WINCHESTER ENGINEERING AND ANALYTICAL CENTER

PROCEDURES FOR LABORATORY TESTING OF MICROWAVE OVENS

OCTOBER 1981

FOOD AND DRUG ADMINISTRATION
WINCHESTER ENGINEERING AND ANALYTICAL CENTER

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INTRODUCTION

The purpose of this document is to establish procedures for laboratory testing of microwave ovens that are certified by the manufacturer as being in compliance with the DHHS Performance Standard for Microwave Ovens published in 21 CFR 1010 and 21 CFR 1030.10. The procedures described in this document are applicable to both domestic and imported microwave ovens manufactured for use in homes, restaurants, food vending or service establishments, on interstate carriers, and in similar facilities. Definitions of terms used in this document are identical to definitions published in 21 CFR Parts 1000 through 1030.

GENERAL INSTRUCTIONS

1. Laboratory control of microwave ovens shall be maintained as specified in the FDA Regulatory Procedures Manual, the Analyst Operations Manual, Compliance Program 7393.804 "Compliance Testing of Electronic Products at WEAC", and Compliance Program Circular 7397.804A "Compliance Testing of Microwave Ovens at WEAC".

2. Upon notification of assignment of an oven for analysis the Analyst shall:

   a. obtain a copy of the service manual for the assigned oven (if not available, consult Supervisor); and,

   b. arrange with the Sample Custodian to transfer the oven to the testing laboratory.

3. All test data shall be recorded on Analyst Worksheets (FDA-431 and 431a) and/or the preprinted data sheets contained in Appendix A. When recording test data on the preprinted worksheets, all boxes shall be filled in (use N/A if item is not applicable).

4. The sample number shall be acquired from the "Collection Report" (Form FD-464) for the sample and verified with the "Official Seal" (Form FD-415a), and shall be clearly printed on all worksheets and preprinted data sheets. If no seal is present on the sample, consult Supervisor.

5. Before breaking the seal and removing the oven from its shipping carton, the Analyst shall initiate:

   a. an Analyst Worksheet (FD-431) in accordance with Chapter 9 of the Analyst Operations Manual; and,

   b. a preprinted data sheet set (see Appendix A).

6. Caution shall be taken in unpacking the oven. The original shipping carton and packing material shall be saved and the packing material shall be returned to the carton for later use in repacking the oven for storage or shipment.

7. All microwave leakage measurements shall be carried out according to the procedures outlined in Appendix B "Test Procedures for Measurement of Microwave Energy Leakage from Microwave Ovens".

8. All accompanying materials (user and service manuals and other materials) shall be read and understood before any testing procedures are initiated. Consult Supervisor if any problems are encountered with these materials.

9. Consult Supervisor if at any time during testing component failure occurs in the oven.

10. Microwave and electrical hazards are inherent with these tests. Perform all operations with extreme care.

11. CAUTION: If at any time during the testing the measured microwave radiation leakage reaches 5 mW/cm^2, STOP. Immediately notify Supervisor.

PART A - COMPLIANCE LABORATORY TESTING

Introduction

The compliance tests delineated in Part A are performed on all microwave ovens selected for analysis at WEAC under Compliance Program Circular 7393.804A. Endurance Testing (Part B) is performed on specially designated samples.

If any of the following labels are found to be missing, have this finding verified by another Analyst.

I. Labeling

A. User Precautions Label

Visually examine the label specified in 21 CFR 1030.10 part (c)(6)(i) for the following:

1. Presence
2. Permanence
3. Legibility
4. Proper location

Document any inadequacies.

B. Service Caution Label

Visually examine the label specified in 21 CFR 1030.10 part (c)(6)(ii) for the following:

1. Presence
2. Permanence
3. Legibility
4. Proper location

Document any inadequacies.

C. Certification Label

Visually examine the certification label (21 CFR 1010.2) for the following:

1. Presence
2. Permanence
3. Legibility
4. Accessibility

Document any inadequacies.

D. Identification Label

Visually examine the identification label (21 CFR 1010.3) for the following:

1. Presence
2. Permanence
3. Legibility
4. Accessibility

Verify that the month and year of manufacture are clear and legible without abbreviation and with the year shown as a four-digit number. If the date is not on the identification label, indicate its location on the worksheet.

