

ICP Plasma Etcher

SI 500

Configuration

ICP plasma etcher with load lock, reactor, pumping unit, plasma source, substrate electrode for 8" wafers and control rack

PTSA-ICP plasma source with 1200 W RF power supply and automatic matching network

Substrate electrode with mechanical clamping. He backside cooling and 600 W RF power supply

Maximum 12 gas lines per gas box

The **SI 500** platform is generally able to cover a temperature range from -150°C up to +300°C. Detailed specifications are depending from the customised configuration and available on request.

Client-server architecture with remote field controller, serial bus and Windows based user interface software

Remote monitoring and data logging of process parameters

Software and hardware safety interlocks, PC

System Options

- Extra gas lines, extra gas box
- Pumping unit of magnetic levitated turbo pump and dry pump
- Liner
- Chiller
- Reactor heating
- Laser based interferometric endpoint detection
- Optical emission spectroscopy for endpoint detection
- Fiberoptical measurement for real substrate temperature
- Cluster configuration
 - Single wafer manual loading
 - Single wafer cassette to cassette loading
 - Bosch extension for DRIE
- Cryogenic ICP plasma etching with LN2

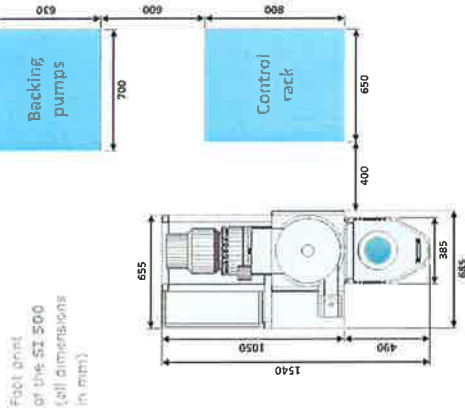
SENTECH Instruments GmbH

Schwarzschildstraße 2
12489 Berlin
Germany

Phone: +49 30 6392 5520
Fax: +49 30 6392 5522
marketing@sentech.de
www.sentech.com



Erfolg durch Leistung



Floor plan of the SI 500 (all dimensions in mm)

Utility requirements

Power	3 x 400 V +/- 5 %, 32 A/phase, 50 Hz / 60 Hz
Compressed air	6 bar
Nitrogen	3 - 4 bar, 25 liter per run
Cooling water	4 bar (filtered), 6 - 8 l/min
Exhaust	DN 40 KF (processed gas) Ø _A 80 mm (gas box)

Ordering information

SI 500	ICP plasma etcher with vacuum load lock
SI 500 C	Cryogenic ICP plasma etcher with vacuum load lock
SI 500-1M	ICP plasma etcher module for cluster tool integration
SI TK	3.4 & 6 port transfer chambers
SI TK CTOC	Cassette station for C to C vacuum loading
SI TK XX1	Single wafer vacuum load lock

Technical details and specifications are subject to change without notice.

SENTECH Worldwide Distributor Network

Sales

SENTECH
Gesellschaft für Sensortechnik mbH

Konrad-Zuse-Bogen 13
82152 Krailing
Germany

Phone: +49 89 897 96070
Fax: +49 89 897 960722
sales@sentech.de
www.sentech-sales.de

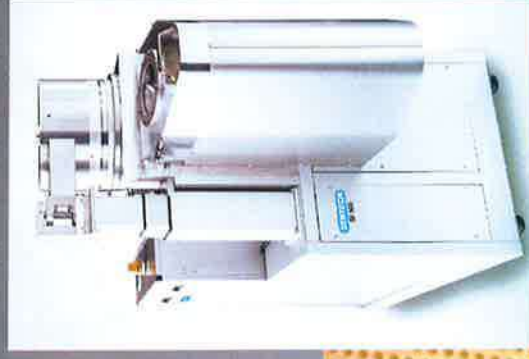
For details as well as for technical and application support please directly contact SENTECH Instruments, Berlin, or your nearest representative.



SI 500 PTSA-ICP Plasma Etcher

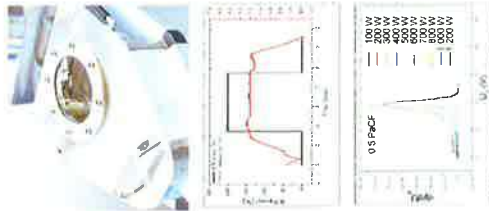
High rate
Low damage
High aspect ratio

ICP



Erfolg durch Leistung

ICP Plasma Etcher **SI 500** from SENTECH



The **SI 500** represents the leading edge for ICP processing in research and production. Flexibility and modularity are design characteristics of the **SENTECH SI 500**.

