

DEPARTMENT OF HEALTH,  
EDUCATION, AND WELFARE

## Food and Drug Administration

48355

[Docket No. 79N-0314]

**Radiofrequency Sealers, Heaters, and Gluers; Open Workshop**

**AGENCIES:** Food and Drug Administration; Occupational Safety and Health Administration.

**ACTION:** Notice.

**SUMMARY:** The Bureau of Radiological Health (BRH) of the Food and Drug Administration (FDA) and the Occupational Safety and Health Administration (OSHA) announce an open workshop to discuss potential hazards to persons involved in the use of radiofrequency (RF) sealers, heaters, and gluers. Techniques for the control or elimination of hazards from such RF-emitting devices are also being sought.

**DATES:** The workshop will be held September 12 and 13, 1979, and will convene at 9 a.m. each day.

**ADDRESSES:** The workshop will be held at the Department of Labor auditorium New Department of Labor Building, Second and Constitution Ave. NW., Washington, DC 20210.

Written supplemental comments to the Hearing Clerk (HFA-305), Food and Drug Administration, Rm. 4-65, 5600 Fishers Lane, Rockville, MD 20857.

**FOR FURTHER INFORMATION CONTACT:**

Zory Glaser, Bureau of Radiological Health (HFX-460), Food and Drug Administration, Department of Health, Education, and Welfare, 5600 Fishers Lane, Rockville, MD 20857, 301-443-3426; or

Frank Tipton, OSHA—OHP, Rm. N-3718, Department of Labor, Second and Constitution Ave., NW., Washington, DC 20210, 202-523-7174.

**SUPPLEMENTARY INFORMATION:** BRH and OSHA are concerned about potential adverse health effects on personnel exposed to RF energy emitted from RF sealers, heaters, and gluers. These RF-emitting devices are also known as: heat sealers, fusers, molders, fasteners or embossers; high frequency (HF) sealers or dryers; electronic or electromagnetic sealers or welders; and dielectric heaters. They are generally designed to operate at a frequency between 3 and 100 megahertz (MHz). Another class of electromagnetic radiation-emitting devices which operate at or near these frequencies include induction heating equipment.

## NOTICE

Radiofrequency sealers, heaters, and gluers hazards; workshop

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The open workshop is being scheduled to bring together users, manufacturers, Federal agency staff, employee representatives, trade associations, and others concerned with RF sealers, so that BRH and OSHA may benefit from their expertise, as well as to ensure that the present knowledge of the possible hazards of these devices is appreciated in the affected industries. Field measurements have confirmed that a significant number of personnel are exposed to high levels of RF radiation from these devices. Because the RF energy at these frequencies can penetrate deeply into the body without activating the heat sensors located in the skin, operators of such RF equipment may be unaware of exposures to the RF energy.

The workshop will cover topics important to the assessment and control of the possible hazards of RF energy from RF sealers, heaters, and gluers. The topics to be discussed are expected to include:

- Measurement of electric and magnetic field intensities generated by these devices;
- A brief review of biological effects at frequencies between 3 MHz and 100 MHz;
- Explanation of the near-field conditions that are a part of these exposures, and the difficulty posed under these conditions in exposure measurement and in predicting possible adverse effects to persons so exposed;
- A discussion of RF radiation measurement equipment and techniques;
- Procedures or techniques available for control of RF emissions;
- Possible initiatives of Federal agencies on the control of RF-emitting devices;
- Technical aspects related to the use or application of RF heater-type equipment, and the possible resultant effects upon intended functions and unnecessary radiation emission; and
- Other topics pertinent to the discussion of possible health hazards from RF equipment, particularly RF heaters, sealers, and gluers.

BRH and OSHA are anxious to gain information especially from users and manufacturers of RF sealers, heaters, and gluers, on the techniques for

## DEPARTMENT OF LABOR

48385

## Occupational Safety and Health Administration

**Radiofrequency Sealers, Heaters, and Gluers; Open Workshop**

**Cross Reference:** For a notice of open workshop issued by the Food and Drug Administration and the Occupational Safety and Health Administration to discuss potential hazards of using radiofrequency sealers; heaters, and gluers, see FR Doc. 79-25278 appearing in the Notices section of this issue.

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measurement of emissions of such RF energy assessment of operator exposure to the RF energy, and the techniques and procedures for the control or elimination of stray RF emission from sealers, heaters, and gluers. Other relevant information is also solicited.

Several speakers from the involved agencies are expected to make short presentations on the above topics. Opportunity will be provided for comments and questions by any interested person. Persons wishing to present brief prepared statements should contact Zory Glaser or Frank Tipton by September 5, 1979.