Document any inadequacies.

II. Performance Tests

A. Door Open Start Test

Verify that the oven will not operate under any of the following conditions.

1. Open the oven door. With no time on the timer, try to start the oven by pushing the "ON", "START", "COOK" or other buttons which have the same function.

2. Open the oven door. Set the timer. (Some push button or programmable timers cannot be set when the oven door is open. If this is the case, skip to #3.) Try to start the oven by pushing the button specified in #1 above.

3. Close the oven door. Set the timer. Open the oven door. Try to start the oven by pushing the button specified in #1 above.

B. Insertion

1. Examine the oven cavity, waveguide, or other microwave energy containing spaces for all entrances which allow access to them with the oven door closed, and all lamp and vent covers in place. The possible entrances include, but are not restricted to, ventilation slots, holes in the corners of the oven door, or gaps in the corners of the oven cavity.

2. Describe any insertion paths found and document these paths photographically. Have the insertion path verified by another analyst.

C. Microwave Measurements-General

1. Ovens shall be tested at their rated line voltage as shown on the microwave oven unit, ± 5%.

2. The same microwave power density measuring instruments should be used for all tests on a given sample. Record the manufacturer, model number, and serial number of the probe and survey meter. Record the calibration factor for the power density measuring unit.

3. Due to calibration schedules, ovens that are endurance tested may not have the final compliance tests performed using the same instrument; this should be noted on the data sheets.

4. Record manufacturer, model number, and serial number of the line voltage monitor or other instrumentation used in the determination of compliance status.

5. Microwave leakage measurements shall be performed according to procedures described in Appendix B.

CAUTION: Microwave and electrical hazards are present.

D. Leakage Measurements-Door Closed

1. Study Appendix B and survey the following oven surfaces for microwave leakage:

   a. The circumference of the door/cavity seal. Should be performed while pulling on the door or door handle in order to pull the door snug against the door latch(es).
   b. The area of the door screen.
   c. The area of the control panel.
   d. The line cord at the point where it enters the oven.
   e. All vent openings.
   f. All cabinet seams.
   g. Any other suspected openings.

2. Record the value and location of the maximum leakage. Use codes as shown in the location identification guide in Appendix C.

3. Record the line voltage under which the test was performed.

E. Leakage Measurements-Door Fixed

This test applies to any oven that does not have a positive latch interlock (one that turns the oven off

before door movement can begin). If an oven does not have a positive latch interlock, the following procedure shall be followed:

1. Turn the oven on, slowly open the door, and determine the distance the door must open before the primary interlock interrupts the oven operation.

2. Make as many measurements as required to determine the location of the maximum leakage using the fast response position on the microwave power density measuring instrument.

3. Using the slow response position of the microwave power density measuring instrument, determine the maximum leakage. Record the value and location of the maximum leakage using the codes on the location guide in Appendix C.

4. Record the line voltage at which the test was performed.

F. Secondary Interlock Leakage Measurements

This test is intended to determine the leakage control limit of non-positive (those which allow door motion before actuating) secondary interlocks. If it is determined that the secondary interlock is a positive interlock, the portion of the preprinted data sheet for the secondary interlock leakage measurement will indicate that this test is not applicable (N/A).

1. Defeat the primary and other interlocks as necessary so that microwave power is controlled by the action of the secondary interlock only.

2. It may be necessary to defeat the interlock monitor before this test can be performed.

3. Proceed as described previously in Section II.D.

4. Record the value and location of the maximum leakage.

G. Safety Interlock Tests

1. Verify that there is a minimum of two functional interlocks.

2. Test all interlocks for defeatability by:

   a. Any part of the body, and/or
   b. A rod with useful length of 10 centimeters, and/or
   c. A test magnet, for magnetic interlocks.

Only the force necessary to activate the interlock switch itself shall be used.

3. Verify that the interlock actuators are not removable without disassembly of the oven or its door.

4. Review the electrical and mechanical design of the interlocks to determine if any single electrical or mechanical failure could cause all safety interlocks to become inoperative.

