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An American National Standard

Standard Test Method for Performance of Rapid Cook Ovens[1]

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1. Scope

1.1 This test method evaluates the energy consumption and cooking performance of rapid cook ovens. The food service operator can use this evaluation to select a rapid cook oven and understand its energy consumption.

1.2 This test method is applicable to gas and electric rapid cook ovens.

1.3 The rapid cook oven can be evaluated with respect to the following (where applicable):

1.3.1 Energy input rate (see 10.2),

1.3.2 Preheat energy consumption and time (see 10.3),

1.3.3 Idle energy rate (see 10.4),

1.3.4 Pilot energy rate (if applicable) (see 10.5), and

1.3.5 Cooking energy efficiency, cooking-load energy efficiency and production capacity (see 10.6).

1.4 The values stated in inch-pound units are to be regarded as standard. The SI units given in parentheses are for information only.

1.5 *This test method may involve hazardous materials, operations, and equipment. This test method does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D3588 Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels

2.2 *ASHRAE Documents:*

ASHRAE Handbook of Fundamentals "Thermal and Related Properties of Food and Food Materials," Chapter 30, Table 1, 1989[3]

ASHRAE Guideline 2-1986 (RA90) Engineering Analysis of Experimental Data[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *cooking energy efficiency*, *n*—quantity of energy imparted to the specified food product, expressed as a percentage of energy consumed by the rapid cook oven during the cooking event.

3.1.2 *cooking energy rate*, *n*—average rate of energy consumption (Btu/h or kW) during the cooking energy efficiency tests. Refers to all loading scenarios (heavy, medium, light).

3.1.3 *cooking-load energy efficiency*, *n*—quantity of energy imparted to the specified food product and the pot, pan, tray, or dish containing the food product, expressed as a percentage of energy consumed by the rapid cook oven during the cooking event.

3.1.4 *energy input rate*, *n*—peak rate at which a rapid cook oven consumes energy (Btu/h or kW).

3.1.5 *idle energy rate*, *n*—the rapid cook oven's rate of energy consumption (Btu/h or kW), when empty, required to maintain its cavity temperature at the specified thermostat set point or to otherwise maintain the oven in a ready-to-cook condition.

3.1.6 *oven cavity*, *n*—that portion of the rapid cook oven in which food products are heated or cooked.

3.1.7 *pilot energy rate*, *n*—rate of energy consumption (Btu/h) by a rapid cook oven's continuous pilot (if applicable).

3.1.8 *preheat energy*, *n*—amount of energy consumed (Btu or kWh), by the rapid cook oven while preheating its cavity from ambient temperature to the specified thermostat set point or while preheating any other component of the oven, for example, an integral heat exchanger, to a ready-to-cook condition.

3.1.9 *preheat time*, *n*—time (min.) required for the rapid cook oven cavity to preheat from ambient temperature to the specified thermostat set point or for the rapid cook oven to achieve a ready-to-cook condition.

3.1.10 *production capacity*, *n*—maximum rate (lb/h) at which an rapid cook oven can bring the specified food product to a specified "cooked" condition.

[1] This test method is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.06 on Productivity and Energy Protocol.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.

3.1.11 *production rate*, *n*—rate (lb/h) at which a rapid cook oven brings the specified food product to a specified "cooked" condition. Does not necessarily refer to maximum rate. Production rate varies with the amount of food being cooked.

3.1.12 *rapid cook oven*, *n*—a cooking appliance that utilizes one or more heat transfer technologies to cook food product within a chamber and which is capable of cooking the food product significantly faster than is possible using solely radiant oven or convection oven technologies. Heat transfer technologies which may be employed include microwave, quartz halogen and high velocity or impingement convection, both gas and electric.

3.1.13 *uncertainty*, *n*—measure of systematic and precision errors in specified instrumentation or measure of repeatability of a reported test result.

4. Summary of Test Method

4.1 Energy input rate is determined to confirm that the rapid cook oven is operating within 5 % of the nameplate energy input rate. For a gas rapid cook oven, the pilot energy rate and the fan and control energy rates are also determined.

4.2 Preheat energy and time are determined.

4.3 Idle energy rate is determined.

4.4 Cooking energy efficiency, cooking-load energy efficiency and production rate are determined during single-run and barreling-run cooking tests using pizza and chicken breasts as food products.

