

# Infrared Heaters For Controlled Concentrated Curing

## Model 4555



### Infrared Heat. Instantaneous Results.

The Model 4555 High Density Infrared Panel heater is a modular, panel-type heating unit that combines radiant and convection heating techniques. A forced air flow system turns waste heat into usable energy and allows the heater to operate efficiently at very high power levels. This heater is available with either medium-wavelength or short wavelength lamps. You also have the choice of a ceramic reflector or an aluminum reflector.

### Applications

The Models 4555 PanelIR may be used in any conveyor oven or custom heating system requiring clean, fast response and efficient infrared radiant heat. Typical applications include:

- Activating Thermo Transfer
- Ceramic Processing
- Cure and Melt Powders
- Curing
- Dry and Cure Paint
- Dry Adhesive
- Drying Coatings
- Laminating Composites
- Pre-Cure
- Preheating
- Resin Curing
- Soldering/ Desoldering
- Structural Tests
- Thermoforming
- Thick Film Drying
- Vulcanizing
- Weld Stress Relief



## FAST. FOCUSED. CONTROLLED.

### Features and Benefits

- The lamps of these heaters heat up and cool down instantly in response to power control signals.
- They reach 90 percent of full operating temperature within three to six seconds of a cold start, depending on the lamps you use.
- The radiant energy dissipates to ten percent five seconds after the power supply is disconnected.
- Localized heat focuses only on the desired area without heating the rest of the product.
- The construction of these heaters, combined with air-cooling, allows them to withstand continuous high temperature operation.
- Non-contact heat source does not come in contact with product being heated.
- The infrared energy emitted from these heaters can be adjusted to match the heating requirements of a variety of applications.
- Repeatable results can be achieved for consistent process outputs.
- Research, Inc. manufactures a complete line of process control instruments and SCR power controllers to control the operation of these heaters.
- The ceramic reflector in the heater module is self-cleaning in most applications. This feature provides both high efficiency and low maintenance cost.
- PanelIR heaters can be electrically wired so individual heating 'zones' can be generated to heat different target sizes.
- The Model 4555 is modular in design allowing for multiple units to be installed side-by-side to create large areas of continuous heat output.

module maintain a high surface temperature that continually vaporizes organic contaminants. The reflector material also serves as a re-emitter of medium wave (3 to 4 micron) infrared energy. This can be beneficial in many processes depending on the absorptive properties of the material being heated.

The heater module is available in heated lengths of 10, 16, 25, and 38 inches (254, 406, 635, and 965 mm) and heated widths of 6, 9, or 12 inches (152, 229, and 305 mm). All other models use lamps installed on 1" centers. Heated length and width are specified within the model number.

A strip of terminal blocks is located in each end of the Model 4555 for easy lamp wiring connection. This configuration allows for either individual lamp wiring or for specific 'zones' to be generated by wiring multiple lamps together.

### Forced Air Blowers

Forced-air blowers are integrated in the Model 4555 (see Figure 2 below). Forced air is required to protect the lamp end seals from overheating when the heater is in operation. These assemblies include 120V and 230V versions (both operable at either 50 Hz or 60 Hz). Air from the blowers is directed through bleed holes in the heater reflector along the full length of each lamp. This air cools the reflector and lamps while providing a preheated convection air flow to improve the heating rate and power efficiency in most applications. Air flow rates required to operate the various Model 4555 heaters are listed in Specifications.