5. Perform individual function tests for all interlocks whose function has not been determined by previous tests. This will include tertiary and higher order interlocks. If necessary, a high impedance neon lamp may be placed in series with the power transformer to indicate interlock function and prevent possible door open operation. In some cases other interlocks and the monitor may have to be defeated to perform this test. If appropriate the procedure of G.2.a. may be used.

6. Record the following information for all safety interlocks:

   a. Whether or not it is monitored (see G below)
   b. Whether or not it is concealed (see #2 above)
   c. Whether or not it is positive.

H. Monitor Function Test

1. Review the schematic diagram as well as the physical components of the monitored safety interlock(s) circuit and determine whether the monitor would cause the oven to become inoperable and remain so until repaired if the required safety interlock(s) should fail to perform required functions. Determine if interlock failures would disrupt the monitoring function. Comment on inadequate operation.

2. The following techniques may be used to determine whether the monitor will perform its function if the monitored interlock(s) should fail.

   a. Neon indicator method - for monitors using the "crow-bar" techniques or using fuses and/or thermal elements.

      (1) Insure that the oven is not connected to the power line and that the capacitor is discharged.

      (2) Disconnect the two leads of the primary side

of the magnetron high voltage transformer (required only if completion of this test would cause current to flow in the transformer primary).

(3) Place a neon test light having a high resistance in series with one of the two leads of the monitor switch. An electrical or electronic circuit that will indicate current flow may be used in place of the neon test light.

(4) Short the monitored interlock(s).

(5) Tape all exposed terminals to avoid electrical shorts.

(6) Close the oven door, connect the power line, activate the oven, and then open the oven door. The neon test light should light and remain so indicating proper operation of the monitor. Consult with your Supervisor if the neon light does not indicate proper monitor operation.

(7) Restore all components to their original condition.

b. All other monitors not covered by a. above.

(1) Insure that the oven is not connected to the power line and that the capacitor is discharged.

(2) Disconnect the two leads of the primary side of the magnetron high voltage transformer (required only if completion of this test would cause current to flow in the transformer primary).

(3) Short the monitored interlock(s).

(4) Tape all exposed terminals to avoid electrical shorts.

(5) Close the oven door, activate the oven, and then open the door. The monitor should render the oven inoperable.

(6) Restore all components to their original condition.

III. Manuals

A. User Manuals

1. Identify the manual(s) by title and/or part number.

2. Verify that the user manual(s) contain(s) the instructions as specified in 21 CFR 1030.10(c)(4).

3. Document inadequate or improper instructions.

B. Service Manual

The only manuals which are to be evaluated are those directly applicable to the unit being tested (limited to the microwave portion of a Hi/Lo unit).

1. Evaluate the instructions including adjustment and replacement procedures to see that adherence to them would result in proper operation of the oven. Document any inadequate or improper instructions.

2. Verify that service instructions (including diagrams and schematics) correctly identify the primary and secondary interlocks. Document discrepancies.

3. Verify that the service manual(s) contain(s) the instructions as specified in 21 CFR 1030.10(c)(5).

4. Identify the manual(s) by title and/or part number. Include the manual publication date if shown on the manual(s). Also include information about how and when the manual(s) was/were received at WEAC.

PART B - ENDURANCE LABORATORY TESTING

I. Introduction

The DHHS Performance Standard for microwave ovens requires that the plane wave power density of the microwave radiation emitted by a microwave oven not exceed 5 mW/cm^2 at any point 5 cm or more from the external surface of the oven after acquisition by a purchaser (21 CFR 1030.10(c)). This statement has been interpreted to require that this limit shall apply throughout the useful life of the oven. In order to evaluate the potential for leakage of the oven as a function of use, the oven door and interlocks shall be cycled at least 100,000 cycles of operation for household ovens and 200,000 cycles for commercial appliances. A cycle consists of closing door, energizing power and allowing the microwave energy source to operate and stabilize, shutting off the power by opening the door, and closing the oven door to restart the cycle.

II. Preparatory Procedures

A. Test Stand Preparation

Endurance testing is performed on special test stands. These test stands provide the means of operating the door and its latching mechanisms as well as any operator controls that are necessary to place the oven in the cook mode.

