

Minnesota Department of Labor and Industry

ORDER ADOPTING RULES

Adoption of Rules Governing the Adoption of the 2012 International Mechanical Code and 2012 International Fuel Gas Code, Minnesota Rules, chapter 1346; Revisor's ID Number R-04147

BACKGROUND INFORMATION AND STATEMENT OF FACT

1. The Department of Labor and Industry has complied with all notice and procedural requirements in Minnesota Statutes, chapter 14, Minnesota Rules, chapter 1400, and other applicable law.
2. The Department received two timely written comments and submissions on the rules and one late comment. Three persons requested a public hearing of whom none withdrew their request. Therefore, there are not 25 or more requests for a public hearing.
3. No persons requested notice of the date the rule has been submitted to the Office of Administrative Hearings.
4. The 2012 International Mechanical Code is referred to as "IMC."
5. The 2012 International Fuel Gas Code is referred to as "IFGC."
6. The American Society of Heating, Refrigerating and Air Conditioning Engineers is referred to as "ASHRAE." ASHRAE publishes various standards and guidelines relating to heating, ventilation and air conditioning ("HVAC") systems.
7. A copy of the proposed rules with the amendments below is attached and incorporated into this order as Exhibit A.
8. A copy of the referenced document titled "Combustion Air Requirements for Power Burner Appliances" is attached as Exhibit B.
9. The Department is making the following amendments to its proposed rules as published with the Notice on the Department's website. Relevant excerpts provided below.

A. 1346.0202 SECTION 202 GENERAL DEFINITIONS.

Subpart 1. Section 202; Adding or amending definitions. IMC section 202 is amended by adding or amending the following definitions:

....

Subp. 2. Deleting definitions. IMC section 202 is amended by deleting the following definitions:

Extra-Heavy-Duty Cooking Appliance.

Heavy-Duty Cooking Appliance.

Light-Duty Cooking Appliance.

Medium-Duty Cooking Appliance.

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.0202. The proposed rule published at the time of the Notice amends two additional definitions and further amends another definition. Those amendments remain as published. Upon consideration of a comment received during the comment period, the Department proposes to delete four definitions: extra-heavy-duty cooking appliance; heavy-duty cooking appliance; light-duty cooking appliance; and medium-duty cooking appliance.

There is a table taken from ASHRAE Standard 154-2011 added to section 507.2.1 that classifies appliances into light-duty, medium-duty, heavy-duty and extra-heavy-duty cooking appliances.¹ This table replaces the four definitions proposed for deletion above. The IMC definitions are outdated; they haven't been updated since at least 2003, if not earlier.

The table is used instead of the IMC definitions because the table was developed by ASHRAE using current information about appliances. ASHRAE is the leading organization on commercial kitchen ventilation research and standards development. The table more clearly conveys the information and represents accepted current appliance classifications.

B. 1346.0401 GENERAL

Subpart 1. Section 401.1. IMC section 401.1, Scope, is amended by adding the following exception to the end of the section:

....

Subp. 2. Section 401.4. IMC section 401.4 is amended to read as follows: Air intake openings shall comply with all of the following:

A. Intake openings shall be located a minimum of ten feet (3,048 mm) from lot lines or buildings on the same lot. Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.

¹ See 507.2.1 explanation below.

B. Mechanical outdoor air intake openings shall be located a minimum of ten feet (3,048 mm) from any hazardous or noxious contaminant, such as chimneys, plumbing vents, streets, alleys, parking lots, and loading docks, except as specified in item C or section 501.2.1. Outdoor air intake openings shall be permitted to be located less than ten feet (3,048 mm) horizontally from streets, alleys, parking lots, and loading docks provided that the openings are located not less than 25 feet (7,620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.

C. Intake openings shall be located not less than three feet (914 mm) below contaminant sources where such sources are located within ten feet (3,048 mm) of the opening.

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.0401. The proposed rule published at the time of the Notice strikes large portions of the existing rule that amends section 401.4. Upon consideration of a comment received during the comment period, the Department will restore IMC section 401.4, with different amendments (that is, different from the existing code amendments). The strikethrough will largely remain and section 401.4 is reintroduced to more closely reflect the IMC language. The new amendments to IMC section 401.4 preserve IMC requirements one through three, with amendments described below, and delete the fourth requirement.²

The first IMC requirement, “A,” is modified by adding a sentence that reads, “Intake openings that front on a street or public way must be located a minimum of 10 feet (3048 mm) horizontally from the centerline of the street or public way.” This addition clarifies that intake openings on the exterior wall in buildings that are in close proximity to property lines are

² The existing rule significantly amends the IMC language particularly in organization but the new proposed amendment will restore IMC formatting.

allowed because the 10-foot measurement is taken to the centerline of the street rather than the property line.

