Department of Public Service

Adopted Permanent Rules Relating to Energy Code Revisions

Rules as Adopted

7670.0100 AUTHORITY; SCOPE; APPLICABILITY.

[For text of subps 1 and 2, see M.R.]

Subp. 3. **Applicability.** Buildings covered by this chapter must comply with the Model Energy Code as amended by parts 7670.0260 to 7670.1000. ~~For purposes of~~ This ~~part, "buildings" includes~~ chapter also applies to driveways, walkways, entrances, parking lots, and grounds.

EXCEPTION: Relocated residential buildings need not comply with this chapter, except that, where available, an energy audit must be conducted on the relocated building.

7670.0130 INCORPORATIONS BY REFERENCE.

Subpart 1. **Incorporated items.** The following standards and references are incorporated by reference:

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

I. NFRC 100-91: Procedure for Determining Fenestration Product Thermal Properties (Currently Limited to U-values).

[For text of subp 2, see M.R.]

7670.0260 MATERIALS AND EQUIPMENT.

Section 102 of the Model Energy Code is amended by adding a paragraph to read:

102.3 Thermal Insulation. Thermal insulation used in residential buildings three stories or less in height must conform to chapter 7640, Minnesota Thermal Insulation Standards, adopted by the Department of Public Service. All thermal insulation must achieve stated performance at 75 degrees Fahrenheit mean temperature and no less than stated performance at winter design conditions.

EXCEPTION: Thermal insulation designed to reduce summer

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cooling load only is not required to achieve stated performance at winter design conditions.

7670.0325 AMENDMENTS TO SECTION 201: DEFINITIONS.

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

Subp. 4. **Window area.** Section 201 of the Model Energy Code is amended by adding a new definition to read:

WINDOW AREA. Window area, or glazing area, is equal to the rough opening less installation clearances.

Subp. 5. **Advanced framing.** Section 201 of the Model Energy Code is amended by adding a new definition to read:

ADVANCED FRAMING. Advanced area framing means framing techniques used to minimize the amount of uninsulated area that is required for proper structural support consistent with requirements of the Uniform Building Code, including section 2517. Advanced wall framing means 2 x 6 stud spacing of 24" on center, insulated headers, two-stud corners using approved backing for the attachment of facing materials, full insulation wherever possible between partition wall intersections with exterior walls, and, when foam insulated sheathing is used, replacement of cripples with hangers whenever possible. Advanced ceiling framing means achieving full insulating value to the outside of exterior walls.

7670.0470 AMENDMENTS TO SECTION 502: ENVELOPE THERMAL TRANSMITTANCE.

Subpart 1. **Opaque wall components and roof/ceiling components.** Section 502.2.1 of the Model Energy Code is amended by adding a paragraph to read:

502.1.4 Thermal transmittance of opaque wall components and roof/ceiling components. Thermal transmittance of opaque wall components (U_w) and roof/ceiling components (U_r) must be calculated using the following methods:

(1) Wood frame: Parallel heat flow method.

(2) Masonry blocks with insulation inserts or filled cores and other envelope assemblies containing nonmetal framing: Series-parallel method.

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(3) Metal framing bonded on one or both sides to a metal skin or covering: Thermal bridges in sheet metal construction method.

(4) Nonmetal surface with metal framing:

(a) For elements identified in Standard RS-24 listed in chapter 7, the parallel path correction factor method.

(b) For elements not identified in Standard RS-24 listed in chapter 7, the zone method.

Subp. 2. **Window area and skylight elements.** Section 502.1 of the Model Energy Code is amended by adding a paragraph to read:

502.1.5 Thermal transmittance of window area and skylight elements. Thermal transmittance of window area (U_g) and skylight elements (U_s) must be determined in accordance with one of the following methods:

(1) Representative U-values for fenestration products, pages 27.16 to 27.18 of Standard RS-1 listed in chapter 7;

(2) Standard RS-26 listed in chapter 7;

(3) Standard RS-27 or RS-28 listed in chapter 7 using design conditions specified in footnote (a) of table 13, chapter 27 of Standard RS-1; or

(4) Standard RS-20 listed in chapter 7.

