Panel IR
INFRARED HEATERS

# Infrared Heaters For Controlled Concentrated Heating

# Model 4555

## FAST. FOCUSED. CONTROLLED.

### 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

- 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

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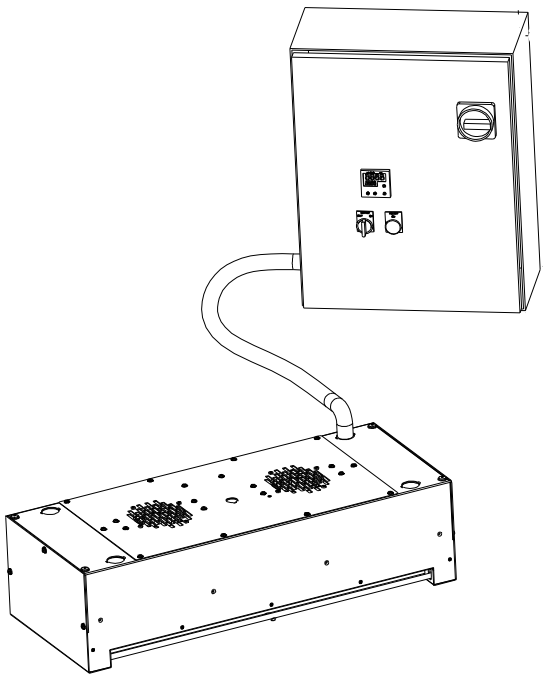
## Features and Benefits-PanelIR 4555

- 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 Model 4555 is modular in design allowing for multiple units to be installed side-by-side to create large areas of continuous heat output.

## Product Drawing-PanelIR 4555 with Controller



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# Product Description-PanelIR 4555

## Heater Construction

### Metal Housing

The Model 4555 PanelIR uses rugged aluminum housing to contain the lamps, blowers and reflector.

### Reflector

A polished aluminum or ceramic reflector is installed in the housing in back of the lamps to direct the heat toward the product. The choice of ceramic or polished aluminum is based on the application.

#### Polished Aluminum Reflector

Polished Aluminum Reflectors are the most commonly used. They have a lower thermal mass than ceramic and as a result, they allow the heater to respond quicker to changes in the lamp temperature.

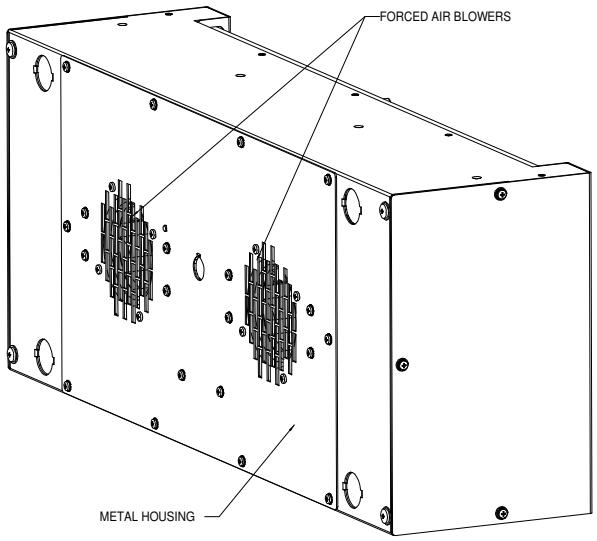
#### Ceramic Reflector

A ceramic reflector is generally used for applications where smoke or dirt are released as a part of the process. These contaminates will burn off of the ceramic reflector during operation so the reflector will not require cleaning.

The ceramic reflector is heavier than a polished aluminum reflector and has more thermal mass to it to take as much as 10 seconds to heat up to operating temperature and to cool down when the lamps are shut off.

### Forced Air Blowers

Blowers are installed in the housing behind the reflector. The blowers pressurize the chamber behind reflector and force air through the holes in the reflector to enhance the heating capability of the panel and to cool the end seals on the lamps.

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# Product Description-PanelIR 4555 cont.

