NSF/ANSI Standard 50 –

Equipment for Swimming Pools, Spas, Hot Tubs and other Recreational Water Facilities

Note: This section to be located at the end of the existing sections, before the annexes.

X Heat exchangers, heaters, coolers, and solar water heating systems

X.1 General

The requirements in this section apply to devices utilized to increase or decrease the temperature of pools, spas, and other recreational waters. Some examples of products addressed by this section include metal and or plastic heat exchangers, heaters, coolers, and solar radiant panel collectors and associated components such as fittings, couplings, and valves.

X.1.1 Sections of the heater that may require inspection or service shall be accessible.

X.1.2 Heaters shall be marked or labeled for proper assembly/installation and operation.

X.1.3 Replacement parts for the heater shall fit the heater without a need for undue alteration of the heater or replacement part.

X.1.4 Heaters shall comply with the material formulation requirements in 3.2.

X.1.5 Heaters shall comply with the corrosion resistance requirements in 3.3.

X.2 Performance

Heaters and associated components shall meet the applicable performance requirements of this section based upon their design and construction including related components such as fittings, couplings, valves, controllers, etc.

X.2.1 Dimensional conformity test

Heaters and associated components under pressure shall be evaluated for dimensional conformance with the piping and fitting dimensions recommended by the manufacturer.

X.2.2 Hydrostatic pressure test

Heaters and associated components under pressure shall be capable of withstanding a hydrostatic pressure test at 150% of the rated working pressure test per Annex B.

X.2.3 Cyclic pressure test
Heaters and associated components under pressure shall be capable of withstanding 20,000 cycle low/high/low cyclical pressure test per Annex B.

X.2.4 Design burst hydrostatic pressure test

Heaters and associated components under pressure shall be capable of withstanding a hydrostatic pressure test at 200% of the rated working pressure test per Annex B.

X.2.5 Elevated temperature hydrostatic pressure test

Heaters and associated components under pressure shall be capable of withstanding a hydrostatic pressure test at 200% of the rated working pressure when tested at 140 °F (60 °C)

X.2.6 Head loss curve

Manufacturers shall make available a head loss curve for the heater equipment and associated components.

Heaters Equipment and associated components shall not exceed the head loss indicated by the manufacturer’s head loss curve when tested in accordance with manufacturers’ installation orientation and plumbing design.

X.3 Operation and installation instructions

The manufacturer shall provide written operation and installation instructions with each unit. The instructions shall include drawings, charts, and parts list necessary for the proper installation, operation, repair and maintenance of the heater and its associated components.

The operation and installation instruction shall contain the following information:

- A heater’s maximum flow rating (LPM, GPM) shall be specified to mitigate erosion damage, as directed by the manufacturer;

- Based on the nominal pipe size (or less if requested by the manufacturer) intended to plumb the pressure line. The maximum velocity for any nominal pipe size connection to the heater shall not exceed 3.05 MPS (10 FPS) for PVC pipe, 5 fps for copper pipe or flow rates appropriate for any other piping material to minimize potential corrosion and scale formation;

- A heater’s minimum flow rating (LPM, GPM) shall be specified to prevent overheating or scale formation as directed by the manufacturer;

- A warning that the heater equipment is to shall be installed in full compliance with the manufacturer’s recommendations as well as the local regulatory and building code requirements for gas supply, plumbing, electrical connections, air exchange and ventilation. Corrosive chemicals should be stored away from the heater to minimize potential damage to the exterior of the heater;

- A warning that the heater equipment is not to shall not be installed immediately after the injection point for low pH or acidic chemicals to minimize potential corrosive damage to the inside of the heater;
Reference to recommended use chemicals, maximum, and minimum concentrations (i.e., salt level, total alkalinity, calcium hardness, etc.);

- Applicable caution and warning statements shall be prominently displayed;

Example: If system flow is allowed to stagnate in a solar collector there is potential risk of high water temperatures. Consider draining the system otherwise water in solar collectors can reach high temperatures and create hot liquid/gas. If hot liquids or gas are not purged from the system it could adversely affect plumbing, or the safety of swimmers near water return fittings.

- Instructions or guidance for proper size selection and installation; and

- A statement of the manufacturer’s warranty, if any; and

- Applicable diagrams and a parts list to facilitate the identification and ordering of replacement parts or other supply and installation needs.

X.4 Marking and product identification

The heater shall be clearly and permanently marked or labeled with the following:

- manufacturer name and address or website;
- model number;
- serial number, date code, or other means to identify date of production;
- whether the unit was evaluated for pools and/or spas, if not evaluated for both applications;
- working pressure;
- size or capacity;
- flow direction (if applicable);
- maximum head loss; and
- maximum design flow rate.