



48⁺ Years
Of experience

DRYING WITH INDUSTRIAL **MICROWAVE OVENS**



In Association with SVCH-Technologii, Moscow (Russia)

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018

ABOUT US

KERONE is now renowned for serving the specialized needs of customers with the best quality and economical process of application engineering solutions and industrial heating products manufactured in a high-quality environment by a trained and qualified workforce (special purpose machinery)



KERONE is a pioneer in application and implementation engineering with its vast experience and team of professionals.



KERONE is devoted to serve the industry to optimize its operations both economically and environmentally with its specialized process engineering solutions.



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



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



48+ Years Manufacturing Excellence



Great Sale Support



Highly Customized Product



Adherence to Standards



Sound Infrastructure



Team of experts Delivering Quality



Timely Delivery



Cost Effective Solutions

WHY CHOOSE US

"Choose Kerone for innovative solutions tailored to your unique product needs, ensuring efficiency, reliability, and unmatched quality."

With decades of expertise, cutting-edge technology, and a customer-centric approach, Kerone Engineering offers tailor-made Applications Engineering solutions that prioritize quality, flexibility, and cost-effectiveness. Benefit from our commitment to excellence, post-sales support, and innovative solutions for your unique Applications Engineering needs. Choose Kerone Engineering for reliability, performance, and unmatched value.

MISSION



To enhance the value of customer operation through our customer need centric engineering solution.



We are committed to providing our customers with unique and best-in-class products in the industrial thermal processing segments. Through strategic tie-ups for technical know-how with renowned leaders in industry-specific segments, we ensure that our offerings meet the highest standards of quality and innovation.

VISION



Turn into a world leader in providing specialized, top-notch quality and ecological industrial heating, cooling, and drying solutions across the globe.



To attain global recognition as the best of quality and environment-friendly engineering solution company.



Enhance the value of customer operation through our customer need centric engineering solution.



TRUSTED PARTNERS





Drying With Industrial Microwave Ovens

Introduction

Industrial microwave ovens offer a highly efficient and rapid method for drying various materials, including food products, building materials, and pharmaceuticals. Unlike conventional methods that rely on surface heat transfer, microwave drying heats materials volumetrically by targeting water molecules inside the material, resulting in faster moisture evaporation and reduced energy consumption. This targeted approach not only speeds up the drying process but also makes it more energy-efficient, as it focuses energy precisely where needed.

The versatility of microwave drying makes it suitable for a wide range of applications, from cooking and tempering food products to drying building materials and pharmaceuticals. The ability to adjust power levels and exposure time allows for precise control over the drying process, ensuring optimal moisture removal without damaging the product. Businesses considering microwave drying systems can benefit from lower long-term operating costs due to reduced production time, lower utility expenses, and decreased maintenance needs.

Step 1

Determine How Much Water You Need To Evaporate

With any given material, you will first need to measure how much water it contains before drying and determine a target for how much you want it to contain after being processed. For example, if you have 200 kilograms of material at 60% water saturation that you need to bring to 10% saturation then the calculation is simply $200(.6) - 200(.1) = 200(.5) = 100$ kilograms of water.

Generally speaking, you will likely have some target time in mind as well for how long you are willing to subject the material to microwaves in order to achieve that goal. So, let's say you are trying to evaporate 100 kg of water in two hours. Let's assume the starting temperature of the material is 20°C.

Step 2

Understand How Your Material Will React To Microwaves

For most materials, water will easily be the most microwave sensitive molecule and will therefore minimize the amount of energy lost through absorption to the rest of the material you are trying to dry. The calculations to follow are specific to the amount of energy required to evaporate the water alone and so should serve as a rough estimate of the total energy you will need since some small part will be lost to the rest of the material.

However, this loss should be small (less than 5% in most cases). If you have a material with a high dielectric loss tangent though, this will be larger. Also, if you have a material that is highly receptive to microwaves then you may want to consider drying over a longer time period to avoid unwanted heating of the base material.

