

Auxiliary equipment for use with CaseMaster® sealed quench chamber furnaces



BREW high tempering chamber furnace



BREN low tempering chamber furnace



WSD chamber washer

CaseMaster® furnaces can be equipped with the following auxiliary equipment:

- ▣ TASKMASTER® mobile loading and/or loading – unloading cars
- ▣ Endothermic atmosphere generators
- ▣ Loading tables
- ▣ Special instrumentation.

Complete technological lines incorporating CaseMaster® sealed quench furnaces

The configuration of technological lines incorporating CaseMaster® chamber furnaces with integral quench tanks is made up depending on the individual requirements of each customer and the specifics of the relevant technological process.



Main advantages of CaseMaster® sealed quench chamber furnaces

- ⊕ High quality parts following heat treatment
- ⊕ Very good process repeatability
- ⊕ Minimisation of quench distortions
- ⊕ No load decarburization and oxidation
- ⊕ High reliability
- ⊕ Low consumption of technological mediums
- ⊕ The ability to configure a complete and automatically controlled heat treatment centre
- ⊕ Full automation of the process
- ⊕ Minimisation of negative environmental effects
- ⊕ Furnace is delivered to the customer as a “turnkey” installation, after completion of various tests prior to shipment to guarantee high manufacturing quality
- ⊕ Conformity with AMS 2750 norm



References

Pratt & Whitney Poland
 Visteon (Ford) Poland
 PZL-Rzeszów Poland
 Sauer Danfoss Poland
 Thompson Polcolor Poland
 Kennametal Poland
 Maag Gear Zamech Poland
 Daewoo Poland
 Archimedes Poland
 ERDIREN Turkey
 Dodge MFG Corp USA
 Electromotive - Div GMC USA
 Anzeromasz Russia
 Gomsielmasz Byelarusia
 Certified Heat Treating USA
 General Electronic USA
 Houston Heat Treating USA
 Detroit Diesel USA

SKF Industries USA
 I.B.F. For Metalac S.A. Brasil
 Thompson Metal Treating USA
 Whirlpool Corp USA
 IBM Corporation USA
 Commercial Metal Treating USA
 Dresser Ind USA
 Count Heat Treat Inc USA
 Capital Export Corporation USA
 Glidden Metals USA
 Arrow Gear Co. USA
 Avco Lycoming USA
 Curtiss Wright Corp USA
 Frantz Mfg Co USA
 NY Air Brake USA
 Gravley Tractor USA
 Rockford Products USA
 Fuel Furnaces Ltd UK



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**CaseMaster®
 Multipurpose Sealed Quench
 Chamber Furnaces**



WORLD CLASS HEAT TREATMENT EQUIPMENT FOR METALS

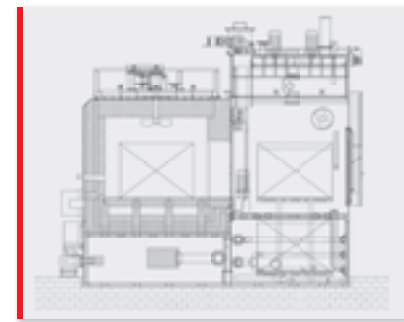
Technological applications

- ❑ Carburizing
- ❑ Nitrocarburizing
- ❑ Bright hardening
- ❑ Annealing in protective atmospheres
- ❑ Carbon recovery

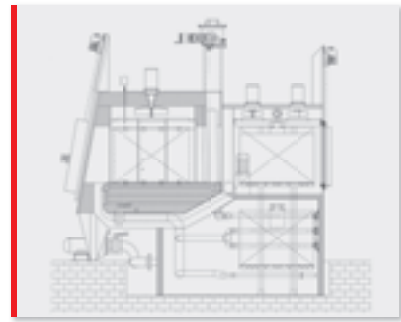
Typical load types

- ❑ Aircraft industry: aircraft engine components (oil pumps clutches, manometer pistons, pinions, yokes, pins, etc) and aircraft undercarriages
- ❑ Automotive industry: gearbox components and drive axles (shafts, gears, etc)
- ❑ Machine building industry: drive axles, gear wheels, toothed rings, hydraulic and pneumatic elements, bolts, etc
- ❑ Bearing industry: bearing rings

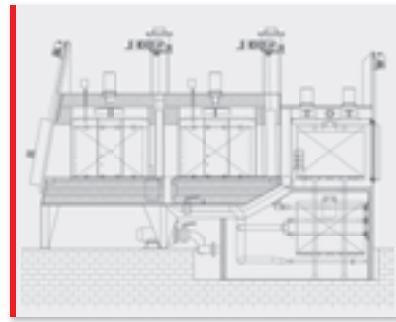
Versions available



AFS



AFC



AFT

AFS – batch (in-out) version; AFC – continuous single-chamber version; AFT – continuous double-chamber version

