

1.1 **Department of Labor and Industry**

1.2 **Proposed Permanent Rules Adopting Changes to the Commercial Energy Code**

1.3 **1323.0010 INCORPORATION BY REFERENCE OF THE INTERNATIONAL**
1.4 **ENERGY CONSERVATION CODE - COMMERCIAL ENERGY PROVISIONS.**

1.5 Subpart 1. **General.** The ~~2012~~ commercial provisions of chapters 2 to 4 and 6 of the
1.6 2018 edition of the International Energy Conservation Code (IECC) as promulgated by the
1.7 International Code Council, Inc. (ICC), Washington, D.C., ~~is~~ are incorporated by reference
1.8 and made part of the Minnesota State Building Code except as qualified by the applicable
1.9 provisions in Minnesota Rules, chapter 1300, and as amended in this rule chapter. Portions
1.10 of this publication reproduce excerpts from the ~~2012~~ 2018 IECC, International Code Council,
1.11 Inc., Washington, D.C., copyright ~~2012~~ 2017, reproduced with permission, all rights reserved.
1.12 The IECC is not subject to frequent change, and a copy of the IECC, with amendments for
1.13 use in Minnesota, is available in the office of the commissioner of labor and industry.

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

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

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

1.23 **1323.0020 REFERENCES TO OTHER INTERNATIONAL CODE COUNCIL (ICC)**
1.24 **CODES.**

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

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

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

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

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

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

2.12 **1323.0100 ADMINISTRATION FOR COMMERCIAL ENERGY CODE.**

2.13 Subpart 1. **Application.** In addition to the requirements in Minnesota Rules, part
2.14 1323.0030, the administrative provisions in this part apply.

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

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

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

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

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

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

3.4 Subp. 9. [See repealer.]

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

3.11 A. insulation materials and their *R*-values;

3.12 B. fenestration *U*-factors and SHGCs;

3.13 C. area-weighted *U*-factor and SHGC calculations;

3.14 D. mechanical system design criteria;

3.15 E. mechanical and service water heating system and equipment types, sizes, and
3.16 efficiencies;

3.17 F. economizer description; equipment and systems controls;

3.18 G. fan motor brake horsepower for fan motors 1 horsepower (hp) or larger;

3.19 H. fan motor horsepower (~~hp~~) and controls;

3.20 I. duct sealing, duct sizing, duct and pipe insulation and location, terminal air or
3.21 water design flow rates;

3.22 J. electrical distribution diagram(s);

3.23 K. lighting fixture schedule with wattage and control narrative; ~~and~~

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

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

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

4.8 **1323.0202 SECTION C202, GENERAL DEFINITIONS.**

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

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

4.13 1. inspection, investigation, or testing;

4.14 2. accepted principles;

4.15 3. computer simulations;

4.16 4. research reports; or

4.17 5. testing performed by either a licensed engineer or by a locally or nationally recognized
4.18 testing laboratory.

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

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

5.1 electronic data equipment power density of greater than 20 watts per square foot (20 watts
5.2 per 0.092 m²) of conditioned floor area or a connected design electronic data equipment
5.3 load of greater than 10 kW.

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

5.7 **U-FACTOR (THERMAL TRANSMITTANCE).** "U-factor" means the coefficient
5.8 of heat transmission (air to air) through a building component or assembly, inclusive of the
5.9 inside and outside air films, equal to the time rate of heat flow per unit area and unit
5.10 temperature difference between the warm side and cold side of the building component or
5.11 assembly (Btu/h•ft²•°F)[W/(m²•K)].

