thermal performance shall be in accordance with ASTM C 177-76, ASTM C 236-80, ASTM C 518-76 or ASTM C 976-82 at the manufacturer's option, at the test-defined density of the material. R-value testing shall 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 shall then be tested at the maximum thickness of suggested use.

D. Density shall be determined in accordance with section 7 of ASTM E 605-77. The density established by this test shall be used in the preparation of manufacturer's installation guidelines and in the determination of thermal performance.

E. Critical radiant flux and smoldering combustion shall be tested for in accordance with the CPSC Interim Safety Standard for Cellulose Insulation, Federal Register volume 44, pages 39966-39982 (July 6, 1979) [or the ASTM equivalent in C 739-84]. Values achieved shall not exceed those established by the CPSC.

F. Moisture absorption shall be determined in accordance with section 15 of ASTM C 553-70. Moisture absorption shall not exceed 15 percent by weight.

G. The product shall comply with test standards for air erosion, bond strength, and bond deflection that have been accepted by the ASTM or a federal or state government agency.

H. Test procedures in item F are not required of products that are installed in such a manner that physical restrictions imposed by the construction elements preclude any possibility of subsequent delamination, erosion, or dusting, and the product is identified only for such installations.

Subp. 5. Mineral fiber in loose-fill form. The product shall comply with ASTM C 764-84, Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.

Subp. 6. Mineral fiber in batts and blankets form. The product shall comply with ASTM C 665-84, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

Subp. 7. Mineral fiber in board form. The following requirements apply to mineral fiber in board form:

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

B. Determination of the thermal performance shall be in accordance with ASTM C 177-76, ASTM C 236-80, ASTM C 518-76, or ASTM C 976-82, at the manufacturer's option.

C. Surface burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ASTM E 84-84 and shall not exceed the following values: flame spread, 25; and smoke developed, 450. Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ASTM E 84-84 test. Insulation boards exclusive of facings and membranes shall not exceed the following values: flame spread, 25, and smoke developed, 50.

Subp. 8. **Mineral fiber spray applied.** The product shall comply with ASTM C 1014-84, Standard Specification for Spray-Applied Mineral Fiber Thermal or Acoustical Insulation.

Subp. 9. **Perlite in loose-fill form.** The following requirements apply to perlite loose fill insulation:

A. The product shall comply with ASTM C 549-81, Standard Specification for Perlite Loose Fill Insulation

B. The manufacturer shall disclose to the department any chemical treatment of the perlite material and the purpose of the treatment.

Subp. 10. **Polystyrene in board form.** The product shall comply with ASTM C 578-83, Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation and the accompanying Supplementary Requirements.

Subp. 11. **Polyurethane and polyisocyanurate in board form.** Unfaced polyurethane and polyisocyanurate shall comply with ASTM C 591-83, Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation. Faced polyurethane and polyisocyanurate shall comply with Federal Specification HH-I-1972, dated August 21, 1981, Insulation Board Thermal Faced Polyurethane or Polyisocyanurate.

Subp. 12. **Reflective foil.** The following requirements apply to reflective foil:

A. Specimens for tests shall 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, examine the reflective surfaces to determine whether the adhesive has bled through the surface or delamination has occurred.

Adhesive used in bonding shall be waterproof and shall show no sign of bleeding when tested in accordance with the test procedure in item B. Bleeding at cut edges may be disregarded.

B. Reflective foil insulation shall be tested according to ASTM C 976-82 to determine the thermal performance in horizontal, upward, and downward directions. The tested thermal performance in the heat-flow direction or directions of the intended application shall 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.

(1) Thermal performance for single or multiple sheet sections shall be determined according to ASTM C 976-82. The test panel shall consist of a panel utilizing a wooden frame of two-by-six inch boards 16 inches apart and at least 24 inches long, covered with 3/4-inch plywood on each side. For tests in the vertical position, the test panel shall 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 shall be based upon the insulation only.

(2) Foil facings on insulation material must comply with Federal Trade Commission requirements in section 460.5 of Federal Register, volume 44, page 50242 (August 27, 1979).