5. Significance and Use

5.1 The energy input rate test is used to confirm that the rapid cook oven is operating properly prior to further testing.

5.2 Preheat energy and time can be useful to food service operators to manage power demands and to know how quickly the rapid cook oven can be ready for operation.

5.3 Idle energy rate and pilot energy rate can be used to estimate energy consumption during non-cooking periods.

5.4 Cooking energy efficiency is a precise indicator of a rapid cook oven's energy performance while cooking a typical food product under various loading conditions. If energy performance information is desired using a food product other than the specified test food, the test method could be adapted and applied. Energy performance information allows an end user to better understand the operating characteristics of a rapid cook oven.

5.5 Production capacity information can help an end user to better understand the production capabilities of a rapid cook oven as it is used to cook a typical food product and this could help in specifying the proper size and quantity of equipment. If production information is desired using a food product other than the specified test food, the test method could be adapted and applied.

6. Apparatus

6.1 *Analytical Balance Scale*, for measuring weights up to 20 lb, with a resolution of 0.01 lb and an uncertainty of 0.01 lb.

6.2 *Barometer*, for measuring absolute atmospheric pressure, to be used for adjustment of measured natural gas volume to standard conditions. Shall have a resolution of 0.2 in. Hg and an uncertainty of 0.2 in. Hg.

6.3 *Canopy Exhaust Hood*, 4 ft in depth, wall-mounted with the lower edge of the hood 6 ft, 6 in. from the floor and with the capacity to operate at a nominal exhaust ventilation rate of 300 cfm per linear foot of active hood length. This hood shall extend a minimum of 6 in. past both sides and the front of the cooking appliance and shall not incorporate side curtains or partitions.

6.4 *Convection Drying Oven*, with temperature controlled at 220 ± 5°F, to be used to determine moisture content of pizza crust, pizza sauce and pizza cheese.

6.5 *Gas Meter*, for measuring the gas consumption of a rapid cook oven, shall be a positive displacement type with a resolution of at least 0.01 ft^3 and a maximum uncertainty no greater than 1 % of the measured value for any demand greater than 2.2 ft^3/h. If the meter is used for measuring the gas consumed by the pilot lights, it shall have a resolution of at least 0.01 ft^3 and a maximum uncertainty no greater than 2 % of the measured value.

6.6 *Pressure Gage*, for monitoring natural gas pressure. Shall have a range of zero to 10 in. H_2O, a resolution of 0.5 in. H_2O, and a maximum uncertainty of 1 % of the measured value.

6.7 *Stop Watch*, with a 1-s resolution.

6.8 *Temperature Sensor*, for measuring natural gas temperature in the range of 50 to 100°F with an uncertainty of ± 1°F.

6.9 *Thermocouple*, industry-standard, insulated, 24 gage, type T or Type K thermocouple wire, welded and calibrated, with an uncertainty of ±1°F.

6.10 *Thermocouple Probe*, Type T or Type K, micro needle, product probe with a response time from ambient to 200°F of less than 20 s, and an uncertainty of ±1°F.

6.11 *Watt-Hour Meter*, for measuring the electrical energy consumption of a rapid cook oven, shall have a resolution of at least 10 Wh and a maximum uncertainty no greater than 1.5 % of the measured value for any demand greater than 100 W. For any demand less than 100 W, the meter shall have a resolution of at least 10 Wh and a maximum uncertainty no greater than 10 %.

7. Reagents and Materials

7.1 *Chicken Breasts* shall be nominal 5 oz frozen, boneless, skinless, butterfly cut, chicken breasts (whole meat, not fabricated). When thawed and drained, each chicken breast shall weigh 4.8 ± 0.2 oz.

7.2 *Pizza Crust* shall be a 12 in. diameter, prebaked or parbaked crust, weighing 0.9 ± 0.2 lb and having a moisture content of 36 ± 3 % by weight, based on a gravimetric moisture analysis. Refrigerate to 39 ± 1°F.

7.3 *Pizza Sauce* shall be a simple, tomato based sauce with a moisture content of 90 ± 2 % by weight, based on a gravimetric moisture analysis. Refrigerate to 39 ± 1°F.

