

**Department of Labor and Industry****Proposed Permanent Rules Adopting Changes to the Commercial Energy Code****1323.0010 INCORPORATION BY REFERENCE OF THE INTERNATIONAL ENERGY CONSERVATION CODE - COMMERCIAL ENERGY PROVISIONS.**

Subpart 1. **General.** The ~~2012~~ commercial provisions of chapters 2 to 4 and 6 of the 2018 edition of the International Energy Conservation Code (IECC) as promulgated by the International Code Council, Inc. (ICC), Washington, D.C., ~~is~~ are incorporated by reference and made part of the Minnesota State Building Code except as qualified by the applicable provisions in Minnesota Rules, chapter 1300, and as amended in this rule chapter. Portions of this publication reproduce excerpts from the ~~2012~~ 2018 IECC, International Code Council, Inc., Washington, D.C., copyright ~~2012~~ 2017, reproduced with permission, all rights reserved. The IECC is not subject to frequent change, and a copy of the IECC, with amendments for use in Minnesota, is available in the office of the commissioner of labor and industry.

Subp. 2. **Mandatory chapters.** The commercial provisions of the ~~2012~~ 2018 IECC-CE chapters 2 (CE) to ~~5~~ 4 (CE) and 6 (CE), shall be administered by any municipality that has adopted the code, except as qualified by the applicable provisions in Minnesota Rules, chapter 1300, and as amended by this rule chapter.

Subp. 3. ~~**Replacement chapters**~~ **References to administration.** ~~The following 2012 IECC chapter is being deleted and replaced with the provisions listed below:~~

References to Chapter 1 (CE) of the ~~2012~~ 2018 IECC and any references to code administration in this code are deleted and replaced with Minnesota Rules, chapter 1300, Administration of the State Building Code.

**1323.0020 REFERENCES TO OTHER INTERNATIONAL CODE COUNCIL (ICC) CODES.**

*[For text of subpart 1, see Minnesota Rules]*

Subp. 2. **Building code.** References to the International Building Code or IBC in this code mean the Minnesota Building Code, Minnesota Rules, chapter 1305, adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1.

Subp. 3. **Residential code.** References to the International Residential Code or IRC in this code mean the Minnesota Residential Code, Minnesota Rules, chapter 1309, adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1.

*[For text of subparts 4 and 5, see Minnesota Rules]*

Subp. 6. **Mechanical code.** References to the International Mechanical Code or IMC in this code mean the Minnesota Mechanical Code, Minnesota Rules, chapter 1346, adopted pursuant to Minnesota Statutes, section 326B.106, subdivision 1.

*[For text of subparts 7 to 11, see Minnesota Rules]*

### **1323.0100 ADMINISTRATION FOR COMMERCIAL ENERGY CODE.**

Subpart 1. **Application.** In addition to the requirements in Minnesota Rules, part 1323.0030, the administrative provisions in this part apply.

*[For text of subparts 2 and 3, see Minnesota Rules]*

Subp. 4. **Change of occupancy or use.** Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code. Where the use in a space changes from one use in Table ~~€405.5.2(1)~~ C405.3.2(1) or (2) to another use in Table ~~€405.5.2(1)~~ C405.3.2(1) or (2), the installed lighting wattage shall comply with Section ~~€405.5~~ C405.3.2.

*[For text of subpart 5, see Minnesota Rules]*

Subp. 6. **Compliance.** Residential buildings shall meet the provisions of IECC - Residential Provisions (RE), as amended by Minnesota Rules, chapter 1322. Commercial

buildings shall meet the provisions of IECC - Commercial Provisions (CE), as amended by this chapter.

*[For text of subparts 7 and 8, see Minnesota Rules]*

Subp. 9. [See repealer.]