C. Layers of insulation composed of unsupported foil that is exposed shall have a minimum thickness of 0.0004 inch. Unsupported foil that is sand-

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wiched in multilayer sheet shall have a minimum thickness of 0.00035 inch. Foil bonded to kraft paper shall have a minimum thickness of 0.00025 inch. Minimum space between layers of a multilayer sheet shall conform with FS HH-1-1252B dated August 18, 1976.

D Surface burning characteristics shall be determined according to ASTM E 84-84 and shall not exceed the following values: flame spread, 25, and smoke developed, 50.

E Foil shall be folded and the folded edge smoothed using a light finger pressure. The finished insulation shall 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).

Subp. 13. Urea formaldehyde foam field applied. The following requirements apply to urea formaldehyde foam:

A The product shall comply with ASTM C 951-83, Standard Specification for Urea-Formaldehyde-Based, Foam-in-Place Insulation.

B. Resm and foaming agent containers shall be marked with conditions of proper storage and the derated R-value and shrinkage of the prepared foam as certified by the manufacturer.

C. Installers of urea formaldehyde foam insulation shall present a safety notice to the purchasers of the foam prior to the signing of the contract for installation. The notice shall be printed in a minimum of eight point type size. One copy of the notice signed by the purchaser shall be immediately given to the purchaser; one copy shall be retained by the installer, and one copy shall be mailed by the installer to the Director of the Office of Energy Conservation and Development, Department of Energy and Economic Development within 24 hours after the contract for installment is completed with the purchaser.

Manufacturers shall make all sales of urea formaldehyde foam insulation components expressly subject to the application restrictions listed in the notice described in subpart 14.

Subp. 14. Urea Formaldehyde Foam Insulation Safety Notice.

UREA FORMALDEHYDE FOAM INSULATION SAFETY NOTICE

This product emits formaldehyde. Eye, nose, and throat irritation, headache, nausea, and a variety of asthma-like symptoms, including shortness of breath, have been reported as a result of formaldehyde exposure. Elderly persons and young children, as well as anyone with a history of asthma, allergies, or lung problems, may be at greater risk. If you have any questions regarding the health effects of formaldehyde, consult your doctor or local health department.

UFFI Sale Notice To The Department

(Please print or write legibly)

Purchaser Name or Names _____

Purchaser's Address _____

City _____ State _____ Zip _____

Purchaser's Phone Number Home () _____
Work () _____

Location Of Insulation If Different From Above

Location Address _____

City _____ State _____ Zip _____

The purchaser acknowledges he or she
has read and understands this notice.

Signed X _____ Date _____

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Signed X _____ Date _____

Name of Installer _____

Address _____

City _____ State _____ Zip _____

Phone Number () _____

Signature _____

Name of Manufacturer _____

Address _____

City _____ State _____ Zip _____

Phone Number () _____

Signature _____

Mail one copy to: Director, Office of Energy Conservation and Development, Energy Division, Department of Energy and Economic Development, 900 American Center Building, 150 East Kellogg Boulevard, Saint Paul, Minnesota 55101.

Subp. 15. Vermiculite in loose-fill form. The following requirements apply to vermiculite in loose-fill form:

A. The product shall comply with ASTM C 516-80, Standard Specification for Vermiculite Loose-Fill Thermal Insulation.

B. The manufacturer shall disclose to the department any chemical treatment of the vermiculite material and the purpose of the treatment.

Statutory Authority: *MS s 116J 03; 116J.10, 325F 20 to 325F 24*

History: *10 SR 1208*

4155.0140 OTHER INSULATIONS; REPORTING AND TEST DATA.

Subpart 1. Reporting. Manufacturers of insulation other than insulation specified in part 4155.0130 that is intended to be sold, marketed, or advertised for use in residential structures in Minnesota shall report to the department by June 1 of every year. The report must contain, at a minimum, the following information:

A. description of insulation;

B. nature of insulation;

C. intended use and recommended application;

D. the results of thermal performance or R-value test;

E. the result of surface burning characteristics test;

F. the result of moisture resistance test,

G. citation to, and description of tests applied to product;

H. name and address of a manufacturer; and

I. the documents required by part 4155.0150 for department acceptance.

Subp. 2. Required test. Before an insulation is sold, marketed, or advertised for use in residential structures in Minnesota, the manufacturer must test the insulation with an approved laboratory and submit a certification of compliance with a federal, state, or ASTM standard specification that addresses all of the performance characteristics of the product. When no federal, state, or ASTM standard specification has been developed, the manufacturer must present test data from an approved laboratory that shows the insulation and its intended uses are safe and effective and do not pose a threat to human health.

