

# **DUREX**

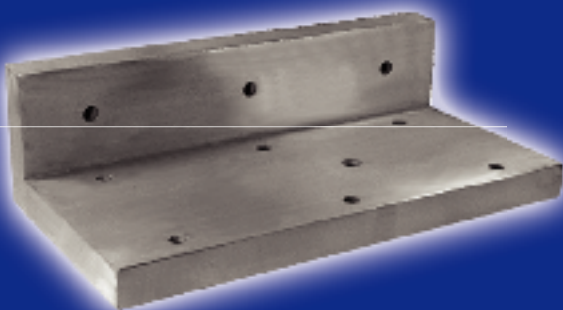
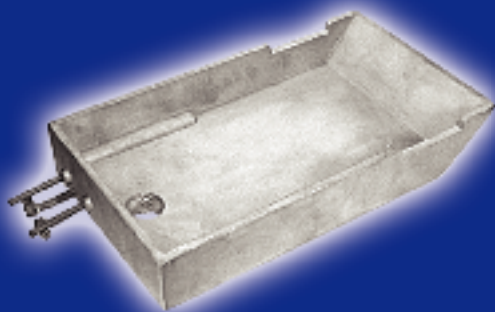
## **INDUSTRIES**

# **DUROCAST™**

## **CAST-IN HEATER**

### **PRODUCTS**





Durex Industries is the premier supplier of custom designed cast-in electric heaters for a broad range of thermal applications. Our capabilities range from large quantities of simple platens to complex heated machine parts with unmatched temperature uniformity. Our complete in-house facilities include:

- **CAD/CAM Design**
- **3-D Solidification Modeling**
- **CNC Machining**
- **Coordinate Measuring Machines**
- **Computerized Heat Profiling**
- **Full Foundry Services**
- **Tooling Fabrication**
- **Heating Element Manufacturing**
- **X-Ray Facility**
- **Teflon® Coating**
- **Life Cycle Testing**
- **UL/CSA Recognition**

Our engineering expertise and superior manufacturing techniques will deliver the customized thermal solution to meet and exceed your specifications.

## TYPICAL APPLICATIONS FOR DUREX HEATERS:

- *Chemical Processing*
- *Die Heating*
- *Foodservice Equipment*
- *Glue Pots*
- *Heat Sealing Equipment*
- *Heat Treating Equipment*
- *Hot Melt Dispensing Equipment*
- *Hot Stamping Machinery*
- *Laminating Equipment*
- *Medical Equipment*
- *Packaging Machinery*
- *Plastics Machinery*
- *Process Pipelines*
- *Solvent Reclaim Equipment*
- *Research and Development*
- *Semiconductor Processing*
- *Silk Screening Equipment*
- *Textile Manufacturing*
- *Vacuum Forming*



**PLASTIC EXTRUSION MACHINERY**

Cast-in heaters are an essential component for all plastics extrusion machinery. Durex designs and manufactures rugged extruder barrel heaters of aluminum and bronze for all machine sizes. Stringent machining tolerances on the inside working surface and robust element construction guarantee high performance from these critical machine components

**HOT MELT ADHESIVE SYSTEMS**

Hot melt adhesive delivery systems require complex cast-in heater designs to optimize melt flow while distributing even heat throughout the process. Durex heaters power high volume systems for automotive and industrial applications worldwide.

**HEAT TRANSFER PRESS-DIE HEATING-HOT STAMPING**

Platen heaters manufactured by Durex can be configured for operation in any equipment that requires a uniform and durable heat source. The unique characteristics of the cast-in heater allow for great versatility in mounting options and heating surface features.

**RUNNERLESS MOLDING SYSTEMS**

Precision casting and machining methods developed by Durex are used to manufacture a unique line of nozzle heaters for the plastic injection molding market. Cast-in nozzle heaters are superior to other nozzle heaters in superior durability and high temperature performance. The small inside diameter can be adapted to other applications such as pipe heating and heat exchangers.



**SEMICONDUCTOR**

Hot plates and chucks are manufactured by Durex with precision heat uniformity to meet the demands of wafer processing applications. Cooling stations provide chilling surfaces for liquid or gas induced applications. All platens are custom machined to application specific requirements.

**TEXTILE MACHINERY**

Processing of synthetic fibers for the textile industry requires custom heater design capable of extended service at high temperatures. Innovative mounting constructions and electrical terminations developed by Durex insure uninterrupted operation of machines used throughout the world.