### Description

#### Heater Module

The Model 4555 uses tubular quartz lamps backed by either a ceramic or an aluminum reflector to provide heat. It is available in a variety of heated widths and heated lengths to accommodate different heating requirements. The absorption/emission characteristics of the ceramic reflector surfaces in the heater

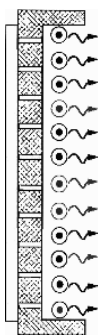
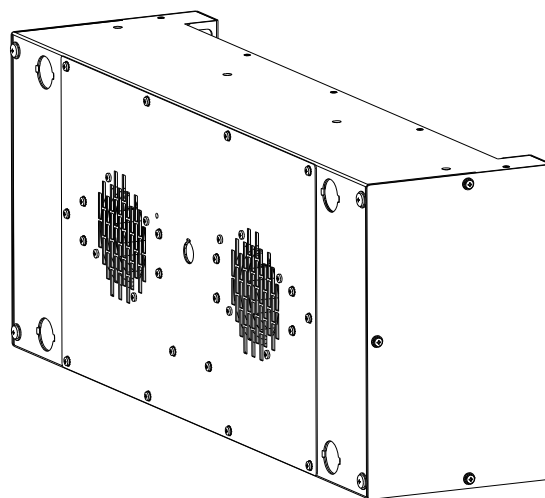


Figure 1:  
Designed with either ceramic or aluminum reflectors, the PanelIR Model 4555 heater provides consistent heat over a large area

Figure 2: PanelIR Model 4555 Forced-Air Blowers



**Overheat Protection**

A thermostat is mounted to the backside of the heater reflector that can be wired directly to the power source or to an external failure indicator (i.e. an alarm, failure light, etc.). The thermostat will either remove power from the unit or trip the external indicator if the heater exceeds the thermostat trip temperature.

**Product Temperatures**

The maximum work-piece temperature depends upon the voltage applied to the heater lamps, the ability of the work-piece to absorb radiant energy, and the amount of heat loss. For most continuous heating processes, the maximum work-piece temperature should not exceed 800°F (427°C).

**Product Sizes**

Areas of up to 38 X 12 inches (965 x 305 mm) can be heated with a single heater. Larger heated areas can be created by mounting two or more Model 4555 heaters side-by-side.

**Heat Flux Densities**

The Model 4555 is 100 watts per inch (3.9 watts per millimeter) of lighted length. Dissipated power for the Model 4555 is 100 watts per square inch (155 kilowatts per square meter). The heaters are also available in either medium-wave or short-wave lamps.

**Optional Edge Reflectors**

Edge reflectors are available to restrict the radiant energy to a rectangular area. The edge reflectors are constructed from the same materials used in the heater modules. Edge reflectors are specified in the model number or as accessories (in pairs), ordered separately from the Model 4555 heater.

