KERONE
Kerone Engineering Solutions Limited

# RADIO FREQUENCY **HEATING SYSTEM**

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 Heating /cooling and drying 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 devoteded to serve the industry to optimize its operations both economically and environmentally with its specialized heating and drying 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.

# WHY CHOOSE US

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

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

## MISSION

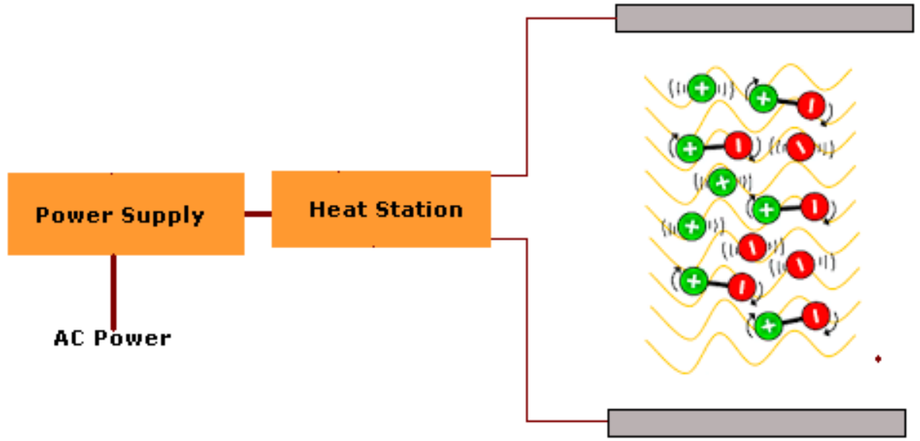
- To enhance the value of customer operation throughi our customer need centricengineefing solution
- We are cominitted to provide our customers, unique arid best in class products in Industrial heating drying and cooling segment with strategic tie-up for the technical know-how with renowned leader in the industry specific segment

## 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.

# Introduction

- Radio Frequency (RF) heating Systems is a type of Electromagnetic radiating system.
- Radio Frequency (RF) heating systems generates electromagnetic radiation of 30-300Mhz.
- RF heating System heats materials and substances by igniting conductive molecules.
- RF heating is similar to microwave heating at lower frequency.
- RF heating is also known as Induction Heating and/or Dielectric Heating.




# Radio Frequency Heating System Classification

- **Radio Frequency Heating Systems are classified as follows :**

- Batch Radio Frequency Heating System
- Continuous Radio Frequency Heating System
- Hybrid Radio Frequency + IR Heating System

# Radio Frequency Heating System Vs Conventional Heating System

| Radio Frequency Heating System | Conventional Heating System |
| --- | --- |
| RF heating systems are fast, as heat is generated due to induction of electromagnetic waves in material. | Conventional heaters have slow hating rate, heat is transferred via means of air. |
| Ions within the material gets ignited dues to changing radio frequency. | Instance heating does not takes place, it requires warm-up of surrounding. |
| Environmental friendly and green heating solution, no carbon emission. | Produces carbon or toxic gases hence not much environmental friendly heating solutions. |
| 100% energy utilization, as heating takes place within the material. | 100% energy utilization is not possible, as material is heated by surrounding hot air. |
| Better floor utilization index as it doesn't require chamber area. | Poor floor utilization index as it require bigger chamber area for material to rotate. |
| No Temperature loss in surrounding, ambient workplace. | Surrounding air temperature rises with rise in heater temperature. |

# Radio Frequency Heating System Vs Infrared Heating System

| Radio Frequency Heating System | Infrared Heating System |
| --- | --- |
| RF heating system are part of Electromagnetic heating utilizes frequency of 30 to 300 Mhz . | IR heating system are also part of Electromagnetic heating but it utilize frequency of 20 to 214 Thz. |
| Heats the objects from within the object. | Heats the object from surface of object. |
| Radio Frequency heating systems are known as Direct heaters. | Infrared heating systems are known as Indirect heaters. |
| RF heating systems does not require larges space hence offers better floor utilization index. | Compact system providing better floor utilization index. |
| Depth of heat penetration is higher for the RF heaters. | Depth of heat penetration is lower in infrared heaters as it heats from surface. |
| Rate of heating depends on the moisture content within the material. | Rate of heating depends on the surface characteristics of material. |