**COMMERCIAL FOODSERVICE EQUIPMENT**

Cast-in heater products are used for the robust demands of the foodservice industry. Heat uniformity, rapid heat delivery, and continuous service are major design considerations for foodservice equipment. Durex designs and manufactures platen heaters for large volume production, guaranteed to perform to customer specifications each and every time.

**SPECIAL PURPOSE DESIGN**

Durex specializes in the design of custom heated components for unique applications. Our extensive experience with successful solutions across many industries can be put to work for your challenging requirements. Large or small, Durex can design the right heater for you.



## HEATING AND LIQUID COOL



This design features a cast-in heating element with an integral cooling tube for uniform process control. Cooling tube sizes of 3/8" or 1/2" diameter are available in stainless steel or Incoloy. Dual cooling tubes are also available to prevent any downtime associated with clogged cooling lines. A variety of electrical and cooling tube terminations are provided to customize the designs to your specifications (see page 8 and 9). Mounting the heaters to the extruder barrel can utilize a strap-on or bolt-on configuration.

## HEAT WITH AIR COOLING



Air-cooled heaters feature a variety of cast fin patterns to circulate forced air across the body of the casting. Specific fin patterns are used to maximize this airflow for efficient process cooling of the extruder barrel. Low profile fin patterns can be used for areas with restricted space or rapid cooling requirements. In some cases, the cooling capacity of the air-cooled design can be augmented with cast-in cooling tubes to maximize the cooling function.

**HEAT ONLY WITH NO COOLING**

The heat only design allows for a casting thickness down to 5/8". This provides a more reliable replacement alternative for mica band or ceramic band heater applications. Heat only cast designs can also be customized to fit onto pipes, elbows, or other irregular shaped surfaces.

**VENT CONSTRUCTION**

Designed to fit around vents on the extruder barrel, this construction has a specified area "cut out" of one half of the cast heater set. The other half can be supplied with or without additional holes.

**"L" SHAPE HEATERS**

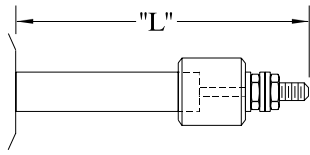
The "L" shape cast heater is designed for rectangular or square twin screw extruders. They are typically constructed of a bronze alloy due to high temperatures that are associated with these applications, however, aluminum can be used where lower watt densities are acceptable. The most common electrical termination for this design includes a vented tower protecting the heating elements as they exit the back of the casting with a moisture resistant terminal housing.

**CAST AIR SHROUDS AIR COOLING**

Cast shrouds are engineered to be an integral component for air-cooled applications. The shroud is designed to fit tightly over the fin pattern of an air-cooled heater. The shroud also features a throat section with a flange for mounting the blower and directing the airflow across the body of the casting. This system optimizes the air cooling function of individual heater zones through the dedicated operation of individual blowers.

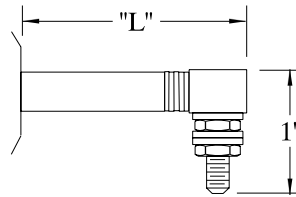


**ELECTRICAL TERMINATIONS**



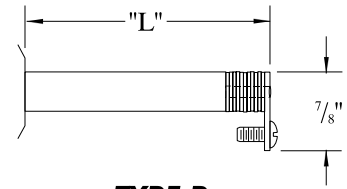
**TYPE S**

10-32 threaded screw terminal with ceramic insulator. Includes nuts and washers. Type S standard for cast-in heaters. 6-32, 8-32 and metric sizes also available.



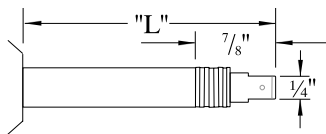
**TYPE A**

Right angle terminal block seated on mica washers with 10-32 threaded stud. Includes nuts and washers.



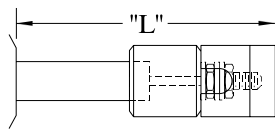
**TYPE R**

Screw lug terminal seated on mica washers and welded to pin. Includes 8-32 screw for wire connection.



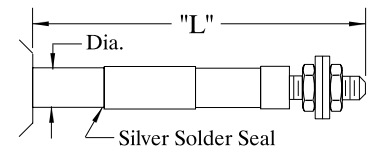
**TYPE D**

Quick-disconnect spade lug with 1/4" blade welded to pin. Other blade sizes available upon request.



