

### How to Select a Ceramic Infrared Heater

Safe, economical and efficient infrared radiation heating systems can be designed, installed and operated by following some basic rules and guidelines.

#### Heating Distance for Stationary and Moving Systems

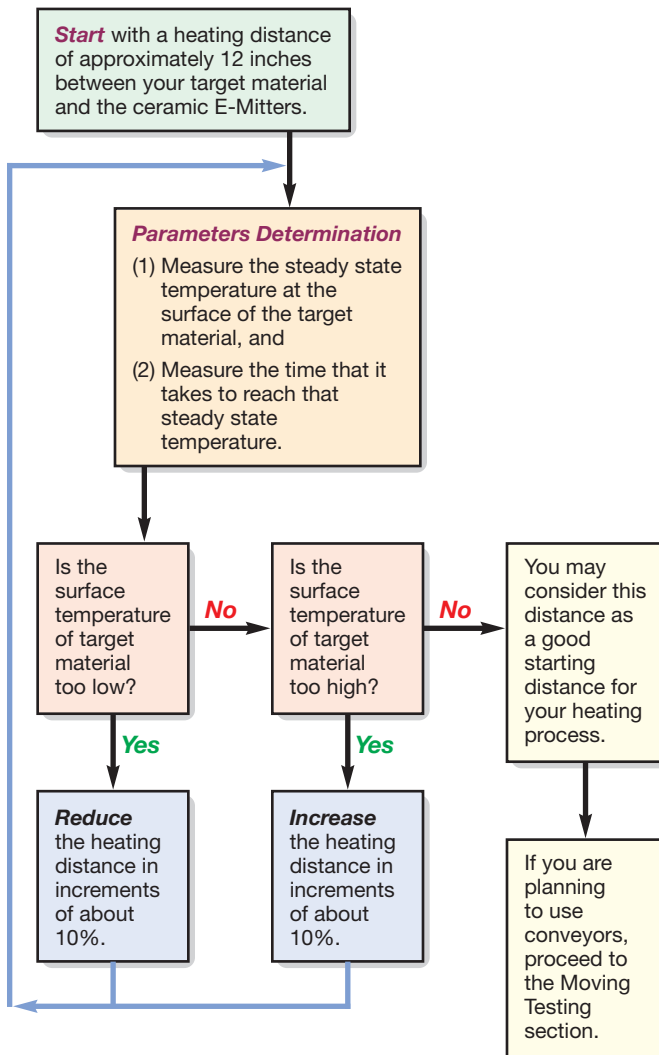
The optimum heating distance cannot be accurately determined for a given application without some preliminary testing because of the many different factors that affect the radiation transfer of heat. Therefore only general guidelines can be offered here.

In any heating application, it is recommended that Stationary Testing be done first. This can be accomplished by following some simple steps.

#### Stationary Testing

##### OBJECTIVE

Determination of the heating distance



#### DESIGN GUIDELINE

##### A General Information

1. Use the table on page 7-98 to match your target material with its corresponding ceramic E-Mitter rating. If the table does not list your target material, consult Tempco for assistance.

2. Select and order the ceramic E-Mitter based on the wattage rating. Tempco offers a complete line of industrial ceramic infrared heaters for you to choose from. Other wattage and voltage combinations can be designed and manufactured to suit your particular application. Consult Tempco with your requirements.

3. Next, what heating process are you going to apply to your target material: Process Heating, Drying, Curing, Cooking or another process? **Your answer will dictate the next design guideline and how to proceed for the determination of the correct heating distance.**

#### DESIGN GUIDELINE

##### B Process Heating

In many industrial applications, heat has to be applied to a target material before being processed further. In some cases, hot spots or large temperature gradients must be avoided. For this reason, it is highly recommended that several temperature controllers be used together with ceramic E-Mitters and integrated thermocouples. Three main processes require special attention:

**1. Plastic sheets** The fact that plastics have very low internal thermal conductivity causes localized heating if the applied heat is not uniformly distributed or if the sheets are too thick. In this situation, it is recommended that heat be applied to both sides of the sheet for the heat to be distributed throughout the material.

**2. Metallic sheets or strips** Metals are better internal conductors of heat than plastics but they absorb much less radiant energy because most of it is reflected at the surface. To overcome this problem, match the emission spectra of the radiant heater with the absorption spectra of the metal. Tempco's sales engineering staff will gladly help you in this endeavor.

**3. Granular form material** A relatively uniform heating of granulated compounds can be achieved by placing a thin layer of granules on a vibrating surface or conveyor to aerate the material while heating.

#### DESIGN GUIDELINE

##### C Drying, Curing & Cooking

**Drying** involves the release of water vapor, solvents or other materials that are vaporized during the process. In some cases, the solvents may be harmful or explosive and would require special protection. The user is solely responsible for the installation of the heating system and the strict observance of all applicable regulations.

**Water vaporization**, on the other hand, does not present this problem, but offers other related ones that also require special handling, such as how to remove the water vapor as it comes off the material being processed.

As for **curing and cooking**, because of the many different applications encountered within various industries, no specific rules can be offered in this general guideline. Testing of the application is recommended to determine the process requirements. Contact Tempco's sales engineers if assistance is needed.