

## CHAPTER 10

# BOILERS, WATER HEATERS AND PRESSURE VESSELS

### SECTION 1001 GENERAL

**1001.1 Scope.** The purpose of this chapter is to establish and provide minimum standards for the protection of the public welfare, health, safety and property by regulating and controlling the installation of steam and hot-water boilers, water heaters, pressure vessels and their related piping that are not regulated by the *Oregon Boiler and Pressure Vessel Specialty Code* (OBPVSC) or the *Oregon Plumbing Specialty Code* (OPSC).

**480.515 Definitions for ORS 480.510 to 480.670.** As used in ORS 480.510 to 480.670, unless the context requires otherwise:

- (1) "Alteration" means a change or addition to equipment, other than the ordinary repair or replacement of an existing part of the equipment.
- (2) "Board" means the Board of Boiler Rules created under ORS 480.535.
- (3) "Boiler" or "boilers" means:
  - (a) A closed vessel or vessels intended for the heating or vaporizing of liquids to be used externally to such vessel or vessels by the application of heat from combustible fuels, electricity or nuclear energy;
  - (b) Related appurtenances including, but not limited to, pressure piping directly connected and related to the safe operation of a boiler; and
  - (c) Pressure piping consisting of boiler or nonboiler external piping connected to a boiler, but not potable water nonboiler external piping.
- (4) "Boiler external piping" has the meaning given the term in the 1986 Pressure Piping Code B 31.1, adopted by the American Society of Mechanical Engineers.
- (5) "Certificate of competency" means a certificate issued under the provisions of ORS 480.565(3).
- (6) "Department" means the Department of Consumer and Business Services.
- (7) "Director" means the Director of the Department of Consumer and Business Services.
- (8) "Installation permit" means a permit issued by the department for the installation, alteration or repair of a boiler or pressure vessel.
- (9) "Minimum safety standards" means the rules, regulations, formulae, definitions and interpretations for the safe construction, installation, operation and repair of boilers and pressure vessels either adopted by ORS 480.510 to 480.670 or adopted by the board, under ORS 480.510 to 480.670.

(10) "Nonboiler external piping" has the meaning given the term in the 1986 Pressure Piping Code B 31.1, adopted by the American Society of Mechanical Engineers.

(11) "Operating permit" means a permit issued by the department authorizing the operation of a boiler or pressure vessel.

(12) "Pressure vessel" means containers for the containment of pressure, either internal or external. This pressure may be obtained from an external source or by the application of heat from a direct or indirect source, or any combination thereof.

(13) "Related appurtenances" means any equipment instrumental to the safe operation of a boiler or pressure vessel.

(14) "Shop inspection" means an inspection at a boiler or pressure vessel manufacturing, construction or repair facility.

(15) "Temporary operation authorization" means an authorization issued by the department to operate a boiler or pressure vessel for a specified period pending the issuance of an operating permit. [1961 c.485 §3; 1969 c.582 §2; 1971 c.753 §58; 1973 c.830 §1; 1983 c.676 §3; 1987 c.414 §35; 1991 c.518 §2; 1993 c.744 §142; 2007 c.487 §3; 2009 c.696 §11]

### SECTION 1002 DEFINITIONS

**1002.1 Definitions.** Certain words and terms used in this chapter, unless clearly inconsistent with their context, shall mean as follows:

**BOILER.** As defined in ORS 480.515(3).

**ORS 480.515(3)** is not a part of this code but is reproduced here for the reader's convenience:

**480.515 Definitions for ORS 480.510 to 480.670.**

(3) "Boiler" or "boilers" means:

- (a) A closed vessel or vessels intended for the heating or vaporizing of liquids to be used externally to such vessel or vessels by the application of heat from combustible fuels, electricity or nuclear energy;
- (b) Related appurtenances including but not limited to pressure piping directly connected and related to the safe operation of a boiler; and
- (c) Pressure piping consisting of boiler or nonboiler external piping connected to a boiler, but not potable water nonboiler external piping. [1961 c.485 §3; 1969 c.582 §2; 1971 c.753 §58; 1973 c.830 §1; 1983 c.676 §3; 1987 c.414 §35; 1991 c.518 §2; 1993 c.744 §142; 2007 c.487 §3; 2009 c.696 §11]

**DOMESTIC WATER HEATER.** As defined in ORS 480.525(1)(b).

**ORS 480.525(1)(b)** is not a part of this code but is reproduced here for the reader's convenience:

**480.525 Exempt vessels.**

(1)(b) Domestic water heaters designed for heating potable water, equipped with an approved pressure-relieving device, containing only water and that do not exceed a:

- (A) Capacity of 120 gallons;
- (B) Water temperature of 210 degrees Fahrenheit;
- (C) Pressure of 150 pounds per square inch gauge pressure; or
- (D) Heat input of 200,000 BTU per hour.