Subp. 3. **Alternative compliance.** Section 502.2.1 of the Model Energy Code is amended by adding a new section to read:

502.2.1.7 Alternative compliance. Alternative methods of compliance with sections 502.2.1.1, 502.2.1.2, and 502.2.1.3 for one- and two-family residential buildings.

Minimum performance for components of Type A-1 (one- and two-family) buildings:

Minimum thermal resistance of the insulation in the roof/ceilings: R-38.

Minimum thermal resistance of the insulation in floors not over conditioned space: R-21.

Minimum thermal resistance of the insulation in rim joists: R-19.

Maximum window and door area as a percentage of overall

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exposed wall area with the combination of framing technique, R-value of insulation within the insulated cavity, sheathing, R-value, insulation on exposed foundation wall, and window overall U-value as indicated below:

MAXIMUM WINDOW AND DOOR AREA

AS A PERCENT OF OVERALL EXPOSED WALL

			R-5 Foundation Wall Insulation			
	Cavity		Window U-Value			
Framing	Insulation	Sheathing	0.49	0.36	0.31	0.27
STANDARD	R-15	≥R-5	11.2%	15.7%	18.6%	21.9%
STANDARD	R-21	<R-5	11.1%	15.5%	18.4%	21.7%
STANDARD	R-21	≥R-5	12.9%	17.8%	21.1%	24.7%
ADVANCED	R-21	<R-5	12.0%	16.7%	19.7%	23.2%
ADVANCED	R-21	≥R-5	13.4%	18.5%	21.8%	25.5%
			R-10 Foundation Wall Insulation			
			Window U-Value			
			0.49	0.36	0.31	0.27
STANDARD	R-15	≥R-5	12.5%	17.6%	20.9%	24.6%
STANDARD	R-21	<R-5	12.4%	17.4%	20.6%	24.3%
STANDARD	R-21	≥R-5	14.1%	19.7%	23.2%	27.2%
ADVANCED	R-21	<R-5	13.3%	18.5%	21.9%	25.8%
ADVANCED	R-21	≥R-5	14.7%	20.3%	24.0%	28.0%

Notes:

1) Maximum of 12 inches foundation wall exposed, excluding window wells.

2) Foundation windows must be insulated glass, 1/2-inch between panes and wood or vinyl frame, or equivalent.

3) Standard framing is wall framing that is not advanced as defined in section 201 of the Model Energy Code.

7670.0480 AMENDMENT TO SECTION 502: EFFECTIVENESS OF REQUIRED THERMAL INSULATION.

Section 502.1 of the Model Energy Code is amended by adding paragraphs to read:

502.1.4 Cold weather vapor condensation. Building assemblies are required to maintain the thermal performance of required insulation and the integrity of building materials against cold weather water vapor condensation.

502.1.4.1 Vapor retarder. A vapor retarder must be installed between the interior surface and the winter design condition dew point location within each building envelope surface. Joints in the vapor retarder must be sealed between solid blocking.

EXCEPTION: A vapor barrier need not be installed on the

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rim joist insulation.

502.1.4.2 Air leakage barrier. A barrier against air leakage must be installed to prevent the leakage of moisture-laden air from the conditioned space into the building envelope. An air barrier must be continuous at all plumbing and heating penetrations of interior surface of the building exterior envelope. If a tub or shower is located on an exterior wall, an air barrier must be provided at the interior surface of the building exterior envelope behind the tub or shower.

502.1.5 Preventing wind wash. A barrier must be provided at the following locations to mitigate wind wash:

(1) the exterior edge of attic insulation; and

(2) cantilevered floors and bay windows, including corners with adjoining vertical walls above and below.

