

Compound Semiconductor Processing

centrotherm

equipment
process
solutions

Activator 150

High Temperature Furnace

For SiC or GaN Annealing

The centrotherm Activator 150 high temperature furnace line has been developed for post implantation annealing of Silicon Carbide (SiC) or Gallium Nitride (GaN) devices. The unique design of the centrotherm process tube and heating system allows process temperatures up to 1850 °C.

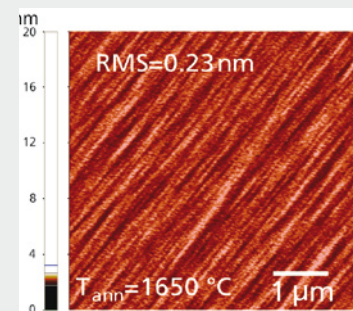
The development of the centrotherm new generation SiC processing furnace was driven by the need for a furnace to process the upcoming 150 mm SiC wafers. The centrotherm Activator 150-5 is specifically developed for R&D work, whereas the Activator 150-50 is designed for high volume production.

The centrotherm Activator 150 stand-alone equipment offers a wide range of process possibilities; allowing optimization and adaptation of the annealing process to the specific implant and substrate (3C, 4H, 6H). This results in the highest possible activation and the lowest surface roughness for the substrate.

With regard to the special heating system, the Activator 150 is capable of handling capped or uncapped SiC as well as structured wafers. The outstanding reactor of the new centrotherm Activator 150 was designed for high performance, small footprint and low cost of ownership while offering the highest process flexibility.



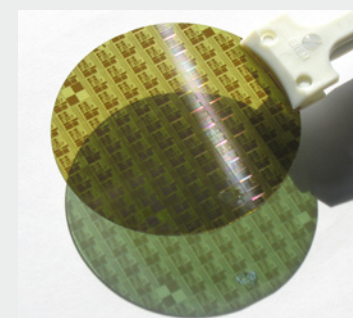
centrotherm Activator 150



AFM image of the implanted sample after annealing at 1650 °C

Features and Benefits

- ▶ high activation rate
- ▶ minimum surface roughness
- ▶ max. temperature 1850 °C [2000 °C under development]
- ▶ small footprint [1.8 m²]
- ▶ heating ramp up to 150 K/min
- ▶ batch processing of 2", 3", 100 mm, 150 mm or any combination
- ▶ batch size up to 40 wafers [2"], 50 wafers [150 mm]
- ▶ vacuum < 1 x 10⁻³ mbar
- ▶ side-by-side installation possible



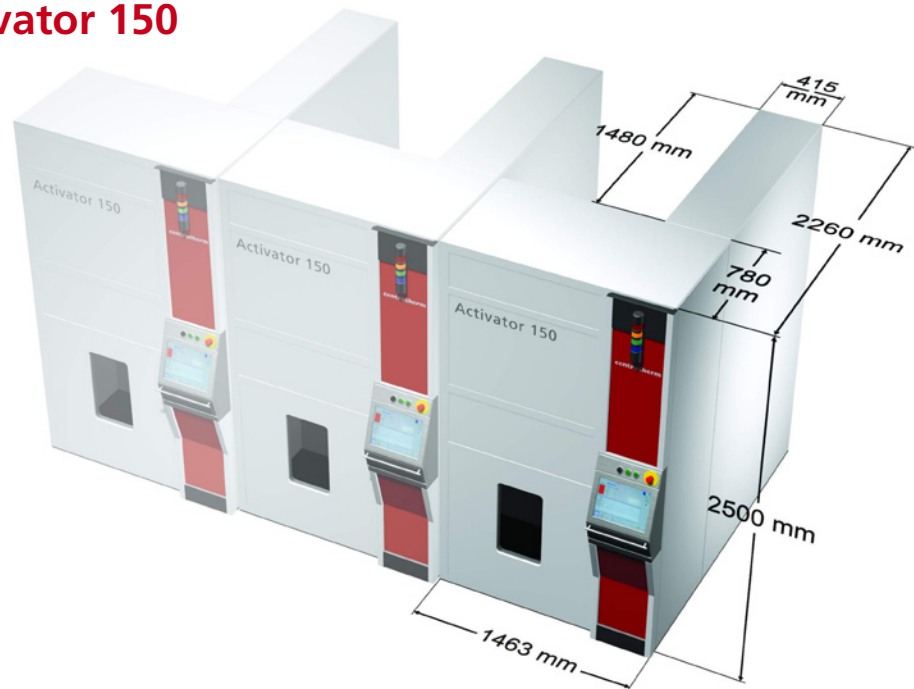
The centrotherm Activator 150 is designed for annealing of SiC or GaN wafers up to 150 mm

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Dimensions

Activator 150



Technical
Data

centrotherm Activator 150 High Temperature Furnace

	Activator 150-5	Activator 150-50
Wafer and batch size	5 [15] x 2", 10 x 3", 5 x 100 mm, 5 x 150 mm wafers	40 [120] x 2", 40 x 3", 50 x 100 mm, 50 x 150 mm wafers
Heating system	resistive heating	resistive heating
Possible gases	H ₂ , He, SiH ₄ , C ₃ H ₈ , C ₂ H ₄ , Ar	H ₂ , He, SiH ₄ , C ₃ H ₈ , C ₂ H ₄ , Ar
Dimensions [L x W x H]	2260 x 1463 x 2500 mm	2260 x 1463 x 2500 mm
Power consumption	max. 25 kW	max. 45 kW
Power supply	400 V, 40 A [3 ph] 50 Hz*	400 V, 70 A [3 ph] 50 Hz*
Dry air	6000 – 10000 Pa	6000 – 10000 Pa
Cooling water	25 LPM	25 LPM
Exhaust	400 m ³ /h	400 m ³ /h

* system will be modified to country-specific power supply

Options

- | load lock – mini environment
- | pressure regulation from 1-25 mbar
- | robot handling
- | profiling thermocouple

Typical Applications

- | high temperature post implantation annealing [3C, 4H, 6H devices, sensors]
- | SiC surface preparation [e.g. carbonization]
- | annealing of Gallium Nitride [GaN]

centrotherm
thermal solutions

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