

## **4101:2-9-01 Specific appliances, fireplaces and solid fuel-burning equipment.**

*[Comment: When a reference is made within this rule to a federal statutory provision, an industry consensus standard, or any other technical publication, the specific date and title of the publication as well as the name and address of the promulgating agency are listed in rule 4101:2-15-01 of the Administrative Code. The application of the referenced standards shall be limited and as prescribed in section 102.5 of rule 4101:1-1-01 of the Administrative Code.]*

### **SECTION 901 GENERAL**

**901.1 Scope.** This chapter shall govern the approval, design, installation, construction, maintenance, alteration and repair of the appliances and equipment specifically identified herein and factory-built fireplaces. The approval, design, installation, construction, maintenance, alteration and repair of gas-fired appliances shall be regulated by the “International Fuel Gas Code”.

***Exception:** Section 501.8 of the “International Fuel Gas Code” permits certain gas fired appliances to be installed without venting. This section should not be construed as permitting the installation of portable unvented heaters in locations otherwise prohibited by section 3701.82 of the Revised Code or rules adopted by the state fire marshal pursuant to 3701.82 of the Revised Code.*

**901.2 General.** The requirements of this chapter shall apply to the mechanical equipment and appliances regulated by this chapter, in addition to the other requirements of this code.

**901.3 Hazardous locations.** Fireplaces and solid fuel-burning appliances shall not be installed in hazardous locations.

### **SECTION 902 MASONRY FIREPLACES**

**902.1 General.** Masonry fireplaces shall be constructed in accordance with the *building code*.

**902.2 Fireplace accessories.** Listed and labeled fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer’s instructions. Fireplace accessories shall comply with UL 907.

### **SECTION 903 FACTORY-BUILT FIREPLACES**

**903.1 General.** Factory-built fireplaces shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Factory-built fireplaces shall be tested in accordance with UL 127.

**903.2 Hearth extensions.** Hearth extensions of approved factory-built fireplaces shall be installed in accordance with the listing of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

**903.3 Unvented gas log heaters.** An unvented gas log heater shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, listed and labeled for such use in accordance with UL 127.

**903.4 Gasketed fireplace doors.** A gasketed fireplace door shall not be installed on a factory-built fireplace except where the fireplace system has been specifically tested, listed and labeled for such use in accordance with UL 127.

### **SECTION 904 PELLET FUEL-BURNING APPLIANCES**

**904.1 General.** Pellet fuel-burning appliances shall be listed and labeled in accordance with ASTM E 1509 and shall be installed in accordance with the terms of the listing.

### **SECTION 905 FIREPLACE STOVES AND ROOM HEATERS**

**905.1 General.** Fireplace stoves and solid-fuel-type room heaters shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Fireplace stoves shall be tested in accordance with UL 737. Solid-fuel-type room heaters shall be tested in accordance with UL 1482. Fireplace inserts intended for installation in fireplaces shall be listed and labeled in accordance with the requirements of UL 1482 and shall be installed in accordance with the manufacturer's instructions.

**905.2 Connection to fireplace.** The connection of solid fuel appliances to chimney flues serving fireplaces shall comply with Sections 801.7 and 801.10.

**905.3 Hearth extensions.** Hearth extensions for fireplace stoves shall be installed in accordance with the listing of the fireplace stove. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

## **SECTION 906 FACTORY-BUILT BARBECUE APPLIANCES**

**906.1 General.** Factory-built barbecue appliances shall be of an approved type and shall be installed in accordance with the manufacturer's instructions, this chapter and Chapters 3, 5, 7 and 8, and the International Fuel Gas Code.

## **SECTION 907 INCINERATORS AND CREMATORIES**

**907.1 General.** Incinerators and crematories shall be listed and labeled in accordance with UL 791 and shall be installed in accordance with the manufacturer's instructions.

