CHAPTER 23.20
LOCAL AMENDMENTS TO THE INTERNATIONAL MECHANICAL CODE
2000 EDITION

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The amendments to the 2000 Edition of the International Mechanical Code are listed hereafter by Section. The last digits of the section number (after the title and chapter digits) are the section of the International Mechanical Code to which the amendment refers, i.e., 23.20.303 refers to amendments to Section 303 of the International Mechanical Code 2000 Edition).

Delete entire chapter except for Section 101 - General,

**23.20.202 Definitions**

Amend by adding the following definitions:

- Heat Recovery Device - is an assembly containing a heat recovery element.
- Heat Recovery Element - is a device or series of devices whose purpose is to reclaim only the heat content of air, vapors, gases, and/or fluids that were being expelled through the exhaust system, and transferring the thermal energy so reclaimed to a location whereby a useful purpose may be served.

**23.20.301.14 Prohibited Location**

Amend sentence to read as follows:

Mechanical systems shall not be located in an elevator shaft with the exception of mechanical equipment and devices exclusively serving the elevator.

**23.20.303.3 Prohibited Locations**

From the third exception delete the words “weather stripped in accordance with the exterior door air leakage requirements of the International Energy Conservation Code and.”

Insert the words “tightly gasketed” before “solid” to read “tightly gasketed solid door.”

**23.20.303.8 Elevator Shafts**

Amend sentence to read as follows:

Mechanical systems shall not be located in an elevator shaft except mechanical equipment and devices exclusively serving the elevator.

**23.20.306.4 Appliances Under Floors**

Amend by adding the following as the first sentence:

Installation of fuel burning appliances in underfloor crawl spaces is prohibited unless prior written approval is obtained from administrative authority.

**23.20.306.5 Equipment and Appliances On Roofs or Elevated Structures**

Amend by deleting Section 306.5 and replace with the following:
Where new or replaced equipment and appliances requiring access are installed on roofs or elevated new or existing structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances’ level service space. Such access shall be located interior to the building and shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Permanent roof access shall be provided for new construction, single story buildings where roof heating, ventilation, air conditioning or similar equipment requiring regular maintenance are installed on the roof.

**Exception:** Existing or replaced equipment may be accessed by portable ladder on the single story portion of an existing building that does not exceed 16 feet (4880 mm) in height.

### 23.20.TABLE 401.6 Opening Sizes in Louvers, Grilles and Screens Protecting Outdoor Exhaust and Air Intake Openings

Revise the minimum and maximum opening sizes as follows:

<table>
<thead>
<tr>
<th>OUTDOOR OPENING TYPE</th>
<th>MINIMUM AND MAXIMUM OPENING SIZES IN LOUVERS, GRILLES AND SCREENS MEASURED IN ANY DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust openings</td>
<td>½ inch</td>
</tr>
<tr>
<td>Intake openings in residential occupancies</td>
<td>½ inch</td>
</tr>
<tr>
<td>Intake openings in other than residential occupancies</td>
<td>Not &lt; ½ inch and not &gt; 1 inch</td>
</tr>
</tbody>
</table>

### 23.20.403.3 Ventilation Rate

Amend by adding to the end of the first sentence the words “or in accordance with the latest version of ASHRAE Standard 62.”

### 23.20.406.1 General

Delete Section 406.1.

### 23.20.501.3 Outdoor Discharge

Delete Exception to 501.3

### 23.20.505.1 Domestic Systems

Delete Exception 1 to 505.1

### 23.20.506.5 Kitchen Ventilation Heat Recovery Equipment

Amend by adding new Section 506.5 as follows:

506.5.1 General. The provisions of this section apply to installation of kitchen ventilation heat recovery equipment installed within the interior of the building.
506.5.2 Ceiling Penetrations. Any grease duct or hood penetrating a ceiling (whether or not the ceiling is rated) shall be considered concealed and must be enclosed within a rated duct enclosure per Section 506.3.11.

506.5.3 Equipment Installations. Only fans associated with heat recovery devices, and heat recovery devices serving Type I hoods may be located in the grease duct within a rated enclosure. This equipment must be specifically listed or the equipment housing must maintain the integrity of the externally welded liquid tight duct up to the entrance of and the exit from the exhaust fan and/or heat recovery element for kitchen ventilation application. Provisions shall be made for access to the equipment and internal components of devices containing fans and/or heat recovery elements for proper maintenance and cleaning. Duct access doors shall comply with Section 506.3.9. Access doors to enclosure shall comply with Section 506.3.12.