The second IMC requirement, “B,” is modified by deleting “and gravity” from the first sentence because this section of the Minnesota rules addresses only mechanical intake openings and gravity openings are not mechanical.³ The last sentence that addresses measurement is modified by replacing “from the closest edge of the street or public way” with “to the centerline of the street or public way.” Intake openings would not be possible when buildings are within 10 feet of the property line, which is sometimes necessary, if the IMC is not amended here. The required separation from potential contaminants into an intake opening has been measured from the centerline of the street in the building and mechanical codes adopted in Minnesota for decades. Therefore, the reference to the closest edge of the street is replaced with the centerline of the street to allow the buildings that are adjacent to alleys and streets (public ways) be allowed to have intake openings installed consistent with the original design and intent of the previous codes.

The third IMC requirement, “C,” is not amended except for numbering and spelling out “three” and “ten” instead of the Arabic numerals “3” and “10,” respectively.

The fourth IMC requirement is deleted because it regulates intake openings on structures in flood hazard areas. Flood hazard areas are regulated by Minnesota Rules, Chapter 1335.

C. 1346.0506 SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST APPLIANCES.

~~Subpart 1. Section 506.1. IMC section 506.1 is amended by adding a sentence to the end of the section to read as follows:~~

³ The existing Minnesota Rule that adopts the 2006 International Mechanical Code, with amendments, omits “and gravity.” This amendment continues with that narrower scope, which does not include gravity intake openings.

~~For additional requirements for commercial kitchen hoods licensed and inspected by the Department of Agriculture, Department of Health, or local authorities that conduct inspections of food establishments, refer to the Minnesota Food Code, Minnesota Rules, chapter 4626.~~

~~Subp. 1a-Subpart 1. Section 506.3.~~

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.0506. The proposed rule published at the time of the Notice adds a new subpart 1 and renumbered the existing subparts accordingly. The new subpart 1 references the Minnesota Food Code in Minnesota Rules, chapter 4626, and is provided for the convenience of the user of this code. The Department received one request for hearing during the comment period that expressed concern that the reference to the Minnesota Food Code causes confusion for users of this code. Upon consideration of that request for hearing, the Department will not add the new subpart and will revert to the original subpart numbering. Furthermore, two other references to the Minnesota Food Code were proposed for deletion from the existing code as reflected in the proposed rule published at the time of the Notice.⁴

D. 1346.0507 SECTION 507 COMMERCIAL KITCHEN HOODS.

Subp. 2. **Section 507.2.** IMC section 507.2 is amended to read as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with ASHRAE standard 154. Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over medium-duty, heavy-duty, and extra-heavy-duty cooking appliances. Type I hoods shall be

⁴ Chapter 4626 is referenced in the existing code in part 1346.0506, subpart 2, part 1346.0507, subpart 2, and part 1346.0507, subpart 7. The proposed rule published with the notice deleted two of the references and relocated the reference in part 1346.0506, subpart 2. The relocated reference in part 1346.0506 is now proposed for deletion as well.

installed over light-duty cooking appliances that produce grease or smoke. The duty classifications of cooking appliances served by Type I hoods shall be in accordance with Table 507.2.1.

Exception: A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m³/s) in accordance with Section 17 of UL 710B.

Table 507.2.1
Appliance Duty Classifications by Appliance Type

Appliance Description	Size	Type I Hoods			
		Light Duty	Medium Duty	Heavy Duty	Extra-Heavy Duty
Braising pan/tilting skillet, electric	All	•	-	-	-
Oven, rotisserie, electric and gas	All	•	-	-	-
Oven, combi, electric and gas	All	•	-	-	-
Oven, convection, full-size, electric and gas	All	•	-	-	-
Oven, convection, half-size, electric and gas (protein cooking)	All	•	-	-	-
Oven, deck, electric and gas	All	•	-	-	-
Oven, mini-revolving rack, electric and gas	All	•	-	-	-
Oven, rapid cook, electric	All	•	-	-	-
Oven, rotisserie, electric and gas	All	•	-	-	-
Range, discrete element, electric (with or without oven)	All	•	-	-	-
Salamander, electric and gas	All	•	-	-	-
Braising pan/tilting skillet, gas	All	-	•	-	-
Broiler, chain conveyor, electric	All	-	•	-	-
Broiler, electric, under-fired	All	-	•	-	-
Conveyor oven, electric	6 kW or larger	-	•	-	-
Conveyor oven, gas	All	-	•	-	-
Fryer, doughnut, electric and gas	All	-	•	-	-
Fryer, kettle, electric and gas	All	-	•	-	-
Fryer, open deep-fat, electric and gas	All	-	•	-	-
Fryer, pressure, electric and gas	All	-	•	-	-
Griddle, double-sided, electric and gas	All	-	•	-	-
Griddle, flat, electric and gas	All	-	•	-	-
Range, cook-top, induction	All	-	•	-	-
Range, open-burner, gas (with or without oven)	All	-	•	-	-
Range, hot top, electric and gas	All	-	•	-	-
Broiler, chain conveyor, gas	All	-	-	•	-
Broiler, electric and gas, over-fired (upright)	All	-	-	•	-

