

Instructions Microwave Device CSR-MU21K



Read the instructions for use carefully **before using your microwave**, as this is the only way to use your device safely and correctly.

The device may only be operated by users who have been registered with us by name and in compliance with these instructions for use. Incorrect use / operation can cause damage and there is a risk of death.

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Important safety instructions

Please read this instruction carefully! Only then can you operate your device safely and correctly. Keep the instructions for use for later use.

The Device:

- Check after unpacking. Do not connect if it is damaged
- Is only intended for private households and the domestic environment
- Use only for pest control of wooddestroying insects
- Only use in closed rooms
- is ready to plug in and may only be connect to a properly installed safety socket. The fuse must be at least 10 amps. The mains voltage must correspond to the voltage specified on the rating plate
- **must be personally supervised during operation**
- Do not use multiple plugs and connector strips. There is a risk of fire if overloaded. The device plug must always be accessible. Keep children up to the age of 14 away from the device and the connecting cable

Fire hazard!

The device gets very hot. The wood to be treated also gets very hot. Observe the information on the minimum distance above and next to the device in the Installation and connection chapter.

Make sure that no residue, resin or the like is on or has formed on the polystyrene front panel. Scrape off such dirt with a sharp knife. Do not use solvents or cleaning agents containing solvents.

Improper use of the device is dangerous and can cause damage.

Risk of serious damage to health!

Never operate the device without aligning it with the wood to be treated. In the case of very small slats, boards or beams, fill the marked treatment area with additional wood, if possible of the same material thickness. Otherwise impermissibly high and dangerous microwave potentials can occur in the room. See also chapter Exposure areas.

Electric shock hazard!

Repairs may only be carried out by competent persons.

Only a technician trained by us has the necessary expertise to be able to carry out repairs. If you discover a defect in the device, pull out the mains plug and put the device out of operation. Keep children away.

Risk of burns!

Depending on the duration of the treatment, the device can become very hot. The treated wood can also become very hot. Allow to cool after use. Keep children away.

Risk of scalding!

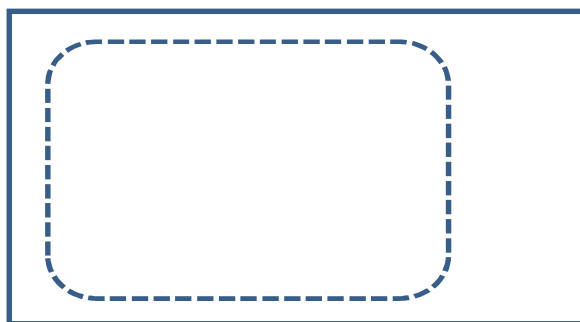
The heating of the wood can cause hot steam due to delayed boiling and steam bubbles can splatter, even after the appliance has been switched off again. This also applies to any dissolved resin in the wood. Keep distance. Keep children away.

Risk of injury!

Always place the device on a suitable and solid surface so that it cannot fall over. If necessary, tie down with tension belts, but do not cover the marked treatment area.

Preparation for microwave use

The treatment surface is located on the device and is covered with a hard foam plate from which the microwaves emerge. The treatment area (dashed line) when looking at the front of the device is approx 21 x 33 cm:

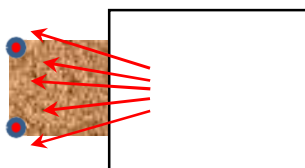


It is very dangerous to expose yourself or others to this range of microwaves!

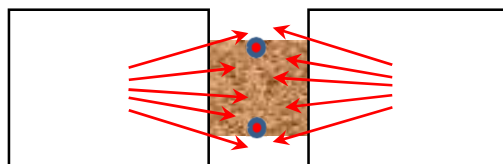
For safety, there are additional instructions on the sides of the housing:



To ensure success, you need to measure the temperature in the most unfavorable areas. For one-sided treatment, these are the red circles:



For bilateral treatment, these are the areas:



Please note that it is of no use to you if you "overheat" one area and do not heat the other area sufficiently. Buoyancy also has a significant influence, meaning you should position the device slightly below the center of the beam. Only when you reach the lethal temperature across the entire cross-section can you be sure of successfully combating the infestation. During operation, the measured temperatures are not exact, as they are distorted by microwave interference. Therefore, to obtain accurate measurements, you must turn the device off. However, the measurement error is relatively constant during operation, so you can determine whether the device is optimally positioned, i.e., whether the critical temperatures are uniform.

