**TO:** Joint Committee on Food Equipment

**FROM:** Michael Perez, Chair of the Joint Committee

**DATE:** February 26, 2024

**SUBJECT:** Proposed revisions to NSF/ANSI 18 – *Manual Food and Beverage Dispensing Equipment*

Revision 1 of NSF/ANSI 18 issue 24 is presented to the Joint Committee on Food Equipment (JCFE) for consideration. Please review the proposed new language to these standards and **submit your ballot by March 18, 2024** via the NSF Online Workspace at <www.standards.nsf.org>. Log in at https://standards.nsf.org/kws.

When adding comments, please add all comments under one comment number whenever possible. If additional space is needed, please use the comment template included as a reference document with these ballots and upload your comment document to the NSF Online Workspace.

**Purpose**

The purpose of this ballot is to affirm revised and new language regarding cleaning, sanitizing and temperature holding for remote TCS product supply systems in NSF/ANSI Standard 18.

**Background**

Issue paper **FE-2023-13** proposes revised and new language to Standard 18 to include remote TCS product supply systems.

The issue proponent contends that NSF/ANSI 6 currently contains requirements and performance test for time / temperature control for safety (TCS) food and CIP for remote product supply systems.

NSF/ANSI 18 covers dispensers, some of which may include a remote product supply system intended to dispense non TCS food.

However, an NSF/ANSI 18 dispenser offered with a remote product supply system that could be used to dispense TCS food, language from NSF/ANSI 6 should be added to NSF/ANSI 18 to include TCS, CIP and performance test criteria necessary for an NSF/ANSI 18 dispenser to dispense TCS food.

This revision 1 approval ballot reflects the language proposed by the issue proponent and is being presented here for your consideration.

If you have any questions about the technical content of the ballot, you may contact me in care of:

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c/o Allan Rose
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**[Note – the recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by grey highlighting. Rationale Statements are in *red italics* and only used to add clarity; these statements will NOT be in the finished publication.]**

NSF/ANSI Standard
for Food Equipment –

# Manual Food and Beverage Dispensing Equipment

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**5.1.4** Food zones for which 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 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 CIP is intended including those in remote product supply systems. The type and concentration of sanitizing agent recommended in the instructions by the manufacturer shall comply with 40 C.F.R. § 180.940.

NOTE — CIP procedures are not required for oil distribution systems that only circulate fresh, edible oil throughout the fixed system.

### 5.27 Temperature-indicating devices for hot and cold food storage

**5.27.1** Storage compartments intended for the hot or cold storage of time / temperature control for safety food or beverages shall have a securely mounted temperature-indicating device that clearly displays the air temperature in the compartment. Temperature-indicating devices shall be accurate to ± 2 °F (± 1 °C) and shall be graduated in increments no greater than 2 °F (1 °C) in the intended range of compartment temperatures. The device shall be removable and easy to read. The sensing element of the device shall be easily cleanable and located to reflect the coolest temperature of a heated compartment or the warmest temperature of a refrigerated compartment. A temperature-indicating device is not required in storage compartments intended for frozen or semi-frozen food only or designed to conform to the requirements of Section 6.4.

**5.27.2** Product reservoirs intended to hold time / temperature control for safety food or beverage before dispensing shall have a securely mounted temperature-indicating device that clearly displays the temperature of the product. Sensors may be positioned to indirectly measure the product temperature if the temperature-indicating system is designed to display the actual product temperature. Temperature-indicating devices shall be accurate to ± 2 °F (± 1 °C) and shall be graduated in increments no greater than 2 °F (1 °C) in the intended range of compartment temperatures. The device shall be removable and easy to read. The sensing element of the device shall be easily cleanable and located to reflect the representative temperature of the product. A temperature-indicating device is not required in product reservoirs intended only for frozen or semi-frozen food or designed to conform to the requirements of Section 6.4.

**5.27.3** Remote product supply systems (if provided) shall have a securely mounted temperature indicating device that clearly displays the temperature of the product. Sensors may be positioned to indirectly measure the product temperature if the temperature indicating system is designed to display the actual product temperature. Temperature indicating devices shall be accurate to ± 2 °F (± 1 °C) and shall be graduated in increments no greater than 2 °F (1 °C) in the intended range of product temperatures. The device shall be removable and easy to read. The sensing element of the device shall be easily cleanable and located to reflect the warmest representative temperature of the product.

# 6 Performance

## 6.1 Cleaning and sanitization procedures

### 6.1.1 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 CIP and sanitizing procedures recommended by the manufacturer.