Statutory Authority: *MS s 116J.03; 116J 10; 325F.20 to 325F.24*

History: *10 SR 1208*

4155.0150 APPLICATION AND INSTALLATION STANDARDS.

Subpart 1. **Applicability.** Industry members who offer insulation installation services for residential buildings shall comply with the application standards in this part.

The application standards in this part shall not apply to nonresidential buildings or construction.

This part applies to new residential construction and retrofit applications.

Subp. 2. **Report of intended application and installation.** Manufacturers shall submit to the department, for each residential insulation they offer or sell in this state, a statement as to whether the product is intended to be used above or below ground, in exterior or interior applications, in walls, in attics, under flooring, under roofing, or in other areas of use. Application instructions shall accompany each recommended use.

Subp. 3. **Application, generally.** Industry members installing insulation must follow manufacturers written application instructions.

Subp. 4. **Inspection of heat sources.** In attic areas where insulation is to be installed, the installer must locate all flush and recessed light fixtures, and other heat producing appurtenances, and shall comply with the following safety procedures:

A. In accordance with section 410-66 of the National Electrical Code (1984), insulation shall not be installed closer than three inches to the sides of recessed light fixtures. Rigid nonflammable blocking shall be installed to maintain a three-inch minimum clearance from the sides of the fixture. This requirement shall be waived if the fixture is approved for coverage with thermal insulation in accordance with section 410-66 of the National Electrical Code (1984).

B. A three-inch minimum air space shall be maintained around other heat-producing appurtenances, such as motors, fans, and heaters, unless the fixture is specifically approved for coverage with thermal insulation materials. If the fixture is designated by the manufacturer to require a larger air space than three inches, such larger air space shall be maintained. Rigid nonflammable blocking shall be installed to maintain the designated clearances.

Subp. 5. **Prohibitions.** The following prohibitions apply to the installation and application of insulation regulated by this chapter:

A. Industry members shall not install any regulated thermal insulation material in residential structures unless it is in conformance with the product quality standards established by this chapter.

B. Industry members and other persons shall not engage in the mobile manufacture of cellulose insulation, that is, the simultaneous on-site production and installation of cellulose insulation as an integral mechanical and manufacturing process.

C. Urea formaldehyde foam or pre-cured forms shall not be used in attics or ceilings.

D. Cellulose fiber spray-applied shall not be used in below ground application.

E. Polystyrene loose fill shall not be used in attics unless it complies with the state building code.

Subp. 6. **Manufacturer's installation or application instructions.** Manufacturers must provide installation and application instructions which comply with this subpart.

A. The manufacturer's written instructions describing areas of recommended use, the proper methods of application, and required or recommended safety measures shall be provided to each intermediate consumer and installer of all insulation sold for use in Minnesota within ten days of the sale

B. Intermediate consumers and installers have a duty to provide or make available all written instructions to ultimate consumers.

C. Written instructions on below ground use of insulation shall, at a minimum, contain instructions or information regarding:

- (1) optimal application techniques;
- (2) drainage, as specified in section R-305 of the One & Two Family Dwelling Code by CABO (1983 Edition),
- (3) waterproofing and dampproofing, as specified in section R-306 of the One & Two Family Dwelling Code by CABO (1983 Edition);
- (4) varying soil and soil moisture conditions;
- (5) temperature effects on application;
- (6) optimal backfill techniques for protection from physical damage, and

(7) the manufacturers' warranty, if any. The manufacturer shall state whether it warrants the insulation for below ground use and, if applicable, the conditions of warranty and the length of warranty, including a statement of the number of years for which the product is warranted to maintain 80 percent of its advertised R-value.

D. Manufacturers that recommend a product for below ground use in the vertical or horizontal position shall provide complete instructions for its respective applications.

Subp. 7. Practice of insulation use for exterior below ground installation. The following requirements apply to the exterior installation or application of insulation below the ground:

A. The installation or application of insulation in the vertical and horizontal position shall conform to the manufacturers' instructions and recommendations.

