



1300°C

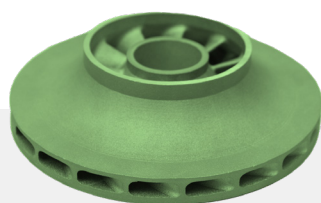
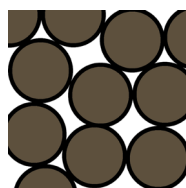
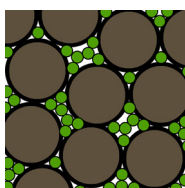
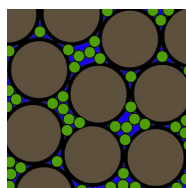
LEADING HEAT TECHNOLOGY

**ENABLING THE WORLD OF
ADDITIVE MANUFACTURING**

GLO 8/13 – ALL-IN-ONE DEBINDING AND SINTERING SOLUTION

Carbolite Gero offers the GLO 8/13 furnace, a compact and versatile debinding and sintering solution for additive manufacturing. This furnace features rotationally symmetrical heating elements that encompass a 180 mm iD cylindrical retort, providing even heating throughout its length. It is suitable for all additive manufacturing processes that require either nitrogen, argon, or forming gas (N₂/H₂ 95/5% or Ar/H₂ 98/2%). With a maximum temperature of 1300 °C, this furnace can accommodate nearly 80% of printed metals.

Annealing
Stress-Relieving
Debinding
Sintering
Heat Treatment



GREEN PART

< 600 °C

Debinding



BROWN PART

< 1400 °C

Sintering



FINAL PART

In the 3D printing of metal or ceramic components using techniques such as binder jetting, lithography, or metal extrusion, a binder is typically used to maintain the integrity of the structure. It's essential to eliminate this binder from the green part to enable the sintering of the powder particles. A multi-stage debinding process is often employed, commencing with an initial debinding step at low temperatures up to 250°C (which may only involve drying). Following this, the complete removal of organic materials occurs at temperatures ranging from 400 to 600°C, resulting in the formation of the brown part.

During this process, off-gases and volatiles are handled using a binder trap or afterburner, which can be powered thermally or catalytically. After a final debinding step the part is sintered at approximately 80% of the metal's melting temperature. At this stage, all particles soften and begin to form interconnecting bridges, leading to a solid-state reaction and fusion. The complete removal of the binder is critical to ensure a low carbon content and to prevent a reduction in the material's melting point due to the formation of a eutectic phase.

MORE INFORMATION ON AM & FURNACES



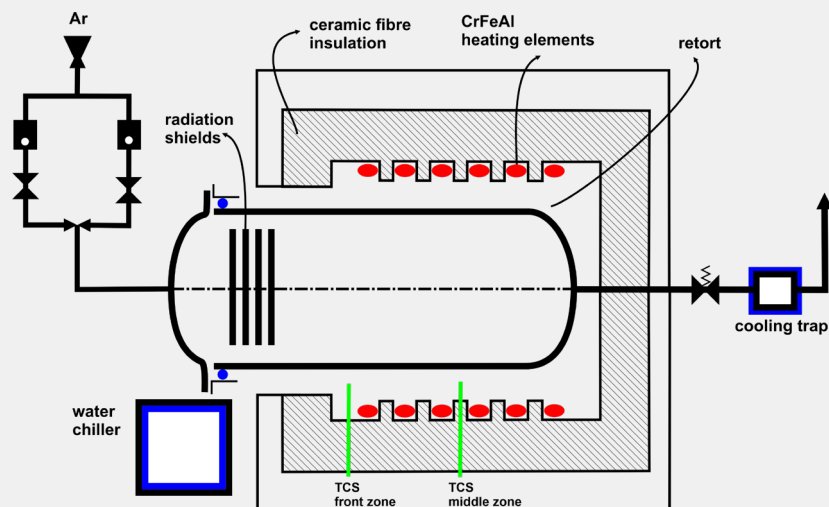
WEBSITE



BROCHURE

WHY CHOOSE A GLO 8/13?

