

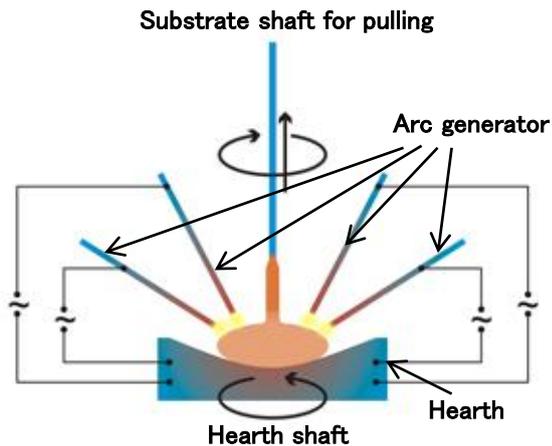
# Tetra-arc Furnace for Single Crystal Growth

## [Outline]

We have delivered dozens of furnaces for single crystal growth to both domestic and foreign research institutes since we developed and manufactured the first Tri-arc furnace for single crystal growth in 1986.

High-melting-point material is melted by four electric arcs in inert gas. Single crystals are grown using the **Czochralski** method.

## [Feature]



- 1) The temperature of the sample in the hearth is distributed uniformly because four arc-electrodes are located in the respective quarters.
- 2) High-quality single crystals can be grown as the sample is pulled upward from the center of the rotated hearth.
- 3) The vacuum discharge speed is so high that high vacuum in the chamber can be realized in less than one hour because a high-vacuum turbo molecule pump (TMP) is mounted directly to the chamber.
- 4) Contamination in the chamber is easily cleaned up because each upper cover, chamber, and lower cover can be opened.
- 5) The control panel and monitor screen can be detached for operation.
- 6) Single crystal growth can be done after on-site installation because we have the accumulated know-how for both hardware and software.

## [Specifications]

Chamber	stainless steel (double hull + cooling water )	
Range for working pressure	$5 \times 10^{-6}$ torr (within 1 hour) -1.1 atm	
Upper cover displacement unit	300 mm uprising	
Vacuum discharge system	turbo molecule pump: 220 L/s + Rotary pump: 100 L/min	
Vacuum gage	measurement range: 760 torr - $1 \times 10^{-9}$ Torr	
Arc generator / Getter generator	200 A	
Substrate shaft	Shaft seal	stainless / ferro-fluidic seal + bellows type
	Normal speed of shaft travel	0-39 mm/ Hr (servo-motor)
	Travel stroke	150 mm
	Speed stability of shaft travel	$\pm 1.0\%$ FS
	Rapid travel	175 mm/min (fix)
	Rotation speed	0-10 rpm
Hearth shaft	Shaft seal	stainless / ferro-fluidic seal + bellows type
	Rotation speed	0-10 rpm

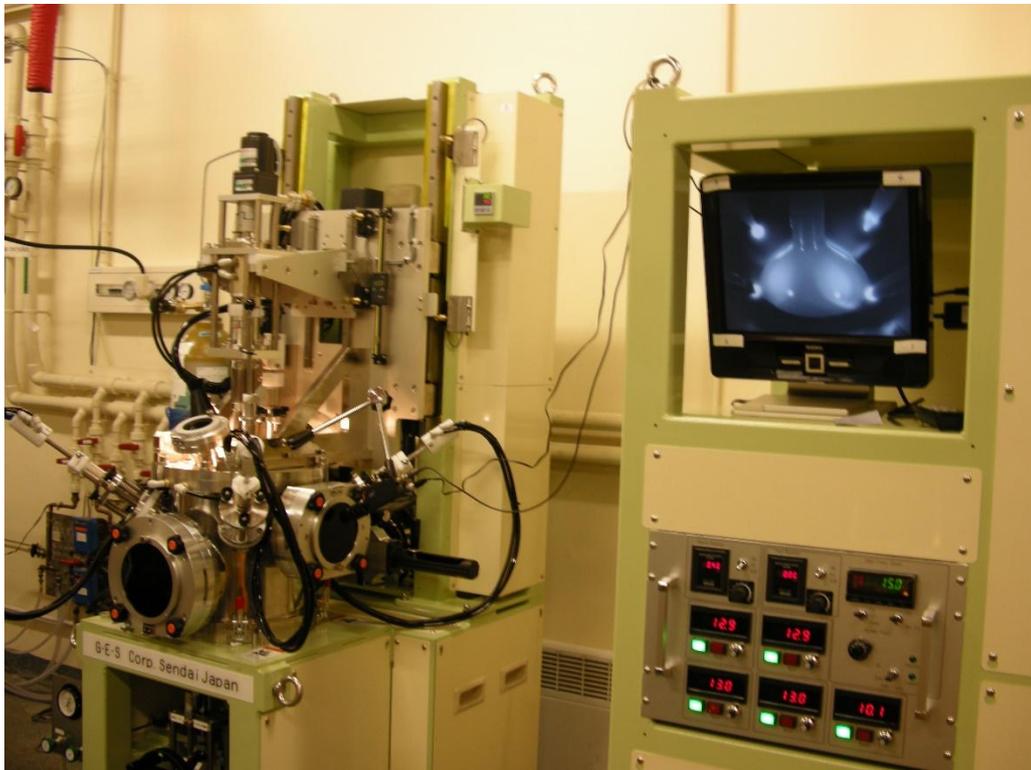


## Tetra-arc Furnace for Single Crystal Growth

### [Constitution]

Furnace for single crystal growth (including Seed shaft, Hearth shaft, Hearth)	1 set
Vacuum discharge system	1 set
Getter shaft	1 set
Power unit	1 set
TV monitor	1 set
CCD Camera	1 set

### [Machine overview]



### [Single crystal of $\text{CeRh}_2\text{Si}_2$ (cerium, rhodium, silicon)]

photo in GES



\*) Specifications subject to change for improvement without notification



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