



LEADING HEAT TECHNOLOGY

LABORATORY & INDUSTRIAL
OVENS & FURNACES TO 3000 °C

A WHOLE WORLD
OF HEATING

PROVIDING OUTSTANDING SOLUTIONS



LEADING HEAT TECHNOLOGY

CARBOLITE GERO – OVER 80 YEARS OF INNOVATION

The Carbolite Gero brand is synonymous with high quality, leading heat technology in the design and manufacture of laboratory and industrial ovens & furnaces ranging from 30 °C to 3000 °C which are sold globally to over 100 countries.

On 1st January 2016 Carbolite (UK) and Gero (Germany) merged to become one company under the name of Carbolite Gero. With the combined product lines, the company is strengthening its market position locally and globally. In the past, both companies acquired strong, established reputations for engineering expertise in applied heating technology.

Carbolite Gero has two manufacturing and sales sites. One is based in Derbyshire in the United Kingdom, where Carbolite manufactures laboratory and industrial ovens and furnaces up to 1800 °C; the second facility is located in Neuhausen, southern Germany, where high temperature furnaces up to 3000 °C with a large variety of solutions for vacuum and other modified atmospheres have been manufactured since 1982.

In addition to the extensive range of standard products as shown in this catalogue, Carbolite Gero is an expert in the development of customized equipment for complex heat treatment processes. Solving customers' individual application requirements has given Carbolite Gero an important place in aerospace, engineering, materials science, heat treatment, medical, bioscience and contract testing laboratories globally. Not only can Carbolite Gero supply products with Standards-compliant furnace and oven designs (e.g., Nadcap heat treatment processes (AMS2750F)), but also fully traceable certification for control, measurement, recording and data acquisition devices, issued by an independent UKAS accredited laboratory.

All products, and more, featured in this catalogue are available through your local Carbolite Gero office, Verder Scientific office or an extensive network of 3rd party dealers and sales organisations.