A wide range of etch processes including III-V compounds (e.g. GaAs, InP, GaN, InSb.), dielectrics, quartz, glass, silicon and silicon compounds (SiC, SiGe) are available.

The **SENTECH** proprietary planar triple spiral antenna (PTSA) produces a truly inductive high density plasma (reactive species, ions, electrons) at low operation pressure with low dc self-bias at the substrate proven by low damage etch of quantum dots and wires. The highly efficient coupling of the ICP rf power to the plasma results in high aspect ratio etch processes even at low plasma power. Dynamic temperature control using resistance heating against the external liquid cooling circuit guarantees constant substrate temperatures independent from the applied plasma power. Etch performances of via holes in Si, GaAs, and SiC demonstrate the optimal process control at high rate etching necessary for deep etching applications. Extremely smooth sidewalls in trenches and ridges can be achieved by using the cryogenic substrate electrode.

SENTECH global network

SENTECH provides a fast service response combined with local and knowledgeable customer support through the worldwide distributor network. **SENTECH** has established a broad user network exploring the most modern etch applications to maintain the companies competitive edge. **SENTECH** customers benefit from latest application and process development.



Erfolg durch Leistung

SENTECH Plasma Operating Software

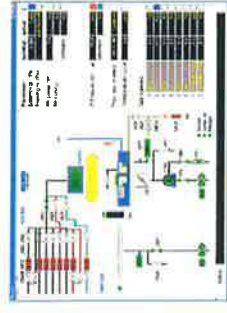


Transfer chamber with robot and cassette station for 25 wafers or 12 carriers

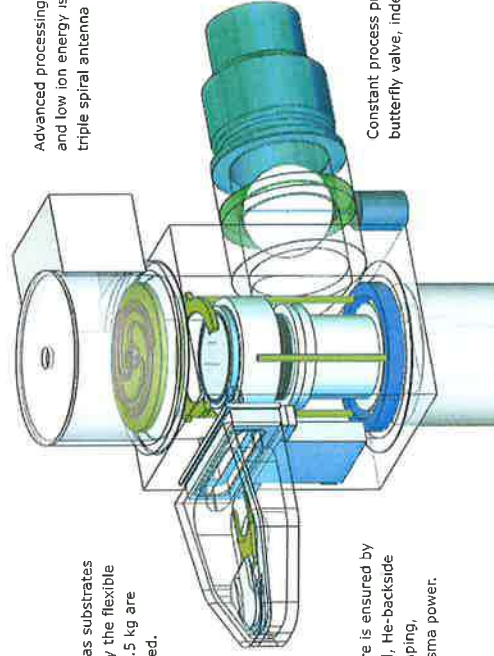
The system control is based on the remote field control (RFC) of all components via serial field bus allowing easy hardware extension later on. The server-client architecture of the **SI 500** allows communication across corporate LAN and internet which enables powerful remote monitoring and servicing.

The **SENTECH** user friendly and intuitive plasma operating software controls the etch process from a Windows based PC. The software user interface provides the total status of the systems at a glance and enables intuitive and quick preparation and execution of recipes. It further allows the setting and logging of process parameters.

Fully automated processing of wafers from the load lock or a cassette station applying intelligent, parameterized recipes or manual system control meet the diversity of user requirements. Hard- and software interlocks guarantee a safer system operation under all conceivable conditions.



Operation software: The scheme of the reactor and the parameter settings are shown. Active components of the reactor are highlighted in green.



Advanced processing with high ion density and low ion energy is enabled using planar triple spiral antenna PTSA 200 ICP-source.

4", 6", and 8" wafers as well as substrates on carriers can be handled by the flexible load lock. Substrates up to 1.5 kg are reliably and quickly transferred.

Constant process temperature is ensured by dynamic temperature control, He-backside contact and mechanical clamping, independently of applied plasma power.

Cryogenic etching of silicon

GaAs-AlGaAs-Bragg reflector of VCSELs. Deep etching of quartz

Etching of Si pillars

Array of fluorinated-sulphure cones

