



Introduction

Cast heaters provide the ultimate long-term solution to machine heating, giving an unrivalled heat source where machine and die physics allow their use. LPC engineers have developed cast heaters for almost all current process applications including; Extruder barrels, Injection moulding machines, Hot presses, Hot stamping, Textile irons, Multiple colour feeds, Glue pots, Dies and filter units, Mould tools, Curing tables, Sealing bars/platens, Blow moulder heads, Crossheads, Flameproof mediums.

Ordering Procedure

Specify: Type, Width, Length, Diameter (if applicable), Watts, Volts, Holes & Cut-outs, Termination, Clamping & Mounting. Ideally please provide a sketch or photo with your enquiry.

Construction

Cast heaters consist of a tubular element which is bent and formed to the required shape then cast into brass, bronze or aluminium as required, care being taken to stay the element during the process to prevent it deforming. Contact surfaces and critical dimensions are machined with precision and a variety of terminations to the cold legs are available.

Design

Cast heater design lends itself to a much wider range of applications than other heaters. From conventional round, flat, 'U' shape or disc types, for example, to the more complex tasks providing barrel temperature control, in the form of air and liquid heater coolers.

Barrel Control

The controller/heater marriage is very sensitive. Under certain conditions straightforward proportional control can result in severe temperature oscillations beyond the tolerance of material being processed. Proportional, integral and derivative control (PID) minimises this problem by handling the thermal lag times and allowing for the adiabatic heat generated by the screw during processing. With both air and liquid cooled heaters the control situation can be assisted by careful design of the finning and the cooling tube layout.

Air Cooled System

Finned heater-coolers offer the most economical solution to barrel temperature control as they can be applied as replacements for existing heater systems without the cost of expensive chiller units and softening plant.

Advantages:

- Lower costs
- Simple to install
- Generally maintenance free
- Clean and safe to operate
- Easy to install
- Simple to balance and adjust control



Liquid Cooled Systems

Where the rate of cooling achievable with finned heaters-coolers is insufficient then liquid cooled systems can provide the answer, particularly for high speed extrusion where heat generated by the screw during processing is often excessive. A particular problem with liquid cooled systems is the rate at which mineral deposits tend to accumulate in the cooling tubes. LPC uses a system of deploying large bore tubing (9.5mm, 12mm or 15mm) and designing the layouts in a horizontal free flow method to avoid gravity traps within the heater. Dual tubes can also be provided for extra cooling or as spare circuits for an extended life.

LPC can supply complete systems – including heaters, shrouds, fans and controllers if required. Our engineers are happy to advise on any conversion or application required.

Product Details

Manufacturing Tolerances

Resistance: $\pm 10\%$
 Wattage: $\pm 10\%$
 Voltage: Tubular: 6mm OD up to 260volts
 8mm OD up to 440volts
 11mm OD up to 580volts

Loadings:

Aluminium: 40w/sq ins 400°C
 Brass/Bronze: 50w/sq ins 550°C

Temperatures:

Recommended appliance temperature: 300°C
 Highest appliance temperature available: 600°C

Machining:

Larger heaters [$> 150\text{mm id} \times 300\text{mm wide}$]: $\pm 0.25\text{mm}$
 Small heaters [$< 150\text{mm id} \times 300\text{mm wide}$]: $\pm 0.125\text{mm}$

Sizes:

Thickness: Plate heaters: 20mm min
 Round heaters: 20mm min
 Finned heaters: 37mm min
 Heater coolers: 43mm min
 Length: Plate heaters: 60mm min
 Diameter (ID): 10mm min, 800mm max
 Width: 20mm min, 800mm max

Cooling tubes:

9.5mm, 12mm or 15mm
 304 Stainless or Incoloy

Material:

Aluminium: LM4 or LM6 spec
 Brass/Bronze: to customer specification

Testing:

All heaters are tested to British standards BS7351 and cooling tubes are pressure tested to 150 p.s.i.

