



KEIRONE

Complete Engineering Solutions...

About KERONE

KERONE is one of the most admired and valuable company for customer satisfaction.



KERONE has reported annual revenue of \$18 to \$20 Million , increasing year-on-year.



KERONE is possessing employee strength of more than 280 experts continuously putting efforts for happy industrial engineering solutions



KERONE is possessing experience of 48+ years in engineering excellence.

KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.

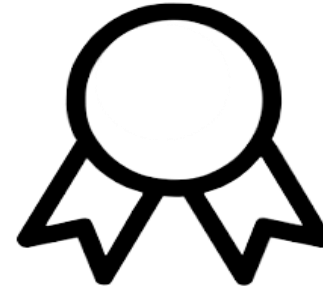
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48+

Years Experience



150+

Experts



5000+

Satisfied Clients



280+

Employees

Our Vision and Mission



Vision

- Turn into world leader in providing specialized, top-notch quality and ecologically sustainable industrial heating, cooling , drying and engineering solution across the globe.
- To attain global recognition as best of quality and environment friendly engineering solution company.

Mission

- To enhance the value of customer operation through our customer need centric engineering solution.
- We are committed to provide our customers, unique and best in class products in Industrial heating, drying and cooling segment, with strategic tie-up for the technical know-how with renowned leader in the industry specific segment.
- We are company that believes in strong ethics and timely commitment helps to build long term relationship.



Value Propositions



Highly
Customized Product



Sound
Infrastructure



Adherence
to
Standards



Timely
Delivery



Team of experts
Delivering Quality



Cost Effective
Solutions

We are in collaboration with...

Member of AIMCAL



Member of IHEA



Strategic Partners of
Emitech Italy



IRQAO Certified For
Quality



Recognized and Rated by
CRISIL



CRISIL Verified



Member of A.M.P.E.R.E.
(Europe)



ASCB(E) Certification for
Best practice



We are Certified by...



ISO 9001:2008 | ISO 9001:2015 | OHSAS 18001 | EMS 14001

Microwave Chamber Furnace

About Microwave Chamber Furnace?

Microwave Chamber Furnace is a type of furnace that utilizes microwaves to generate heat and sinter materials. It is widely used in material processing, synthesis, and sintering of ceramics, metals, and composites. Compared to traditional furnaces, microwave chamber furnaces offer several advantages, including faster heating rates, better control over temperature and atmosphere, energy efficiency, and reduced environmental impact.

The furnace consists of several components, including a microwave generator, waveguide, furnace chamber, refractory lining, and temperature control system. The microwave generator produces microwaves at a specific frequency (usually 2.45 GHz), which are transmitted through the waveguide and into the furnace chamber. The material to be sintered is placed in the furnace chamber, where it absorbs the microwaves and heats up rapidly. The temperature control system regulates the microwave power and duration to maintain the desired temperature.



Features

- Measurement of the microwave power injected into the chamber and reflected from the chamber.
- Electromagnetic simulation of the microwave coupling systems (antennas) and the microwave chamber to generate very homogeneous microwave fields .
- Sophisticated control or regulation via Siemens PLC . Hot air system adjustable in volume flow, humidity and temperature up to 250 °C .
- Drying according to defined progressions in the h-x diagram.
- R camera with high resolution, fiber optics and jacketed high temperature sensors.
- Moisture measurement up to 250 °C
- Electric lift door
- Microwave chamber largely sealed to allow drying or heat treatment under controlled atmosphere
- illumination of the microwave chamber Viewing window or camera to allow visual inspection during drying or heat treatment

Components

- **Microwave Generator**

The component generates microwaves at a specific frequency (usually 2.45 GHz). It is usually a magnetron or klystron tube that converts electrical energy into microwave radiation.

- **Waveguide**

The waveguide is a metal tube that transmits the microwaves from the generator to the furnace chamber. The waveguide is designed to prevent leakage of the microwaves and to maximize their transfer efficiency.

- **Furnace Chamber**

The furnace chamber is a cavity where the material to be sintered is placed. It is made of a refractory material that can withstand high temperatures and corrosive atmospheres.

Components

▪ Refractory Lining

The refractory lining is a layer of material that lines the furnace chamber to protect it from the high temperatures and corrosive atmospheres. It is usually made of alumina, zirconia, or silicon carbide.

▪ Temperature Control System

The temperature control system regulates the temperature inside the furnace chamber. It consists of a thermocouple or pyrometer that measures the temperature, a controller that adjusts the microwave power and duration, and a power supply that provides the electrical power to the microwave generator.

