ICPECVD
Plasma Deposition System SI 500 D

Low damage layer deposition

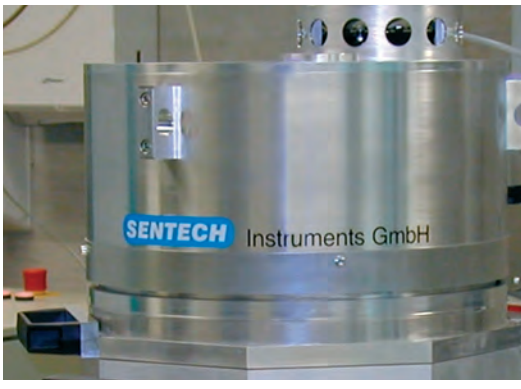
Low temperature deposition (≤100°C)

Si_3N_4 layer lift-off

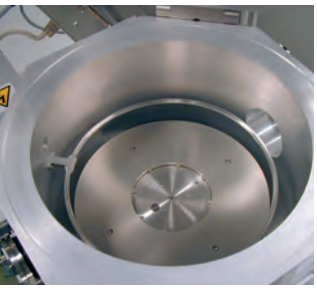
PECVD

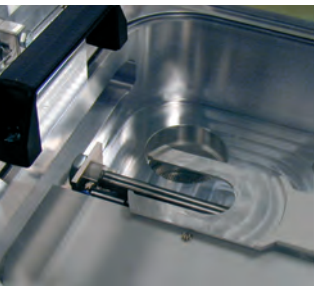
SENTECH Erfolg durch Leistung

The ICPECVD Plasma Deposition System SI 500 D from SENTECH



SENTECH SI 500 D ICPECVD plasma deposition reactor with opened lid – The substrate electrode with cover ring and the gas inlet ring for silane are shown.





Load lock of SENTECH SI 500 D ICPECVD plasma deposition system – The transparent lid and the spatula are shown.

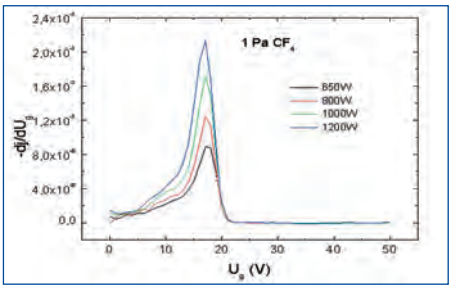
The ICPECVD plasma deposition system SI 500 D is designed for both production and R&D of highly sophisticated process technologies and devices. The SI 500 D provides excellent performance for silane based deposition processes in III-V and silicon processing.
The parallel plate plasma deposition system SI 500 PPD is designed for cost-effective silane based standard deposition processes of dielectric films.
SENTECH SI 500 D and SI 500 PPD can be configured as single reactors or as cluster tools with cassette to cassette loading.
High quality SiO_2, SiOxNy and SixNy films can be deposited by SENTECH SI 500 D in the temperature range of 80°C to 350°C using ICPECVD or between 200°C and 350°C by SENTECH SI 500 PPD using standard PECVD plasma deposition.

For high process stability and repeatability the SI 500 D and SI 500 PPD features MFC controlled gas flow, flow rate independent gas pressure control, dry pump operated load lock, remote field control (RFC) of all system components via serial field bus (interbus), and SENTECH plasma process systems operating software. Outstanding feature of the SI 500 D are the planar inductively coupled plasma (ICP) source and the substrate electrode with helium backside cooling.

SENTECH SI 500 D ICPECVD plasma deposition system.

SENTECH SI 500 PPD PECVD plasma deposition system

Ion energy distribution in a CF_4 plasma at 1 Pa pressure for a PTSA ICP source at different settings of the ICP RF power unit.



SENTECH Erfolg durch Leistung

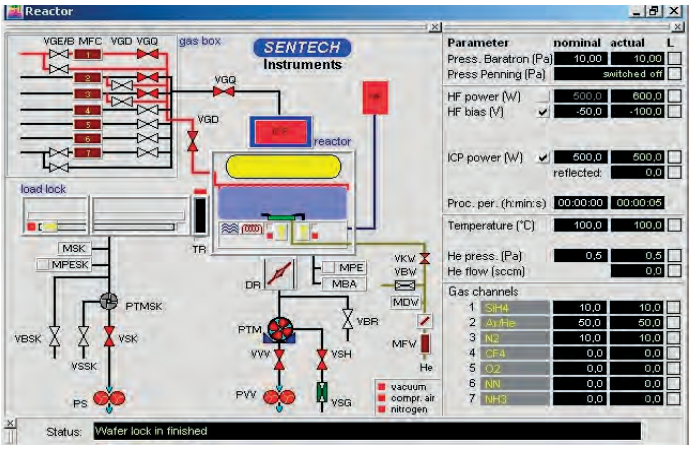
PTSA ICP source of SENTECH SI 500 D ICPECVD plasma deposition system.

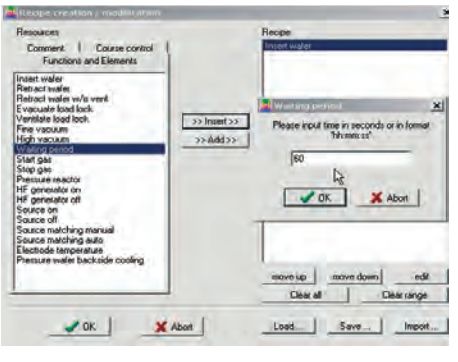
SENTECH Plasma Process Systems Operating Software

SENTECH plasma process systems operating software offers access level based interaction. The server-client architecture allows communication via LAN and the internet.
The deposition process can be controlled in real time by the remote field controller via serial field bus (interbus).