7670.0510 AMENDMENT TO SECTION 502: FOUNDATION WALLS.

Section 502.2.1.6 of the Model Energy Code is combined with section 502.2.1.5 and is amended to read:

502.2.1.5 Foundation walls. Foundation walls enclosing heated or conditioned spaces must be insulated.

Either the thermal resistance (R) of the insulation on the entire opaque foundation wall must be not less than R-5, or the thermal resistance (R) of the insulation on the opaque foundation wall must be not less than R-10 from the top of the wall down to the design frost line. If the top of the footing is at or above the design frost line, the thermal resistance (R) of the insulation on the wall must not be less than R-5 from the top of the wall to the top of the footing.

All insulation used in or on foundation walls must be approved for the intended use. The insulation must be installed in accordance with the approved manufacturer's specifications.

If the foundation wall insulation is on the exterior, the portion from the top of the foundation wall to six inches below grade must be covered by an approved protective coating finish to protect the insulation from deterioration due to sunlight and physical abuse.

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7670.0530 AMENDMENT TO SECTION 502: SLAB ON GRADE FLOORS.

Section 502.3.1.4 of the Model Energy Code is amended to read:

502.3.1.4 Slab on grade floors. For slab on grade floors, the thermal resistance of the insulation around the perimeter of the floor may not be less than the value given in Table No. 502.3.1. The insulation must extend downward from the top of the slab to the design frost line or downward to the bottom of the slab then horizontally beneath the slab for an equivalent distance, and must be of an approved type.

7670.0550 AMENDMENTS TO SECTION 502: AIR LEAKAGE.

[For text of subps 1 and 2, see M.R.]

Subp. 3. **Air sealing.** Section 502 of the Model Energy Code is amended by adding paragraphs to read:

502.4.5 Air sealing of rim joists. Rim joists, band joists, and where floor joists or trusses meet the building envelope must be sealed in an approved manner to prevent air leakage.

502.4.6 Air sealing of interior partition walls. The top of interior partition walls that join insulated ceilings must be sealed in an approved manner to block air leakage.

7670.0610 AMENDMENTS TO SECTION 503: BUILDING MECHANICAL SYSTEMS.

[For text of subps 1 and 2, see M.R.]

Subp. 3. **Air-systems.** Section 503.5.1 of the Model Energy Code is amended to read:

503.5.1 Air-systems. The power required by motors of constant air volume fan systems must not exceed 0.8 W/cfm of supply air at design conditions.

The power required by motors of variable air volume fan systems must not exceed 1.25 W/cfm of supply air at design conditions.

Subp. 4. **Pumping system design criteria.** Section 503.5.2 of the Model Energy Code is amended to read:

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503.5.2 Piping friction loss. Piping systems must be designed at a friction pressure loss rate of no more than 4.0 ft. of water per 100 equivalent ft. of pipe where a "C-factor" of 125 is used.

Subp. 5. **Variable flow pumping.** Section 503.5 of the Model Energy Code is amended by adding a paragraph to read:

503.5.3 Variable flow pumping. Pumping systems serving control valves designed to modulate or step open and closed as a function of load must be designed for variable fluid flow. The system must be capable of reducing system flow to 50 percent of design flow or less.

EXCEPTIONS: Pumping loops where a minimum flow greater than 50 percent of the design flow is required for the proper operation of equipment served by the system, such as chiller loops and systems that serve no more than one control valve.

Subp. 6. **Balancing.** Section 503.6 of the Model Energy Code is amended to read:

503.6 Balancing. Means must be provided to balance air and water systems in accordance with this section.

503.6.1 Air system balancing. Air systems must be balanced. Fan speed must be adjusted to meet design air system flow.

EXCEPTION: Speed adjustment is not required for air system balancing with fan motors of 1 hp or less.

503.6.2 Hydronic system balancing. Hydronic systems must be balanced. Pump impellers must be trimmed or pump speed must be adjusted to meet design system flow.

