Fricke und Mallah Microwave Technology GmbH
Product Catalog

Tunnel Ovens

Chamber Ovens

Microwave Generators

Laboratory Ovens and Simulation
Microwave Tunnel Ovens

Tunnel Dryer for Selective and Fast Drying of Plant Pet Food
- Drying of plant pet food
- Hygienic design
- Microwave power: 24 kW
- Usable length: 4770 mm
- Usable width: 290 mm
- Usable height 290 mm
- Total length: 11311 mm
- Total width: 1606 mm
- Total height: 2391 mm

Tunnel Heating Plant for Homogeneous Preheating of Wood Materials
- Application: Preheating of wood fibre (MDF)
- Microwave power: 720 kW
- Usefull length: 4400 mm
- Usefull width (belt width): 2600 mm
- Usefull height (from upper edge of forming belt): 530 mm
- Total length: approx. 11000 mm
- Total height: approx. 7000 mm
- Total width: approx. 7200 mm

Hybrid Tunnel Dryer for Fast and Homogeneous Drying of Technical Ceramics
- Application: honeycomb ceramics
- Microwave power: 32 kW
- Hot air: 72 kW / max. 80°C
- Usable length: 4660 mm
- Usable width: 500 mm
- Usable height 50 mm
- Overall length: 8500 mm
- Total width: 3000 mm
Microwave Tunnel Ovens

Microwave Pasteurizing Tunnel for Heat Treatment of Meal Trays

- Application: Modular Microwave Pasteurizing Tunnel for homogeneous, selective and gentle heat treatment of ready meal trays to increase minimum shelf time up to 25 days
- Hygienic Design
- Microwave Power: 108 kW
- Usable length: 9000 mm
- Usable width: 1400 mm
- Usable height: up to 50 mm
- Total length: 14000 mm
- Total width: 2350 mm
- Total height: 4400 mm

Modular Tunnel for Homogeneous Pasteurization of Packaged Mussels

- Application: Pasteurisation of packaged mussels
- Hygienic design
- Microwave power: 180 kW
- Usable length: 6000 mm
- Usable width: 1200 mm
- Usable height: 100 mm
- Total length: 13000 mm
- Total width: 3000 mm
- Total height: 2800 mm

Modular Tunnel for Homogeneous Pasteurization of Packaged Meat Products

- Application: Pasteurisation of packaged meat products
- Hygienic design
- Extreme field homogeneity through professional field simulation
- PLC Siemens Simatic S7
- Microwave power: 110 kW
- Usable length: 9280 mm
- Usable width: 1200 mm
- Usable height: 130 mm
- Total length: 15000 mm
- Total width: 3000 mm
- Total height: 2310 mm
Chamber Ovens for Industrial Applications

**Microwave Chamber Dryer 36 kW / 2445...2475 MHz & 10 kW / 910...920 MHz**
- Application: Microwave chamber dryer for homogeneous drying of various refractory
- Microwave power 36 kW / 2445...2475 MHz & 10 kW / 910...920 MHz
- Chamber dimensions (WxDxH): 1200 x 1200 x 900 mm
- Overall dimensions (WxDxH): 2200 x 3700 x 3600 mm
- Movable frequency controlled roller conveyor, usable dimensions 1500x2000 mm, loads up to 2000 kg
- Heating up to 400 °C over 3 hours
- Humidity measurement up to 250° C

**Chamber Oven 10 kW / 915 MHz, Solid State Microwave Technology**
- Application: Heating of various food
- Solid State Generators 10 kW / 900...930 MHz, stepless adjustable power and frequency
- Chamber dimensions (WxDxH): 620 x 1680 x 420 mm
- Overall dimensions (WxDxH): 2000 x 2200 x 2500 mm

**Hybrid Chamber Oven 24 kW / 2.45 GHz**
- Application: Heating of plastics and silicone moulds
- Microwave power: 24 kW / 2.45 GHz, stepless adjustable power setting
- Circulating air heating up to 160° C
- Chamber dimensions (WxDxH): 1200 x 1200 x 800 mm
- Overall dimensions (WxDxH): 2200 x 2000 x 2600 mm
Chamber Ovens for Laboratories

Microwave Chamber Dryer 6 kW / 2.45 GHz
- Application: Heating of mineral fibers
- Microwave power: 6 kW, 2.45 GHz
- Chamber size (Wx Dx H): 416 x 300 x 168 mm
- Outside dimensions (W x D x H): 1555 x 890 x 1761 mm
- Microwave power control according to temperature or/and weight
- Exhaust system
- PLC control with Touch Panel

Laboratory Oven 2 kW / 2.45 GHz, Solid State Microwave Technology
- Application: Drying/heat treatment of granulates
- Microwave power: Semiconductor-based generators 2 kW / 2.45 GHz, stepless power setting
- Chamber size (W x D x H): 535 x 330 x 250 mm
- External dimensions (W x D x H): 810 x 1425 x 1790 mm
- Side IR camera to monitor product temperature
- Chamber lighting
- Exhaust ventilator
- Air filter in the front side
- Microwave Lab Oven with PLC Control

Chamber Oven 2 kW / 2.45 GHz, Solid State Microwave Technology
- Application Oven for crustless bread
- Microwave power: 2 kW, 2.45 GHz, semiconductor-based microwave technology
- External dimensions (W x D x H): 1100 x 860 x 1765 mm
- Chamber lighting
- Humidity sensor
- Hot air ventilation setting - 8 positions, closed circuit
Low Ripple Switch Mode Power Supply for Magnetrons