B. All insulations extending above the ground line shall be covered with an exterior wall finish to protect the insulation from ultraviolet sunlight, moisture absorption, freeze-thaw durability, air erosion, and general weather conditions.

C. Polyurethane or polyisocyanurate spray-applied application must meet the following conditions:

(1) Manufacturers shall recommend the type of urethane systems to be used for below ground use and applicators shall only use a recommended system.

(2) Polyurethane or polyisocyanurate spray-applied application shall have a protective coating applied to its exterior surface above and below ground. The type of protective coating and method of application shall be in accordance with the insulation manufacturer's instructions and recommendations.

D. Mineral fiber foundation insulation and drainage boards must meet the following conditions.

(1) The board shall be manufactured to facilitate proper downward drainage, or in the alternative, manufactured in such a manner that moisture will not substantially penetrate horizontally toward the foundation wall.

(2) The board shall not be used without exterior drainage, as defined in part 4155.0120.

Subp. 8. Application testing requirements for use of exterior below ground insulation. The following testing requirements apply to exterior below ground insulation:

A. The insulation by itself or as part of a system shall be in-service tested in a testing facility designed to duplicate actual below ground conditions. The testing environment shall reflect the extremes of weather, moisture, and soil conditions. The purpose of the testing shall be to determine aged R-value per-

formance, giving consideration to the conditions listed in item C. A summary of the test results shall be submitted to the department.

B. As an alternative to item A, the testing initiator may elect to have an insulation tested by an approved laboratory and listed for below ground use, with consideration given to the conditions listed in item C.

C. The listing of the product for below ground use shall be based on the most recent applicable ASTM tests or any other tests that are available that give consideration to each of the following conditions:

- (1) moisture absorption,
- (2) mechanical durability under freeze-thaw cycling conditions;
- (3) soil compatibility;
- (4) flexural strength or compression, and
- (5) vapor drives due to high-low pressure gradients.

D. The initiator seeking the listing shall select the appropriate tests that best address the conditions stated in item C.

E. Associations or trade representatives may initiate a product's listing on behalf of its constituency. The association must submit representative samples for testing, and certify to the department which manufacturers within its constituency the samples are representative of. The association must have an internal certification procedure to determine constituency conformity to the representative samples submitted for testing.

F. A summary of test results for item B shall be submitted to the department.

Statutory Authority: *MS s 116J.03; 116J 10, 325F.20 to 325F 24*

History: *10 SR 1208*

4155.0160 LABELING.

All insulations used or offered for sale in Minnesota shall be labeled according to applicable federal requirements such as the United States Consumer Products Safety Commission requirements set forth in Federal Register, volume 44, pages 39966-39982 (July 6, 1979), the United States Federal Trade Commission requirements set forth in Federal Register, volume 44, pages 50242-50245 (August 27, 1979), and any other applicable state or federal law

Statutory Authority: *MS s 116J 03; 116J 10, 325F 20 to 325F 24*

History: *10 SR 1208*

4155.0170 INCORPORATIONS BY REFERENCE AND CITATIONS.

Subpart 1. **Generally.** Portions of the following standards listed in subparts 2 and 3 which are found throughout this chapter are incorporated by reference, most of the material is subject to frequent change, and all of the standards listed are available to the public at the public libraries and the organizations listed in subpart 4

The standards and tests selected are all an integral part of current insulation industry testing procedures. All manufacturers and testing laboratories presently possess or have access to each referenced incorporation.

Subp. 2. **ASTM.** The following apply to incorporations by reference of ASTM standards:

A. ASTM is the American Society of Testing and Materials, a scientific and technical organization responsible for the development and authoring of the tests and standards listed. The incorporated references are published by the organization in the "Annual Book of ASTM Standards." All but one of the standards are published in the annual book of 1984, volumes 04.06 and 04.07. Test Standard ASTM C 764-84 will be published in the annual book of 1985,

volume 04.06 (released October 1985), but it is available immediately for order from ASTM.

The last two digits of each test standard number indicate the year of publication and version incorporated by reference.

B. ASTM Quick Reference.

- (1) C 168-80a
- (2) C 177-76
- (3) C 236-80
- (4) C 516-80
- (5) C 518-76
- (6) C 549-81
- (7) C 553-70
- (8) C 578-83
- (9) C 591-83
- (10) C 665-84
- (11) C 739-84
- (12) C 764-84
- (13) C 951-83
- (14) C 976-82
- (15) C 1014-84
- (16) E 84-84
- (17) E 605-77

(1) ASTM C 168-80a, Standard Definitions of Terms Relating to Thermal Insulation Materials.