Subp. 10. **Information on construction documents.** Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall indicate the location, nature, and extent of the work proposed, and show in detail pertinent data and features of the building, systems, and equipment as governed in this code. ~~Examples of this detail include~~ The details shall include the following as applicable:

- A. insulation materials and their *R*-values;
- B. fenestration *U*-factors and SHGCs;
- C. area-weighted *U*-factor and SHGC calculations;
- D. mechanical system design criteria;
- E. mechanical and service water heating system and equipment types, sizes, and efficiencies;
- F. economizer description; equipment and systems controls;
- G. fan motor brake horsepower for fan motors 1 horsepower (hp) or larger;
- H. fan motor horsepower (~~hp~~) and controls;
- I. duct sealing, duct sizing, duct and pipe insulation and location, terminal air or water design flow rates;
- J. electrical distribution diagram(s);
- K. lighting fixture schedule with wattage and control narrative; ~~and~~

L. locations of daylight zones on plans and provisions for functional testing of lighting controls;

M. air sealing details. ~~Air sealing details shall clearly delineate~~ delineating the air barrier location and ~~show~~ showing continuity between roof, wall, foundation, around frames and sleeves, and at other similar openings; and

N. additional details as required by the building official to determine whether the work proposed will conform to this code.

### **1323.0202 SECTION C202, GENERAL DEFINITIONS.**

A. IECC section C202 is amended by modifying the following definitions to read as follows:

**APPROVED.** "Approved" means approval by the building official, pursuant to the Minnesota State Building Code, by reason of:

1. inspection, investigation, or testing;
2. accepted principles;
3. computer simulations;
4. research reports; or
5. testing performed by either a licensed engineer or by a locally or nationally recognized testing laboratory.

~~**BUILDING THERMAL ENVELOPE.** The basement walls, exterior walls, floor, roof, air barrier, and any other building envelope components that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.~~

**COMPUTER ROOM.** "Computer room" means a room whose primary function is to house equipment for the processing and storage of electronic data and that has a design

electronic data equipment power density of greater than 20 watts per square foot (20 watts per 0.092 m<sup>2</sup>) of conditioned floor area or a connected design electronic data equipment load of greater than 10 kW.

**INFILTRATION.** "Infiltration" means the uncontrolled inward air leakage into a building caused by the pressure effects of wind, the effect of differences in the indoor and outdoor air density, or the imbalance between supply and exhaust air systems.

**U-FACTOR (THERMAL TRANSMITTANCE).** "U-factor" means the coefficient of heat transmission (air to air) through a building component or assembly, inclusive of the inside and outside air films, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side of the building component or assembly (Btu/h•ft<sup>2</sup>•°F)[W/(m<sup>2</sup>•K)].

B. Section C202 is amended by adding the following ~~definitions to read as follows~~ definition:

**CODE.** "This code" or "the code" means the Minnesota Commercial Energy Code, Minnesota Rules, chapter 1323.

~~**CONTINUOUS INSULATION (c.i.)** Insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building thermal envelope.~~

~~**ROOF REPLACEMENT.** An alteration consisting of the removal of the existing roof covering, repairing any damaged substrate, and installing a new roof covering.~~

### **1323.0303 SECTION C303, MATERIALS, SYSTEMS, AND EQUIPMENT.**

IECC section C303.1 is amended to read as follows:

**C303.1 Identification.** Materials, systems, and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code. Materials shall be designed for the intended use, and installed in accordance with the manufacturer's installation instructions, any listing, or certifications required. (Subsections C303.1.1, ~~C303.1.1.1, C303.1.2, C303.1.3,~~ through C303.1.4, and Tables C303.1.3(1), C303.1.3(2), and C303.1.3(3) are maintained without amendment remain unchanged.)

### 1323.0403 SECTION C403, BUILDING MECHANICAL SYSTEMS.

Subpart 1. IECC section ~~€403.2.1~~ C403.1.1 **Calculation of heating and cooling loads.** IECC section ~~€403.2.1~~ C403.1.1 is amended to read as follows and by adding Table C403.1.1:

~~€403.2.1~~ C403.1.1 **Calculation of heating and cooling loads.** Design loads associated with heating, ventilating, and air conditioning of the building shall be determined in accordance with ~~the procedures described in ANSI/ASHRAE/ACCA Standard 183, Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings, and by~~ or by an approved equivalent computational procedure using the design parameters specified in Table ~~€403.2.1.~~ C403.1.1. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook by an approved equivalent computational procedure.