**TYPE T**

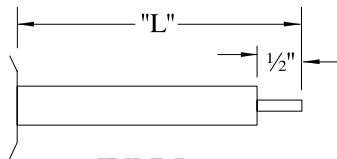
Ceramic insulator with ceramic top for insulation of electrical connections. Includes complete Type "S" termination with 10-32 threaded stud.



**TYPE HS**

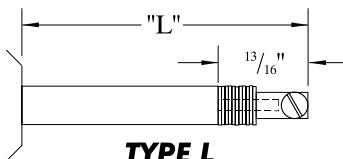
Ceramic to metal hermetic seal is silver soldered directly to heating element for moisture-proof termination. 10-32 screw terminal includes nuts and washers.

Dia.	"L"	Thread
.430	1 1/8"	1/4-28
.315	1 3/8"	10-32
.250	1 5/8"	8-32



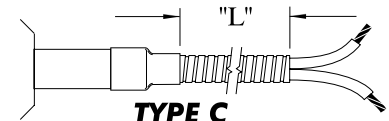
**TYPE P**

Plain pin for field attachment of termination. Pin length is 1/2" standard.



**TYPE L**

Terminal lug with 10-32 screw is welded directly to heater pin. Can be oriented straight or at a right angle.

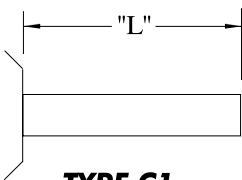


**TYPE C**

Flexible armor cable for abrasion resistance with high temperature leadwire attached to heating element. Specify "L" dimension when ordering.

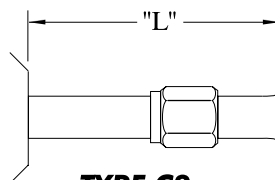
**Special Termination Design and Element Seals Are Also Available.**

**COOLING TUBE TERMINATIONS**



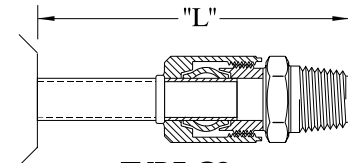
**TYPE C1**

Plain cooling tube cut to standard 3" length extending from heater. Specify longer length if required.



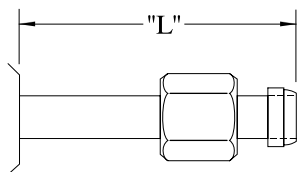
**TYPE C2**

37° Flare nut fitting allows for cooling tube connection to compression fitting.



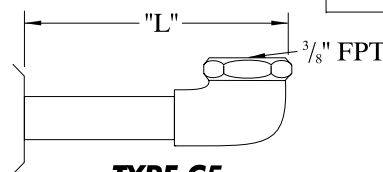
**TYPE C3**

Compression fitting mounted directly to cooling tube provides seal for high pressure hook up. Available in standard 3/8" and 1/2" NPT. 3/8 Dia #55-0010 1/2 Dia #55-0011



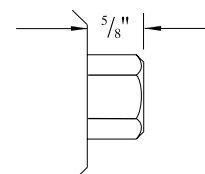
**TYPE C4**

Brazed seal with locknut provide an effective seal for high pressure applications. Mating fittings available upon request.



**TYPE C5**

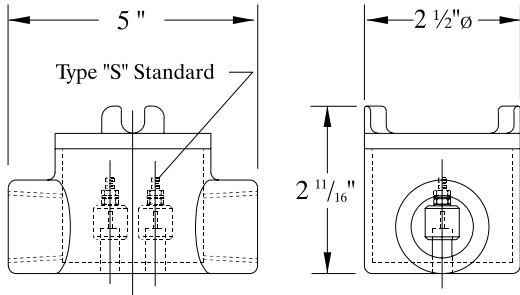
Brazed angle fitting mounted directly to cooling tube with right angle 3/8 FPT as standard. Specify "L" dimension for clearance.



**TYPE C6**

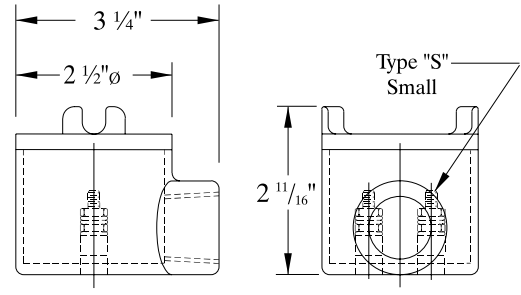
Cast-in fitting with standard 3/8 FPT for quick installation of cooling lines with no additional fittings.