The user-friendly software interface enables quick and comfortable process development and recipe generation. The status of the plasma deposition system is displayed. Executed recipe steps are marked.
Intelligent deposition process control is available using jumps, loops, and calls in plasma deposition recipes.
Main parameter settings can be changed during the deposition process by internal parameter comparison and external parameter control via in-situ measurement techniques. In the manual operation mode each process step can be executed separately.
An extended data logging facility records all analog parameters in an ASCII file. Password controlled login with flexible management is provided.

Up to eight reactor units can be controlled at the same time and independently from each other.

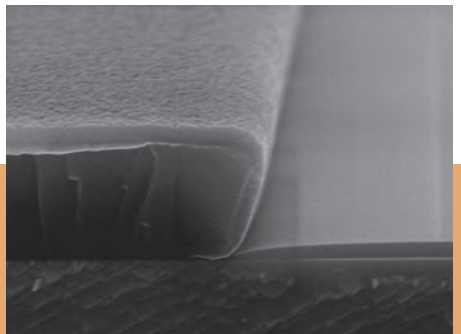




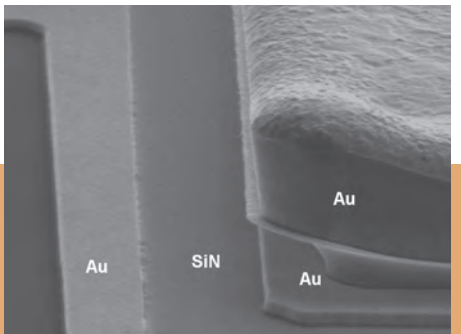
SENTECH plasma process systems operating software – The recipe creation and modification window is shown. Predefined operation steps can be chosen from the list of functions/elements. Parameters can be specified by input windows that are automatically predefined by the menu.

SENTECH plasma process systems operating software – The diagram of the reactor and the parameter settings are shown. Each active unit of the reactor is highlighted in red.

High quality low temperature SiN_x deposition on photoresist on GaAs (T < 90°C) using SENTECH SI 500 D. Courtesy Ferdinand-Braun-Institut für Höchstfrequenztechnik Berlin.



MIM structure on InP. The isolating SiN_x film was patterned by lift-off technique.
Courtesy Heinrich-Hertz-Institut für Nachrichtentechnik Berlin.



ICPECVD Plasma Deposition System SI 500 D

Configuration

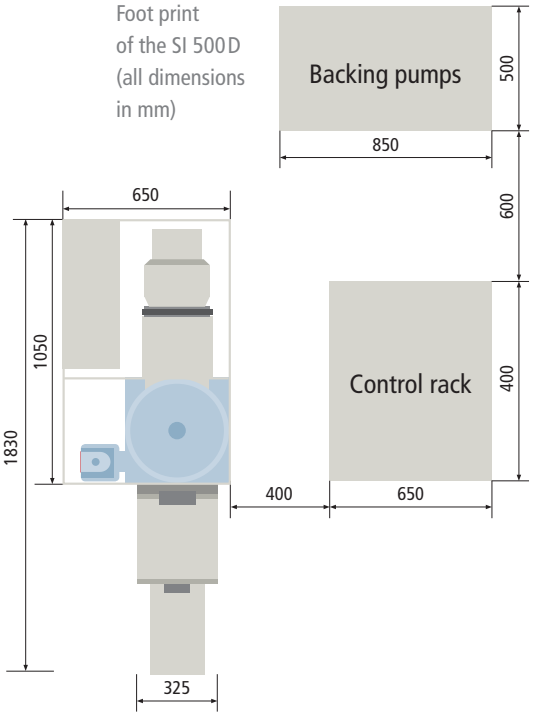
SI 500 D plasma deposition system with ICP source especially designed for low temperature deposition of dielectric films with load lock, roots and backing pump, turbo, substrate electrode for 4"–8" (pieces on carrier), 1200 W RF power supply, 5 gas lines for SiH_4, NH_3, O_2, CF_4, Ar including MFC's, and SENTECH plasma process system operating software (Windows 7 based).

SI 500 PPD plasma deposition system with parallel plate electrode configuration for deposition of dielectric films with load lock, roots and backing pump, turbo pump, substrate electrode for 4"–8" (pieces on carrier), 600 W RF power supply, 6 gas lines for SiH_4, NH_3, O_2, N_2O, CF_4, Ar including MFC's, and SENTECH plasma process system operating software (Windows 7 based).

System Options

Additional gas lines
In-situ ellipsometer
Cluster configuration
- Single wafer loading
- Cassette to cassette loading

Foot print of the SI 500 D (all dimensions in mm)



Utility requirements

Power	3 x 400 V +/- 5%, 16 A, 50 Hz
Compressed air	6 bar (oil and water free)
Nitrogen	3–4 bar, 25 liter per run, process purity
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 D	ICPECVD plasma deposition system
SI 500 D-1M	ICPECVD plasma deposition system module for cluster tool integration
SI 500 PPD	Parallel Plate PECVD deposition system
SI 500 PPD-1M	PECVD plasma deposition system module for cluster tool integration
SI 4TK	4 port transfer chamber (others optionally)
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.

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