506.5.4 Duct and Equipment Enclosure. A grease duct enclosure may be enlarged to enclose equipment or may connect to the equipment housing if the equipment housing meets the rating of the grease duct enclosure. The duct may be run exposed within the rated equipment enclosure to the entrance of, and the exit from, the equipment which complies with new Section 506.5.3.

506.5.5 Fire Dampers. Other associated duct work located within the grease duct enclosure per new Section 506.5.3 shall be fire dampered where penetrations of the enclosure occur.

506.5.6 Exhaust Outlets. The grease duct shall terminate above the roof per Section 506.3.13 and Section 506.4. A grease duct enclosure that stops at the rated equipment enclosure shall be vented to the exterior as if the rated equipment enclosure were a continuation of the duct enclosure.

23.20.511.1 Dust, Stock and Refuse Conveying Systems

Amend by adding the following exception to 511.1 to read as follows:

**Exception:** Listed dust collectors and separator designed and installed in accordance with NFPA 664.
23.20.601.3  Contamination Prevention
Amend by adding the following exception to 601.3 to read as follows:

Exception: Environmental air exhaust ducts under positive pressure may extend into or through ducts or plenums if one of the following design approaches is used:
1. Route environmental air exhaust ducts inside a shaft when passing through a duct or plenum.
2. Install a second duct around the environmental air exhaust duct where passing through ducts and plenums to minimize leakage to the duct or plenum. Seal both ends of the outer duct to outside.
3. Seal the environmental air exhaust ducts along all seams and joints using a listed low to medium pressure duct sealant which is typically applied by brush, trowel, or caulking gun. Install sealant per manufacturer's recommendations.
4. Provide flexible duct with no seams in the duct or plenum only to a limit of 8'. The 8' limit is due to high static losses. Also, sleeving the metal duct with flexible seamless duct is acceptable.

23.20.602.1  General
Delete from the second sentence the words “uninhabited crawl spaces.”
Add the following sentence to the end of the paragraph: “Underfloor crawlspaces shall not be used as plenums.”

23.20.603.8  Joints, Seams and Connections
Delete paragraph and replace with the following:
All joints, longitudinal and transverse seams, and connections in ductwork, shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, or tapes. Tapes and mastics used to seal ductwork shall be listed and labeled in accordance with UL 181A or UL 181B. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Duct tape is not permitted as a sealant on any metal ducts.

Add the following exception:

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

23.20.604.1  General
Delete the words “and the International Energy Conservation Code.”
Add to the end of the paragraph:
All supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation when located in unconditioned spaces and with a minimum of R-8 insulation when located outside the building envelope. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:
1. When located within equipment.
2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).
3. When located within the under floor crawlspace of a one or two family dwelling unit.

23.20.700 **Combustion Air**

Amend Chapter 7 by adding new Section 711 titled Cold Climate Alternate Requirement for Combustion and Ventilation Air:

Section 711 Cold Climate Alternate Requirements For Combustion and Ventilation Air.

711.1 Purpose

711.1 Purpose. The purpose of this section is to provide alternate methods of designing combustion air and ventilation air systems for fuel burning appliances in cold climate regions. Only persons registered to practice engineering in the applicable jurisdiction will be permitted to use these alternate design methods.

711.2 Scope

711.2.1 Scope. The requirements of this section apply to all fuel gas burning appliances.

**Exception:** Direct vent appliances, listed cooking appliances, appliances having separated combustion system, enclosed furnaces, refrigerators and domestic clothes dryers.

711.3 Definitions

Certain words and terms used in this section shall have meanings as listed. The below-listed definitions shall apply to this section only, even though they may differ with broader definitions found elsewhere in the code.

- **COMBUSTION AIR** is that air required for stoichiometric combustion, plus excess air, plus flue dilution air.
- **VENTILATION AIR** is that air required for cooling of the appliance enclosure to maintain temperatures required for proper equipment operation.
- **FREE AREA** is the net actual open area of a louver, screen, duct, or intake grille.

