

## CHAPTER 23

# SOLAR SYSTEMS

### SECTION M2301 SOLAR ENERGY SYSTEMS

**M2301.1 General.** This section provides for the design, construction, installation, alteration, and repair of equipment and systems utilizing solar energy to provide nonpotable space heating or cooling, and swimming pool heating. Equipment and systems utilizing solar energy to directly or indirectly heat potable water are regulated under the plumbing chapters in this code.

**M2301.2 Installation.** Installation of solar energy systems shall comply with Sections M2301.2.1 through M2301.2.9.

**M2301.2.1 Access.** Solar energy collectors, controls, dampers, fans, blowers and pumps shall be accessible for inspection, maintenance, repair and replacement.

**M2301.2.2 Roof-mounted collectors.** The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Roof-mounted solar collectors that serve as a roof covering shall conform to the requirements for roof coverings in Chapter 9 of this code. Where mounted on or above the roof coverings, the collectors and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

**M2301.2.3 Pressure and temperature relief.** System components containing fluids shall be protected with pressure- and temperature-relief valves. Relief devices shall be installed in sections of the system so that a section cannot be valved off or isolated from a relief device.

**M2301.2.4 Vacuum relief.** System components that might be subjected to pressure drops below atmospheric pressure during operation or shutdown shall be protected by a vacuum-relief valve.

**M2301.2.5 Protection from freezing.** System components shall be protected from damage resulting from freezing of heat-transfer liquids at the winter design temperature provided in Table R301.2(1). Freeze protection shall be provided by heating, insulation, thermal mass and heat transfer fluids with freeze points lower than the winter design temperature, heat tape or other approved methods, or combinations thereof.

**Exception:** Where the winter design temperature is greater than 32°F (0°C).

**M2301.2.6 Expansion tanks.** Expansion tanks in solar energy systems shall be installed in accordance with Section M2003 in closed fluid loops that contain heat transfer fluid.

**M2301.2.7 Roof and wall penetrations.** Roof and wall penetrations shall be flashed and sealed to prevent entry of water, rodents and insects in accordance with Chapter 9 of this code.

**M2301.2.8 Solar loop isolation.** Valves shall be installed to allow the solar collectors to be isolated from the remainder

of the system. Each isolation valve shall be labeled with the open and closed position.

**M2301.2.9 Maximum temperature limitation.** Systems shall be equipped with means to limit the maximum water temperature of the system fluid entering or exchanging heat with any pressurized vessel inside the dwelling to 180°F (82°C). This protection is in addition to the required temperature- and pressure-relief valves required by Section M2301.2.3.

**M2301.3 Labeling.** Labeling shall comply with Sections M2301.3.1 and M2301.3.2.

**M2301.3.1 Collectors.** Collectors shall be listed and labeled to show the manufacturer's name, model number, serial number, collector weight, collector maximum allowable temperatures and pressures, and the type of heat transfer fluids that are compatible with the collector. The label shall clarify that these specifications apply only to the collector.

**M2301.3.2 Thermal storage units.** Pressurized thermal storage units shall be listed and labeled to show the manufacturer's name, model number, serial number, storage unit maximum and minimum allowable operating temperatures and pressures, and the type of heat transfer fluids that are compatible with the storage unit. The label shall clarify that these specifications apply only to the thermal storage unit.

**M2301.4 Prohibited heat transfer fluids.** Flammable gases and liquids shall not be used as heat transfer fluids.

**M2301.5 Backflow protection.** All connections from the potable water supply to solar systems shall comply with the plumbing chapters in this code.