[1961 c.485 §11; 1967 c.447 §1; 1969 c.582 §4; 1973 c.830 §2; 1983 c.676 §5; 1985 c.398 §1; 1987 c.847 §1; 1991 c.518 §6; 1999 c.713 §1; 2007 c.386 §1; 2007 c.487 §5; 2009 c.696 §13]

**SECTION 1003  
WATER HEATERS**

**1003.1 General.** Potable water heaters and hot water storage tanks shall be listed and labeled and installed in accordance with the manufacturer's installation instructions, the *Plumbing Code* and, where applicable, this code. All water heaters shall be capable of being removed without first removing a permanent portion of the building structure. The potable water connections and relief valves for all water heaters shall conform to the requirements of the *Plumbing Code*.

**1003.2 Water heaters utilized for space heating.** Water heaters utilized both to supply potable hot water and provide hot water for space-heating applications shall be *listed and labeled* for such applications by the manufacturer and shall be installed in accordance with the manufacturer's installation instructions and the *Plumbing Code*.

**1003.2.1 Sizing.** Water heaters utilized for both potable water heating and space-heating applications shall be sized to prevent the space-heating load from diminishing the required potable water-heating capacity.

**1003.2.2 Temperature limitation.** Where a combination potable water-heating and space-heating system requires water for space heating at temperatures higher than 140°F (60°C), a temperature actuated mixing valve that conforms to ASSE 1017 shall be provided to temper the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less.

**1003.3 Supplemental water-heating devices.** Potable water-heating devices that utilize refrigerant-to-water heat exchangers shall be *approved* and installed in accordance with the *Plumbing Code* and the manufacturer's installation instructions.

**SECTION 1004  
BOILERS AND PRESSURE VESSELS**

**1004.1 General.** The requirements of this section shall apply to the boiler rooms, combustion air, chimneys, vents and fuel

pipng related to the construction, installation, repair and alteration of rooms for the installation of boilers and pressure vessels.

**1004.2 Standards.** Boilers and pressure vessels that are not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* shall be designed and constructed in accordance with the requirements of their listing and labeling or the applicable standards for their use.

**1004.3 Installation.** In addition to the requirements of this code, the installation of boilers and pressure vessels that are not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* shall conform to the manufacturer's instructions. Operating instructions of a permanent type shall be attached to the boiler. Boilers shall have all controls set, adjusted and tested by the installer. The manufacturer's rating data and the nameplate shall be attached to the boiler.

**1004.4 Workmanship.** All *equipment*, appurtenances, devices and *pipng* shall be installed in a workman like manner conforming to the provisions and intent of this chapter.

**SECTION 1005  
PERMITS REQUIRED**

**1005.1 Permits.** It shall be unlawful to install any boiler or pressure vessel regulated by this code or the *Oregon Boiler and Pressure Vessel Specialty Code* without first obtaining a permit from the local building jurisdiction and an installation permit from the Oregon Building Codes Division, Boiler and Pressure Vessel Program. Permits obtained from the local jurisdiction shall apply to the boiler rooms, combustion air, chimneys, vents, and fuel and hydronic *pipng* related to the construction, repair and alteration of rooms for the installation of boilers and pressure vessels and the installation of any boiler or pressure vessel regulated by this code.

**SECTION 1006  
DETAILED REQUIREMENTS**

**1006.1 Safety requirements.** The installation of all boilers and pressure vessels not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* shall conform to the minimum requirements for safety established by this code.

**1006.1.1 Safety relief valves for hot water boilers.** Hot water boilers shall be protected with a safety relief valve.

**1006.1.2 Pressure relief for pressure vessels.** All pressure vessels shall be protected with a pressure relief valve or pressure-limiting device as required by the manufacturer's installation instructions for the pressure vessel.