**TABLE ~~€403.2.1~~ C403.1.1**

#### **CLIMATIC DATA DESIGN CONDITIONS**

<b>City</b>	<b>Summer Db/Wb °F</b>	<b>Winter Db °F</b>
Aitkin	82/72	-24
Albert Lea	85/72	-15

08/06/19	REVISOR	SS/SL	RD4513
Alexandria	86/70	-21	
Bemidji	84/68	-24	
Cloquet	82/68	-20	
Crookston	84/70	-27	
Duluth	81/67	-20	
Ely	82/68	-29	
Eveleth	82/68	-26	
Faribault	86/73	-16	
Fergus Falls	86/71	-21	
Grand Rapids	81/67	-23	
Hibbing	82/68	-19	
International Falls	83/67	-28	
Litchfield	85/71	-18	
Little Falls	86/71	-20	
Mankato	86/72	-15	
Minneapolis/St. Paul	88/72	-15	
Montevideo	86/72	-17	
Mora	84/70	-21	
Morris	84/72	-21	
New Ulm	87/73	-15	
Owatonna	86/73	-16	
Pequot Lakes	84/68	-23	
Pipestone	85/73	-15	
Redwood Falls	89/73	-17	
Rochester	85/72	-17	
Roseau	82/70	-29	
St. Cloud	86/71	-20	
Thief River Falls	82/68	-25	
Tofte	75/61	-14	

08/06/19	REVISOR	SS/SL	RD4513
Warroad	83/67		-29
Wheaton	84/71		-20
Willmar	85/71		-20
Winona	88/74		-13
Worthington	84/71		-14

Db = dry bulb temperature, degrees Fahrenheit

Wb = wet bulb temperature, degrees Fahrenheit

Subp. 2. **IECC section ~~C403.2.2~~ Equipment and system sizing C403.4.1.4 Heated or cooled vestibules (mandatory).** IECC section ~~C403.2.2~~ C403.4.1.4 is amended by adding a third exception to read as follows:

3. ~~Heating and cooling equipment sizing is permitted to be up to ten percent greater than the calculated peak heating and cooling loads to allow for building pickup and cool down after temperature setback conditions.~~

**C403.4.1.4 Heated or cooled vestibules (mandatory).** The heating system for heated vestibules and air curtains with integral heating shall be provided with controls configured to shut off the source of heating when the outdoor air temperature is greater than 60°F (16°C). Vestibule heating and cooling systems shall be controlled by a thermostat located in the vestibule configured to limit heating to a temperature not greater than 68°F (20°C) and cooling to a temperature of not less than 85°F (29°C).

**Exception:** Control of heating or cooling provided by site-recovered energy or transfer air that would otherwise be exhausted.

Subp. 2a. **IECC section C403.4.1.5 Hot water boiler outdoor temperature setback control (mandatory).** IECC section C403.4.1.5 is amended by adding an exception to read as follows:



**Exception:** Boiler systems used for service water heating.

Subp. 3. **IECC section ~~€403.2.4.3.1~~ C403.4.2.1 Thermostatic setback capabilities.** IECC section ~~€403.2.4.3.1~~ C403.4.2.1 is amended to read as follows:

**~~€403.2.4.3.1~~ C403.4.2.1 Thermostatic setback capabilities.** Heating systems shall be equipped with controls that have the capacity to automatically restart and temporarily operate the systems to maintain zone temperatures above a heating setpoint adjustable down to 55°F (13°C) or lower. Cooling systems shall be equipped with controls that have the capacity to automatically restart and temporarily operate the system to maintain zone temperatures below a cooling setpoint adjustable up to ~~90°F (32°C)~~ 85°F (29°C) or higher or to prevent high space humidity levels.

**Exceptions:**

1. Radiant floor and radiant ceiling heating systems.
2. Spaces where constant temperature conditions must be maintained.