<u>Broiler, gas, under-fired</u>	<u>All</u>	-	-	•	-
<u>Range, wok, gas and electric</u>	<u>All</u>	-	-	•	-
<u>Appliances using solid fuel (wood, charcoal, briquettes, and mesquite) to provide all or part of the heat source for cooking</u> <u>Exception: Appliances complying with Section 14.3.4 of NFPA Standard 96</u>	<u>All</u>	-	-	-	•

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking appliances shall not involve or depend upon any component of a fire extinguishing system.

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and appliances as required by Table 507.2.2. The duty classifications of cooking appliances served by Type II hoods shall be in accordance with Table 507.2.2. Type II hoods shall be installed above all appliances that produce products of combustion and do not produce grease or smoke as a result of the cooking process. Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.

Table 507.2.2

Type II Hood Requirements by Appliance Description

<u>Appliance Description</u>	<u>Size</u>	<u>Hood Not Required^{a,b}</u>	<u>Type II Hoods^a</u>	
			<u>Light Duty</u>	<u>Medium Duty</u>
<u>Cabinet, holding, electric</u>	<u>All</u>	•	-	-
<u>Cabinet, proofing, electric</u>	<u>All</u>	•	-	-
<u>Cheese-melter, electric</u>	<u>All</u>	•	-	-
<u>Coffee maker, electric</u>	<u>All</u>	•	-	-
<u>Cooktop, induction, electric</u>	<u>All</u>	•	-	-
<u>Dishwasher, under-counter, electric</u>	<u>All</u>	•	-	-
<u>Dishwasher, powered sink, electric</u>	<u>All</u>	•	-	-
<u>Drawer Warmer, 2 drawer, electric</u>	<u>All</u>	•	-	-
<u>Egg cooker, electric</u>	<u>All</u>	•	-	-

<u>Espresso machine, electric</u>	All	•	-	-
<u>Grill, panini, electric</u>	All	•	-	-
<u>Hot dog cooker, electric</u>	All	•	-	-
<u>Hot plate, countertop, electric</u>	All	•	-	-
<u>Ovens, conveyor, electric</u>	< 6 kW	•	-	-
<u>Ovens, microwave, electric</u>	All	•	-	-
<u>Ovens, warming, electric</u>	All	•	-	-
<u>Popcorn machine, electric</u>	All	•	-	-
<u>Rethermalizer, electric</u>	All	•	-	-
<u>Rice cooker, electric</u>	All	•	-	-
<u>Steam table, electric</u>	All	•	-	-
<u>Steamers, bun, electric</u>	All	•	-	-
<u>Steamer, compartment atmospheric, countertop, electric</u>	All	•	-	-
<u>Steamer, compartment pressurized, countertop, electric</u>	All	•	-	-
<u>Table, hot food, electric</u>	All	•	-	-
<u>Toaster, electric</u>	All	•	-	-
<u>Waffle Iron, electric</u>	All	•	-	-
<u>Cheese-melter, gas</u>	All	-	•	-
<u>Dishwasher, conveyor rack, chemical sanitizing</u>	All	-	•	-
<u>Dishwasher, conveyor rack, hot water sanitizing</u>	All	-	•	-
<u>Dishwasher, door-type rack, chemical sanitizing</u>	All	-	•	-
<u>Dishwasher, door-type rack, hot water sanitizing</u>	All	-	•	-
<u>Kettle, steam jacketed, tabletop, electric, gas and direct steam</u>	< 20 gallons	-	•	-
<u>Oven, convection, half-size, electric and gas (non- protein cooking)</u>	All	-	•	-
<u>Pasta cooker, electric</u>	All	-	•	-
<u>Rethermalizer, gas</u>	All	-	•	-
<u>Rice cooker, gas</u>	All	-	•	-
<u>Steamer, atmospheric, gas</u>	All	-	•	-
<u>Steamer, pressurized, gas</u>	All	-	•	-
<u>Steamer, atmospheric, floor-mounted, electric</u>	All	-	•	-
<u>Steamer, pressurized, floor-mounted, electric</u>	All	-	•	-
<u>Kettle, steam-jacketed floor mounted, electric, gas and direct steam</u>	< 20 gallons	-	•	-
<u>Pasta cooker, gas</u>	All	-	-	•
<u>Smoker, electric and gas, pressurized</u>	All	-	-	•
<u>Steam-jacketed kettle, floor mounted, electric and gas</u>	20 gallons or larger	-	-	•