Main technical data for standard sizes of CaseMaster® furnaces

Type	Useful dimensions HxWxL (mm)	Load weight (gross) (kg)*	Heating power (kW)
			Electrical / Gas
AFS / AFC - 5	610 x 610 x 910	400	72 / 120
AFS / AFC - 6	760 x 610 x 910	540	84 / 160
AFS / AFC - 8	610 x 760 x 1.220	600	120 / 200
AFS / AFC - 10	760 x 760 x 1.220	1.000	140 / 220
AFS / AFC - 13	760 x 910 x 1.220	1.200	160 / 220
AFS / AFC - 17	910 x 910 x 1.220	1.360	180 / 260
AFT - 5	2 x 610 x 610 x 910	2 x 400	2 x 72 / 2 x 120
AFT - 6	2 x 760 x 610 x 910	2 x 540	2 x 84 / 2 x 160
AFT - 8	2 x 610 x 760 x 1.220	2 x 600	2 x 120 / 2 x 200
AFT - 10	2 x 760 x 760 x 1.220	2 x 1.000	2 x 140 / 2 x 220
AFT - 13	2 x 760 x 910 x 1.220	2 x 1.200	2 x 160 / 2 x 220
AFT - 17	2 x 910 x 910 x 1.220	2 x 1.360	2 x 180 / 2 x 260

* 1) Gross load weight means maximum weight of details subjected to the process and equipment weight.
2) Maximum weight of actual objects subjected to the process depends on their shape, dimensions and necessary specialized equipment.

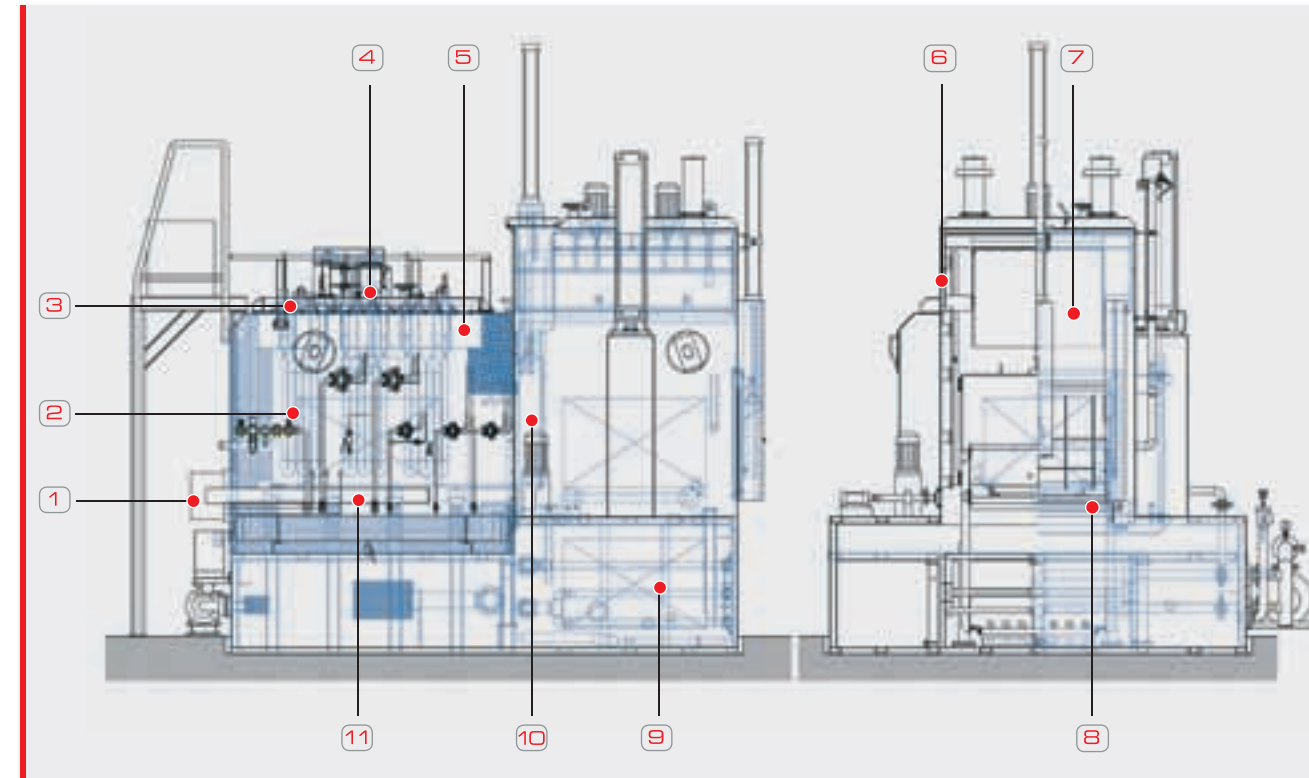
! Customised versions can be produced to the furnace chamber dimensions requested by customers.