**1006.2 Stack dampers.** Stack dampers on boilers not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* fired with oil or solid fuel shall not close more than 80 percent of the stack area when closed, except on automatic boilers with prepurge, automatic draft control and interlock. Operative dampers shall not be placed within any stack, flue or vent of a gas-fired boiler, except on an automatic boiler with prepurge, automatic draft control and interlock.

### SECTION 1007 EXPANSION TANKS

**1007.1 Expansion tanks.** Expansion tanks shall be securely fastened to the structure; supports shall be adequate to carry twice the weight of the tank filled with water without placing any strain on connecting *pipng*.

All water heating systems incorporating hot water tanks or fluid relief columns shall be installed to prevent freezing under normal operating conditions.

An expansion tank shall be installed in every hot water system. For multiple boiler installations, a minimum of one expansion tank is required. Expansion tanks shall be of the closed- or open-type. Tanks shall be rated for the pressure of the hot water system.

### SECTION 1008 SAFETY OR RELIEF VALVE DISCHARGE

**1008.1 General.** The discharge from relief valves for water heaters and boilers not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* shall be piped to within 18 inches (457 mm) of the floor or to an open receptacle, and when the operating temperature is in excess of 212°F (100°C), shall be equipped with a splash shield or centrifugal separator. When the discharge from safety valves would result in a hazardous discharge of steam inside the boiler room, such discharge shall be extended outside the boiler room. Valves are prohibited between the safety valve and the atmosphere.

### SECTION 1009 GAS PRESSURE REGULATORS

**1009.1 General.** An *approved* gas pressure regulator shall be installed on gas-fired boilers not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* where the gas supply pressure is higher than that at which the main burner is designed to operate. A separate *approved* gas pressure regulator shall be installed to regulate the gas pressure to the pilot or pilots. A separate regulator shall not be required for the pilot or pilots on manufacturer-assembled boiler-burner units which have been *approved* by the building official and on gas-fired boilers in Group R occupancies of less than six units and in Group U occupancies.

### SECTION 1010 CLEARANCE FOR ACCESS

**1009.1 Access.** When boilers not regulated under the *Oregon Boiler and Pressure Vessel Specialty Code* are installed or replaced, clearance shall be provided to allow access for inspection, maintenance and repair, and passageways shall have an unobstructed width of not less than 18 inches (457 mm). Clearance for repair and cleaning may be provided through a door or access panel into another area, provided the opening is of sufficient size. Package boilers, miniature boilers, low-pressure boilers and hot water supply boilers with no manhole on top of shell shall have a minimum clearance of 2 feet (610 mm) from the ceiling.

### SECTION 1011 BOILER ROOM ENCLOSURES

**1011.1 Boiler rooms.** Boiler rooms and enclosures and access thereto shall comply with Chapter 3 of this code and the *Building Code*.

### SECTION 1012 FLOORS

**1012.1 General.** Boilers shall be mounted on floors of non-combustible construction unless listed for mounting on combustible floors. The floor and related structural supports shall be designed as required in the *Building Code* to carry the loads imposed by the boiler and appurtenances.

### SECTION 1013 CHIMNEYS OR VENTS

**1013.1 General.** When required, boilers shall be connected to a chimney or vent in accordance with Chapter 8 for oil or wood and Appendix C for fuel gas installations.

### SECTION 1014 DRAINAGE

**1014.1 Drains.** The boiler room shall have an *approved* floor drain or equivalent means for disposing of accumulation of liquid wastes incidental to cleaning or recharging.

### SECTION 1015 FUEL SUPPLY PIPING

**1015.1 Piping.** Fuel supply *pipng* shall conform to Chapter 13, Appendix C or the standards cited in Chapter 15, Referenced Standards.

### SECTION 1016 AIR FOR COMBUSTION AND VENTILATION

**1016.1 General.** Air for combustion and ventilation shall be installed in accordance with Chapter 7 or Appendix C of this code.

### SECTION 1017 STEAM AND HOT WATER PIPING

**Note:** Boilers and pressure vessels and related piping are regulated by the State of *Oregon Boiler and Pressure Vessel Law* (ORS 480.510 to 480.670).

**1017.1 General.** Steam piping is regulated under the jurisdiction of the *Oregon Boiler and Pressure Vessel Law* and related administrative rules and is under the jurisdiction of the Building Codes Division, Boiler and Pressure Vessel Program.

**1017.1.1 Hot water piping systems.** Water *pipng* used for hot water heating systems and hydronics shall be installed in accordance with the Chapter 12 of this code.