^a A hood shall be provided for an electric appliance if it produces 3.1×10^{-7} lb/ft³ (5 mg/m³) of grease or more when measured at 500 cfm (236 L/s).

^b Where hoods are not required, the additional heat and moisture loads generated by such appliances shall be accounted for in the sensible and latent loads for the HVAC system.

507.2.2.1. Type II hood exhaust flow rates. The net exhaust flow rate for Type II hoods shall comply with Table 507.2.2.1. The duty level for the hood shall be the duty level of the

appliance that has the highest (heaviest) duty level of all of the appliances that are installed underneath the hood according to Table 507.2.2.

Table 507.2.2.1

Type II Hood Minimum Net Exhaust Airflow Rates

<u>Type of Hood</u>	<u>Minimum Net Exhaust Flow Rate per Linear Hood Length in cfm/ft (L/s/m)</u>	
	<u>Light-Duty Equipment</u>	<u>Medium-Duty Equipment</u>
<u>Wall-mounted canopy</u>	<u>200 (310)</u>	<u>300 (465)</u>
<u>Single island</u>	<u>400 (620)</u>	<u>500 (775)</u>
<u>Double island (per side)</u>	<u>250 (388)</u>	<u>300 (465)</u>
<u>Eyebrow</u>	<u>250 (388)</u>	<u>250 (388)</u>
<u>Backshelf/Pass-over</u>	<u>200 (310)</u>	<u>300 (465)</u>

507.2.2.2 Type II hood overhang. Type II hoods shall overhang the appliances and equipment served in accordance with Table 507.2.2.2.

Table 507.2.2.2

Minimum Overhang Requirements for Type II Hoods

<u>Type of Hood</u>	<u>End Overhang</u>	<u>Front Overhang</u>	<u>Rear Overhang</u>
<u>Wall-mounted canopy</u>	<u>6 in. (154 mm)</u>	<u>12 in. (154 mm)</u>	<u>N/A</u>
<u>Single-island canopy</u>	<u>12 in. (154 mm)</u>	<u>12 in. (154 mm)</u>	<u>12 in. (154 mm)</u>
<u>Double-island canopy</u>	<u>12 in. (154 mm)</u>	<u>12 in. (154 mm)</u>	<u>N/A</u>
<u>Eyebrow</u>	<u>N/A</u>	<u>12 in. (154 mm)</u>	<u>N/A</u>
<u>Backshelf/Proximity/Pass-over</u>	<u>6 in. (154 mm)</u>	<u>10 in. (254 mm) (setback)</u>	<u>N/A</u>

N/A = not applicable

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.0507, subpart 2. The proposed rule published at the time of the Notice deletes subsections 507.2.1, 507.2.1.1 and 507.2.2. Upon consideration of a comment received during the comment period, the Department will restore large portions of the stricken language, add language to match that of the IMC, and add new tables in sections 507.2.2.1 and 507.2.2.2.

Section 507.2.1, including Table 507.2.1; Sections 507.2.1.1 and 507.2.2, including Table 507.2.2. The proposed changes incorporate provisions from ASHRAE Standard 154-2011 (“Standard 154”) to clearly identify all of the types of cooking equipment and processes that occur in commercial kitchen cooking applications. Standard 154 is the product of scientific research conducted by ASHRAE, the leading organization on commercial kitchen ventilation research and standards development. Standard 154 classifies the duty level required for both Type I and Type II hoods based on several ASHRAE research projects that evaluated wall canopy hood performance, appliance heat gain, capture and containment, and island hood performance. Standard 154 includes tables that classify appliances as unhooded, requiring Type I hoods or requiring Type II hoods. These tables allow for more consistent application and enforcement of the mechanical code in commercial kitchens. This amendment is necessary because the existing code lacks clarity and specificity. The Mechanical/Fuel Gas Code Committee⁵ recommended these tables be included in the amendments to Section 507 to provide clarity in the code.⁶ Despite this recommendation, the Department did not include them in the rule because there was no copyright agreement between the Department and ASHRAE. In response to the comment and other changes to this proposed rule, the tables are added and a copyright agreement between the Department and ASHRAE is in place to use these tables in Minnesota rules.⁷

Section 507.2.2.1, including Table 507.2.2.1. The proposed changes incorporate a table from Standard 154 to clearly identify the minimum net exhaust flow rates for various kinds of type II

⁵ The Mechanical/Fuel Gas Code Committee, a rule advisory committee, met eight times between November 30, 2011, and February 29, 2012.