# Advantages Radio Frequency Heating System

- Consistent heating throughout the material.
- Increase in speed of heating as heat is generated internally.
- High energy efficiency.
- Improved quality of output material.
- Compact in size hence better floor utilization.
- Reduction in unwanted side reaction
- Rapid turn ON/OFF control can be achived.
- Better and more rapid process control is achieved.
- Improve reproducibility.
- High efficiency of heating.
- Environmental heat loss is save, Reduce wastage of heat
- Selective heating i.e. heating selectively one reaction component.

# RF Heating System in Pharmaceutical Industries

RF Heating System find wide applications in the growing and critical pharmaceutical and Chemical Industries, few of them are mentioned below:

- Sterilization of bottles, injections and packing materials
- Chemical Synthesis
- Drug Extraction
- Drying of Powders and pills
- Drying of Gelatin
- Drying of water-based Adhesives
- Thawing
- Chemical reaction or decomposition

# RF Heating System in Plastic Industries

Plastic industries has various applications that require heating and RF heating systems provides many advantages:

- Curing and Preheating of PVC sheet
- Phenolic Resin PC Boards
- Laminating Flexible PC Boards
- Welding of PVC Interior
- Plastic Thermoforming
- Welding and Embossing of PVC and other plastices

# RF Heating System Rubber and Wood Industries

RF heating system finds various application in Rubber and Wood Industries:

- Pre-heating Rubber
- Pre Heating Of Solid Rubber Tyres
- Extrusion and Post Curing
- Rubber Coating
- Veneer Drying of plywood
- Glue drying for Edge bonding
- Lumber Drying

# RF Heating System in Textile Industries

Textile in the oldest industry that requires heating or drying for various process, RF heating systems help textile industry to achieve better quality output at lesser cost:

- Drying Pantyhose
- Drying Bulk Yarn
- Drying Tow and Webs of Woven Material
- Heat Setting Of Nylon Rope
- Printing  of Carpet Tiles
- Heating  of Wool Bales
- Drying  of Wool
- RF Transfer Printing
- Textile Bonding
- Drying  of Synthetic Fibers

# RF Heating System in Food Industry

The Food and Packed Food industry has multiple application that require RF Heating are as follows:

- Tempering of Frozen Products
- Thawing
- Blanching
- Baking
- Drying/Dehydratinng
- Pasteurization and Sterilization
- Cooking and Roasting

# RF heating System in Paper and Printing Industry

Paper and Printing industries are having various applications that requires RF heating systems:

- Drying of Paper
- Drying of Adhesives on Carton Board
- Drying of Glue for Blister Packs
- Moisture Profiling of Paper
- Drying Matchbox striking Edges
- Drying of Water based printing inks
- Paper Roll formation
- Smudging Paper
- Drying of Adhesives on Stationary Products

# RF Heating System for Some Miscellaneous Applications

Paper and Printing industries are having various applications that requires RF heating systems:

- Increasing the Fertility of Seeds
- Drying Agricultural Products
- Drying of Salt
- Drying of Refractory Products
- Accelerated Concrete Curing
- Drying of Glass
- Drying of Sand Cores
- Phenolic Resin PC Boards
- Laminating Flexible PC Boards
- Cracking of Concrete

# TRUSTED PARTNERS

AFCONS

Technip

TÜV ISO 14001:2004

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Reliance Engineering Associates Pvt. Ltd.

TATA CONSULTING ENGINEERS LIMITED

SC Shroff Consultants

STERLING & WILSON

# THANK YOU

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