



SAFETY OF MICROWAVE OVENS

Introduction

Microwave ovens have become a common feature in many kitchens over the past 15 years. In a microwave oven, microwaves are directed into the oven cavity where they are repeatedly reflected by the metal walls until absorbed by the food. The energy in the microwaves is converted to heat energy in the food, which warms and eventually cooks it.

Materials such as glass, paper, china, and heat resistant plastics are transparent to microwaves and do not absorb them, so can be used as cooking utensils. Metal surfaces generally reflect microwaves, but electric arcs may form about edges of metal objects, including tin or aluminum foil and metal utensils, so these should not generally be placed within the cooking cavity. The oven cavity and door opening are designed to prevent the microwaves leaking out of the oven.

Once the oven is switched off, microwaves are no longer produced and are not present in the oven cavity.

Safety of microwave ovens

Microwaves can also be absorbed in the human body, causing it to heat up. Exposure to excessive amounts of microwave radiation can be harmful. Because of this risk, the Microwave Ovens Regulations 1982 stipulate that ovens sold in New Zealand incorporate safety features to limit leakage radiation emission to low levels. The National Radiation Laboratory is responsible for administering these regulations.

The regulations require that the oven incorporates at least 2 independent interlocks which switch off the microwave generator if the door is not fully closed, and also that microwave leakage does not exceed prescribed limits.

Excessive leakage could occur if the door were bent or damaged, so that it did not close firmly, or if the door interlock switches were interfered with. The door grille allows viewing of the oven contents without leaking microwave radiation. A hazard could

arise if metallic objects were inserted through the grille or any holes in the oven cavity as the protruding end could act as an antenna and transmit radiation outside the oven. As with any appliance, poking metal objects into the oven also carries a risk of electric shock.

Precautions to observe when using microwave ovens

Harmful effects are unlikely to occur if the following precautions are taken:

- 1 do not operate an oven if the door does not close firmly or the grille, hinges, or metal seals are damaged;
- 2 do not tamper with or inactivate the door-interlocking devices;
- 3 do not insert any object through the grille or around the door seal;
- 4 do not open the door when the oven is operating;
- 5 do not place metal utensils of any description in the oven cavity;
- 6 clean the oven cavity, the door and the seals with water and a mild detergent regularly (do not use an abrasive cleaner or cleaning method);
- 7 do not operate the oven without a load such as food or water unless specifically permitted in the manufacturer's instructions;
- 8 ensure the door does not open more than a few millimetres without the safety switches operating.

Safety tests

The National Radiation Laboratory has been measuring microwave leakage of a wide variety of new and used ovens for several years. In the most recent survey, 109 new ovens and 119 old ovens were tested. The tests showed that any leakage was well below the maximum permitted, and for most ovens was at least 10 to 100 times below the permitted level. There was no difference between new and used ovens, so provided the door is clean, undamaged and closes properly, and there is no other damage to the oven cavity, there is no need for ovens to be tested regularly.

For further information, contact

National Radiation Laboratory
P O Box 25099
Christchurch
New Zealand

Phone: +64 3 366 5059
Fax: +64 3 366 1156
Internet: <http://www.nrl.moh.govt.nz>

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