⁶ See <http://www.dli.mn.gov/CCLD/rm/1346.asp>, specifically, accepted proposal IMC #28a.

⁷ A copy of the copyright agreement is attached as Exhibit C.

hoods based on several ASHRAE research projects that evaluated wall canopy hood performance, appliance heat gain, capture and containment, and island hood performance. This table also specifies that type II hoods are allowed only for light-duty and medium-duty commercial kitchen equipment, based on the various configurations of hoods. This table allows for more consistent application and enforcement of this code in commercial kitchens. The existing code lacks clarity and specificity. This table is based on scientific research completed by ASHRAE. The Mechanical/Fuel Gas Code Committee recommended these tables be included in the amendments to Section 507 to provide clarity in the code.⁸

Section 507.2.2.2, including Table 507.2.2.2. The proposed changes incorporate Table 507.2.2.2 from Standard 154 to clearly identify the minimum overhang requirements for various kinds of type II hoods in commercial kitchen applications based on several ASHRAE research projects that evaluated wall canopy hood performance, appliance heat gain, capture and containment, and island hood performance. This table provides clarity because it contains minimum requirements for end overhang, front overhang and rear overhang for various configurations of type II hoods. This table allows for more consistent application and enforcement of this code in commercial kitchens. The existing code lacks clarity and specificity. The table is based on scientific research completed by ASHRAE. The Mechanical/Fuel Gas Code Committee recommended these tables to be included in the amendments to Section 507 to provide clarity in the code.⁹

E. 1346.0607 SECTION 607, DUCT AND TRANSFER OPENINGS.

607.6.1 Through penetrations.

Exceptions:

1. A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided such duct meets all of the following requirements:

⁸ See <http://www.dli.mn.gov/CCLD/rm/1346.asp>, specifically, accepted proposal IMC #28a. Please note the same circumstances for Table 507.2.1 apply here.

⁹ Id.

a. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712 mm) (No. 26 gage) or the duct shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479. The approved through-penetration firestop system shall have an F rating or T rating of not less than the required rating of the horizontal assembly being penetrated.

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.0607. The proposed rule published at the time of the Notice amends IMC section 607.6.1, including the exceptions. Exception 1 allows an exception when certain requirements are met. Requirement (a) addresses duct construction, including setting minimum requirements for duct wall thickness. The Department intended to make this exception the exact same as part 1305.0717, subpart 2, exception 1, to avoid confusion.¹⁰ However, a portion of requirement (a) was left out. Part 1305.0717, subpart 2, exception 1 in relevant part reads, “The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712 mm) (No. 26 gage) *or the duct shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479. The approved through-penetration firestop system shall have an F rating or T rating of not less than the required rating of the horizontal assembly being penetrated.*” Emphasis added here. The italicized portion is the exact same language missing in the published rule and added here.

F. 1346.1001 SECTION 1001 GENERAL.

Relevant excerpts:

Subpart 1. **Section 1001.1, Scope.** IMC section 1001.1 is amended as follows:
1001.1, Scope.

Subp. 1a. **Section 1001.2, Scope; boilers; labor and industry.** IMC section 1001 is amended by adding a section to read as follows:

¹⁰ Minnesota Rules, chapter 1305 is currently undergoing rulemaking amendments, including part 1305.0717, subpart 2. The Department anticipates this proposed rule amendment will be published by the end of 2014.

1001.2, Scope; boilers; labor and industry.

Subp. 1b. **Section 1001.3, ~~Scope; pressure vessels; labor and industry.~~** IMC section 1001 is amended by adding a section to read as follows:

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

These are edits from the Revisor.

G. 1346.5304 SECTION 304 (IFGC) COMBUSTION, VENTILATION AND DILUTION AIR.

Subpart 1. **Section 304.1.** IFGC section 304 is amended by adding language to the end of the first paragraph and additional exceptions to read as follows:

304.1 General. Refer to IFGC Appendix E for Worksheet E-1, "Residential Combustion Air Calculation Method" and Table E-1, "Residential Combustion Air Required Volume." in part 1346.6012.