Controls are provided to adjust the sequence, speed of operation, and the pneumatic devices required to operate the particular model of oven being tested. Electromechanical registers are provided to: display the total number of door closings, display the total number of operating cycles, automatically terminate the door cycling after 10,000 cycles, and indicate the number of cycles since the last 10,000 cycle termination.

B. Oven Preparation

1. Remove the oven wrapper and disconnect the timer drive mechanism if it cannot be operated by the endurance test stand mechanism. Make connections to both sides of the high voltage transformer primary (or equivalent) to drive the operating cycle counting register. Replace the wrapper.

2. Mount the oven on the endurance test stand and adjust the operation of the endurance test stand so that the door closure force simulates normal operation. The door shall swing, where applicable, from the closed

position to 90 ± 10 degrees. Make connection to the operating cycle register.

3. Place the carbon loaded, synthetic rubber endurance load supplied by BRH, or other suitable microwave energy absorbing heat dissipating load in the oven cavity. (The BRH load shall be placed with the solid side up.)

4. Adjust the test stand controls so that the power source operates and stabilizes without causing the load to overheat.

III. Endurance Tests

CAUTION: If at any time during testing the microwave radiation leakage exceeds 5 mW/cm^2, STOP and notify Supervisor.

A. Initial Set-up

1. Disconnect the door from the test stand and perform a microwave leakage survey following procedures described in Appendix B. The microwave leakage survey in the compliance testing report may be used as the initial survey.

2. Record the value of the maximum microwave leakage and the location of the maximum leakage and your initials on the preprinted worksheet.

3. Install the BRH endurance test load and connect endurance test stand oven operating mechanisms. Set the counters to zero.

B. Daily Operational Procedure

1. Check load placement.

2. Check registers for previous days counter readings.

3. Periodically throughout the day the stands and ovens should be checked for proper operation. The test loads should be warm but not hot. A cool test load usually indicates oven malfunction.

4. At the end of each day record the following: (a) accumulated number of cycles, (b) the date, and (c) your initials on the preprinted worksheet.

C. 10,000 Cycle Test

1. Disconnect the door from the endurance test stand at the completion of every 10,000 cycles of operation.

2. Follow the instructions of "A. Initial Set-up", 1 through 3. Resetting only the 10,000 cycle register.

D. Final Test

1. Disconnect the door from the endurance test stand at the completion of the scheduled number of cycles (at least 100,000 for household and at least 200,000 for commercial ovens).

2. Perform microwave energy leakage survey as prescribed in Attachment B.

3. Determine if the interlocks are still functioning by making voltage or resistance checks at the end of the test. In some cases there will be test stand monitors to indicate interlock operation.

4. Test the interlock monitor to see that it is capable of disabling the microwave generator. If completion of this test would cause current to flow in the transformer the two leads on the primary may be disconnected. (See Part A, Section G of this document.)

5. Enter the results obtained above and the data accumulated from each 10,000 cycle test on the endurance test data sheet.

APPENDIX A

DATA SHEETS

APPENDIX A

PREPRINTED DATA SHEETS
FOR
COMPLIANCE TESTING

3. SEALS	4. DATE REC'D	5. RECEIVED FROM	6. DISTRICT OR LABORATORY
☐ INTACT ☐ NONE ☐ BROKEN			WEAC

7. DESCRIPTION OF SAMPLE
One cardboard carton

8. NET CONTENTS		9. LABELING	
☒ NOT APPLICABLE	DECLARE/UNIT _____	_____	ORIGINAL(S) SUBMITTED
☐ NOT DETERMINED	AMOUNT FOUND _____	_____	COPIES SUBMITTED (photographic)
____ UNITS EXAMINED	% OF DECLARED _____	☐ NONE	

10. SUMMARY OF ANALYSIS

Labeling: See page 2 and below

Code (Found on Identification Label):

FOR BRH USE ONLY ☐☐☐☐ ☐☐

Manufacturer _____
Brand _____
Model # _____
Serial # _____
Date Manufactured _____
Location of Identification Label _____

Product: _____ Microwave Oven

Rated Line Voltage: _____ VAC

Analysis:

Method: Winchester Engineering and Analytical Center
Procedures for Laboratory Testing of Microwave Ovens - October 1981
Part A

Performance Standards:

Certification : 21 CFR 1010.2
Identification: 21 CFR 1010.3
Performance : 21 CFR 1030.10

11. RESERVE SAMPLE
Original cardboard carton officially sealed

12. a. ANALYST SIGNATURE (Broke Seal ☐)	13. WORK-SHEET CHECK	a. BY
b.		b. DATE
c.		14. DATE REPORTED

GENERAL CONTINUATION SHEET	PRODUCT MICROWAVE OVEN	SAMPLE NO.

