

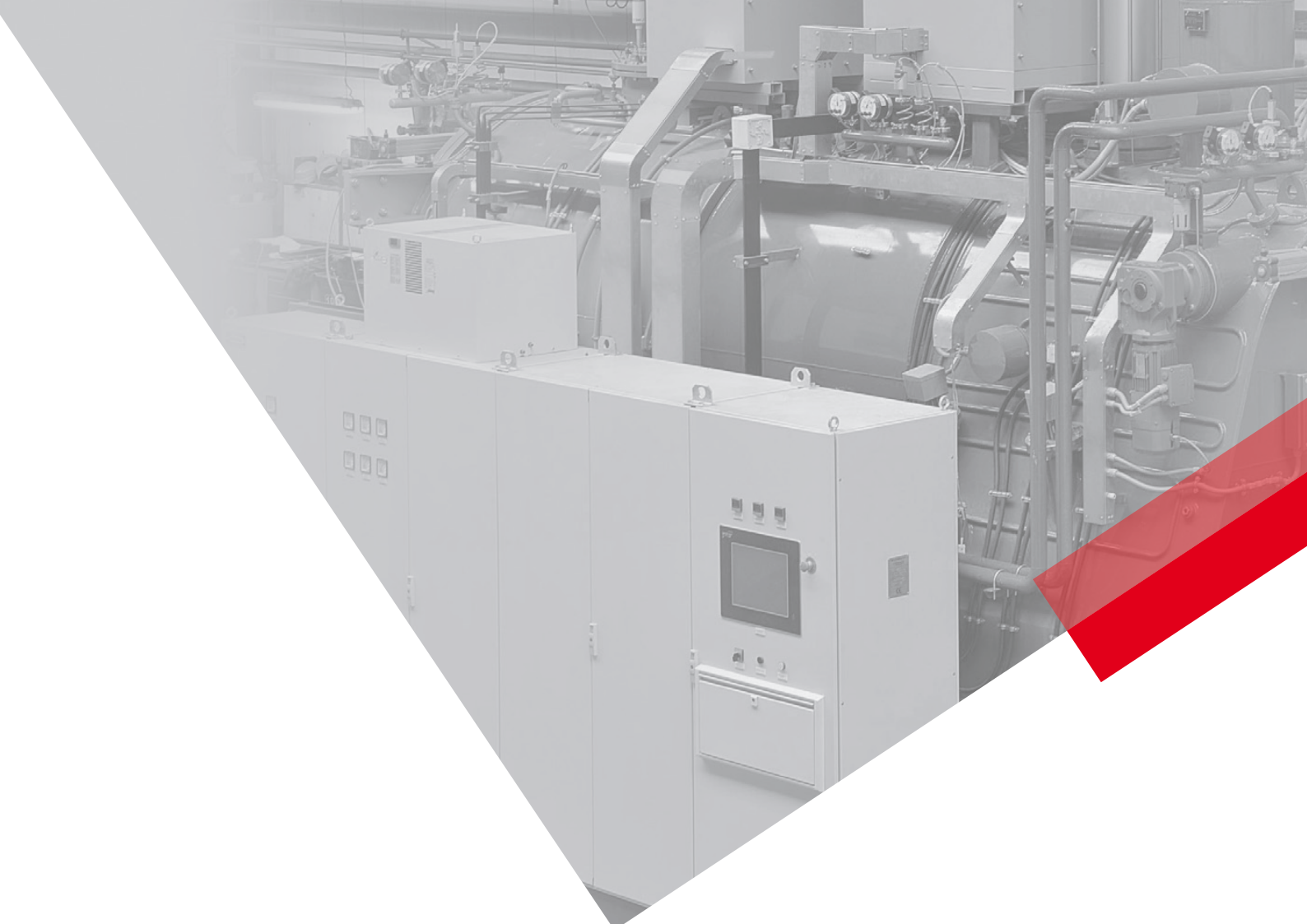


**SECO/WARWICK**

INVENTION MEETS RELIABILITY

# CaseMaster Evolution - T/D

Double- and triple-chamber vacuum furnaces for low pressure carburizing (LPC) and oil or gas quenching in high volume production



# CaseMaster Evolution - T/D



## INDUSTRIES

- / Commercial Heat Treatment
- / Gears & Transmission
- / Bearing, Aviation
- / Automotive
- / Machine-building



