Commercial cooking, rethermalization, and powered hot food holding and transport equipment

NSF International Standard/ American National Standard

NSF/ANSI 4 – 2006e

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NSF International Standard/
American National Standard
for Food Equipment —

Commercial cooking, rethermalization, and powered hot food holding and transport equipment

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Foreword[2] (This foreword is not part of ANSI/NSF 4 – 2006e.)

The purpose of this Standard is to establish minimum food protection and sanitation requirements for the materials, design, construction and performance of commercial cooking, rethermalization, and powered hot food holding and transport equipment.

This Standard uses inch-pound units as the primary units with SI (metric) units provided in parentheses for informational purposes. The Joint Committee carried a motion that this convention be adopted in future revisions to this Standard. The SI units provided in parenthesis generally represent a hard conversion of the inch-pound units, meaning that the SI value may have been rounded to provide a reasonable and measurable dimension.

In NSF/ANSI 4-2006, section **5.49 (Equipment provided with a security package)** was a repetition of information already included in 7 (**Food equipment provided with a security package**.) **5.49** has been removed from this editorial revision.

In this version of NSF/ANSI 4-2006, the normative references were updated.

In NSF/ANSI 4 - 2005, the requirements for **5.34 Cappuccino machines with milk reservoirs** was inadvertently left out and the incorrect test method and acceptance criteria for **6.2 Open top hot food holding equipment** was inserted. These sections were corrected in the NSF/ANSI 4 – 2005e addition.

5.34 Cappuccino machines with milk reservoirs

5.34.1 Except as noted in 5.34.2, milk reservoirs and all milk-conveying components on cappuccino machines shall conform to the temperature performance criteria of NSF/ANSI 18.

5.34.2 The requirements in 5.34.1 shall not apply to tubing used to convey milk, provided the tubing is:

– designed such that it is completely drained of milk between uses;

– transparent enough to verify that it is void of milk; and

– no greater than 18 in (46 cm) in length.

5.34.3 Milk reservoirs and all milk conveying components, including tubing, shall conform to 5.1.3.

6.2.2 Test method

6.2.2.1 The performance of open hot food holding equipment shall be evaluated within a test chamber maintained under the following conditions for the duration of the test:

– ambient temperature of 73 ± 3 °F (23 ± 2 °C), as measured approximately 10 in (250 mm) from test unit and 36 in (90 cm) from the floor;

– no vertical temperature gradient exceeding 1.5 °F per foot (2.5 °C per meter); and

– maximum air current velocity of 50 ft/min (15.2 m/min) across the surfaces of the test pans.

6.2.2.2 The test unit shall be preheated in accordance with the manufacturer's operating instructions before loading the unit. The test unit shall be loaded with pans of test media prepared and conditioned in accordance

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with annex A, section A.1 (including proper thermocouple placement). The time required to transfer a single pan from the oven/holding cabinet to the test unit shall not exceed 5 min. Care should be taken to limit the disturbance of the test media during transfer of the pans.

The test unit shall be loaded to the maximum capacity recommended by the manufacturer. If a unit is comprised of multiple, identical hot food holding wells that are individually heated and have separate controls, only a single well shall be loaded and tested. The remaining identical wells shall be kept empty and shall not be operational during the test.

Pan covers shall be removed before the start of the test.

6.2.2.3 The temperature at each thermocouple location shall be monitored immediately upon placing the pans into the unit. The test shall be started upon verification that the media temperature at all thermocouple locations is 150 °F (65 °C) or greater (see the note below regarding temperature stabilization). The temperature at each thermocouple location shall be recorded at 5-min intervals over a test period of 2 h.

> NOTE – If the temperature at any thermocouple location drops below 150 °F (65 °C) within 20 min of placing the media in the test unit, the start of the 2-h test period may be delayed until all temperatures are 150 °F (65 °C) or greater. The test period shall start no later than 20 min after the media has been placed in the test unit. The test shall be stopped if the temperature at any thermocouple location is less than 150 °F (65 °C) at the 20-min mark or if a temperature of less than 140 °F (60 °C) is recorded at any time.

6.2.3 Acceptance criteria

The media temperature at each thermocouple location shall be 150 °F (65 °C) or greater throughout the 2-h test period.

In the version of NSF/ANSI 4 (NSF/ANSI 4 – 2005), the MPN evaluation method used for the IPC evaluation has been replaced with the Membrane Filtration (MF) technique. The MF method also serves as an alternative to both the MPN and the pour plate methodologies. The MPN method has been deemed outdated for this application.

MF is a more sensitive method of determination. The volume of sample analyzed post-IPC is equal to the volume collected (500 mL). Per this method, the entire slug of effluent collected is analyzed (as opposed to the MPN method which employs statistical interpolation to determine the amount of organisms *most probably* present in the entire slug from aliquots thereof). Also, the use of MF makes pour plating with VRB agar procedurally obsolete as the MF technique utilizes a media selective only for the enumeration of the challenge organism.

MF provides a more accurate assessment of the efficacy of the IPC procedure. As such, the NSF Joint Committee on Food Equipment and the NSF Council of Public Health Consultants recommends that NSF/ANSI 4 incorporate the most suitable methodologies and up-to-date techniques commonly available to microbiologists for these evaluations and that this methodology be utilized for the IPC performance evaluations.

A hot-holding performance test has been included for open heated merchandiser units, which will reduce the likelihood of potentially hazardous foods being held out of temperature. Other revisions include: editorial changes to clarify requirements, achieve consistency with the “boilerplate” language in the NSF food equipment standards and update the normative references.

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, USA.

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for Food Equipment —

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1 General

1.1 Purpose

This Standard establishes minimum food protection and sanitation requirements for the materials, design, construction, and performance of commercial cooking, rethermalization, and hot food holding and transport equipment and their related components. This Standard does not contain safety requirements.

1.2 Scope

Equipment covered by this Standard includes, but is not limited to, ranges, ovens, fat/oil fryers, fat/oil filters, griddles, tilting griddle skillets, broilers, steam and pressure cookers, kettles, rotisseries, toasters, coffee makers and other hot beverage makers, component water heating equipment, proofing boxes and cabinets, hot food holding equipment, rethermalization equipment, and hot food transport cabinets.

Section 7 of this Standard pertains to food handling and processing equipment that has been designed and manufactured for special use purposes. Food equipment designed and manufactured with a security package is utilized in environments such as correctional facilities, mental health facilities, or some schools. For these environments, where both sanitation and security are concerns, 7 contains exceptions to this Standard that shall only be applicable to the splash and nonfood zones of food equipment provided with a security package.

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

1.3 Alternative materials, design, and construction

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

1.4 Measurement

Decimal and SI conversions provided parenthetically shall be considered equivalent. Metric conversions have been made according to IEEE/ASTM SI 10.