



**Summary of Substantive Changes
between the 2019 and the 2020 editions of
NSF/ANSI 4 “Commercial Cooking, Rethermalization, and Powered Hot Food
Holding and Transportation Equipment”**

Presented to the IAPMO Standards Review Committee on September 13, 2021

General: The changes to this standard should not impact currently listed products. The substantive changes are:

- Added requirements and testing for open heated merchandisers (see Sections 5.49, and 6.8)
- Clarified the term potentially hazardous foods into time / temperature control for safety food and added some language for clarification (see Sections 5.45, 5.48, 6.1.2.5, 6.2.2.4, and 6.7.2.2)

Section 5, Design and construction: Added abbreviations for clarification as follows:

5.1 General sanitation

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5.1.3 Food zones shall be readily accessible and easily cleanable or shall be designed for ~~in-place-cleaning~~ CIP when a readily accessible design is not feasible.

5.1.4 Food zones for which ~~in-place-cleaning~~ CIP is intended shall be designed and manufactured so that cleaning and sanitizing solutions may be circulated or passed throughout the fixed system. The design shall ensure that cleaning and sanitizing solutions contact all food contact surfaces. The system shall be self-draining or capable of being completely evacuated. Equipment and appurtenances designed for ~~in-place-cleaning~~ CIP shall have a section of the cleaned area accessible for inspection or shall provide for other acceptable inspection methods. The manufacturer shall provide written instructions for the cleaning and sanitizing of all food zone surfaces for which ~~in-place-cleaning~~ CIP is intended. The type and concentration of sanitizing agent recommended in the instructions by the manufacturer shall comply with 40 CFR § 180.940.5

NOTE — ~~in-place-cleaning~~ CIP procedures are not required for fat / oil filter systems that circulate filtered fat or oil throughout the fixed system.

5.45 Hot food holding and hot food transport equipment

5.45.1 Powered hot food holding cabinets and powered hot food transport cabinets intended for the holding of ~~potentially hazardous foods~~ time / temperature control for safety food shall have a securely mounted temperature indicating device that clearly displays the air temperature in the cabinet. This requirement shall not apply to steam tables, bains-marie, kettles, heat lamps, and other radiant heat sources, and similar equipment.

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5.48 Food warming equipment

Food warming equipment intended solely for the display of foods that are not ~~potentially hazardous~~ time / temperature control for safety foods shall have a permanently attached label that states:

“Not for the storage or display of ~~potentially hazardous~~ time / temperature control for safety foods.”



Section 5.49, Open heated merchandisers: Added requirements for open heated merchandisers as follows:

5.49 Open heated merchandisers

5.49.1 Open heated merchandisers designed to operate in a reduced energy mode shall be constructed with an indicator to signify when the equipment is operating in the reduced energy mode. An indicator shall be provided for each independently heated zone that is visible to the user upon installation of the equipment. All indicators shall be clearly visible to the user after installation of the equipment.

5.49.2 Open heated merchandisers capable of operating in a reduced energy mode using sensors to detect the presence of a food load, shall indicate where food must be placed during operation.

Section 6, Performance: Clarified the term potentially hazardous foods into time / temperature control for safety food and added some language for clarification, and added requirements for open heated merchandisers as follows:

6.1 Enclosed hot food holding equipment and hot food transport cabinets

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6.1.2.5 This test does not apply to food warming equipment intended solely for the display of foods that do not require temperature control for safety as detailed in Section 5.48.

6.2 Open top hot food holding equipment

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6.2.2.4 This test does not apply to food warming equipment intended solely for the display of foods that do not require temperature control for safety as detailed in Section 5.48.

6.4 Cleaning and sanitization procedures

6.4.1 Performance requirement

Cleaning and sanitization procedures recommended by the manufacturer shall effectively clean and sanitize food contact surfaces.

NOTE — This requirement applies to manual cleaning and sanitizing procedures and to ~~in-place-cleaning~~ CIP and sanitizing procedures recommended by the manufacturer.

