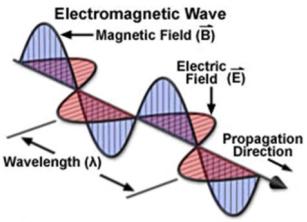
Microwave Heating Seminars

Fundamentals of Microwave Heating

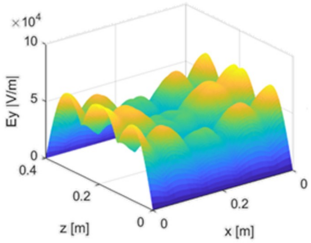
jfGerling MICROWAVE APPLICATIONS CONSULTING

Microwave energy is used for heating materials in a wide variety of industrial, commercial, consumer and medical applications. Although microwaves are in common use world-wide, many users are not familiar with the basic fundamentals of microwave heating technology. **Fundamentals of Microwave Heating** provides an overview of electromagnetic energy in the microwave frequency range, mechanisms of interaction with materials, techniques for generating and delivering microwave power, and the associated health effects and human safety. An overview of microwave food processing and cooking is also presented.

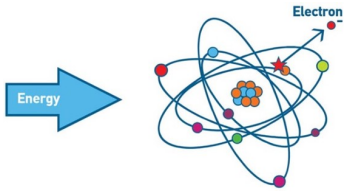
This seminar is intended for engineers, designers and researchers involved in the development of material processes and design of process systems. The information presented may also be useful to those involved in the installation, operation and maintenance of microwave processing equipment, as well as managers and executives who are key decision-makers responsible for the acquisition of microwave equipment.



- **Electromagnetic energy basics**
  - Electromagnetic energy defined
  - E/m spectrum and common uses
  - Sources of e/m energy
- **Materials interactions**
  - Dielectric heating explained
  - How it differs from conventional heating methods
  - Factors that influence microwave heating
  - Microwave heating of metals



- **Microwave sources, waveguides and cavities**
  - Magnetrons and solid state energy sources
  - Propagation in waveguides
  - Microwave fields in cavities
  - Quality factor and frequency sensitivity
  - Methods to prevent microwave leakage
- **Bioeffects and Safety**
  - Ionizing vs. non-ionizing radiation
  - Thermal effects and hazards
  - Cell phones and microwave ovens
  - Non-thermal effects
  - Regulatory standards for safety
  - Microwave ovens and pacemakers



- **Microwaves and foods**
  - Common microwave food processes
  - Myths and misunderstandings about microwave cooking
  - Impact on nutrients in foods
  - Microwave safe food containers

JFGerling Microwave Applications Consulting offers a series of technology seminars designed for anyone directly or indirectly involved in the development and/or utilization of microwave heating technologies. Seminar topics range from technology basics for non-technical newcomers to in-depth details for experienced technical users. Seminars can also be customized for a specific application or process and presented as a webinar or in-person at the client's facility or GCI. Hands-on workshops are also available. Please contact GCI for more information.

Gerling Consulting, Inc. ● Tel: +1-209-602-9478 ● Email: john@jfgerling.com