

How Safe Are Microwave Ovens?

Microwaves are a non-ionizing form of radiation which disappears as soon as the magnetron is turned off. They will not make food or the oven materials radioactive. Therefore, foods cooked in a microwave oven are perfectly safe to eat. Also, providing the oven is in good working condition and proper operating procedures are followed, the microwave oven itself is entirely harmless.

However, if the door seals are not tight, or if the door interlock switches are inoperative, the oven may leak radiation. So as a safety precaution, because research in other countries has suggested that persons exposed to levels of microwave radiation in excess of 50 milliwatts per square centimeter for extended periods of time may develop cataracts, the Canadian government has established exposure limits much lower than this amount to provide substantial safety margins for the protection of the oven user.

Government Safety Regulations

The Health Protection Branch recently established standards governing the design, construction and functioning of microwave ovens sold in Canada. These regulations, incorporated into the *Radiation Emitting Devices Act and Regulations* on November 13, 1974, are intended to reduce any possible radiation hazards involved in the operation of microwave ovens. Some of the requirements in the regulations state that:

- Ovens must have off-on indicators;
- Oven doors must have at least two interlock switches to ensure that the door cannot be opened until the microwave power generator has been turned off, and that the microwave power generator cannot be switched on while the door is open;
- If a door interlock fails, the oven must be rendered automatically inoperable;

- Ovens must have a permanently affixed label showing the manufacturer, model number, serial number, date and place of manufacture, type of microwave generator, peak operating voltage, operating frequency and the normal power output;
- Microwave radiation leakage from the oven must not exceed one milliwatt per square centimeter measured five centimeters from the external surface of the oven;
- A warning sign, like the one depicted below, must be visible on the oven from a distance of at least three feet. This sign must be a two-colour inverted triangle containing a symbolic representation of a microwave generator, and must contain the words "CAUTION—MICROWAVES, ATTENTION—MICRO-ONDES".



Precautions to be Taken by the User

Even a device manufactured according to stringent government standards can be hazardous if it is used improperly. For the safe operation of microwave ovens, the Radiation Protection Bureau of the Health Protection Branch recommends the following guidelines:

- Follow carefully the operating instructions in the manual provided by the manufacturer.

- Have the oven checked for wear, damage, tampering, and radiation leakage by a qualified serviceman every two years, or more frequently if the oven is subjected to heavy use.
- Never operate an oven which is damaged, or thought to be damaged, until it has been repaired or checked by a qualified serviceman.
- Do not use metal cookware except as advised by the manufacturer. Use only paper, earthenware, or glass cookware.
- Do not operate the oven when it is empty.
- Avoid the habit of watching foods while they are cooking. With older ovens, stay at least an arm's length away from the front of the oven while it is on.
- Never insert any object (such as a fork) through the viewing screen or between the door and the door seal. Never allow even a paper towel to stick out of the door.
- Never tamper with or inactivate the door interlocks which are designed to shut off the power when the door is opened.
- Clean the door, door seals, and inside of the oven regularly with a wet cloth. Avoid using steel wool or abrasive pads.

References

"Radiation Emitting Devices Regulations — Microwave Ovens", Health Protection Branch, I.L. 384, March 1973, and I.L. 432, November 1974.

"Radiation Emitting Devices Regulations, Amendment", Canada Gazette Part II, Vol. 108, No. 21, November 1974.