Exceptions:

1. Direct vent appliances.
2. Type 1 clothes dryers that are provided with makeup air in accordance with the manufacturer's installation instructions.
3. Replacement of a fuel gas utilization appliance that complies with all of the following conditions:
 - 3.1 Replacement appliance has a Btu/hr (kW) input rating not greater than 30 percent above the original appliance input rating.
 - 3.2 Combustion air provisions meet the code requirements in effect at the time of the original installation.
 - 3.3 Replacement appliance shall not cause an existing mechanical system to become unsafe, hazardous, or overloaded.

4. Combustion air may be determined using Table 304.1 for gas-fired appliances when combustion air is provided from a single opening from the outdoors, commencing within 12 inches of the bottom of the enclosure.

5. Combustion air for power burner appliances equipped with a draft control device and having an input above 400,000 Btu/hr shall have a net free area of 0.2 square inches per 1,000 Btu/hr. Combustion air shall be provided from a single opening from the outdoors, terminating within 12 inches of the bottom of the enclosure. In lieu of this requirement, combustion air requirements specified by the manufacturer for a specific power burner appliance may be approved by the building official.

6. Combustion air for power burner appliances not equipped with a draft control device and having an input above 400,000 Btu/hr shall have a net free area of 0.1 square inches per 1,000 Btu/hr. Combustion air shall be provided from a single opening from the outdoors, terminating within 12 inches of the bottom of the enclosure. In lieu of this requirement, combustion air requirements specified by the manufacturer for a specific power burner appliance may be approved by the building official.

Table 304.1

<u>Combustion Air Requirements for Gas-fired Appliances When the Combined Input Is Up To and Including 400,000 Btu/hr</u>		
<u>Total input of appliances¹, thousands of Btu/hr (kW)</u>	<u>Required free area of air-supply opening or duct, square inches (sq mm)</u>	<u>Acceptable approximate round duct equivalent diameter², inch (mm)</u>
<u>25 (8)</u>	<u>7 (4,500)</u>	<u>3 (75)</u>
<u>50 (15)</u>	<u>7 (4,500)</u>	<u>3 (75)</u>
<u>75 (23)</u>	<u>11 (7,000)</u>	<u>4 (100)</u>
<u>100 (30)</u>	<u>14 (9,000)</u>	<u>4 (100)</u>
<u>125 (37)</u>	<u>18 (12,000)</u>	<u>5 (125)</u>
<u>150 (45)</u>	<u>22 (14,000)</u>	<u>5 (125)</u>
<u>175 (53)</u>	<u>25 (16,000)</u>	<u>6 (150)</u>
<u>200 (60)</u>	<u>29 (19,000)</u>	<u>6 (150)</u>
<u>225 (68)</u>	<u>32 (21,000)</u>	<u>6 (150)</u>
<u>250 (75)</u>	<u>36 (23,000)</u>	<u>7 (175)</u>
<u>275 (83)</u>	<u>40 (26,000)</u>	<u>7 (175)</u>
<u>300 (90)</u>	<u>43 (28,000)</u>	<u>7 (175)</u>

<u>325 (98)</u>	<u>47 (30,000)</u>	<u>8 (200)</u>
<u>350 (105)</u>	<u>50 (32,000)</u>	<u>8 (200)</u>
<u>375 (113)</u>	<u>54 (35,000)</u>	<u>8 (200)</u>
<u>400 (120)</u>	<u>58 (37,000)</u>	<u>9 (225)</u>
¹ For total inputs falling between listed capacities, use next largest listed input.		
² If flexible duct is used, increase the duct diameter by one inch.*		
*Flexible duct shall be stretched with minimal sags.		

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.5304, subpart 1. The proposed rule amendments to this part published at the time of the Notice will not be changed. The Department proposes an additional amendment which will add, “in part 1346.6012” to clarify where Appendix E is located.

Part 1346.5304, exceptions. In addition to the proposed rule amendments to this part at the time of the Notice, which will not be changed, are the following additional amendments. Upon consideration of one comment received during the comment period, three more exceptions will be added to section 304.1 and Table 304.1, “Combustion Air Requirements for Gas-fired Appliances When the Combined Input Is Up To and Including 400,000 Btu/hr” will be added.

