

**LOG OF MEETING  
DIRECTORATE FOR ENGINEERING SCIENCES**

SUBJECT: Turkey Fryer Task Group Meeting.

DATE OF MEETING: December 17 and 18, 2002

PLACE OF MEETING: Canadian Standards Association (CSA), Independence, OH.

LOG ENTRY SOURCE: Hammad A. Malik *ham*

COMMISSION ATTENDEES: Hammad A. Malik

NON-COMMISSION ATTENDEES:

Ronald E. Mell (Chair)	R.E.Mell & Associates
T. Jay Busin	Barbour International, Inc.
Don McLemore	Masterbuilt Manufacturing Inc.
Christopher V. Childers	Weber-Stephen Products Company
Paul Heald	Marshall Gas Controls
James Jollay	Char-Broil
Jake Halder	Morrone
Timothy Edwards	Metal Fusion, Inc.
Rob Butcher	Eastman Outdoors
Christine Parrish	The Brinkmann Corporation
Jack Goldman	Home Patio & Barbecue Association (HPBA)
Daniel Restelli	Underwriters Laboratories
Carl C. Radcliffe	Underwriters Laboratories
Susan McCarthy	CSA International, Cleveland
Rick Fort	CSA International, Cleveland
Raymond Thurton	CSA International, Toronto
Nino Mancini	CSA International, Toronto
Johnny Major	Masterbuilt
Tom Freeland	Manchester Tank
Norman Bourgeois	Metal Fusion, Inc.
Carl Suctiovsky	Gas Consultants, Inc.
Mark Tully	Kidde-Fenwal, Inc.
Peter Baker	Maxitrol Co.
John Pallanti	Underwriters Laboratories
Bali Singh	Thermodisc Inc, Mfd.

SUMMARY OF MEETING:

Ron Mel brought the meeting to order and then requested all attendees to introduce themselves. All attendees introduced themselves.

The agenda for this meeting was reviewed. The Chair made it clear that the Task Group was formed to specifically look at Turkey Fryers and provide advice to the ANSI Z21.89 Technical

CPUSA 6 (b)(1) Cleared *12-30-02*  
*AB*  
\_\_\_\_ No Mfrs/PrvtLblrs or  
Products Identified  
\_\_\_\_ Excepted by \_\_\_\_\_  
\_\_\_\_ Firms Notified,  
Comments Processed.

Area Group (TAG). The Task Group is purely advisory in nature and does not have the authority to change any standards.

See attachment A for the agenda.

See attachment B for the results of discussion.

See attachment C for the way that the task force recommendations will affect ANSI Z21.89

# Attachment A

## **TURKEY FRYER TASK GROUP**

### **SUMMARY OF TABLED AND OUTSTANDING AGENDA ITEMS**

- 1. TEMPERATURE LIMITING DEVICES**
- 2. THERMOMETERS**
- 3. OIL OVERFILL CONTROL**
- 4. SPLASH SHIELDS**
- 5. STABILITY**
- 6. HOT SURFACES**
- 7. FLOOR TEMPERATURES**
- 8. PLACEMENT OF PROPANE TANK**
- 9. MAXIMUM AND MINIMUM O.D. OF COOKING UTENSIL**
- 10. INSTRUCTIONS**
- 11. FIXED RELATIONSHIP BETWEEN PARTS**

**1. TEMPERATURE LIMITING DEVICES (for limiting the temperature of cooking liquids used with fryer/boilers)**

**STATUS: TABLED (input requested from controls industry)**

**COMMENTS/CONCERNS:**

- **1.10.1 400F may lead to nuisance problems. 475F is the limit in ANSI Z83.11/CSA 1.8**
- **1.10.2 Review standards references**
- **1.10.5 Relies on user & movement of device may cause damage – no requirement for appliance to fail to operate if not installed or broken**
- **The appliance shall be capable of maintaining the temperature of cooking oil below a temperature that will allow the oil to reach the flash point, with some allowance for safety. The minimum quantity of oil specified by the manufacturer shall be placed in the smallest cooking vessel specified by the manufacturer for frying purposes, but not less than some quantity (percentage) of the smallest capacity cooking vessel recommended by the manufacturer for use with this appliance.**

**Notes:**

- 1. The maximum diameter of the smallest capacity cooking vessel must be specified by the manufacturer shall be used for this test.**
- 2. The environmental conditions of this test will have to be standardized.**

*Rationale: The purpose of this test is to provide requirements that will establish uniform acceptance tolerance for preventing the cooking oil from approaching its flash point. The maximum diameter of the smallest pot specified by the manufacturer is required for this test because it will allow the maximum heat transfer.*

**UL PROPOSAL:**

**1.10 FRYER TEMPERATURE LIMITING DEVICES**

**1.10.1 Fryers shall be equipped with a separate high temperature limit control, having a maximum temperature setting, which functions to shut off the main burner(s) so that the cooking oil temperature will not exceed 400°F (204.4°C). This control may be in combination with the gas regulating control.**

**1.10.2 The high oil temperature cutoff shall comply with the Safety Standard for Limit Controls, ANSI/UL 353, or the Standard for Combination Gas Controls for Gas Appliances, ANSI Z21.78•CGA 6.20.**

**1.10.3 The construction of a temperature control valve shall be such that operating parts are not capable of field disassembly. Use of tamper-resistant fastenings is acceptable.**

**1.10.4 The manufacturer shall supply evidence satisfactory to the testing agency that material used as a protective coating for thermal sensing element tubes is suitable for the service, particularly with respect to toxicity, solubility, brittleness and temperature limits.**

Evidence of current certification under National Sanitation Foundation Standard *ANSI/NSF 51, Food Equipment Materials*, with appropriate end use shall be deemed acceptable.

1.10.5 A fryer provided with a temperature limiting device having a remote temperature limiting sensor mounted in a liftable part shall bear a caution label on Class IIA marking material attached in a conspicuous location close to the lifting part that holds the temperature limiting sensor.

The label shall state:

“Caution! Gas valve must be off before removing oil temperature limiting sensor from oil.”

## 2.13 FRYER TEMPERATURE LIMITING DEVICES

The high temperature limit control provided on a fryer shall shut off the gas supply to the main burner(s) so that the cooking oil temperature will not exceed 400°F (204.4°C).

### Method of Test

The test shall be conducted at normal inlet test pressure. The cooking utensil shall be filled with cooking oil in accordance with the manufacturer’s instructions.

Temperature readings shall be taken with an indicating or recording potentiometer and a thermocouple with the thermocouple junction immersed in the center of the cooking utensil *X* inches (*Y* mm) below the surface of the cooking oil. (*Specific dimensions of temperature measurement to be determined.*)

Starting the appliance at room temperature and with the gas pressure regulator set at its maximum setting the gas to the main burner(s) shall be ignited and the appliance operated until the limit control functions to shut off the gas supply.

The temperature of the cooking oil shall be continuously recorded and shall at no time, either prior to or after shutoff of the gas supply, exceed 400°F (204.4°C).

*Rationale: A method to limit the maximum oil temperature is required to reduce the risk of auto-ignition of the cooking oil. These requirements are based upon those in ANSI Z83.11 and ANSI Z21.22.*

## 2. THERMOMETERS

STATUS: TABLED (handle with UL proposal)

COMMENTS/CONCERNS:

- Proposed 2.24.1 should be a construction provision under 1..2.18
- Oil resistance & 48 hour submersion test – rationale needed linking the two
- CSA to provide revised proposal

CSA PROPOSAL:

### 2.24 Thermometers

2.24.1 The monitoring thermometer markings shall be tamper-proof, and shall be oil resistant.

All parts of a thermometer must be capable of maintaining a fixed relationship with each other and must not be adjustable with either hand tools or with the bare hands.

The marking on a thermometer shall remain legible after complete and continuous submergence in cooking oil at room temperature for a period of 48 hours.

2.24.2 Accessory thermometers must be verified in the laboratory to register 350F or higher when compared with a calibrated thermometer in an oil bath at 350F.

*Rationale: The above requirements of this section are intended to address what a suitable thermometer means.*

### 3. OIL OVERFILL CONTROL

STATUS: TABLED (handle with UL proposal)

COMMENTS/CONCERNS:

- References to “oil” were changed to “cooking liquid” throughout
- No need for a section b. For Fryers – all other proposals were included under 1.20.2a14 (a) through (p) – proposal below renumbered as new 1.20.2a14(r)

CSA PROPOSAL:

#### 1.20 INSTRUCTIONS

1.20.2 The instructions accompanying the appliance include:

a. For all appliances:

134. If applicable, statements indicating that:

(r) Manufacturers shall specify the maximum and minimum quantity, or the required maximum and minimum level of the cooking liquid in the cooking vessel for each type of food product for which this fryer is intended to cook. The quantities may be indicated by permanent marks on the cooking vessel. The maximum level of cooking liquid obtainable when the largest volume of food is placed in the cooking vessel must be marked on the vessel.