Therefore, drill four holes, either straight or angled, in the most unfavorable areas and insert temperature sensors. The depth of the holes depends on external accessibility. If there is unobstructed access, 1–2 cm is sufficient. Ensure that the measuring tip is in secure contact with the wood. Secure the sensors, e.g., with suitable wooden dowels (not included). If you want to use unshielded sensors, holes with a diameter of 2–3 mm are sufficient; shielded cable sensors require a diameter of 6–8 mm. Please note that the measuring devices offered for this purpose only measure reliably when no microwaves are in operation, and that when measuring with microwaves, the interference error of unshielded sensors is considerably greater than that of shielded versions.

When treating large beams (> 18 cm thick), temperatures of > 100 °C may occur at the treatment front, or the wood may discolor and change its structure at temperatures > 120 °C. In this case, it is advisable to place temperature sensors on the front, which you can attach with a U-shaped (paper) clip. It may then be necessary to interrupt microwave operation for a few minutes until the front temperature drops below 100 °C, and then possibly reheat in pulsed mode until you reach the lethal temperature in the most unfavorable areas.

With even thicker beams, we reach the limits of the device's application. For dimensions over 20 cm in oak or 23-25 cm in softwood, we recommend positioning two devices opposite each other, as shown in the diagram on the previous pages. Due to the limited power of the device(s), the beam cannot be heated economically across its entire cross-section. For beams 30 cm or even larger, even more devices may be required, but these can no longer be classified as household-like use and should therefore be left to professional pest controllers.

According to DIN 68800, the safe lethal temperature for all insects is 55°C, which must be maintained for one hour. However, these treatment parameters are based on earlier hot air treatments, where the temperature could only be slowly introduced from the outside via heat conduction. In reality, these functional parameters depend on temperature and time. For example, you can also be successful with 60°C and a holding time of 30 minutes, or 65°C and 10 minutes, or 70°C and two minutes. However, we recommend adhering to the recognized rule of technology according to DIN 68800 (55°C for 1 hour). To ensure this with microwave technology, it is sufficient to heat the thermally insulated beam to around 65–68°C. If the insulation remains, the beam then cools down to around 55°C within an hour, and there have been no complaints about this procedure to date.

But there's no rule without an exception: In our experience, the sapwood beetle (*Lyctus*) does not comply with the DIN standard. Since this beetle originates from the tropics, its lethal temperature is 66°C. We therefore recommend controlling this beetle at 70°C.

If the two sensors for the lethal temperature differ significantly ($> 5^{\circ}\text{C}$), the device can be positioned better, thus reducing the treatment time.

For documentation purposes, we recommend preparing a measurement report.

Treatment of beams

Rigid foam (Styrofoam) is the preferred insulation material, as it offers virtually no resistance to microwaves. Rock wool has also proven effective for odd-shaped beams because it is more flexible. Even small gaps in the insulation of 1-2 mm cause significant heat loss and should be avoided. Silicone or PU foam are suitable for sealing such gaps. However, please avoid direct contact with the beam. Insulate the beam to be treated with approximately 3 cm thick rigid foam panels. You can also easily secure the panels with nails. However, avoid nails in the immediate treatment area. You don't need to insulate the area of the treatment surface, as the front panel also provides insulation. For round beams, we recommend rock wool mats. If the beam is located between a wall, the wall can also serve as insulation. Align the device with the front panel directly against the beam to be treated. If necessary, position the device securely (e.g., on boards, planks, or a tripod) and, if necessary, secure it with tensioning straps. The front panel must remain free. But before we begin treatment, we need to address risks, namely the hazard and exposure areas explained below.

