

## About Retech Systems LLC, a SECO/WARWICK Company

Since 1963, Retech Systems LLC has been a global leader in the supply of vacuum metallurgical processing equipment. As an integral part of SECO/WARWICK Group, the most fully integrated furnace manufacturer in the world, we provide customer access to a wide range of in-house resources, including technology, material and process development. Whether a laboratory scale furnace or complete custom design, identifying customer needs, as well as understanding the importance of producing cost-effective technologies is the foundation upon which Retech is built.



# VACUUM ARC REMELTING (VAR) FURNACES

Vacuum Arc Remelted (VAR) steels, superalloys, titanium alloys and zirconium alloys are used in a large number of demanding applications, where cleanliness, homogeneity and improved fatigue properties in the final product are essential. Aerospace, power generation and nuclear industries rely on the properties and performance of materials processed in VAR systems.

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## VAR Advantages

- Vacuum or inert melting atmosphere
- Melt rate control based on alloy and ingot size
- Removal or reduction of dissolved gases, such as hydrogen, nitrogen and carbon dioxide
- Reduction of undesired trace elements with high vapor pressure
- Processing of segregation sensitive alloys
- Controlled solidification of ingots to avoid macro-segregation and reduce micro-segregation
- Low energy input for remelting processes
- Ceramic free process
- Range of materials that can be processed

Retech can support you with VAR systems that are efficient, reliable, and robust allowing you to effectively provide your customers with increasingly complex materials that meet the needs of their advanced applications.

## VAR-T - Traditional design for reactive metals such as titanium and zirconium

- Large systems with up to 1100mm diameter crucibles
- Medium systems with up to 800mm diameter crucibles
- Small systems with up to 400mm diameter crucibles

## VAR-S - Optimized for specialty steel and superalloy processing

- Next-generation accessible, compact, electromechanical design
- Large systems with up to 1000mm diameter crucibles
- Standard systems with up to 800mm diameter crucibles

Advanced VAR systems include process control technology to repeatedly produce high quality products, and the following features:

- Free-standing design independent from building structure
- Remote operator control console



- PLC based control system with computer based HMI
- Ethernet communication interface
- Data acquisition
- Multiple melt recipe storage
- Intuitive multi-segment recipes and a variety of melt modes
- Accurate ram drive positioning and speed regulation
- Accurate X-Y electrode positioning
- Clean, stable DC power supply with excellent drip short control
- Melt rate control
  - Power
  - Electrode position
  - Loss-in-weight\*
- Arc gap control
  - Voltage
  - Drip short
- Clear 360o degree view of the melt zone
- Stainless steel head liner for improved pumpdown times
- Maximized throughput with high speed changeover
- Designed for ease of maintenance and high uptime

Depending on the customer's needs, Retech offers the following options:

- Modified designs to accommodate the customer's stubs and crucibles
- High precision shear beam load cell system for melt rate and melt termination control
- Elimination of hydraulics to reduce contamination risk and complexity
- Extended power ram stroke to accommodate compacted and artwork electrodes
- Deep vacuum levels and decreased pumpdown times
- High definition viewing cameras showing the melt zone
- Programmable bi-directional stirring
- Helium ingot cooling
- Partial pressure operation and control