### 6.1.2 Test method

Microbiological methods for stock culture preparation, and enumeration / analysis *Escherichia coli* shall be performed as specified in Annex N-1.

**6.1.2.1** The equipment shall be filled with the *E. coli* suspension.

If a remote product supply system is being tested, the product supply lines shall be configured to the manufacturer's recommended installation restrictions (see Section 7.5) indicated in the manual prior to testing

**6.1.2.2** The equipment shall be operated so that food contact surfaces are exposed to the *E. coli* suspension. If a remote product supply system is being tested, the remote line set shall be filled with *E. coli* suspension so all food contact surfaces are exposed (i.e., no air in remote line set). The equipment shall then be cleaned in place according to the manufacturer's instructions and refilled with sterile buffered dilution water (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 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.*

### 6.1.3 Acceptance criteria

For each sample, the total counts on the initial inoculum density ($N_i$) of at least 1,000,000 ($1 \times 10^6$) and the total counts on the colony-forming units (cfus) recovered ($N_f$) shall demonstrate a reduction equal to or greater than 99.9999% (6 log). The log reduction, $R$, is calculated from the following equation:

$$R = \log_{10} (N_i / N_f)$$

where

$N_i$ = initial inoculum density (cfu/mL)
$N_f$ = the number of cfu recovered in each sample (cfu/mL)

If $N_f < 1$, the samples shall be considered acceptable.

### 6.2 Temperature requirements – Cold time / temperature control for safety food and beverages

#### 6.2.1 Performance requirement

~~Product reservoirs~~ Dispensing equipment intended for the cold holding of time / temperature control for safety food and beverages prior to their being dispensed shall be capable of maintaining product at a temperature of 41 °F (5 °C) or below.

#### 6.2.2 Test method

##### 6.2.2.1 Apparatus and materials

— temperature-controlled testing chamber or room; and
— intended food or beverage product; and
— remote temperature sensing devices with accuracies of ± 1 °F (± 0.6 °C).

##### 6.2.2.2 Procedure

The ability of manual food and beverage dispensing equipment to maintain its contents at 41 °F (5 °C) or below shall be evaluated by monitoring the temperature of the intended food or beverage product in the product reservoir, ~~and~~ in the product holding area of the dispensing head, and in the remote product supply systems (if provided) over a 4-h period in an 86 ± 3 °F (30 ± 2 °C) ambient environment.

Prior to the test, the equipment shall be allowed to establish thermal equilibrium according to the manufacturer's instructions or shall be allowed to cycle on and off at least two full times at room temperature (70 ± 5 °F [21 ± 2.8 °C]). The product reservoir shall then be filled with the intended food or beverage product at 35 ± 1 °F (1.7 ± 0.6 °C). The system shall then be purged of entrapped air by dispensing a small amount of the product.

Remote temperature sensors with accuracies of ± 1 °F (± 0.6 °C) shall be used to monitor the product temperature. A sensor shall be placed 1 ± 0.1 in (25 ± 3 mm) below the product level in the middle of the product reservoir and in the product holding area of the dispensing head. If a dispenser has a remote product supply system, a sensor shall be placed in the product tubing, 5 ± 0.25 in (127 ± 6.35 mm) from each end and in the middle of the remote product supply line(s).

The equipment shall be placed in a test chamber with an ambient air temperature of 86 ± 3 °F (30 ± 2 °C); or the ambient room air temperature shall be raised to 86 ± 3 °F (30 ± 2 °C). The chamber or room shall not have a vertical temperature gradient exceeding 1.5 °F/ft (2.5 °C/m). Before initiating the 4-h timed test period, the temperature of the food or beverage product shall be confirmed to be 41 °F (5 °C) or below.

The product temperature in the product reservoir, ~~and~~ in the product holding area of the dispensing head, and in the remote product supply systems (if provided) shall be monitored. Temperatures shall be measured

and recorded every 5 min for 4 h.
Units that are designed with a temperature-indicating system that indirectly measures product temperature, as permitted in Section 5.27.2 or 5.27.3, shall be permitted to reach a steady state temperature for the purpose of comparing the temperature reading of the temperature-indicating device to the temperature sensed by the test sensor located in the product reservoir. This comparison can be made at any point in time during the test and does not need to be made through the entire test duration.

#### 6.2.3 Acceptance criteria

The temperature at each thermocouple location shall not exceed 41 °F (5 °C) during the 4-h test period.