▪ Gas Inlet and Outlet

The gas inlet and outlet are used to control the atmosphere inside the furnace chamber. The gas inlet is used to introduce a controlled atmosphere, such as hydrogen or nitrogen, while the gas outlet is used to remove any by-products or gases generated during the sintering process.

Operation

▪ Loading the Material

The material to be sintered is loaded into the furnace chamber. The material is usually in the form of a powder or a compacted shape.

▪ Setting the Temperature

The temperature is set according to the specific sintering requirements of the material. The temperature control system is used to maintain the desired temperature.

▪ Setting the Atmosphere

The gas inlet is used to introduce a controlled atmosphere, such as hydrogen or nitrogen, into the furnace chamber. The atmosphere is set according to the specific sintering requirements of the material.

▪ The Microwave Generator

The microwave generator is started, and the microwaves are transmitted through the waveguide and into the furnace chamber.

Operation

▪ Absorption of Microwaves

The material absorbs the microwaves and rapidly heats up. The microwaves penetrate the material, causing it to heat up uniformly from the inside.

▪ Sintering

The material is sintered at the desired temperature and atmosphere. The sintering process involves the formation of chemical bonds between the particles of the material, resulting in a solid, dense, and high-strength material.

▪ Cooling

Once the sintering process is complete, the microwave generator is turned off, and the material is allowed to cool down slowly. This process helps to prevent cracking and other defects.

▪ Unloading the Material

Once the material has cooled down to room temperature, it can be removed from the furnace chamber.

Advantages

- Faster heating rates: microwaves heat the material directly, without relying on conduction or convection, resulting in faster and more uniform heating
- Better control over temperature and atmosphere: the temperature can be controlled more precisely, and the atmosphere inside the furnace can be controlled by adjusting the gas flow rate
- Energy efficiency: microwaves are highly efficient at converting electrical energy into heat, resulting in lower energy consumption and reduced operating costs
- Reduced environmental impact: because the sintering process is faster and more energy-efficient, the environmental impact is reduced, and there is less waste produced



Application

- Heating of plastics and silicone moulds for the Automotive Industry.
- Food industry: Poultry, meat and seafood / sea fish
- Defrosting, Heating, Pasteurizing
- Microwave chamber dryer for homogeneous drying of various refractory products.
- Application Research microwave oven for homogeneous drying of various products with minimal pressure losses across the microwave chamber. The device is suitable for all drying and heating processes (up to 1500° C using insulating box) under different atmospheres like
- Bricks and Ceramics
- Refractory products
- Metal processing
- Food (in a hygienic design)
- Composites

Optional Features

- Optional microwave generators based on Solid State Microwave Technology
- Oscillating work table. This allows processes to be simulated in continuous operation
- Installation of high temperature insulation for sintering processes is possible
- Microwave chamber made microwave permeable material like vacuum desiccator
- Humidification system
- Convection, circulation and mixed operation of hot air
- I R heating min. 10 kW
- Pressure measurement in microwave chamber
- Weighing system Turntable with integrated weighing system
- Manual door instead of the electric lift door



Conclusion

Microwave chamber furnaces are a powerful tool for material processing and synthesis. Their ability to provide rapid and uniform heating, precise temperature control, and controlled atmosphere make them ideal for a variety of applications in industries such as ceramics, electronics, and materials science. The features of microwave chamber furnaces such as energy efficiency, compact design, and easy-to-use controls make them suitable for small-scale laboratory research or industrial applications where space is limited.

While microwave chamber furnaces are not suitable for all types of materials and processes, they offer a unique set of advantages that can greatly improve the quality and efficiency of material processing and synthesis. As technology continues to evolve, we can expect to see further improvements and innovations in microwave chamber furnace design and operation, leading to even more advanced and powerful material processing capabilities.

Trusted Partner of following consultants...



Our Clients...

Serving Across Borders...





KEIRONE



 **Locate-Us**

UNIT I

A/4, Marudhar Industrial Estate,
Goddev Fatak road, Bhayander(E),
Mumbai-401105

Phone : +91-22-28150612/14

UNIT II

Plot No. B-47, Addl.
MIDC Anandnagar, Ambernath (East),
Dist. Thane- 421506

Phone : +91-251-2620542/43/44/45/46

EMAIL

info@kerone.com | sales@kerone.com |
unit2@kerone.com

WEBSITE

www.kerone.com | www.kerone.net |
www.keroneindia.com

INDIA | EUROPE | UAE | UK | USA | BANGLADESH | THAILAND | AUSTRALIA