

MICROWAVE AND SAFETY

Dr. Sitaram Dixit, Chairman – CGSI

Microwave ovens nowadays are familiar kitchen equipments in urban India. It is therefore important that radiation emissions from microwave ovens do not pose a hazard to public health. In India, the manufacture of microwave ovens, is only under the 'Compulsory Registration Scheme' for self declaration of conformity of safety standard, and assurance of product performance by the Bureau of Indian Standards (BIS), list of electronics and IT Goods (IS 302-2-25). In view of this regulation the microwave ovens safety and its proper use and maintenance, as recommended by the user manual of the manufacturer becomes crucial.

How Microwave Oven Works

In order to understand microwave ovens safety, we should first know how this energy and time saving technical marvel works. Microwave ovens produce microwaves, a type of electromagnetic radiation. Microwaves vibrate water molecules present in food that in turn, generates heat necessary to cook the food. An electron tube within the microwave oven called a magnetron produce these waves. The oven's metallic interiors reflect microwaves within itself. The food present in the oven absorbs these microwaves as these waves have an ability to pass through glass, paper, plastic and similar materials. It is important to realize that contrary to popular understanding, a microwave oven does not cook food from the "inside out".

Operational Guidelines for Safety

- Strictly follow manufacturer's recommended safety precautions, operating procedures and the suggested heating time.
- Strictly avoid using the microwave oven if the door is bent, distorted, damaged or does not close properly or firmly since leakage of excess microwaves can happen from damaged door hinges, or latch seals.
- In case the door is likely to open while using the microwave it is advisable not to use the oven at all, but instead contact the microwave oven manufacturer or the service centre.
- Some manufacturers do not permit users to operate the microwave oven when empty. Follow the instruction manual.
- Hot-water eruption can occur on using a microwave oven to super-heat (heating water above 100°C, without any signs of boiling) water. Slightly moving or disturbing super-heat water can make the water present, to explode violently out of the cup. Serious skin burns and scalding of the user's hands and faces can result because of this. To reduce the accident risks of hot-water eruption add materials like tea, coffee, sugar, etc., to the water before heating.

Microwave-Safe Containers

- Use only cookware (glass, ceramic containers, plastics, etc.) exclusively for use in the microwave oven.
- Avoid using metal utensils and aluminum foils. Microwaves reflect off them, cooking the food unevenly also damaging the microwave oven.

Health & Microwave Ovens

According to the current BIS rules microwave manufacturers should self-certify that their ovens have emission limits below the threshold level that constitutes risk to public health. Around the world instances of radiation injury have been rare and that too only because of abnormal conditions or inappropriate servicing of the kitchen equipment. In fact, most injuries were only with respect to serious thermal burns from hot containers, overheated foods or exploding liquids. As an additional precaution even though contemporary pacemakers are able to shield electrical interference, it is advisable for persons with pacemakers to consult the physician before using a microwave oven.