- Low Ripple Switch Mode Power Supply (LRSMPS) for Magnetrons 2, 3, 5 or 6 kW
- 19” Rack
- Air- or watercooled
- Low Ripple Current ≤ 2%, ideally for plasma applications and other most applications
- Microcontroller based Monitoring and Controlling of all important Magnetron Operating Parameters like High Voltage and Current. The LRSMPS ensures that the Magnetron is always operating in the ideal Operating Point (longer Magnetron lifespan)
- Low electromagnetic interference, improved fail-safe design against electromagnetic interference's
- No electromagnetic interference, much more fail safe against electromagnetic interference's
- Personal protection against accidental contact with the high voltage
- Improved alarm visualization, all alarms are described and displayed in plain text
- Two different control options to suit most application requirements (e.g. PLC control or fieldbus control capabilities)
- Profinet-Interface
### Switch Mode Power Supplies

<table>
<thead>
<tr>
<th>Power</th>
<th>Frequency</th>
<th>Watercooled</th>
<th>Aircooled</th>
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<tbody>
<tr>
<td>2 kW</td>
<td>2.45 GHz</td>
<td>PS2kW400-W</td>
<td>PS2kW400-A</td>
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<tr>
<td>3 kW</td>
<td>2.45 GHz</td>
<td>PS3kW400-W</td>
<td>PS3kW400-A</td>
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<tr>
<td>6 kW</td>
<td>2.45 GHz</td>
<td></td>
<td>PS6kW400-A</td>
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<tr>
<td>5 kW</td>
<td>915 MHz</td>
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<td>PS5kW400-A</td>
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Components for Magnetron Applications

Power Detector FM-PD2CH2450S

The Power Detector FM-PD2CH2450S is designed for industrial drying and heating application as well as for researchers in laboratory application. The Power Detector allows numerical and graphical display of forward and reflected RF power to monitor the process.

A storage of the process data is with the display unit possible. An analog output exists for monitor the forward and reflected RF power in combination with a programmable logic controller unit. The frequency correction can be set manually or optionally with a frequency counter in a range from 2400 MHz to 2500 MHz.

Directional Coupler FM - WR340/N(f)

The directional coupler FM - WR340/N(f) allow monitoring forward and reflected power in a waveguide transmission system.

Both versions (20 dB and 60 dB Coupling) are equipped with standard N(f) connectors at the sidearm. Allowing the connection of standard power meters or spectrum analyzers.

Microwave Components

Microwave components like Waveguides with rectangular and circular cross section, Isolauncher and Adjustable Shorts. Made of aluminium, brass or stainless steel.
Components for Magnetron Applications

**Tuning components: Manual, Motorized and Automatic Version**

Tuning components like three stub tuners, E-H-Tuner and magic tees. Watercooled, hand or motor controlled, made for 915 MHz, 2.45 GHz and 5.8 GHz.

**Magnetrons**

2.45 GHz from 300 W up to 30 kW. Air and water cooled with fitting incoupling units and isolators. 5.80 GHz 800 W. Air cooled with fitting incoupling units and isolators.

**Magnetronheads, Water Cooled**

- 2kW or 3kW HF-Power output
- Frequency 2440...2470 MHz
- Integrated filament transformer
- Integrated magnetron, water cooled
- Integrated Temperature switch
- Compact housing
- Interlock: Arc detection and Magnetron over-temperature
- Fully enclosed
Solid State Microwave Generator 500 W 2.4..2.5 GHz in a 19" rack

- Compact lightweight construction: 19" 4HE Rack
- Output power 0-500W, adjustable in 0.2W steps
- Output frequency 2400-2500 MHz, adjustable in steps of 1 MHz
- Real time measurement of reflected power and frequency
- Low attenuation flexible coaxial cable to improve high power efficiency
- AC input 230 VAC; 50/60 Hz
- Efficiency up to 60%.

Solid State Microwave Generators

- Output power adjustable from 0 W to max. power in 1.0 W steps
- Output frequency adjustable in steps of 1 MHz
- Real time measurement of reflected power and frequency
- High temperature stability through efficient water cooling
- VSWR protection mechanisms
- Communication Interface with industrial bus standards

Solid State Generators are available in the following versions:

<table>
<thead>
<tr>
<th>2400..2500 MHz</th>
<th>900..930 MHz</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>1 kW</td>
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<tr>
<td>6 kW</td>
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</table>
Microwave plasma technology is a very demanding application used to activate surfaces in electrical engineering, automotive, textile and many other industries. Fricke and Mallah and Heuermann HF-Technik GmbH develop microwave plasma sources with an excellent heat coupling. The result is a particularly high plasma density and high temperature processes of up to 5,000 °C. This field is generated by our microwave generator with 2.45 GHz and 3 kW output power. The plasma jet reaches lengths of up to 10 cm. This is a unique result in this range.
Fricke und Mallah Microwave Technology was founded in the year 1995 in Hanover, Germany. In the meantime, technologically and technically as well as in terms of personnel we have developed considerably in the recent years. At our location in Peine we employ currently 38 highly qualified and motivated engineers, technicians and production staff. At the end of 2016, we moved into our new building with more than 800 m² of office space and approximately 1300 m² of production space. So in combination with our old Building we have totally ca. 1200 m² office and at least 2000 m² production area.

Our range of services extends from process analysis to consulting. An important component are the well-founded and realistic simulations, which bring the customer and research projects to success in a plannable way. This saves time and resources. We have a professional department for deep modeling of electromagnetic and temperature fields using mainly the Software CST and occasionally COMSOL as well as very effective and innovative mechanical and electrical design department.