

Quintus[®] Compact HIP Systems

Highest performance and easy to use



Compact HIP Systems: Features and Benefits



Common applications for Hot Isostatic Pressing include:

- » Defect healing of castings, additive manufactured (AM) parts or metal injection molded (MIM) parts
- » Consolidation of powder metal or ceramic parts
- » Combined densification and heat treatment of critical components
- » Diffusion bonding
- » Post treatment of 3D-printed or metal injection molded (MIM) parts.

Why you should HIP:

~100% of theoretical density

- » Longer life time of parts
- » Reduced scrap rate
- » Predictive life time
- » Lighter and/or lower weight designs

Improved material properties

- » Increased mechanical properties e.g. fatigue, wear and abrasion
- » Reduced scatter in material properties
- » Increased corrosion properties
- » Increased quality of machined and/or polished surfaces

HIP including heat treatment

- » Quintus URC® and URQ® furnaces makes it possible to combine HIP with heat treatment of your parts in the HIP due to its fast cooling rates

Hot Isostatic Pressing

Today, Hot Isostatic Pressing (HIP) is commonly used to eliminate internal defects and improve material properties of metal and ceramic parts aimed for usage in demanding applications.

The HIP process applies high temperature under high isostatic pressure and the result is a fully consolidated material with a density of 100%. The recent years development of the patented Quintus URC® and URQ® furnaces enables heat treatment to be made in the HIP. Combining HIP and post-treatment of the parts results in a cost efficient production process with excellent control of the quality of the processed parts.

Quintus Compact HIP Systems

The parts are first loaded into the cylindrical wire wound pressure vessel that is furnished with an electric furnace. An insulating mantle works as a thermal barrier and keeps the heat away from the watercooled pressure vessel. The most common pressure medium is Argon although other alternatives exist.

Quintus' Compact HIP Systems are delivered as Plug & Play units built on a common skid. The units are suitable for small scale production or laboratory and research purposes.

The smallest model (QIH9) is housed in a single, space-saving cabinet while the other models (QIH15, QIH21, QIH32 and QIH48) are delivered on a single unit skid including equipment cabinets and an operators platform.

Each model is equipped with necessary subsystems for operation of the HIP, such as:

- » Vacuum gas system including high pressure compressor to pressurize the HIP, valves and sensing equipment. Gas reclaim by pumping is included to minimize the gas consumption per cycle.
- » Vacuum system for the initial vacuum pumping.
- » Power system to feed both the furnace as well as all motors, sensing and electrical equipment.
- » Cooling system to cool the pressure vessel during operation.
- » Control system (PLC) and HMI that makes the machine easy to operate.

All models have a built in crane that helps loading/unloading the HIP and the larger models are equipped with an upper closure manipulator and station for workload build-up as well as a parking station for the furnace mantle, all to make production logistics easier.



Hot Isostatic Pressing with performance and productivity in focus

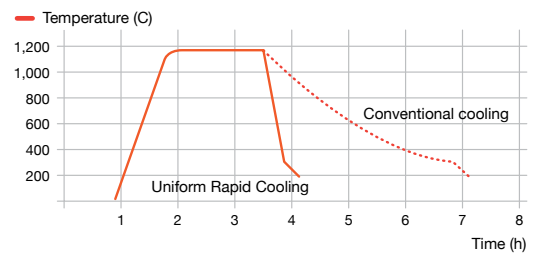


Uniform Rapid Cooling, URC®

Quintus Technologies' URC furnaces can provide the highest productivity, and often a combined HIP and heat treatment cycle and cools all areas of the workload uniformly, minimizing thermal distortion of the processed parts.

A pre-requisite for efficient rapid cooling of the workload is that large amounts of energy is allowed to be transferred from the load to the cooling water outside the pressure vessel in a short period of time. This requirement is fulfilled by the Quintus pressure vessel.

HIP Cycle: Conventional Cooling Versus URC



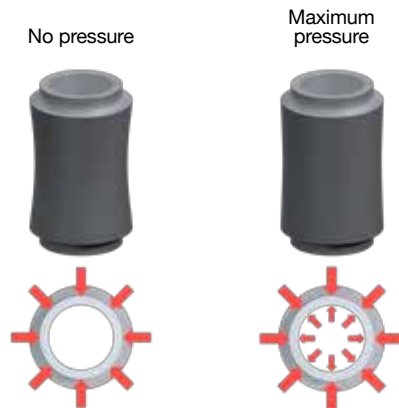
Uniform Rapid Quenching, URQ®

For certain HIP applications where extreme cooling performance is desired, a conventional URC system may not be able to provide sufficiently high cooling rates. Examples of such types of applications can include precipitation hardening and martensitic hardening to enhance the material properties. For such applications, Quintus can offer HIP with Uniform Rapid Quenching furnaces.

Safety

- » Every Quintus Hot Isostatic Press features a cylindrical vessel and yoke frame that are pre-stressed and wire-wound with high tensile spring steel wire.
- » The pre-stressing causes the pressure vessel cylinder wall to remain in residual compression, even at maximum operating pressure, eliminating tensile loads and preventing crack propagation and brittle failure.
- » The wire wound pressure vessel design of Quintus HIP system are widely acknowledged to be the safest, most reliable and durable pressure containment system ever designed.

Pre-stressed thin-walled cylinder



Quintus Compact HIP Systems

Model	Hot Zone Dimensions [mm]				Unit size LxWxH [m]	Weight [kg]
	URC Furnaces		URQ Furnaces			
	Molybdenum 1,400°C	Graphite 2,000°C	Molybdenum 1,400°C	Graphite 2,000°C		
QIH9	-	-	87x160	82x160	2.2x1.7x2.0	4,000
QIH15L	186x500	186x500	175x300	175x300	3.5x1.9x3.4	7,000
QIH21	228x700	228x700	215x410	215x410	6.1x3.5x4.8	15,000
QIH32	300x890	270x820	285x500	255x470	9.0x3.5x5.6	17,000
QIH48	375x1,200	360x1,100	355x700	340x650	9.0x3.5x6.4	24,000

URC cooling rates up to 200°K/min. URQ cooling rates up to 3,000°K/min. All sizes have max operating pressure of 2,070 bar / 30,000 psi.





The Global Leader in High Pressure Technology

Quintus Technologies specializes in the design, manufacture, installation, and support of high pressure systems for sheet metal forming and densification of advanced materials and critical industrial components. Headquartered in Västerås, Sweden, and represented in 35 countries worldwide, the company is the world leader in high pressure technology and has delivered more than 1,800 systems to customers across the globe within industries such as aerospace, automotive, energy, and medical implants.

For more information please visit: www.quintustechnologies.com

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