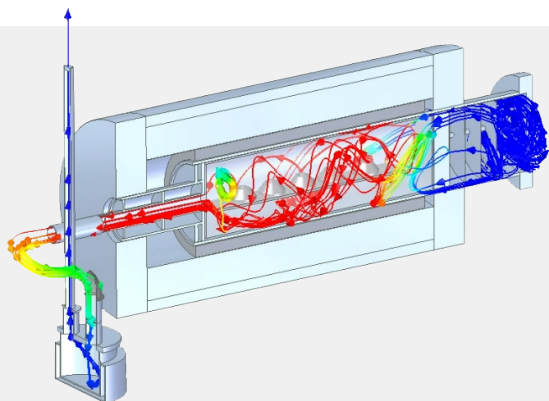
1. Versatile furnace with a small footprint, ideal for areas with constraint space
2. Robust design for temperatures at the sample of approx. 1280°C
3. Separate front zone with offsets to adjust and improve the temperature uniformity
4. Low energy consumption due to multiple insulation layers and intelligent design
5. Optimized gas outlet for efficient binder removal
6. Covers approx. 80% of AM metals and enables a cost-effective solution, opening doors into the AM world



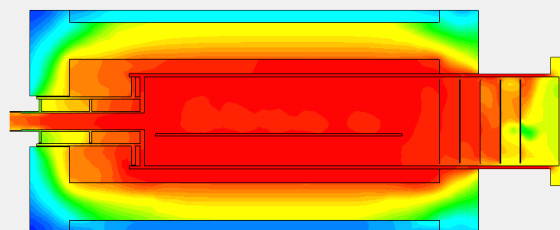
A combination of an over pressure valve and COOLING TRAP ensures the condensation of binder. Almost all condensables with a condensation point above 20°C are trapped. It is easy to clean and maintain.

ADVANCED STANDARD FEATURES

- | Rotameter (flow controller) for process and purge gas
- | 2-zone control with thermocouple type S
- | Build in cooling trap and over pressure valve
- | Build in water cooling chiller
- | Designed to withstand 1300°C
- | Placed on castor rollers to locate the furnace anywhere suitable
- | Plug & Play power and gas connections



In red arrows indicate the removal of the binder @ 600°C. The high turbulent gas flow efficiently removes organics.



Temperature uniformity during debinding step @ 600°C with 10 small plane Ø 80 mm samples placed on the rack.

SMART CONTROL SYSTEM

TOUCH PANEL

CC-T1 touch controller (4.3" 480x272 Pixel)

Resistive color display

Eurotherm EPC2000

Single setpoint and program file control

Real time clock and program scheduler

Ethernet & USB connection

Storage of 10 programs

24 Segments (steps, dwell times) per program

All working setpoints and process values stored in .csv-file format

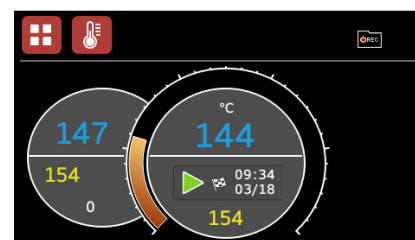
Automatic & manual batch file saving for each furnace run

Recording time resolution of 10 seconds

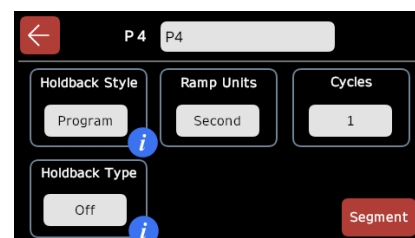
3 different user levels as standard

English, German, Chinese, Japanese, French, Italian, Spanish, Russian

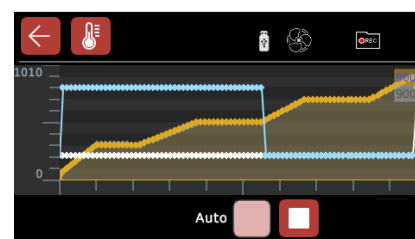
Accessible via Eurotherm iTools software



