

The ALD
Powerhouse



SERIES

www.picosun.com

DEFINING THE ALD PRODUCTION

Picosun focuses exclusively on ALD systems. Our pioneering ALD experience has been refined into the fast and safe processing capability of SUNALE™ P-series ALD equipment. The modern compact design of our reactors saves expensive production space.

SUNALE™ P-SERIES ALD Process Tools



Focus on ALD

Picosun is exclusively an ALD-company. This explains why we get it right, where many just struggle. We have more ALD experience than any other company in the world, be these large or small in size. ALD-exclusivity creates exceptional products and amazing results.

Defining the standards

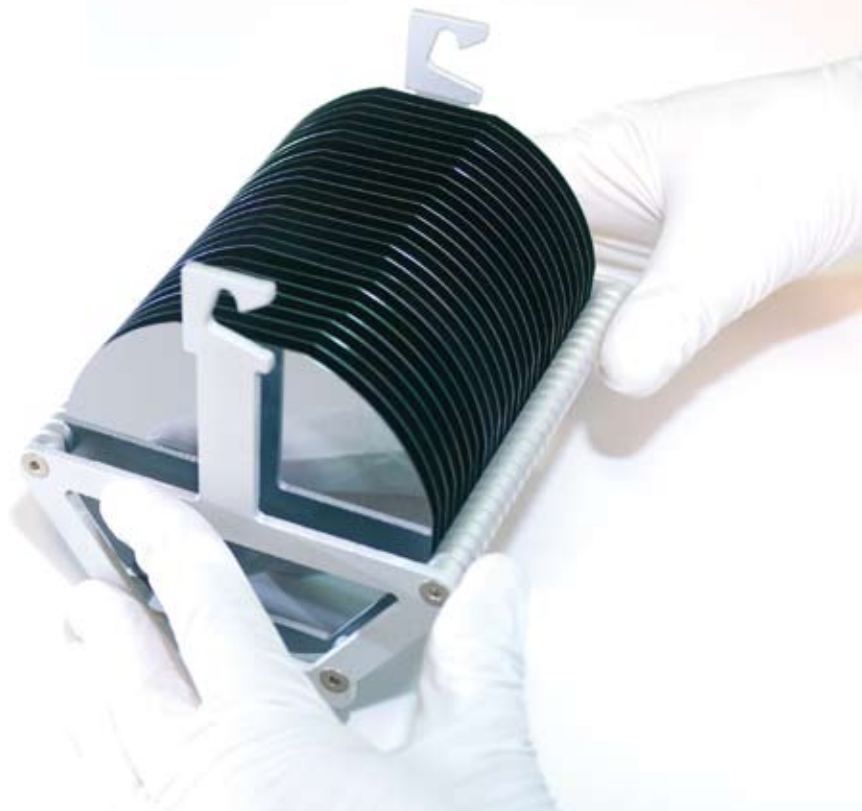
SUNALE™ P-series ALD process tools enable unique scalability from research to production. PicoBatch™ system defines new standards for efficient wafer processing. Performance of the ALD tool can be maximized with the use of a robotic handler.

Strong processing power in a compact design

Reliability, speed and quality makes SUNALE™ P-series ALD tools the optimal choice for production. Pioneering ALD experience has been refined into the fast and safe processing capability of our equipment. The modern compact design of SUNALE™ P-series ALD equipment saves expensive production space. Quick and easy maintenance of our systems results in short tool downtime.

World-class service

Picosun is proud to offer high quality after-sale service managed by our Customer Service Department. The service is offered off- or on-site covering various requirements from functionality of SUNALE™ reactors and new process chemistry to process integration. Picosun can offer field service contracts or hourly services based on the customer needs.