As time permits, other persons present will be given the opportunity to make brief statements. This will be an informal open workshop, but a transcript will be made so that the maximum benefit may be derived from the workshop. Anyone wishing to submit written statements or other information relevant to the subject of this workshop for inclusion in the permanent record may do so at the workshop, or by sending it to the FDA Hearing Clerk (address above) by October 12, 1979. Written submissions should be clearly identified with the words "BRH-OSHA open workshop on RF sealers."

Although this workshop is not a hearing, and is not a part of any formal rulemaking, all the information and opinion submitted in preparation for, during or in response to this workshop will become a part of a permanent file for any new or modified rules that may be issued by either agency concerning RF heaters, sealers, and gluers.

Dated: August 10, 1979.

William F. Randolph,  
Acting Associate Commissioner for  
Regulatory Affairs.

[FR Doc. 79-25278 Filed 8-16-79; 8:45 am]

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Radiofrequency sealers, heaters, and gluers  
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U.S. DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Public Health Service  
Food and Drug Administration  
Bureau of Radiological Health  
Rockville, Maryland 20857  
(HFX-460)

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ing when the door is not securely fastened. In addition, a monitoring system now is required that stops the oven from operating in case the interlock systems fail. These systems assure that emission of microwaves will cease the moment the oven door is opened or the latch is released. There is no residual radiation remaining after microwave emission has stopped. All ovens made since October 7, 1971, should have a label stating that they comply with FDA standards.

FDA also requires that all ovens manufactured after October 3, 1975, have a label affixed explaining precautions for safe use. This requirement may be waived if the manufacturer has demonstrated that the oven will not exceed the allowable emission limits even if operated under the conditions cautioned against on the label.

To make sure its performance standards are being met, FDA tests microwave ovens in commercial establishments, dealer and distributor premises and manufacturing plants, and in its own laboratories. FDA also evaluates manufacturers' radiation testing and quality control programs. If FDA finds that a certain model or make of oven contains a defect in design or manufacture that causes a safety problem, it requires the manufacturer to correct all defective ovens. If defective ovens have been sold to consumers the manufacturer must correct them at no cost to the purchasers.

Based on current knowledge about microwave radiation, FDA believes that microwave ovens which meet the performance standards and are properly operated should be safe for home use.

### Tips on Safe Oven Operation

Here are some tips for consumers on safe use of microwave ovens:

- Examine a new oven for evidence of shipping damage.
- Do not have the oven rewired or adjusted so that the interlock system on the door will not operate.
- Follow the manufacturer's instruction

manual for recommended operating procedure and safety precautions.

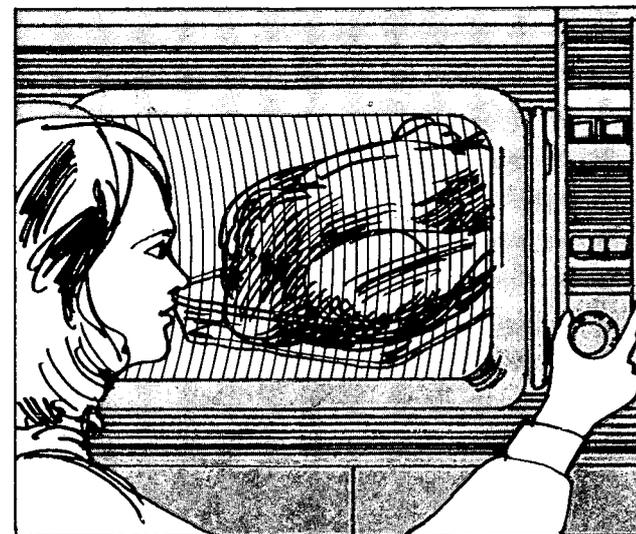
- Never operate an oven if the door does not close firmly or is bent, warped, or otherwise damaged.
- Never insert objects through the door grill or around the door seal.
- Never turn the oven on when it is empty.
- Clean the oven cavity, door, and seals frequently with water and mild detergent. Do not use scouring pads, steel wool, or other abrasives.
- Although there is little cause for concern unless the door, hinges, latch, or seals are damaged, if you believe your oven might be leaking excessive microwaves contact your State health department. It may have a program for inspecting ovens. Microwave oven servicing organizations also frequently are equipped to test ovens for excessive emissions. A limited number of ovens are tested in the home by FDA as part of its overall program to assure that ovens meet Federal safety standards. Your local FDA office may be able to arrange to have your oven tested. The number of ovens that can be tested is limited, however, and FDA cannot guarantee that your oven will be checked.

- Don't try to test the oven yourself with any of the devices that are sold to consumers for such purposes. FDA has tested a number of these devices and found that many of them are inaccurate and unreliable. The testing devices used by public health authorities to measure oven leakage are tested for accuracy by FDA.