EXCEPTION: Impeller trimming or speed adjustment is not required for hydronic system balancing with pump motors of 5 hp or less.

503.6.3 Systems balancing reports. Systems balancing reports must be submitted to the building official upon request.

Subp. 7. **Controls.** Section 503.8 of the Model Energy Code is amended by adding paragraphs to read:

503.8.4 Variable air volume (VAV) fan controls. VAV fans with motors 75 hp and larger must provide controls for the fan

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motor to demand no more than 50 percent of design wattage at 50 percent of design air volume, based on manufacturer's test data.

~~503.8.5 Supplementary heat controls. Controls on supplementary heaters must provide a means of activating the supplementary heat source on an emergency basis and an indicator must be provided to show the control status.~~

503.8.6 HVAC control system testing. HVAC control systems must be tested to assure that control elements are calibrated, adjusted, and in proper working condition.

Subp. 8. **Air-handling duct system insulation.** Section 503.9.1 of the Model Energy Code is amended by modifying the definition of delta t to read:

Where delta t = the design temperature differential between the air in the duct and the ambient temperature outside of the duct.

Subp. 9. **Duct construction.** Section 503.10 of the Model Energy Code is amended to read:

503.10 Duct construction. Ductwork must be constructed and erected in accordance with chapter 1346.

503.10.1 Duct leakage test. Ductwork designed to operate at static pressure in excess of 3 in. wc. must be leak tested and classified in a duct leakage class equal to or less than leakage Class 6 according to Standard RS-18 listed in chapter 7.

503.10.2 Additional sealing. Where supply air ducts and plenums that are designed to operate at static pressures from 0.25 in. to 3 in. wc. inclusive are located outside of conditioned space or in return plenums, joints must be sealed in accordance with Seal Class B as defined in Standards RS-17, RS-18, and RS-19 listed in chapter 7. All other ducts and plenums operating from 0.25 in. to 3 in. wc. inclusive must be sealed in accordance with Seal Class C. Pressure sensitive tape must not be used as the primary sealant where ducts are designed to operate at static pressure of 1 in. wc. or greater.

Subp. 10. **Operation and maintenance manual.** Section 503 of the Model Energy Code is amended by adding a paragraph to read:

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503.12 Operation and maintenance manual. An operation and maintenance manual must be provided. The manual must include basic data relating to the operation and maintenance of HVAC systems and equipment. Required routine maintenance actions must be clearly identified. Where applicable, HVAC controls information such as diagrams, schematics, control sequence descriptions, and maintenance and calibration information must be included.

7670.0660 AMENDMENT TO SECTION 503: EQUIPMENT EFFICIENCY.

Subpart 1. **HVAC equipment efficiency.** Section 503.4 of the Model Energy Code, with the exception of sections 503.4.2.3 and 503.4.4, is amended to read:

503.4 HVAC equipment performance requirements. HVAC equipment must meet minimum efficiency requirements specified in Standard RS-10 listed in chapter 7 with the following exceptions:

(1) Table 8.3-6 is amended to cite the reference standard for air conditioners, air cooled as ARI 360-86; to cite the reference standard for air conditioners, water/evaporatively cooled as ARI 360-86; and efficiency requirements added as follows:

Air Conditioners (air cooled)	≤760,000 Btu/h 8.5 EER	>760,000 Btu/h ~~8.7~~ 8.2 EER
Heat Pumps (cooling) (air cooled)	<760,000 Btu/h 8.5 EER	≥760,000 Btu/h 8.7 EER

(2) Table 8.3-7 is amended to read:

WATER COOLED	CFC	NON-CFC
Centrifugal	0.63 KW/Ton	0.73 KW/Ton
Helical-rotary (screw)	0.75 KW/Ton	0.80 KW/Ton
Reciprocating or Scroll	0.93 KW/Ton	
AIR COOLED (any type)		
≥150 Ton	1.41 KW/Ton	
<150 Ton	1.30 KW/Ton	

503.4.1 Heat-operated water chilling packages. Double-effect, heat-operated water chilling packages must be used in lieu of single-effect equipment, except where the energy input is from low temperature waste-heat or renewable energy sources.