Units that are designed with a temperature-indicating system that indirectly measures product temperature, as permitted in Section 5.27.2 or 5.27.3, shall be capable of displaying a temperature within ± 2 °F (± 1 °C) of the temperature sensed by the test sensor located in the product reservoir.

### 6.3 Temperature requirements – Hot time / temperature control for safety food and beverages

#### 6.3.1 Performance requirement

~~Product reservoirs~~ Dispensing equipment intended for the hot holding of time / temperature control for safety food and beverages prior to their being dispensed shall be capable of maintaining product at a temperature of 140 °F (60 °C) or greater.

#### 6.3.2 Test method

##### 6.3.2.1 Apparatus and materials

- temperature-controlled testing chamber or room; and
- intended food or beverage product; and
- remote temperature sensing devices with accuracies of ± 1 °F (± 0.6 °C).

##### 6.3.2.2 Procedure

The ability of manual food and beverage dispensing equipment to maintain its contents at 140 °F (60 °C) or greater shall be evaluated by monitoring the temperature of the intended food or beverage product in the product reservoir, ~~and~~ in the product holding area of the dispensing head, and in the remote product supply systems (if provided) over a 4-h period in a 73 ± 3 °F (23 ± 2 °C) ambient environment.

Prior to the test, the equipment shall be allowed to establish thermal equilibrium according to the manufacturer's instructions or shall be allowed to cycle on and off at least two full times at room temperature (70 ± 5 °F [21 ± 2.8 °C]). The product reservoir shall then be filled with the intended food or beverage product. The system shall then be purged of entrapped air by dispensing a small amount of the product. The product shall be maintained at 140 °F (60 °C) or greater.

Remote temperature sensors with accuracies of ± 1 °F (± 0.6 °C) shall be used to monitor the product temperature. A sensor shall be placed 1 ± 0.1 in (25 ± 3 mm) below the product level in the middle of the product reservoir and in the product holding area of the dispensing head. If a dispenser has a remote product supply system, a sensor shall be placed in the product tubing, 5 ± 0.25 in (127 ± 6.35 mm) from each end and in the middle of the remote product supply line(s).

The equipment shall be placed a test chamber or room with an ambient air temperature of 73 ± 3 °F (23 ± 2 °C). The chamber or room shall not have a vertical temperature gradient exceeding 1.5 °F/ft (2.5 °C/m). Before initiating the 4-h timed test period, the temperature of the food or beverage product shall be confirmed to be greater than 140 °F (60 °C).

The product temperature in the product reservoir, ~~and~~ in the product holding area of the dispensing head, and in the remote product supply systems (if provided) shall be monitored. Temperatures shall be measured and recorded every 5 min for 4 h.

Units that are designed with a temperature-indicating system that indirectly measures product temperature, as permitted in Section 5.27.2 or 5.27.3, shall be permitted to reach a steady state temperature for the purpose of comparing the temperature reading of the temperature-indicating device to the temperature sensed by the test sensor located in the product reservoir. This comparison can be made at any point in time during the test and does not need to be made through the entire test duration.

### 6.3.3 Acceptance criteria

The temperature at each thermocouple location shall not be less than 140 °F (60 °C) during the 4-h test period.

Units that are designed with a temperature-indicating system that indirectly measures product temperature, as permitted in Section 5.27.2 or 5.27.3, shall be capable of displaying a temperature within ± 2 °F (± 1 °C) of the temperature sensed by the test sensor located in the product reservoir.

## 7.5 Remote product supply systems intended for CIP

If a remote product supply system is used that is intended for CIP, the manual shall indicate the following information regarding the manufacturers recommended installation restrictions for the remote product supply lines:

- maximum overall length of the product supply line;
- maximum number of line bends;
- minimum bend radius;
- minimum bend angle;
- maximum number of vertical deflections;
- maximum peak-to-peak vertical deflection height;
- maximum overall end-to-end vertical elevation change;
- remote product line diameter; and
- CIP pump specification – manufacturer model number.

Instructions shall provide provisions for remote line set installation such that they remain in their intended configuration and prevent sagging.

***Rationale:*** *NSF/ANSI 6 currently contains criteria for temperature control and CIP of remote product lines. NSF/ANSI 18 covers many dispensers that also use remote product lines but the products being dispensed were not TCS beverages. If an NSF/ANSI 18 dispenser were designed with remote product lines that would be intended to include TCS beverages, criteria from NSF/ANSI 6 could be added to NSF/ANSI 18 to address the temperature control and CIP criteria necessary for an NSF/ANSI 18 dispenser with remote product lines intended to dispense TCS foods/beverages.*