

DEP^X

the world's highest speed
SiNx deposition system



Capacity

	DEP ^X 750	DEP ^X 1000	DEP ^X 1500	DEP ^X 2400	
Gross wafer throughput rate	750	1000	1500	3000/2400/1200	wafers/hour
Wafer size, square/semi square	125/156	125/156	125/156	125/156/200	mm
Wafer thickness	140 - 300	140 - 300	140 - 300	100 - 300	µm
Target yield ¹	≥ 98	≥ 98	≥ 98	≥ 99	%
Target uptime ²	≥ 95	≥ 95	≥ 95	≥ 96	%
Foot print	4.3 x 2.4	6.9 x 2.4 ³	7.8 x 2.4 ³	8.3 x 2.2 ³	m

1) Dependent on delivered wafer quality and down stream process quality. 2) Excluded scheduled Preventive Maintenance time. 3) Including automated handling.

General specifications

Layer thickness	60 - 100 nm	Number of sources	3-5 pieces
Layer uniformity <i>(wafer-to-wafer / carrier-to-carrier)</i>	< 5% % (min. - max.)	Ion/electron energy	0.1/0.5 eV
Index of refraction	1.9 - 2.3	Ar speed gas flow	4.5 - 7.5 slm
R.I. Uniformity	< 1% % (min. - max.)	Ar inlet pressure	300 - 500 mbar
Deposition rate SiNx	3 - 6 nm/s with process	Ar ionization rate	10 - 15 %
Process temperature	350 - 450 °C	Precursor gases	SiH4/NH3
Plasma power	2 - 4 kW, DC (remote)	Max. precursor total gas flows	0.6/4.5 slm
		Base pressure process vacuum	< 1 x 10 ⁻³ mbar



For more information
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KEY BENEFITS

- High throughput and yield
- Excellent process uniformity
- Low Total Cost of Ownership
- Easy to maintain and operate
- Compact footprint
- Standalone use and inline integration

OTB SOLAR
empowering solar cell production

OTB SOLAR HAS DEVELOPED A REVOLUTIONARY DEPOSITION SYSTEM FOR ANTI-REFLECTIVE LAYERS AND PASSIVATION: THE DEP^X. THE EQUIPMENT INCORPORATES NEW TECHNOLOGIES SUCH AS A MAGNETIC CARRIER TRANSPORT SYSTEM AND ULTRA FAST PLASMA ENHANCED CVD SOURCE (PECVD), CAPABLE TO DEPOSIT SILICON NITRIDES WITH DEPOSITION SPEEDS UP TO TENS OF NANOMETERS PER SECOND.

ETP technology

The heart of the system is the unique ETP (Expanded Thermal Plasma) source, a patented technology. In the cascade plasma source of the PECVD system, a DC-discharge of argon is sustained in a plasma channel at high pressure. The plasma emanates from the source through a nozzle and expands into the vacuum towards the substrate. An important benefit of the ETP plasma source is the fact that it generates remote plasma, which means that plasma production, transport and deposition are geometrically

separated. The substrate does not play a role in plasma production and ion bombardment of high-energy particles on the substrate is virtually absent (0.1 / 0.5 eV for ion / electron energy). A wide variety of materials can be deposited with the ETP source. Typically a variety of materials are included in a process flow for solar cell manufacturing for front and back side passivation. Relevant materials include SiN, SiO_x, SiC and a-Si. OTB Solar can provide all relevant DEP^X modifications to adapt the standard machine for these materials.

LMS technology

The system includes a Linear Motor System (LMS), a patented technology. The carriers are transported on a rail system in vacuum without any feed-through to the outside. The motion of the carriers is achieved by a magnetic system placed outside the vacuum. Therefore the transport system is almost maintenance free and reduces the risk of a vacuum leak to a minimum.

DEP^X highlights

DEP^X has the smallest process chamber and due to its small footprint, cleaning of the system is reduced to an absolute minimum. Available in different output capacities with the benefit of a high uniformity through out this range. DEP^X can be easily integrated in both inline and batch processing.

DEP^X product family:

- **DEP^X 750** up to 750 wafers/hour manual operation
- **DEP^X 1000** up to 1000 wafers/hour manual operation or fully automated operation
- **DEP^X 1500** up to 1500 wafers/hour manual operation or fully automated operation
- **DEP^X 2400** up to 2400 wafers/hour manual operation or fully automated operation