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

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

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

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

5.22 **1323.0303 SECTION C303, MATERIALS, SYSTEMS, AND EQUIPMENT.**

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

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

6.8 **1323.0403 SECTION C403, BUILDING MECHANICAL SYSTEMS.**

6.9 Subpart 1. **IECC section ~~C403.2.1~~ C403.1.1 Calculation of heating and cooling**
 6.10 **loads.** IECC section ~~C403.2.1~~ C403.1.1 is amended to read as follows and by adding Table
 6.11 C403.1.1:

6.12 **~~C403.2.1~~ C403.1.1 Calculation of heating and cooling loads.** Design loads
 6.13 associated with heating, ventilating, and air conditioning of the building shall be
 6.14 determined in accordance with ~~the procedures described in ANSI/ASHRAE/ACCA~~
 6.15 ~~Standard 183, Peak Cooling and Heating Load Calculations in Buildings Except~~
 6.16 ~~Low-Rise Residential Buildings, and by~~ or by an approved equivalent computational
 6.17 procedure using the design parameters specified in Table ~~C403.2.1.~~ C403.1.1.
 6.18 Heating and cooling loads shall be adjusted to account for load reductions that are
 6.19 achieved where energy recovery systems are utilized in the HVAC system in
 6.20 accordance with the ASHRAE HVAC Systems and Equipment Handbook by an
 6.21 approved equivalent computational procedure.

6.22 **TABLE ~~C403.2.1~~ C403.1.1**

6.23 **CLIMATIC DATA DESIGN CONDITIONS**

6.24 City	Summer Db/Wb °F	Winter Db °F
6.25 Aitkin	82/72	-24
6.26 Albert Lea	85/72	-15

7.1	Alexandria	86/70	-21
7.2	Bemidji	84/68	-24
7.3	Cloquet	82/68	-20
7.4	Crookston	84/70	-27
7.5	Duluth	81/67	-20
7.6	Ely	82/68	-29
7.7	Eveleth	82/68	-26
7.8	Faribault	86/73	-16
7.9	Fergus Falls	86/71	-21
7.10	Grand Rapids	81/67	-23
7.11	Hibbing	82/68	-19
7.12	International Falls	83/67	-28
7.13	Litchfield	85/71	-18
7.14	Little Falls	86/71	-20
7.15	Mankato	86/72	-15
7.16	Minneapolis/St. Paul	88/72	-15
7.17	Montevideo	86/72	-17
7.18	Mora	84/70	-21
7.19	Morris	84/72	-21
7.20	New Ulm	87/73	-15
7.21	Owatonna	86/73	-16
7.22	Pequot Lakes	84/68	-23
7.23	Pipestone	85/73	-15
7.24	Redwood Falls	89/73	-17
7.25	Rochester	85/72	-17
7.26	Roseau	82/70	-29
7.27	St. Cloud	86/71	-20
7.28	Thief River Falls	82/68	-25
7.29	Tofte	75/61	-14

8.1	Warroad	83/67	-29
8.2	Wheaton	84/71	-20
8.3	Willmar	85/71	-20
8.4	Winona	88/74	-13
8.5	Worthington	84/71	-14
8.6	Db = dry bulb temperature, degrees Fahrenheit		
8.7	Wb = wet bulb temperature, degrees Fahrenheit		

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

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

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

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

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

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

9.2 Subp. 3. **IECC section ~~C403.2.4.3.1~~ C403.4.2.1 Thermostatic setback**
9.3 **capabilities.** IECC section ~~C403.2.4.3.1~~ C403.4.2.1 is amended to read as follows:

9.4 **~~C403.2.4.3.1~~ C403.4.2.1 Thermostatic setback capabilities.** Heating systems
9.5 shall be equipped with controls that have the capacity to automatically restart
9.6 and temporarily operate the systems to maintain zone temperatures above a
9.7 heating setpoint adjustable down to 55°F (13°C) or lower. Cooling systems
9.8 shall be equipped with controls that have the capacity to automatically restart
9.9 and temporarily operate the system to maintain zone temperatures below a
9.10 cooling setpoint adjustable up to ~~90°F (32°C)~~ 85°F (29°C) or higher or
9.11 prevent high space humidity levels.