New exception 4. Combustion air requirement calculations in the existing code are complicated and cumbersome. Table 304.1 offers a simpler alternate method to determine adequate combustion air requirements for new and existing installations within a limited input range. The method in Table 304.1 is based on the results of a research project completed for the Fire Protection Research Foundation, on behalf of National Fire Protection Association (“NFPA”), by Exponent that evaluated combustion air requirements for various gas-fired appliances.¹¹ One of the combustion air options reviewed was based on Canadian provisions that require one square inch of outdoor combustion air per 7,000 Btu/hr input rating of appliances, up to and including 400,000 Btu/hr. Because the operating conditions and heating and ventilation needs in Canada are similar to those in Minnesota, it is reasonable to apply the same formula in this code as an

¹¹ See Exhibit B, “Combustion Air Requirements for Power Burner Appliances; Final Report,” by Utiskul, Wu, Biteau of Exponent, © Fire Protection Research Foundation, January 2012.

alternative to the general requirements contained in Section 304 of the 2012 IFGC. The formula developed from the study described above and accepted for use is reasonable to apply here because the research and data are reliable and produced by a nationally recognized organization. Based on review of the report, the Department confirmed the reliability of the research and data.

New exception 5. Combustion air requirements for power burners with Btu/hr ratings above 400,000¹² equipped *with* a draft control device are not specifically and not correctly regulated in the existing code, resulting in unnecessarily large outdoor air openings in the mechanical room where power burner appliances are installed. The large openings create unsafe situations in these spaces due to possible freezing water pipes and damage to other equipment from the severe cold. A study done in 2012 shows a minimum combustion air opening of 0.2 square inches per 1,000 Btu/hr input rating for power burner appliances with Btu/hr ratings above 400,000 is adequate.¹³ It is reasonable to incorporate that as the new combustion air requirement for power burner appliances equipped with a draft control device because the formula is derived from recent, solid research conducted by a nationally recognized organization.

New exception 6. Combustion air requirements for power burners *not* equipped with a draft control device are not specifically and not correctly regulated in the existing code, resulting in unnecessarily large outdoor air openings in the mechanical room where power burner appliances are installed. The large openings create unsafe situations in these spaces due to possible freezing water pipes and damage to other equipment from the severe cold. Based on the results of a 2012 research project completed for the Fire Protection Research Foundation, on behalf of NFPA, by Exponent that evaluated combustion air requirements for various gas-fired appliances, the new exception requires a minimum combustion air opening of 0.1

¹² 400,000 Btu/hr is considered a threshold point because appliances above 400,000 Btu/hr trigger additional safety measures because of its significant size.

¹³ See Exhibit B, "Combustion Air Requirements for Power Burner Appliances; Final Report," by Utiskul, Wu, Biteau of Exponent, © Fire Protection Research Foundation, January 2012.

square inches per 1,000 Btu/hr input rating for power burner appliances.¹⁴ This is a reasonable requirement regulating the combustion air requirement for power burner appliances *not* equipped with a draft control device because it is based on recent, solid research conducted by a nationally recognized organization.

H. 1346.5800 CHAPTER 8 REFERENCED STANDARDS.

Subp. 2. **Supplemental standards.** The ~~standard~~standards listed in this part shall supplement the list of referenced standards in chapter 8 of the 2012 IFGC. The ~~standard~~standards referenced in this rule shall be considered part of the requirements of this rule to the extent prescribed in each rule or reference.

- A. NFPA 54-2012 *National Fuel Gas Code*.
- B. ANSI LC-4-2012 *Press-Connect Metallic Fittings for Use In Fuel Gas Distribution Systems*.

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.5800. The proposed rule published at the time of the Notice added one additional referenced standard, NFPA 54-2012 National Fuel Gas Code, to chapter 8, the referenced standards chapter. Upon consideration of a comment received during the comment period, a second standard that is referenced in the code, ANSI LC-4-2012 Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems, must be added to the referenced standards chapter. It is referenced in section 403.10.1, as amended. Related amendments, such as changing singular “standard” back to “standards” and renumbering accordingly, are included here as well.

I. 1346.5901 SECTION 901 (IFGC) GENERAL. [RENUMBERED TO PART 1346.5900]

Relevant excerpts:

1346.5900 CHAPTER 9, INSTALLATION AND TESTING OF FUEL GAS-FIRED EQUIPMENT. [MOVED FROM PARTS 1346.5901 TO 1346.5907]

Subpart 1. Chapter 9. The IFGC is amended by adding a chapter to read as follows:

¹⁴ Id.

SECTION 901

GENERAL CHAPTER 9

Subp. 2. Installation and testing of fuel gas-fired equipment; general.

~~901.1 General.~~

Subp. 3. Placing equipment in operation.

SECTION 902

EQUIPMENT PLACEMENT

~~902.1 Placing equipment in operation.~~

Subp. 4. Pilot operation.