Carbolite Gero,
Neuhausen/Germany



Carbolite Gero,
Hope/United Kingdom

| 1938

Carbolite founded in
Sheffield

| 1966

Production moves
from Sheffield to
Bamford Mill

| 1982

Gero founded in
Germany

| 1993

Carbolite relocates
to a new site in Hope
as Gero relocates to
Neuhausen

| 2012

Carbolite acquired by
Verder Group

| 2013

Gero acquired by
Verder Group

| 2016

Companies merged as
Carbolite Gero

OVEN & FURNACE SELECTION

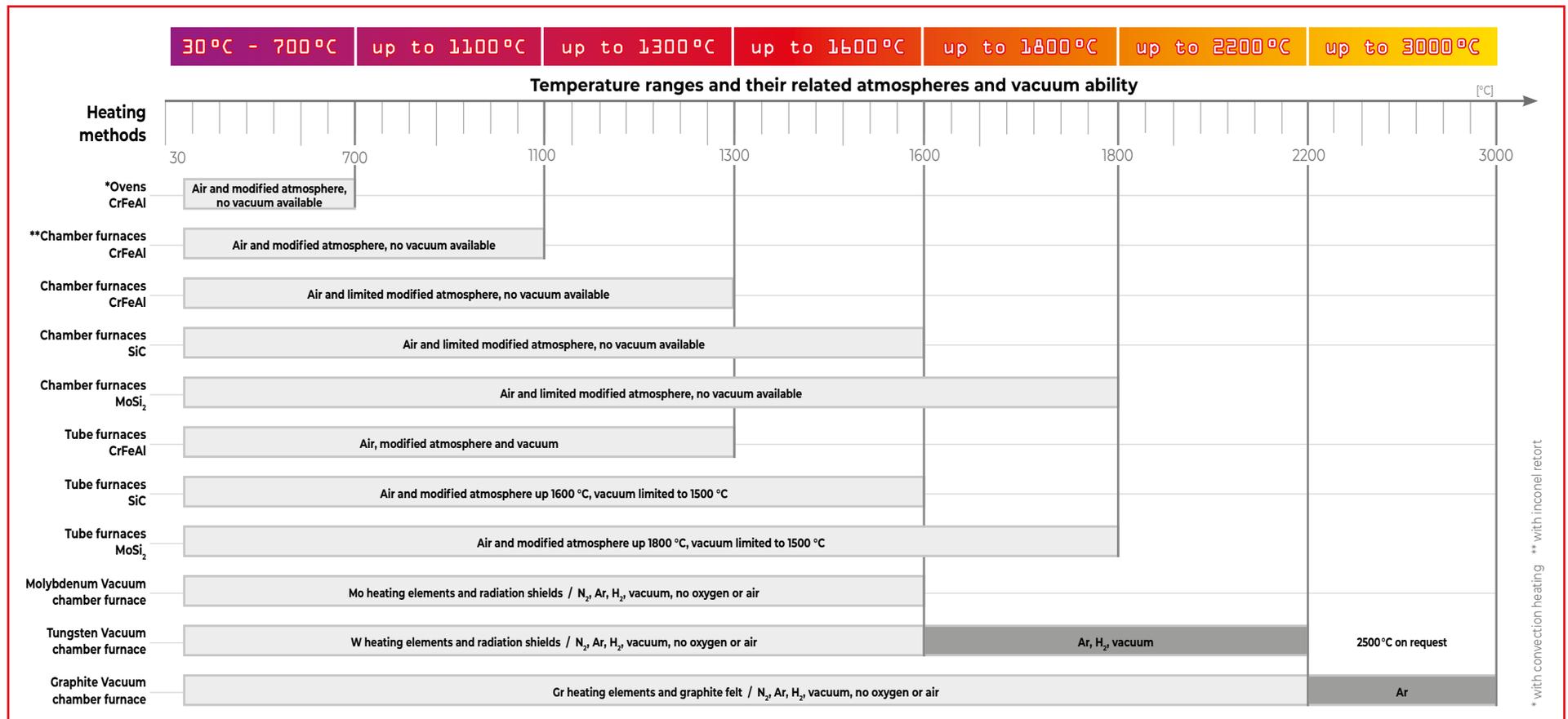
THE CORRECT HEAT TREATMENT FOR EVERY APPLICATION

A critical factor in the use of Carbolite Gero products is the determination of the atmosphere required for a specific heat treatment process. The table below provides an overview of product type, its heating element material and the type of atmospheres or vacuum in relation to the temperature range.

For gas tight ovens below 700°C modified atmospheres are available but vacuum is not possible.

Standard chamber furnaces are available to run with an air atmosphere up to 1800°C. Alternatively, vacuum chamber furnaces are available when either a nitrogen, argon or hydrogen atmosphere, or vacuum is required. When working at temperatures above 2200°C, an argon atmosphere must be used.

Tube furnaces can be used with work tube packages to enable vacuum up to 1500°C and modified atmospheres up to 1800°C.



INDUSTRIES

OUR SOLUTIONS FOR YOUR APPLICATIONS



| Aerospace



| Automotive



| Batteries / Electronics



| Cement



| Ceramics / Glass



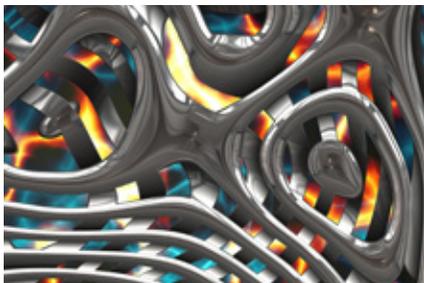
| Chemistry / Plastics



| Coal / Power plant / Energy



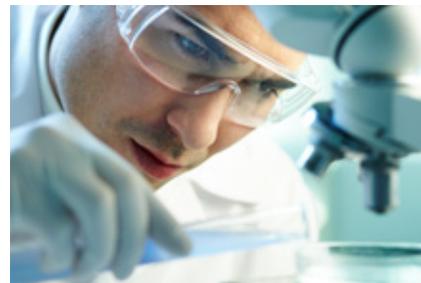
| Food / Feed



| Materials Research



| Medicine / Pharmaceuticals



| Research / University



| Steel / Metallurgy

OPTIONS & ACCESSORIES

Air, inert gas atmosphere and vacuum work tube packages options are available for tube furnaces, along with vacuum pump packages and gas safety systems for working with flammable gases. Vertical packages are available to enable tube furnaces to be mounted in a vertical orientation.

Carbolite Gero offers vacuum pumps or complete pumping systems with appropriate vacuum measuring technology.

We also offer accessories and consumables including crucibles, boats, tongs, etc. along with personal safety equipment including face protection and a variety of heat resistant gloves.



TUBE FURNACE CONFIGURATIONS

FLEXIBILITY TO SUIT ANY APPLICATION

MOUNTING CONFIGURATIONS

Carbolite Gero supplies a wide range of tube furnace mounting configurations, suiting any customer specification.

Most Carbolite Gero tube furnaces are supplied in a horizontal configuration as standard. Vertical packages are available to support the tube furnace and work tube in a vertical configuration.