U.S. DEPARTMENT OF HEALTH,  
EDUCATION, AND WELFARE  
Public Health Service  
Food and Drug Administration  
Office of Public Affairs  
Rockville, Maryland 20857

HEW Publication No. (FDA) 78-8058

## We Want You To Know About Microwave Oven Radiation



The use of microwaves has soared in the past decade. Microwaves are used in police radar speed monitors, in telephone and television relay stations, and in diathermy machines for treating muscle soreness. Industry uses microwaves to dry and cure plywood, to cure rubber and resins, to raise bread and doughnuts, and to cook potato chips. But the most common consumer use of microwave energy is in microwave ovens. Although millions of these ovens are in use, many people have questions about cooking with microwaves.

### **What Is Microwave Radiation?**

Microwaves are a type of electromagnetic radiation; that is, they are waves of electric and magnetic energy moving through space. Microwaves are a different form of radiation than x rays. Microwaves don't have as much energy as x rays and don't have the same effects on the body.

### **Cooking With Microwaves**

The microwaves in an oven are generated by an electron tube, called a magnetron, inside the cabinet. Because the metal interior of the oven reflects rather than absorbs microwaves, they bounce back and forth and are absorbed by food. Microwaves cause the water molecules in the food to vibrate, thus producing heat. This is what cooks the food. Foods high in water content cook more quickly than other foods.

Microwaves penetrate into the food and produce heat quickly. Glass, paper, or plastic containers are used to hold the food being cooked because the microwaves pass through most types of these materials. Although such containers will not absorb nor be heated by microwaves, they can become hot from the food cooking in them.

Metal pans or aluminum foil should not be used in a microwave oven. The microwaves will bounce off them, causing the food to cook unevenly and possibly damaging the magnetron tube. The instructions which

come with a microwave oven should indicate the kinds of containers that should be used.

Because all the heat in a microwave oven is produced in the food the interior of the oven doesn't get hot. In a conventional oven, the air in the oven compartment is heated and the heat then transferred to the food. Microwave cooking can be more energy-efficient than a conventional oven because the food heats more quickly and the energy is used only to heat the food, not the compartment. Foods cooked in microwave ovens are not heated from the inside out. When thick foods such as a roast are cooked, the outer layers are heated and cooked primarily by microwaves and the inside is cooked mainly by the slower conduction of heat from the hot outer layers.

Neither microwave nor conventional ovens should be used in home canning, because they may not produce temperatures high enough to destroy harmful bacteria. In addition, these ovens are not designed to withstand the pressure of a sealed glass jar which could burst. The oven could be damaged and anyone nearby could be seriously injured.

Microwave energy only heats food, it does not make the food radioactive or contaminated. As for nutritional value, evidence indicates that foods cooked in a microwave oven retain at least as many vitamins and minerals as those cooked in conventional ovens.

### **Microwaves and Human Health**

Much research is underway to determine the effects of microwaves on human health. It is known that microwave radiation can heat body tissue the same way it heats foods. Exposure to high levels of microwaves can cause a painful burn. The lens of the eye is particularly sensitive to intense heat and exposure to high levels of microwaves could cause cataracts. The testicles are also very sensitive to dramatic changes in temperature. Accidental exposure to high levels of microwaves could result in tempo-

rary sterility. But these types of injuries — burns, cataracts, temporary sterility — can be caused only by exposure to very high levels of microwave radiation, levels much higher than users of microwave ovens might receive.

There is much less information available on how exposure to low levels of microwave radiation might affect people. Animals exposed to low-level microwave radiation experiments displayed an avoidance reaction, that is, they tried to get away from the microwaves. But nothing conclusive is known about how this may relate to possible effects on people.

At one time there was concern that leakage from microwave ovens could interfere with the proper functioning of certain cardiac pacemakers. (There was similar concern about pacemaker interference from electric shavers, auto ignition systems, and other electronic products.) The problem has been largely resolved since pacemakers are now designed so they are shielded against such electrical interference.

### **Microwave Oven Safety Standards**

To protect consumers from exposure to unnecessary or hazardous levels of microwave radiation, the Food and Drug Administration (FDA) has set safety standards for the performance of microwave ovens.

FDA's performance standard covers all microwave ovens manufactured after October 6, 1971. It sets a limit on the amount of microwave radiation that is permitted to leak from the oven wall, the seals around the door, and the window compartment. This limit, which is 5 milliwatts of microwave radiation per square centimeter measured at 5 centimeters (2 inches) from the oven surface, is far below the level known to have adverse effects on people. As distance from the oven increases, the level of microwaves decreases dramatically.

The standard also requires all ovens to be equipped with two independent interlock systems that prevent the oven from operat-

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