

PLD pro.

**PULSED LASER DEPOSITION
FOR THIN FILM GROWTH WITH
ATOMIC PRECISION**

Unlock atomic precision in thin film research

Experience the next generation of thin film innovation with Demcon TSST Pulsed Laser Deposition systems. Engineered for excellence, our PLD systems, optionally featuring advanced in situ RHEED technology, empower researchers to achieve atomic-level control and reproducibility across a wide spectrum of materials, including complex oxides. Trusted by leading institutions, our solutions deliver proven results in the most demanding research environments.

Why choose Demcon TSST?

- Academic collaborations: Continuously sharing expertise with the renowned materials science group at the University of Twente, our systems embody the latest breakthroughs in thin film growth and process optimization.

- Ultimate flexibility: Effortlessly tailor every essential parameter, gas mixtures, process pressure, target-to-substrate distance, and substrate temperature, with unmatched precision, enabling you to push the boundaries of your research.
- Comprehensive support: From on-site installation and acceptance testing by our expert engineers to hands-on user training and yearly organised PLD workshops, we ensure our systems facilitate monolayer growth control using RHEED. Our dedicated support team and intuitive software with robust data logging guarantee fast, effective remote assistance whenever you need it.

Transform your research capabilities and achieve results that set you apart. Discover how Demcon TSST PLD systems can elevate your laboratory to new heights of performance and reliability.

SYSTEM SPECIFICATIONS

Vacuum chamber

Chamber:	Spherical, including ports for RHEED
Base pressure:	<10-7 mbar
Pumpline:	Turbo (300l/s), manual gate valve, manual bypass line for pumpspeed control Roughing line, allowing high pressure annealing
Process gasses:	Two MFC controlled process gasses (e.g. O ₂ , Ar, N ₂)
Pressure control:	Automated upstream pressure control
Deposition geometry:	Vertical
Quick access door for easy access, sample and target transfer	

Heater stage

Heating method:	Radiative heating
Temperature:	<1000°C
Sample size:	<2" substrates, flagstyle sample plate platform compatible
Sample manipulation:	XY-range 25mm, Z-range 100mm, azimuth and continuous rotation
Shutter, allows use of RHEED while closed	

Target stage

Movement:	Target rastering, XY range 25mm, Z range 100mm, target select
Amount of targets:	up to 6
Targetsize:	1"
Whole target carousel transfer through loadlock	

Demcon TSST control software

Full manual to automated control, including growth recipes and parameter logging

OPTIONS AND UPGRADES

Loadlock

Pumpline:	Turbo (>70l/s)
Base pressure:	<10-5 mbar
Both sample and target carousel transfer	

High pressure RHEED

Electron gun specifications:	30kV
Operational process pressure":	<0.5mbar, differentially pumped

Heater stage

Heating method:	Laser heating
Temperature:	>1100°C
Sample size:	<10x10mm substrates, flagstyle sample plate platform compatible
Sample manipulation:	XY-range 25mm, Z-range 100mm, azimuth and continuous rotation
Shutter, allows use of RHEED while closed	

Optics and laser

Fluence range flexibility for complex materials and metal ablation, fully enclosed beam delivery optics

Excimer laser:	400-800mJ, 10-50Hz
Beam delivery optics with clipping mask imaging for homogeneous spotsize and fluence control	

Nd:YAG laser:	100mJ @ 266nm, 10Hz
Focusing lens for variable spotsize control, software controlled shutter for introducing laser pulse at stable energy	

Additional options:	Manual beam attenuator, laser energy meter
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