



**THE FUTURE OF
HEAT TREATING
HAS ARRIVED**

SECO/VACUUM

We support your success.



SUPPORTING YOUR SUCCESS WITH SIX STELLAR TECHNOLOGIES

Only SECO/VACUUM can help you upgrade and integrate your heat treatment operations with the manufacturing methods of the future.

- Vector®, our single chamber high pressure gas quench vacuum furnace, shines as one of the most versatile furnaces available, perfect for the many jobs you do
- CaseMaster Evolution®, our multi-chamber gas or oil quench vacuum furnace, can increase throughput by as much as double a single-chamber design
- Super IQ®, one of our newest stars, does more and costs less than traditional gas carburizing furnaces
- UniCaseMaster® and 4D Quench®, hot additions to our line-up, are single-piece flow furnaces that quench parts in 4 dimensions to predict and control distortion
- ZeroFlow®, a proprietary gas nitriding technology, helps keep our world safe and clean by using only ammonia as a process gas, reducing gas usage and emissions
- Pit LPC™, the newest star in our galaxy, re-invents the legacy pit furnace to heat treat large parts or parts requiring deep case depths while simultaneously improving our environment



VECTOR®

High Pressure Vacuum Quench

- Single chamber, high-pressure gas quench vacuum furnaces, in horizontal and vertical configurations
- Performs multiple heat treatment operations across a range of process applications
- Wide array of sizes, workload capacities, temperature and vacuum ranges, and quench pressures
- Compact and easy to operate
- Ideal for processes such as annealing, brazing, carburizing, hardening, nitriding, sintering, stress relieving and tempering



CASEMASTER®

Multi-Chamber Oil Quench

- Multi-chamber vacuum oil quench furnaces available in two (in-out) and three (straight through) chamber configurations
 - Used for hardening and case hardening; carburizing and/or carbonitriding; and normalizing and stress relieving
 - Available with high pressure gas or oil quenching
- Advantages of CMe systems include:
- Increased productivity
 - Faster carburizing cycles
 - Consistent processing of dense loads
 - Uniform quenching with less distortion



SUPER IQ®

Low Pressure Gas Carburizing

Super IQ® combines the best of SECO/VACUUM's proven hardening technologies to conduct precision carburizing beyond the limitations of legacy integral quench furnaces, including the capability of operating at higher standard temperatures.

- Runs clean, cool and safe
- No flames and no endogas
- Higher temps to over 2000°F
- Oil quenching using standard quench oils
- Fast transfer to integral quench
- Decarb-free through hardening
- Carburizing with FineCarb®
- "Top" cooling



UNICASE MASTER® AND 4D QUENCH®

Single-Piece Flow Vacuum Furnaces

Advanced, in-line manufacturing solutions for processing gears, bearings and similar components in a continuous single-piece flow vacuum heat treatment system.

- Every part is heat treated using the same process parameters and part movement for consistent, repeatable, high quality results
- Both models incorporate patented 4D high pressure gas quench to predict and control distortion
- UniCase Master® is designed for hardening and low-pressure vacuum carburizing with PreNit® and FineCarb®
- Can also be used for annealing/normalizing, brazing and specialty processes



ZEROFLOW® Gas Nitriding

- Lower ammonia consumption
- Simplified gas system
- Accurate and precise nitriding process
- Gas nitriding process is fully controlled with only ammonia additions
- Low consumption of nitrogen
- Precise atmosphere analysis without external gas sampling
- Lower operating costs



PIT LPC® Vacuum Carburizing

- High quality and process uniformity
- Carburizes large elements
- Reduces production and capital costs
- Low process gas consumption
- Instant low pressure carburizing saves time and increases productivity
- Eliminates combustion, increases work safety
- Cleaner, environmentally-friendly process



SECO/VISORY

THE BEST HEAT TREAT SOLUTION FOR YOU STARTS WITH THE RIGHT PAIRS OF EARS.

The SECO/VISORY Heat Treat Advisory Council is a team of SECO/VACUUM heat treat experts and consultants with diverse thermal experience and process knowledge who are available to help companies solve their specific heat treat equipment challenges.

Expert teams are assembled with the appropriate skill sets to match the specific concerns and objectives of each customer, whether it's establishing a new heat treat facility or enhancing an existing one.

And this service comes at NO COST TO QUALIFIED COMPANIES!

Count on SECO/VISORY to ask the right questions, offer the best technologies, and provide the support you deserve for the life of your process, for ALL of your heat treat challenges.

Call 1-814-332-8520 to make an appointment.

Here are just some of the ways SECO/VISORY can help:

- Facility setup and/or optimization
- Process validation/improvements
- Market validation
- Part design
- Personnel training
- Equipment purchases
- Utility optimization
- Material selection
- In-house testing
- Preventive and on-going maintenance

ENGINEERING

SECO/VACUUM is fully supported by an extensive engineering team. More than 100 engineers have designed intricate thermal processing technologies that have been successfully implemented in over 70 countries around the world and in a variety of different industries including automotive, energy, aerospace/aviation, medical, machine, and nuclear.

There are key thermal processing technologies where we have earned global success: FineCarb®, PreNitLPC®, and ZeroFlow®.

Our engineering capabilities include:

- CFD & FEA simulation
- Demonstration furnaces & laboratory analyses
- The ability to benchmark equipment performance and productivity with customers' parts
- Partnerships with academic and scientific groups
- Participation in R&D projects worldwide
- Innovations such as low pressure carburizing and oil and gas quench

SERVICE & SUPPORT

SECO/VACUUM's Professional Services Team offers a full range of maintenance services to keep your equipment running at peak performance. In the case of an equipment failure, we strive to minimize equipment downtime. Our services cover everything from small furnace repairs to complete equipment upgrades.

Our Professional Services include:

- Spare parts, equipment upgrades and installation
- Equipment start-up and repairs
- Sales and replacement of spare parts
- Preventive maintenance programs, service agreements
- Modernization, including upgrades to HMI and management reporting/communication systems
- Equipment relocation

As part of our Professional Services, we have three value-added services to enhance your productivity:

SECONOMY: This combination of operational economies balanced with environmental issues allows us to reduce both production costs and emissions. Energy costs can be reduced by up to 50%.

SECOLUTION: This is a set of advanced tools for data analysis and system control enabling you to securely connect from anywhere.

SECO/VISORY: Our experts visit your site – no charge for their time.



RESEARCH & DEVELOPMENT

Over the past decade, SECO/VACUUM's R&D team has implemented thousands of projects, secured numerous patents, and established relationships with technical universities and scientific groups. Our R&D team continually seeks opportunities to fund innovation and development programs.

SECO/VACUUM's R&D department is not only a highly qualified team of experts, but also has a large, well-equipped lab with full-sized thermal processing furnaces and dedicated software for calculations using computational fluid dynamics and mechanical modeling systems.



Through technological leadership and decades of experience, SECO/VACUUM offers unmatched vacuum furnace innovation and performance backed by a commitment to provide our customers with the best support in the industry and the lowest cost of ownership.

Contact SECO/VACUUM to discuss your next heat treating project!

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www.SecoVacUSA.com

SECO/VACUUM is a division of the SECO/WARWICK Group, a leading manufacturer of heat treatment furnaces and technology.