*Rationale: To provide the user with oil quantities that will prevent over-filling, which could result in cooking liquid spillage, and under-filling which could result in overheating the cooking liquid.*

STATUS: TABLED (boxed warning 6 and new 1.21.3 until December meeting)

COMMENTS/CONCERNS:

- Boxed warnings 1 through 5 rejected – already addressed elsewhere

UL PROPOSAL:

#### 1.20 INSTRUCTIONS

1.20.1 Add the following instructions in boxed warnings:

Follow these instructions prior to using the appliance:

1. Place the food product on the holder.
2. Place the food product and holder into the empty utensil.
3. Fill the utensil with water just until the food product is completely submerged.
4. Remove the food product from the utensil and either mark the water level on the side of the utensil or measure the amount of water in the utensil.
5. Remove the water and completely dry the utensil



**6. This is the amount of cooking oil the utensil is to be filled with to cook the food product. IN ANY CASE, DO NOT FILL PAST THE MAXIMUM FILL LINE ON THE UTENSIL.**

**“WARNING – DO NOT FILL PAST THE MAXIMUM FILL LINE MARKED ON THE UTENSIL.”**

**WARNING - If the information in items 1 – 6 above is not followed exactly, a fire causing death or serious injury may occur.**

## 1.21 MARKING

**1.21.3 Each cooking utensil for a fryer/boiler shall bear a Class I marking on the exterior of the cooking utensil showing the manufacturers maximum recommended oil fill level. This marking shall be accompanied by a Class I marking referring the user to the instruction manual for instructions on determining the proper amount of cooking oil to be used.**

*Rationale: In order to reduce the risk of fire, an indication should be made regarding the maximum level of cooking oil recommended by the manufacturer. Further, it is being recommended that instructions be provided for a test fill of the utensil using water and the food product. The purpose of the test fill being to give the user a reference for the amount of oil required to just cover the food product. This is intended to reduce the risk of cooking oil spilling or boiling over the sides of the appliance and coming in contact with an ignition source. These requirements are based upon the current requirements in Z21.89 and Z21.58A and are supplemented with new wording.*

#### 4. SPLASH SHIELDS

STATUS: TABLED

COMMENTS/CONCERNS:

- Reference to drip tray changed to splash shield
- Max temperature (300F) – is it reasonable & attainable in designing a shield – must consider effects on combustion & burner operating characteristics
- Must work with largest and smallest pots

UL PROPOSAL:

##### 1.15 SPLASH SHIELDS

Splash shields shall be provided as a permanent part for all fryers/boilers and on other appliances as necessary. Splash shields shall:

- a. Be constructed of corrosion-resistant material or have a corrosion-resistant finish suitable for the temperatures encountered under normal operation with occasional exposure to cooking oil or water.
- b. Have the edges raised, the corners made tight and the edges smooth; and
- c. Be so constructed as to direct oil from boil over and overflow away from contact with a source of ignition, as determined by 2.17, Splash Shields.

##### 2.17 SPLASH SHIELDS

2.17.1 The maximum temperature on the surface of splash shields, as required by 1.15A, shall not exceed 300°F (149°C).

###### Method of Test

This test shall be conducted in conjunction with 2.20, Wall and Floor Temperatures. During the test period, temperatures on the surface of the splash shield shall be determined.

2.17.2 Construction of the splash shield shall be such that any overflow of liquid shall be directed away from any potential sources of ignition.

###### Method of Test

Prior to filling the cooking utensil with cooking oil, the utensil shall be filled with water to a level one inch below the top of the cooking utensil. Submerge an object having a volume 80 percent of the volume of the cooking utensil at a rate of 6 inches per second, while observing the path of the displaced water.

The cooking utensil shall be emptied of water, dried and filled with cooking oil to a level two inches below the top. With the burner operating at its highest pressure and when the cooking oil

**reaches maximum cooking temperature (400 °F), the test shall be repeated. There shall be no ignition of any displaced cooking oil.**

**Under PART IV, DEFINITIONS**

**SPLASH SHIELD. A shield used to direct cooking oil from coming in contact with a source of ignition due to overfill or boil over.**

*Rationale: A means of deflecting any spilled or boiled over cooking oil from contacting a source of ignition is necessary. While steps are being recommended to reduce this risk by including a maximum fill mark (with corresponding instructions) and recommended instructions for removing as much moisture as possible from food product prior to placement in oil, there is still a reasonably foreseeable risk of spillage and boil-over. Also, a definition of "splash shield" is being recommended. These suggested requirements expand upon those currently in Z21.89 for drip trays.*

## 5. STABILITY

STATUS: TABLED (mfrs. to provide feedback)

### COMMENTS/CONCERNS:

- Proposed requirement for a minimum footprint rejected
- Proposed additional 10 degree cooking utensil tip test rejected
- During the Tip Test, 2.19.4, the vessel shall be filled to the maximum fill level obtainable when the largest quantity of food product for which the appliance is designed to cook is in the vessel. The water or oil shall not spill at anytime during this test.
- Clause 2.19.4 shall be amended so that the tip test is also applied to the vessel, regardless of how the appliance is anchored to a base.
- An Impact Test to simulate the vessel being impacted by a turkey being transferred to the cooking vessel.
- CSA to provide revised coverage (off-set or centered pot)

### UL PROPOSAL:

#### 2.19 APPLIANCE STRUCTURE

- 2.19.4 An appliance shall be constructed so it cannot be tipped by any reasonable pressure. This shall not apply to appliances that are provided with means, including necessary screws, bolts or both, and instructions for attaching them to the floor or mounting their bases in the ground.

##### Method of Test

With all lids or covers in the closed position, water filled cooking utensils of the maximum size recommended by the manufacturer in place, or fryer or boiler utensils provided by the manufacturer in place; if applicable, the appliance shall be tipped in any direction at an angle of 15 degrees (0.26 rad) from the vertical and shall not tip over when released.

Additionally for fryers and boilers, when the appliance does not adequately restrict the movement of the cooking utensil, the cooking utensil shall be subjected to a force equal to 1/3 of the weight of the cooking utensil when filled with the maximum recommended level of oil, see 1.21.3A, but not less than a 20 pound-force (9.1 kg), applied to the top of the cooking utensil in any direction. During the test, the cooking utensil is to be resting on its intended appliance. As a result of the force, the cooking utensil shall not tip over.

An appliance for connection to a self-contained LP-gas supply system shall comply with this test with and without a full cylinder in place.

*Rationale: The current stability requirements of Z21.89 are inadequate for fryers and boilers. Many of these products are susceptible to tip over. Also, the current requirements only address the stability of the cooking appliance, not the utensil. These requirements expand upon the existing Z21.89 requirements.*

## 6. HOT SURFACES

STATUS: TABLED (handle with UL proposal)

COMMENTS/CONCERNS:

CSA PROPOSAL:

### 2.21 HANDLE TEMPERATURES

Revise 2.21 to add: The cooking vessel handles and pot handles shall also be subjected to the same Handle Temperature limits of Section 2.21 of the latest standard.

*Rationale: The handle of a cooking vessel is very susceptible to being held while hot, so it must meet the same requirements as Section 2.21.*

STATUS: OUTSTANDING

COMMENTS/CONCERNS:

UL PROPOSAL:

### 2.21 HANDLE TEMPERATURES

The surface temperatures of the grasping area of handles of burner valves and for appliances with self-contained LP-gas supply systems, LP-cylinder shutoff valve hand wheel, and if provided, knobs doors, lids, covers, spit handles and handles (including areas surrounding the handle if they are likely to be contacted while holding the handle) intended for use in moving an appliance or its intended cooking utensil, shall not exceed the following limits:

Metallic handles	54°F (30°C) above room temperature
Nonmetallic handles	90°F (50°C) above room temperature

And shall not exceed the following temperatures regardless of the room temperature:

Metallic handles	144°F (62°C)
Nonmetallic handles	180°F (82°C)

(Also see B.1.4-b.)

#### Method of Test

This test shall be conducted at normal test pressure.

A rotisserie (motor, bracket and spit), if provided, shall be installed in accordance with the manufacturer's instructions and operated throughout the specified test period.

The gas input to the burners shall be regulated to maintain an equilibrium condition as defined below:

- Fryer/Boiler -** The contents of a cooking vessel of the maximum diameter specified by the manufacturer filled to 75% of its capacity with cooking oil shall be 350+/-10°F (176.5+/-5.5°C).
- Smoker -** The cooking chamber of the unit shall be 250+/-10°F (139+/-5.5°C).
- Table Top -** The cooking grate plane to be 550+/-10°F (288+/-5.5°C).

(If for an appliance, the specified temperature cannot be reached on high setting then the test is to be done at the maximum obtainable temperature. If an appliance exceeds the specified maximum temperature on the lowest setting at normal pressure, then the test is to be done at the temperature obtained.)

The equilibrium temperature for fryer/boiler shall be measured as follows:

A No. 24 AWG (0.20 mm<sup>2</sup>) iron-constantan thermocouple shall be placed 2 inches (50.8 mm) below the cooking oil surface in the center of the cooking vessel. The thermocouple shall be read using a measuring instrument of sufficient response time. The gas shall be ignited and the appliance allowed to operate until the cooking oil reaches equilibrium.

The equilibrium temperatures for smoker and table top units shall be measured as follows:

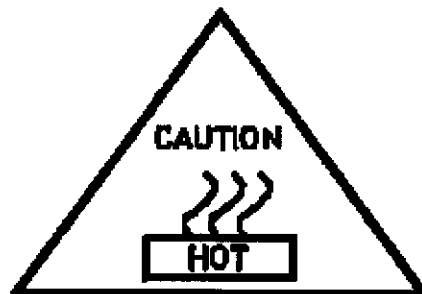
Temperatures shall be determined by means of an indicating potentiometer and nine No. 24 AWG (0.20 mm<sup>2</sup>) thermocouples connected in parallel. The thermocouples shall be evenly placed on the main cooking grate and shall measure the air temperature. Final placement is up to the determination of the certifying agency.

With the appliance at room temperature, the gas shall be turned on, ignited and the door or cover, if provided, closed. Handle temperatures shall be taken 1 hour after constant temperature of the operating section has been reached.

The surfaces to be measured shall be instrumented with No. 24 AWG (0.20 mm<sup>2</sup>) iron-constantan thermocouples with a beaded or with the junction brazed in the face of a copper plate 0.218 inch (5.54 mm) in diameter and 0.024 inch (0.61 mm) thick whichever method is most applicable by the agency based on the appliance design. The temperatures are to be read by a calibrated measuring device.