## Heater Construction cont.

### Infrared Lamps

#### Short Wavelength Lamp

These lamps are generally used in applications where a product is to be heated or cured. These lamps may be operated in horizontal or vertical orientations. Typical short wavelength applications include:

- Heat treating metals
- Annealing metals
- Spot welding metals and plastics
- Localized softening plastics for bending or forming
- Curing silicone and other rubber extrusions

#### *Limitations

Absorption of short wavelength is affected by product color. Black and dark colors absorb well. Heating lighter colors may be more readily achieved with medium wavelength lamps.

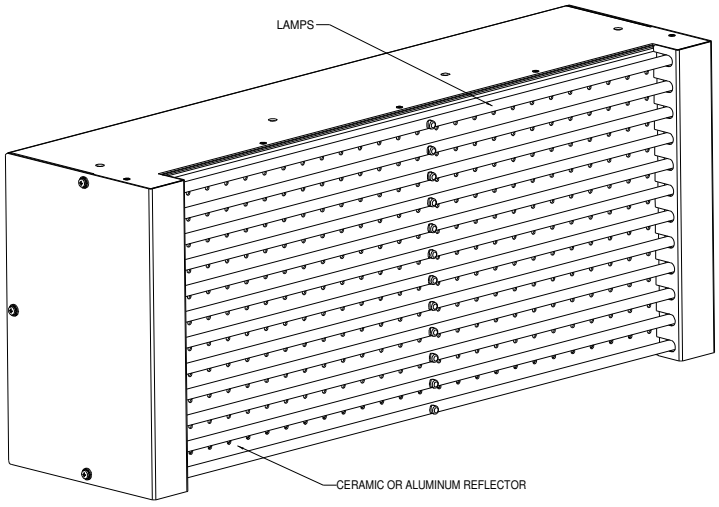
#### Medium Wavelength Lamps

These lamps are generally used in applications where a surface needs to be dried. They may only be operated in a horizontal orientation.

- High speed drying of water or solvent based ink
- Removing water after coil coating
- Heating substances such as Teflon that do not absorb short wavelength
- Heating lighter colored surfaces

#### *Limitations

Medium wavelength does not penetrate as deeply into metals, plastics, or rubber as short wavelength. They may only be operated in a horizontal orientation.

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# Product Description-PanelIR 4555 cont.

## Controls

The model 4555 PanelIR heater is designed to be powered by one of the standard Research Inc. control panels. The model of the control panel required depends on (1) the voltage and amperage required to power the panel, (2) the electrical service in the facility, and (3) the type of temperature control required for the process.

The 900 series control panels are for single phase power and the 925 series panels are for three phase power. Both series can be specified with circuit breakers from 20 amps to 60 amps and with manual or set point control.

Terminal blocks inside the panel allow convenient termination for incoming power, all lamps and the forced air blower. A step down transformer is included in the 440 volt panel to power the 220 volt blowers.

**Power Controller Chart for Model 4555 PanelIR**

This chart shows the control panels that are available for all sizes of the Model 4555 PanelIR heater.

| Heater Module | Power Controller | | |
|---|---|---|---|
| | 240 Volt 1 Phase | 240 Volt 3 Phases | 480 Volt 3 Phase |
| Model 4555-05-06 | 900-240-20 | | |
| Model 4555-05-12 | 900-240-40 | 925-240-30 | |
| Model 4555-10-06 | 900-240-40 | 925-240-30 | |
| Model 4555-10-09 | 900-240-40 | 925-240-30 | |
| Model 4555-10-12 | 900-240-60 | 925-240-30 | |
| Model 4555-16-06 | 900-240-60 | 925-240-30 | 925-480-30 |
| Model 4555-16-09 | | 925-240-60 | Not Available |
| Model 4555-16-12 | | 925-240-60 | 925-480-30 |
| Model 4555-25-06 | | | 925-480-30 |
| Model 4555-25-09 | | | 925-480-30 |
| Model 4555-25-12 | | | 925-480-60 |
| Model 4555-38-06 | | | 925-480-30 |
| Model 4555-38-09 | | | 925-480-60 |
| Model 4555-38-12 | | | 925-480-80 |