6.4.2 Test method

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6.4.2.2 The equipment shall be operated so that food contact surfaces are exposed to the E. coli suspension. The equipment shall then be cleaned in place according to the manufacturer's instructions and refilled with SBDW. The SBDW shall be dispensed and five 100-mL samples shall be collected at intervals from the start of the dispensing until the unit is empty. When adequate sample volumes cannot be realized, more SBDW shall be added accordingly. The equipment shall then be operated so that food contact surfaces intended for ~~in-place-cleaning~~ CIP are exposed to the SBDW. Sufficient SBDW shall then be dispensed. The challenge organisms present in each sample shall be collected and enumerated using the Standard Total Coliform Membrane Filter Procedure in accordance with Standard Methods.

6.7 Open heated merchandisers

6.7.1 Performance requirement

Open heated merchandisers shall be capable of maintaining a minimum product temperature of 150 °F (65.5 °C) when tested in accordance with Section 6.7.2. This requirement is intended to ensure that the nonenclosed equipment, which does not utilize food pans or food wells, is capable of holding packaged



potentially hazardous time / temperature control for safety foods at a minimum temperature of 140 °F (60 °C) under intended use conditions.

NOTE — The test is designed for open hot food holding equipment that does not utilize wells and does not include test criteria for open top hot food holding equipment, which is covered under Section 6.2. This requirement shall not apply to heating equipment designed to temporarily slow the cooling of food.

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6.7.2.2 The test unit shall be preheated in accordance with the manufacturer’s operating instructions before the unit is loaded. If the test unit is designed to automatically operate in a reduced energy mode until food is placed in the unit, the unit shall be preheated in the low energy mode. If the temperature for the low energy mode is not preprogrammed, the manufacturer’s operating manual shall be reviewed to determine the lowest recommended setting specified. The test unit shall be loaded with samples of test media prepared and conditioned in accordance with Annex N-1, including proper thermocouple placement. The time required to transfer a single sample 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 test sample containers.

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6.7.2.4 This test does not apply to food warming equipment intended solely for the display of foods that do not require temperature control for safety as detailed in Section 5.48.

6.8 Open heated merchandisers with a reduced energy mode and sensors - sensor activation

6.8.1 Performance requirement

Open heated merchandisers capable of operating in a reduced energy mode shall include a sensor which sends a signal to activate the heat source as intended when a food load is placed in the path of the sensor and receiver.

6.8.2 Test method

6.8.2.1 The test shall be performed with or without using the test media prepared in Section N-1.3. Thermocouples shall not be present, and preheating of the media is not required. If the test unit is designed to automatically operate in a reduced energy mode until food is placed in the unit, the unit shall be preheated in the low energy mode. If the temperature for the low energy mode is not preprogrammed, the manufacturer’s operating manual shall be reviewed to determine the lowest recommended setting specified.

NOTE — If the sensor can be activated with empty packaging, then the tests of Section 6.8 can be performed without the test media of Annex N-1.3.

6.8.2.2 A food load shall be placed in the center of the path of a sensor. It will then be confirmed that the heating element energizes as intended in response to the presence of the food load. The heating element shall remain energized for at least two minutes, or until the operating setpoint is reached, whichever is first.

After two minutes or after the operating setpoint is attained, remove the food load and allow the unit to cycle off the heat source for five minutes. It must be confirmed that the reduced energy mode indicator turns on during this time.

6.8.2.3 Each sensor shall be examined three times according to Section 6.8.3, using the food load in Section N-1.3.

6.8.2.4 Using two samples of the food load prepared in Section N-1.3, position the samples between the same two sensors so that the long sides of the samples are parallel to the path of the sensor. The two samples shall be inserted so that they are pushed together from their outside edges so that they converge roughly in the center of the path of the sensor. Confirm that the heating element energizes as



intended in response to the presence of the food load. The heating element shall remain energized for at least 2 min, or until the operating setpoint is reached, whichever is first. After 2 min or after the operating setpoint is attained, remove the food load and allow the unit to cycle off the heat source for 5 min.

6.8.2.5 Each sensor shall be examined three times according to Section 6.8.3.

6.8.3 Acceptance criteria

For each heated zone, the heat source shall energize within 15 s of the food being loaded and remain energized as intended for at least 2 min, or until the operating setpoint is reached, whichever is first. When the food load is removed from the path of the sensors, it must be confirmed that the reduced energy mode indicator was activated within 5 min of the food load being removed from the unit.