Subp. 4. **IECC section ~~€403.2.4.5~~ Snow melt system controls ~~C403.4.3.3.2~~ Heat rejection.** IECC section ~~€403.2.4.5~~, the title and the body, are C403.4.3.3.2, item 3, is amended to read as follows:

**~~€403.2.4.5~~ Freeze protection and snow melt system controls.** Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls capable of shutting off the system when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid prevent freezing. Snow and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C) and no

~~precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (4°C), so the potential for snow or ice accumulation is negligible.~~

3. Where an open-circuit or closed-circuit cooling tower is used in conjunction with a separate heat exchanger to isolate the open-circuit or closed-circuit cooling tower from the heat pump loop, heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

(The exception remains unchanged.)

Subp. 5. [Renumbered subp 7]

Subp. ~~43~~ 5. **IECC section C403.4.3.3.3 Two-position valve.** IECC section C403.4.3.3.3 is amended to read as follows:

**C403.4.3.3.3 Two-position valve.** Each hydronic heat pump shall have a two-position automatic valve interlocked to shut off the water flow when the compressor is off.

Subp. 6. [Renumbered subp 8]

Subp. ~~14~~ 6. **IECC section ~~C403.4.5.4~~ C403.6.5 Supply-air temperature reset controls.** IECC section ~~C403.4.5.4~~ C403.6.5 is amended to read as follows:

**~~C403.4.5.4~~ C403.6.5 Supply-air temperature reset controls.** Multiple zone HVAC systems shall include controls that automatically reset the supply-air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be capable of resetting the supply-air temperature at least 25 percent of the difference between the design supply-air temperature and the design room air temperature. Zones with constant loads shall be designed for the fully reset supply temperature.

**Exceptions:**

1. Systems that prevent reheating, recooling, or mixing of heated and cooled supply air.
2. 75 percent of the energy for reheating is from site-recovered or site solar energy sources.
3. Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

Subp. 7. [Renumbered subp 11a]

Subp. ~~5~~ 7. **IECC section ~~€403.2.6~~ C403.7.4 Energy recovery ventilation systems (mandatory).** IECC section ~~€403.2.6~~ C403.7.4 is amended to read as follows:

**~~€403.2.6~~ C403.7.4 Energy recovery ventilation systems.** Where the supply airflow rate of a fan system exceeds the values specified in Table ~~€403.2.6~~ C403.7.4, the system shall include an energy recovery system. The energy recovery system shall ~~have the capability~~ be configured to provide a change in the enthalpy of the outdoor air supply of not less than 50 percent of the difference between the outdoor air and return air enthalpies, at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass or controls ~~which~~ that permit operation of the economizer as required by section ~~€403.4~~ C403.5.

**Exception:** An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are prohibited by the International Mechanical Code, as amended in Minnesota Rules, chapter 1346.
2. Laboratory fume hood systems that include at least one of the following features:

2.1 Variable-air-volume hood exhaust and room supply systems capable of reducing exhaust and makeup air ~~volume~~ volumes to 50 percent or less of design values except when higher volumes are required to maintain safe operating conditions.

2.2 Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) above room setpoint, cooled to no cooler than 3°F (1.7°C) below room setpoint, with no humidification added, and no simultaneous heating and cooling used for dehumidification control.

3. Systems serving spaces that are heated to less than 60°F (15.5°C) and are not cooled.

4. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.

5. Heating energy recovery in Climate Zones 1 and 2.

6. Cooling energy recovery in Climate Zones 3C, 4C, 5B, 5C, 6B, 7, and 8.

7. Systems requiring dehumidification that employ energy recovery in series with the cooling coil.

8. Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design outdoor air flow rate.

9. Systems expected to operate less than 20 hours per week at the outdoor air percentage covered by Table ~~C403.2.6~~ C403.7.4.

10. Systems exhausting paint fumes; toxic, flammable, or corrosive fumes; or dust.

11. Commercial kitchen hoods used for collecting and removing grease vapors and smoke.

Subp. 8. [Renumbered subp 12a]

Subp. ~~6~~ 8. **IECC Table C403.2.6 C403.7.4 Energy recovery requirement Exhaust Air Energy Recovery.** IECC Table C403.2.6 is amended by modifying the title to read C403.7.4(1) and Table C403.7.4(2) are deleted and replaced with the following:

**TABLE C403.7.4**

**EXHAUST AIR ENERGY RECOVERY**

<u>Climate Zone</u>	<u>Percent (%) Outdoor Air At Full Design Airflow Rate</u>							
	<u>≥10 and &lt;20%</u>	<u>≥20 and &lt;30%</u>	<u>≥30% and &lt;40%</u>	<u>≥40% and &lt;50%</u>	<u>≥50% and &lt;60%</u>	<u>≥60% and &lt;70%</u>	<u>≥ 70% and &lt;80%</u>	<u>≥80%</u>
	<u>Design Supply Fan Airflow Rate (cfm)</u>							
<u>6A</u>	<u>NR</u>	<u>NR</u>	<u>≥5,500</u>	<u>≥4,500</u>	<u>≥3,500</u>	<u>≥2,000</u>	<u>≥1,000</u>	<u>≥0</u>
<u>7</u>	<u>NR</u>	<u>NR</u>	<u>≥2,500</u>	<u>≥1,000</u>	<u>≥0</u>	<u>≥0</u>	<u>≥0</u>	<u>≥0</u>

For SI: 1 cfm = 0.4719 L/s

NR = Not Required

Subp. 9. [Renumbered subp 15]

Subp. 9. **IECC section C403.7.7 Shutoff dampers (mandatory).** The exception to IECC section C403.7.7 is amended to read as follows:

**Exception:** Nonmotorized gravity dampers shall be an alternative to motorized dampers for exhaust and relief openings as follows:

1. In buildings less than three stories in height above grade plane.
2. Where the design exhaust capacity is not greater than 300 cfm (142 L/s).

Each nonmotorized gravity damper shall also meet one of the following requirements:

1. The damper shall have a maximum air leakage rate of 20 cfm/ft<sup>2</sup> (101.6 L/s • m<sup>2</sup>) where not less than 24 inches in either dimension and 40 cfm/ft<sup>2</sup> (203.2 L/s • m<sup>2</sup>) where less than 24 inches in either dimension. The rate of air leakage shall be determined at 1.0 inch water gauge (249 Pa) when tested in accordance with AMCA 500D for such purpose.
2. The damper shall be for an exhaust duct 8 inches (203 mm) in diameter or smaller and shall be equipped with a spring-loaded backdraft damper and a weather hood at the point of discharge.

Subp. 10. ~~IECC section C403.2.10.1 Allowable fan motor horsepower~~ C403.9.4 Tower flow turndown. IECC section ~~C403.2.10.1~~ C403.9.4 is amended by adding an exception to read as follows:

~~**C403.2.10.1 Allowable fan motor horsepower.** Each HVAC system at fan system design conditions shall not exceed the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) as shown in Table C403.2.10.1(1). This includes supply fans, return/relief fans, exhaust fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single zone variable air volume systems shall comply with the constant volume fan power limitation.~~

~~**Exceptions:** The following fan systems are exempt from allowable fan motor horsepower requirements:~~

- ~~1. Hospital, vivarium, and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships~~

~~necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.~~

~~2. Individual exhaust fans with motor nameplate horsepower of 1 hp or less.~~

**Exception:** An increase in the water flow rate is permitted during freezing conditions.

Subp. 11. [See repealer.]

Subp. ~~7~~ 11a. **IECC section ~~€403.2.7~~ C403.11.1 Duct and plenum insulation and sealing.** IECC section ~~€403.2.7~~ C403.11.1 is amended to read as follows:

**~~€403.2.7~~ C403.11.1 Duct and plenum insulation and sealing.** Insulation shall be protected from damage, including damage from sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be suitable for outdoor service and shall be protected by aluminum, sheet metal, painted canvas, plastic cover, or other similar materials approved by the building official. Cellular foam insulation shall be protected as required by this subpart or painted with a coating that is water-retardant and provides shielding from solar radiation that causes degradation of the material. All supply, return, exhaust, and relief air ducts and plenums shall be insulated according to Table ~~€403.2.7~~ C403.11.1, located in subpart ~~13~~ 12a.

**Exception:** Where located within equipment.

All ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with ~~section 603.9~~ of the International Mechanical Code, as amended in Minnesota Rules, chapter 1346.

Subp. 12. [See repealer.]

