

## CHAPTER 14

# SOLAR SYSTEMS

### SECTION 1401 GENERAL

**1401.1 Scope.** This chapter shall govern the design, construction, installation, *alteration* and repair of systems, *equipment* and appliances intended to utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating or process heating. Photovoltaic solar systems shall be installed in accordance with *International Building Code* and Article 690 of the *Seattle Electrical Code*. Systems interconnected to the electric grid shall comply with additional requirements of Seattle City Light.

**Note:** See the Seattle Boiler and Pressure Vessel Code for regulations applicable to boilers and pressure vessels, and the *Uniform Plumbing Code* for regulations applicable to water heaters.

**1401.2 Potable water supply.** Potable water supplies to solar systems shall be protected against contamination in accordance with the (~~*International*~~) *Uniform Plumbing Code*.

**Exception:** Where all solar system piping is a part of the potable water distribution system, in accordance with the requirements of the (~~*International*~~) *Uniform Plumbing Code*, and all components of the piping system are *listed* for potable water use, cross-connection protection measures shall not be required.

**1401.3 Heat exchangers.** Heat exchangers used in domestic water-heating systems shall be *approved* for the intended use. The system shall have adequate protection to ensure that the potability of the water supply and distribution system is properly safeguarded.

**1401.4 Solar energy equipment and appliances.** Solar energy *equipment* and appliances shall conform to the requirements of this chapter and shall be installed in accordance with the manufacturer's installation instructions.

**1401.5 Ducts.** Ducts utilized in solar heating and cooling systems shall be constructed and installed in accordance with Chapter 6 of this code.

### SECTION 1402 INSTALLATION

**1402.1 Access.** Access shall be provided to solar energy *equipment* and appliances for maintenance. Solar systems and appurtenances shall not obstruct or interfere with the operation of any doors, windows or other building components requiring operation or access.

**1402.2 Protection of equipment.** Solar *equipment* exposed to vehicular traffic shall be installed not less than 6 feet (1829 mm) above the finished floor.

**Exception:** This section shall not apply where the *equipment* is protected from motor vehicle impact.

**1402.3 Controlling condensation.** Where attics or structural spaces are part of a passive solar system, ventilation of such spaces, as required by Section 406, is not required where other *approved* means of controlling condensation are provided.

**1402.4 Roof-mounted collectors.** Roof-mounted solar collectors that also serve as a roof covering shall conform to the requirements for roof coverings in accordance with the *International Building Code*.

**Exception:** The use of plastic solar collector covers shall be limited to those *approved* plastics meeting the requirements for plastic roof panels in the *International Building Code*.

**1402.4.1 Collectors mounted above the roof.** When mounted on or above the roof covering, the collector array and supporting construction shall be constructed of non-combustible materials or fire-retardant-treated wood conforming to the *International Building Code* to the extent required for the type of roof construction of the building to which the collectors are accessory.

**Exception:** The use of plastic solar collector covers shall be limited to those *approved* plastics meeting the requirements for plastic roof panels in the *International Building Code*.

**1402.5 Equipment.** The solar energy system shall be equipped in accordance with the requirements of Sections 1402.5.1 through 1402.5.4.

**1402.5.1 Pressure and temperature.** Solar energy system components containing pressurized fluids shall be protected against pressures and temperatures exceeding design limitations with a pressure and temperature relief valve. Each section of the system in which excessive pressures are capable of developing shall have a relief device located so that a section cannot be valved off or otherwise isolated from a relief device. Relief valves shall comply with the requirements of Section 1006.4 and discharge in accordance with Section 1006.6.

**1402.5.2 Vacuum.** The solar energy system components that are subjected to a vacuum while in operation or during shutdown shall be designed to withstand such vacuum or shall be protected with vacuum relief valves.

**1402.5.3 Protection from freezing.** System components shall be protected from damage by freezing of heat transfer liquids at the lowest ambient temperatures that will be encountered during the operation of the system.

**1402.5.4 Expansion tanks.** Liquid single-phase solar energy systems shall be equipped with expansion tanks sized in accordance with Section 1009.

**1402.6 Penetrations.** Roof and wall penetrations shall be flashed and sealed to prevent entry of water, rodents and insects.

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**1402.7 Filtering.** Air transported to occupied spaces through rock or dust-producing materials by means other than natural convection shall be filtered at the outlet from the heat storage system.

### SECTION 1403 HEAT TRANSFER FLUIDS

**1403.1 Flash point.** The flash point of the actual heat transfer fluid utilized in a solar system shall be not less than 50°F (28°C) above the design maximum nonoperating (no-flow) temperature of the fluid attained in the collector.

**1403.2 Flammable gases and liquids.** A flammable liquid or gas shall not be utilized as a heat transfer fluid. The flash point of liquids used in occupancies classified in Group H or F shall not be lower unless *approved*.

### SECTION 1404 MATERIALS

**1404.1 Collectors.** Factory-built collectors shall be *listed* and *labeled*, and bear a label showing the manufacturer's name and address, model number, collector dry weight, collector maximum allowable operating and nonoperating temperatures and pressures, minimum allowable temperatures and the types of heat transfer fluids that are compatible with the collector. The label shall clarify that these specifications apply only to the collector.

**1404.2 Thermal storage units.** Pressurized thermal storage units shall be *listed* and *labeled*, and bear a label showing the manufacturer's name and address, model number, serial number, storage unit maximum and minimum allowable operating temperatures, storage unit maximum and minimum allowable operating pressures and the types of heat transfer fluids compatible with the storage unit. The label shall clarify that these specifications apply only to the thermal storage unit.