WORK TUBE PACKAGES

Work tube packages are available for all Carbolite Gero tube furnaces. Work tube packages for use with air, inert atmosphere, or vacuum combine all the accessories required for the majority of users applications.

Each package comprises a work tube with insulation plugs or radiation shields appropriate for the operating atmosphere. End seals are included for the inert atmosphere and vacuum packages.

VACUUM PUMP PACKAGES

Both rotary vane pump (5×10^{-3} mbar) and turbo-molecular pump (1×10^{-5} mbar) packages are available. A vacuum pump package consists of vacuum pump, inert gas package module, vacuum gauge, vacuum tight valve, bypass for fast purging, gas outlet valve and safety overpressure valve.

Combining a vacuum pump package with a work tube vacuum package offers a complete solution for horizontal tube furnaces. Please contact Carbolite Gero for assistance.



TS tube furnace converted to vertical use with a vertical package.



Examples of work tube packages



TF tube furnace combined with the Rotary vane pump package and vacuum work tub package

TUBE FURNACES

IDEAL FOR HEATING SMALL SAMPLES



TUBE FURNACE TF (Universal)

- | Max temp: 1100 °C to 1600 °C
- | Heated lengths 150 to 1200mm
- | Furnace Ø: 32 to 125 mm
- | 1 or 3 heated zones



TUBE FURNACE TS (Split)

- | Max temp: 1200 °C
- | Heated lengths 150 to 1200mm
- | Furnace Ø: 60 to 200 mm
- | 1 or 3 heated zones



TUBE FURNACE TG (Gradient)

- | Max temp: 1200 °C
- | Heated lengths 425 or 600mm
- | Furnace Ø: 60 to 125 mm
- | 2 or 3 heated zones



TUBE FURNACE FHA / FHC

- | Max temp: 1350 °C
- | Heated length 200 to 1250mm
- | Furnace Ø: 40 to 150 mm



TUBE FURNACE HTRH

- | Max temp: 1600 °C to 1800 °C
- | Heated length 100 to 600 mm
- | Furnace Ø: 47 to 200 mm



TUBE FURNACE TSO (Oscillatory Reactor Furnace)

- | Max temp: 1100 °C
- | Heated length 400 to 1000 mm
- | 1 or 3 heated zones

TUBE FURNACES

Carbolite Gero's range of tube furnaces are frequently selected as the most economical way of heating a small sample with our standard tube furnaces capable of operating between 1100 °C and 1800 °C.

Our power-efficient tube furnace design significantly lowers the overall power consumption required for every heating cycle. This, in turn, reduces the day-to-day running costs and can improve your Return on Investment.

Tube furnaces enable rapid temperature changes on the sample and are available with single, three zone or gradient heating capabilities.

Tube furnaces can easily be configured with an inert atmosphere or a vacuum if required and provide a high level of temperature uniformity.

Our TF, TS and TG models are supplied in a horizontal configuration as standard, but can also be operated when dismantled from the control box or mounted vertically with the addition of the vertical package.



QUALITY COMES
AS STANDARD

**OVER 80 YEARS OF SKILL
AND EXPERTISE IN EVERY
SINGLE PRODUCT**

LABORATORY OVENS

EXCELLENT TEMPERATURE UNIFORMITY AND EASE OF USE



LABORATORY OVEN AX

- | Fan oven: Forced convection
- | Max temp: 250 °C
- | Min temp: Ambient +30 °C
- | Volume: 28 to 128 litres



LABORATORY OVEN PF

- | Fan oven: Forced convection
- | Max temp: 250 °C or 300 °C
- | Min temp: Ambient +30 °C
- | Volume: 28 to 910 litres



LABORATORY OVEN PN

- | Natural convection
- | Max temp: 300 °C
- | Min temp: Ambient +30 °C
- | Volume: 27 to 215 litres



LABORATORY OVEN LHT

- | Fan oven: Forced convection
- | Max temp: 400 °C to 600 °C
- | Min temp: Ambient +60 °C
- | Volume: 30 to 120 litres

LABORATORY OVENS

Carbolite Gero offers several oven ranges with different maximum operating temperatures from 250 °C to as high as 600 °C with minimum working temperatures of ambient +30 °C to +60 °C

Our smallest bench mounted oven has a capacity of 30 litres, but larger standard volume ovens up to 14,000 litres are available.

Simple ovens have heating elements mounted in the base of the chamber, and are not fitted with fans. Instead, air is circulated via convection.