## 1.21 MARKING

1.21.6 For fryers and boilers, the surface of the cooking utensil shall bear a Class 1 marking with the words "CAUTION – HOT" or the following symbol:



SM218

*Rationale: The existing standard does not address contact with hot surfaces of the cooking utensil, it only addresses contact with the appliance. This recommendation expands the existing requirements to the handles of the cooking utensil. Further, some existing designs of cooking utensils do not have sufficient clearance between the handle and the main portion of the utensil. Therefore, it is likely that contact will occur with the main portion of the utensil. It is recommended in those cases that the surrounding area of the cooking utensils handle also be required to be below the maximum temperature. Also, recommendation is being made for markings to be put on the main body of the utensil to avoid contact. These requirements are an expansion on the current requirements based upon the requirements of UL 197.*

**STATUS: OUTSTANDING (formerly Item 16 from Sept 24-25, 2002 TAG mtg)**

**COMMENTS/CONCERNS:**

- At the Sept 24-25, 2002 TAG mtg, Mr. Fort asked that the task group consider the following:

**Background:**

In a memo dated February 25, 2002, Mr. Rick Fort of CSA International, suggested that section 2.15 of the final draft of ANSI Z21.89/CSA 1.18 standard was in error. A proposal from Mr. Fort was reviewed at the February JSC meeting and generally supported by the JSC. However, there were a few identified issues that needed to be better defined/addressed. These included:

- exemption of handle(s) of access cover(s) for Smokers
- proposed minimum letter height of ¼ inch (6.4 mm)
- lack of coverage for other appliance's compartments similar to smoking chambers that may need a marking indicating the word "HOT".

## 7. FLOOR TEMPERATURES

STATUS: OUTSTANDING

COMMENTS/CONCERNS:

UL PROPOSAL:

### 2.20 WALL AND FLOOR TEMPERATURES

At the end of the test, the maximum temperature on the walls, and the floor shall not exceed 194°F (90°C).

#### Method of Test

##### a. Test Structure

The appliance shall be installed in a partial enclosure with its back and sides parallel to the walls of the enclosure as shown in Figure 3 (Typical Test Enclosure for Wall and Floor Temperature Tests of Outdoor Specialty Cooking Appliances), and with the clearances specified by the manufacturer.

Vertical walls of the enclosure shall be constructed of nominal 1 inch-thick wooden boards or 0.750 inch plywood and finished in dull black. The back wall shall be 6 feet (1.83 m) high and the side walls shall extend 6 inches (152 mm) beyond the front of the appliance. The floor shall be constructed of 1 inch tongue-and-groove oak flooring finished with clear varnish.

An appliance whose design is not compatible with the test enclosure shown in Figure 3 shall be installed in a modified test enclosure, as deemed necessary by the testing agency.

##### b. Instrumentation

Enclosure surface temperatures shall be determined by means of an indicating potentiometer and No. 24 AWG (0.20 mm<sup>2</sup>) iron-constantan thermocouples, the junctions of which are copper discs 0.687 inch (17.45 mm) in diameter and 0.022 inch (0.559 mm) thick, to which the thermocouple wires are silver-soldered 0.125 inch (3.2 mm) apart. The discs shall be embedded so their surfaces are flush with the surrounding surfaces. The surfaces of the copper discs, except those in the floor, shall be finished dull black.

Thermocouples shall be placed at intervals of 3 inches (76.2 mm) apart over the surfaces of panels facing the appliance. Thermocouples embedded in the floor shall be 6 inches (152 mm) apart, with thermocouples specifically being embedded at the points where the appliance contacts the floor. The center line of one row of thermocouples on the side panel shall be 1 inch (25.4 mm) below the cooking top.

The thermometers for determining room temperature shall be installed adjacent to the test area as shown in Figure 4 (Location of Thermometers for Determining Ambient Room Temperature During Wall and Floor Temperature Test).

##### c. Operating Conditions of the Appliance

The various sections and components of the appliance shall be operated during this test as follows:

1. Appliances shall be operated as indicated in Table X (Appliance Operating Conditions for the Wall and Floor Temperature Test).



2. Any electrical equipment provided, such as a rotisserie motor, shall be installed but not operated throughout the specified test periods.
3. On an outdoor specialty cooking gas appliance for connection to a self-contained LP-gas supply system, the gas from the supply cylinder shall be purged outside of the test structure at a rate equal to manufacturer's specified hourly input rate of the outdoor cooking gas appliance within +/-5% for determining compliance with 1.6.19. This test shall be started with the LP-gas cylinder no more than 50% full.

**d. Test Period**

The appliance shall be operated at normal test pressure and in accordance with the specified conditions of time and burner input, as specified in Table IX (Body Loading), and under any further special conditions specified in the Notes to Table IX. If the appliance is provided with a cover or hood, the above test shall be conducted with the cover or hood in the position deemed most critical by the testing agency.

At the end of the specified test periods and operating conditions listed in Table IX, all wall temperatures shall be determined and recorded. Ambient room temperature shall be determined by thermometers located as shown in Figure 4 and recorded.

At the end of the test period, no wall or floor temperature shall exceed; 194°F (90°C).

*Rationale: Currently requirements do not ensure that floor temperatures will be measured directly where the appliance rests on the floor (where high temperatures are expected to be found). Therefore, it is recommended that it be required that this area of the floor's temperature be measured.*

## **8. PLACEMENT OF PROPANE TANK**

**STATUS: OUTSTANDING**

**COMMENTS/CONCERNS:**

- **Developing a Tripping Test to simulate someone tripping on the supply hose, unless the design of the cylinder and appliance with the cooking vessel retention means prevents this from occurring.**
- **The current standard does not address placement of the propane tank. The gas supply hose should be long enough to reduce the risk of the propane tank and appliance coming in contact (even if either falls over). However, the supply hose should not be so long as to increase the risk of foot traffic between the tank and the appliance (increasing the risk of tripping on the supply tank).**
- **1.20.2b11 requires the cylinder placement diagram to be in a WARNING format in accordance with ANSI Z535.4. ANSI Z535.4 requires the WARNING format to be printed in orange. This is similar to the situation previously discussed for the cylinder label. The marking should be in black and white.**
- **At the Sept 24-25, 2002 TAG mtg, Daryl Hossler indicated the ANSI Z21/83 committee has requested the removal of all references to ANSI Z535.4 in all Z21/83 standards.**
- **The requirements of 1.6.2 are applicable to appliances that do not incorporate wheels or other means of movement other than lifting. Yet the specific instruction and marking requirements referenced (1.20.2b.11 and 1.21.3) are now proposed to state that they are only applicable to appliances “intended for use with other than a CGA No. 600 connection”. The actual test under 2.19.6 is OK as currently written because it refers to appliances complying with the requirements of 1.6.2.**
- **As mounting space is limited on many specialty appliance designs, manufacturers continue to request the use of a tag. There is established construction and performance coverage in the ANSI Z21.11.2 dealing with flexible fasteners, metal tags, and Class IIIA-3 permanent tags.**

**9. MAXIMUM AND MINIMUM O.D. OF COOKING UTENSIL**

**STATUS: OUTSTANDING**

**COMMENTS/CONCERNS:**

- **Testing should be conducted with the maximum and minimum O.D. cooking utensils recommended by manufacturer to ensure that the product meets the requirements of the standard in all possible configurations.**

## 10. INSTRUCTIONS

**STATUS: OUTSTANDING**

**COMMENTS/CONCERNS:**

- **Requirements for instructions are lacking, in addition to previously mentioned, the following are some areas of concern.**
  - a) **Importance of slowly submersing food product into fryer.**
  - b) **Importance of ensuring food product is as free of moisture as possible.**
  - c) **Instructions (and marking cooking utensil) to not tamper with safety controls in order to exceed the 400°F limit.**
  - d) **Importance of avoiding fire risk due to combustibles surrounding the appliance.**
  - e) **Importance of avoiding hot surfaces of appliance and utensil.**
  - f) **Instructions to only use cooking utensils which are recommended by the manufacturer (and which meet the requirements of the standard).**
  - g) **What to do in case of fire:**
    1. **Call the Fire Department.**
    2. **Do not attempt to extinguish with water.**
    3. **Stay clear from flame.**

**11. FIXED RELATIONSHIP BETWEEN PARTS**

**STATUS: OUTSTANDING**

**COMMENTS/CONCERNS:**

- **Clause 1.2.10 (fixed relationship of parts) shall also apply to accessories, such as cooking vessels.**

# Attachment B

1. **TEMPERATURE LIMITING DEVICES (for limiting the temperature of cooking liquids used with fryer/boilers)**

**STATUS: TABLED - RECOMMENDATION TO THE TAG THAT THIS ISSUE BE FOLLOWED AND PURSUED, BECAUSE THERE HAS BEEN NO EVIDENCE OF DEMONSTRATED AND PROVEN TECHNOLOGY APPLIED TO CURRENT PRODUCT DESIGNS AT THIS TIME.**

**COMMENTS/CONCERNS:**

- A timer may be a good option. The maximum time on the timer could be limited by the time it takes to reach auto-ignition from 350F. 1 hour, 15 minutes and 5 minutes were also suggested. A timer may lead to other safety hazards such as the need to re-ignite the burner each time the timer functions.
- 1.10.1 400F may lead to nuisance problems. 475F is the limit in ANSI Z83.11/CSA 1.8
- 1.10.2 Review standards references
- 1.10.5 Relies on user & movement of device may cause damage – no requirement for appliance to fail to operate if not installed or broken
- The appliance shall be capable of maintaining the temperature of cooking oil below a temperature that will allow the oil to reach the flash point, with some allowance for safety. The minimum quantity of oil specified by the manufacturer shall be placed in the smallest cooking vessel specified by the manufacturer for frying purposes, but not less than some quantity (percentage) of the smallest capacity cooking vessel recommended by the manufacturer for use with this appliance.

**Notes:**

3. The maximum diameter of the smallest capacity cooking vessel must be specified by the manufacturer shall be used for this test.
4. The environmental conditions of this test will have to be standardized.