RESULTS & SUMMARY OF ANALYSIS

	Date	Adequate	Not Adequate	Questionable
Labeling Requirements				
a. User Precautions Label				
b. Service Caution Label				
c. Certification Label				
d. Identification Label				
Performance Requirements				
e. Door Open Start Test				
f. Insertion				
g. Microwave Leakage				
h. Secondary Interlock Microwave Leakage				
i. Safety Interlocks				
1. Minimum of Two				
2. At Least One is Concealed				
3. Non-Removal of Actuators				
4. Failure of Single Component Will Not Cause Interlocks to Become Inoperative				
j. Monitor Function				
Manuals (Instructions & Warnings)				
k. User Manual (User Precautions Statement Present)				
l. Service Manual				
1. Service Adjustments or Service Procedures Do Not Cause Safety Interlocks to Become Inoperative or Allow the Microwave Radiation Emission to Exceed Power Density Limits				
2. Primary and Secondary Interlocks Properly Identified in Manual				
3. Service Precautions Statement Present				

ANALYST'S	ANALYST NO.	PAGE ____ OF ____ PAGES

GENERAL CONTINUATION SHEET	PRODUCT MICROWAVE OVEN	SAMPLE NO.

PERFORMANCE TEST DATA

DATE: _____

A. Safety Interlocks	Monitored Yes	Monitored No	Concealed Yes	Concealed No	Positive Yes	Positive No
1. Primary Interlock	___	___	___	___	___	___
2. Secondary Interlock	___	___	___	___	___	___
3. Other	___	___	___	___	___	___
4. Monitor			___	___	___	___
			___	___	___	___

B. Instrumentation for Microwave Survey

Microwave Survey Inst. Mfr. _____
Meter Model # _____
Meter Serial # _____
Probe Serial # _____
Calibration Factor _____
Line Voltage Meter Mfr. _____
Meter Model # _____
Meter Serial # _____

	LEAKAGE IN mW/cm^2	21 CFR LIMIT	LINE VOLTAGE	*SURFACE	*LOCATION ON SURFACE
C. Door Closed	☐☐.☐	1.0 mW/cm^2	_____	☐	☐
D. Door Fixed Leakage: (To be filled in only if primary interlock is non-positive.)	☐☐.☐	1.0 mW/cm^2	_____	☐	☐
E. Secondary Leakage: (To be filled in only if secondary interlock is non-positive.)	☐☐.☐	5.0 mW/cm^2	_____	☐	☐

*SEE APPENDIX C OF WEAC PROCEDURES FOR LABORATORY TESTING OF MICROWAVE OVENS - OCTOBER 1981

ANALYST(S):	ANALYST NO.	PAGE ____ OF ____ PAGES

GENERAL CONTINUATION SHEET	PRODUCT MICROWAVE OVEN	SAMPLE NO.

MANUAL IDENTIFICATION

USER MANUAL(S):

SERVICE MANUAL(S):

ANALYST	ANALYST NO.	PAGE ____ OF ____ PAGES

APPENDIX A

PREPRINTED DATA SHEETS
FOR
ENDURANCE TESTING

ANALYST WORKSHEET	MICROWAVE OVEN	

3. SEALS ☐ NONE ☐ INTACT ☐ BROKEN	4. DATE REC'D	5. RECEIVED FROM	6. DISTRICT OR LABORATORY: WEAC

7. DESCRIPTION OF SAMPLE
One cardboard carton

8. NET CONTENTS	☒ NOT APPLICABLE ☐ NOT DETERMINED ___ UNITS EXAMINED	DECLARE/UNIT _____ AMOUNT FOUND _____ % OF DECLARED _____	9. LABELING	___ ORIGINAL(S) SUBMITTED ___ COPIES SUBMITTED ☐ NONE