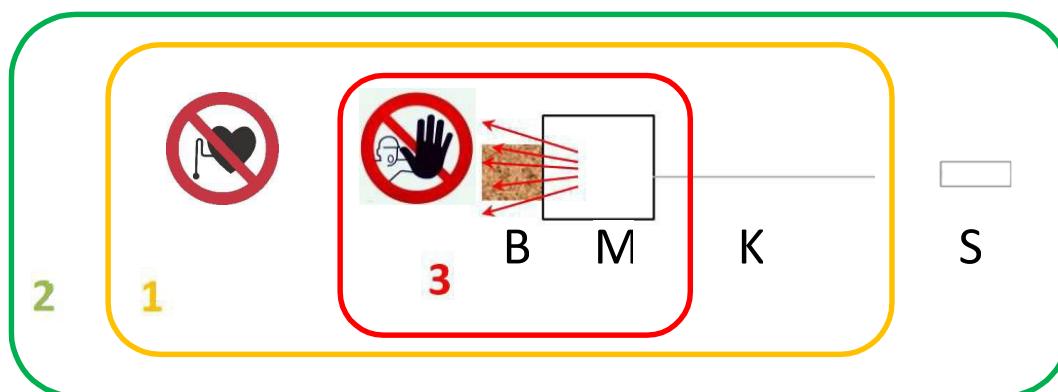
Hazard and exposure zones

The German Employers' Liability Insurance Association (BGV B11 and BGR B11) has issued the regulations and guidelines on "Electromagnetic Fields" (BGV B11 and BGR B11) for this purpose. Even if you, as a private user, have no dealings with the Employers' Liability Insurance Association (BGV B11), we accept these regulations because they are intended for your safety. We have compiled the relevant values from these documents:

Accordingly, the permissible limit value for continuous exposure in the increased exposure range and exposure range 1 is 5 mW/m^2 50 W/m^2

in exposure area 2: $1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$

Definition of areas:



Exposure zone 2 is practically everywhere, except the yellow and red zones, with max. $1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$

Exposure zone 1, continuous with max. $5 \text{ mW/cm}^2 = 50 \text{ W/m}^2$
No access for people with pacemakers



Exposure zone 3
Danger area, no entry



Explanation of symbols

- B => Beam
- M => Microwave device
- K => Control cable 5m
- S => Control unit

To give you an idea of the residual microwave potential, here are some comparative data: When you use your mobile phone, the 5 mW/cm^2 limit directly at the ear is usually exceeded.

A long-term study (> 10 years) in radiofrequency laboratories in the USA found that continuous exposure to 100 mW/cm^2 does not cause any detectable damage or changes in humans or animals.

In medical microwave applications, e.g., for muscle relaxation, people are treated with $500\text{--}1,000 \text{ mW/cm}^2$.