*Rationale: The purpose of this test is to provide requirements that will establish uniform acceptance tolerance for preventing the cooking oil from approaching its flash point. The maximum diameter of the smallest pot specified by the manufacturer is required for this test because it will allow the maximum heat transfer.*

**UL PROPOSAL:**

**1.10 FRYER TEMPERATURE LIMITING DEVICES**

**1.10.1 Fryers shall be equipped with a separate high temperature limit control, having a maximum temperature setting, which functions to shut off the main burner(s) so that the cooking oil temperature will not exceed 400°F (204.4°C). This control may be in combination with the gas regulating control.**

**1.10.2 The high oil temperature cutoff shall comply with the Safety Standard for Limit Controls, ANSI/UL 353, or the Standard for Combination Gas Controls for Gas Appliances, ANSI Z21.78•CGA 6.20.**

**1.10.3 The construction of a temperature control valve shall be such that operating parts are not capable of field disassembly. Use of tamper-resistant fastenings is acceptable.**

**1.10.4 The manufacturer shall supply evidence satisfactory to the testing agency that material used as a protective coating for thermal sensing element tubes is suitable for the service, particularly with respect to toxicity, solubility, brittleness and temperature limits.**

**Evidence of current certification under National Sanitation Foundation Standard ANSI/NSF 51, Food Equipment Materials, with appropriate end use shall be deemed acceptable.**

**1.10.5 A fryer provided with a temperature limiting device having a remote temperature limiting sensor mounted in a liftable part shall bear a caution label on Class IIA marking material attached in a conspicuous location close to the lifting part that holds the temperature limiting sensor.**

**The label shall state:**

**“Caution! Gas valve must be off before removing oil temperature limiting sensor from oil.”**

## **2.13 FRYER TEMPERATURE LIMITING DEVICES**

**The high temperature limit control provided on a fryer shall shut off the gas supply to the main burner(s) so that the cooking oil temperature will not exceed 400°F (204.4°C).**

### **Method of Test**

**The test shall be conducted at normal inlet test pressure. The cooking utensil shall be filled with cooking oil in accordance with the manufacturer’s instructions.**

**Temperature readings shall be taken with an indicating or recording potentiometer and a thermocouple with the thermocouple junction immersed in the center of the cooking utensil X inches (Y mm) below the surface of the cooking oil. (Specific dimensions of temperature measurement to be determined.)**

**Starting the appliance at room temperature and with the gas pressure regulator set at its maximum setting the gas to the main burner(s) shall be ignited and the appliance operated until the limit control functions to shut off the gas supply.**

**The temperature of the cooking oil shall be continuously recorded and shall at no time, either prior to or after shutoff of the gas supply, exceed 400°F (204.4°C).**

***Rationale: A method to limit the maximum oil temperature is required to reduce the risk of auto-ignition of the cooking oil. These requirements are based upon those in ANSI Z83.11 and ANSI Z21.22.***



## 2. SPLASH SHIELDS

STATUS: TABLED – ORIGINAL UL PROPOSAL REJECTED. UL ASKED TO PROVIDE REVISED PERFORMANCE BASED PROPOSAL. UL DEVELOPED A PROPOSED OIL OVERFLOW TEST. MANUFACTURERS AND CPSC TO PROVIDE COMMENTS REGARDING TEST METHOD AND REPEATABILITY AT APRIL, 2003 MTG.

### COMMENTS/CONCERNS:

- Reference to drip tray changed to splash shield
- Max temperature (300F) – is it reasonable & attainable in designing a shield – must consider effects on combustion & burner operating characteristics
- Must work with largest and smallest pots

### UL PROPOSAL:

#### 1.15 SPLASH SHIELDS

Splash shields shall be provided as a permanent part for all fryers/boilers and on other appliances as necessary. Splash shields shall:

- a. Be constructed of corrosion-resistant material or have a corrosion-resistant finish suitable for the temperatures encountered under normal operation with occasional exposure to cooking oil or water.
- b. Have the edges raised, the corners made tight and the edges smooth; and
- c. Be so constructed as to direct oil from boil over and overflow away from contact with a source of ignition, as determined by 2.17, Splash Shields.

#### 2.17 SPLASH SHIELDS

2.17.1 The maximum temperature on the surface of splash shields, as required by 1.15A, shall not exceed 300°F (149°C).

##### Method of Test

This test shall be conducted in conjunction with 2.20, Wall and Floor Temperatures. During the test period, temperatures on the surface of the splash shield shall be determined.

2.17.2 Construction of the splash shield shall be such that any overflow of liquid shall be directed away from any potential sources of ignition.

##### Method of Test

Prior to filling the cooking utensil with cooking oil, the utensil shall be filled with water to a level one inch below the top of the cooking utensil. Submerge an object having a volume 80 percent of the volume of the cooking utensil at a rate of 6 inches per second, while observing the path of the displaced water.

The cooking utensil shall be emptied of water, dried and filled with cooking oil to a level two inches below the top. With the burner operating at its highest pressure and when the cooking oil

reaches maximum cooking temperature (400 °F), the test shall be repeated. There shall be no ignition of any displaced cooking oil.

#### Under PART IV, DEFINITIONS

SPLASH SHIELD. A shield used to direct cooking oil from coming in contact with a source of ignition due to overflow or boil over.

*Rationale: A means of deflecting any spilled or boiled over cooking oil from contacting a source of ignition is necessary. While steps are being recommended to reduce this risk by including a maximum fill mark (with corresponding instructions) and recommended instructions for removing as much moisture as possible from food product prior to placement in oil, there is still a reasonably foreseeable risk of spillage and boil-over. Also, a definition of "splash shield" is being recommended. These suggested requirements expand upon those currently in Z21.89 for drip trays.*

#### UL REVISED PROPOSAL:

##### 2.17 OIL OVERFLOW TEST

2.17.1 On fryers, there shall be no ignition of oil as a result of overflow when subjected to the following Method of Test.

##### Method of Test

A turkey with a total packaged weight equal or  $\pm 2$  lbs. ( $\pm 0.91$  kg) of the maximum specified weight for the utensil used shall be frozen to an internal temperature of  $0\pm 2^{\circ}\text{F}$  ( $-17\pm 1^{\circ}\text{C}$ ).

The turkey will be removed from the freezer and will be thawed in a refrigerator maintained at a temperature of  $36\pm 2^{\circ}\text{F}$  ( $2\pm 1^{\circ}\text{C}$ ) for a period of time based on 50% of the recommended time for thawing as specified by ??.

The intended cooking vessel intended for frying will be filled to the maximum marked oil level line with corn (vegetable) oil at ambient ( $25\pm 2^{\circ}\text{C}$ ) temperature.

The fryer shall be placed on a  $\frac{1}{2}$  inch (2.27 cm) CDX grade plywood (C rated side up). The oil will then be heated with the fryer set at the maximum heat level until the temperature as measured 1 inch (2.54 cm) below the surface at the center of the utensil measures  $375^{\circ}\text{F}$  ( $190^{\circ}\text{C}$ ).

The turkey will then be placed in a representative basket and immediately submerged into the oil at a rate of 2 inches (5.04 cm) per second.

There shall be no ignition of oil as a result of overflow.

### 3. HANDLE TEMPERATURES

**STATUS: ACCEPTED IN PRINCIPAL. RICK FORT TO PROVIDE FORMAL PROPOSAL TO TAG FOR APRIL, 2003 MTG.**

#### **COMMENTS/CONCERNS:**

- **At the Sept 24-25, 2002 TAG mtg, Mr. Fort asked that the task group consider the following:**

#### **Background:**

**In a memo dated February 25, 2002, Mr. Rick Fort of CSA International, suggested that section 2.15 of the final draft of ANSI Z21.89/CSA 1.18 standard was in error. A proposal from Mr. Fort was reviewed at the February JSC meeting and generally supported by the JSC. However, there were a few identified issues that needed to be better defined/addressed. These included:**

- **exemption of handle(s) of access door(s) for Smokers**
- **proposed minimum letter height of ¼ inch (6.4 mm)**
- **lack of coverage for other appliance's compartments similar to smoking chambers that may need a marking indicating the word "HOT".**
- **Task group wants to use UL symbol or the word "CAUTION – HOT"**
- **The marking should be on the knob or in the near vicinity of the knob**
- **The text shall be written as an either/or situation. Compliance with the handle temperature requirement would not require a marking. If the handle does not comply, the marking is required**
- **Rick Fort to provide formal text to TAG for April, 2003 mtg.**

#### **4. PLACEMENT OF PROPANE TANK**

**STATUS: ACCEPTED IN PRINCIPAL. JIM JOLLAY TO PREPARE PROPOSAL FOR ATTACHED TAGS FOR THE APRIL, 2003 MTG.**

#### **COMMENTS/CONCERNS:**

- **As mounting space is limited on many specialty appliance designs, manufacturers continue to request the use of a tag. There is established construction and performance coverage in the ANSI Z21.11.2 dealing with flexible fasteners, metal tags, and Class IIIA-3 permanent tags.**

**5. MAXIMUM AND MINIMUM O.D. OF COOKING UTENSIL**

**STATUS: ACCEPTED IN PRINCIPAL. NINO MANCINI TO PREPARE PROPOSAL FOR THE APRIL, 2003 MTG.**

**COMMENTS/CONCERNS:**

- **Testing should be conducted with the maximum and minimum O.D. cooking utensils recommended by manufacturer to ensure that the product meets the requirements of the standard in all possible configurations.**

# Attachment C

## PART I

### CONSTRUCTION

#### 1.2 GENERAL CONSTRUCTION AND ASSEMBLY

1.2.18 Each fryer/boiler shall include as standard equipment and be shipped with a thermometer suitable for measuring the temperature of the cooking liquid. The thermometer shall be sized to fit the cooking vessel provided with the appliance. (See section 1.20, Instructions.) The thermometer shall meet the criteria of clause (a), (b), (c), (d) and (e) below:

- a. For analog type thermometers it shall not be possible to change the relative position of the temperature indicating needle to the temperature scale when tested in accordance with the test of clause 2.26, Thermometer Scale Misalignment;
- b. The temperature markings shall remain legible when tested per the oil immersion test of clause 2.27, Marking Material Resistance to Oil;
- c. The thermometer shall not have an error of greater than  $\pm 20^{\circ}\text{F}$  ( $11^{\circ}\text{C}$ ) from the measured temperature value when calibrated at  $212^{\circ}\text{F}$  ( $100^{\circ}\text{C}$ ) and  $400^{\circ}\text{F}$  ( $204^{\circ}\text{C}$ ), in accordance with the test of clause 2.28, Thermometer Calibration;
- d. The thermometer shall incorporate a mechanical stop to prevent multiple rotations of the temperature indicator; and
- e. The indicator dial of the thermometer shall be marked with a red zone which starts at a temperature no higher than  $400^{\circ}\text{F}$  ( $200^{\circ}\text{C}$ ) and continues to the maximum temperature of the dial. The red zone shall state "Fire Hazard".
- f. The thermometer shall comply with the calibration test of clause 2.28 after being conditioned at an ambient temperature of  $-22^{\circ}\text{F}$  ( $-30^{\circ}\text{C}$ ) for a period of 48 hours.

