Microwave Ovens and their Hazards – Fact Sheet

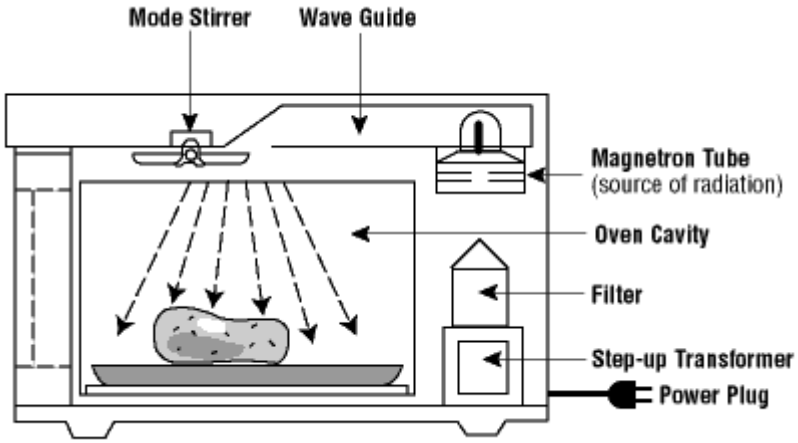


WHY DO PEOPLE WORRY ABOUT MICROWAVE RADIATION?

Microwave ovens are used daily in restaurants, cafeterias, lounges, kitchens, snack bars, and homes. Some microwave oven users may be concerned about potential health hazards from the exposure to microwave radiation leakage. You can help to keep your exposure to microwave energy at a minimum by keeping your microwave oven in good working order.

How do microwave ovens work?

In a microwave oven, food is cooked by exposing it to microwave radiation. Microwaves are a form of radiofrequency (RF) electromagnetic energy. When this energy comes in contact with food, the absorbed energy causes the water molecules in the food to rotate. This movement causes friction between the molecules and produces a rapid rise in temperature. Microwave energy generated by the magnetron is transferred to the oven cavity through a waveguide section (2450 MHz (megahertz) for most conventional ovens). A mode stirrer spreads the microwave energy more or less evenly throughout the oven.



Regulators states, “Microwaves should not be confused with X-rays or other intense forms of energy. The microwaves generated by a microwave oven do not cause food or the oven itself to become radioactive”.

Can microwaves leak radiation?

Regulators states that “some microwave energy may leak from your oven while you are using it, but this would pose no known health risks, as long as the oven is properly maintained.” Old or faulty door seals are the most common causes of microwave radiation leakage. Mechanical abuse, a build-up of dirt, or wear and tear from continued use can cause door seals to be less effective.

How is the radiation measured outside the microwave?

Microwave radiation is measured as ‘power density’ in units of milliwatts per square centimetre (mW/cm2) which is essentially the rate of energy present in one square centimetre. Special equipment is needed to detect and measure the leakage.

What happens to people with pacemakers when they are near microwave ovens?

Regulators states: “Some early models of pacemakers were susceptible to interference from microwave ovens. Improvements in the shielding and filtering of modern pacemakers and a reduction in the leakage levels from newer microwave ovens have reduced or eliminated these concerns. Most models today are not affected by being near a microwave oven, as long as the leakage is within the limits specified by Health Canada’s regulation. Anyone with a pacemaker who gets dizzy or experiences discomfort around a microwave oven should move away from the oven immediately and consult a health care professional.”

What are some general safety precautions for microwave ovens?

Safety tips for the operation of microwave ovens:

- Follow the manufacturer’s instructions for operating procedures and safety precautions. You may be injured if you misuse the oven.
- As mentioned above, persons with modern pacemakers should not experience difficulty when near a microwave that is in good working condition. However, if you have concerns or notice symptoms (e.g., dizziness or discomfort), move away from the microwave immediately and consult with your doctor.
- Check to see that door seal and inside surfaces of door and oven cavity are clean after each use.
- Repair or replace any microwave that is not in good working condition.
- Repairs should only be done by a qualified service person.
- Do not use the microwave if the door does not close (e.g., is bent, warped or damaged in any way).
- Do not disable or by-pass any safety locks.
- Do not insert an object through an opening or around the door seal.

Safety tips for the maintenance of microwave ovens include:

- Take special care to make sure that no damage occurs to the part of the oven making contact with the door or door seals.
- Repairs should only be done by a qualified service person.
- Do not by-pass the door interlocks.

Safety tips for the repair and testing of microwave ovens and their components include:

- Only qualified service personnel should attempt repairs and/or testing of microwave ovens and their components.
- Service personnel should be aware of any risk associated with exposure to microwave energy when performing tests or repairs.

Adjustment of applied voltages, replacement of the microwave power generating component, dismantling of oven components, and refitting of waveguides must only by persons who have been specifically trained for such tasks. Do not test a microwave power generating component without an appropriate load connected to its output. The power generated must never be allowed to radiate freely into occupied areas.

Are there any standards that apply to microwave ovens?

Regulators established the Radiation Emitting Devices Regulations, under the Radiation Emitting Devices Act in order to “govern the design, construction and function of microwave ovens that are sold, leased or imported into Canada.”

Part III (Microwave Ovens) of the Radiation Emitting Devices Regulations (C.R.C., C. 1370) specifies the following limits for the leakage radiation at 5 cm from the surface of the microwave oven:

- mW/cm2 with test load
- 5.0 mW/cm2 without test load

Information about measuring equipment for microwave oven leakage can be obtained from the suppliers and manufacturers of such instruments. The Radiation Emitting Devices Regulation requires that the measuring instrument must be capable of measuring a power density of 1.0 mW/cm2 with an accuracy of ±2dB or better and have an indicator with response time not greater than 3 seconds.

Persons exposed to microwave or radiofrequency radiation may also wish to consult Health Canada’s Safety Code 6: Health Canada’s Radiofrequency Exposure Guidelines

Regulators states: “The exposure limits in Safety Code 6 are based on an ongoing review of published scientific studies, including both internal and external authoritative reviews of the scientific literature, as well as Health Canada’s own research. The code is periodically revised to reflect new knowledge in the scientific literature.”

Source: © Copyright 1997-2021 CCOHS