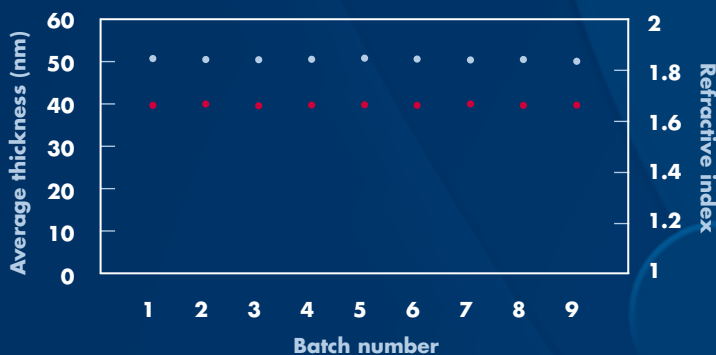
Examples of ALD applications

Material	Applications
Aluminum oxide, Al ₂ O ₃	MEMS coatings, passivation coating, insulator for microelectronics, ion diffusion barrier, fill layers for magnetic read heads, etch stop layer
Tin dioxide, SnO ₂	Optoelectronics, gas sensors, antistatic coatings, ARC
Titanium dioxide, TiO ₂	Photocatalytic coatings, photovoltaics, antistatic coatings
Vanadium oxides, V ₂ O ₅ and VO ₂	Catalyst coatings, optical switching materials, energy storage
Zinc oxide, ZnO	Semiconductor materials, buffer layers in solar cells, UV blocking layer
Titanium nitride, TiN Tantalum nitride, Ta ₃ N ₅	Metal electrodes, diffusion barriers
Nanolaminates	E.g. AlTiO as electrical insulator

Wafer batch run to run repeatability of Al₂O₃

Picosun customer data
5 points, average

● Thickness ● RI



Wafer batch film non-uniformity of Al₂O₃

Picosun customer data
9 points, 1-σ standard deviation

	Specification	Measured Data
Within wafer	< 1 %	0.6 %
Within batch	< 2 %	1.0 %
Batch to batch	< 2 %	0.3 %

SUNALE™ P-series technical features

Basic features

Wafer size	4", 100 mm
Number of wafers	25-50 pcs
Process temperature	Up to 500°C
Reaction chamber volume	Large
Reaction chamber material	316 SS, Ti, Ni, Al
Precursor sources	2-4 liquid / gas
Substrate loader	Pneumatic lift

Measures

Dimensions	27.6 x 41.3 x 36.4", 70 x 105 x 92.5 cm (W x H x D)
Weight	200 kg

Utilities

Power supply	100-240 V, 50/60 Hz, 1- or 3-phase, 3.7 kW
Vacuum pump	30-80 m ³ /h
Carrier gas	99.999 % N ₂ / Ar, min. 2 slm
Compressed air	4-5.5 bar overpressure
Cooling water	Not required for the reactor
Exhausts	For vacuum pump and source cabinets



SEMI organisation President and CEO Stanley T. Myers presents the European SEMI 2004 award to Dr. Tuomo Suntola at Semicon Europa 2004 exhibition in Munich.

PICOSUN – THE ALD POWERHOUSE

Picosun is an international equipment manufacturer with a world-wide sales and service organization. We develop and manufacture Atomic Layer Deposition (ALD) reactors for micro- and nanotechnology applications. Picosun provides its customers with user-friendly, reliable and productive ALD process tools, which offer unique scalability from research to production. Picosun is based in Espoo, Finland and has its US headquarters in Detroit. SUNALE™ ALD process tools are used by leading scientific institutions and companies across Europe, America and Asia.

Picosun has expertise that has been attained from over three decades of ALD reactor manufacturing in Finland. Dr. Tuomo Suntola, the inventor of the ALD method in 1974, is a Member of the Picosun Board of Directors. Our CTO Sven Lindfors has continuously designed ALD systems since 1975. Combined, Picosun people share over 200 years of ALD experience and have contributed to more than 100 patents on ALD. Our long history and comprehensive background establishes Picosun as the optimal partner for your ALD technology needs.

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