*Rationale: The word "suitable" is subjective, and should be avoided in a standard unless the criteria to define "suitable" are contained in the standard.*

- a) *If it is possible to easily change the orientation of the needle, then it will not provide the proper temperature reading. This is a safety device that is being relied upon to indicate a potential fire hazard, so we need a certain level of assurance that the device chosen will fulfill its intended function.*
- b) *There are certain paints that are oil soluble. The selection process of the thermometer should include a test to ensure that the paint has a minimum level of oil resistance. The legibility criteria parallel that required for nameplates.*
- c) *The thermometer must have a minimum level of accuracy to perform its intended function of indicating a potential fire hazard. The committee decided the limit of  $\pm 20^{\circ}\text{F}$  is satisfactory from a safety standpoint and a product selection standpoint. The rationale for choosing the points is as follows:  $212^{\circ}\text{F}$  because this is the point at which we specify in the manual that a user should perform the operational verification and  $400^{\circ}\text{F}$  is defined as the critical point at which the appliance should be turned off.*
- d) *The needle of a thermometer should be prevented from rotating more than one full rotation to prevent an inaccurate indication of the cooking liquid temperature.*
- e) *The committee felt that thermometers need be marked so that temperatures exceeding  $400^{\circ}\text{F}$  are clearly indicated.*

- f) *The thermometers are routinely stored with the fryer pot when not in use, and usually in an unheated garage. In northern areas the winter temperature may reach a very low value. Some incorporate a bimetal as the active means of temperature determination. The very low temperatures damage some types of bimetals to the point where they are no longer accurate. That is, there is a hysteresis effect. The test is inserted to insure that when a thermometer is used after winter storage that the accuracy has not been compromised by winter storage.*

## 1.6 SELF-CONTAINED LP-GAS SUPPLY SYSTEMS

- 1.6.2 **On appliances that do not incorporate wheels or other means of movement, other than lifting and intended for use with other than a CGA No. 600 connection, cylinder retention is not required. The product markings and instructions shall include a pictorial representation of the manufacturers recommended appliance and cylinder placement. (See 1.20.2-b11 and 1.21.3) A minimum warning level statement advising the customer of the hazard of tripping over the hose and tipping of the supply cylinder shall also be included. The hose connecting the appliance to the supply cylinder shall be of such a length that the cylinder, when positioned in accordance with the manufacturers recommendation will fall to the ground without striking the appliance on the downward fall or pulling the appliance sufficiently to cause spillage of liquid from the cooking vessel, when the cylinder is tipped in any direction, in accordance with the test method. (See 2.19.6)**

*Rationale: This provision was intended only to be applicable to appliances for use with a 20 lb. LP-gas cylinder. With this change, the coverage above is now consistent with 1.20.2-b11 and 1.21.3.*

## 1.20 INSTRUCTIONS

**Each appliance shall be accompanied by clear, concise printed instructions and diagrams, stated in terms adequate for proper field assembly, installation, maintenance, safe use and operation.**

**The safety-related items included in the instructions shall be prominently displayed and shall precede the instructions concerning the functional use of the appliance.**

**The instructions shall be marked with directions to the installer to leave them with the consumer and to the consumer to retain them for future reference.**

**The instructions shall be reviewed by the testing agency for comprehensibility, accuracy and compatibility with results of test.**

- 1.20.1 **The front cover or the first page of the instructions shall bear the following:**
- a. **Boxed warnings in 12 point boldfaced type:**



**DANGER**

If you smell gas:

1. Shut off gas to the appliance.
2. Extinguish any open flame.
3. Open lid.
4. If odor continues, keep away from the appliance and immediately call your gas supplier or your Fire Department.

Failure to follow these instructions could result in fire or explosion which could cause property damage, personal injury or death.

*Rationale: The fire department is the quickest available and properly trained source for help. The addition of the failure to follow instructions boxed section is done to be consistent with ANSI 535 guidelines and gives the consequences if the instructions are not followed.*

**WARNING**

1. Never operate this appliance unattended.
- ~~2. Do not store spare LP cylinder~~ Never operate this appliance within 10 feet (3.05 m) of this appliance any other gas cylinder.
- ~~23. Do not store or use gasoline or other~~ Never operate this appliance within 25 feet (7.5 m) of any flammable liquids or vapors within 25 feet (7.62 m) of this appliance.
- ~~34. When cooking with oil/grease, do not~~ Never allow the oil/grease to get hotter than 350 400°F (176.5 200°C). If the temperature exceeds 400°F (200 °C) or if oil begins to smoke, immediately turn the burner or gas supply OFF.
- ~~45. Do not leave oil/grease unattended.~~ Heated liquids remain at scalding temperatures long after the cooking process. Never touch cooking appliance until liquids have cooled to 115°F (45 °C) or less.

Failure to follow these instructions could result in fire or explosion which could cause property damage, personal injury or death.

**NOTE:** Boxed warnings above that are not applicable to a specific appliance may be deleted.

*Rationale: Warnings should be prioritized according to the degree of risk they present and should focus on the appliance when it is in operation. In this case attending the appliance while in operation should be given the highest priority. The °C temperature values implied a degree of precision that is unachievable by the consumer, and therefore, have been rounded. The maximum oil temperature was raised from 350 °F to 400 °F as 350 °F is a normal cooking temperature and 400 °F is approaching a hazard level. Burn hazards exist long after the cooking process has ended. The warning in item 5 informs the user of this hazard. The addition of the failure to follow instructions boxed section is done to be consistent with ANSI 535 guidelines and gives the consequences if the instructions are not followed.*

- b. ~~As~~ **Statements in 12 point bold faced type advising the consumer: that failure to follow these instructions could result in fire or explosion which could cause property damage, personal injury or death.**

This instruction manual contains important information necessary for the proper assembly and safe use of the appliance.

Read and follow all warnings and instructions before assembling and using the appliance.

Follow all warnings and instructions when using the appliance.

Keep this manual for future reference.

*Rationale: The failure to follow instruction information is now included in both boxed warnings above. The instruction manual should bear the text noted above in recognition of the crucial role the instructions play in the proper assembly and safe use of the appliance.*

1.20.2 The instructions accompanying the appliance include:

- a. For all appliances:
1. A statement that the installation must conform with local codes or, in the absence of local codes, with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54, Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58* or *CSA B149.1, Natural Gas and Propane Installation Code.*
  2. Instructions to the effect that this appliance shall be used only outdoors and shall not be used in a building, garage or any other enclosed area.
  3. If an external electrical source is utilized, a statement that the appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the *National Electrical Code, ANSI/NFPA 70*, or the *Canadian Electrical Code, CSA C22.1.*
  4. A statement that this appliance is not intended to be installed in or on recreational vehicles and/or boats.
  5. Manufacturer's, distributor's, jobbers or dealers name, as it appears on the name plate; and address and appliance model or series number.
  6. Information specifying the necessity for maintaining proper clearances from combustible construction, the specific minimum clearances from such construction to the sides and back of the appliance, and that the appliance shall not be located under overhead unprotected combustible construction. For fryer/boilers, the minimum clearance shall be at least 10 feet (3 m) from any structure or combustible material.

*Rationale: While distances less than 10 feet (3 m) may pass the wall temperature test, this test condition does not simulate past field experience where additional clearance is deemed necessary.*

7. **The instructions shall contain a list of parts, and accessories supplied with the appliance.** Directions for proper assembly and for assembly of field-installed parts and accessories supplied with the appliance, and proper procedures for gas leak testing.

*Rationale: It is important that all parts of the appliance are included in the instructions and are available to the consumer before assembling or using the appliance.*

8. Information on the importance of properly locating the burner with respect to the orifice and instructions on how to verify the proper installation.
9. An instruction to clean and inspect the hose before each use of the appliance. If there is evidence of abrasion, wear, cuts or leaks, the hose must be replaced prior to the appliance being put into operation. The replacement hose assembly shall be that specified by the manufacturer.

If removal of an access plate(s) or opening of a door(s) is required for this inspection, instructions shall be provided on how to gain access for inspection.

10. When a flexible service cord is provided to connect the appliance to a line-voltage electrical supply, the intent of the warning statement specified in 1.21.8 and a statement as follows:

**“Keep any electrical supply cord ~~and the fuel supply hose~~ away from any heated surfaces.”**

*Rationale: This provision was revised so it is now specific to an electrical supply cord. A specific instruction for the hose is below.*

11. **When a fuel supply hose is provided a statement as follows:**

**“Keep the fuel supply hose away from any heated surfaces.”**

*Rationale: This provision was added so there is now a specific instruction for the hose.*

112. **Lighting instructions and control operation, including pictorial representations and instructions on what action to take if the burner flame is accidentally extinguished.**

*Rationale: If the flame is accidentally extinguished, additional steps may have to be taken other than simply relighting in order to ensure safe operation.*

123. A statement that the appliance is not intended for commercial use.

134. If applicable, statements indicating that:

(a) The use of alcohol, prescription or non-prescription drugs may impair the consumer's ability to properly assemble or safely operate the appliance.