711.4 General

711.4.1 Air Supply. Fuel-burning equipment shall be provided with a sufficient supply of combustion and ventilation air.

711.4.1.1 Enclosures Containing Fuel Burning Appliances. Enclosures shall be provided with minimum unobstructed combustion air openings as specified in Section 711.9 and arranged as specified in Sections 711.5 and 711.6 of this code and ventilation air systems shall be as specified in Section 711.10.

711.4.1.2 Existing Buildings. When fuel-burning appliances are installed in an existing building containing other fuel-burning equipment, the enclosure shall be provided with sufficient combustion and ventilation air for all fuel-burning equipment contained therein as specified in Sections 711.9 and 711.10.

711.5 Combustion Air Openings

711.5.1 Location. The combustion air opening(s) may be located anywhere in the enclosure provided that there is an unobstructed area extended to the fire box that does not increase the total combustion air system static pressure requirements.
711.5.2 Dampers Prohibited. Combustion air openings shall not be installed so as to
open into construction where fire dampers are required. Volume dampers shall not be
installed in combustion air openings.

    **Exception:** Motor operated dampers interlocked with appliance controls to open
damper prior to firing appliance. If damper blade actuated end switch are provided
to prevent appliance operation should dampers fail to open.

711.5.3 Screening. Combustion air openings shall be covered with corrosion-resistant
screen of 1/2 inch (12.8 mm) mesh, except as provided in Section 711.7.3.

    **Exception:** Combustion air openings serving a nonresidential portion of a building
may be covered with a screen having openings larger than 1/2 inch (12.8 mm) but
in no case larger than 1 inch (25.4 mm).

711.6 Sources Of Combustion And Ventilation Air
711.6.1 Air from Outside. Combustion and ventilation air obtained from outside the
building shall be supplied as follows:
1. Through permanent openings of the required area directly to the outside of the
building through the floor, roof, or walls of the appliance enclosure; or
2. Through continuous ducts of the required cross-sectional area extending from the
appliance enclosure to the outside of the building.

711.6.2 Under-Floor Supply. Combustion and ventilation air openings may connect with
under-floor areas conforming to the following requirements:
1. Under-floor spaces having unobstructed openings to the exterior which are sized to
not exceed the maximum system static pressure requirements specified in Sections
711.9 and 711.10.
2. The height of the under-floor space shall comply with the requirements of the
Building Code and be without obstruction to the free flow of air.

711.6.3 Interior Spaces. Large indoor areas may be used for combustion and/or
ventilation air if sufficient infiltration or other outside air supply is available by nature of
the building construction, system design, or building use.

711.6.4 Prohibited Sources. Openings and ducts shall not connect appliance enclosures
with space in which the operation of a fan may adversely affect the flow of combustion
air. Combustion and ventilation air shall not be obtained from a hazardous location or
from any area in which objectionable quantities of flammable vapor, lint or dust are given
off. Combustion and ventilation air shall not be taken from a machinery room.

711.7 Combustion And Ventilation Air Ducts
711.7.1 General. Combustion and ventilation air ducts shall:
1. Be of galvanized steel complying with Chapter 6 or equivalent corrosion-resistant
material approved for this use.
2. Have a minimum cross-sectional dimension of 3 inches.
3. Serve a single appliance enclosure.
711.7.2 Dampers. Combustion air ducts shall not be installed so as to pass through
construction where fire dampers are required, unless properly enclosed in a rated shaft.
Volume dampers shall not be installed in combustion air ducts.

**Exception:** Motor operated dampers interlocked with appliance controls to open
damper prior to firing appliance are permitted, if damper blade actuated end
switches are provided to prevent appliance operation should dampers fail to open.

711.7.3 Screen. Neither end of the ducts, which terminate in an attic shall be screened.

711.8 Special Conditions Created By Mechanical Exhausting Or Fireplaces

Operation of exhaust fans, kitchen ventilation systems, clothes dryers or fireplaces shall
be considered in determining combustion and ventilation air requirements to avoid
unsatisfactory operation of installed fuel burning appliances.

711.9 Area Of Combustion Air Openings

711.9.1 General. The free area of openings, ducts or plenums, screens and louvers
supplying combustion air to enclosures containing fuel-burning appliances shall be as
required: The opening(s) shall communicate directly or by means of ducts with outdoors
or to such spaces (crawl space) that freely communicate with outdoors and shall be sized
in accordance with Table No. 7-1.

