Complete Engineering Solutions...

Microwave Heaters

- Aerospace Industry
- Steel Industry
- Paper Industries

(An Iso 9001-2008 Company)
About KERONE

KERONE is possessing experience of 40 years in engineering excellence.

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

KERONE is pioneer in application and implementation engineering.

KERONE is having immense expertise in manufacturing and implementing various types of heaters and dryers.

KERONE is possessing employee strength of more than 140 experts continuously putting efforts for happy industrial heating solutions.

KERONE has reported annual revenue of $8 to $10 Million, increasing year-on-year.
Our Vision and Mission

**Vision**

- Turn into world leader in providing specialized, top-notch quality and ecological industrial heating, cooling and drying 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

- 40 years of rich experience
- Sound infrastructure
- Adherence to standards
- Timely delivery
- Highly customized product
- Cost effective solutions
- Team of experts delivering quality
- Great after sale support

KERONE Engineering Solutions Pvt. Ltd.

(An ISO 9001-2008 Company)

A CRISIL-NSIC RATED COMPANY
ISO-9001-2008 COMPANY
AFFILIATED TO THE UNIVERSITY OF NOTTINGHAM
MEMBER OF A.M.P.E.R.E.(EUROPE)

ASCB(e) Certification for Best practice
IRAQAO Certified for quality

Member of A.M.P.E.R.E. (Europe).
ISO 9001-2008 Certified company

Recognized and Rated by CRISIL
CRISIL Verified

In Association with SVCH-Technologii,
Moscow (Russia)
Introduction of Microwave

Microwave heaters is member of Electromagnetic heating family.

Microwaves has frequency of 2.45Ghz and 950Mhz.

Microwave is generated from small device known as Magnetron.

Microwave heaters has property to heat from within.

Microwave heater volume of material hence known as ‘Volumetric Heating’.
Microwaves Heater Classification

Microwave heating Systems are classified as follows:

Based on Microwave Frequency
- 950 Mhz
- 2450 Mhz

Based on Heater Type
- Batch
- Continuous
- Hybrid
## Microwave Heaters Vs Conventional Heaters

<table>
<thead>
<tr>
<th>Microwave Heaters</th>
<th>Conventional Heaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microwave heating system is generates the heat very fast within material.</td>
<td>Conventional heaters have slow hating rate, heat is transferred via means of air.</td>
</tr>
<tr>
<td>Heating of materials are due to molecule movements hence no chamber warm up time is required.</td>
<td>Instance heating does not takes place, it requires warm-up of surrounding.</td>
</tr>
<tr>
<td>Environmental friendly and green heating solution, no carbon emission.</td>
<td>Produces carbon or toxic gases hence not much environmental friendly heating solutions.</td>
</tr>
<tr>
<td>100% energy utilization, as heating takes place within the material.</td>
<td>100% energy utilization is not possible, as material is heated by surrounding hot air.</td>
</tr>
<tr>
<td>Better floor utilization index as it doesn’t require chamber area.</td>
<td>Poor floor utilization index as it require bigger chamber area for material to rotate.</td>
</tr>
<tr>
<td>No Temperature loss in surrounding, ambient workplace.</td>
<td>Surrounding air temperature rises with rise in heater temperature.</td>
</tr>
</tbody>
</table>
## Microwave Heaters Vs Infrared Heaters

<table>
<thead>
<tr>
<th>Microwave Heaters</th>
<th>Infrared Heaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microwave heating systems utilizes electromagnetic system uses wavelength of about 1 centimeters.</td>
<td>IR heating systems utilizes electromagnetic system uses wavelength of about 0.01 centimeters.</td>
</tr>
<tr>
<td>Heats the objects from within the object.</td>
<td>Heats the object from surface of object.</td>
</tr>
<tr>
<td>Microwave heaters also does not require large space hence offers better floor utilization index.</td>
<td>Compact system providing better floor utilization index.</td>
</tr>
<tr>
<td>Microwave heaters cant not substitute the conventional heaters.</td>
<td>Infrared heaters are better substitution of traditional convention heaters.</td>
</tr>
<tr>
<td>Depth of heat penetration is higher in Microwave heaters.</td>
<td>Depth of heat penetration is lower in infrared heaters as it heats from surface.</td>
</tr>
<tr>
<td>Rate of heating depends on the moisture content within the material.</td>
<td>Rate of heating depends on the surface characteristics of material.</td>
</tr>
</tbody>
</table>
## Advantages Microwave Heaters

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniform heating occurs throughout the material</td>
<td>Process speed is increased.</td>
</tr>
<tr>
<td>Desirable chemical and physical effects are produced.</td>
<td>Purity in final product.</td>
</tr>
<tr>
<td>Floor space requirements are decreased.</td>
<td>Reduction in unwanted side reaction (reaction Quenching)</td>
</tr>
<tr>
<td>Better and more rapid process control is achieved.</td>
<td>Better and more rapid process control is achieved.</td>
</tr>
<tr>
<td>Selective heating i.e. heating selectively one reaction component.</td>
<td>Improve reproducibility</td>
</tr>
<tr>
<td>High efficiency of heating.</td>
<td>Environmental heat loss is save, Reduce wastage of heat</td>
</tr>
</tbody>
</table>
Microwave based heating systems has very significant role in various process in Pharmaceutical industrial processing, some are mentioned below:

- Assists Drug Extraction
- Microwave Digestion
- Chemistry Synthesis
- Sterilization
- Drying and Powder Making
- Thawing
- Cancer Therapy
Microwave heater in Plastic and Rubber Industries

Plastic and Rubber has increased its application in various application, so the demand. Below and few important applications those require heating:

- Pyrolysis Of Plastic
- Plastic Welding
- Plastic Thermoforming
- Vulcanization Of Rubber
- Preheating Of Rubber
Microwave heater in Plastic and Rubber Industries

- Pre Heating Of Solid Rubber Tyres
- Extrusion Curing
- Rubber Coating
- Post Curing
Microwave heater in Food Industry

The Food and Packed Food industry has multiple application that require microwave heating are as follows:

- Tempering of Frozen Products
- Thawing
- Blanching
- Baking
- Drying/Dehydrating
- Pasteurization and Sterilisation
- Cooking
Microwave heater in Ceramics

Glass and Ceramics find multiple applications those require Microwave heaters:

- Plasma Processing
- Liquid State Processing
- Solid State Processing
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- LLOYD’S
- TOYO Engineering
- EIL
- HIT
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