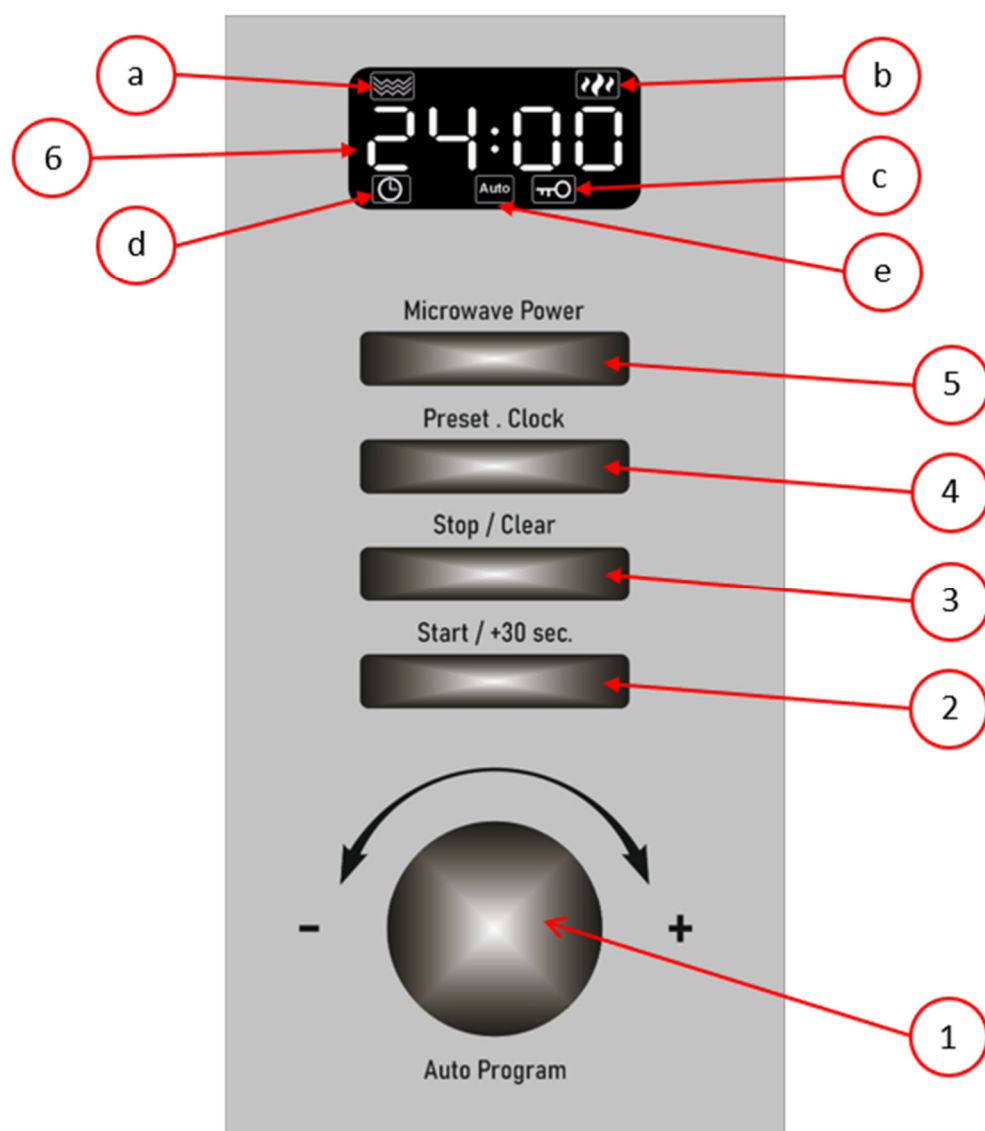
Setting up and connect

The device is intended for private household and household-like use only.

Place the device on a firm, level surface and position it **directly in front of the wood to be treated. Never operate the device empty without wood or a wall in front of it!!!** The ventilation slots on the back, top, and bottom must always remain clear.

When temperature differences are involved, buoyancy must also be taken into account. This is indeed noticeable. Heating from above takes considerably longer than heating from below. With side heating, we still see differences of 10–20%. Consequently, beams are treated more efficiently from below. With side heating, it is better to position the device axis approximately 10–20% below the center of the beam.

The control panel



- 1) Rotary knob for setting time/power level/duration
- 2) Start/resume current operation, immediately start a new operation at the highest power level, increase duration by 30 seconds, confirm power level
- 3) Pause or cancel current operation, delete current program, activate/deactivate child lock
- 4) Select/display current time
- 5) Select performance level
- 6) Display:
 - a) Microwave operation/all power levels
 - b) Power level 1000W, 800W
 - c) Locking/safety
 - d) Time setting
 - e) Quick Start Program

Time setting

When the device is connected or after a power failure, 0:00 appears on the display.

Press button *Preset Clock* (4). The hour display flashes.

1. Turn the *rotary knob* (1) to set the hour
2. Press the button *Preset.Clock* (4) again to confirm. The minute display flashes
3. Turn the *rotary knob* (1) to set Set the minutes
4. Press the button *Preset.Clock* (4) again to confirm

If the clock is not set, it will always display 0:00.

Microwave Services

Power	Display	Application
100W	10P	Thawing frozen wood
300W	30P	Heating of smaller construction timber, e.g roof battens
500W	50P	Heating small to medium beams
800W	80P	Slow heating of medium to large beams
1000W	100P	Heating od medium to large beams

Set the microwave

Example microwave power 500W

- Press the *Microwave Power* (5) button or turn the rotary knob until "50P" appears on the display and confirm by pressing the *Start/+30sec.* (2) button
- Use the *rotary knob* (1) to set the desired duration
- Press the *Start/+30sec.* (2) button and the time will visibly run down
- As soon as the time has elapsed, a signal sounds and „0:00“ appears on the display.
- The treatment duration can also be changed during operation. Pressing the *Start/+30sec.* button (2) increases the treatment duration by 30 seconds with each press.

Example highest performance level with individual duration

- Turn the *rotary knob* (1) counter-clockwise
- Select the duration by turning clockwise or counter-clockwise.
- Press the *Start/+30sec.* (2) button and the time will visibly run down.
- As soon as the time has elapsed, a signal sounds and „0:00“ appears on the

display.

- The treatment duration can also be changed during operation. Pressing the *Start/+30sec.* button (2) increases the treatment duration by 30 seconds with each press.