Subp. 2. [See repealer.]

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Subp. 3. **Efficiency requirements.** HVAC system heating and cooling equipment regulated by the National Appliance Energy Conservation Act of 1987 must conform to the efficiency requirements of Standard RS-5 listed in chapter 7.

7670.0710 AMENDMENTS TO SECTION 504: SERVICE WATER HEATING.

Subpart 1. **Efficiency requirements.** Section 504.2 of the Model Energy Code is amended to read:

504.2 Efficiency requirements. Service water heating equipment must meet the minimum efficiency requirements listed in RS-6 with the following exceptions:

Fuel Type	Input Rating	Input to Volume Ratio (Btuh/gal)	Efficiency	Standby Loss (%/hour)
Electric	>12 KW			0.30 + 27 ÷ Vt
Gas/Oil	≤155,000 Btuh	>4,000	80 percent	1.3 + 114 ÷ Vt
Gas/Oil	>155,000 Btuh	>4,000	80 percent	1.3 + 95 ÷ Vt
Gas/Oil	All	≥4,000	80 percent	2.3 + 67 ÷ Vt

Where: Vt is the measured storage volume in gallons.

Test procedures for electric, gas, and oil water heaters not regulated by the National Appliance Energy Conservation Act (NAECA) of 1987 must follow procedures prescribed in ANSI Z21.10.3-1990.

Subp. 2. **Time clocks.** Section ~~504.5.3~~ 504.5 of the Model Energy Code is amended ~~to read:~~ by deleting section 504.5.3.

~~504.5.3 Time clocks.--Time clocks must be installed on all swimming pool heaters to allow for the shutdown of heating devices during hours of peak utility demand.~~

Subp. 3. **Pipe insulation.** Section 504.7 of the Model Energy Code is amended by deleting the exception and by adding a paragraph to read:

504.7.1 Nonrecirculating systems. Either the first eight feet of both inlet and outlet pipe from the storage tank must be insulated in accordance with Table No. 504.7, or heat traps must be installed on both inlet and outlet pipes with pipe insulation between the storage tank and heat traps installed in accordance with Table No. 504.7.

Subp. 4. **Devices to limit temperature.** Section 504.8.2 of the Model Energy Code is amended by deleting section 504.8.2.2.

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Subp. 5. **Efficiency requirements.** Service water heating equipment regulated by the National Appliance Energy Conservation Act of 1987 must conform to the efficiency requirements of Standard RS-5 listed in chapter 7.

7670.0800 AMENDMENTS TO SECTION 505: ELECTRIC POWER AND LIGHTING.

Subpart 1. **Electric energy determination.** Section 505.2 of the Model Energy Code is amended to read:

505.2 Electrical energy consumption. In multifamily dwellings, provision must be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.

EXCEPTION: Motels, hotels, college dormitories, other transient facilities, and buildings intended for occupancy primarily by persons who are 62 years of age or older or handicapped, or which contain a majority of units not equipped with complete kitchen facilities.

505.2.1 Electrical distribution monitoring. In electrical panels of buildings other than ~~low-rise~~ residential buildings three stories or less in height, all feeder wiring and the panel feeder must be capable of accepting a clamp-on ~~ampmeter~~ ammeter.

