

## Introduction to Infrared Radiation

### Infrared Radiant Heaters Are Ideal for Many Diverse Applications

#### Plastics and Rubber

- *Plastifying of plastic sheets and rolls for thermoforming and vacuum forming*
- *Preheating or vulcanizing rubber sheets*
- *Heating glass fiber reinforced plastic during production*
- *Curing plastisols*
- *Laminating and plastic welding*

#### Paper/Pulp

- *Drying of paper pulp*
- *Quick drying of gummed, sized, or lacquered paper*
- *Drying of unprocessed and printed wallpaper*
- *Heating papier-mâché before pressing*
- *Adhesive activation*

#### Textiles

- *Setting Nylon® and Perlon® threads*
- *Gelling PVC paste coatings on fabrics*
- *Drying washed, dyed, and finished textile fabrics*
- *Heat set synthetic fabrics*

#### Food

- *Baking and browning small bakery products*
- *Keeping food warm*
- *Heating processed cheeses*
- *Packaging food products*

#### Miscellaneous Processes

- *Drying and curing of paint and powder coatings*
- *Drying raw tobacco*
- *Evaporation of water and solvents*
- *Manufacturing shrink packaging equipment*
- *Ink drying*
- *Comfort heat for agricultural, zoological and reptilian pet applications*

### Introduction to Infrared Radiation Heating Systems

#### Tempco's Radiant Heaters

fall into the medium wavelength range of electromagnetic infrared radiation. Infrared energy is commonly used to heat plastics, remove moisture, cure painted finishes or heat food products. This is because plastics, organic substances and water absorb infrared energy more efficiently than other materials in industrial applications.

#### A Straightforward Approach to Infrared Radiant Heating Technology

Radiant heating is regarded by many as a black magic technology that is complicated and difficult to work with. While radiation theory can be complicated, it is far easier to apply when given the appropriate heating devices and guidance on which device best suits your application.

In this section, Tempco will present an overview of our product offerings, their capabilities, and relevant technical data that will aid you in selecting the heating system that best serves your requirements.

No matter what the application needs, Tempco has the right product to satisfy your requirements.

#### The Basics

The three main modes of heat transfer are:

**Conduction** – When two bodies of different temperature are brought in contact with each other, heat energy flows from the hotter to the colder body.

**Convection** – Heat energy is transferred from a higher temperature region in a gas or liquid to a lower temperature region as a result of movement of masses within the fluid or gas.

**Radiation** – Infrared radiant energy is transported through space by electromagnetic waves without the need for a conductive media. Consequently, heat can be delivered in concentrated areas at very fast rates.

Electromagnetic radiation can be further broken down into four basic categories:

1. Ultraviolet
2. Infrared – (Short/Medium/Long Wavelength)
3. Microwave
4. Radio Frequency/Induction

#### Operating life



A ceramic infrared E-Mitter should not be immersed in or have contact with any liquids. The E-Mitter surface must be kept clean and free of any contamination. Failure to do so can compromise heater operating life.

#### Explosion Protection



**Ceramic Infrared Heaters** are not explosion-proof heaters. These heaters can only be used in atmospheres where the vapor concentration is well below the explosion limits of the processed material. Special provisions, such as forced ventilation, must be made to remove highly flammable vapors from the heater's path. Strict observance of the drying temperature is required for enamel-based materials.

The user is solely responsible for the installation of the E-Mitters and strict observance of all applicable regulations.