Pause / abort operation

Press the *Stop.Clear button*(3) once to pause operation. To resume, press the *Start/+30sec. Button*(2).

Press the *Stop.Clear button*(3) twice to abort operation

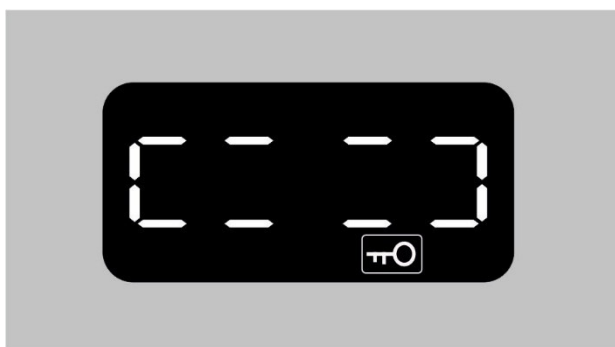
Retrieve power level during operation

Press the *Microwave Power* (5) button during operation; the power level is displayed for 3 seconds.

Locking/Securing

The *Stop.Clear button*(3) activates the locking/security function. The Control panel is locked to prevent unauthorized use.

1. Press the *Stop.Clear button*(3) for 3 seconds to activate, a beep and a frame on the display, as well as the key symbol (c), confirm the activation.



2. Press the *Stop.Clear button*(3) again for 3 seconds to deactivate the lock/safety. A confirmation beep will sound again

Quick Start Programme

ATTENTION: For experienced users only!

This device has some programmed operations that you can select by turning the *rotary knob* (1):

Code	Power	Time
A1	1000W	1 Minute, 45 Seconds
A2	800W	4 Minutes
A3	1000W	3 Minutes, 30 Seconds
A5	1000W	5 Minutes
A7	1000W	0 Minutes, 55 Seconds
A8	1000W	1 Minute, 30 Seconds
A4	Do not use, service program	
A6		

Start the selected program by pressing the *Start/+30sec.* (2) button twice.

Be sure to supervise the machine personally during operation!

Danger zone and metrological tour

You will find a warning sign attached. Print it out and attach it to a suitable surface (e.g., cardboard, wood, etc.). Place the warning sign in a clearly visible location to mark the danger area. Once you have secured the room, go to exposure area 2 with the control panel and press the start button. Then, proceed with the measurement tour.

After commissioning, walk from safe exposure area 2 toward the microwave oven and measure until you reach the limit of 1 mW/cm^2 . Move the meter up and down with the front facing the microwave oven to detect any hot spots. This way, you can define exposure area 1 around the entire area behind and to the sides of the microwave oven.

Then, at a safe distance, go to the front and measure the limit value for exposure area 2. This may also be necessary in the neighboring apartment. If areas occur there that exceed the limit value, there is no other option than to safely seal off this area or take it out of service until you have found another solution..

Furthermore, the extended limit values of $< 5 \text{ mW/cm}^2 = 50 \text{ W/m}^2$ and $< 6 \text{ min}$ in exposure range 1 and $< 30 \text{ mW/cm}^2 = 300 \text{ W/m}^2 < 6 \text{ min}$ in the increased exposure range provide safe limit values for your measurement tour. Our desired exposure range 2 can also temporarily become exposure range 1 if you detect areas of increased exposure. Briefly elevated measured values are not considered dangerous!

Care and cleaning

With careful care and cleaning, your microwave will remain beautiful and intact for a long time. We explain how to properly care for and clean your appliance here.

Any stains on the hard foam front panel are due to manufacturing and do not constitute a problem.



Danger of short circuit!

Never use high-pressure or steam cleaners for cleaning



Danger of burns!

Never clean the device immediately after turning off. Allow the device to cool down



Danger of electric shock!

Never immerse the device in water or clean it under a jet of water

Use:

- Wash new sponge cloths thoroughly before use
- Clean the device with a damp cloth and mild cleaning agents and dry with a clean cloth
- Do not use harsh or abrasive cleaning agents. Should such agents get onto the front panel (hard foam), wipe it off immediately with water
- No glass or metal scrapers
- No hard scouring pads and/or cleaning sponges
- No alcohol-based cleaning agents

Caution: Unplug before cleaning!

