

Wafer based modular platform

New applications and markets are demanding continuous improvement of deposition technologies to address the new challenges in thin film processing. The availability of high quality Pulsed

Laser Deposition processes on up to 300 mm wafers allows our customers to extend their thin film deposition capabilities addressing new possibilities to solve these challenges. As a highly

innovative company Solmates can combine IP-protected hardware with years of processing experience to support integration of our layers into your application.

The **wafer based modular platform** is the next step beyond fundamental pulsed laser deposition research.

The reliable hardware is flexible for fast process optimization and allows uniform thin film deposition up to 300 mm diameter with high reproducibility. The automated software ensures easy operation and stable performance. With this equipment, innovative materials and processes at Technology Readiness Level (TRL) 4 to 6 are within reach.

- Reliable and cost effective equipment, tailored to process development and pilot production
- Can easily be upgraded with atmospheric robot for cassette-to-cassette operation
- Tool layout can be customized
- Patented (time-of-flight) particle filter technology for high device yield
- CE certified: interlocks and safety features, ease of use for daily operation
- Control via touch screen
- Easy process recipe creation
- High flexibility for process development and optimization
- Fully automated deposition, use of standard "black box" recipes
- Easy transfer of developed processes to Pilot and Volume production PLD

Solmates' PLD solution forms the missing link between lab and fab for Beyond-Moore processes and unconventional materials

Global service network, proven track record and process development support for your manufacturing needs

Equipment

Substrate dimensions	Up to Ø300 mm
Substrate shape	Round and square
Laser	KrF excimer laser
Beam delivery	Complete integrated optics
Process temperature	RT – 800°C
Substrate temperature-uniformity	<2%
Process gasses	O ₂ , Ar, N ₂ – others on request (forming gas)
Particles	Active particle filtering technology

Process specifications

Thickness uniformity		
W / W		< 2 % 1s
WtW / RtR		< 1.5 % 1s
Composition uniformity		< 2 % 1s

Options

- Host interface
- Target library loadlock

Markets	Application / functionality	Materials
OLED & LED	Anti-reflection, TCO's, barriers, passivation	Al ₂ O ₃ , AZO, HfO ₂ , IGZO, ITO, MgO, Mg-ZnO, Ta ₂ O ₅ , ZnO, ZrO ₂
MEMS & NEMS	Sensing, actuation, acoustics	Al ₂ O ₃ , BiFeO ₃ , KNN, LaNiO ₃ , PbTiO ₃ , Pb(Zr,Ti)O ₃ , PMN-PT, SrRuO ₃ , LiNbO ₃ , ZnO, AlN, Sc:AlN, HfO ₂
CMOS & power IC	High-k, passivation, barriers, spintronics	AlN, Al ₂ O ₃ , CeO ₂ , HfO ₂ , MgO, PZT, SrTiO ₃ , TiN, ZrO ₂
Energy	SOFC, PV, batteries, thermoelectrics	YSZ, CIGS, Gd-CeO ₂ , ITO, (La,Sr)(Co,Fe)O ₃ , Li _x MnO ₂ , Li _x CoO ₂ , Na _x CoO ₂ , Zn _{1-x} Al _x O
Photonics	Electro-optics, IR-detection, waveguides, quantum computing, Pockels	Al ₂ O ₃ , BaTiO ₃ , ITO, LiNbO ₃ , PLZT, Y ₃ Fe ₅ O ₁₂ , ZnO
Memory	MRAM	BiFeO ₃ , CoFe ₂ O ₄ , CrO ₂ , LSMO, MnFe ₂ O ₄ , MnO
Conductors	Electrodes, reflectors, alloys, superconductors, metal-insulator transition, oxide electrodes	Ba(Bi, Pb)O ₃ , LaNiO ₃ , SrRuO ₃ , SrLaCuO ₄ , V ₂ O ₃ , Yba ₂ Cu ₃ O _{7-x} , ITO
Epitaxy	templates, superlattices, 2D-materials	CeO ₂ , GaN, LaAlO ₃ , MgO, SrTiO ₃ , TiN, YSZ, MoS ₂
RF & 5G	SAW, BAW, discrete devices (varactors, beam-steering, high-K)	AlN, BN, BaTiO ₃ , Ba1-xSr _x TiO ₃ , Sc:AlN, LiNbO ₃

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 THIN FILM EQUIPMENT