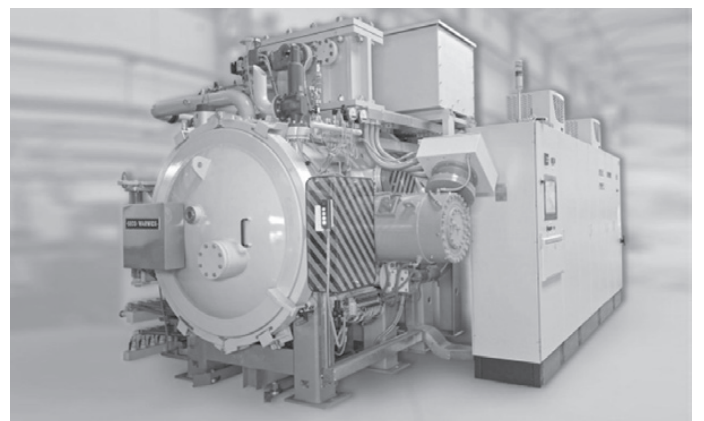
## TECHNOLOGIES

- / Case Hardening
- / Quenching
- / Annealing
- / Brazing

CaseMaster Evolution (CMe) - two or three chambers vacuum furnaces for low pressure carburizing (LPC). This solution provides maximum flexibility in heat treating and continuous batch processing. With dozens of CMe oil quench vacuum heat treating furnaces installations, SECO/WARWICK is perceived as an expert at this vacuum technology.

CMe brings the best operating performance and enable the heat treatment of many different materials. This is the key factor when selecting furnace to be used in e.g. commercial hardening plants.

Combined with low process costs, shorter cycles, higher output and precise control over the process, they make the



carburizing made in SECO/WARWICK highly competitive. The family of CaseMaster Evolution "CMe" vacuum furnaces is dedicated for batch and semi-continuous case hardening by low pressure carburizing LPC® and oil or gas quenching as well as for through hardening as a wide attractive alternative for atmospheric sealed quench furnaces, continuous lines and multi-chambers systems.



## OPTIONS

The CMe furnaces are available in several workload flow configurations: - Horizontal – CMe D or T type

CaseMaster Evolution furnaces appear in two types: D and T. Type D is a double-chamber furnace, equipped with a heating/process chamber and a quenching chamber (available both: oil and gas) separated from each other and ambient conditions. It's a single batch-type furnace, one side loading, and unloading.

While type T is a triple-chamber furnace equipped additionally with a pre-heating chamber at a loading side, which speeds up heating rate and finally shortens an occupation of the heating/process chamber. It works in semi-continuous mode, loaded from one side and unload from another. The furnace treats 3 loads at the same time in a very efficient way. All these result in significant increases in a furnace throughput, as much as twice or even triple times.

Quenching / cooling can be carried out in two main ways:

- / In the oil – in dedicated oil quench chamber.
- / Under high pressure gas (24 bar) in dedicated gas quench chamber.

- / In addition:
  - / Under gas over the oil.
  - / Under high pressure gas in the heating chamber.




## BENEFITS

- / Extremely economical and efficient:
  - / 3 times shorter carburizing (LPC).
  - / 3 times faster production (T).
  - / 1/3 process cost.
- / Safe - elimination of:
  - / Flammable and explosive atmosphere.
  - / Open flame.
  - / An atmosphere generator.
  - / Fire and explosion risk.
- / Excellent carburizing uniformity (LPC):
  - / Uniform carburizing of densely packed load and difficult geometrically parts.
- / Highly accurate and precise LPC process simulator (SimVaC).
- / No intergranular oxidation (IGO) and decarburization.
- / Reduce distortion by 24 bar N<sub>2</sub> or He quenching.
- / Full operational flexibility, on demand operation, immediate start/stop.
- / Elimination of time waste for atmosphere conditioning.
- / No CO/CO<sub>2</sub> emission.
- / Clean, environmentally friendly process.



## FEATURES

- / Vacuum, horizontal, double-, and triple-chamber.
- / Fully automated processing.
- / Graphite heating chamber.
- / Low pressure carburizing (LPC).
- / Low heat losses by increased thermal insulation.



## SECO/WARWICK Invention Meets Reliability

SECO/WARWICK is the **1<sup>st</sup> choice supplier** of solutions for heat treatment and metallurgy.

We create innovative products that provide our customers with reliable, safe and environmentally friendly solutions for heat treatment and metallurgy and ensure the economic efficiency of their businesses. Expertise includes end-to-end solutions in 5 categories: vacuum heat treatment, atmosphere, and aluminum thermal processing, controlled atmosphere brazing of aluminum heat exchangers and vacuum metallurgy.

SECO/WARWICK Group, with 8 companies located on 3 continents, has customers in nearly 70 countries with more than 4000 deployed solutions. The company provides standard or customized state-of-the-art heat processing and metallurgy equipment and technologies to leading companies in the following industries: automotive, aerospace, electronics, tooling, medical, recycling, energy including nuclear, wind, oil, gas, solar and production of steel, titanium, and aluminum.

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