Things to know about microwaves

Microwaves convert their energy directly into the material, the wood, exclusively into heat. This is the great advantage of microwaves. Therefore, the temperature inside the wood is higher than outside. As soon as the microwave's power supply is interrupted, no more heat is generated. It's like a light switch: switch off => light off.

Theoretically, the depth of penetration is infinite. In practice, however, approximately 50% of the energy is absorbed over every 12 cm. Mathematically, this suggests that single-sided treatments could be performed up to a maximum depth of 18 cm.

Experience has shown us that penetration depths of up to 20 cm are possible with single-sided treatment. As always, everything depends on the wood

moisture content and the wood species. For larger cross-sections, it is advisable to treat from both sides simultaneously.

If you can position the device under a beam, you can take advantage of thermal buoyancy and thus operate efficiently.

If vapors form within the wood and then condense again in colder areas, behind or next to the main field, this can lead to thermal stresses and cracking. To avoid this, **you should not exceed 100°C**. Please note that stored resin can also become liquid at these temperatures and then concentrate primarily at the base of the branches.

If the wood is rotten or already largely corroded, it will heat up even faster because its density/mass is significantly lower. If there is only loose gnawing or drilling dust inside the beam, the ignition temperature may be exceeded. A smoldering fire can occur. **Therefore, avoid temperatures above 100°C.**

Furthermore, the device's hard foam front panel deforms at temperatures close to and above 100 °C. However, this is not a functional defect, but merely a cosmetically unsightly side effect that does not compromise safety.

Simply take breaks of a few minutes. This will allow the heat to be dissipated further from the surface areas, allowing you to reheat when the critical (near-surface) areas are below your desired level. While this will extend the treatment time, it also allows you to maintain lower temperatures, such as 80°C. Even if only 60°C is permissible for sensitive colors, this can be achieved with pulsating operation.

You can check surface temperatures with an infrared thermometer when the microwave is turned off. Never use these devices while the microwave is running.

Microwaves penetrate glass, porcelain, paper, ceramics, and air without significant resistance (attenuation). Microwaves are reflected by metal surfaces, regardless of their thickness or surface finish—i.e., bare, polished, or painted—and whether copper, brass, aluminum, steel, stainless steel, or galvanized.

Here, too, there are exceptions to every rule. If a thin, long metal rod is exposed to microwaves, it can become a rod (dipole) antenna. It then no longer reflects the microwaves, but absorbs them and converts the energy into heat. It therefore becomes hot. This depends on the diameter, the length of the rod, and the wavelength. It can affect nails or screws that are embedded in the wood or protrude. In practice, however, this has so far only occurred with headless steel nails, which are commonly used to attach floorboards. These nails are usually 3 cm long ($\lambda/4$) and less than 1 mm in diameter. In this case, pay particular attention to possible overheating. All other commercially available nails and screws are too thick

relative to their length to assume this phenomenon and therefore cannot cause problems.

Hot spots are non-reproducible, regional concentrations of microwaves and cannot be avoided. They depend on many parameters, not all of which we can measure in practice. However, through natural heat conduction, temperatures equalize with their surroundings, so that in practice, there are often barely measurable differences, and these "hot spots" are therefore often not even noticed. Nevertheless, in individual cases, they can limit or shift the treatment area.

Like all electromagnetic waves, microwaves also affect other, similarly operated devices. This includes electronic or magnetic devices such as radios, televisions, PCs (including their remote controls and connecting cables), loudspeakers, radios, mobile phones, and magnetic memory cards such as check or credit cards. Such objects must be removed from the rooms being treated. Any claims for alleged or actual defects in these devices are strictly excluded! Therefore, the relevant safety instructions for these devices must be strictly observed.

People with pacemakers are not permitted to enter exposure area 1. Since it cannot be ruled out that you may carelessly enter the exposure area for a short time, the device must not be operated by people with pacemakers.

Before you start up the microwave, double-check that you've made all the necessary preparations. This includes, in particular, estimating the expected exposure area 1 if the area behind the beam or parquet flooring to be treated isn't open or visible. Make sure you know what's behind it. If it's another apartment, for example, inform the neighbors and lock the room to ensure that a baby, for example, can't be there during your microwave treatment. If necessary, you may have to forgo the treatment or take shielding measures if you can't clarify this before starting up.