## **SECTION 908 COOLING TOWERS, EVAPORATIVE CONDENSERS AND FLUID COOLERS**

**908.1 General.** A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995.

**908.2 Access.** Cooling towers, evaporative condensers and fluid coolers shall be provided with ready access.

**908.3 Location.** Cooling towers, evaporative condensers and fluid coolers shall be located to prevent the discharge vapor plumes from entering occupied spaces *or outdoor public areas*. Plume discharges shall be not less than 5 feet (1524 mm) above or ~~20~~ 25 feet (~~6096~~7620 mm) away from any ventilation inlet to a building *including operable windows*. ~~Location on the property shall be as required for buildings in accordance with the building code.~~

*Note: See ASHRAE Guideline 12-2000 Minimizing the Risk of Legionellosis Associated with Building Water Systems.*

**908.4 Support and anchorage.** Supports for cooling towers, evaporative

condensers and fluid coolers shall be designed in accordance with the *building code*. Seismic restraints shall be as required by the *building code*.

**908.5 Water supply.** Cooling towers, evaporative coolers and fluid coolers shall be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. The piping system and protection of the potable water supply system shall be installed as required by the *plumbing code*.

**908.6 Drainage.** Drains, overflows and blowdown provisions shall be indirectly connected to an approved disposal location. Discharge of chemical waste shall be approved by the appropriate regulatory authority.

**908.7 Refrigerants and hazardous fluids.** Heat exchange equipment that contains a refrigerant and that is part of a closed refrigeration system shall comply with Chapter 11. Heat exchange equipment containing heat transfer fluids which are flammable, combustible or hazardous shall comply with the *fire code*.

**908.8 Cooling towers.** Cooling towers, both open circuit and closed circuit type, and evaporative condensers shall comply with Sections 908.8.1 and 908.8.2.

**908.8.1 Conductivity or flow-based control of cycles of concentration.** Cooling towers and evaporative condensers shall include controls that automate system bleed based on conductivity, fraction of metered makeup volume, metered bleed volume, recirculating pump run time or bleed time.

**908.8.2 Drift eliminators.** Cooling towers and evaporative condensers shall be equipped with drift eliminators that have a maximum drift rate of 0.005 percent of the circulated water flow rate as established in the equipment's design specifications.

## SECTION 909 VENTED WALL FURNACES

**909.1 General.** Vented wall furnaces shall be installed in accordance with their listing and the manufacturer's instructions. Oil-fired furnaces shall be tested in accordance with UL 730.

**909.2 Location.** Vented wall furnaces shall be located so as not to cause a fire hazard to walls, floors, combustible furnishings or doors. Vented wall furnaces installed between bathrooms and adjoining rooms shall not circulate air from

bathrooms to other parts of the building.

**909.3 Door swing.** Vented wall furnaces shall be located so that a door cannot swing within 12 inches (305 mm) of an air inlet or air outlet of such furnace measured at right angles to the opening. Doorstops or door closers shall not be installed to obtain this clearance.

**909.4 Ducts prohibited.** Ducts shall not be attached to wall furnaces. Casing extension boots shall not be installed unless listed as part of the appliance.

**909.5 Manual shutoff valve.** A manual shutoff valve shall be installed ahead of all controls.

**909.6 Access.** Vented wall furnaces shall be provided with access for cleaning of heating surfaces, removal of burners, replacement of sections, motors, controls, filters and other working parts, and for adjustments and lubrication of parts requiring such attention. Panels, grilles and access doors that must be removed for normal servicing operations shall not be attached to the building construction.

## **SECTION 910 FLOOR FURNACES**

**910.1 General.** Floor furnaces shall be installed in accordance with their listing and the manufacturer's instructions. Oil-fired furnaces shall be tested in accordance with UL 729.

**910.2 Placement.** Floor furnaces shall not be installed in the floor of any aisle or passageway of any auditorium, public hall, place of assembly, or in any egress element from any such room or space.

With the exception of wall register models, a floor furnace shall not be placed closer than 6 inches (152 mm) to the nearest wall, and wall register models shall not be placed closer than 6 inches (152 mm) to a corner.

The furnace shall be placed such that a drapery or similar combustible object will not be nearer than 12 inches (305 mm) to any portion of the register of the furnace. Floor furnaces shall not be installed in concrete floor construction built on grade. The controlling thermostat for a floor furnace shall be located within the same room or space as the floor furnace or shall be located in an adjacent room or space that is permanently open to the room or space containing the floor furnace.

**910.3 Bracing.** The floor around the furnace shall be braced and headed with a support framework design in accordance with the *building code*.