- (b) When cooking with oil/grease, **have a type BC fire extinguisher readily available.**

**In the event of an oil/grease fire immediately call the fire department. Do not attempt to extinguish with water. A Type BC fire extinguisher may, in some circumstances contain the fire.**

*Rationale: The fire department is the quickest available and properly trained source for help. It is important to inform the consumer of the proper types of fire extinguishing materials to use, but their use cannot guarantee that a fire will be extinguished. The elimination of dirt and sand was made because dirt and sand is not a proven method of extinguishing residential fires.*

- (c) In the event of rain, snow, hail, sleet or other forms of precipitation while cooking with oil/grease, cover the cooking vessel immediately and turn off the appliance burners and gas supply. Do not attempt to move the appliance or cooking vessel.

*Rationale: Other forms of precipitation beside rain exist. Therefore, they should be included in the instruction to the user.*

- (d) When cooking, the appliance fryer/boiler must be on a level, stable noncombustible surface in an area clear of combustible material. An asphalt surface (blacktop) may not be acceptable for this purpose.

*Rationale: This provision as originally developed was intended to be applicable only to fryer/boiler. The change from the term appliance reinforces that fact. To reduce the risk of fire, a fryer/boiler should not be used on combustible surfaces.*

- (e) Do not leave the appliance unattended. Keep children and pets away from the appliance at all times.
- (f) Do not place empty cooking vessel on the appliance while in operation. Use caution when placing anything in cooking vessel while the appliance is in operation.
- (g) Do not move the appliance when in use. Allow the cooking vessel to cool before moving or storing.
- (h) This appliance is not intended for and should never be used as a heater.
- (i) This appliance will be hot during and after use. Use insulated oven mitts or gloves for protection from hot surfaces or cooking liquids.

*Rationale: Contact with hot oil or surfaces can result in burns. Protective ware should be used.*

- (j.) When cooking with oil or grease, the thermometer provided **MUST** be used. Follow instructions in this manual for proper installation and use of the thermometer. If the thermometer supplied with this fryer has been lost or damaged, a replacement thermometer meeting or exceeding the appliance manufacturer specifications shall be obtained before using the appliance.

*Rationale: Guidance must be provided to address the installation and use and possibility of loss of the original thermometer.*

- (k.) If the temperature exceeds 400°F (200 °C) or if oil begins to smoke, immediately turn the burner or gas supply OFF and wait for the temperature to decrease to less than 350°F (175°C) before relighting burner according to the manufacturer's instructions. If there is a lid (cover), do not remove the lid.

*Rationale: When oil overheats the only positive way to ensure the temperature decreases is to turn the appliance off. Even low BTU levels can cause the temperature to increase.*

- (l.) Never use a cooking vessel larger than the capacity and diameter recommended by the manufacturer.**

*Rationale: Cooking vessels certified with the burner assembly are the only ones evaluated for safety as part of the fryer.*

- (m.) Never overfill the cooking vessel with oil, grease or water. Follow instructions in this manual for establishing proper oil, grease or water levels.**

*Rationale: Over filling can result in spilling or splashing of hot liquids during the cooking process.*

**The following boxed warning shall also be included:**

**Follow these instructions prior to using the appliance:**

- 1. Place the food product on the holder.**
- 2. Place the food product and holder into the empty utensil.**
- 3. Fill the utensil with water just until the food product is completely submerged.**
- 4. Remove the food product from the utensil and either mark the water level on the side of the utensil or measure the amount of water in the utensil.**
- 5. Remove the water and completely dry the utensil and the food product.**
- 6. This is the amount of cooking oil the utensil is to be filled with to cook the food product. IN ANY CASE, DO NOT FILL PAST THE MAXIMUM FILL LINE ON THE UTENSIL.**

**“ DANGER – DO NOT FILL PAST THE MAXIMUM FILL LINE MARKED ON THE UTENSIL.”**

**DANGER - If the information in items 1 – 6 above is not followed exactly, an oil overflow may occur resulting in a fire which could cause property damage, personal injury or death.**

*Rationale: It is recommended that instructions be provided for a test fill of the utensil using water and the food product. The purpose of the test fill is to give the user a reference for the amount of oil required to just cover the food product. This is intended to reduce the risk of cooking oil spilling or boiling over the sides of the appliance and coming in contact with an ignition source.*

- (n.) Introduction of water or ice from any source into the oil/grease may cause overflow and severe burns from hot oil and water splatter. When frying with oil/grease, all food products MUST be completely thawed and towel dried before being immersed in the fryer.**

*Rationale: Overflow can be caused by the introduction of water from any source not just frozen or wet food.*

**(o.) Avoid bumping of or impact with the appliance to prevent spillage or splashing of hot cooking liquid.**

Rationale: The momentum from an impact/bump may be sufficient to cause spillage of hot liquids..

**(p.) Never drop food or accessories into hot cooking liquid. Lower food and accessories slowly into the cooking liquid in order to prevent splashing or overflow. When removing food from the appliance care shall be taken to avoid burns from hot cooking liquids.**

*Rationale: The text was added to communicate the nature of the hazard as well as the actions to be taken.*

*(q.) Instructions shall be provided to the users to check the thermometer before each use by inserting it into a pot of boiling water and ensuring that it registers approximately 212 °F +/- 20 °F (100 °C +/- 10 °C). If it does not function properly, obtain a replacement that meets or exceeds the manufacturer's specifications before using the appliance.*

*Rationale: This requirement provides a level of confidence to the user that the thermometer being used is functioning. Boiling water is a convenient medium to check the function at that temperature range.*

**145. Maintenance instructions (including recommended frequency guidelines) relative to:**

- (a) Keeping appliance area clear and free from combustible materials, gasoline and other flammable vapors and liquids.**
- (b) Not obstructing the flow of combustion and ventilation air.**
- (c) Keeping the ventilation opening(s) of the cylinder enclosure free and clear from debris.**
- (d) Visually checking burner flames, with pictorial representations.**
- (e) Cleaning appliance, including special surfaces, with recommended cleaning agents, if necessary.**
- (f) Checking and cleaning burner/venturi tubes for insects and insect nests. A clogged tube can lead to a fire beneath the appliance.**

**156. Information for obtaining replacement parts and where they are obtainable.**

**b. For an appliance designed for use with a self-contained LP-gas or propane gas supply system:**

- 1. The specific size and capacity of the cylinder to be used.**
- 2. A statement that the LP-gas supply cylinder to be used must be constructed and marked in accordance with the specifications for LP-gas cylinders of the U.S. Department of Transportation (DOT) or the National Standard of Canada, CAN/CSA-B339, Cylinders, Spheres and Tubes for the Transportation of Dangerous Goods.**
- 3. How to connect and disconnect the LP-gas or propane gas supply cylinder and the proper procedure for leak checking the connections.**

4. When the appliance is equipped with a No. 600 Connection (see 1.6.4), a statement which specifies that the cylinder be disconnected when the appliance is not in use.

If a connection No. 600 is used, a statement that only cylinders marked "propane" must be used.

5. When an appliance is equipped with other than a No. 600 connection, a statement that if the appliance is not in use, the gas must be turned off at the supply cylinder.

Storage of an appliance indoors is permissible only if the cylinder is disconnected and removed from the appliance.

Cylinders must be stored outdoors out of the reach of children and must not be stored in a building, garage or any other enclosed area.

6. A statement that the pressure regulator and hose assembly supplied with the appliance must be used. Replacement pressure regulators and hose assemblies must be those specified by the appliance manufacturer.
7. Information on connecting the pressure regulator in accordance with the applicable portions of 1.6.3.
8. Diagrams illustrating the LP-gas cylinder valve/connection device that will properly and safely mate with the connection device attached to the inlet of the pressure regulator supplied with the appliance.
9. A statement that the cylinder supply system must be arranged for vapor withdrawal.
10. A statement that the cylinder used, if in excess of 2.2 lbs. (1.00 kg.) propane capacity, must include a collar to protect the cylinder valve.
11. For appliances intended for use with other than a CGA No. 600 connection, a diagram with dimensions showing the manufacturer's recommended position of the ~~fryer/boiler~~ appliance, and its supply cylinder and hose routing shall be included. At a minimum, the diagram shall be in a WARNING format in accordance with ANSI Z535.4, Product Safety Signs and Labels. (See 1.6.2).

*Rationale: This provision was intended only to be applicable to appliances for use with a 20 lb. LP-gas cylinder. To ensure the hose does not come in contact with hot surfaces, hose routing instructions should be provided to the consumer.*

12. A statement:

- (a) Do not store a spare LP-gas cylinder under or near this appliance;
- (b) Never fill the cylinder beyond 80 percent full; and
- (c) If the instructions in "-b12(a)" and "-b12(b)" are not followed exactly, a fire causing death or serious injury may occur.

- c. For post-mounted appliances:

A statement that in-ground metallic posts shall be protected against corrosion as warranted by soil conditions. Corrosion protection shall be provided as needed with a suitable coating to retard the effects of corrosion conditions existing in local areas.

- 1.20.3 The instructions accompanying an appliance for use with other than a self-contained LP-gas or propane gas supply system shall include a statement that:
- a. The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of  $\frac{1}{2}$  psi (3.5 kPa).
  - b. The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than  $\frac{1}{2}$  psi (3.5 kPa).
- 1.20.4 See also 1.12.2, 1.12.3 and 1.13.1.

## 1.21 MARKING

- 1.21.1 Marking material shall be identified by class number and shall meet the following specifications. All metal marking materials shall be rustproof. All markings shall be suitable for application to surfaces upon which applied and shall demonstrate suitable legibility as specified under 2.25, Marking Material Adhesion and Legibility. The designation of any class of marking shall not preclude the use of a lower number class.

### Class I. Integral Marking

Marking that is embossed, cast, stamped or otherwise formed in the part. This includes markings baked into an enameled surface.