Mark the relevant areas, e.g., with warning tape and signs, or place the control unit in a clearly visible location in front of the access point, as this also indicates microwave operation. Through your personal, permanent monitoring, you also ensure that no unauthorized persons (e.g., those with pacemakers) have access to exposure area 1. Afterwards, document your measurements and actions in the measurement log.

Wood moisture

The influence of wood moisture content is relatively small. While a certain minimum moisture content (> approx. 1–2%) is required for microwaves to be absorbed, this moisture content is practically always present. However, the thermal conductivity of moist wood (> 20–30%) is better. This also allows more heat to flow to colder

regions, but this is only relevant during the initial heating phase and does not result in any additional losses overall.

Moisture loss during microwave treatment is also relatively low, averaging around 2–3% for dry beams (< approx. 10–12% wood moisture content) when treated optimally. However, evaporation is also greater for relatively thick (> 18 cm) and new beams (wood moisture content of approx. 30%), which can only be treated on one side and thus can sometimes take several hours. We have even measured wood moisture levels 5–10% lower after treatment than before.

Paints and coatings

Based on previous experience, no changes or discoloration have been observed in the paints encountered. However, for unknown colors, we recommend contacting the manufacturer for information about their temperature resistance and, if necessary, testing the temperature resistance on a sample or, if possible, on a remote area.

Practical tip

- - For example, for a beam with a cross-section of 15 x 15 cm, set the maximum power to 1000 W and measure the temperatures as described above. Switch the device on for 5 minutes and measure the temperatures again. Now calculate the quotient of the temperature increase and the operating time, e.g. $14^{\circ}\text{C}/5 \text{ min.} = 2.8^{\circ}\text{C}/\text{min.}$ So if you started at 20°C and reached 34°C after 5 minutes, you would need to treat for $(68 - 34)/2.8 = 12$ minutes at the same power to reach 68°C .
- For rafters and beams, you can improve the microwave's performance by using a rigid foam board. Cover it with aluminum foil. Secure the non-foiled side to the back of the beam, for example, using clamps. The escaping microwaves are reflected by the aluminum foil and reheat the wood.

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Fault table

If a problem occurs, it's often just a minor issue. Using the table below, you can troubleshoot minor issues yourself.

Error message	Possible cause	Remedy / Note
The Device is not working	The plug was not plugged in	Insert Plug
	Power failure	Use another device to check whether the outlet is live
	Fuse defective	Check the fuse box to see if the fuse for the device is ok
	Incorrect operation	Turn off the fuse in the fuse box and turn it back on after about 10 seconds
The microwave doesn't work	You didn't press the Instant.Start Button	Press the Instant.Start Button
The display shows 0:00	Power failure	Reset the time
The control panel doesn't respond	The lock/safety device was accidentally activated (key symbol and frame is visible)	Press the Stop.Clear button for 3 seconds
Microwave operation stops for no apparent reason	The microwave is malfunction	If this error occurs repeatedly, contact customer service

 **Risk of electric shock! Improper repairs are dangerous**

 **Only a technician trained by us may carry out repairs**

Customer service

If your device needs repair, our service is there for you. We always find a suitable solution, even to avoid unnecessary repairs.

This appliance complies with EN 55011 and CISPR 11. It is a Group 2, Class B product. Group 2 means that microwaves are generated for the purpose of heating; Class B means that the appliance is suitable for private household use.

Technical Data

Power Supply	220 – 230 V, 50 Hz
Power input	1500 W
Microwave Output	1000 W
Microwave frequency	2450 MHz
Dimensions	ca. H 31 x W 52,5 x D 37,5 cm
Effective treatment area	ca. 21 x 33 cm
Max. one-sided penetration depth of wood	26 cm
Wight	ca. 12 Kg
Environmental conditions	-1035° C, max. 95 % r.F.
CE-sign	yes

Warrenty

We provide a manufacturer's warranty of two years from the date of purchase. During this period, we will remedy any defects that are demonstrably due to material or manufacturing defects and that significantly impair functionality free of charge. Further claims are excluded. Damage resulting from failure to follow the instructions or improper handling is excluded from the warranty.

Environmentally responsible waste disposal

Please dispose of the packaging in an environmentally friendly manner. This device complies with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment. This directive sets the framework for the EU-wide return and recycling of old devices.

Entering prohibited!
Behind this barrier
Danger from microwaves!