SECTION 903 PILOT OPERATION

~~903.1 Pilot operation.~~

Subp. 5. Burner operation.

SECTION 904

BURNER OPERATION

~~904.1 Burner operation.~~

Subp. 6. Method of test.

SECTION 905

METHOD OF TEST

~~905.1 Method of test.~~

Subp. 7. Pressure regulators.

SECTION 906

PRESSURE REGULATORS

~~906.1 Pressure regulators.~~

Subp. 8. Equipment information.

SECTION 907

EQUIPMENT INFORMATION

907.1 Equipment information.

1346.5902 SECTION 902 (IFGC) EQUIPMENT PLACEMENT.

[RENUMBERED TO PART 1346.5900, SUBPART 3]

1346.5903 SECTION 903 (IFGC) PILOT OPERATION.

[RENUMBERED TO PART 1346.5900, SUBPART 4]

1346.5904 SECTION 904 (IFGC) BURNER OPERATION.

[RENUMBERED TO PART 1346.5900, SUBPART 5]

1346.5905 SECTION 905 (IFGC) METHOD OF TEST.

[RENUMBERED TO PART 1346.5900, SUBPART 6]

1346.5906 SECTION 906 (IFGC) PRESSURE REGULATORS.

[RENUMBERED TO PART 1346.5900, SUBPART 7]

1346.5907 SECTION 907 (IFGC) EQUIPMENT INFORMATION.

[RENUMBERED TO PART 1346.5900, SUBPART 8]

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Parts 1346.5900 to 1346.5907. The existing code adds two chapters to the IFGC. See parts 1346.5901 and 1346.6000. In the proposed amendments published at the time of the Notice, formatting and other changes were made to 1346.6000. The formatting changes in part 1346.6000 are applied here so that both rule parts that add a chapter to the IFGC are organized and formatted consistently. To reach this consistency, it requires renumbering part 1346.5901 to 1346.5900, among other formatting changes. Because the new formatting in part 1346.6000 is the most clear and logical, that format is replicated here.

- J. 1346.6000 CHAPTER 9-10, MANUFACTURED HOME
PARK/COMMUNITY FUEL GAS EQUIPMENT AND APPLIANCE
INSTALLATION.**

Subpart 1. ~~IFGC Chapter 9-10~~. The IFGC is amended by adding a chapter to read as follows:

CHAPTER ~~9-10~~
MANUFACTURED HOME PARK/COMMUNITY FUEL GAS
EQUIPMENT AND APPLIANCE INSTALLATION

Subp. 2. **General.** Except as otherwise permitted or required by this chapter, all fuel gas equipment and appliance installations in manufactured home parks and communities shall comply with the provisions of this code. The provisions of this chapter shall not apply to manufactured home gas piping, appliances, and equipment.

Subp. 3. **Required gas supply.** The minimum hourly volume of gas required at each manufactured home lot outlet or any section of the manufactured home gas piping system shall be calculated as shown in ~~IFGC Table 902-1002~~. Required gas supply for buildings or other fuel gas utilization equipment and appliances connected to the manufactured home gas piping system shall be calculated as provided in this code.

Table ~~902-1002~~

Demand Factors for Calculating Gas Piping Systems in Manufactured Home Parks and Communities

Statement of Need and Reasonableness for this Amendment to the Proposed Rule.

Part 1346.6000. The proposed rule published at the time of the Notice changes some content and formatting of the added chapter to the IFGC. However, the proposed content changes are incorrect. While the formatting changes are maintained, the content changes are reverted to the existing code language.

10. The amendments to the proposed rules do not make the rules substantially different from the proposed rules because they are within the scope of adopting the Minnesota Mechanical Code and the Minnesota Fuel Gas Code by incorporating by reference, *with amendments*, the 2012 editions of the International Mechanical Code and the International Fuel gas code as announced in the Dual Notice. Emphasis added. The amendments include corrections, clarifications and improvements based on comments submitted to the

Department. Corrections to numbering throughout and particularly in parts 1346.5900 and 1346.6000 are within the Revisor's editorial edits if not proposed here. These amendments are a logical outgrowth of the contents of the Dual Notice and to the comments submitted in response to the Dual Notice.

11. The rules are needed and reasonable.

ORDER

The above-named rules, in the form published and referenced in the State Register on May 27, 2014, with the modifications as indicated in the Revisor's draft, file number AR4147, dated September 8, 2014, are adopted under my authority in Statutes, sections 326B.02 and 326B.106.

10/15/14
Date


Ken B. Peterson, Commissioner
Department of Labor and Industry