7.4 *Pizza Cheese* shall be a part skim, low moisture, shredded mozzarella cheese with a moisture content of 50 ± 2 % by weight, based on a gravimetric moisture analysis. Refrigerate to 39 ± 1°F.

7.5 *Pizza* shall be comprised of a pizza crust, pizza sauce and pizza cheese according to the following: uniformly spread

0.25 lb of pizza sauce on top of a pizza crust to within 0.5 in. of the edge of the crust and cover the pizza sauce with 0.375 lb of pizza cheese.

7.6 Gravimetric moisture analysis shall be performed as follows: To determine moisture content, place a 1 lb sample of the test food on a dry, aluminum sheet pan and place the pan in a convection drying oven at a temperature of 220 ± 5°F for a period of 24 h. Weigh the sample before it is placed in the oven and after it is removed and determine the percent moisture content based on the percent weight loss of the sample. The sample must be thoroughly chopped (⅛ in. or smaller squares) and spread evenly over the surface of the sheet pan in order for all of the moisture to evaporate during drying and it is permissible to spread the sample on top of baking paper in order to protect the sheet pan and simplify clean-up.

NOTE 1—The moisture content of pizza crust, pizza sauce, and pizza cheese can be determined by a qualified chemistry lab using the AOAC procedure 984.25 Moisture (Loss of Mass on Drying) in Frozen French Fried Potatoes.

8. Sampling and Test Units

8.1 *Rapid Cook Oven*—Select a representative production model for performance testing.

9. Preparation of Apparatus

9.1 Install the appliance in a properly ventilated area in accordance with the manufacturer's instructions. The associated heating or cooling system shall be capable of maintaining an ambient temperature of 75 ± 5°F within the testing environment.

NOTE 2—The ambient temperature requirements are designed to simulate real world kitchen temperatures and are meant to provide a reasonable guideline for the temperature requirements during testing. If a facility is not able to maintain the required temperatures, then it is reasonable to expect that the application of the procedure may deviate from the specified requirements (if it cannot be avoided) as long as those deviations are noted on the Results Reporting Sheets.

9.2 Connect the rapid cook oven to a calibrated energy test meter. For gas installations, install a pressure regulator downstream from the meter to maintain a constant pressure of gas for all tests. Install instrumentation to record both the pressure and temperature of the gas supplied to the rapid cook oven and the barometric pressure during each test so that the measured gas flow can be corrected to standard conditions. For electric installations, a voltage regulator may be required during tests if the voltage supply is not within ±2.5 % of the manufacturer's nameplate voltage.

9.3 For an electric rapid cook oven, confirm (while the rapid cook oven elements are energized) that the supply voltage is within ±2.5 % of the operating voltage specified by the manufacturer. Record the test voltage for each test.

NOTE 3—It is the intent of the testing procedure herein to evaluate the performance of a rapid cook oven at its rated gas pressure or electric voltage. If an electric unit is rated dual voltage (that is, designed to operate at either 240 or 480 V with no change in components), the voltage selected by the manufacturer or tester, or both, shall be reported. If a rapid cook oven is designed to operate at two voltages without a change in the resistance of the heating elements, the performance of the unit (for example, preheat time) may differ at the two voltages.

9.4 For a gas rapid cook oven, adjust (during maximum energy input) the gas supply pressure downstream from the appliance's pressure regulator to within ± 2.5 % of the operating manifold pressure specified by the manufacturer. Make adjustments to the appliance following the manufacturer's recommendations for optimizing combustion.

10. Procedure

10.1 *General*:

10.1.1 For gas appliances, record the following for each test run:

10.1.1.1 Higher heating value,

10.1.1.2 Standard gas pressure and temperature used to correct measured gas volume to standard conditions,

10.1.1.3 Measured gas temperature,

10.1.1.4 Measured gas pressure,

10.1.1.5 Barometric pressure, and

10.1.1.6 Energy input rate during or immediately prior to test (for example, during the preheat for that days testing).

NOTE 4—Using a calorimeter or gas chromatograph in accordance with accepted laboratory procedures is the preferred method for determining the higher heating value of gas supplied to the rapid cook oven under test. It is recommended that all testing be performed with gas having a higher heating value of 1000 to 1075 Btu/ft^3.

