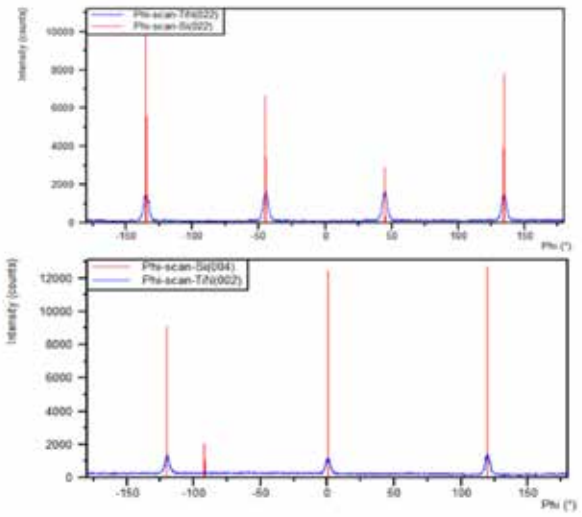
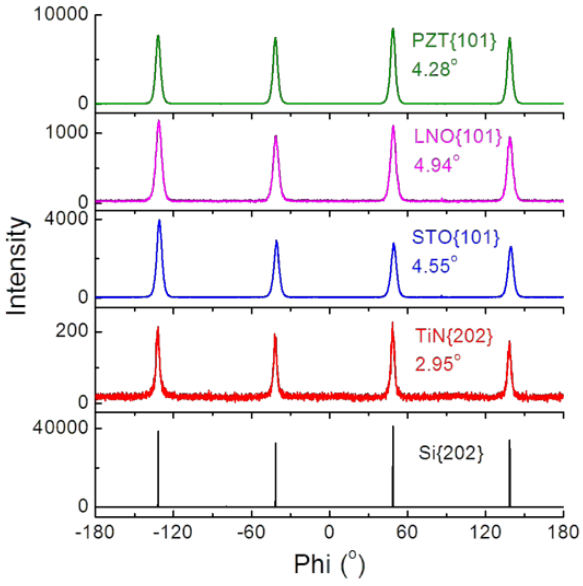
Solmates epitaxial layers on Silicon

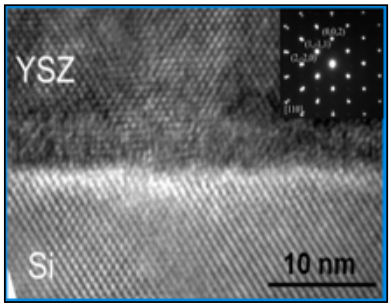
New material systems are more and more driven by integration of epitaxial materials directly on Silicon wafers. Solmates' unique industrialized PLD process provides a fast solution for epitaxial template layers on different interfaces. This epitaxial growth is driven by the fundamental principle of easy nucleation in a PLD process and applies to a variety of materials. Such epitaxial seeding layers enables integration of epitaxial layers to standard Silicon wafers, enabling a variety of novel devices.

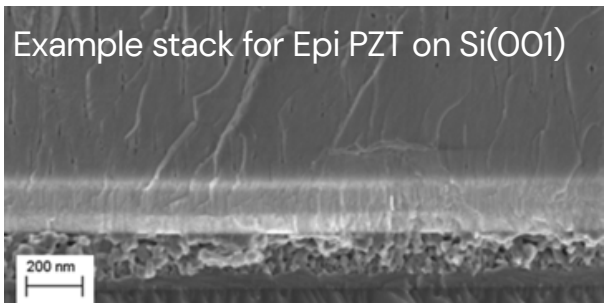
- High-quality epitaxial layers, directly grown on Silicon substrates
- Standard industrial values achieved for throughput and defect density
- Epitaxial templates used to grow in-situ perovskite multilayers
- Full integration possible to any other deposition technique or material system

Epi TiN on Si(001) and Si(111)









SOLMATES
THIN FILM EQUIPMENT

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

Basic features

Substrate size	Up to 200 mm
Substrate type	Round, squares
Target capacity	Up to 4 targets in situ changeable
Laser	Integrated high power excimer laser
Beam delivery	Complete integrated beam delivery optics
Process temp.	RT - 800 °C
Substrate temp. uniformity	< 2 %
Droplet trap	Yes
Process gasses	O_2 , Ar and/or N_2

Process specifications

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

Options

- Host interface
- 1 or 2 cassette loadports
- Customization

Markets	Application / functionality	Materials
OLED & LED	Anti-reflection, TCOs, barriers	Al_2O_3, AZO, HfO_2, IGZO, ITO, MgO, Mg-ZnO, Ta_2O_5, ZnO, ZrO_2
MEMS & NEMS	Sensing, actuation, acoustics	Al_2O_3, $BiFeO_3$, KNN, $LaNiO_3$, $PbTiO_3$, Pb(Zr,-Ti)O_3, PMN-PT, $SrRuO_3$
CMOS & power IC	High-k, passivation	AlN, Al_2O_3, CeO_2, HfO_2, MgO, $SrTiO_3$, TiN, ZrO_2,
Energy	SOFC, PV, batteries, thermoelectrics	YSZ, CIGS, Gd-CeO_2, ITO, (La,Sr)(Co,Fe)O_3, Li_xMnO_2, Li_xCoO_2, Na_xCoO_2, $Zn_{1-x}Al_xO$
Photonics	Electro-optics, IR-detection, waveguides, quantum computing	$BaTiO_3$, ITO, $LiNbO_3$, PLZT, Y_3Fe5O_{12}, ZnO
Memory	Magnetics, spintronics	$BiFeO_3$, $CoFe_2O_4$, CrO_2 , LSMO, $MnFe_2O_4$, MnO
Metals & conductors	Electrodes, reflectors, alloys, super-conductors, metal-insulator transition	Ag, Au, Ba(Bi,Pb)O_3, $LaNiO_3$, Ni, Pd, Pt, $SrRuO_3$, $SrLaCuO_4$, V_2O_3, $YBa_2Cu_3O_{7-x}$
Epitaxy	Templates, superlattices	CeO_2, GaN, $LaAlO_3$, MgO, $SrTiO_3$, TiN, YSZ

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SOLMATES - Auke Vleerstraat 3, 7521 PE Enschede - The Netherlands
T +31 53 700 97 09 - **E** info@solmates.nl **www.solmates.nl**

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