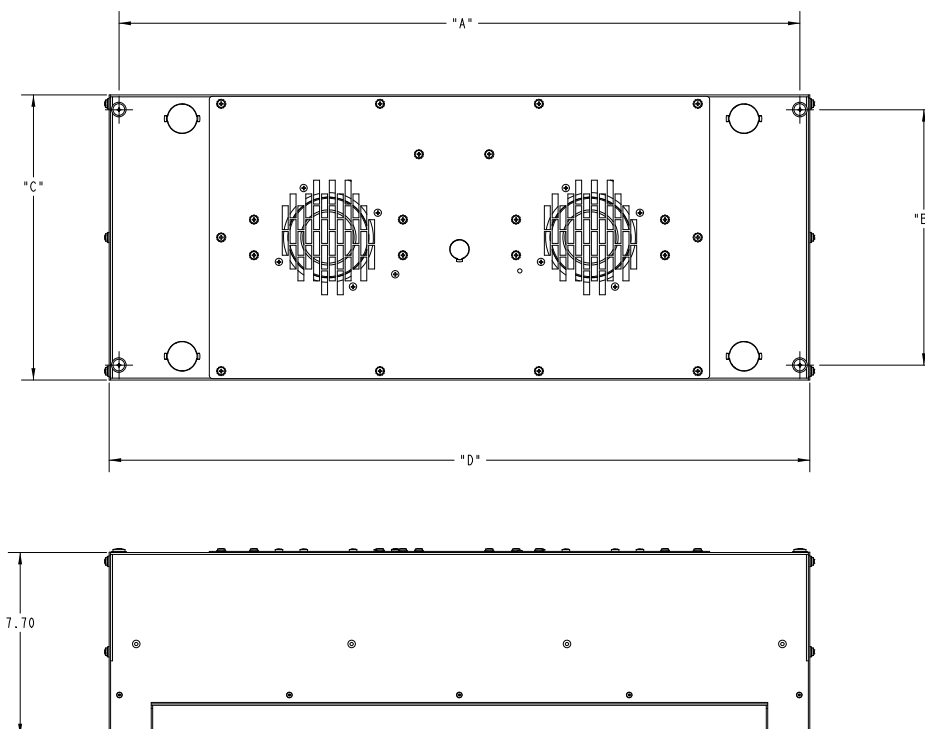
**Lamps**

A variety of high intensity, short wave or medium wave, tubular quartz, 'T3-style', halogen lamps are available for the different heated lengths of the Model 4555. The short wave emitter in these lamps has an operating temperature of approximately 4000°F (2205°C) with a spectral energy peak wavelength of 1.15 microns. The medium wave emitter has a temperature of 2450°F (1325°C) with a spectral energy peak wavelength of 1.8 microns. The numbers of lamps required to operate the various Model 4555 heaters are listed in Specifications. The lamps are included with the Model 4555 heaters but shipped separately to avoid damage.

**Mounting**

The back of the Model 4555 has four 1/4-20 X 1/2 inch screws installed for mounting purposes.

**Figure 2: Dimensions-Model 4555**





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Dimensions – Model 4555

Model	Lighted Length (LL) Inches (mm)	Overall Length (A) Inches (mm)	Overall Width (B) Inches (mm)	Voltage	Watts/in <sup>2</sup>	Short Wave Lamp	Medium Wave Lamp
4555-10	10 (254)	14.41 (365)	6, 9, or 12 inches (152, 229, 305, and 965 mm)	240	100	103390-003	106656-001
4555-16	16 (406)	20.41 (518)		240	100	103390-005	106656-003
4555-25	25 (635)	29.41 (746)		480	100	103390-007	106656-004
4555-38	38 (965)	42.41 (1076)		480	100	103390-010	106656-005

Ordering Information – Model 4555

Model	Product Description
4555	PanelIR High Density, Area Infrared Heater
Code	Length
10	10 Inches (254 mm)
16	16 Inches (406 mm)
25	25 Inches (635 mm)
38	38 Inches (965 mm)
Code	Lamp Width
06	6 Inches (152 mm)
09	9 Inches (229 mm)
12	12 Inches (254 mm)
Code	Lamp Type
MW	4.0 kW Medium-Wave
SW	4.0 kW Watt Short-Wave
Code	Reflector Type
AR	Aluminum Reflector
CR	Ceramic Reflector
Code	Blower Options
	120V Blower
	230V Blower
Code	Additional Options
	Edge Reflectors For:
ER10	10 Inches (254 mm) length
ER16	16 Inches (406 mm) length
ER25	25 Inches (635 mm) length
ER38	38 Inches (965 mm) length
00	None
Code	Custom Options
00	None



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### Ordering Example

	Model	Length	Width	Lamp Type	Reflector Type	Additional Options
Typical Model Number	4555	16	09	MW	AR	ER16

### Accessories, Spare, and Replacement Parts – Model 4555

Model	Description
	<b>Set of two edge reflectors for:</b>
ER-4555/4-10	10 Inches (254 mm) length
ER-4555/4-16	16 Inches (406 mm) length
ER-4555/4-25	25 Inches (635 mm) length
ER-4555/4-38	38 Inches (965 mm) length
M4555	Additional Operation Manual



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## Infrared Heaters For Controlled Concentrated Curing.

### Heater's Available From Research, Inc.

Research, Inc. is the industry leader in the design, development and manufacture of electric infrared heating components and integrated heating systems. Our products are designed to meet a wide variety of process requirements including the drying, heating, curing, soldering, bonding and annealing of many different materials.