10.1.2 For gas rapid cook ovens, add electric energy consumption to gas energy for all tests, with the exception of the energy input rate test (see 10.3).

10.1.3 For electric rapid cook ovens, record the following for each test run:

10.1.3.1 Voltage while elements are energized, and

10.1.3.2 Energy input rate during or immediately prior to test (for example, during the preheat for that days testing).

10.1.4 For each test run, confirm that the peak input rate is within ± 5 % of the rated nameplate input. If the difference is greater than 5 %, terminate testing and contact the manufacturer. The manufacturer may make appropriate changes or adjustments to the rapid cook oven.

10.2 *Energy Input*:

10.2.1 Set the rapid cook oven controls so that the oven will operate at the maximum input rate and turn the oven on.

10.2.2 Record the time and energy consumption starting as soon as the elements or burners cycle on and continuing over a period that is long enough to accurately determine the energy input rate of the oven. The oven must be fully on over the entire period and the test period must end when any of the burners or elements first cycle off.

NOTE 5—The rapid cook oven may be equipped with a high temperature limit control which prematurely cycles the oven off if no food load is present in the oven cavity. In this case, the researcher may select an appropriate food load which will allow the oven to operate for the duration of the test period.

10.2.3 Calculate and record the rapid cook oven's energy input rate and compare the result to the rated nameplate input. For gas rapid cook ovens, the burner energy consumption is used to compare the calculated energy input rate with the rated gas input and any electrical energy consumption shall be used to compare the calculated energy input rate with the rated electrical input.

10.2.4 In accordance with 11.4, calculate and report the rapid cook oven energy input rate and rated nameplate input.

10.3 *Preheat Energy Consumption and Time*:

10.3.1 Determine whether the rapid cook oven requires preheating in order to achieve a ready-to-cook state. If the oven requires preheating, verify that the oven cavity temperature is 75 ± 5°F and turn the rapid cook oven on.

10.3.2 Record the time and energy consumption required to preheat the rapid cook oven, from the time when the unit is turned on until the time when the rapid cook oven achieves a ready-to-cook state.

10.3.3 In accordance with 11.5, calculate and report the preheat energy consumption and time.

10.4 *Idle Energy Rate*:

10.4.1 Turn the rapid cook oven on and allow it to achieve a ready-to-cook state. If the oven requires preheating in order to achieve a ready-to-cook state then allow the oven to idle for 60 min after it is fully preheated.

10.4.2 Begin recording the rapid cook oven's idle energy consumption for a minimum of 2 h. Record the length of the idle period.

10.4.3 In accordance with 11.6, calculate and report the rapid cook oven's idle energy rate.

NOTE 6—For a rapid cook oven that does not require preheat, the idle energy rate will consist of the computer controls, control circuits, fans, and any other energy consumption that is required to keep the unit in a standby or ready-to-cook state.

10.5 *Pilot Energy Rate*:

10.5.1 For a gas rapid cook oven with a standing pilot, set the gas valve at the "pilot" position and set the rapid cook oven's temperature control to the "off" position.

10.5.2 Light and adjust the pilot according to the manufacturer's instructions.

10.5.3 Monitor gas consumption for a minimum of 8 h of pilot operation.

10.5.4 In accordance with 11.7, calculate and report the pilot energy rate.

10.6 *Pizza and Chicken Breast Preparation*:

10.6.1 Prepare 27 pizzas in accordance with 7.4. Three of these pizzas will be used for single-run cooking energy efficiency tests and the remaining 24 will be used for barreling-run tests. Cover the pizzas with plastic wrap (to inhibit moisture loss), place in a refrigerator and chill the pizzas until they stabilize at 39 ± 1°F. Do not test with pizzas that have been in the refrigerator more than 24 h. Each pizza will comprise a pizza test load.

NOTE 7—The test pizzas should not be stored in the refrigerator for long periods, more than 24 h, because the pizza crust may absorb excessive moisture from the sauce and evaporation may reduce the moisture content of the sauce, changing the thermal characteristics of the pizza. The 24-h period is a practical "time" specification that allows the preparation of test pizzas on day one, overnight chilling and stabilization and application of the procedure the following day.