**910.4 Clearance.** The lowest portion of the floor furnace shall have not less than a 6-inch (152 mm) clearance from the grade level; except where the lower 6-inch (152 mm) portion of the floor furnace is sealed by the manufacturer to prevent entrance of water, the minimum clearance shall be reduced to not less than 2 inches (51 mm). Where these clearances are not present, the ground below and to the sides shall be excavated to form a pit under the furnace so that the required clearance is provided beneath the lowest portion of the furnace. A 12-inch (305 mm) minimum clearance shall be provided on all sides except the control side, which shall have an 18-inch (457 mm) minimum clearance.

### **SECTION 911 DUCT FURNACES**

**911.1 General.** Duct furnaces shall be installed in accordance with the manufacturer's instructions. Electric duct furnaces shall comply with UL 1996.

### **SECTION 912 INFRARED RADIANT HEATERS**

**912.1 General.** Electric infrared radiant heaters shall comply with UL 499.

**912.2 Support.** Infrared radiant heaters shall be fixed in a position independent of fuel and electric supply lines. Hangers and brackets shall be noncombustible material.

**912.3 Clearances.** Heaters shall be installed with clearances from combustible material in accordance with the manufacturer's installation instructions.

### **SECTION 913 CLOTHES DRYERS**

**913.1 General.** Clothes dryers shall be installed in accordance with the manufacturer's instructions. Electric residential clothes dryers shall be tested in accordance with UL 2158. Electric coin-operated clothes dryers shall be tested in accordance with UL 2158. Electric commercial clothes dryers shall be tested in accordance with UL 1240.

**913.2 Exhaust required.** Clothes dryers shall be exhausted in accordance with Section 504.

**913.3 Clearances.** Clothes dryers shall be installed with clearance to combustibles in accordance with the manufacturer's instructions.

## **SECTION 914 SAUNA HEATERS**

**914.1 Location and protection.** Sauna heaters shall be located so as to minimize the possibility of accidental contact by a person in the room.

**914.1.1 Guards.** Sauna heaters shall be protected from accidental contact by an approved guard or barrier of material having a low coefficient of thermal conductivity. The guard shall not substantially affect the transfer of heat from the heater to the room.

**914.2 Installation.** Sauna heaters shall be listed and labeled in accordance with UL 875 and shall be installed in accordance with their listing and the manufacturer's instructions.

**914.3 Access.** Panels, grilles and access doors that are required to be removed for normal servicing operations shall not be attached to the building.

**914.4 Heat and time controls.** Sauna heaters shall be equipped with a thermostat that will limit room temperature to 194°F (90°C). If the thermostat is not an integral part of the sauna heater, the heat-sensing element shall be located within 6 inches (152 mm) of the ceiling. If the heat-sensing element is a capillary tube and bulb, the assembly shall be attached to the wall or other support, and shall be protected against physical damage.

**914.4.1 Timers.** A timer, if provided to control main burner operation, shall have a maximum operating time of 1 hour. The control for the timer shall be located outside the sauna room.

**914.5 Sauna room.** A ventilation opening into the sauna room shall be provided. The opening shall be not less than 4 inches by 8 inches (102 mm by 203 mm) located near the top of the door into the sauna room.

**914.5.1 Warning notice.** The following permanent notice, constructed of approved material, shall be mechanically attached to the sauna room on the outside:

WARNING: DO NOT EXCEED 30 MINUTES IN SAUNA. EXCESSIVE EXPOSURE CAN BE HARMFUL TO HEALTH. ANY PERSON WITH

POOR HEALTH SHOULD CONSULT A PHYSICIAN BEFORE USING SAUNA.

The words shall contrast with the background and the wording shall be in letters not less than  $\frac{1}{4}$ -inch (6.4 mm) high.

**Exception:** This section shall not apply to one-, and two-, and three-family dwellings.

## **SECTION 915 ENGINE AND GAS TURBINE-POWERED EQUIPMENT AND APPLIANCES**

**915.1 General.** The installation of liquid-fueled stationary internal combustion engines and gas turbines, including exhaust, fuel storage and piping, shall meet the requirements of *this section*.

