

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.

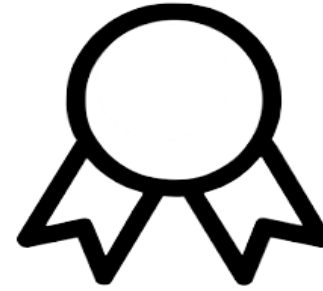
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48+

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 Sterilization

What is Microwave Sterilization?

Microwave sterilization refers to the process of using microwave energy to eliminate or reduce the presence of microorganisms, such as bacteria, viruses, and fungi, on various objects or substances. It is a method commonly used in the food industry, healthcare settings, and laboratories to achieve sterilization or disinfection.

The process involves exposing the object or substance to microwave radiation, which generates heat and effectively kills the microorganisms. Microwaves are a form of electromagnetic radiation with wavelengths between radio waves and infrared radiation. When they interact with water molecules or other polar molecules present in the object being sterilized, they cause rapid vibration and rotation of these molecules, resulting in the generation of heat.



How Microwave Sterilization Works

■ Microwave Radiation

Microwaves are a form of electromagnetic radiation with wavelengths ranging from 1 millimeter to 1 meter. In a microwave sterilization system, a microwave generator produces and emits these microwaves.

■ Absorption of Microwave Energy

Microwaves are a form of electromagnetic radiation with wavelengths ranging from 1 millimeter to 1 meter. In a microwave sterilization system, a microwave generator produces and emits these microwaves.

■ Molecular Excitation

As the absorbed microwave energy interacts with the molecules, it causes them to rapidly vibrate and rotate. This molecular excitation results in the conversion of microwave energy into heat energy.

How Microwave Sterilization Works

■ Thermal Effects

The heat generated by the microwaves raises the temperature of the object or substance being sterilized. Microorganisms are sensitive to temperature changes, and sustained exposure to high temperatures can lead to their destruction or inactivation. The heat disrupts vital cellular structures and metabolic processes, ultimately killing the microorganisms.

■ Uniform Heating

To ensure effective sterilization, it is essential to achieve uniform heating throughout the object or substance. Microwave sterilization systems employ various mechanisms, such as rotating platforms or multiple microwave sources, to distribute the microwave energy evenly and minimize temperature variations.

■ Monitoring and Control

During the sterilization process, it is crucial to monitor the temperature and exposure time to ensure that the desired sterilization levels are achieved. This monitoring helps prevent under-sterilization or overheating, which could compromise the effectiveness of the process or damage the object or substance being sterilized.

Advantages of Microwave Sterilization

- **Increased nutrient retention**

Microwave sterilization can help to retain more nutrients in food than traditional methods. This is because microwaves heat food from the inside out, which can help to prevent the loss of nutrients that can occur when food is cooked on the outside first.

- **Improved food quality**

Microwave sterilization can help to improve the color, texture, and flavor of food. This is because microwaves heat food evenly, which can help to prevent the formation of hot spots that can lead to overcooking.

- **Reduced processing time**

Microwaves can heat food much faster than traditional methods, such as boiling or baking. This can help to preserve the quality of the food, as it is exposed to heat for a shorter period of time.

- **Reduced energy consumption**

Microwave sterilization uses less energy than traditional methods of sterilization. This is because microwaves heat food directly, rather than heating the air around the food.

Advantages of Microwave Sterilization

- **Improved safety**

Microwave sterilization can help to improve the safety of food by killing harmful microorganisms. This can help to reduce the risk of foodborne illness.

- **Flexibility**

Microwave sterilization can be used to sterilize a wide variety of foods, including liquids, solids, and powders.

- **Scalability**

Microwave sterilization systems can be scaled up or down to meet the needs of different food processing operations.

- **Cost-effectiveness**

Microwave sterilization can be a cost-effective way to sterilize food, especially when compared to traditional methods.

Applications

■ Food Industry

Microwave sterilization is commonly used in the food industry to ensure the safety and extend the shelf life of food products. It can be applied to sterilize packaged foods, ready-to-eat meals, spices, herbs, and dried foods. Microwave sterilization helps to eliminate or reduce harmful bacteria, molds, and other microorganisms without compromising the quality, taste, or nutritional value of the food.