9.12 **Exceptions:**

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

9.15 Subp. 4. **IECC section ~~C403.2.4.5~~ Snow melt system controls ~~C403.4.3.3.2~~ Heat**
9.16 **rejection.** IECC section ~~C403.2.4.5~~, the title and the body, are C403.4.3.3.2, item 3, is
9.17 amended to read as follows:

9.18 **~~C403.2.4.5~~ Freeze protection and snow melt system controls.** Freeze
9.19 protection systems, such as heat tracing of outdoor piping and heat
9.20 exchangers, including self-regulating heat tracing, shall include automatic
9.21 controls capable of shutting off the system when outdoor air temperatures
9.22 are above 40°F (4°C) or when the conditions of the protected fluid prevent
9.23 freezing. Snow and ice-melting systems, supplied through energy service
9.24 to the building, shall include automatic controls capable of shutting off
9.25 the system when the pavement temperature is above 50°F (10°C) and no

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

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

10.9 (The exception remains unchanged.)

10.10 Subp. 5. [Renumbered subp 7]

10.11 Subp. ~~4~~ 5. **IECC section C403.4.3.3.3 Two-position valve.** IECC section
 10.12 C403.4.3.3.3 is amended to read as follows:

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

10.16 Subp. 6. [Renumbered subp 8]

10.17 Subp. ~~4~~ 6. **IECC section ~~C403.4.5.4~~ C403.6.5 Supply-air temperature reset**
 10.18 **controls.** IECC section ~~C403.4.5.4~~ C403.6.5 is amended to read as follows:

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

11.1 **Exceptions:**

11.2 1. Systems that prevent reheating, recooling, or mixing of heated and
11.3 cooled supply air.

11.4 2. 75 percent of the energy for reheating is from site-recovered or site
11.5 solar energy sources.

11.6 3. Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

11.7 Subp. 7. [Renumbered subp 11a]

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

11.10 **~~€403.2.6~~ C403.7.4 Energy recovery ventilation systems.** Where the supply
11.11 airflow rate of a fan system exceeds the values specified in Table ~~€403.2.6~~
11.12 C403.7.4, the system shall include an energy recovery system. The energy recovery
11.13 system shall ~~have the capability~~ be configured to provide a change in the enthalpy
11.14 of the outdoor air supply of not less than 50 percent of the difference between the
11.15 outdoor air and return air enthalpies, at design conditions. Where an air economizer
11.16 is required, the energy recovery system shall include a bypass or controls ~~which~~
11.17 that permit operation of the economizer as required by section ~~€403.4~~ C403.5.

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

11.20 1. Where energy recovery systems are prohibited by the International
11.21 Mechanical Code, as amended in Minnesota Rules, chapter 1346.

11.22 2. Laboratory fume hood systems that include at least one of the following
11.23 features:

- 12.1 2.1 Variable-air-volume hood exhaust and room supply systems capable
12.2 of reducing exhaust and makeup air ~~volume~~ volumes to 50 percent or
12.3 less of design values except when higher volumes are required to maintain
12.4 safe operating conditions.
- 12.5 2.2 Direct makeup (auxiliary) air supply equal to at least 75 percent of
12.6 the exhaust rate, heated no warmer than 2°F (1.1°C) above room setpoint,
12.7 cooled to no cooler than 3°F (1.7°C) below room setpoint, with no
12.8 humidification added, and no simultaneous heating and cooling used for
12.9 dehumidification control.
- 12.10 3. Systems serving spaces that are heated to less than 60°F (15.5°C) and are
12.11 not cooled.
- 12.12 4. Where more than 60 percent of the outdoor heating energy is provided from
12.13 site-recovered or site solar energy.
- 12.14 5. Heating energy recovery in Climate Zones 1 and 2.
- 12.15 6. Cooling energy recovery in Climate Zones 3C, 4C, 5B, 5C, 6B, 7, and 8.
- 12.16 7. Systems requiring dehumidification that employ energy recovery in series
12.17 with the cooling coil.
- 12.18 8. Where the largest source of air exhausted at a single location at the building
12.19 exterior is less than 75 percent of the design outdoor air flow rate.
- 12.20 9. Systems expected to operate less than 20 hours per week at the outdoor air
12.21 percentage covered by Table ~~C403.2.6~~ C403.7.4.
- 12.22 10. Systems exhausting paint fumes; toxic, flammable, or corrosive fumes;
12.23 or dust.

