

GPCMA - Modified Atmosphere Chamber Furnaces

Our GPCMA chamber furnaces are equipped with a metallic retort to provide a uniform heated volume with a controlled atmosphere. These floor-standing models have a smooth action double pivot door. Available with a range of maximum temperatures from 1000 °C to 1200 °C depending on the selected retort material. Retort working volumes range from 37 to 245 litres. Oxygen levels can be reduced to 30 ppm depending on the application. Perfect for stress relieving additive manufactured components particularly those produced via DMLS. This range of furnaces can be optionally specified for compliance to AMS2750E Nadcap Class 1 for aerospace applications.



GPCMA/174 with semi automatic gas system with digital flowmeters and data logging options

Applications

- Stress relieving 3D printed additive manufactured parts
- Pyrolysis
- Debinding

Standard features

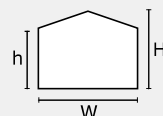
- A range of maximum temperatures dependent on retort material:
 - 310 Stainless Steel retort 1000 °C maximum
 - 314 Stainless Steel retort 1050 °C maximum
 - Inconel 601 retort 1100 °C maximum
 - Haynes 230 retort 1150 °C maximum
 - APMT retort 1200 °C maximum
- Programmable 3508P1 controller
- 2-zone cascade control
- Over-temperature protection
- 37, 56, 117, 174, 208, or 245 litre retort volume
- Semi-automatic gas system with analogue flowmeters for nitrogen
- Free radiating coiled wire elements on two sides, the roof and under the hearth (37 litre: two sides and under hearth)
- Low thermal mass insulation for fast response & energy efficiency
- Smooth action double pivot door shields the user from excessive heat
- Type R control thermocouples
- Internal retort thermocouple: type K up to 1100 °C, type N above 1100 °C
- Silicone rubber water cooled door seal
- Door safety interlock

Options (specify these at time of order)

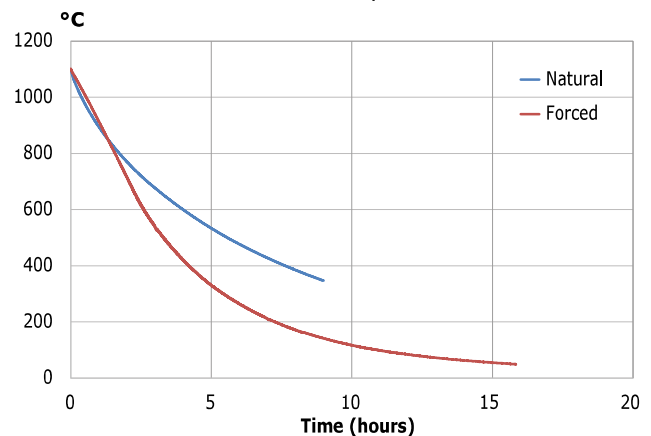
- Vacuum option (10⁻² mbar) for faster atmosphere exchange **at room temperature only**. A vacuum retort **MUST** be ordered with this option
- Semi-automatic gas system with analogue flowmeters for argon
- Semi-automatic gas system with digital flowmeters (will be data logged if a data logger option is selected)
- Automatic gas system with gas monitoring and control with mass flow controllers
- Oxygen monitoring system with 3504 programmer
- Automatic forced cooling system
- Afterburner option (NOT compatible with vacuum option/ vacuum retorts)
- Chiller unit, 5 litre/min, 1 kW.
- A range of sophisticated digital controllers, multi-segment programmers and data loggers is available. These can be fitted with RS232, RS485 or Ethernet communications (see pages 106 - 111)
- AMS2750E Nadcap compatible models are available
- Various loading and unloading options can be supplied

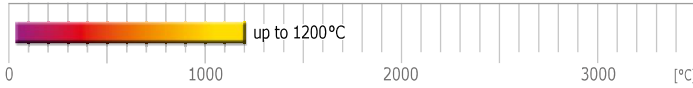
GPCMA retort internal dimensions

Model	Height h/H [mm]	Width W [mm]	Depth [mm]
GPCMA/37	205/230	337	538
GPCMA/56	238/295	400	665
GPCMA/117	278/345	500	815
GPCMA/174	428/495	500	815
GPCMA/208	428/495	500	965
GPCMA/245	500/574	600	815



Cool down rates for GPCMA/174





GPCH2 - Hydrogen atmosphere

The Carbolite Gero GPCH2 furnaces are designed specifically for use with a hydrogen atmosphere. The GPCH2 furnace range has the same retort capacities as the GPCMA furnace range and incorporates all the safety equipment required for safe use with hydrogen.

Please refer to the Carbolite Gero GPCH2 product range which is detailed in the 'Vacuum, Inert and Reactive Gas Furnaces catalogue'.



GPCH2

Furnace capacity for typical AM base plate sizes

Model	Retort capacity Plate size 350 x 250 x 250 (H x W x D) [mm]	Retort capacity Plate size 400 x 400 x 400 (H x W x D) [mm]
GPCMA/37	1 plate, max height 100 mm	Not applicable
GPCMA/56	1 plate, max height 150 mm	Not applicable
GPCMA/117	2 plates, max height 200 mm	1 plate, max height 200 mm
GPCMA/174	2 plates, max height 350 mm	1 plate, max height 350 mm
GPCMA/208	3 plates, max height 350 mm	2 plate, max height 350 mm
GPCMA/245	4 plates, max height 400 mm	1 plate, max height 400 mm



Temperature Uniformity

- Can achieve AMS2750E Class 1, instrument type B: $\pm 3^\circ\text{C}$

Temperature and atmosphere requirements for AM metals heat treatment

Carbolite Gero product range	Material	Temperature	Atmosphere
HTMA (see page 22)	Aluminium	500°C	Air or inert gas
GPCMA	Titanium	900°C - 1100°C	Argon
GPCMA	Tool Steel	900°C - 1100°C	Argon
GPCMA	Co/Cr	1150°C	Argon
GPCMA	Inconel 718	960°C & 1060°C Requires fast cooling to 200°C. (2-4 hrs)	Argon
GPCMA	Ti-6Al-4V	750°C - 950°C	Argon
GPCMA	Inconel 625	900°C	Argon
GPCMA	Copper alloys	900°C	Argon

Technical data

Model	Retort Volume [litres]	Max. temp with Retort	Dimensions (H x W x D) [mm]			Power [W]	Weight [kg]
			External Overall Size	Retort Internal Size	Uniform volume $\pm 5^\circ\text{C}$		
GPCMA/37	37	dependent on retort material	1990 x 900 x 1326	205 x 337 x 538	100 x 250 x 300	17000	220
GPCMA/56	56	dependent on retort material	1846 x 1260 x 1725	229 x 400 x 610	150 x 275 x 300	24000	485
GPCMA/117	117	dependent on retort material	1896 x 1360 x 1875	279 x 500 x 840	200 x 400 x 550	30000	608
GPCMA/174	174	dependent on retort material	2045 x 1360 x 1875	428 x 500 x 815	350 x 400 x 550	36000	705
GPCMA/208	208	dependent on retort material	2045 x 1360 x 2025	428 x 500 x 970	350 x 400 x 800	39000	800
GPCMA/245	245	dependent on retort material	2145 x 1460 x 2025	500 x 600 x 815	400 x 500 x 500	45000	950