■ Healthcare and Medical Settings

In healthcare facilities, microwave sterilization can be used to sterilize medical instruments, equipment, and supplies. It provides a rapid and effective method for killing microorganisms on items such as surgical tools, endoscopes, catheters, and dressing materials. Microwave sterilization is particularly useful for heat-resistant and moisture-sensitive medical devices.

■ Laboratory and Research

Microwave sterilization finds applications in laboratories and research facilities for sterilizing glassware, plastic ware, and laboratory equipment. It is often used for disinfecting or decontaminating microbiological cultures, media, and waste. Microwave sterilization can help prevent cross-contamination and ensure the sterility of lab equipment and materials.

Applications

■ Pharmaceuticals

Microwave sterilization is utilized in the pharmaceutical industry for sterilizing drugs, drug delivery systems, and pharmaceutical packaging materials. It helps maintain product integrity by effectively eliminating microorganisms and reducing the risk of contamination.

■ Agriculture and Horticulture

Microwave sterilization can be used in agriculture and horticulture to treat soil, seeds, and agricultural products. It helps control pests, pathogens, and weed seeds, reducing the need for chemical treatments and promoting plant health.

■ Environmental Applications

Microwave sterilization is also employed in waste management and sanitation systems. It can be used to treat medical waste, sewage sludge, and other organic waste to minimize pathogens and reduce the risk of contamination.

Comparison with Other Sterilization Methods

▪ Steam Sterilization (Autoclaving)

- Microwave sterilization is generally faster compared to steam sterilization. While autoclaving can take 20 minutes to several hours, microwave sterilization can achieve similar results within minutes.
- Autoclaving requires a dedicated autoclave machine, while microwave sterilization can be performed using standard microwave ovens or specialized microwave sterilization systems, providing more accessibility and flexibility.



Comparison with Other Sterilization Methods

■ Chemical Sterilization

- Microwave sterilization does not require the use of chemical agents, eliminating the need for handling and disposing of potentially hazardous chemicals.
- Chemical sterilization methods often require longer exposure times for effective sterilization, whereas microwave sterilization can achieve rapid sterilization within a shorter period.
- Microwave sterilization does not leave behind chemical residues on the sterilized items, which can be an advantage for certain applications.



Comparison with Other Sterilization Methods

▪ Dry Heat Sterilization

- Microwave sterilization is generally faster than dry heat sterilization. Hot air ovens typically require longer exposure times at higher temperatures to achieve sterilization compared to microwave sterilization.
- Microwave sterilization can achieve more uniform heating throughout the object or substance being sterilized, which may be more challenging to achieve with hot air ovens.
- Dry heat sterilization can cause more heat-related damage to certain materials compared to microwave sterilization, especially for heat-sensitive objects.



Comparison with Other Sterilization Methods

■ UV Sterilization

- Microwave sterilization provides a more comprehensive and penetrating sterilization effect compared to UV sterilization. UV light has limitations in terms of reaching shadowed areas or penetrating opaque materials, while microwaves can penetrate the objects or substances more uniformly.
- UV sterilization requires direct exposure to the UV light source, while microwave sterilization can treat objects or substances inside closed containers or packages, providing more convenience and reducing the risk of exposure.



Conclusion

- Microwave sterilization is a rapid, efficient, and versatile method of sterilization that utilizes microwave radiation to generate heat and kill or inactivate microorganisms on objects or substances. It offers several advantages over traditional sterilization methods, including speed, energy efficiency, uniform heating, reduced chemical usage, convenience, and the ability to achieve dry heat sterilization. Microwave sterilization finds applications in various industries such as food processing, healthcare, laboratories, pharmaceuticals, water treatment, agriculture, and waste management.
- It's important to consider the specific requirements and limitations of the materials being sterilized and follow appropriate guidelines and protocols to ensure safe and effective sterilization. Consulting with professionals and adhering to industry-specific regulations is crucial to make informed decisions and achieve optimal results.
- Microwave sterilization is a valuable sterilization method that offers speed, efficiency, and convenience in various industries, contributing to the safety, quality, and preservation of products and materials.

Trusted Partner of following consultants...



Our Clients...

Serving Across Borders...





KEIRONE



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