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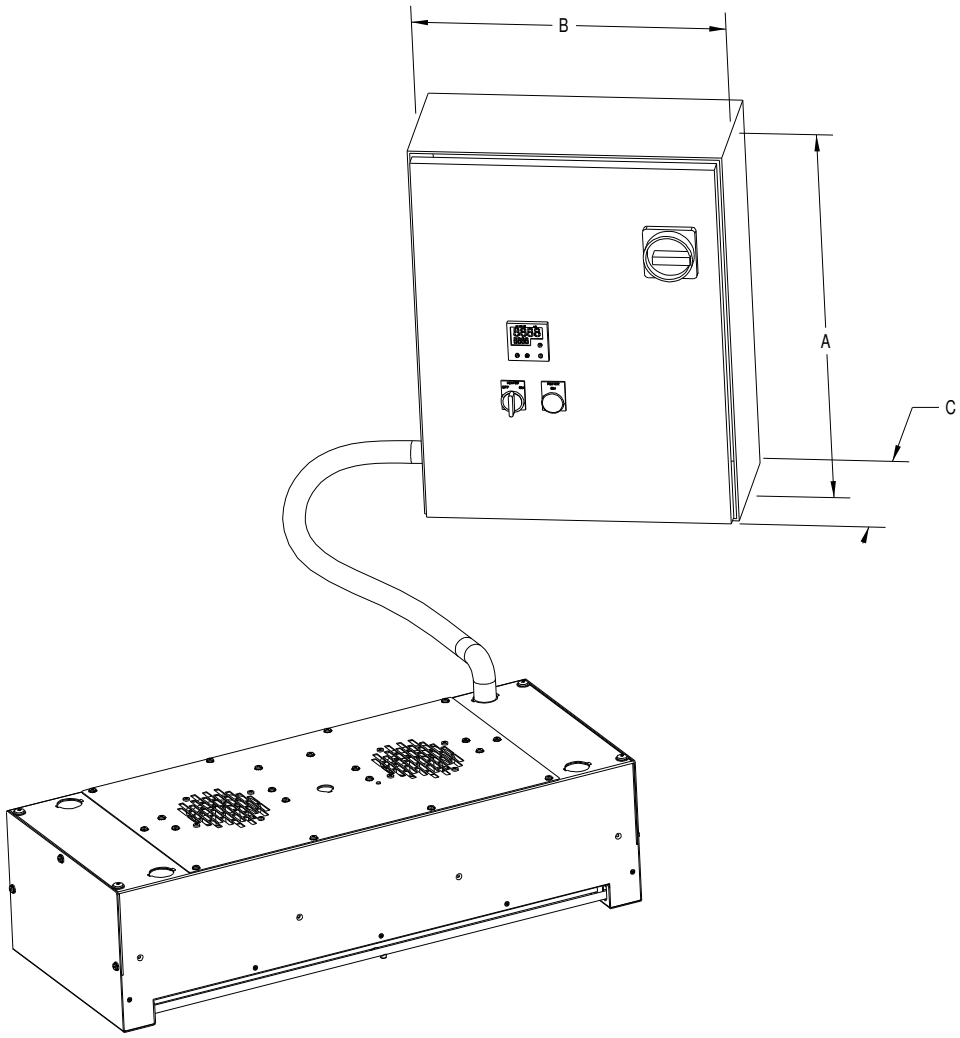
# Technical Information – PanelIR Model 4555

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## Product Description-PanelIR 4555 cont.

