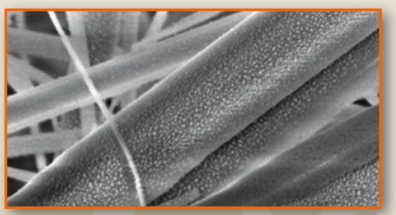
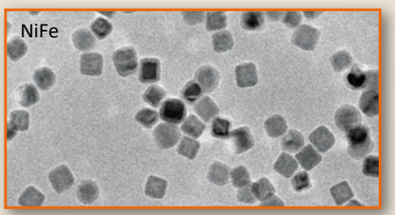
NEXUS
Nanomaterials
Deposition System



Plasmonics

Green Hydrogen



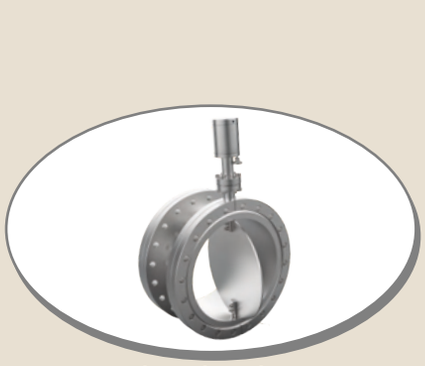
Catalysis

Deposit hydrocarbon free nanoparticles.

Your complete vacuum deposition solution.