PROTECTIVE HOUSINGS



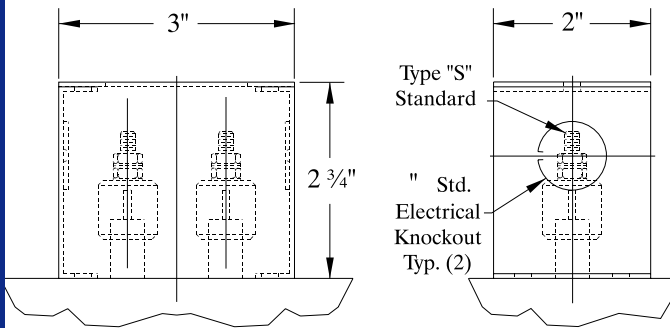
**Type B1**

Explosion proof cast iron housing with 1/2" NPT double hub. Single phase design shown. Larger housing for 3 phase design also available.



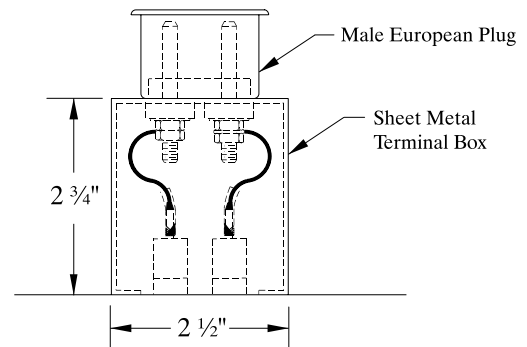
**Type B2**

Explosion proof cast iron housing with 1/2" NPT single hub. Single phase design shown. Larger housing for 3 phase design also available.



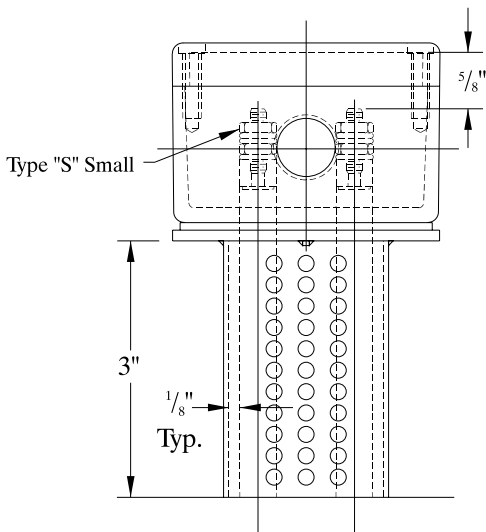
**Type B3**

Standard size stainless steel sheet metal box with (2) 1/2" electrical knockouts. Other sizes and types available.



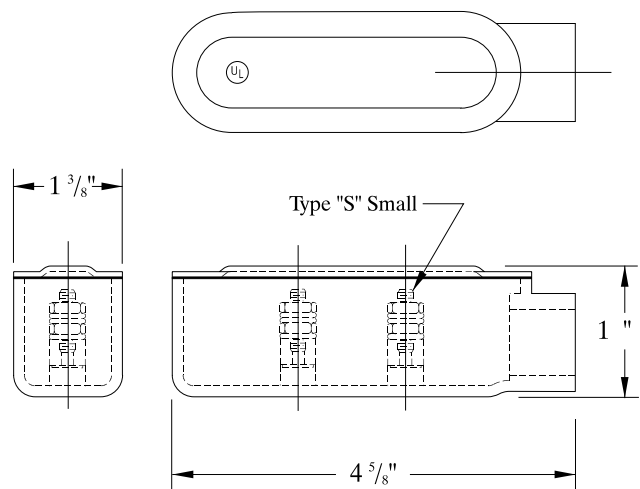
**Type B4**

Stainless steel terminal enclosure with male ERGE plug mounted on top. Mating connections available upon request.



**Type B5**

Die cast aluminum enclosure with 1/2" or 3/4" threaded electrical connections mounted to vented cooling tower. Other sizes and types available for single and 3 phase designs.



**Type B6**

Explosion proof box with 1/2" NPT single hub, designed for low profile applications. Single phase only. Different hub configurations are available.

## HEATER SPECIFICATIONS

### CAST MATERIALS

Aluminum 443	<b>MAX. OPERATING TEMPERATURE</b> 800° F (427°C)
Aluminum 319/356	700° F (371°C)
Bronze/Copper alloys	1400° F (760°C)
Iron	900° F (482°C)

*If required, other cast materials are available.*

### CAST PROCESSES

Durocast™ perm-mold system uses steel permanent molds. No bake sand system for special castings and short production runs.