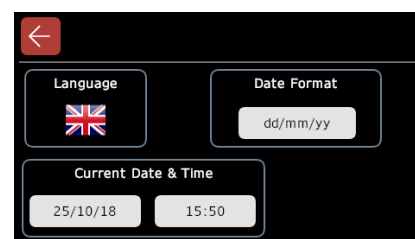
OVERVIEW SCREEN



INTUITIVE PROGRAMMING



DATA LOGGING & TREND VIEW



LANGUAGE ADJUSTMENTS

Please note: This unit is indented for debinding and sintering processes with maximum binder content of 750 g (5 mass% @ 15 kg load). Regular cleaning of the condensate trap is mandatory.

★★★★★ USER FEEDBACK

"Acquiring the GLO 8/13 has allowed us to perform debinding and sintering of 3D printed parts with ease and at a low cost without requiring significant infrastructure investment. Once the process is established, our next move would be to transition to a vacuum furnace to scale up our production."

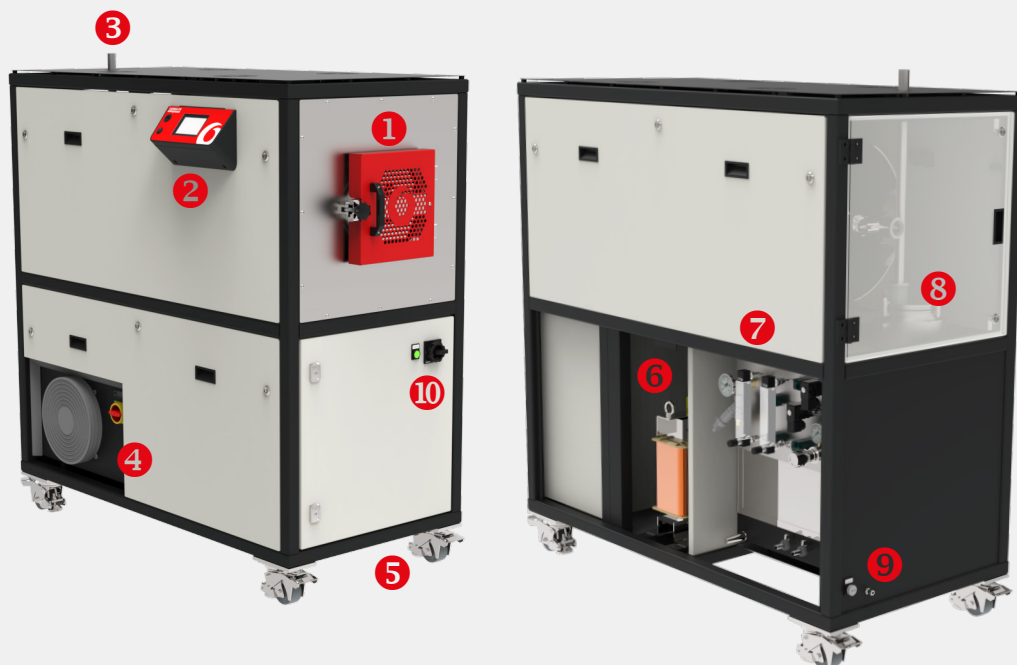
2023, Headmade Solutions



OVERVIEW & FOOTPRINT

PART IDENTIFICATION

- 1) Door with lock
- 2) Touch panel controller
- 3) Gas exhaust pipe
- 4) Cooling water chiller
- 5) Wheels with stopper
- 6) Transformer
- 7) Process & purge gas
- 8) Condensation trap
- 9) Mains & gas connection
- 10) Main & power switch