| Control Panel | Voltage | Circuit Breaker | Dimensions | | |
|---|---|---|---|---|---|
| **Single Phase** | | | A | B | C |
| Model 900-240-20 | 240 Volt | 20 amp | 20 inch | 16 inch | 8.62 inch |
| Model 900-240-40 | 240 Volt | 40 amp | 20 inch | 16 inch | 8.62 inch |
| Model 900-240-60 | 240 Volt | 60 amp | 20 inch | 16 inch | 8.62 inch |
| | | | | | |
| **Three Phase** | | | | | |
| Model 925-240-30 | 224 Volt | 30 amp | 20 inch | 20 inch | 8.62 inch |
| Model 925-240-60 | 240 Volt | 60 amp | 24 inch | 24 inch | 12.62 inch |
| Model 925-480-30 | 480 Volt | 30 amp | 20 inch | 20 inch | 8.62 inch |
| Model 925-480-60 | 480 Volt | 60 amp | 24 inch | 24 inch | 12.62 inch |
| Model 925-480-80 | 480 Volt | 80 amp | 24 inch | 24 inch | 12.62 inch |

## Control Options

All panels have an operator interface that allowed the heater to be controlled int any one of three operator selected modes.

**Manual Operation**

The digital control is used to directly set the percent uotput of the lamps from 0 to 100%.

**Automatic-Temperature Control**

The controller takes the input from a type “K” thermocouple or IR sensor and regulates the lamp output so the product temperature will match the preset value.

**Automatic-Line Speed**

The controller will take the output from a 0 to 10 VDC line that references line speed and vary the lamp output from 0 to 100% proportionally.

Once you have determined the appropriate size Model 4555 PanelIR Heater, please refer to the Power Controller to select the correct controller for your application.

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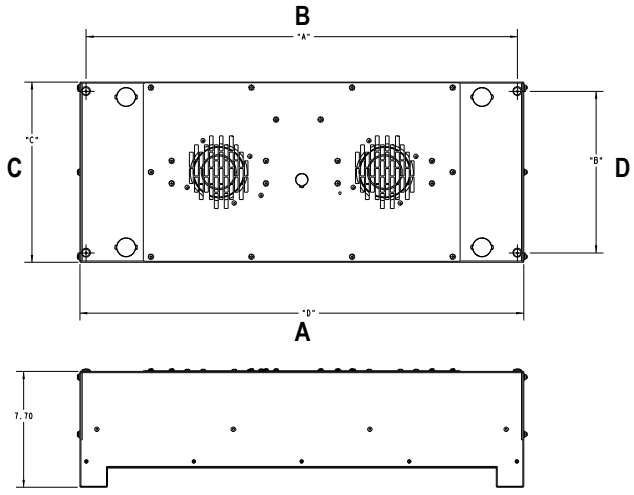
## SPECIFICATIONS – PanelIR 4555

| MODEL | Lighted Length | Dimension A | Dimension B | Dimension C | Dimension D |
|---|---|---|---|---|---|
| Model 4555-05-06 | 5 (127) | 9.28 | 8.58 | 6.00 | 5.375 |
| Model 4555-05-12 | 5 (127) | 9.28 | 8.58 | 12.00 | 10.75 |
| | | | | | |
| Model 4555-10-06 | 10 (254) | 14.28 | 13.58 | 6.00 | 5.375 |
| Model 4555-10-09 | 10 (254) | 14.28 | 13.58 | 9.00 | 8.375 |
| Model 4555-10-12 | 10 (254) | 14.28 | 13.58 | 12.00 | 10.75 |
| | | | | | |
| Model 4555-16-06 | 16 (406) | 20.28 | 19.58 | 6.00 | 5.375 |
| Model 4555-16-09 | 16 (406) | 20.28 | 19.58 | 9.00 | 8.375 |
| Model 4555-16-12 | 16 (406) | 20.28 | 19.58 | 12.00 | 10.75 |
| | | | | | |
| Model 4555- 25-06 | 25 (636) | 29.28 | 28.58 | 6.00 | 5.37 |
| Model 4555-25-09 | 25 (636) | 29.28 | 28.58 | 9.00 | 8.375 |
| Model 4555-25-12 | 25 (636) | 29.28 | 28.58 | 12.00 | 10.75 |
| | | | | | |
| Model 4555-38-06 | 38 (965) | 42.28 | 41.58 | 6.00 | 5.375 |
| Model 4555-38-09 | 38 (965) | 42.28 | 41.58 | 9.00 | 8.375 |
| Model 4555-38-12 | 38 (965) | 42.28 | 41.58 | 12.00 | 10.75 |