sales@nikalyte.com www.nikalyte.com

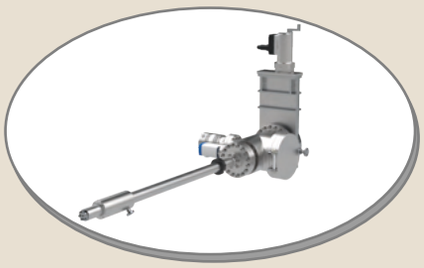
Configuration options



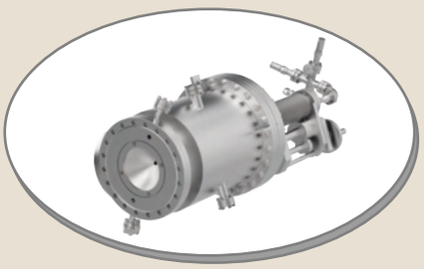
Throttle valve

Substrate table

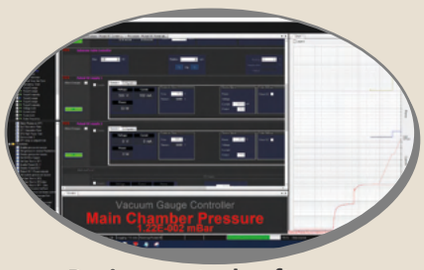
Mass filter



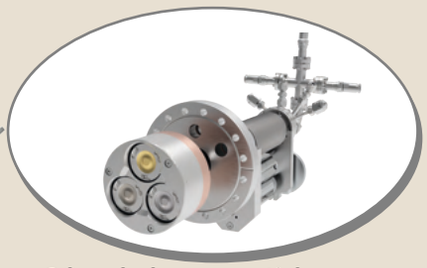
Load-lock



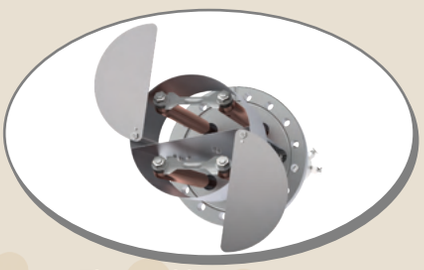
Nanoparticle aggregation zone



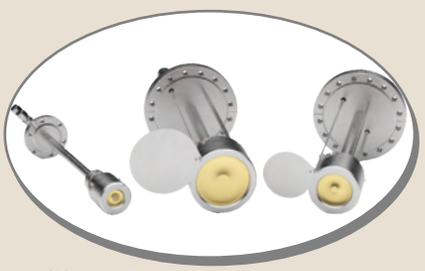
Recipe control software



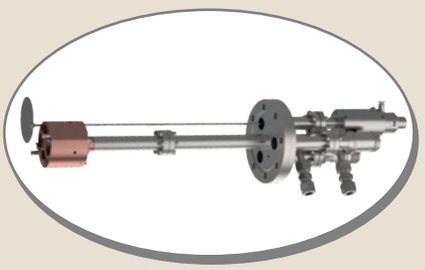
3 headed nanoparticle source



Thermal boat sources



Magnetron sputter sources



Mini e-beam evaporator

Discuss your application(s) with our PVD specialists. We can help you determine the most effective and cost-efficient solution to meet your process needs.

Regular consultations with our in-house design team as your system takes shape.

Installation and comprehensive training including demonstration of basic PVD processes and parameters to help get you started.

Supported by technologists with decades of combined experience in nanoparticle deposition and nanomaterial applications

Overview

Powerful, flexible PVD research platform

- System base pressure 5x10-7 Torr.
- Interlocks to protect both personnel and equipment.
- 2 Confocal CF150 and 3 confocal CF100 source ports.
- Additional ports for pumping, gauges, load-lock, mass spectrometer, viewport, process monitoring.
- Combination turbo/dry backing pump(s).
- Up to 4 inch diameter wafer sample table with 20rpm rotation.
- Quartz Crystal Microbalance (QCM) for rate monitoring and end-point detection.
- Fully integrated software control of all system functions, data logging and automated process control recipes. **See our software brochure** for further details.

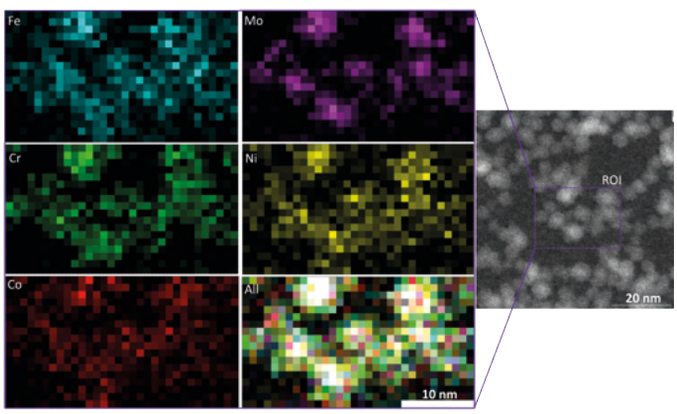
Upgrade to UHV performance with load-lock, bakeout and pumping upgrade option.

Entry level system.

Hydrocarbon free Nanoparticle source

- Nanoparticle (NP) size can be tuned via variable aggregation zone volume, carrier gas flow and plasma power.
- Greater deposition rates achievable than other commercial nanoparticle sources – up to 3mg/hr/cm² demonstrated for Platinum.
- Single 2 inch target source or triple 1 inch target option, with independent control of each cathode for varying composition of alloy NPs.
- Water or liquid nitrogen compatible cooling jacket surrounding the nanoparticle aggregation zone.
- Quadrupole mass filter for real-time nanoparticle size selection and filtering.

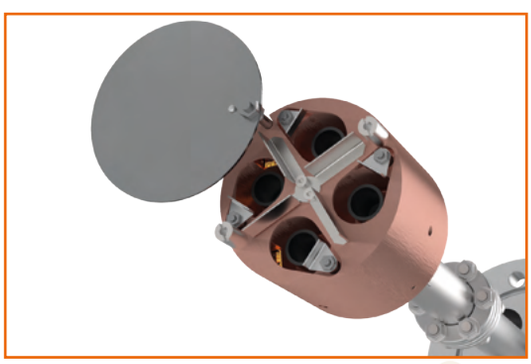
See our **NL-UHV brochure,** for further details **click here**.



NiFeCoMoCr alloy NPs.
Photo courtesy of Weatherup Group, University of Oxford.