**915.2 Powered equipment and appliances.** Permanently installed equipment and appliances powered by internal combustion engines and turbines shall be installed in accordance with the manufacturer's instructions and NFPA 37.

*Section 915.2.1 Fuel tanks connected to engine-driven building services equipment.* Fuel tanks piped to and supplying fuel for engine-driven building service equipment may be engine-mounted, located inside of a building, outside of a building, or on a roof in accordance with NFPA 37 or NFPA 30 and as modified by Section 1308 of the mechanical code for fuel oil and diesel oil tank installations.

*Section 915.2.1.1 Engine-mounted tanks.* Engine-mounted tanks located outdoors may be located in accordance with Section 4.1.4 of NFPA 37 and shall be vented in accordance with NFPA 30. Engine-mounted tanks shall be provided with adequate clearance to enable filling, maintenance, and testing, shall be safeguarded against public access, and shall be protected from impact.

*Section 915.2.1.2 Other fuel tanks.* Fuel tanks, other than engine-mounted tanks, piped to and supplying the engine shall be located, installed, and vented in accordance with the applicable sections of NFPA 37 or located, installed, and vented in accordance with NFPA 30.

*Section 915.2.2 Gaseous fuel supply.* Where an internal combustion engine supplied with gaseous fuel powers building service equipment, the fuel gas storage and piping system shall comply with NFPA 37 and the "International



*Fuel Gas Code”.*

**Section 915.3 Engine-driven Stationary generators.** *Stationary emergency and standby power generator assemblies shall be listed in accordance with UL 2200 and shall comply with Section 2702.1 of the building code.*

## SECTION 916 POOL AND SPA HEATERS

**916.1 General.** Pool and spa heaters shall be installed in accordance with the manufacturer’s instructions. Oil-fired pool and spa heaters shall be tested in accordance with UL 726. Electric pool and spa heaters shall be tested in accordance with UL 1261.

## SECTION 917 COOKING APPLIANCES

**917.1 Cooking appliances.** Cooking appliances that are designed for permanent installation, including ranges, ovens, stoves, broilers, grills, fryers, griddles and barbecues, shall be listed, labeled and installed in accordance with the manufacturer’s instructions. Commercial electric cooking appliances shall be listed and labeled in accordance with UL 197. Household electric ranges shall be listed and labeled in accordance with UL 858. Microwave cooking appliances shall be listed and labeled in accordance with UL 923. Oil-burning stoves shall be listed and labeled in accordance with UL 896. Solid-fuel-fired ovens shall be listed and labeled in accordance with UL 2162.

**917.2 Domestic cooking appliances.** Cooking appliances installed within dwelling units and within areas where domestic-type cooking operations occur shall be listed and labeled as *domestic or* household type appliances for domestic use.

## SECTION 918 FORCED-AIR WARM-AIR FURNACES

**918.1 Forced-air furnaces.** Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer’s instructions.

**918.2 Heat pumps.** Electric heat pumps shall be tested in accordance with UL 1995.

**918.3 Dampers.** Volume dampers shall not be placed in the air inlet to a furnace in a manner that will reduce the required air to the furnace.

**918.4 Circulating air ducts for forced-air warm-air furnaces.** Circulating air for fuel-burning, forced-air-type, warm-air furnaces shall be conducted into the blower housing from outside the furnace enclosure by continuous air-tight ducts.

**918.5 Outdoor and return air openings.** Outdoor intake openings shall be located in accordance with Section 401.4. Return air openings shall be located in accordance with Section 601.5.

**918.6 Outdoor opening protection.** Outdoor air intake openings shall be protected in accordance with Section 401.5.

## **SECTION 919 CONVERSION BURNERS**

**919.1 Conversion burners.** The installation of conversion burners shall conform to ANSI Z21.8.

## **SECTION 920 UNIT HEATERS**

**920.1 General.** Unit heaters shall be installed in accordance with the listing and the manufacturer's instructions. Oil-fired unit heaters shall be tested in accordance with UL 731.

*This section should not be construed as permitting the installation of portable unvented heaters in locations otherwise prohibited by section 3701.82 of the Revised Code or rules adopted by the state fire marshal pursuant to 3701.82 of the Revised Code.*

**920.2 Support.** Suspended-type unit heaters shall be supported by elements that are designed and constructed to accommodate the weight and dynamic loads. Hangers and brackets shall be of noncombustible material. Suspended type oil-fired unit heaters shall be installed in accordance with NFPA 31.