#### Class IIA-1. Permanent Plate

Shall be made of metal having a minimum thickness of 0.012 inch (0.30 mm) and shall be securely attached by mechanical means.

#### Class IIA-2. Permanent Plate

Shall be made of metal having a thickness of 0.006 to 0.012 inch (0.15 to 0.30 mm) and shall have mechanical attachment means at all corners with a maximum spacing of 6 inches (152 mm) between mechanical fasteners.

#### Class IIA-3. Permanent Plate

Shall be made of metal having a thickness less than 0.006 inch (0.15 mm). Such plates shall be attached by means of nonwater-soluble adhesive which will comply with 2.25, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.20, Wall and Floor Temperatures.

#### Class IIA-4. Permanent Plate

Shall be made of pressure-sensitive metal foil requiring no solvent or activator, provided such plates comply with 2.25, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.20, Wall and Floor Temperatures.

#### Class IIIA-1. Permanent Label

Shall be made of material not adversely affected by water, shall be attached by means of nonwater-soluble adhesive and shall comply with 2.25, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.20, Wall and Floor Temperatures.



**Class IIIA-2. Permanent Label**

Shall be made of material not adversely affected by water, shall be attached by means of nonwater-soluble adhesive and shall comply with 2.25, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 175°F (79.5°C) as determined during conduct of 2.20, Wall and Floor Temperatures.

**Class IIIB. Waterproof Marking**

Shall be printed directly on the part with waterproof marking not adversely affected by a temperature of 175°F (79.5°C). This marking shall not be used on surfaces having temperatures exceeding 175°F (79.5°C) as determined during conduct of 2.20, Wall and Floor Temperatures.

**Class IIIC. Waterproof Label**

Shall be made of material not soluble in water and may use water-soluble adhesive for attachment means.

**Class IV. Semi-Permanent Label**

Shall be made of material which may be soluble in water, and may use water-soluble adhesive for attachment means.

**Class V. Printed Marking**

Marking shall be clear and prominent and may be applied directly by any printing means.

**Class VI. Attached Tags**

**1.21.2 NAME PLATE(S).** Each appliance shall bear a marking of Class IIIA-2 marking material located on the appliance or supporting structure where it can be easily read and on which shall appear the following:

- a. **Manufacturer's or dealer's name and address.**
- b. **Model number of the appliance.**
- c. **An identification number which stipulates the manufactured date of the appliance by month and year or equivalent means of product manufacture traceability acceptable to the certification agency.**
- d. **The manufacturer's normal hourly Btu input rating for all main burners.**
- e. **The type(s) of gas for which equipped as follows: Nat., Mfd., Mix., LP, Propane, \_\_\_ Btu LP gas-air mixtures. (For LP gas-air mixtures the heating value or range of heating values shall be indicated.)**
- f. **The statement, "For Outdoor Use Only. If Stored Indoors, Detach and Leave Cylinder Outdoors." The marking for an appliance for connection to a fixed fuel piping system need only display the first sentence of this statement.**
- g. **If the appliance utilizes any electrical equipment, the voltage, frequency and current input.**
- h. **Identification of this standard by indicating either this edition of the standard, or the most recent effective addenda thereto, with one of the following markings:**

**"ANS Z21.89•CSA 1.18-(year) Outdoor Cooking Specialty Gas Appliance;"**

**“ANS Z21.89a•CSA 1.18a-(year) Outdoor Cooking Specialty Gas Appliance;”**  
**or**  
**“ANS Z21.89b•CSA 1.18b-(year) Outdoor Cooking Specialty Gas Appliance.”**

- i. The symbol for the organizations making the tests for compliance with this standard.
- j. Minimum distance from sides and back of unit to walls or railings is \_\_\_ inches (\_\_\_ mm). Do not use under overhead construction.
- k. “This appliance is not intended for commercial use.”

**1.21.3** ~~Each fryer/boiler a~~ Appliances intended for use with other than a CGA No. 600 connection shall bear a Class IIIA-2 marking, located where it can be easily read;

a. Showing the manufacturers recommended position, including dimensions, of the fryer/boiler appliance, and its supply cylinder and hose routing and a minimum warning level advising the end user of the potential hazard of placing the cylinder too close to the appliance; and

b. Containing the following:

“The instruction manual contains important information necessary for the proper assembly and safe use of the appliance.

Read and follow all warnings and instructions before assembling and using the appliance.

Follow all warnings and instructions when using the appliance.

If instructions or parts are missing contact the manufacturer or dealer listed on the appliance.”

*Rationale: This provision was intended only to be applicable to appliances for use with a 20 lb. LP-gas cylinder. To ensure the hose does not come in contact with hot surfaces, hose routing instructions should be provided to the consumer. The information in b is added because this information is extremely important for all users at all times and prominently displaying it on a marking is the most effective way of ensuring it is seen.*

**1.21.4** **Lighting Instructions: Each appliance shall bear Class IIIA-2 marking located on the appliance where it can be easily read during operation of the burner control and on which shall appear the following:**

- a. Read all instructions before lighting.
- b. Open lid during lighting.
- c. If ignition does not occur in 5 seconds, turn the burner control(s) off, wait 5 minutes, and repeat the lighting procedure.

**Exception: If the appliance does not have a lid, item “-b” may be eliminated.**

**This marking shall have a minimum letter height of  $\frac{1}{8}$  inch (3.2 mm).**

**1.21.5** **Where necessitated by the position of the igniter, a multiple burner appliance shall bear a Class IIIA-2 marking indicating the burner which must be lit first.**

**1.21.6** **When a gas appliance pressure regulator, for use with an outdoor cooking specialty gas appliance for connection to a fixed fuel piping system, is supplied separately:**

- a. The appliance shall be marked: "For use with a gas appliance pressure regulator." and
- b. The appliance shall also bear a marking on Class VI marking material in an obvious location stating, "The regulator supplied must be used with this appliance."

1.21.7 Appliances for connection to a self-contained LP-gas supply system shall bear the following marking on Class IIIA marking material:

"CAUTION: The gas pressure regulator provided with this appliance must be used. Replace only with regulator Model No. \_\_\_ (Model No. to be provided by the appliance manufacturer)."

1.21.8 An open top appliance having an attached top cover which is not intended to be closed when the appliance is in operation, shall bear a permanent marking on Class IIIA marking material as follows:

"Top cover must be open when main burner(s) is in operation."

1.21.9 An appliance provided with a flexible service cord for connection to a line-voltage electrical supply shall bear a Class VI marking attached to the plug end of the cord which includes the following information:

#### WARNING

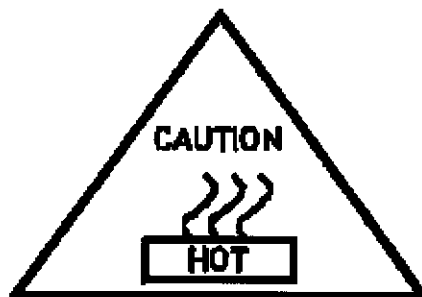
##### Electrical Grounding Instructions

This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

1.21.10 Each cooking vessel intended for frying a turkey shall bear a Class I marking readily visible on the interior of the cooking vessel showing the manufacturer's maximum recommended cooking liquid fill level and associated maximum turkey weight. This marking shall be accompanied by a Class I marking referring the user to the instruction manual for instructions on determining the proper amount of cooking liquid to be used.

*Rationale: In order to reduce the risk of fire associated with frying turkeys, an indication should be made regarding the maximum level of cooking oil recommended by the manufacturer.*

1.21.11 The surface of each cooking vessel intended for frying a turkey shall bear a Class 1 marking with the words "CAUTION – HOT" or the following symbol:



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If the symbol is used, the equilateral triangle shall have a minimum height of 1-1/2 inches (3.81 cm). The symbol and words inside the triangle shall be sized proportionally. If the words "CAUTION – HOT" are used, the letters shall have a minimum height of ½ inch (1.27 cm). The symbol or words shall be located adjacent to the fill line.

*Rationale: The existing standard does not address contact with hot surfaces of the cooking utensil, it only addresses contact with the appliance. Also, recommendation is being made for markings to be put on the main body of the utensil to avoid contact.*

1.21.102 When a minimum letter height is not specified for markings, a minimum letter height of 6 point shall be used.

1.21.143 Also see provisions of 1.6.14 and 1.8.7.

## PART II

### PERFORMANCE

#### 2.19 APPLIANCE STRUCTURE

2.19.4 An appliance shall be constructed so it ~~cannot be~~ does not tipped by any reasonable pressure at an angle of 15 degrees (0.26 rad). This shall not apply to appliances which are provided with means, including necessary screws, bolts or both, and instructions for attaching them to the floor or mounting their bases in the ground.

#### Method of Test

~~With a~~ All lids or covers shall be in the closed position during the conduct of this test. If applicable, or water-filled cooking vessels and lids of the maximum size recommended by the manufacturer shall be in place and centered over the burner during the conduct of this test.; if applicable, Cooking vessels shall be filled with water to the maximum fill line marked on the vessel and outlined in the manufacturer's instructions. In the absence of a maximum fill line, the vessel shall be filled with water to within 1 inch (2.54 cm) of the top edge of the vessel when the vessel is tipped at an angle of 15 degrees (0.26 rad). †The appliance shall be tipped in any direction placed in its most critical configurations on a plane which is oriented at an angle of 15 degrees (0.26 rad) from the vertical horizontal and shall not tip over when released break contact with the plane or the cooking vessel fall from the base. Multiple orientations may be tested, or the plane may be rotated 360 degrees (6.24 rad) to determine the most critical configuration.

An appliance for integral connection to a self-contained LP-gas supply system shall comply with this test with and without a full cylinder in place.

*Rational: Specific instructions for filling the cooking vessel, placing the lid on the vessel and orienting the vessel with respect to the burner are provided for clarity and repeatability. Placing the appliance on a plane and requiring the appliance not to break contact with the plane is a more accurate and repeatable way to evaluate the appliance under the tip condition. Only integral self-contained LP-gas supply systems affect the outcome of the tip test.*

#### 2.20 WALL AND FLOOR TEMPERATURES

At the end of the test, the maximum temperature on the walls, and the floor shall not exceed 194°F (90°C).