Whether it's one of our standard products or a custom heating system, we are committed to providing solutions to meet our customer's most demanding heating needs. The following types of heaters are available:



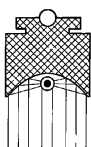
A single lamp and reflector heating system that focuses energy on a small (.25") target. Instant on/instant off capability makes it ideal for applications such as soldering, localized heat treating, and stress relieving.



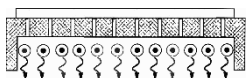
A lamp and formed reflector that concentrates heat precisely on a .25" wide line. Excellent for forming plastic, local heat treating and drying ink.



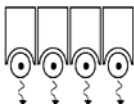
A lamp and formed reflector that provides even heat distribution across a 1.7" wide strip. Can be used for curing, drying and precise heating.



Designed with either ceramic or aluminum reflectors, the heater can provide consistent heat over a large area. Used for most drying and curing applications.



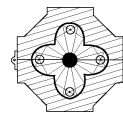
Offers the capability to create a custom area heater design to match the application's area heating needs. Multiple modules are housed



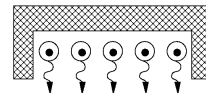
together in a sheet metal enclosure to provide the desired heating effect.



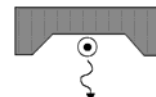
A cylindrical chamber with controlled, concentrated infrared energy for curing extrusions, drying ink in a moving line or heating a stationary test specimen.



Designed to provide high-intensity infrared heat onto localized areas with a high concentration of infrared heat. Excellent for annealing, heat treating, or providing controlled heat for high temperature controlled testing.



Designed with aluminum reflectors, the heater provides a low, uniform heat flux. Ideal for drying or curing adhesives, curing rubber/silicone and plastics processing.



An aluminum reflector and either medium or short-wave lamps provide a band of heat from .5" - 4" wide. Can be used for water-based drying, solvent-based drying and adhesive curing.



Used for efficient irradiation of test vehicle surfaces to simulate the infrared energy generated by the sun, planet reflection, and planet radiation inside a space chamber.



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# Application Chart

Family	Spot IR	Line IR	Strip IR	Panel IR	Chamber IR	Hi-Temp IR	Module IR	Lo-Temp IR	Dry IR	Simulate IR
Coatings	Cure and Melt Powders			✓					✓	
	Dry and Cure Paints	✓	✓	✓				✓	✓	
Composites	Dry Inks		✓	✓				✓	✓	
	Dry Adhesives		✓	✓				✓	✓	
	Preheating		✓	✓	✓			✓	✓	
	Resin Curing		✓	✓	✓			✓	✓	
Electronics	Curing	✓	✓	✓	✓					
	Filament Winding	✓		✓				✓		
	Laminating			✓				✓		
Material Testing	Ceramic Processing			✓						
	Shrink Insulation			✓						
	Soldering/ Desoldering	✓	✓							
	Thick Film Drying		✓							
	Wafer Processing					✓				
Metal Processing	Aerodynamic Heating Simulation					✓				✓
	Coupon Tests					✓				
	Structural Tests				✓					
	Thermal Stress Test				✓					
	Annealing	✓	✓							
	Brazing	✓	✓							
	Preheating	✓	✓	✓						
	Soldering	✓	✓	✓						
	Spring Stress Relief			✓						
	Weld Stress Relief			✓						
Plastics	Activating Thermo Transfer	✓	✓	✓				✓	✓	
	Bending		✓					✓		
	Bonding	✓	✓							
	Preheating	✓	✓	✓				✓		
	Thermoforming	✓	✓	✓				✓		
	Welding	✓	✓							
	Chocolates			✓						
Reglossing	Cosmetics									
	Plastic Tubing				✓					
	Soap		✓							
Rubber/ Silicone	Curing			✓						
	Pre-Cure			✓						
	Preheating	✓	✓	✓				✓		
	Vulcanizing			✓						



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