Temperatures up to 2500°C

"Degrees Ahead in Quality"

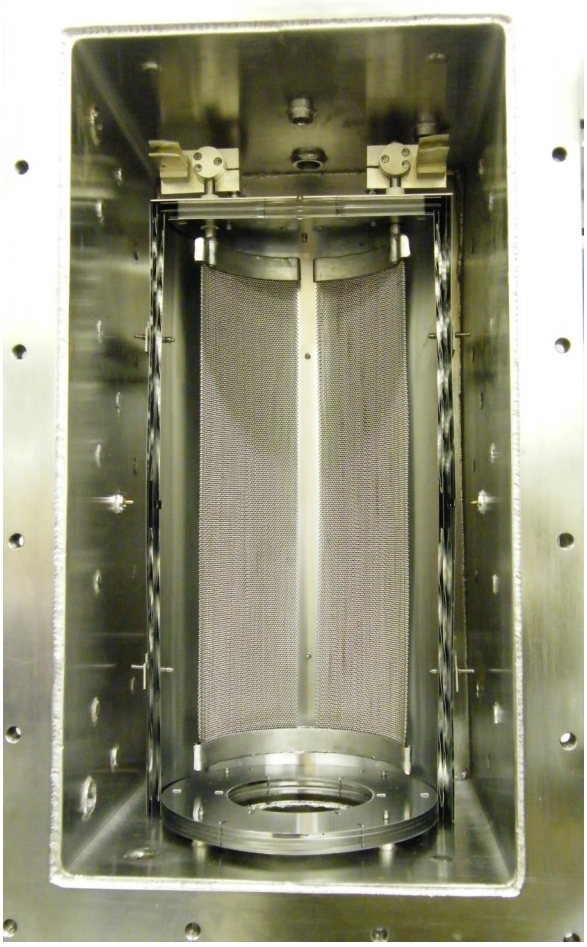
OXY-GON INDUSTRIES, INC.

OXY-GON's Modified FR Series Furnaces are configured specifically for Crystal Growth Systems by Bridgman-Stockbarger and Directional Solidification Techniques. OXY-GON engineers and constructs these systems for ease of operation and to provide years of continuous service. Perfect for use in Research and University Laboratories.

OXY-GON Bridgman Crystal Growth Furnace System

Generally, the basic Crystal growth furnace system includes the following:

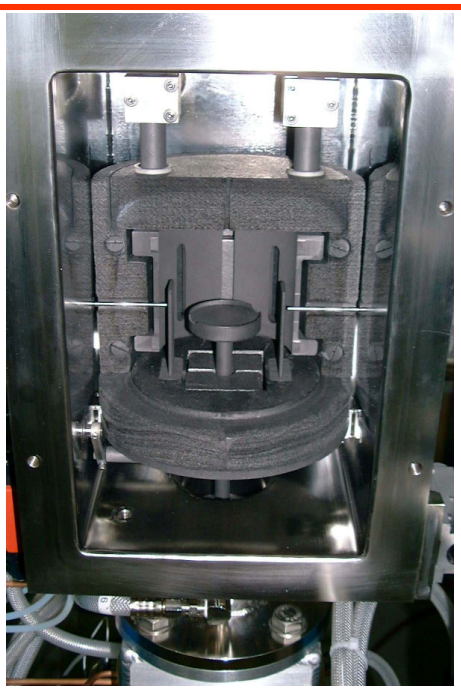
* Furnace Assembly and Choice of Heat Zone
* Temperature Controls and Power Supply
* Crystal Puller—Translation Mechanism
* Evacuation System
* Inert Gas Supply



▲ REFRACTORY METAL HEAT ZONE ►

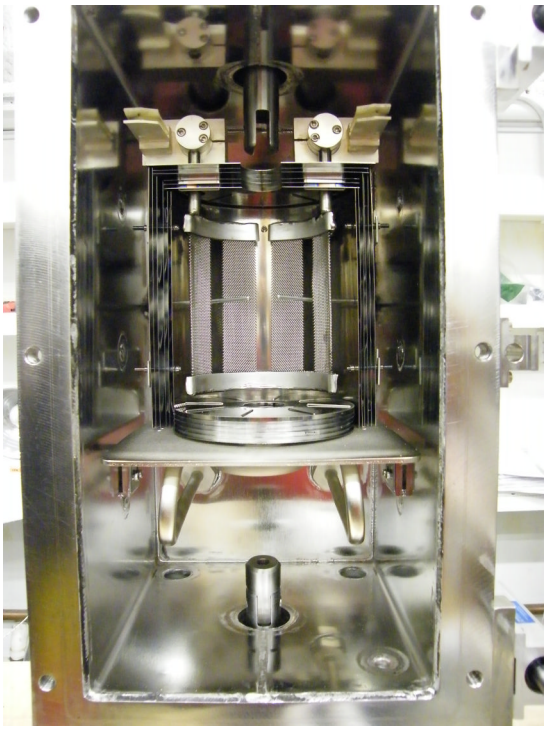
The above photograph shows a single zone refractory metal heat zone for a Bridgman Crystal Growth Furnace System that drops into a separate water-cooled vacuum chamber.

The photo to the right shows a single zone heat zone configuration that incorporates a water-cooled plate that facilitates establishing steeper axial gradients for directional solidification processes.