10. SUMMARY OF ANALYSIS

Labeling: See Compliance Testing Report Dated _____

Code: (Found on Identification Label, See Compliance Testing Report for Location of Label)

Manufacturer _____
Brand _____
Model # _____
Serial # _____
Date Manufactured _____

Product: _____ Microwave Oven

Rated Line Voltage: _____ VAC

Analysis:

Method: Winchester Engineering & Analytical Center
Procedures for Laboratory Testing of Microwave Ovens - October 1981
Part B

Performance Standards: 21 CFR 1030.10

NOTE: This oven was put on the endurance test stand _____ to await set-up.

NOTE: The compliance tests for this unit have been previously reported.

11. RESERVE SAMPLE

12. a. ANALYST SIGNATURE (Broke Seal ☐)	13. WORK-SHEET CHECK	a. BY
b.		b. DATE
c.	14. DATE REPORTED	

GENERAL CONTINUATION SHEET	PRODUCT MICROWAVE OVEN	SAMPLE NO.

ENDURANCE TEST SUMMARY

A. Leakage vs. Number of Cycles

# of Cycles	Leakage (mW/cm^2)	Surface	*Location on Surface	Line Voltage (VAC)	Date	Initials
0						
10,000						
20,000						
30,000						
40,000						
50,000						
60,000						
70,000						
80,000						
90,000						
100,000						

*See Appendix C of WEAC Procedures for Laboratory Testing of Microwave Ovens - October 1981.

B. Interlocks functional at end of test: Yes ____ No ____

C. Monitor function test at end of cycling: Passed ____ Failed ____

D. Condition of monitor switch at end of test:

Normal ____ Other ____ If "Other", specify _____

_____

E. Instrumentation

1. Line Voltage Monitor - The instrument listed below was used throughout the entire endurance testing unless otherwise noted.

   Manufacturer _____
   Model # _____
   Serial # _____

2. Microwave Survey Instrument - The following instruments were used for the measurement of microwave energy for the indicated 10,000 cycle checks:

10,000 Cycle Check	Manufacturer	Meter Model #	Meter Serial #	Probe Serial #	Calibration Factor

ANALYST S.	ANALYST NO.	PAGE ____ OF ____ PAGES

MICROWAVE OVEN
Endurance Test Continuation Sheet

Number of Cycles Completed

Analyst	Date	Transformer	Door	Operation*

*Operation Code: 1-Daily Check, 2- 10,000 Cycle Check, 3- Repair, 4- Other (Specify)

APPENDIX B

TEST PROCEDURES FOR MEASUREMENT OF MICROWAVE ENERGY LEAKAGE FROM MICROWAVE OVENS

APPENDIX B

TEST PROCEDURES FOR MEASUREMENT OF MICROWAVE ENERGY LEAKAGE FROM MICROWAVE OVENS

I. Purpose

To obtain the microwave radiation characteristics of a microwave oven in order to determine whether the oven is in compliance with the requirements of 21 CFR 1030.10.

II. Apparatus

A. Microwave Survey Meter

The microwave survey meter shall comply with the requirements of 21 CFR 1030.10(c)(3)(i).

The instrument shall reach 90% of its steady-state reading within 3 seconds when it is subjected to a stepped input signal.

The instrument shall have a radiation detector with an effective aperture of 25 cm^2 or less as measured in a plane wave, said aperture having no dimension exceeding 10 cm. This aperture shall be determined at the fundamental frequency of the oven.

The instrument shall be capable of measuring the power density limits of 21 CFR 1030.10 with an accuracy of plus 25% and minus 20% (plus or minus 1 decibel).

Examples of instruments which fulfill these requirements are the Narda model 8110 modified such that when the Response Switch is in the Slow position, it reaches 90% of the steady-state value in approximately 3 seconds; and the Holaday model 1501.

B. Line Voltage Meter

The instrument shall measure the AC line voltage within $\pm$ 1% of the reading.

