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INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

IAPMO GUIDE CRITERIA FOR

BRACING SYSTEMS FOR WATER HEATERS TO WOOD STUDS

IGC 202 – 2004a

1. PURPOSE

- 1.1** The purpose of this standard is to establish a generally acceptable standard for bracing systems for water heaters to wood studs. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users; to promote understanding regarding materials, manufacture and installation; and to provide for identification for installation complying with this standard.
- 1.2** The provisions of this standard are not intended to prevent the use of any alternate material or method of construction provided any such alternate meets the intent of this standard.

2. SCOPE

- 2.1** This standard serves to supplement the provisions of the Uniform Plumbing Code, Sections 508.0 and 510.5.
- 2.2** This standard covers minimum standards for materials in the construction of bracing systems, and to prescribe minimum test requirements for the performance of bracing systems for water heaters, together with methods of marking and identification.

3. REFERENCED STANDARDS

- 3.1** All standards referenced herein shall be the current edition of that standard or as published in Table 14-1 of the Uniform Plumbing Code.

ASME A112.18.1	Plumbing Fixture Fittings
ASTM A 653	Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 1008	Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low Alloy with Improved Formability (Superceding ASTM A 366)

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4. DEFINITIONS

- 4.1 Bracing Systems** – A bracing system that prevents the overturning or excessive movement of a water heater in case of earthquake or disaster. Bracing systems shall consist of two restraints each to be located within the top 1/3 and bottom 1/3 of the water heater. Lower strap shall not interfere with controls. Each restraint shall consist of two points of attachment to affix restraint to the wooden studs in the wall, one on each side of the water heater, a strap element that is affixed to the wall attachments and can either extend around the front of the heater or wrap completely around the heater to hold it up against the wall and a method of tensioning or ensuring that slack is removed from the strap element.
- 4.2 Spacer** – Spacers shall be constructed from standard 2" X 4" wooden boards or other materials and in a manner compliant with codes and the water heater manufacturer's instructions, to provide a mechanical support between the water heater and the wall behind it. The spacers shall be located in approximately the same place as the bracing system (one within the top third of the heater and one within the bottom third) and solidly affixed to the wall structure.

5. GENERAL REQUIREMENTS

- 5.1** Brackets and buckles shall be manufactured from minimum 14 gauge (AISI) steel complying with ASTM A 653 or ASTM A 1008.
- 5.1.1** Brackets and buckles formed of unfinished steel shall be protected from rust by a finish such as zinc plate, paint, powder coat, etc. and comply with Section 2.2.1(c) Corrosion Test in ASME A112.18.1.
- 5.2 Straps**
- 5.2.1** Polyester Straps shall be no less than 1 3/4" in width and shall have the following specifications that shall be affirmed to by the manufacturer or supplier:
- a) Breaking strength: 2000 - 3000 daN (4400 - 6600 lbs)
 - b) Thickness: 1.1 - 1.6 mm (0.04 - 0.06 inches)
 - c) Webbing is UV resistant
 - d) Melting point of 265°C (509°F) nominal
- 5.2.2** Metal Straps shall be no less than 24 gauge (AISI) steel complying with ASTM A 653 or ASTM A 1008. Straps of unfinished steel shall be protected from rust by a finish such as zinc plate, paint, powder coat, etc. and comply with Section 2.2.1(c) Corrosion Test in ASME A112.18.1.
- 5.3** Lag Bolts used to attach brackets or straps to the wooden wall studs shall be minimum 1/4" X 2 1/2" and shall be manufactured from heat-treated carbon steel. Graded bolts shall be a minimum SAE-Grade 3. Lag bolts shall be hot-dipped or plated with a suitable finish to resist rust and corrosion and comply with Section 2.2.1(c) Corrosion Test in