TECHNICAL DATA

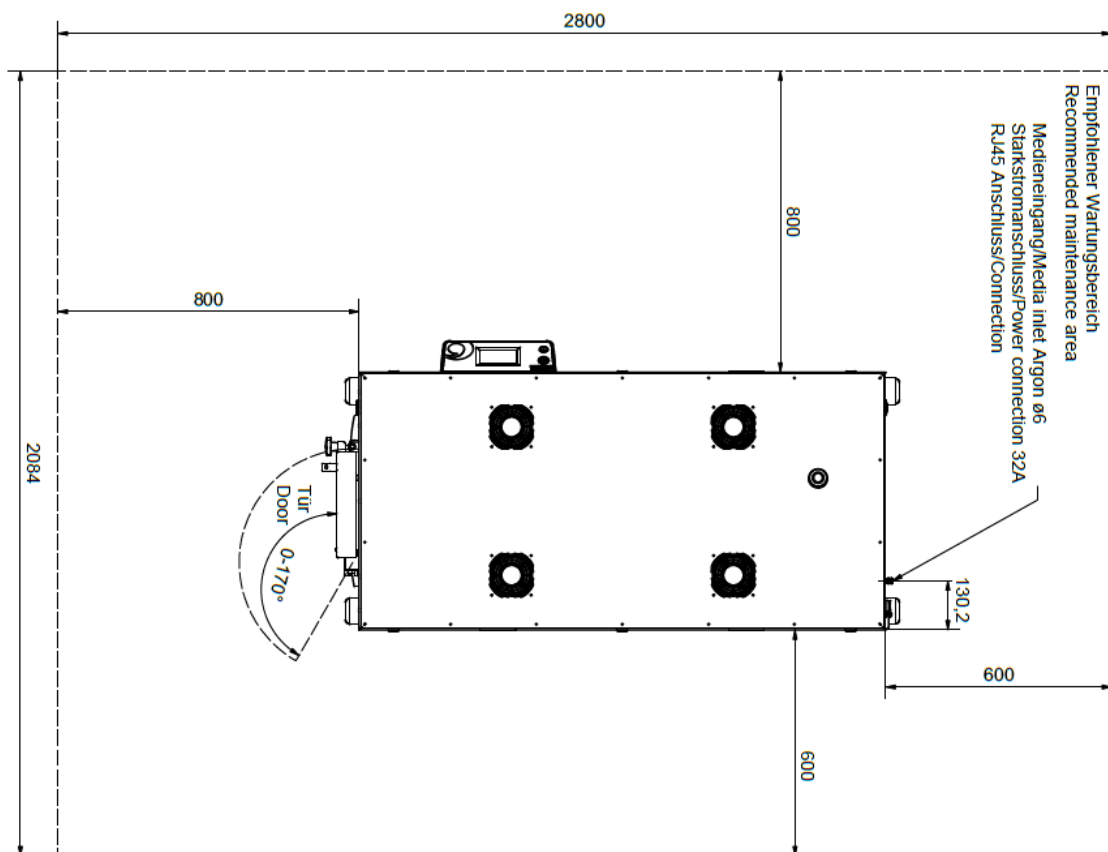
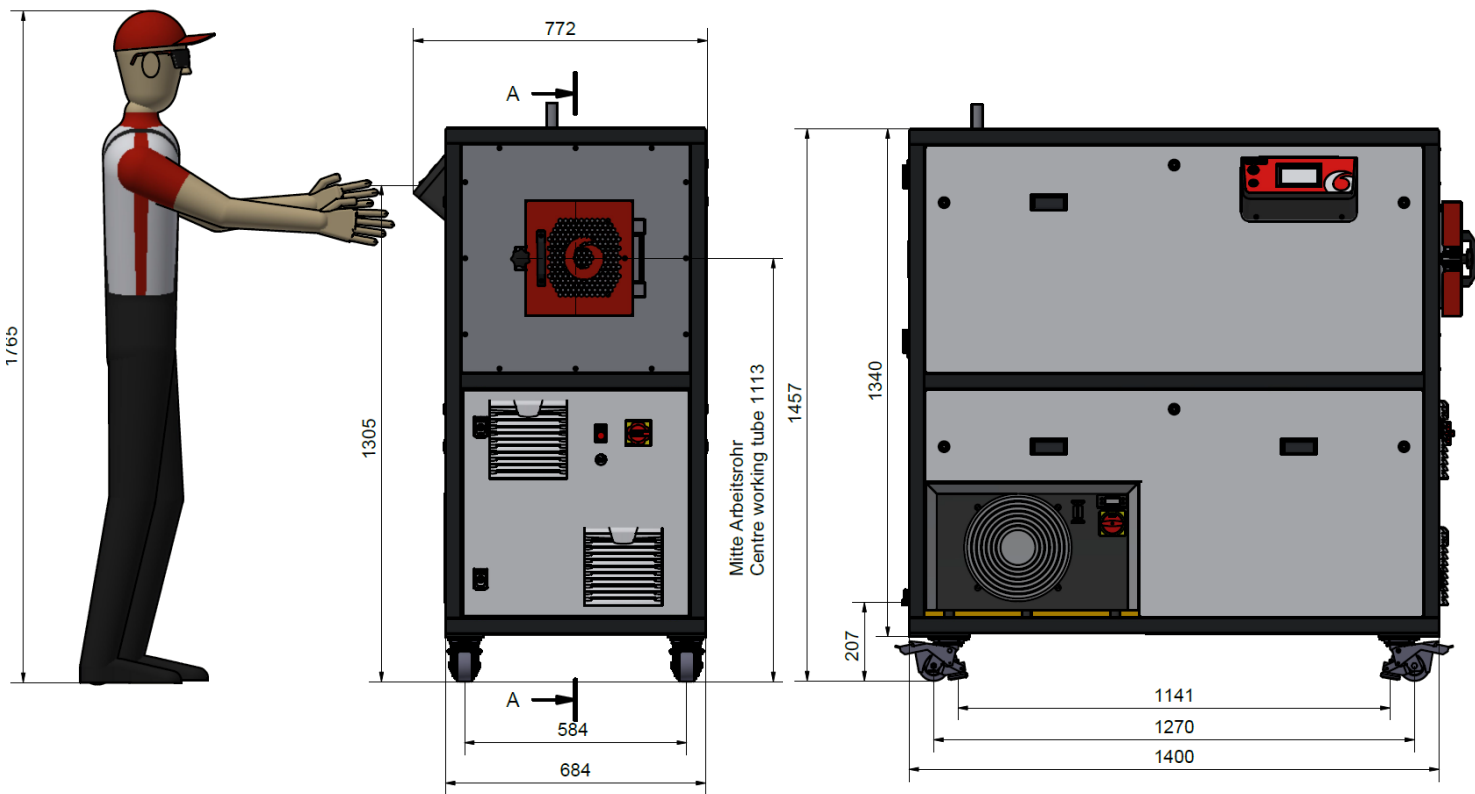
WHAT YOU GET !

Tmax furnace incl. tube	1300°C
Tmax at sample	1250°C
Gas flow rate	35 – 370 L/h
Pressure	Atmospheric +40 mbar. rel.
Furnace dimension (HxWxD)	1460 x 780 x 1500 mm
Total furnace weight	650 kg
Volume retort	iD 180 x L 500 mm (125 x 125 x 500)
Maximum sample weight	15 kg
Certification	Machinery directive / CE

REQUIRED INFRASTRUCTURE

WHAT YOU NEED !

Cooling water (requires separate power supply)	1kW chiller incl. 0.8kW, 230V, 4.1A 1Ph + N + E, 50 Hz
Extraction system above furnace	5 m ³ /h
Compressed Air	7 bar abs.
Argon	7 bar abs.
Power supply	15 kW
Voltage	3 x 400 V + N + E, 50 Hz
Pre-fuse	3 x 32 A
Plug Chiller Plug Furnace incl. 3 m cable	Schuko 32 A CEE



SIGN UP FOR OUR NEWSLETTER!

You will occasionally receive **exclusive information** on seminars/webinars, applications and product news.

Subscribe now:



www.carbolite-gero.com/newsletter
(You may unsubscribe any time)