In fan convection ovens, the heating elements are located on the side of the oven chamber. On smaller ovens, the fan blows air through an air guide, over the heating elements, and around the chamber.

On larger ovens, where a more complex air guide is required, the fan pulls air over the heating elements. The fan action thoroughly mixes the heated air before blowing it around the chamber. This provides a uniform volume within the oven chamber for applications that require a specific temperature uniformity.

INDUSTRIAL OVENS

Typical applications for our industrial ovens include drying, baking, or curing components. In addition to these applications, all of the industrial ovens that we offer can be highly customised, and are therefore able to completely fulfil the demanding requirements of many different industries.

For applications such as heat treatment processes compliant to Nadcap AMS 2750F standards, our general purpose and high temperature industrial ovens can all be modified to include sophisticated control systems and data recording. All modifications must be specified at the time of order.

Our rapid cooling industrial oven is perfect for tempering and annealing applications including, but not limited to, annealing thermo-luminescent dosimeters. The TLD industrial oven is fitted with a CC-TI programmable controller as standard, providing precise control over the rate of temperature rise or fall, and the period of time over which a particular temperature is held.

INDUSTRIAL OVENS

IDEAL FOR HEAVY DUTY APPLICATIONS



INDUSTRIAL OVEN GP

- | Max temp: 300 °C
- | Volume: 220 to 450 litres
- | Vertical or Horizontal airflow



INDUSTRIAL OVEN LGP

- | Max temp: 250 °C to 700 °C
- | Volume: 500 to 13,820 litres
- | Single & double door models



INDUSTRIAL OVEN HT

- | Max temp: 400 °C to 700 °C
- | Volume: 28 to 343 litres
- | Robust construction



INDUSTRIAL OVEN HTMA

- | Max temp: 400 °C to 700 °C
- | Volume: 28 to 1,000 litres
- | Modified for inert atmospheres



INDUSTRIAL OVEN HTCR

- | Max temp: 400 °C to 600 °C
- | Volume: 28 to 1,000 litres
- | SO 14644-1 Class 5 or 6 compliance



INDUSTRIAL OVEN TLD

- | Max temp: 400 °C
- | Volume: 3 litres
- | Rapid cooling oven

LABORATORY FURNACES

HIGH TEMPERATURE FURNACES BUILT TO THE HIGHEST QUALITY



LABORATORY FURNACE ELF

- | Entry level furnace
- | Max temp: 1100 °C
- | Volume: 6 to 23 litres



LABORATORY FURNACE CWF

- | General purpose
- | Max temp: 1100 °C to 1300 °C
- | Volume: 5 to 65 litres



LABORATORY FURNACE RHF

- | High temperature
- | Max temp: 1400 °C to 1600 °C
- | Volume: 3 to 35 litres



LABORATORY FURNACE RWF

- | Rapid heating
- | Max temp: 1100 °C or 1200 °C
- | Volume: 5 to 23 litres



LABORATORY FURNACE AAF

- | Ashing furnace
- | Max temp: 1100 °C to 1200 °C
- | Volume: 5 to 32 litres



LABORATORY FURNACE HTF

- | High temperature
- | Max temp: 1700 °C to 1800 °C
- | Volume: 4 to 10 litres

LABORATORY FURNACES

An extensive range of chamber / muffle furnaces is available for your laboratory.

Whether you need a small bench mounted affordable solution or a high temperature furnace built to the highest quality, Carbolite Gero has a model that is sure to meet your needs and budget.

Ranging from the entry level ELF models at 1100 °C through to the laboratory sized HTF model with a maximum temperature of 1800 °C, our eight decades of experience in building quality furnaces for customers across the globe, has ensured that the Carbolite Gero name is synonymous with Leading Heat Technology.

Whether you require a front, top or bottom loading chamber furnace, our extensive portfolio ensures there is an appropriate solution to meet your needs. However, our bespoke design service allows us to meet almost every scenario where a standard solution would not meet your requirements.

DESIGNED
TO PERFORM

HIGH QUALITY COMPONENTS AND EXACTING STANDARDS



INDUSTRIAL FURNACES

FURNACES FOR BATCH PROCESSING



INDUSTRIAL FURNACE GPC

- | Max temp: 1200 °C to 1300 °C
- | Volume: 131 to 400 litres
- | Vertical lift door for safety



INDUSTRIAL FURNACE HTF

- | Max temp: 1600 °C to 1800 °C
- | Volume: 27 to 560 litres
- | Molybdenum disilicide elements



INDUSTRIAL FURNACE HB

- | Top Hat furnace
- | Max temp: 1300 °C to 1800 °C
- | Volume: 80 to 560 litres

INDUSTRIAL FURNACES

Our industrial furnaces are designed and built to be extremely hard-wearing, safe, and easy to service. Solutions are available in various sizes, from compact bench mounted units, to large floor standing models. Maximum temperatures of up to 1800 °C are available.

