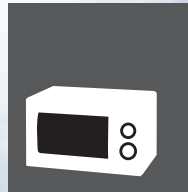


How does a microwave oven work?

In Germany, every second household has a microwave oven, in North America almost every single one. The microwave energy in particular causes water molecules in food to rotate, thus heating it up.



Microwave Ovens



Microwave Ovens Quite the Kitchen Equipment



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What does building biology have to offer?

The building biology environmental consultants from the BUILDING BIOLOGY ASSOCIATION (VB) are experts in identifying and reducing environmental risks in indoor environments. They measure, analyze, and assess Wi-Fi networks in addition to many other factors, including mold, indoor toxins, and other physical exposures from e.g. mobile phones, DECT cordless phones, and radioactivity, air quality and indoor climate. They also make recommendations for remediations. Building biology environmental consultants help find and reduce disease-causing factors that often hide within our own four walls.

We are less interested in discussing or arguing about unreasonable exposure limits than in taking positive action.

Life is more satisfying when there are less stressors-as a precaution and to be on the safe side.

Your Building Biology Consultant
Member of the Building Biology Association e.V. (VB)

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The Building Biology Association (VB) follows the Standard of Building Biology Testing Methods SBM and works in cooperation with the Institute of Building Biology and Ecology IBN/Neubeuern (<http://www.baubiologie.de/site/english.php>). Comprehensive information on building biology can be found in Wolfgang Maes' book "Stress durch Strom und Strahlung" (German ISBN 3-923531-25-7).



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Building Biology Association

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What types of radiation are emitted?

On the one hand, a microwave emits ELF magnetic fields at a level more often found e.g. directly under high-tension power lines. On the other hand, it also generates microwave radiation-hence its name. Microwave ovens are particularly high sources of electromagnetic fields. This energy is potent: In medicine, the same mechanism is used to destroy tumors, to scorch overgrown tissue in prostates, to ablate nerves, to shrink the soft palate of snorers, to constrict veins, to stop bleedings.

With its 1,000 watts, the power of a microwave oven is such that water becomes boiling hot and meat cooks. These thermal effects are for real, often also discussed in association with mobile phones or other wireless devices. A microwave oven operates at a frequency of 2.45 GHz. And just as in radar installations, mobile phones, cordless phones or Wi-Fi, its microwave radiation is pulsed-with a pulse repetition rate of the mains supply (50 or 60 Hz).

Do microwave ovens leak RF radiation?

No microwave oven is truly sealed. It always leaks RF radiation into its environment to a lesser or greater extent: either the legally permissible residual radiation from new models, or the undesirable leakage radiation from devices that have been in use for quite some time or are defective.

Are there exposure limits for this type of radiation?

In order to avoid having humans on the outside heat up in a similar way to the sausages inside the microwave oven, the radiation exposure at any point 5 cm away from the external surfaces is limited. According to DIN, IEEE, and IEC, it must not exceed 50 million microwatts per square meter. From a building biology perspective, this is a staggeringly high value. Hardly any microwave oven ever reaches this level, not even the worst, not even when ten years old. Once again, an exposure limit value that can almost never be found in real life.

Do these exposure limits provide safe protection?

Hardly. Biological problems have already been described for radiation levels that are 10,000 times lower. The government

only limits RF exposures associated with the problem of heating human tissue because the person on the outside is not supposed to be cooked like the vegetables on the inside.

What is the actual emission level of microwave ovens?

The Federal Agency for Radiation Protection of Germany tested 130 microwave ovens, with an average emission level of 600,000 $\mu\text{W}/\text{m}^2$. The emissions of twelve new models tested on behalf of Öko-Test ranged from 10,000 $\mu\text{W}/\text{m}^2$ to 5 million $\mu\text{W}/\text{m}^2$, an older unkempt one exceeded 17 million. RF radiation levels of 1,000 $\mu\text{W}/\text{m}^2$, which already have been documented to trigger EEG effects, can be found at 1 m away from the best microwave ovens and up to 10 m away from the worst, and from real old ones even at over 20 m away. During our routine home inspections, we usually encounter typical levels of around 100,000 $\mu\text{W}/\text{m}^2$. In one case, we were able still to detect the "kitchen radar" two houses down the road.

Do microwave ovens emit RF radiation continuously?

Fortunately, the alarming emission levels of the microwave oven occur only for short periods of time. The microwave only "radiates" when it is turned on to heat-unless you work in a restaurant or hotel kitchen where microwave ovens operate almost around the clock. In the latter case, neighbors adjacent to these establishments also take the brunt of these exposures. Sometimes these exposure levels even exceed a recommendation on RF radiation published by the German Medical Association and other critical scientific research results.

Are microwave ovens recommended?

A microwave does not belong in the organic kitchen even though hundreds of millions of them are used worldwide, 40 million in German households alone. If there is a microwave in the kitchen, do not use it or use it only as rarely as possible. Always keep your distance from the microwave when it is turned on, at a minimum of two to three meters or even more. Better yet, leave the room during its operation. Never allow children to press their noses flat against the viewing window of a microwave! Continuous exposure to microwave radiation may do severe damage, including such conditions as heart attacks, high blood pressure, headaches, nervousness, psychological problems, loss of orientation, sleep problems, eye



damage, tumors, and cancer. Have your microwave checked regularly for leakage (repair service). Most likely, hardly anybody heeds the manufacturers' advice to have the microwave checked every other year. This is a sorry state of affairs.

What happens to the food?

It should also be mentioned here that there is probably no other method that is more effective in destroying food as cooking with a microwave. The research in this area is rather conflicting. Some scientists warn against the aggressive destruction of vital nutrients.



Others show that vitamins or minerals are almost untouched. The science magazine New Scientist in October 2003: "According to the scientists, microwaving was the worst way to cook vegetables." The Spanish researchers have observed that microwaves virtually eliminated the antioxidant phytochemicals found in vegetables. Antioxidants protect cells from free radicals and thus from cancer.

Are there other RF sources in a home?

During many home inspections, building biology environmental consultants are often asked to check the leakage radiation of the microwave oven, but hardly any of these homeowners realizes that mobile phones, DECT cordless phones or Wi-Fi systems are based on a similar technology: Sometimes the microwave exposure levels are similar and sometimes even higher. Go with Keith Richards, the guitarist of the Rolling Stones, he is really consistent: "I don't use a mobile phone. This would be like putting your head into a microwave oven." If you prefer statements by scientists: Dr. Roger Coghill from Wales and Dr. Alan Preece from Bristol found diverse EEG effects: "Anybody who uses a mobile phone for longer than 20 minutes in one go should have his brain checked. Alongside microwave ovens, mobile phones are the strongest sources of electromagnetic radiation in our daily lives, and people place them directly next to their head-the most sensitive body part." By now, this and many other adverse biological effects have been described a hundred times over.