III. Testing Procedure for Microwave Leakage

A. Obtain a standard 600 ml glass beaker having an inside diameter of approximately 8.5 cm filled with

tap water to a level of 275 ± 15 ml, the water being at a temperature of 20°C ± 5°.

B. Place the beaker in the center of the load carrying surface of the oven. If there is an adjustable shelf, place it so that the center of the water volume is as near the center of the cavity as possible.

C. Set the microwave survey instrument up to measure 2,450 MHz signals. If the oven operates at any other frequency, consult Supervisor. Select the appropriate range on the meter. Turn on and zero the meter. Re-zero the meter any time the range is changed. Check the battery and probe with their respective "Test" switches. Check to make sure that movement of the probe cable will not cause erratic readings on the meter.

D. If the power output of the oven is adjustable (Hi-Low Power Switch or multiple magnetrons), set the oven controls so that the maximum microwave power output is obtained.

E. Close the oven door normally and activate any latching mechanisms.

F. Turn the oven on, setting the timer for sufficient operating time to complete the survey. Set the line voltage with a Variac to the rated line voltage. Should the water load begin to boil during the leakage survey, it shall be replaced with water at the specified initial temperature before continuing with the survey.

G. Survey the oven using the microwave survey meter in the following manner:

1. Set the response switch to the fast position.

2. At all times the probe shall be held in such a manner as to be perpendicular to the surface being surveyed. The probe shall be held only by the handle portion of the probe.

3. Survey around the door seal and note locations of all high leakage points. The maximum probe survey speed shall not exceed one inch per second.

4. At several locations in the vicinity of each high leakage point, hold the probe stationary until a steady state value is reached on the microwave survey meter. Observe the maximum leakage at each location.

5. Set the Response Switch to the Slow position; remeasure the leakage at the point of maximum leakage located in step G.4. above. Record the value and location of the maximum leakage measurement with the meter response on Slow.

APPENDIX C

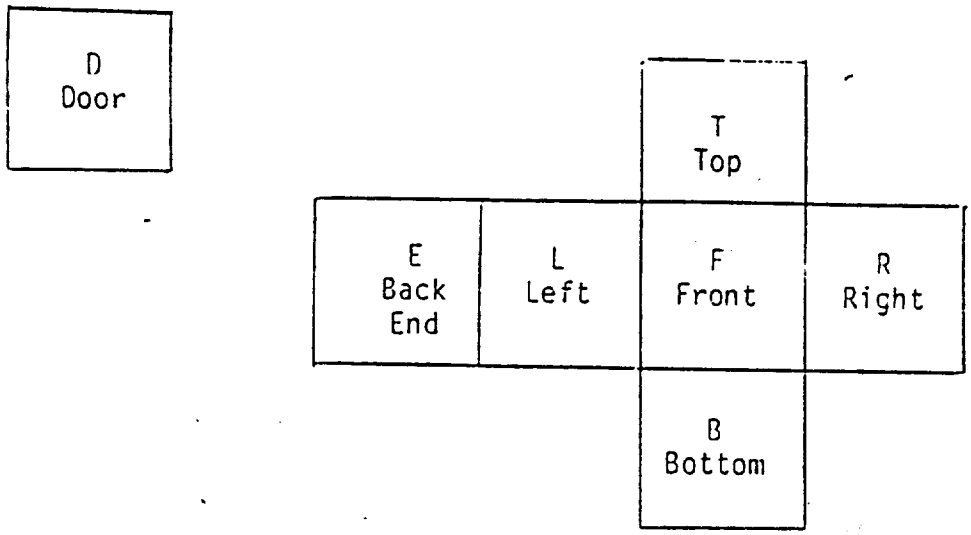
SURFACE AND LOCATION IDENTIFICATION

APPENDIX C

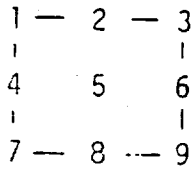
SURFACE AND LOCATION IDENTIFICATION

SURFACE IDENTIFICATION

If leakage is less than 1.0 mW/cm^2 everywhere, use surface - A designation.
If leakage occurs around the door, use the surface - D designation.



LOCATION ON SURFACE



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