711.10 Ventilation Air

711.10.1 General. In addition to the combustion air required, sufficient ventilation shall
be supplied for proper operation of equipment. Ventilation system shall be designed to
maintain positive or atmospheric pressures within the enclosure. If exhaust fans are
provided, mechanical make-up air fan must be installed to make-up exhausted air.
Natural or gravity make-up air is not allowed.

**THIS AREA INTENTIONALLY LEFT BLANK**
<table>
<thead>
<tr>
<th>Fuels</th>
<th>System Static Pressure Limits¹</th>
<th>Combustion Air Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Atmospheric</td>
<td>Forced Draft</td>
</tr>
<tr>
<td></td>
<td>Draft Hoods</td>
<td>Barometric Dampers</td>
</tr>
<tr>
<td>GAS</td>
<td>0.02” WG</td>
<td>0.02” WG</td>
</tr>
<tr>
<td>(Natural,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propane,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butane)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIQUID</td>
<td>0.02” WG</td>
<td>0.02” WG</td>
</tr>
<tr>
<td>(Light Oil,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Oil)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOLID</td>
<td>0.02” WG</td>
<td>0.02” WG</td>
</tr>
<tr>
<td>(Coal, Coke)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** Static pressure values represent maximum static pressure losses across all components of the combustion air system including screens, louvers, ducts and fittings.

**Note 2:** For enclosures containing both atmospheric and forced draft appliances, the most restrictive design requirements shall apply.

PER ASHRAE 1993 FUNDAMENTALS HANDBOOK

CHAPTER 15 TABLE 11 (Pg 15.10)

1 cu. ft. natural gas requires 9.6 cu. ft. air
1 gallon No. 2 fuel oil requires 106 lbs. air
1 lb. semi bituminous coal requires 11.2 lbs. air
Convert to CF/1000 Btu/h

**GAS:**

\[
\begin{align*}
9.6 \text{ cu. ft. air} \times \frac{1 \text{ cu. ft. gas}}{1 \text{ cu. ft. air}} &= 9.6 \text{ cu. ft. air/1000 Btu} \\
1 \text{ cu. ft. gas} \times 1000 \text{ Btu} &= 9.6 \times 1000 \text{ Btu} = 10.85 \text{ cu. ft. air/1000 Btu} \\
&\quad (14.4 \times 50\% \text{ excess})
\end{align*}
\]

**OIL:**

\[
\begin{align*}
106 \text{ lbs. air} \times \frac{1 \text{ cu. ft. air}}{1 \text{ cu. ft. air}} \times \frac{1 \text{ gallon oil}}{140,000 \text{ Btu}} \times 1000 &= 10.85 \text{ cu. ft. air/1000 Btu} \\
1 \text{ gallon oil} &= 0.0698 \text{ lbs.} \\
&\quad (16.3 \times 50\% \text{ excess})
\end{align*}
\]

**COAL:**

\[
\begin{align*}
11.2 \text{ lbs. air} \times \frac{1 \text{ cu. ft. air}}{1 \text{ cu. ft. air}} \times \frac{1 \text{ lb. coal}}{13,000 \text{ Btu}} \times 1000 &= 12.3 \text{ cu. ft. air/1000 Btu} \\
1 \text{ lb. coal} &= 0.0698 \text{ lbs.} \\
&\quad (18.5 \times 50\% \text{ excess})
\end{align*}
\]
*Air at 2000 feet above sea level. Installations above this must derate appliance output 4%/1000 feet.

**Confirm heat capacity of coal, since it varies with type of coal.

EXAMPLE: Combustion Air Flow Rates (CFM) per 100,000 Btuh input. Verify heating values and adjust CFM as required.

<table>
<thead>
<tr>
<th></th>
<th>STOICHIOMETRIC</th>
<th>COMBUSTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0% EXCESS AIR</td>
<td>@ 50% EXCESS AIR</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>16.0 CFM</td>
<td>24 CFM</td>
</tr>
<tr>
<td>1000 Btuh/cu. ft.</td>
<td>100,000 Btuh</td>
<td>100,000 Btuh</td>
</tr>
<tr>
<td>No. 2 Fuel Oil</td>
<td>18.1 CFM</td>
<td>27.1 CFM</td>
</tr>
<tr>
<td>140,000 Btuh/gal.</td>
<td>100,000 Btuh</td>
<td>100,000 Btuh</td>
</tr>
<tr>
<td>Coal - Semi Bituminous</td>
<td>20.5 CFM</td>
<td>30.8 CFM</td>
</tr>
<tr>
<td>13,000 Btuh/lb</td>
<td>100,000 Btuh</td>
<td>100,000 Btuh</td>
</tr>
</tbody>
</table>

23.20.701.3 **Conditions Created By Mechanical Exhausting**

Amend by adding the following paragraph to Section 701.3

Fuel burning appliances may be required to pass a back draft test as a part of the final plumbing or mechanical inspection. This test shall be conducted with all exhaust fans operating and with fireplace draft open.