## Dimensions – PanelIR 4555

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# How to Order – PanelIR Model 4555

## 1. First Specify the heater Module

| PRODUCT DESCRIPTIONS PanelIR Model 4555 | |
|---|---|
| Model | **Description** |
| 4555 | PanelIR High Density Area Infrared Heater w / fan (s) Pressure Switch and Thermostat |
| Code | Length |
| 5<br>10<br>16<br>25<br>38 | 5 inches (127mm)<br>10 inches (254 mm)<br>16 Inches (406 mm)<br>25 Inches (635 mm)<br>38 Inches (965 mm) Short wave lamps only |
| Code | Lamp Width |
| 06<br>09<br>12 | 6 Inches (152 mm)<br>9 Inches (229 mm)<br>12 Inches (254 mm) |
| Code | Lamp Type |
| MW<br>SW | Medium-Wave<br>Watt-Short-Wave |
| Code | Reflector Type |
| AR<br>CR | Aluminum Reflector<br>Ceramic Reflector |
| Code | Custom Options |
| 00 | None |

* Example: 4555-05-06-SW-AR-00

## 2. Second – Specify the Power Controller

| Heater Module | Power Controller | | |
|---|---|---|---|
| | 240 Volt 1 Phase | 240 Volt 3 Phase | 480 Volt 3 Phase |
| Model 4555-05-06 | 900-240-20 | | |
| Model 4555-05-12 | 900-240-40 | 925-240-30 | |
| Model 4555-10-06 | 900-240-40 | 925-240-30 | |
| Model 4555-10-09 | 900-240-40 | 925-240-30 | |
| Model 4555-10-12 | 900-240-60 | 925-240-30 | |
| Model 4555-16-06 | 900-240-60 | 925-240-30 | 925-480-30 |
| Model 4555-16-09 | | 925-240-60 | Not Available |
| Model 4555-16-12 | | 925-240-60 | 925-480-30 |
| Model 4555-25-06 | | | 925-480-30 |
| Model 4555-25-09 | | | 925-480-30 |
| Model 4555-25-12 | | | 925-480-60 |
| Model 4555-38-06 | | | 925-480-30 |
| Model 4555-38-09 | | | 925-480-60 |
| Model 4555-38-12 | | | 925-480-80 |

## 3. Third – Order the Heater Module and Control Panel * Example: Model 4555-05-06-SW-AR-00 PanelIR and Model 900-240-20 Power Controller

# Accessories & Replacement Parts – PanelIR 4555

| ACCESSORIES AND REPLACEMENT PARTS PanelIR 4555 | |
|---|---|
| **Model** | **Description** |
| | Set of two edge reflectors for: |
| ER-4555/4-05 | 5 inch (127 mm) length |
| 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 |
| | **Short Wavelength Lamps** |
| 103390-001 | 5 inch, 500 watt |
| 103390-003 | 10 inch, 1600 watt |
| 103390-005 | 16 inch, 1000 watt |
| 103390-007 | 25 inch, 2500 watt |
| 103390-010 | 38 inch, 3800 watt |
| | **Medium Wavelength Lamps** |
| 106656-001 | 10 inch, 1000 watt |
| 106656-003 | 16 inch, 1875 watt |
| 106656-004 | 25 inch, 2500 watt |
| M4555 | Additional Operation Manual |

## Mounting

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

## 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. For arrays of multiple hookups, only one set of edge reflectors is required for the array.