Your deposition process workhorse

- UHV compatible Stellar Magnetron sputter sources are available in a 1, 2 or 3 inch target size. Magnetrons are compatible with DC, pulsed DC, RF or HiPIMS power supplies. Standard or high-strength (for magnetic materials) magnet options are available.
- The Evap-4 mini e-beam evaporator has 4 independently controlled 1CC crucibles with co-evaporation capability.
- Thermal boat source with 1 or 2 boat option.
- K-cell, Ion source and RF Atom source available from third parties.



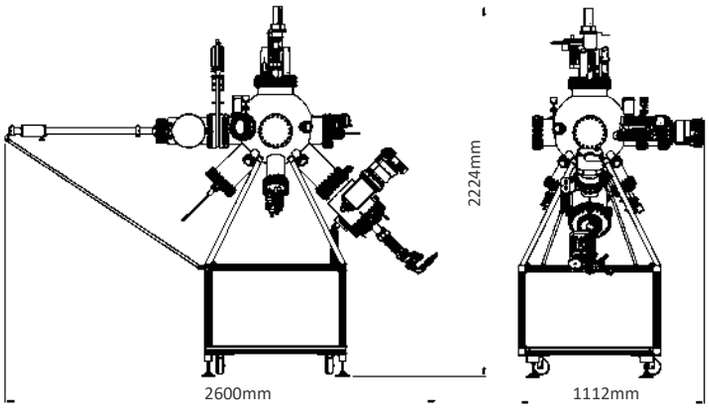
Evap-4 mini ebeam evaporator.

See our **Stellar Magnetron sputter source** and **Evap-4 mini e-beam source brochures** for further details.

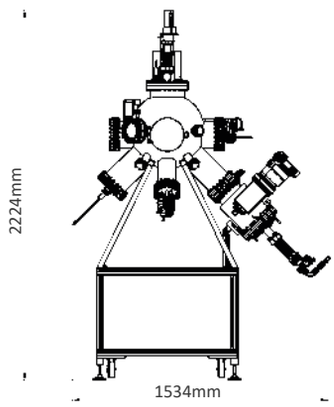
The details

Basic system configuration	Options
5e-7 Torr base pressure	5e-9 Torr base pressure*
Sample stage - up to 4 inch wafer size 20rpm rotation Z-shift for sample loading/unloading	Sample stage - DC bias for Nanoparticle acceleration RF bias for sample surface cleaning Heating to 800°C
Pumping - 300l/s turbo with 7.2m³/hr dry backing pump	Pumping - 700l/s turbo
Manual valves, shutters, and linear drives	Automation options for valves, shutters, and linear drives
Control software for recipe driven processes, power supply control and data logging	Adjustable baffle in front of turbo to increase dynamic pressure range for sputtering at lower gas flows
QCM for process monitoring and end point detection	Separately pumped load-lock with transfer arm
Up to 5 deposition/plasma sources Any combination of: Nanoparticle source*, Magnetron sputter sources, Mini e-beam evaporator, Thermal boat source K-cells†, Ion source†, RF Atom source†	System bakeout
**Additional differential turbo pump required for Nanoparticle source option, †Third party source*	**Requires selection of load-lock, 700l/s turbo and bakeout options*

System footprint



UHV system



HV system

Utilities

Power	415 V, 3Ph + neutral + earth, 32A per phase 50Hz
Process gases	Typically, Argon. Depending on chosen configuration Nitrogen, Oxygen or Helium may also be required. Typical supply pressure 10 psi
Coolant	Typical 1L/min at 50 psi, 1 – 3 kW cooling capacity required depending on chosen configuration
Pneumatics	Compressed air 80 psi
Venting	Regulated Dry Nitrogen supply, max 5psi
Pumping	7.2m³/hr dry backing pump supplied as standard
Exhaust	Extracted exhaust. Exhaust port on backing pump size NW16

Front cover: Catalysis photo courtesy of Weatherup Group, University of Oxford.

For further information please contact: sales@nikalyte.com

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