23.20.701.4.2 **Attic Space**

Delete the wording of this section and replace with the following:

Combustion air shall not be obtained from the attic unless prior written approval is obtained from the administrative authority.

23.20.801.20 **Locations And Support Of Venting Systems Other Than Masonry Chimneys**

Add a new Section 801.20 as follows:

Unless a vent listed for exterior use in cold weather climates is installed, a venting system installed exterior to the building outside the thermal envelope shall be installed in an insulated (R-19 minimum) shaft. The portion of the vent system that is above the last roof and its projected plane need not be enclosed. The portion of the venting system passing through an attic space need not be insulated or enclosed.

23.20.802.9 **Vent Terminals - Ice Dam Protection**

Amend by adding new Paragraph 802.9 as follows:

Vent terminations that penetrate a metal roof with a pitch shall be protected by an ice dam or deflector of an approved type acceptable to the Administrative Authority.

23.20.804.3.4 **Horizontal Terminations**

Add the following two sentences to Item 6:
An anticipated sow depth of 12 inches shall be used when determining the manufacturer’s minimum vent termination height. Measurements shall be made to the bottom of the vent outlet.

23.20.923.2 Small Ceramic Kilns - Ventilation
Amend by adding Section 923.2 as follows:

923.2 Ventilation. A canopy-type hood shall be installed directly above each kiln. The face opening area of the hood shall be equal to or greater than the top horizontal surface area of the kiln. The hood shall be constructed of not less than 0.024-inch (0.61mm) (No. 24 U.S. gauge) galvanized steel or equivalent and be supported at a height of between 12 inches (305 mm) and 30 inches (750 mm) above the kiln by noncombustible supports.

Exception: Electric kilns installed with listed exhaust blowers may be used when marked as being suitable for the kiln and installed in accordance with manufacturer's instructions.

Each hood shall be connected to a gravity ventilation duct extending in a vertical direction to outside the building. This duct shall be of the same construction as the hood and shall have a minimum cross-sectional area of not less than one fifteenth of the face opening area of the hood. The duct shall terminate a minimum of 12 inches (305 mm) above any portion of a building within four feet (1.22 m) and terminate no less than four feet (1.22 m) from any openable windows or other openings into the building or adjacent property line. The duct opening to the outside shall be shielded, without reduction of duct area, to prevent entrance of rain into the duct. The duct shall be supported at each section by noncombustible supports.

Provisions shall be made for air to enter the room in which a kiln is installed at a rate at least equal to the air being removed through the kiln hood.

23.20.1001.1 Scope
Amend Exception 7 by deleting the words “or state”.

23.20.1006.7 Boiler Safety Devices
Amend by adding “Table 10-A” after the word “instructions.”
Table 10-A – CONTROLS AND LIMIT DEVICES FOR AUTOMATIC BOILERS