### Method of Test

#### a. Test Structure

The appliance shall be installed in a partial enclosure with its back and sides parallel to the walls of the enclosure as shown in Figure 3 (Typical Test Enclosure for Wall and Floor Temperature Tests of Outdoor Specialty Cooking Appliances), and with the clearances specified by the manufacturer.

Vertical walls of the enclosure shall be constructed of nominal 1 inch-thick wooden boards or 0.750 inch plywood and finished in dull black. The back wall shall be 6 feet (1.83 m) high and the side walls shall extend 6 inches (152 mm) beyond the front of the appliance. The floor shall be constructed of 1 inch tongue-and-groove oak flooring finished with clear varnish.

An appliance whose design is not compatible with the test enclosure shown in Figure 3 shall be installed in a modified test enclosure, as deemed necessary by the testing agency.

#### b. Instrumentation

Enclosure surface temperatures shall be determined by means of an indicating potentiometer and No. 24 AWG (0.20 mm<sup>2</sup>) iron-constantan thermocouples, the junctions of which are copper discs 0.687 inch (17.45 mm) in diameter and 0.022 inch (0.559 mm) thick, to which the thermocouple wires are silver-soldered 0.125 inch (3.2 mm) apart. The discs shall be embedded so their surfaces are flush with the surrounding surfaces. The surfaces of the copper discs, except those in the floor, shall be finished dull black.

Thermocouples shall be placed at intervals of 3 inches (76.2 mm) apart over the surfaces of panels facing the appliance. Thermocouples embedded in the floor shall be 6 inches (152 mm) apart. The center line of one row of thermocouples on the side panel shall be 1 inch (25.4 mm) below the cooking top.

The thermometers for determining room temperature shall be installed adjacent to the test area as shown in Figure 4 (Location of Thermometers for Determining Ambient Room Temperature During Wall and Floor Temperature Test).

#### c. Operating Conditions of the Appliance

The various sections and components of the appliance shall be operated during this test as follows:

1. Appliances shall be operated as indicated in Table X (Appliance Operating Conditions for the Wall and Floor Temperature Test).
2. Any electrical equipment provided, such as a rotisserie motor, shall be installed but not operated throughout the specified test periods.
3. On an outdoor specialty cooking gas appliance for connection to a self-contained LP-gas supply system, the gas from the supply cylinder shall be purged outside of the test structure at a rate equal to manufacturer's specified hourly input rate of the outdoor cooking gas appliance within +/-5% for determining compliance with 1.6.19. This test shall be started with the LP-gas cylinder no more than 50% full.

4. During the conduct of this test at least one leg deemed most critical by the testing agency with respect to temperature shall be placed over a floor thermocouple.

d. Test Period

The appliance shall be operated at normal test pressure and in accordance with the specified conditions of time and burner input, as specified in Table IX (Body Loading), and under any further special conditions specified in the Notes to Table IX. If the appliance is provided with a cover or hood, the above test shall be conducted with the cover or hood in the position deemed most critical by the testing agency.

At the end of the specified test periods and operating conditions listed in Table IX, all wall temperatures shall be determined and recorded. Ambient room temperature shall be determined by thermometers located as shown in Figure 4 and recorded.

*At the end of the test period, no wall or floor temperature shall exceed; 194 °F (90 °C).*

*Rationale: Currently requirements do not ensure that floor temperatures will be measured directly where the appliance rests on the floor (where high temperatures are expected to be found). Therefore, it is recommended that it be required that this area of the floor's temperature be measured. Due to the symmetry of the appliance, only one temperature measurement is needed.*

## 2.26 THERMOMETER SCALE MISALIGNMENT

It shall not be possible to change the orientation of the indicating needle relative to the temperature scale of a thermometer.

### Method of Test

The thermometer shall be grasped with both hands, and it shall not be possible to change the orientation of the indicating needle to the temperature scale by a twisting, pushing or pulling motion. No mechanical assists, such as tools are permitted.

*Rationale: If it is possible to easily change the orientation of the needle, then it will not provide the proper temperature reading. This is a safety device that is being relied upon to indicate a potential fire hazard, so we need a certain level of assurance that the device chosen will fulfill its intended function.*

## 2.27 MARKING MATERIAL RESISTANCE TO OIL

The legibility of markings shall not be adversely affected by exposure to oil as specified in the following Method of Test.

### Method of Test

The temperature scales of two thermometers shall be fully immersed in a bath of corn oil (vegetable oil) for a period of 48 hours at room ambient. Following the oil immersion, the thermometers shall be cleaned by use of a clean, dry cloth. Each sample shall exhibit:

1. No illegible or defaced printing when rubbed with thumb or finger pressure; and
2. Good adhesion when a dull metal blade (as the back of a pocketknife blade) is held at right angles to the applied marking and scraped across the edges of the marking.

Rationale: There have been some thermometers sold with turkey fryers where the ink was not oil resistant, and the ink dissolved. As the thermometer is used to indicate the temperature of the cooking liquid it is important that the markings remain in tact when the thermometer is exposed to cooking liquids during normal use. The test is adapted from the Marking Material and Adhesion Test of Clause 2.25. The 48 hour limit comes from the CSA Standard C22.2 No. 0.15 Adhesive Labels. The corn oil (vegetable oil) used in the test most accurately represents the anticipated environment to which a thermometer will be subjected.

## 2.28 THERMOMETER CALIBRATION

Four thermometers shall be tested. Two thermometers shall be at room ambient prior to commencement of the test, and two shall be conditioned at an ambient of -22 °F (-30 °C) for a period of 48 hours prior to commencement of this test. The temperature indicated shall not have an error of greater than ±20°F (11°C) from the actual temperature value when calibrated at 212°F (100°C) and 400°F (204°C) in accordance with the Method of Test.

### Method of Test

The thermometer shall be immersed in a vessel containing distilled water for test (a), and any cooking oil for test (b). The thermometer shall be immersed to the depth specified in the operating manual. The liquid in the vessel shall be heated and the temperature monitored.

- a. The temperature of the water shall be stabilized at 212°F (100°C). The thermometer shall not indicate a temperature below 192°F (89°C) nor above 232°F (111°C).
- b. The temperature of the oil shall be stabilized at 400°F (204°C). The thermometer shall not indicate a temperature below 380°F (193°C) nor above 420°F (216°C).

*Rationale: The present clause 1.18 contains the requirement “be shipped with a thermometer suitable for measuring the temperature of the cooking liquid”. The word “suitable” is subjective and does not provide the user of the standard with any criteria by which to judge the thermometer. There needs to be specific criteria in the standard by which to judge the product. The accuracy proposed is ± 20°F. Some thermometers are damaged, that is the reading will no longer be accurate when stored at low temperatures. The test is designed to ensure that the calibration is not adversely affected by storage at a temperature that is foreseeable.*

## PART III

### MANUFACTURING AND PRODUCTION TESTS

The following manufacturing and production tests are intended to provide the means for certifying agencies to uniformly apply quality control standards to all appliances certified as complying with the standard.

- 3.1 The manufacturer shall check, inspect and test the components and the assemblies of each appliance in the following manner:
  - a. Inspect raw materials (to the extent that they may affect the final product) and purchased components using a sampling plan found mutually acceptable to the manufacturer and the certifying agency.



- b. Test each manifold and control assembly for proper gas valve operation and verify the gastightness of the manifold and control assembly. This test shall be conducted on completely assembled appliances, when feasible.
- c. Test each appliance to determine that electrical components function properly. This test shall be conducted on completely assembled appliances, when feasible. When not feasible, subassemblies shall be tested.
- d. Conduct dielectric withstand tests on each factory assembled appliance incorporating, or which has components that incorporate, high-voltage electrical circuits. If the appliance employs a component, such as a solid-state device, that can be damaged by the dielectric potential, the test may be conducted with the point of connection of the component to ground disconnected or before the component is electrically connected. The tests shall consist of the application of the 60 hertz potential between high-voltage current-carrying parts and the casing, frame and similar noncurrent-carrying parts of the appliance with any switch contacts open or closed. The test potential shall be in accordance with the dielectric withstand tests specified in B.1.7 applied for 1 minute, or a potential of 120 percent of that value applied for 1 second.
- e. For appliances designed to operate at pressures in excess of 0.5 psi (3.5 kPa), the manufacturer shall test each manual valve for leakage in both the open and closed position.
- f. For appliances using a combination regulator valve, the manufacturer shall test or provide proof that all regulator valves are tested for leakage in both the open and closed position.

**3.2**

Using a sampling plan found mutually agreeable to the manufacturer and the certifying agency, appliances shall be completely assembled and tested to determine satisfactory operation with respect to:

- a. 2.6, Burner Operating Characteristics;
- b. 2.5, Combustion;
- c. 2.8, Ignition;
- d. Dielectric withstand with solid-state components connected (if not tested under 3.1-d);
- e. For appliances designed to operate at pressures in excess of 0.5 psi (3.5 kPa), the manufacturer shall use a sampling plan found mutually agreeable between manufacturer and certifying agency to check manual gas valves for (1) cycling and (2) impact; and
- f. Combination regulator valves shall be tested for Endurance (2.13.3) and Strength 2.13.2.
- g. The thermometers supplied with the units used for "a", "b" and "c" above shall have their accuracy checked per section 2.28a without cold weather preconditioning.

Under this sampling plan, the frequency of conducting the tests specified in "a" through "d" above need not be the same.

The results of these tests shall be recorded and maintained by the manufacturer for review by the certifying agency.

**The manufacturer's test method(s) shall be capable of relating back to the test(s) specified in the standard.**

***Rationale: With the use of the thermometers becoming more critical, the need to provide for a continuing check of these devices in production is deemed necessary.***