



centrotherm
thermal solutions

Vertical Production Furnace

verticoo 200

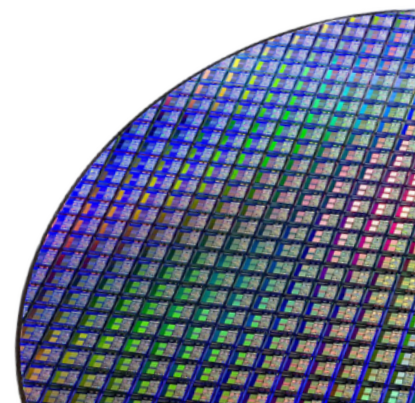
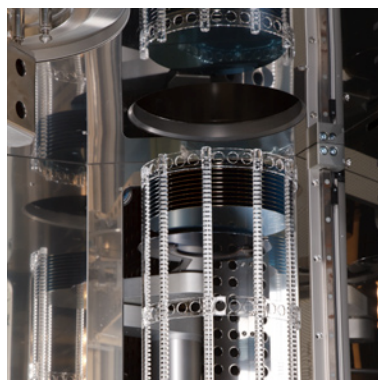
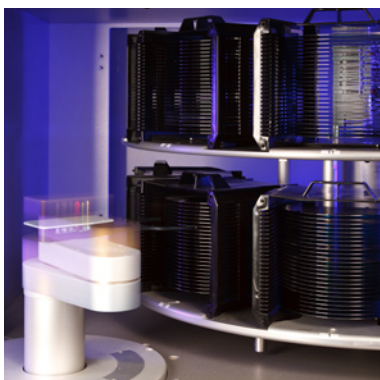
For up to
200 mm wafers

The centrotherm verticoo 200 **mass production furnace** combines a single tube set-up with dual boat and fully automated carrier-to-carrier wafer handling for maximum throughput.

The design of the process chamber and heating system provides a high degree of flexibility for all standard atmospheric and low pressure CVD processes up to 150 wafers per batch.

The centrotherm design is outstanding for high capacity and performance, small footprint, low cost of ownership and high serviceability. centrotherm verticoo 200 is a safe and reliable furnace for many semiconductor device fabrication steps.

Equipment
Process
Solutions



verticoo 200

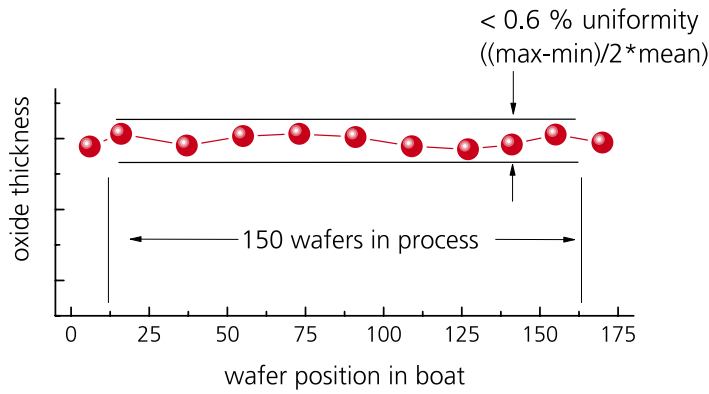
Processes

Atmospheric

- Dry oxidation
- Wet oxidation (centrotherm Hydrox)
- Annealing (N₂, H₂)
- Diffusion

Oxide Uniformity

Dry oxidation | 100 nm | 1050 °C



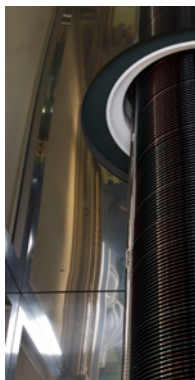
Process Specifications

	Uniformity			Process temperature	Typical thickness range
	p/p (1 σ)	w/w (1 σ)	r/r (1 σ)		
Dry oxidation <15 nm	1.5 Å	1.0 Å	1.0 Å	750-900 °C	2 - 15 nm
Dry oxidation >15 nm	1.5 %	1.0 %	1.0 %	900-1050 °C	15 - 150 nm
Wet oxidation <15 nm	1.5 Å	1.0 Å	1.0 Å	650-850 °C	5 - 15 nm
Wet oxidation >15 nm	1.5 %	1.0 %	1.0 %	850-1050 °C	15 - 1000 nm

Features and Benefits

Design details

- Auto alignment
- Dual boat logistics
- Water cooled heating cassette
- Small footprint [3.1 m²]
- Designed for side-by-side installation
- Internal storage for 20 carriers



Processes

Low pressure CVD

- Polysilicon (doped, undoped)
- Silicon Nitride
- Silicon Oxinitride
- TEOS Oxide
- High Temperature Oxide