(2) ASTM C 177-76, Steady-State Thermal Transmission Properties by means of the Guarded Hot Plate.

(3) ASTM C 236-80, Steady-State Thermal Performance of Building Assemblies by means of a Guarded Hot Box.

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

(5) ASTM C 518-76, Steady-State Thermal Transmission Properties by means of the Heat Flow Meter.

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

(7) ASTM C 553-70, Standard Specification for Mineral Fiber Blanket and Felt Insulation

(8) ASTM C 578-83, Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation.

(9) ASTM C 591-83, Standard Specification for Unfaced Preformed Rigid Cellular Polyurethane Thermal Insulation.

(10) ASTM C 665-84, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing

(11) ASTM C 739-84, Standard Specification for Cellulosic Fiber (wood-base) Loose-Fill Thermal Insulation.

(12) ASTM C 764-84, Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.

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

(14) ASTM C 976-82, Thermal Performance of Building Assemblies by means of a Calibrated Hot Box.

(15) ASTM C 1014-84, Standard Specification for Spray-Applied Mineral Fiber Thermal or Acoustical Insulation.

(16) ASTM E 84-84, Surface Burning Characteristics of Building Materials.

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

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

A. ASHRAE Handbook of Fundamentals, (1981 Edition) by the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (Technical Reference Book).

B. CABO, sections R-305 and R-306 of the One & Two Family Dwelling Code, by the Council of American Building Officials (1983 Edition).

C. Federal Specification (FS) HH-I-1252B (August-18, 1976) by the General Services Administration.

D. Federal Trade Commission (FTC) requirements in Code of Federal Regulations, title 16, part 460, (Federal Register, volume 44, page 50242, August 27, 1979)

E. National Electrical Code, section 410-66 (1984 Edition), by the National Fire Protection Association

F. Consumer Products Safety Commission (CPSC) Interim Safety Standard for Cellulose Insulation, Code of Federal Regulations, title 16, part 1209 (Federal Register, volume 44, pages 39966-39993, July 6, 1979).

G. Uniform Building Code (1982 Edition), by the International Conference of Building Officials.

H. Federal Specification (FS) HH-I-1972 by the General Services Administration.

Subp. 4. **Availability.** The standards incorporated by reference are available for public inspection as follows:

A. All documents incorporated by reference in this chapter are available at the following locations:

(1) Minnesota State Law Library; and

(2) James J. Hill Reference Library.

B. All ASTM test standards are available through the following additional locations:

(1) Minneapolis Public Library;

(2) University of Minnesota Engineering Library; and

(3) American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

C. General Services Administration Federal Specifications are available by:

(1) Mail. GSA Federal Specification Request, Superintendent of Documents, Government Printing Office, Washington, D.C. 20402;

(2) Phone: GSA, Chicago Documents Ordering line: (1) (312) 353-5383.

D. CABO, the One & Two Family Dwelling Code, by the Council of American Building Officials (1983 Edition), is available at: (CABO) Building Officials and Code Administrators International, Inc., 17926 South Halsted Street, Homewood, Illinois 60430

Statutory Authority: *MS s 116J 03, 116J 10, 325F 20 to 325F 24*

History: *10 SR 1208*

4155.0180 TEST VERSIONS.

When ASTM amends, reorganizes, or modifies a standard test method and the manufacturer or testing laboratory desires to use the new version, the department may be petitioned to adopt the new test method version. Until the depart-

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ment adopts or decides not to adopt the new version, the petitioner may request a temporary variance to use the new test method version. Criteria or factors in granting a variance are:

A. whether the new test method version amounts to a substantial change over the old version;

B. whether the amendment to the test version was controversial within the ASTM decision making body;

C. whether the department sees the new test version as an improvement in testing quality control;

D. whether the new version adversely affects consumers or manufacturers; and

E. whether there is strong opposition outside of the ASTM organization to the new test version.

Statutory Authority: *MS s 116J 03; 116J.10, 325F.20 to 325F.24*

History: *10 SR 1208*