### MACHINE FINISH

CNC machining is performed for tight tolerances and complex configurations. Milled finishes, turning, boring and other machine finishes are provided per specification. Belt sanding, lapping and polishing available to meet application specifications.

Standard Machine Finish Range: 64 to 125 rms.  
 Fine Finish Per Specification: 8 rms. to 32 rms.  
 Standard Flatness: Belt Sanded: .015  
 Milled: ±.005  
 Lapped: .001

### HOLES, CUTOUTS, THERMOWELLS

Mounting or clearance holes, cutouts and thermowells, for inserting temperature measurement probes, cast-in or machined per your specifications.

## SPECIAL SERVICES

**Radiograph (X-ray):** Confirmation of internal element configuration and casting soundness available through X-ray.

**Plating/Coating:** Electroless nickel plating, anodize, Teflon coatings and special blasted surfaces are available per customer specification.

**Pressure Testing:** High pressure leakage testing is done in-house per application requirements.

**Heat Treating:** Stress relieving and aging through heat treating available as required.

**CMM Inspection:** Coordinate Measuring Machine used for precision quality control of tight tolerance machining requirements.

**Helium Leak:** Detect microleakage from casting body.

### Temperature

**Uniformity:** Confirm heat uniformity across the finished surface.

### INSERTS

Threaded studs, precision component parts, bushings and special design parts cast accurately in place.

### ELECTRICAL

Resistance tolerance NEMA standard +10% -5%.

Voltages:

Element diameter	.200	.260	.315	.430	.475
Maximum volts	240	240	277	600	600

(Three phase available on large heaters.)

Maximum watt densities depends on size and application. Consult a Durex Engineer.

### UL COMPONENT RECOGNITION

DA series cast-in heaters are recognized per file E110394.

### INSPECTION/TESTING

- Electrical per UL 499 and UL 1030, Canadian Standard C22.2 No. 72
- Dimensional per specifications using Coordinate Measure Machine
- Quality standard per MIL-Q-9858A

## BARREL HEATER ORDERING INFORMATION

**Heater Type:**  ½ Round Strap-on (set)  
 ½ Round Bolt-on (set)  
 Full Ring (piece)

**Material:**  Aluminum  Bronze

**Dimensions:** ID \_\_\_\_\_ Width \_\_\_\_\_ Thickness (1¼ STD) \_\_\_\_\_

**Electrical:** Watts/Half \_\_\_\_\_ Volts/Half \_\_\_\_\_ Phase \_\_\_\_\_

**Cooling:**  Single, ¾ OD, SS.  Single, ½ OD, SS.  
 Single, ½ OD, Incoloy.  Dual, ½ OD, SS.  
 Dual, ½ OD, Incoloy.

**Electrical Terminations:**  Type S-Thread Stud.  Type A-Right Angle Term.  
 Type T-Ceramic Cap  Type C-Armor Cable  
 Other \_\_\_\_\_ Length: \_\_\_\_\_  
*(See pages 8 and 9)*

**Cooling Terminations:**  Type C-Plain Tube.  Type C6-Cast-in ¾ FPT  
 Other \_\_\_\_\_  
*(See page 8)*

**Special Features:** \_\_\_\_\_

\_\_\_\_\_  
*(Cutouts, T/C Holes, Special Machining, Mounting Studs)*

## PLATEN HEATER ORDERING INFORMATION

**Material:**  Aluminum  Bronze

**Dimensions:** ID \_\_\_\_\_ Width \_\_\_\_\_ Thickness \_\_\_\_\_

**Electrical:** Watts \_\_\_\_\_ Volts \_\_\_\_\_ Phase \_\_\_\_\_

**Terminations:**  Type S-Thread Stud.  Type A-Right Angle Term.  
 Type T-Ceramic Cap  Type C-Armor Cable  
 Other \_\_\_\_\_ Length: \_\_\_\_\_  
*(See pages 8 and 9)*

**Surface Finish:**  As Cast  125 RMS  
 64 RMS  Belt Sanded

**Surface Finish:**  Teflon  Nickel  Anodized

**Special Features:** \_\_\_\_\_

\_\_\_\_\_  
*(Mounting Holes, Notches, Helicoils, T/C Holes)*

# **DUREX**

## **INDUSTRIES**

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