

NSF/ANSI 5 – 2000e

# Water heaters, hot water supply boilers, and heat recovery equipment

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**NSF International Standard/  
American National Standard**

NSF/ANSI 5 – 2000e



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NSF/ANSI 5 – 2000e

NSF International Standard/  
American National Standard  
for Food Equipment –

**Water heaters, hot water  
supply boilers, and heat  
recovery equipment**

Standard Developer

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## Foreword<sup>2</sup>

The purpose of this Standard is to establish minimum food protection and sanitation requirements for the materials, design, construction, and performance of water heaters, hot water supply boilers, and heat recovery equipment.

This edition of the Standard contains numerous editorial and format changes intended to promote uniform interpretation of the Standard. Many changes reflect an effort to achieve consistency with other NSF Food Equipment Standards. The style and format of this Standard have been modified for consistency with the guidelines published by the American National Standards Institute.

This Standard uses English units as the primary units of measure with SI (metric) units provided in parentheses for informational purposes. The Joint Committee on Food Equipment carried a motion that this convention be adopted in future revisions to this Standard.

The changes present in NSF/ANSI 5 – 2000e are editorial corrections in section 6.1.2, Apparatus. The percentages should be “accurate to  $\pm$  \_\_ percent” instead of “accurate to \_\_ percent.” Since it was correct in the version reviewed and approved by the Joint Committee, these changes are deemed editorial.

Changes to NSF 5 – 1992 incorporated into this Standard include the following:

- A statement of the purpose of the Standard and a normative references section were incorporated.
- The scope was altered to include instantaneous water heaters that are used to heat water other than for beverages. The requirements for instantaneous water heaters designed to heat water for beverages were removed from the scope and included in NSF/ANSI 18 – *Manual food and beverage dispensing equipment*.
- Many requirements for materials have been consolidated by a simple reference to NSF/ANSI 51 – *Food equipment materials*. NSF/ANSI 51 was revised with the purpose of establishing general materials requirements that may be referenced in other standards.

Other substantive changes in this edition include the following:

- Several definitions were modified and new definitions were added to define terms used but not previously defined in this Standard.
- Design and construction requirements for single wall heat exchangers were modified to consider single wall heat exchangers for which the intermediate transfer media is not supplied by the manufacturer.
- A recovery rate verification performance test and a temperature regulation performance test were added to the Standard.
- The pressure loss test was removed from the Standard, as it was deemed not necessary or appropriate. Pressure loss requirements are provided by local plumbing codes.
- The thermal efficiency test was removed from the Standard, as thermal efficiency does not have a relationship to sanitation. Also, the Energy Policy Act (EPACT) of 1992 contains requirements for the thermal efficiency of commercial gas- and oil-fired water heaters and supply boilers. EPACT requires

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that this equipment meet their efficiency levels. The federal standards for commercial water heaters and supply boilers supersede and preempt all state and local efficiency regulations of these products.

- Installation recommendations are included in annex A.
- The technical information annex is now annex B. Equations have been rewritten for clarity.

This Standard was developed by the NSF Joint Committee on Food Equipment using the consensus process described by the American National Standards Institute.

Suggestions for improvement of this Standard are welcome. Comments should be sent to Chair, Joint Committee on Food Equipment, c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan, 48113-0140.

## NSF/ANSI Standard for Food Equipment –

# Water heaters, hot water supply boilers, and heat recovery equipment

## 1 General

### 1.1 Purpose

This Standard establishes minimum public health and sanitation requirements for the materials, design, construction, and performance of commercial water heaters, hot water supply boilers, and heat recovery equipment. This Standard does not contain safety requirements.

### 1.2 Scope

This Standard contains requirements for heat recovery equipment and equipment intended to provide hot water heated by electricity, gas, steam, or oil. The types of equipment covered by this Standard include, but are not limited to: automatic storage water heaters, circulating water heaters, hot water supply boilers, and steam heat exchangers. Instantaneous water heaters used to heat water other than for beverages are covered under this Standard. Boilers used for space heating are not covered under this Standard.

Materials and components covered under other NSF or ANSI Standards or Criteria shall also comply with the requirements therein. This Standard is not intended to restrict new design, provided such design meets the minimum specifications described herein.

### 1.3 Alternate materials, design, and construction

While specific materials, design, and construction may be stipulated in this Standard, equipment that incorporates alternative materials, design, and construction may be acceptable when such equipment meets the applicable requirements herein.

## 2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this Standard. At the time of publication, the editions listed below were valid. All standards are subject to revision, and parties are encouraged to investigate the possibility of applying the most recent edition of the documents indicated below.

ANSI/ASME B40.1 – 1998, *Gauges – Pressure Indicating Dial Type – Elastic Element*<sup>3</sup>

NSF/ANSI 51 – 1997, *Food equipment materials*

## 3 Definitions

Terms used in this Standard that have special technical meaning are defined here.

**3.1 cleaning:** Physical removal of residues of foods and other soiling materials.

**3.2 closed:** Manufactured with no openings exceeding  $\frac{1}{32}$  in (0.8 mm).

**3.3 coating:** Inorganic and/or organic layer of material applied to the surface of a substrate.

**3.4 corrosion resistant:** Capable of maintaining original surface characteristics under prolonged contact with the intended end-use environment and exposure to appropriate cleaning compounds and sanitizing solutions.

**3.5 differential:** With a constant flow of water, the maximum difference between the inlet water

<sup>3</sup> American National Standards Institute, 11 West 42nd Street, New York, NY 10036