They can be built and supplied with a wide range of options to closely meet customer needs. The available options vary but include over-temperature protection and a range of digital controllers, multi-segment programmers, and data loggers.

Typical applications of industrial furnaces include soldering, heat treatment of steels and alloys, and ceramics sintering.

The modular design of our static or bogie chamber furnace allows it to fulfil a number of different roles, and the versatility of our general purpose industrial chamber furnace makes it ideal for batch processing.



INDUSTRIAL FURNACE HTK

- | Max temp: 3000 °C
- | Volume: 8 to 600 litres
- | Fine or high vacuum



INDUSTRIAL FURNACE GPCMA

- | Max temp: 1150 °C
- | Volume: 37 to 245 litres
- | Metallic retort for atmospheres



INDUSTRIAL FURNACE GLO

- | Max temp: 900 °C to 1100 °C
- | Volume: 5 to 1,300 litres
- | Integrated vacuum retort

TEMPERATURE CONTROL

Our ovens and furnaces can be fitted with a range of high-quality PID (Proportional, Integral, Derivative) temperature controllers which provide accurate temperature control that closely follows programmed ramp rates and setpoint temperatures.

Our temperature controllers range from manual to full automation.

Our recently launched CC-T1 touch screen interface provides intuitive access to a comprehensive menu that includes: selection and editing of program profiles; scheduling of programs at a defined date/time; data logging of setpoint and actual temperature; localization of language and user level security. The CC-T1 series can also store and retrieve 10 unique program profiles. Data-logging is to a csv file which is accessed through the adjacent USB port.

In an increasingly connected world, all of our temperature controllers are fitted with Ethernet as standard to ensure secure remote access to both the oven or furnace and to all the data as it accumulates.

TEMPERATURE CONTROL

CONTROLLERS FROM MANUAL TO FULL AUTOMATION



CONTROLLER CC-T1

- Programmable touch screen
- Program up to 24 segments
- Storage for up to 10 programs



CONTROLLER EPC3016P1

- Programmable control with 24 segments
- 2 relay operated options
- Certified for cybersecurity comms



CONTROLLER EPC3008P10

- Programmable control with 24 segments
- Storage for up to 10 programs
- Certified for cybersecurity communications



CONTROLLER nanodac™

- Programmable controller / recorder
- Program up to 25 segments
- Storage for up to 100 programs

SPECIAL APPLICATIONS

CUSTOM SOLUTIONS FOR YOUR BUSINESS



SPECIAL APPLICATIONS ABA (Asphalt Binder Analyzer)

- Max temp: 750 °C
- Max temp afterburner: 950 °C
- Max sample weight: 4500g



SPECIAL APPLICATIONS CAF G5 (Ash Fusibility)

- Max temp: 1600 °C
- Test 8 samples simultaneously
- Automatic image analysis



SPECIAL APPLICATIONS VMF 10/6 (Volatile Matter Furnace)

- Max temp: 1000 °C
- Test to ISO 562:2010
- Type K thermocouple



SPECIAL APPLICATIONS CF (Cupellation Furnace)

- Max temp: 1200 °C
- Chamber vol: 10 to 43 litres
- Meets ISO 11426:1999



SPECIAL APPLICATIONS EBO (Debinding Furnace)

- Max temp: 150 °C
- 25 to 580 litres
- Catalytic debinding of BASF feedstock



SPECIAL APPLICATIONS iQ Range (Quench Furnaces)

- Max temp: 1700 °C
- Vacuum, inert gas or reactive gas
- Quenching of small parts



SPECIAL APPLICATIONS BV-HTRV (Crystal Growth Furnace)

- Max temp: 1450 °C in vacuum
- Max temp: 1800 °C in inert atmosphere
- Precisely defined and controlled pulling speed

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**SCIENCE
 FOR SOLIDS**

Verder Scientific is a business field belonging to the Verder Group and sets standards in the development, manufacture and sale of laboratory and analytics devices. Used in quality control, research and development for test-piece preparation and the analysis of solids.

For several decades our companies have supplied production plants and research institutes, laboratories for quality testing and analytics, all kinds of technical specialists and scientists with modern, reliable devices to solve the many and varied challenges they face.