Subp. 2. **Lighting power budget.** The lighting requirements of sections 505.3 and 505.4 of the Model Energy Code are amended to read:

The lighting power budget must be the upper limit of the power to provide the lighting needs in accordance with the 1993 criteria and calculation procedure specified in Standard RS-29 listed in chapter 7 with the following exceptions:

(1) at each occurrence, the words "sections 11 and 12" are amended to read "Chapter 4 of the Model Energy Code";

(2) each time the word "shall" is used in reference to an inanimate object, "shall" is changed to "must";

(3) all recommendations identified by "may" or "should" are deleted;

(4) section 3.1.6.2 is amended to reference equation 3.4-1;

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(5) section 3.2 is deleted;

(6) section 3.3.1.2.2 is amended to read:

3.3.1.2.2 Equivalent number of controls. A reduction in the minimum number of controls is permitted by using an equivalent number of controls from Table 3.3-1 where control types used in Table 3.3-1 are used. However, the minimum number of controls must not be less than one for each 20 ampere circuit;

(7) section 3.3.1.2.3(a) is amended to read:

3.3.1.2.3(a) Lighting for spaces that must be used as a whole, such as public lobbies of office buildings, hotels, and hospitals; retail and department stores; and warehouses, storerooms, and service corridors under centralized supervision may be controlled by a lesser number of controls, but not less than one for each 20 ampere circuit or a total of three controls, whichever is greater;

(8) sections 3.3.2.1 and 3.3.2.2 are amended to read:

Fluorescent lamp ballasts must comply with Standard ~~RS-31~~ RS-5 listed in chapter 7 of the Model Energy Code;

(9) section 3.5.5 is amended by changing the units of Interior Power Allowance in equation 3.5-3 to Watts;

(10) section 3.5.5 is amended to calculate "unlisted space" by subtracting the Listed Space Area (LSA) from the Gross Lighting Area (GLA);

(11) Table 3.5-2 is amended to read:

Table 3.5-2

Automatic Control Device(s)	Power Adjustment Factor
Daylight Sensing Controls (DS), continuous dimming	0.30
DS, multiple step dimming	0.20
DS, ON/OFF	0.10
DS, continuous dimming and programmable timing	0.35
DS, multiple step dimming and programmable timing	0.25
DS, ON/OFF and programmable timing	0.15
DS, continuous dimming, programmable timing, and lumen maintenance	0.40
DS, multiple step dimming, programmable timing, and lumen maintenance	0.30
DS, ON/OFF, programmable timing, and lumen maintenance	0.20
Lumen maintenance	0.10
Lumen maintenance and programmable timing control	0.15
Programmable timing control	0.15
Occupancy sensor	0.30

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Occupancy sensor DS, continuous dimming	0.40
Occupancy sensor DS, multiple step dimming	0.35
Occupancy sensor DS, ON/OFF	0.35
Occupancy sensor, DS, continuous dimming, and lumen maintenance	0.45
Occupancy sensor, DS, multiple step dimming, and lumen maintenance	0.40
Occupancy sensor, DS, ON/OFF, and lumen maintenance	0.35
Occupancy sensor and lumen maintenance	0.35
Occupancy sensor and programmable timing control	0.35

Standard RS-31 listed in chapter 7 is an acceptable method for determining compliance of the lighting system design with this subpart.

EXCEPTION: One- and two-family detached dwellings and the dwelling portion of multifamily buildings.

Subp. 3. **Internally illuminated exit signs.** Internally illuminated exit signs must be in accordance with the lighting requirements specified in Minnesota Statutes, section 16B.61, subdivision 3.

Subp. 4. **Electric motor efficiencies.** All permanently wired, single-speed, ~~National Electric Manufacturers Association~~ Design A and B, polyphase induction motors of 1 hp or more must have National Electrical Manufacturers Association nominal efficiencies not less than those listed in the table below.