NOTE 8—In order to easily handle and store the pizzas, it is recommended that the prepared pizzas be placed on full size (18 by 26 in.) sheet pans, two pizzas per pan. The entire pan can then be covered with food grade plastic wrap. When stacking multiple pans in the refrigerator, spacers are necessary between the pans in order to protect the pizzas from damage. Researchers at Pacific Gas and Electric Company's Food Service Technology Center have found that sauce cups can be used as spacers.

NOTE 9—A minimum of 3 test runs is specified, however, more test runs may be necessary if the results do not meet the uncertainty criteria specified in Annex A1.

10.6.2 Prepare a minimum of 4 additional pizzas for use in cook time determination. The actual number of pizzas needed for the cook time determination will vary with the number of trials needed to establish a cooking time that demonstrates a 195 ± 3°F final pizza temperature after cooking.

10.6.3 Determine how many thawed, whole chicken breasts can be placed on the manufacturer's recommended cooking container. The chicken breasts must be spread open and must be placed so as to cover as much of the bottom surface area of the cooking container as possible without allowing any part of two adjacent chicken breasts to overlap. Use only whole chicken breasts as specified in 7.1. Record the number of chicken breasts used. This amount of chicken breasts will comprise a chicken test load.

10.6.4 Thaw enough chicken breasts, as specified in 7.1, for a minimum of seven chicken test loads. Four of these loads will be used for cook time determination and the remaining three loads will be used for single-run cooking energy efficiency tests. The actual number of chicken breasts needed for the cook time determination will vary with the number of trials needed to establish a cooking time that demonstrates a 170 ± 3°F internal temperature after cooking. Arrange the thawed chicken breasts in a single layer on wire racks so that the chicken breasts will drain and place the wire racks on sheet pans inside of a refrigerator. Cover the sheet pans with plastic wrap and allow the chicken breasts to stabilize in the refrigerator for a minimum of 24 h in order to ensure a uniform internal temperature of 39 ± 1°F. Do not store the thawed chicken breasts in the refrigerator for more than one week.

NOTE 10—A minimum of 3 test runs is specified, however, more test runs may be necessary if the results do not meet the uncertainty criteria specified in Annex A1.

NOTE 11—It is suggested that the frozen chicken breasts be thawed in cold running water.

NOTE 12—It is important that the raw chicken breasts be properly and consistently thawed and drained. Excess moisture on the cooking utensil will make it difficult to accurately determine the amount of product shrinkage.

10.7 *Cook Time Determination*:

10.7.1 Turn the rapid cook oven on and allow it to achieve a ready-to-cook state. If the oven requires preheating in order to achieve a ready-to-cook state then allow the oven to idle for 60 min after it is fully preheated. Set the rapid cook oven controls to the manufacturer's recommended setting for cooking a parbaked pizza as specified in 7.4. Estimate a cook time for pizza.

NOTE 13—The rapid cook oven may allow for several different recipes or programs which will all cook the test pizza to an adequate doneness. The researcher should choose the recipe or program that cooks the pizza in the shortest amount of time and with the lowest energy consumption while maintaining the highest quality of the finished pizza. The manufacturer can be a valuable resource in optimizing this cooking process and should be consulted where possible.

10.7.2 Remove a pizza test load (a single pizza) from the refrigerator and place the pizza directly on the manufacturer's

recommended cooking surface or cooking container in the center of the oven. If the manufacturer does not recommend a cooking surface or cooking container for cooking parbaked pizza then place the pizza directly on the oven deck. Do not allow more than 1 min to elapse from the time a pizza is removed from the refrigerator until it is placed in the oven.

10.7.3 Allow the pizza to cook for the duration of the estimated cook time and then remove the pizza from the rapid cook oven and place the pizza on an insulated, non-metallic surface such as corrugated cardboard. A standard cardboard pizza box is acceptable.

10.7.4 Determine the final temperature of the pizza by placing six thermocouple probes on the surface of the pizza. Locate the probes 3 in. from the center of the pizza and spaced equidistant from each other as shown in Fig. 1. The probes should penetrate the cheese and rest on the sauce-crust interface directly beneath the cheese. Allow no more than 10 s from the time the pizza is removed from the oven to the time the probes are placed on the pizza. Leave the probes in place on the pizza and record and average the temperatures of all six probes every five seconds over a one-minute period (for a total of 12 readings). The final pizza temperature is the highest average temperature of the six probes during the one-minute period. If the final pizza temperature is not 195 ± 3°F, adjust the cook time and repeat the cook time determination test as necessary to produce a 195 ± 3°F final temperature.