Step 3

Apply This Formula To Understand Energy Needs

The formula for calculating the amount of energy required to evaporate water is based on the specific heat capacity of water; 4.184 kilojoules (kJ) of energy is required to heat one kilogram of water by one degree Celsius. Once this energy heats water to its boiling point (100°C), roughly another 2600 kJ are then required to phase shift one kilogram of liquid water to steam. So, the calculations for the amount of energy required in our earlier example (100 kg of water in two hour) would be as follows:

Energy required to heat water to boiling + energy required to phase shift the water =

$$\begin{aligned} &\text{Total} \\ &(4.184 * \text{weight of water in kg} * \text{change in temperature in celcius}) + \\ &(2600 * \text{weight of water in kg}) = \text{Total} \\ &(4.184 * 100 * (100 - 20)) + (2600 * 100) = 293,472 \text{ kJ} \end{aligned}$$

Since this amount of energy needs to be applied over the course of two hours (7,200 seconds), then $293472 / 7200 = 40.76 \text{ kJ/sec} = 40.76 \text{ kilowatts}$.

Our total energy requirement is therefore 293,472 kJ which equates to a continuous application of 40.76 kW over two hours.

Step 4

Use This Information To Make An Informed Decision

Knowing your energy requirements up-front will save you time when considering purchasing a microwave oven. When talking with high-power microwave manufacturers, this will be the first data point necessary to establish before more productive conversation can be had about pricing a specific oven or system. For instance, in the example above, the amount of energy required could be supplied by one standard 75 kW generator. However, if the drying had to be done in 20 minutes instead of two hours then three generators would be required to produce the 244.56 kW required.

Energy requirements are also crucial when building a business case for making an investment in new drying systems for your facility. Justifications of this kind are crucial when considering large capital purchases like commercial microwave dryers (like the one seen below).



OUR CLIENTS









THANK YOU

UNIT 1

4 & 5, Marudhar Industrial Estate, Gas Godown Lane, Goddev Fatak Road, Bhayander (E), Dist. Thane - 401105. (India)

Contact Us
+91-22 48255071,
48255072

UNIT 2

Plot No. B-47, Addl. Midc Anandnagar, Ambernath (E), Dist. Thane (India)- 421506

Contact Us
+91(0251)26205
42/43/44/45/46

KRDC

Plot No K2, Industrial Gala F4A, D- Wing, MGN Properties, Opposite Godrej Co., Addl MIDC Anand Nagar, Ambernath (E)- 421506 (India)

Contact Us
+91-2512620543/44

UNIT 4 (EUROPE)

Kerone Engineering Solutions LTD. (EMitech) Viale della Palma, 7, 70033 Corato BA, Italy (Europe)

UNIT 5 (THAILAND)

Thailand Representative:
163 Rajapark Building,
18th floor, Sukhumvit 21
Road (Asoke), Wattana,
Bangkok - 10110, Thailand

Contact Person
G.Vivekanand
+6689 500 9821

Uzbekistan / Kazakhstan (Office)

TIT Company LLC: 100060,
2, A. Kahhar, Tashkent,
Uzbekistan

Contact Person
Mr. Slava
+998 903540963

Israel (Office)

Ornatus Industrial Tech
Ltd: Dam Hamac bim 36,
7178602 Modiin, Israel

Contact Person
Omri Fabian
+972 584844887

Australia & New Zealand (Office)

Linetech Pty Ltd:
Po Box 3046, Browns
Plains, Qld 4118. Australia

Contact Person
Eric Quevauvilliers
+61 (0)418 871 005

Bangladesh (Office)

House-10, Road-5 Priyanka
City, Sector-12, Uttara,
Dhaka-1230, Bangladesh

Contact Person
Md. Emtiaz Morshed
+8801747762200



SCAN HERE

✉ Our Mails

info@kerone.com
sales@kerone.com
marketing@kerone.com

🌐 Website

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