

# IR Image Furnace

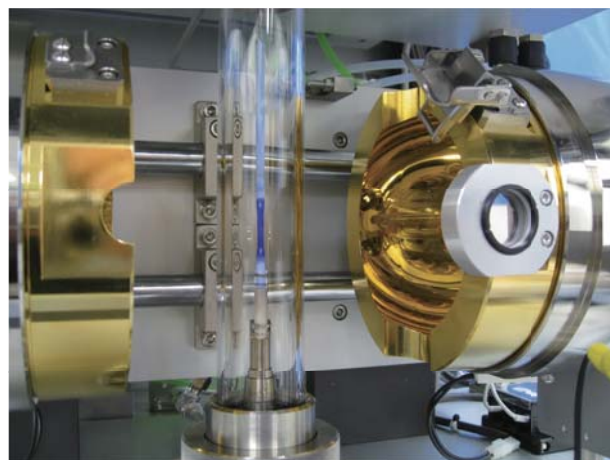


## Features:

- Unsurpassed performance in a convenient, stand-alone design
- Highly efficient two-mirror design
- Gold-coated brass mirrors
- 2100° C in floating zone region
- Excellent IR power stability
- No external cooling required
- Uses standard “off the shelf” lamps
- Single phase power
- CE certified

## Capable of Growing:

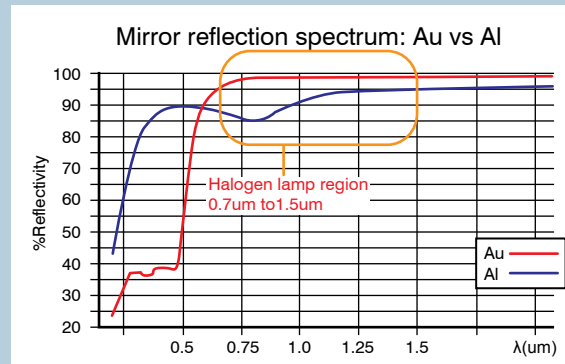
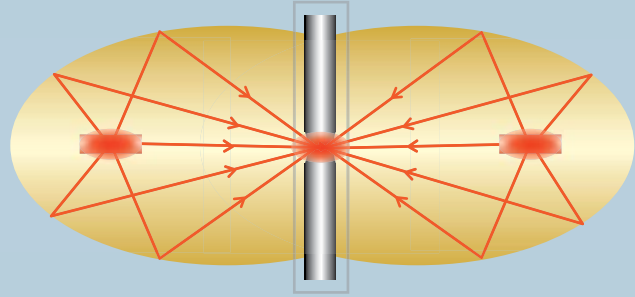
- High temperature superconductors
- Dielectrics and magnetic materials
- Metal compounds
- Semiconductors
- Optical crystals
- Precious stones



# Special Features

## Highly Efficient Gold-Coated Mirrors

- Power efficiently focused toward material
- Deep mirror design produces a sharp power profile in the floating zone region
- Use of gold-coated mirrors maximizes mirror efficiency
- Simple lamp replacement and alignment
- $< 30^{\circ}\text{C}$  circumferential temperature uniformity



## Lamp Power Stability

- Uses high-performance DC power supply
  - Stability: 0.01% of full scale
- $< 0.2^{\circ}$  temperature fluctuations in floating zone region

## Internal Cooling System

Fluid coolant pump and radiator for cooling mirrors

- Coolant also used for cooling the shafts
- Internal air blower for lamp cooling
- Fans at rear to draw hot air out of the furnace



Mirror Cooling



Shaft Cooling



Lamp Cooling



Fans at Rear of Furnace

# Special Features

## Touch Panel Control

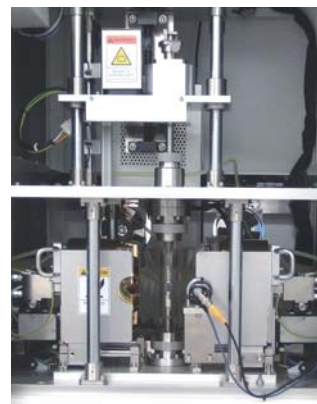
- Control of lamp power
  - Programmable series of lamp voltages
  - Direct setting of lamp power
- Control of crystal growth parameters
  - Growth speed
  - Shaft rotation
  - Fine adjustments of lamp power
- Feed-back of seed and growth rates via integrated shaft encoders
- Real time crystal growth monitoring through CCD camera
- Camera focus adjustable via front door
- Control by PC (optional)



Focus adjust via front door

## Robust Design

- Robust system structure to ensure stable crystal growth conditions
- Up to 10 bar maximum pressure
- Operational safety proven by CE certification
- Interlock protection
  - Against accidental opening of front door
  - Over-temperature protection built in



## External Gas Port

- Floating zone access via external gas port
- Built-in pressure regulator



## CE Certified

- No EMI issue
- Ensures safe operation
- CE certified components



# Specifications

Lamp	Number	2
	Type	Halogen
	Power (programmable)	2 X 650W max
	Cooling	Integrated air blower
	Lamp power stability	0.01 V
Mirror	Type	Double elliptical
	Temperature (floating zone region)	2100° C (4mm material) (can reach 2150° C, $T_m$ of $MgAl_2O_4$ )
	Crystal growth diameter maximum	6mm
	Cooling <sup>1</sup>	Coolant – integrated into system
Shaft control	Crystal growth speed <sup>2</sup>	0.1 to 1.4 mm/hr & 1 to 14 mm/hr
	Shaft drive	Upper & lower independently controlled
	Maximum crystal length	10 cm
	Maximum speed ( coarse mode )	20 mm/min
	Rotation <sup>3</sup>	2.5 to 40 RPM
Other	Control	Via integrated touch panel display (optional control by remote PC)
	Crystal growth monitoring	Real time via CCD camera
	Max pressure (floating zone region)	1MPa (10 bar)
	Size – note all controls packaged into one stand-alone unit	Width: 80 cm Depth: 90 cm Height: 179 cm
	Weight	400 kg
	Input power	200 to 240 V, 15A, 1 $\Phi$

NOTES: 1. No external water supply necessary; 2. Both ranges are standard, other ranges available upon request; 3. Range is standard, other ranges available upon request