NOTE 14—It is recommended that the six thermocouple probes be attached to a simple, lightweight, rigid structure which will maintain the proper spacing and upright position of the probes and will therefore help maintain the consistency of the temperature readings. Fig. 2 shows a thermocouple structure that is made of Plexiglas and includes a simple handle for easy placement of the structure on the pizza. This structure can be gently set on top of the pizza during cook time determination with just enough force to penetrate the cheese but not enough to push the probes beyond the sauce-crust interface. Because the sauce migrates into the crust during cooking, it is relatively easy to remain in the sauce-crust interface during temperature measurement.

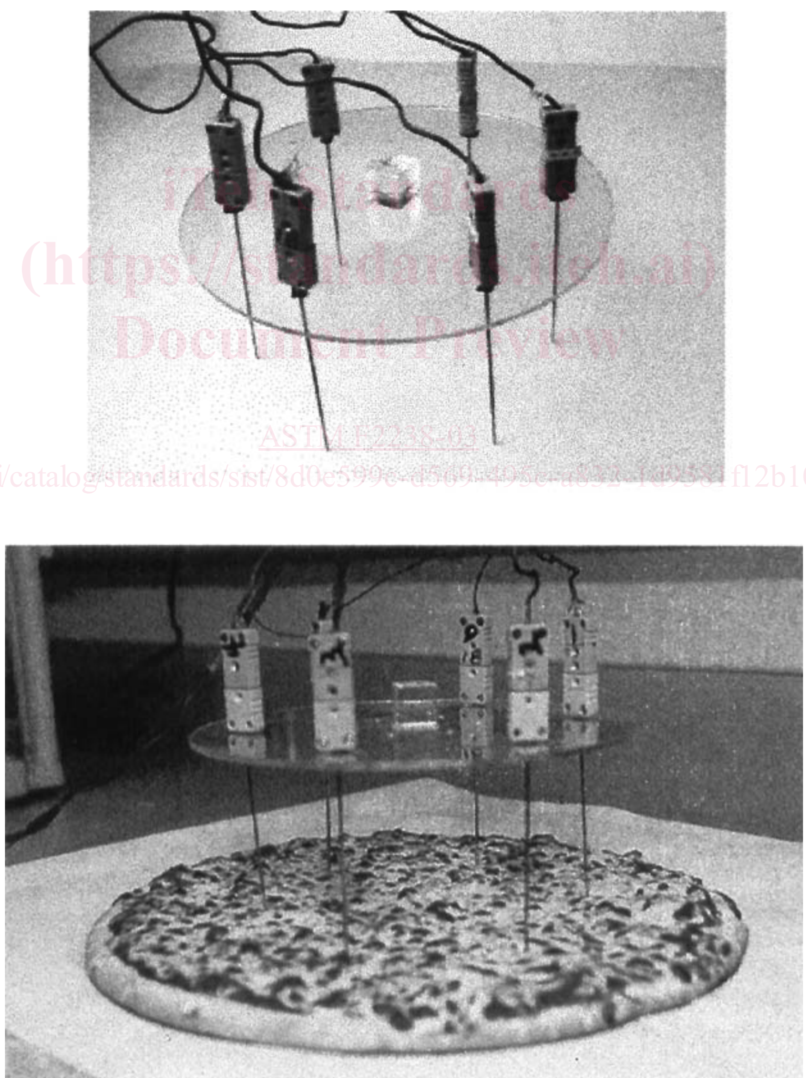

FIG. 1 Location of Thermocouple Probes on Pizza Surface

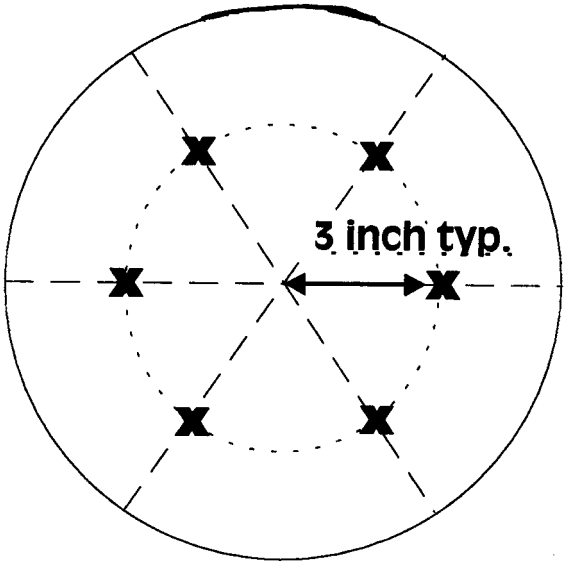

FIG. 2 Thermocouple Structure

10.7.5 Record the determined cook time and the recipe or program for optimized cooking of a pizza test load for use during the cooking energy efficiency and production capacity tests.

10.7.6 Set the rapid cook oven controls to the manufacturer's recommended setting for cooking the amount of chicken breasts, as determined in 10.6.3, comprising a chicken test load. Estimate a cook time for the chicken breasts.

NOTE 15—The rapid cook oven may allow for several different recipes or programs which will all cook the test chicken breasts to an adequate doneness. The researcher should choose the recipe or program that cooks the chicken breasts in the shortest amount of time and with the lowest energy consumption while maintaining the highest quality of the finished product. The manufacturer can be a valuable resource in optimizing this cooking process and should be consulted where possible.

10.7.7 Remove the amount of chicken breasts comprising a chicken test load, as determined in 10.6.3, and place them on the manufacturer's recommended cooking container. The chicken breasts must be spread open and must be placed so as to cover as much of the bottom surface area of the cooking container as possible without allowing any part of two adjacent chicken breasts to overlap. Place the cooking container in the center of the oven. Do not allow more than 1 min to elapse from the time the chicken breasts are removed from the refrigerator until they are placed in the oven.

10.7.8 Allow the chicken breasts to cook for the duration of the estimated cook time and then remove the chicken breasts and the cooking container from the rapid cook oven.