	OPEN				ENCLOSED			
HORSE POWER	3600 RPM	1800 RPM	1200 RPM	900 RPM	3600 RPM	1800 RPM	1200 RPM	900 RPM
					~~75.5%~~			
1 to 4	82.5%	82.5%	80.0%	74.0%	82.5%	82.5%	80.0%	74.0%
5 to 9	85.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	85.5%
10 to 19	88.5%	89.5%	90.2%	89.5%	89.5%	89.5%	89.5%	88.5%
20 to 49	90.2%	91.0%	91.0%	90.2%	90.2%	91.0%	90.2%	89.5%
50 to 99	92.4%	93.0%	93.0%	91.7%	92.4%	93.0%	93.0%	91.7%
100 to 124	93.0%	94.1%	94.1%	93.6%	93.6%	94.5%	94.1%	93.0%
125 and greater	93.6%	94.5%	94.1%	93.6%	94.5%	94.5%	94.1%	93.6%

7670.0850 AMENDMENT TO SECTION 600: DESIGN BY ACCEPTABLE PRACTICE.

Section 601.1 of the Model Energy Code is amended by adding a paragraph to read:

Buildings constructed in accordance with this section must also comply with parts 7670.0470 to 7670.0800 as indicated below:

Model Energy Code	Minnesota Rules Part
602.2	7670.0470, 7670.0480
602.2.4	7670.0500, 7670.0530
602.2.5, 602.2.6	7670.0510

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602.3	7670.0550
603	7670.0610, 7670.0660
604	7670.0710
605	7670.0800

7670.1000 AMENDMENTS TO SECTION 701: STANDARDS.

Section 701.1 of the Model Energy Code is amended by replacing and adding the following code standard numbers to read:

A. RS-1, 1989 ASHRAE Handbook of Fundamentals.

B. RS-3, ASHRAE Standard 62-1989, Ventilation for Acceptable Indoor Air Quality.

C. RS-4, ASHRAE Standard 55-1981 Thermal Environment Conditions for Human Occupancy.

D. RS-5, Code of Federal Regulations, title 10, part 430.32, Energy Conservation Standards for Consumer Products.

E. RS-6, Code of Federal Regulations, title 10, part 435.109, Table 9.3.1, Standard Rating Conditions and Minimum Performance of Water Heating Equipment.

F. RS-10, Code of Federal Regulations, title 10, part 435.108, HVAC Equipment.

G. RS-11, 1991 ASHRAE HVAC Applications.

H. RS-17, SMACNA HVAC Duct Construction Standards: Metal and Flexible, First Edition, 1985.

I. RS-18, SMACNA HVAC Duct Leakage Test Manual, First Edition, 1985.

J. RS-20, NFRC 100-91: Procedure for Determining Fenestration Product Thermal Properties (Currently Limited to U-values).

K. RS-23, Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1951-80 Minnesota. National Oceanic and Atmospheric Administration September 1982.

L. RS-24, Code of Federal Regulations, title 10, part 435.105, section 5.3.3.2.1(b), Calculation procedures for parallel path correction factor method.

M. RS-25, Code of Federal Regulations, title 10, part 435.105, section 5.3.3.2.1(d), Calculation procedures for thermal bridges in Sheet Metal Construction.

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N. RS-26, AAMA Standard 1503.1-88, Voluntary Test Method for Thermal Transmittance and Condensation of Windows, Doors and Glazed Wall Sections.

O. RS-27, ASTM C 236-87, Standard Test Method for Steady State Performance of Building Assemblies by means of a Guarded Hot Box.

P. RS-28, ASTM C 976-82, Standard Test Method for Steady State Performance of Building Assemblies by means of a Calibrated Hot Box.

Q. RS-29, Code of Federal Regulations, title 10, part 435.103, lighting.

R. RS-30, ASHRAE Standard 119-1988, Air Leakage Performance for Detached Single-Family Residential Buildings.

S. RS-31, LTGSTD, lighting prescriptive and system performance compliance calculation program.

7670.1100 EFFECTIVE DATES.

The effective date of amendments to this chapter is 90 days after the notice of adoption is published in the State Register.

Exception: The effective date of part 7670.0550, subpart 3, is January 1, 1993.

REPEALER. Minnesota Rules, parts 7670.0660, subpart 2; and 7670.0670 are repealed.

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