**920.3 Ductwork.** A unit heater shall not be attached to a warm-air duct system unless listed for such installation.

## SECTION 921 VENTED ROOM HEATERS

**921.1 General.** Vented room heaters shall be listed and labeled and shall be installed in accordance with the conditions of the listing and the manufacturer's instructions.

## SECTION 922 KEROSENE AND OIL-FIRED STOVES

**922.1 General.** Kerosene and oil-fired stoves shall be listed and labeled and shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Kerosene and oil-fired stoves shall comply with NFPA 31 and UL 896.

*This section should not be construed as permitting the installation of portable unvented heaters in locations otherwise prohibited by section 3701.82 of the Revised Code or rules adopted by the state fire marshal pursuant to 3701.82 of the Revised Code.*

## SECTION 923 SMALL CERAMIC KILNS

**923.1 General.** Kilns shall be listed and labeled unless otherwise approved in accordance with Sections 106.5 or 114 of the building code. Electric kilns shall comply with UL 499.

**923.1.1 Installation.** Kilns shall be installed in accordance with the manufacturer's instructions and the provisions of this code.

## SECTION 924 STATIONARY FUEL CELL POWER SYSTEMS

**924.1 General.** Stationary fuel cell power systems having a power output not exceeding 10 MW shall be tested in accordance with ANSI/CSA America FC 1 and shall be installed in accordance with the manufacturer's instructions, NFPA 853, the building code and the fire code.

## SECTION 925 MASONRY HEATERS

**925.1 General.** Masonry heaters shall be constructed in accordance with the *building code*.

## **SECTION 926 GASEOUS HYDROGEN SYSTEMS**

**926.1 Installation.** The installation of gaseous hydrogen systems shall be in accordance with the applicable requirements of this code, the *fire code*, the “International Fuel Gas Code” and the *building code*.

## **SECTION 927 RADIANT HEATING SYSTEMS**

**927.1 General.** Electric radiant heating systems shall be installed in accordance with the manufacturer’s instructions and shall be listed for the application.

**927.2 Clearances.** Clearances for radiant heating panels or elements to any wiring, outlet boxes and junction boxes used for installing electrical devices or mounting luminaires shall be in accordance with the *building code* and NFPA 70.

**927.3 Installation on wood or steel framing.** Radiant panels installed on wood or steel framing shall conform to the following requirements:

1. Heating panels shall be installed parallel to framing members and secured to the surface of framing members or shall be mounted between framing members.
2. Mechanical fasteners shall penetrate only the unheated portions provided for this purpose. Panels shall not be fastened at any point closer than  $\frac{1}{4}$  inch (6.4 mm) to an element. Other methods of attachment of the panels shall be in accordance with the panel installation instructions.
3. Unless listed and labeled for field cutting, heating panels shall be installed as complete units.

**927.4 Installation in concrete or masonry.** Radiant heating systems installed in concrete or masonry shall conform to the following requirements:

1. Radiant heating systems shall be identified as being suitable for the installation, and shall be secured in place as specified in the manufacturer’s instructions.
2. Radiant heating panels and radiant heating panel sets shall not be installed where they bridge expansion joints unless they are protected from expansion and contraction.

**927.5 Finish surfaces.** Finish materials installed over radiant heating panels and systems shall be installed in accordance with the manufacturer's instructions. Surfaces shall be secured so that fasteners do not pierce the radiant heating elements.

## **SECTION 928 EVAPORATIVE COOLING EQUIPMENT**

**928.1 General.** Evaporative cooling equipment shall:

1. Be installed in accordance with the manufacturer's instructions.
2. Be installed on level platforms in accordance with Section 304.10.
3. Have openings in exterior walls or roofs flashed in accordance with the *building code*.
4. Be provided with an approved water supply, sized for peak demand. The quality of water shall be provided in accordance with the equipment manufacturer's recommendations. The piping system and protection of the potable water supply system shall be installed as required by the *plumbing code*.
5. Have air intake opening locations in accordance with Section 401.4.