<table>
<thead>
<tr>
<th>Boiler Group</th>
<th>Fuel</th>
<th>Input Range/ (inclusive) (at 20°F/70°F for W)</th>
<th>Type Of Pilot</th>
<th>Trial for Pilot</th>
<th>Direct Electric Ignition</th>
<th>Main Burner Flame Failure</th>
<th>Automatic Fuel Supply Control</th>
<th>Automatic Air Supply Control</th>
<th>Low Fire Shut Up Control</th>
<th>Pre-Purging Control</th>
<th>Hot Water Temp. and Low Water Limit Controls</th>
<th>Mean Temperature and Low Water Limit Controls</th>
<th>Approved Fuel Shutoff</th>
<th>Control and Limit Device System Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Gas</td>
<td>0-400,000 Btu/h</td>
<td>Any type</td>
<td>Not required</td>
<td>90 90 90 Not required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
</tr>
<tr>
<td>B Gas</td>
<td>400,001-2,500,000 Btu/h</td>
<td>Interrupted or intermittent</td>
<td>15 15 15 2-4</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>C Gas</td>
<td>2,500,001-5,000,000 Btu/h</td>
<td>Interrupted or intermittent</td>
<td>15 15 15 2-4</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
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<td>Required</td>
<td>Required</td>
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</tr>
<tr>
<td>D Gas</td>
<td>5,000,001-8,000,000 Btu/h</td>
<td>Interrupted</td>
<td>15 15 15 2-4</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
<td>Required</td>
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<tr>
<td>E Oil</td>
<td>0-400,000 Btu/h</td>
<td>Any type</td>
<td>Not required</td>
<td>90 90 90 Not required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
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<td>Required</td>
</tr>
<tr>
<td>F Oil</td>
<td>400,001-1,000,000 Btu/h</td>
<td>Interrupted</td>
<td>Not required</td>
<td>30 30 2-4</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
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<tr>
<td>G Oil</td>
<td>1,000,001-3,000,000 Btu/h</td>
<td>Interrupted</td>
<td>Not required</td>
<td>15 15 2-4</td>
<td>Required</td>
<td>Required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required</td>
<td>Not required</td>
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<td>Required</td>
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</tr>
<tr>
<td>H Oil</td>
<td>3,000,001-5,000,000 Btu/h</td>
<td>Interrupted</td>
<td>15 15 60 2-4</td>
<td>Required</td>
<td>Required</td>
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</tr>
<tr>
<td>K Elec</td>
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<td>Not required</td>
<td>Not required</td>
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<td>Not required</td>
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23.20.1006.7 Table 10A Controls and Limit Devices for Automatic Boilers

1. Fuel input shall be determined by one of the following:
   1.1 The maximum burner input as shown on the burner nameplate or as otherwise identified by the manufacturer.
   2.2 The nominal boiler rating, as determined by the building official, plus 25 percent.

2. Automatic boilers shall have one flame failure device on each burner which shall prove the presence of a suitable ignition source at the point where it will reliably ignite the main burner, except that boiler Groups A, B, E, F and G which are equipped with direct electric ignition shall monitor the main burner, and all boiler groups using interrupted pilots shall monitor only the main burner after the prescribed limited trial and ignition periods. Boiler Group A equipped with continuous pilot shall accomplish 100 percent shutoff within 90 seconds upon pilot flame failure. The use of intermittent pilots in boiler Group C is limited to approved burner units.

3. In boiler Groups B, C and D, a 90-second main burner flame failure limit may apply if continuous pilots are provided on manufacturer-assembled boiler-burner units which have been approved by an approved testing agency as complying with nationally recognized standards approved by the building official. Boiler Groups F and G equipped to reenergize their ignition system within 0.8 second after main burner flame failure will be permitted 30 seconds for Group F or 15 seconds for Group G to reestablish its main burner flame.

4. Boiler Groups C and D shall have controls interlocked to accomplish a nonrecycling fuel shutoff upon high or low gas pressure, and boiler Groups F, G and H using steam or air for fuel atomization shall have controls interlocked to accomplish a nonrecycling fuel shutoff upon low atomizing steam or air pressure. Boiler Groups F, G and H equipped with a preheated oil system shall have controls interlocked to provide fuel shutoff upon low oil temperature.
Automatic boilers shall have controls interlocked to shut off the fuel supply in the event of draft failure if forced or induced draft fans are used or, in the event of low combustion airflow, if a gas power burner is used. Where a single motor directly driving both the fan and the oil pump is used, a separate control is not required.

Boiler Groups C, D and H, when firing in excess of 400,000 Btu (117 kW) per combustion chamber, shall be provided with low fire start of its main burner system to permit smooth light off. This will normally be a rate of approximately one third of its maximum firing rate.

Boiler Groups C, D and H shall not permit pilot or main burner trial for ignition operation before a purging operation of sufficient duration to permit a minimum of four complete air changes through the furnace, including combustion chamber and the boiler passes. Where this is not readily determinable, five complete air changes of the furnace, including combustion chamber up to the first pass, will be considered equivalent. An atmospheric gas burner with no mechanical means of creating air movement or an oil burner which obtains two thirds or more of the air required for combustion without mechanical means of creating air movement shall not require purge by means of four air changes so long as its secondary air openings are not provided with means of closing. If such burners have means of closing secondary air openings, a time delay must be provided which puts these closures in a normally open position for four minutes before an attempt for ignition. An installation with a trapped combustion chamber shall in every case be provided with a mechanical means of creating air movement for purging.