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

13.3 Subp. 8. [Renumbered subp 12a]

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

13.7 **TABLE C403.7.4**

13.8 **EXHAUST AIR ENERGY RECOVERY**

13.9 Percent (%) Outdoor Air At Full Design Airflow Rate

	<u>Climate</u>	<u>≥10 and</u>	<u>≥20 and</u>	<u>≥30%</u>	<u>≥40%</u>	<u>≥50%</u>	<u>≥60%</u>	<u>≥ 70%</u>	<u>≥80%</u>
13.10	<u>Zone</u>	<u><20%</u>	<u><30%</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	
13.11				<u><40%</u>	<u><50%</u>	<u><60%</u>	<u><70%</u>	<u><80%</u>	
13.12									
13.13				<u>Design Supply Fan Airflow Rate (cfm)</u>					
13.14	<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>
13.15	<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>

13.16 For SI: 1 cfm = 0.4719 L/s

13.17 NR = Not Required

13.18 Subp. 9. [Renumbered subp 15]

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

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

13.23 1. In buildings less than three stories in height above grade plane.

13.24 2. Where the design exhaust capacity is not greater than 300 cfm (142 L/s).

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

14.3 1. The damper shall have a maximum air leakage rate of 20 cfm/ft² (101.6
 14.4 L/s • m²) where not less than 24 inches in either dimension and 40 cfm/ft²
 14.5 (203.2 L/s • m²) where less than 24 inches in either dimension. The rate of
 14.6 air leakage shall be determined at 1.0 inch water gauge (249 Pa) when tested
 14.7 in accordance with AMCA 500D for such purpose.

14.8 2. The damper shall be for an exhaust duct 8 inches (203 mm) in diameter or
 14.9 smaller and shall be equipped with a spring-loaded backdraft damper and a
 14.10 weather hood at the point of discharge.

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

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

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

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

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

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

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

15.7 Subp. 11. [See repealer.]

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

15.10 **~~€403.2.7~~ C403.11.1 Duct and plenum insulation and sealing.** Insulation shall
 15.11 be protected from damage, including damage from sunlight, moisture, equipment
 15.12 maintenance, and wind. Insulation exposed to weather shall be suitable for outdoor
 15.13 service and shall be protected by aluminum, sheet metal, painted canvas, plastic
 15.14 cover, or other similar materials approved by the building official. Cellular foam
 15.15 insulation shall be protected as required by this subpart or painted with a coating
 15.16 that is water-retardant and provides shielding from solar radiation that causes
 15.17 degradation of the material. All supply, return, exhaust, and relief air ducts and
 15.18 plenums shall be insulated according to Table ~~€403.2.7~~ C403.11.1, located in
 15.19 subpart ~~13~~ 12a.

15.20 **Exception:** Where located within equipment.

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

15.24 Subp. 12. [See repealer.]

16.1 Subp. 8 12a. ~~IECC Table C403.2.7~~ C403.11.1 **Minimum required duct and plenum**
 16.2 **insulation.** IECC section ~~C403.2~~ C403.11 is amended by adding Table ~~C403.2.7~~ C403.11.1
 16.3 to read as follows:

16.4 **TABLE ~~C403.2.7~~ C403.11.1**

16.5 **MINIMUM REQUIRED DUCT AND PLENUM INSULATION**

16.6	16.7	16.8	16.9	16.10	16.11	16.12	16.13	16.14	16.15	16.16	16.17	16.18	16.19	16.20	16.21	16.22	16.23	16.24	16.25	16.26	16.27	16.28	16.29	16.30	16.31	16.32
Ducts for Other Than Dwelling Units^{a,b}		Supply Duct Requirements^{c,d}	Return Duct Requirements^{c,d}	Exhaust Duct and Relief Duct Requirements^{c,d,e}																						
Exterior of building		R-8 <u>R-12</u> , V and W	R-8 <u>R-12</u> , V and W	R-8 <u>R-12</u> , V and W																						
Attics, garages, and ventilated crawl spaces		R-8 <u>R-12</u> and V	R-8 <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 ^f	None	None																						
TD less than or equal to 15°F		None	None	None																						
Ducts for Dwelling Units^a			Requirements^{c,d}																							
Exterior of building			R-8 <u>R-12</u> , V and W																							
Attics, garages, and ventilated crawl spaces (except exhaust ducts)			R-8 <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 ^e			R-3.3 and V																							
Within concrete slab or within ground			R-3.5 and V																							
Within conditioned spaces			None																							