Subp. 8 12a. **IECC Table ~~€403.2.7~~ C403.11.1 Minimum required duct and plenum insulation.** IECC section ~~€403.2~~ C403.11 is amended by adding Table ~~€403.2.7~~ C403.11.1 to read as follows:

**TABLE ~~€403.2.7~~ C403.11.1**

**MINIMUM REQUIRED DUCT AND PLENUM INSULATION**

<b>Ducts for Other Than Dwelling Units<sup>a,b</sup></b>	<b>Supply Duct Requirements<sup>c,d</sup></b>	<b>Return Duct Requirements<sup>c,d</sup></b>	<b>Exhaust Duct and Relief Duct Requirements<sup>c,d,e</sup></b>
Exterior of building	<del>R-8</del> <u>R-12</u> , V and W	<del>R-8</del> <u>R-12</u> , V and W	<del>R-8</del> <u>R-12</u> , V and W
Attics, garages, and ventilated crawl spaces	<del>R-8</del> <u>R-12</u> and V	<del>R-8</del> <u>R-12</u> and V	R-6 and V
TD greater than 40°F	R-5 and V	None	R-5 and V
TD greater than 15°F and less than or equal to 40°F	R-3.3 and V	None	R-3.3 and V
Within concrete slab or within ground	R-3.5 and V	R-3.5 and V	None
Within conditioned spaces	None <sup>f</sup>	None	None
TD less than or equal to 15°F	None	None	None
<b>Ducts for Dwelling Units<sup>a</sup></b>		<b>Requirements<sup>c,d</sup></b>	
Exterior of building		<del>R-8</del> <u>R-12</u> , V and W	
Attics, garages, and ventilated crawl spaces (except exhaust ducts)		<del>R-8</del> <u>R-12</u> and V	
Exhaust ducts in attics, garages, and ventilated crawl spaces		R-3.3 and V	
Outdoor air intakes within conditioned spaces		R-3.3 and V	
Exhaust ducts within conditioned spaces <sup>e</sup>		R-3.3 and V	
Within concrete slab or within ground		R-3.5 and V	
Within conditioned spaces		None	



- a. Ducts located within the building thermal envelope shall be located completely on the conditioned side of the air barrier.
- b. TD = Design temperature difference between the air in the duct and the ambient temperature outside of the duct, unless the duct type and location are specifically identified above.
- c. V = Vapor retarder required in accordance with the IMC section 604.11. When a vapor retarder is required, duct insulation required by this section shall be installed without respect to other building envelope insulation.
- d. W = Approved weatherproof barrier.
- e. Insulation is only required in the conditioned space for a distance of 3 feet (914 mm) from the exterior or unconditioned space.
- f. If the temperature rise is greater than 3°F from the supply air connection of the air handling unit to the furthest outlet, duct insulation shall be required for the entire length or for sufficient length to limit the temperature rise to 3°F.

Subp. 13. [Renumbered subp 5]

Subp. 13. **IECC section C403.11.2 Duct construction (mandatory).** IECC section C403.11.2 is amended to read:

~~€403.2.7.1~~ **C403.11.2 Duct construction.** Ductwork shall be constructed and erected in accordance with ~~the International Mechanical Code, as amended~~ Minnesota Rules, chapter 1346.

~~€403.2.7.1.1~~ **C403.11.2.1 Low-pressure duct systems.** All longitudinal and transverse joints, seams, and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with ~~the~~

~~International Mechanical Code, as amended~~ Minnesota Rules, chapter 1346.

**Exception:** Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressure less than 2 inches water gauge (w.g.) (500 Pa) pressure classification.

~~€403.2.7.1.2~~ C403.11.2.2 **Medium-pressure duct systems.** All ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (500 Pa) but less than or equal to 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with section ~~€403.2.7~~ C403.11.1. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with ~~the International Mechanical Code, as amended~~ Minnesota Rules, chapter 1346.

~~€403.2.7.1.3~~ C403.11.2.3 **High-pressure duct systems.** Ducts designed to operate at static pressures in excess of 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with section ~~€403.2.7~~ C403.11.1. In addition, ducts and plenums shall be leak-tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual with the rate of air leakage (CL) less than or equal to 4.0 as determined in accordance with Equation ~~4-5~~ 4-8.