Every automatic hot-water-heating boiler, low-pressure hot-water-heating boiler, and power hot-water boiler shall be equipped with two high-temperature limit controls with a manual reset on the control with the higher setting interlocked to shut off the main fuel supply, except that manual reset on the high-temperature limit control shall not be required on any automatic package boiler not exceeding 400,000 Btu/h (117 kW) input and which has been approved by an approved testing agency. Every automatic hot-water heating, power boiler and package hot-water supply boiler shall be equipped with one low-water-level limit control with a manual reset interlocked to shut off the fuel supply so installed as to prevent damage to the boiler and to permit testing of the control without draining the heating system except on boilers used in Group R Occupancies of less than six units and in Group M Occupancies and further, except that the low-water-level limit control is not required on package hot-water-supply boilers approved by a nationally recognized testing agency. However, a low-water-flow limit control installed in the circulating water line may be used instead of the low-water-level limit control for the same purpose on coil-type boilers.

Every automatic low-pressure steam-heating boiler, small power boiler and power steam boiler shall be equipped with two high-steam pressure limit controls interlocked to shut off the fuel supply to the main burner with manual reset on the control with the higher setting and two low-water-level limit controls, one of which shall be provided with a manual reset device and independent of the feed water controller. Coil-type flash steam boilers may use two high-temperature limit controls, one of which shall be manually reset in the hot-water coil section of the boiler instead of the low-water-level limit control.

Boiler Groups C, D and H shall use an approved automatic reset safety shutoff valve for the main burner fuel shutoff, which shall be interlocked to the programming control devices required. On oil burners where the safety shutoff valve will be subjected to pressures in excess of 10 psi (69 kPa) when the burner is not firing, a second safety shutoff valve shall be provided in series with the first. Boiler Groups C and D, using gas in excess of 1-pound-per-square-inch
(6.9 kPa) pressure or having a trapped combustion chamber or employing horizontal fire tubes, shall be equipped with two approved safety shutoff valves, one of which shall be an automatic-reset type, one of which may be used as an operating control, and both of which shall be interlocked to the limit-control devices required. Boiler Groups C and D using gas in excess of 1-pound-per-square-inch (6.9 kPa) pressure shall be provided with a permanent and ready means for making periodic tightness checks of the main fuel safety shutoff valves.

Control and limit device systems shall be grounded with operating voltage not to exceed 150 volts, except that, on approval by the building official, existing control equipment to be reused in an altered boiler control system may use 220-volt single phase with one side grounded, provided such voltage is used for all controls. Control and limit devices shall interrupt the ungrounded side of the circuit. A readily accessible means of manually disconnecting the control circuit shall be provided with controls so arranged that when they are deenergized the burner shall be inoperative.

23.20.1006.8 **Electrical Requirements**
Delete section in its entirety.

23.20.1007 **Boiler Low-Water Cutoff**
Delete section in its entirety.

23.20.1104.2.2 **Industrial Occupancies and Refrigerated Rooms**
Revise section heading by adding “and commercial” after “industrial” to read:

1104.2.2 Industrial and Commercial Occupancies and Refrigerated Rooms

23.20.1105.3 **Refrigerant Detector**
Add a second sentence to read as follows:

Refrigerant detectors shall alarm both inside and outside the machinery room or refrigerated space.

23.20.1105.6.2 **Make-up Air**
Amend last sentence by changing ¼ -inch to ½ -inch.

23.20.1204.2 **Required Thickness**
Revise section heading and paragraph to read as follows:

1204.2 Required Insulation. The surface temperature of piping located within normal reach of building occupants shall not exceed 120.

23.20.1301.1 **Scope**
Revise the first sentence of the section to read as follows:

The design, installation, construction, and repair of fuel oil storage and piping systems shall be in accordance with this chapter and NFPA 31.

23.20. International Fire Code **Compressed Gases, International Fire Code Chapter 30**
Chapter 30 of the International Fire Code is hereby adopted by reference.

23.20. International Fire Code **Service Stations and Repair Garages, International Fire Code Chapter 22**
Service Stations and Repair Garages from the International Fire Code are hereby adopted by reference.