Polysilicon Details

Polysilicon flat

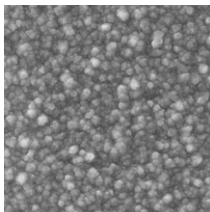
- | | |
|----------------------|---|
| Wafer size: | • 200 mm |
| Batch size: | • 100 process wafers |
| Process temperature: | • 560-620 °C |
| Process pressure: | • 150-250 mTorr |
| Gas: | • SiH ₄ |
| Gas inlet: | • Lances |
| Growth rate: | • ~ 6-10 nm/min |
| Uniformity (p/p): | • <1.5% ((max-min)/2*mean)
<1% (1 σ) |



- | | |
|------------------|--|
| Top: Slot 108: | Mean: 293 nm
Uniformity (p/p):
< 0.97 % ((max-min)/2*mean)
< 0.70 % (1 σ) |
| Middle: Slot 59: | Mean: 302 nm
Uniformity (p/p):
< 1.01 % ((max-min)/2*mean)
< 0.71 % (1 σ) |
| Bottom: Slot 11: | Mean: 299 nm
Uniformity (p/p):
< 1.09 % ((max-min)/2*mean)
< 0.74 % (1 σ) |

Surface Characteristics

Typical polysilicon grain structure

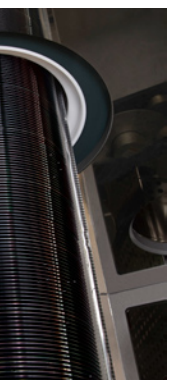


H 200 nm 620 °C

Features and Benefits

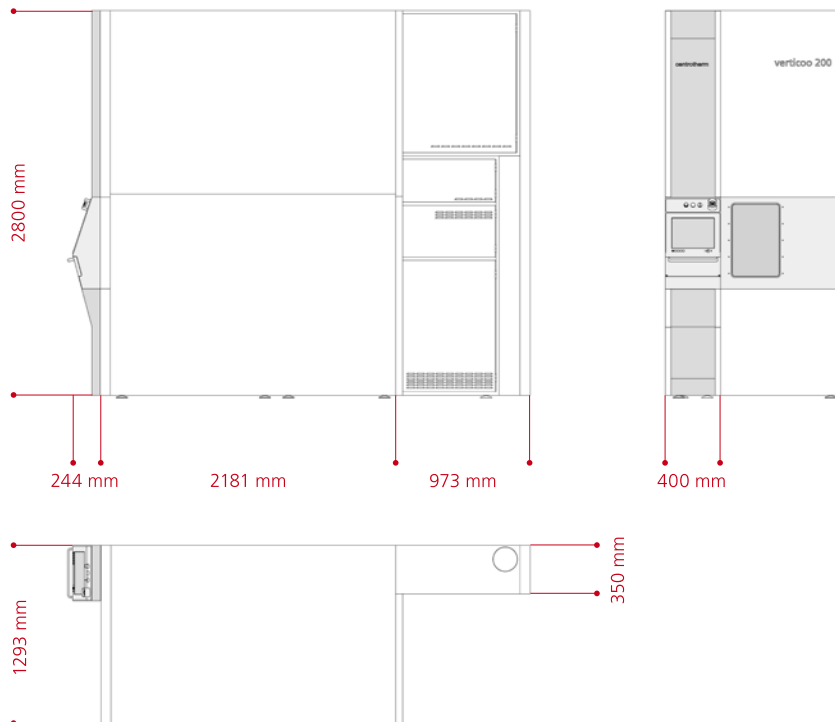
High serviceability

- Main service access at rear side
- Hinged service monitor for easy access
- Fast and easy tube and liner exchange
- Large service doors
- Auto calibration robot



verticoo 200

Dimensions



Technical Data

Model verticoo 200

Wafer size	• 150 mm 200 mm
Batch size	• up to 150 process wafers
Heating system	• 5 zones
Possible process gases	• H ₂ , Ar, O ₂ , N ₂ O, N ₂ , SiH ₄ , NH ₃ , B ₂ H ₆ , PH ₃ , SiH ₂ Cl ₂
Dimensions [L x W x H]	• 3154 mm x 1293 mm x 2800 mm Footprint 3.1 m ²
Power consumption	• max. 25 kW
Power supply	• 400 V, 35 A (3ph) 50 Hz ¹
Dry air	• 6000 – 10000 Pa
Cooling water	• 25 LPM
Exhaust	• 400 m ³ / h

¹ System will be modified to country-specific power supply

Options

- Atmospheric pressure compensation
- N₂ load lock
- SMIF port
- Fast cool

centrotherm thermal solutions GmbH & Co. KG reserves the right to make changes in the product specification at any time and without notice | F I D | verticoo | 02 | E | 09 | 09

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