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

17.15 Subp. 13. [Renumbered subp 5]

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

17.18 ~~C403.2.7.1~~ C403.11.2 Duct construction. Ductwork shall be constructed
17.19 and erected in accordance with ~~the International Mechanical Code, as amended~~
17.20 Minnesota Rules, chapter 1346.

17.21 ~~C403.2.7.1.1~~ C403.11.2.1 Low-pressure duct systems. All longitudinal
17.22 and transverse joints, seams, and connections of supply and return ducts
17.23 operating at a static pressure less than or equal to 2 inches water gauge
17.24 (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets,
17.25 mastics (adhesives), mastic-plus-embedded-fabric systems, or tapes
17.26 installed in accordance with the manufacturer's installation instructions.
17.27 Pressure classifications specific to the duct system shall be clearly
17.28 indicated on the construction documents in accordance with ~~the~~

18.1 ~~International Mechanical Code, as amended~~ Minnesota Rules, chapter
 18.2 1346.

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

18.6 ~~€403.2.7.1.2~~ C403.11.2.2 **Medium-pressure duct systems.** All ducts
 18.7 and plenums designed to operate at a static pressure greater than 2 inches
 18.8 water gauge (w.g.) (500 Pa) but less than or equal to 3 inches water gauge
 18.9 (w.g.) (750 Pa) shall be insulated and sealed in accordance with section
 18.10 ~~€403.2.7~~ C403.11.1. Pressure classifications specific to the duct system
 18.11 shall be clearly indicated on the construction documents in accordance
 18.12 with ~~the International Mechanical Code, as amended~~ Minnesota Rules,
 18.13 chapter 1346.

18.14 ~~€403.2.7.1.3~~ C403.11.2.3 **High-pressure duct systems.** Ducts designed
 18.15 to operate at static pressures in excess of 3 inches water gauge (w.g.)
 18.16 (750 Pa) shall be insulated and sealed in accordance with section ~~€403.2.7~~
 18.17 C403.11.1. In addition, ducts and plenums shall be leak-tested in
 18.18 accordance with the SMACNA HVAC Air Duct Leakage Test Manual
 18.19 with the rate of air leakage (CL) less than or equal to 4.0 as determined
 18.20 in accordance with Equation ~~4-5~~ 4-8.

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

18.22 where:

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

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

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

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

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

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

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

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

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

20.5 **1323.0404 SECTION C404, SERVICE WATER HEATING (MANDATORY).**

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

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

20.13 **Exception:** A vapor-retardant cover is not required for pools deriving over
20.14 ~~70~~ 75 percent of the energy for heating from site-recovered energy, such as
20.15 a heat pump or solar energy source computed over an operating season.

20.16 **1323.0408 SYSTEM COMMISSIONING.**

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

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

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

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

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

21.5 1. Mechanical systems in buildings where the total mechanical equipment capacity
21.6 is less than 480,000 Btu/h (140 690 W) cooling capacity and 600,000 Btu/h (175
21.7 860 W) heating capacity.

21.8 2. Systems included in Section ~~C403.3~~ C403.5 that serve dwelling units and
21.9 sleeping units in hotels, motels, boarding houses, or similar units.

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

21.11 Subp. 2. [See repealer.]

21.12 **REPEALER.** Minnesota Rules, parts 1323.0100, subpart 9; 1323.0402, subparts 2, 3, and
21.13 4; 1323.0403, subparts 11 and 12; 1323.0405; and 1323.0408, subpart 2, are repealed.

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