**(Equation ~~4-5~~ 4-8)**  $CL = F/P^{0.65}$

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface area.

$P$  = The static pressure of the test, which is equal to the design duct pressure class rating, inches w.g.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section. Positive pressure leakage testing is acceptable for negative pressure ductwork.

Subp. 14. IECC Table C403.11.3 Minimum pipe insulation thickness. IECC Table C403.11.3 is amended to add a footnote "d" to read as follows:

d. Insulation requirements do not apply to those sections of piping used as the radiant heat source for radiant heating systems.

Subp. 9 15. IECC section ~~C403.2.8.1~~ C403.11.3.1 Protection of piping insulation. IECC section ~~C403.2.8.1~~ C403.11.3.1 is amended to read as follows:

~~C403.2.8.1~~ C403.11.3.1 Protection of piping insulation. Piping insulation shall be protected from damage, including damage from sunlight, moisture, equipment maintenance, and wind, and shall provide shielding from solar radiation to deter degradation of the material. Adhesive tape shall not be permitted. Piping insulation shall comply with both of the following requirements:

1. Insulation exposed to weather shall be suitable for outdoor service and shall be protected by aluminum, sheet metal, painted canvas, plastic cover, or other similar materials approved by the building official. Cellular foam insulation shall be protected as above or painted with a coating that is water-retardant and provides shielding from solar radiation; and

2. Unless the insulation is vapor-retardant, insulation covering chilled-water piping or refrigerant suction piping located outside the conditioned space shall include a vapor retardant located outside the insulation. All penetrations and joints shall be sealed.

#### **1323.0404 SECTION C404, SERVICE WATER HEATING (MANDATORY).**

~~IECC section C404.7.3 Covers.~~ IECC section ~~C404.7.3~~ C404.9.3 is amended to read as follows:

~~C404.7.3~~ C404.9.3 **Covers.** Heated pools and inground, permanently installed spas shall be provided with a vapor-retardant cover. Covers for heated swimming pools shall comply with Minnesota Rules, part 4717.1575, the Minnesota Department of Health pool cover safety standard. Pools heated to more than 90°F shall have a pool cover with a minimum insulation value of R-12.

**Exception:** A vapor-retardant cover is not required for pools deriving over ~~70~~ 75 percent of the energy for heating from site-recovered energy, such as a heat pump or solar energy source computed over an operating season.

#### **1323.0408 SYSTEM COMMISSIONING.**

Subpart 1. **IECC section C408.2.** IECC section C408.2 is amended to read as follows:

**C408.2 Mechanical systems and service water heating systems commissioning and completion requirements.** Prior to ~~passing~~ the final mechanical ~~inspection~~ and plumbing inspections, the registered design professional, the permit applicant, or an approved agency shall provide evidence of mechanical systems commissioning and completion in accordance with the provisions of this Section.

Construction document notes or specifications shall clearly indicate provisions for commissioning and completion requirements in accordance with this Section and are permitted to refer to specifications for further requirements. Copies of all documentation

shall be given to the owner or the owner's authorized agent and made available to the code official upon request in accordance with Sections C408.2.4 and C408.2.5.

**Exception:** The following systems are exempt from the commissioning requirements:

1. Mechanical systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140 690 W) cooling capacity and 600,000 Btu/h (175 860 W) heating capacity.
2. Systems included in Section ~~C403.3~~ C403.5 that serve dwelling units and sleeping units in hotels, motels, boarding houses, or similar units.

(Subsections C408.2.1 through C408.2.5.2 remain unchanged.)

Subp. 2. [See repealer.]

**REPEALER.** Minnesota Rules, parts 1323.0100, subpart 9; 1323.0402, subparts 2, 3, and 4; 1323.0403, subparts 11 and 12; 1323.0405; and 1323.0408, subpart 2, are repealed.

**EFFECTIVE DATE.** The amendments to this chapter are effective March 31, 2020, or five business days after publication of the notice of adoption in the State Register, whichever is later.