Key construction features of CaseMaster® furnaces

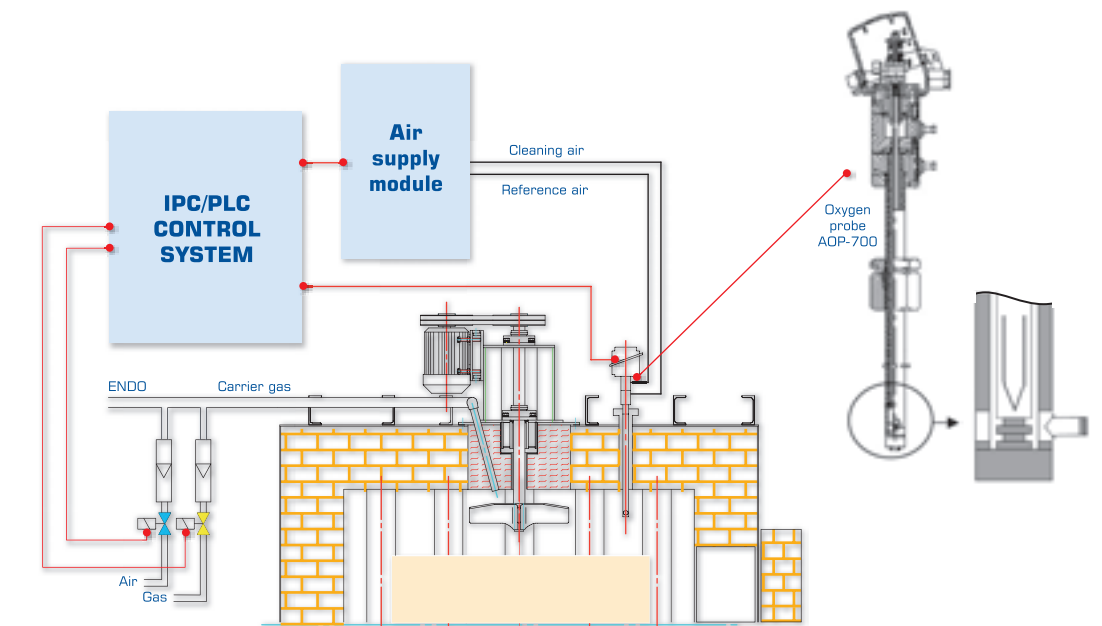
- ⊕ Nominal temperature: up to 1000°C
- ⊕ Very good temperature uniformity of ±5K in the furnace's heating chamber
- ⊕ A ceramic muffle can be applied in the heating chamber

The CaseMaster® chamber furnaces work with controlled atmospheres and have integral quench tanks. They are equipped with the following main systems and subassemblies:



- 1 Load-unload mechanism in the "cold chain" system
- 2 Low-voltage heating system or auto-recuperative gas burners (also available as an option with radiant tubes made of SiC)
- 3 Carbon potential control system on the base of the oxygen probe (or gas analysers)
- 4 Highly efficient atmosphere mixer with a compact design
- 5 Light construction ceiling made using fibrous insulation materials
- 6 Oil-cooled vestibule walls, which eliminate the risk of water vapour condensation
- 7 Slow cooling chamber in the protective atmosphere
- 8 Automatic fast internal transportation system
- 9 Oil quench tank with a system for heating and cooling the oil, equipped with a pump-collector system which enables the modeling of direction and flow frequency of the quench oil
- 10 Very tight internal door with cooled seal
- 11 Perforated bottom plate made of SiC

CarboSystem temperature and carbon potential control system



Automatic control of CaseMaster® furnace operation

The control system of the furnace covers all the functions connected with every mechanism and the power supply of particular energy receivers installed in the furnace.

Set point process parameter values can be introduced, indicating the temperature and carbon potential course over a specified time. The control system provides full visualisation of the furnace operation, and signals failure conditions.

As a standard, CaseMaster® sealed quench furnaces have temperature and carbon potential control systems operating on the base of the oxygen probe, as well as a programmer for temperature and carbon potential.

Key functions of the system include: programming, control, archiving, and heat treatment process reporting.

Other equipment can be incorporated into and controlled by the computer system. The main software module includes databases of materials, heat treatment processes, etc.

CarboSystem enables the following functions to be performed:

- ❑ Calculation of the carbon diffusion profile during carburizing in the "on line" mode
- ❑ Calculation of the furnace atmosphere composition based on mathematical modeling
- ❑ Graphic presentation of calculated carbon profile, predicted hardness profile, current process status on Fe-C diagram and iron oxidation diagram
- ❑ Scheduling of service inspections.