▲ CUSTOM GRAPHITE HEAT ZONE

This photograph shows a custom Graphite heat zone, that has been modified to include a retractable pedestal for rapid thermal processing. Similar graphite heat zones are available for directional solidification process up to 2800°C.



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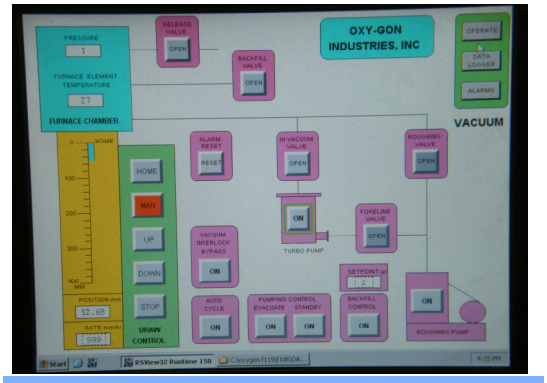
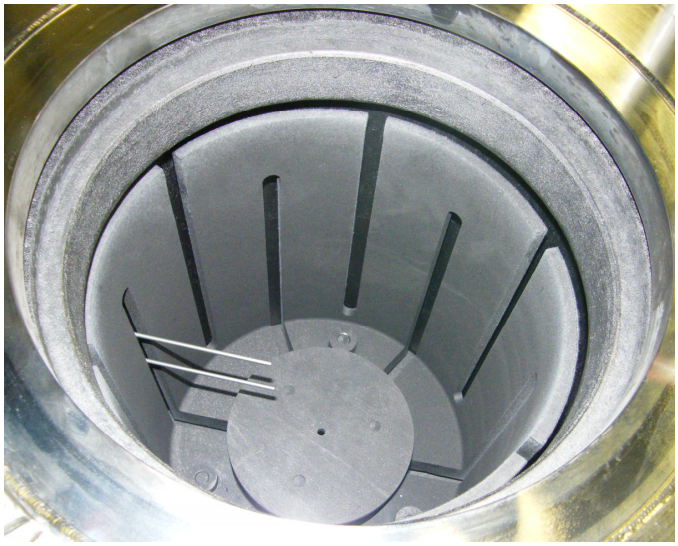
▲ WATER-COOLED CRYSTAL PULLER FOR 100 PSIG BRIDGMAN SYSTEM



▲ EASY TO FOLLOW HMI SCREENS

◄ CERAMIC RETORT WITH VACUUM CONNECTIONS



▲ GRAPHITE HEAT ZONE

The above photograph shows a single zone Graphite heat zone which is typical for Czochralski Crystal Growth Furnace Systems.

▲ 1200°C - TWO-ZONE BRIDGMAN SYSTEM WITH VACUUM RETORT

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FURNACE ASSEMBLY:

The chamber and front door are double walled, 304L stainless steel construction Each component is electro-polished to attain the highest vacuum quality. Ports are incorporated in the chamber and front door for a sight window, thermocouples, or an optical pyrometer. Power to the rear half of the heating element is supplied by nickel-plated, water-cooled power feedthroughs located on the rear surface of the main chamber. Power to the front element half is through silver-plated copper knife switches which eliminates the need for power cables to be mounted on the front door.

HEAT ZONE:

One half of the heating element, the side and top shield packs are mounted on the front door providing easy access to the work area. The element and shield packs can be supplied in Graphite, Molybdenum, Tungsten or Tantalum depending on operating temperature. Work zone sizes range from 1 inch diameter x 2 inches high to 5 inches diameter x 12 inches high.

POWER SUPPLY:

Power supplies can be provided with any of these characteristics: single or three phase, 120, 208, 380 or 480 volts and 50 or 60 Hertz. A typical power supply incorporates a step-down transformer, SCR, circuit breaker, contactor, and amp and volt meters. Power supplies, 25 kVA and above, are housed in a free-standing cabinet separate from temperature controls.

TEMPERATURE CONTROL:

A programmable process temperature controller and a separate overtemperature limiter are standard components. Types of sensors include thermocouple, optical pyrometer, or power transducer. Recorders and data logging devices specific to the Customer's requirements are available as options.

PUMPING SYSTEM:

Fully automatic, PLC controlled, pumping systems can be provided for the range of 10^{-2} Torr (rough pump with mechanical pump only) through 10^{-10} Torr (cryo and ion pumps). Our standard system is automatic and consists of a diffusion or turbomolecular high vacuum pump, a rotary vane or oil free scroll type mechanical pump, isolation valves, and vacuum gauge controller. These systems will consistently operate in the $10^{-5}/10^{-6}$ Torr vacuum range.

INERT GAS/NITROGEN SYSTEM :

To allow operation using inert (Noble) gases or Nitrogen, a kit which includes inlet and outlet valves and a pressure/vacuum gauge is supplied.

CRYSTAL PULLER:

OXY-GON Crystal Pullers and/or translation mechanisms are specifically engineered to provide smooth translation during the crystal growth process by the use of micro-stepping motors that are controlled by the main PLC. Rotational stages can be added to the crystal pullers as well.

For a comprehensive review of your specific requirements, please contact OXY-GON'S technical sales personnel for a customized proposal with specifications.

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