10.7.9 Determine the final average temperature of the chicken test load (all the chicken breasts) by inserting a thermocouple probe into the thickest part of each chicken breast. Insert the probes into the side of the chicken breasts so that the probes are parallel with the bottom of the cooking container. Allow no more than 10 s from the time the chicken breasts are removed from the oven to the time all of the probes are inserted into all of the chicken breasts. Leave the probes in place and record and average the temperatures of all the probes every five seconds over a one minute period (for a total of 12 readings). The final average temperature of all the chicken breasts is the highest average temperature of all the probes during the one minute period. If the final average chicken test load temperature is not 170 ± 3°F, adjust the cook time and repeat the cook time determination test as necessary to produce a 170 ± 3°F final temperature.

10.7.10 Record the determined cook time and the recipe or program for optimized cooking of a chicken test load for use during the cooking energy efficiency and production capacity tests.

10.8 *Cooking Energy Efficiency and Production Capacity*:

10.8.1 Turn the rapid cook oven on and allow it to achieve a ready-to-cook state. If the oven requires preheating in order to achieve a ready-to-cook state then allow the oven to idle for 60 min after it is fully preheated.

10.8.2 The cooking energy efficiency and production capacity tests are to be run a minimum of three times. Allow a minimum of 15 min between each test run. Additional test runs may be necessary to obtain the required precision for the reported test results (see Annex A1). The cooking energy efficiency tests shall be performed in the following sequence, starting with pizza test loads and progressing to chicken test loads:

10.8.3 Set the rapid cook oven controls to the recipe or program for optimized cooking of a pizza test load as determined in 10.7. If the manufacturer recommends cooking parbaked pizza using a cooking surface or container that is separate from the oven deck, then weigh the recommended surface or container and record the weight.

10.8.4 Remove a pizza test load (a single pizza) from the refrigerator, weigh the uncooked pizza, record the weight and place the pizza directly on the manufacturer's recommended cooking surface or cooking container in the center of the oven. If the manufacturer does not recommend a separate cooking surface or cooking container for cooking parbaked pizza; then place the pizza directly on the oven deck. Do not allow more than 1 min to elapse from the time a pizza is removed from the