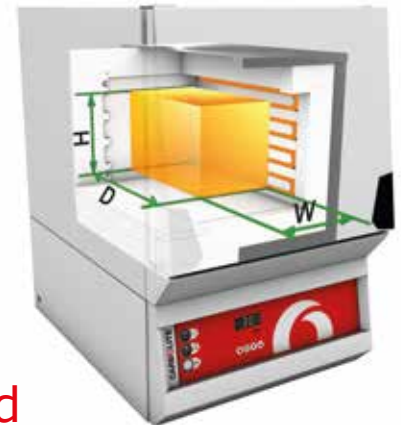


**26 Chamber Furnaces Selection Guide**

Carbolite Gero's extensive chamber furnace range has a maximum operating temperature of 1800°C and chamber capacities up to 725 litres. They are suitable for a variety of laboratory, pilot scale and industrial applications. Although there is flexibility in size and temperature, if the application requires the use of modified atmosphere (above 1100°C) or vacuum then a furnace from Carbolite Gero's tube furnace range should be selected.

Carbolite Gero's design features optimised uniform zone



## The selection of a chamber furnace should take into account the following factors:

### General considerations

- Chamber furnaces have the advantage of being able to heat larger items than tube furnaces
- The size of the chamber required and how it is loaded/unloaded will determine which style of furnace is best for the application
- For applications involving chemical vapours, gases or humidity please check with Carbolite Gero or your local dealer which furnace meets the requirements

### What temperature?

- Carbolite Gero considers all products above 700°C which are heated using radiant heat, (rather than convection), as furnaces
- The range of chamber furnaces is available up to a maximum operating temperature of 1800°C
- Continuous operation of a furnace at its maximum temperature will reduce its life. Recommended maximum continuous operating temperature is 100°C below the maximum operating temperature
- Furnaces are designed to operate at high temperatures. Operation below temperatures of approximately 600°C will be less accurate and continuous use at low temperatures may reduce the element life of some furnaces, ie MoSi<sub>2</sub> heated furnaces
- Each furnace has a uniform working volume; this is a three-dimensional space which meets a specific tolerance and is smaller than the total chamber volume. Carbolite Gero's designs optimise this uniform volume for applications that require a specific temperature uniformity (the image top right shows a typical optimised uniform zone h x w x d)

### Chamber design

- The simplest and least expensive furnaces have front opening side or bottom-hinged doors
- Higher specification front opening 'up and away' vertically lifting doors keep the hot face insulation away from the operator, increasing safety and comfort
- Where tall objects and crucibles need lifting in and out of the chamber, vertically loading furnaces with heating elements in the chamber sides are available
- Bottom loading furnaces allow the load to be lifted into the heated chamber, or lowered to cool them

### Modified atmosphere

To work with inert gases or modified atmosphere, one of the following options must be selected at order placement:

- A gasket, elastomer seal or sand sealed retort in a front opening chamber furnace
- An inverted crucible on a modified hearth in a bottom loading furnace (BLF 1700°C and 1800°C models)

### Temperature control

- All furnaces are supplied with accurate PID (proportional, integral and derivative) single ramp to setpoint controllers providing accurate control and minimal temperature overshoot. Higher temperature furnaces feature an 8-segment programmer as standard
- Multi-segment and/or multi-program controllers are available as an option on most models, please see pages 94–97
- Over-temperature protection is strongly recommended when a furnace is operating whilst unattended, or where the sample is valuable

### Application specific and custom built furnaces

Carbolite Gero designs and manufactures all the furnaces within its range. Many options are available, as well as fully customised furnaces for specific applications. For examples of custom built furnaces and ovens please see pages 82–91 or separate catalogue 'Custom Designed Ovens & Furnaces up to 1800°C'