PanelIR INFRARED HEATERS

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# Application Chart

| | Application | DryIR™ | ChamberI® | Extrudel™ | LineIR® | PanelIR® | ProfileIR™ | SpotI® | StripIR® | Hi-TempIR® |
|---|---|---|---|---|---|---|---|---|---|---|
| Coatings | Cure and Melt Powders | X | X | | | X | | | X | |
| | Dry and Cure Paints | X | X | | | X | | | X | |
| | Dry Ink | X | X | | | X | | | X | |
| | Dry Adhesives | X | X | | | X | | | X | |
| | Preheating | X | X | | | X | | | X | |
| | Resin Curing | X | | | | X | | | X | |
| Composites | Curing | | | | | X | | X | | X |
| | Filament Welding | | | | X | | | X | | X |
| | Laminating | X | | | | X | | | X | |
| Electronics | Ceramic Processing | | | | X | | | X | | X |
| | Shrink Insulation | X | | | | X | | | X | |
| | Soldering Desoldering | | | | X | | | X | | |
| | Thick Film Drying | X | | | | X | | | X | |
| | Wafer Processing | | | | | X | | X | X | |
| Trial Testing | Aerodynamic Heating Simulation | | | | | | | | | X |
| | Coupon Tests | | X | | | | | | | X |
| | Structural Tests | | X | | | | | | | X |
| | Thermal Stress tests | | X | | | X | | | | X |
| Processing | Annealing | | | | X | X | | X | | X |
| | Brazing | | | | X | | | | | X |
| | Preheating | X | X | | X | X | | | X | |
| | Soldering | | | | X | | | X | | |
| | Spring Stress Relief | | | | | X | | | X | X |
| | Weld Stress Relief | | | | X | | | X | X | X |
| Plastic | Bending | | | | X | X | | | X | |
| | Bonding | X | | | X | X | | | | X |
| | Preheating | X | X | | X | X | | | | X |
| | Thermoforming | X | X | | X | X | | | | X |
| | Welding | | | | X | | | | | |
| Glossing | Cosmetics | | | | | X | | | | X |
| | Plastic Tubing | | X | | | | | | | X |
| | Soap | | | | | X | | | | X |
| Rubber | Curing | | X | X | | X | X | | | X |
| | Pre-Cure | | X | X | | | X | | | X |

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## Products 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:

**ControlIR® INFRARED HEATERS**

All Model 5420 ControlIR®s have a power cable and plug to connect to a wall receptacle and a terminal block to terminate the wires coming from the heater. They all use a phase angle fired SCR to control voltage.

**DryIR® INFRARED HEATERS**

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.

**ExtrudeIR® INFRARED HEATERS**

The Model 4069E ExtrudeIR curing System uses high intensity infrared lamps and polished aluminum reflectors to deliver heat precisely where it is needed for many curing and drying applications on extrusion lines.

**LampIR® INFRARED HEATERS**

Research Inc. specifies tungsten filament halogen lamps in most of its heaters. Halogen gas is added to the inert lamp gas to increase the life of the lamp. As the heater operates, tungsten slowly evaporates from the filament and is combined with the halogen to create a tungsten halide.

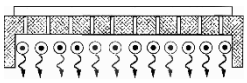
**ChamberIR® INFRARED HEATERS**

The Research, Inc. chamber heater can be ordered in many different sizes for your specific application.

**LineIR® INFRARED HEATERS**

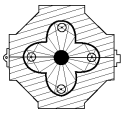
A lamp and formed reflector that concentrates heat precisely on a .25" wide line. Excellent for forming plastic, local heat treating and drying ink

**PanelIR® INFRARED HEATERS**



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

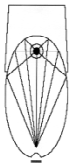
**ProfileIR® INFRARED HEATERS**



The Model 4069 ProfileIR® curing system uses high intensity infrared lamps and polished aluminum reflectors to deliver heat precisely where it is needed to cure irregularly shaped profiles.

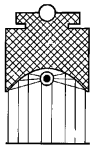
It can instantaneously give a surface cure that eliminates marks that occur when uncured rubber rubs on a conveyor.

**SpotIR® INFRARED HEATERS**



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.

**StripIR® INFRARED HEATERS**



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.

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