



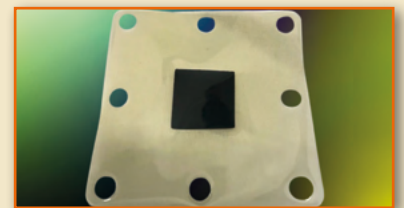
# NL-FLEX Nanomaterials Deposition System



Antimicrobial



Green Hydrogen

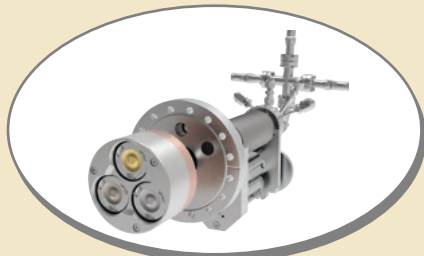


Catalysis

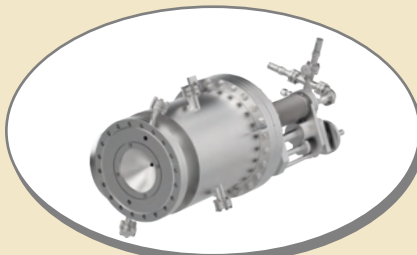
Deposit hydrocarbon free nanoparticles.  
Large area, non-planar and powder coatings.



## Configuration options



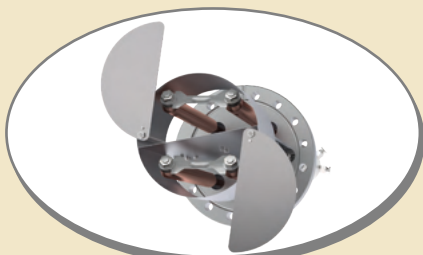
3 headed nanoparticle source



Nanoparticle aggregation zone



Mass filter



Thermal boat source



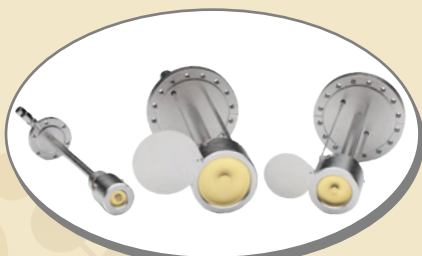
Substrate table



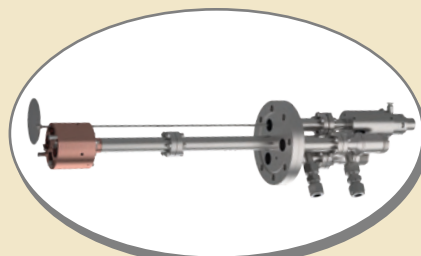
Recipe control software



Throttle valve



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

Sputter down source configuration and easy chamber access allows for:

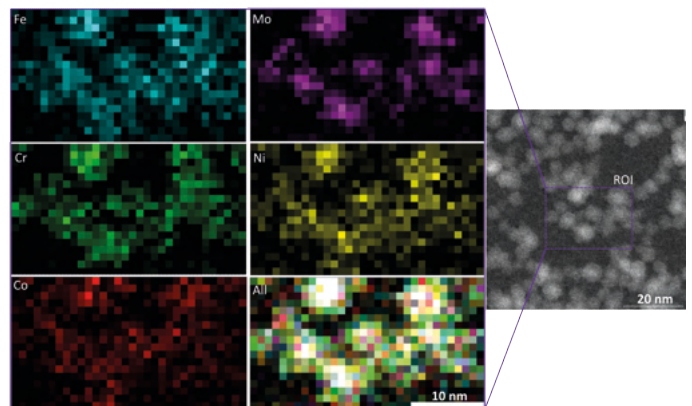
- Easy placement of sensitive substrates or delicate objects that might be compromised by any form of mechanical clamping.
- Coating of 3D objects with the option of rotation and bias depending on object weight and construction.
- Spacious chamber with bespoke mounting points allows for installation of reel to reel or other mechanical assemblies associated with flexible large area substrate coatings.
- Option of using a powder agitator bowl for powder coating applications.
- Upwards facing source configuration available for thermal or ebeam evaporation.



Reel to reel assembly.

## 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 comparable nanoparticle sources on the market – up to 3mg/hr/cm<sup>2</sup> 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 nanoparticle aggregation zone.
- Quadrupole mass filter for real-time nanoparticle size selection and filtering.



NiFeCoMoCr alloy NPs.

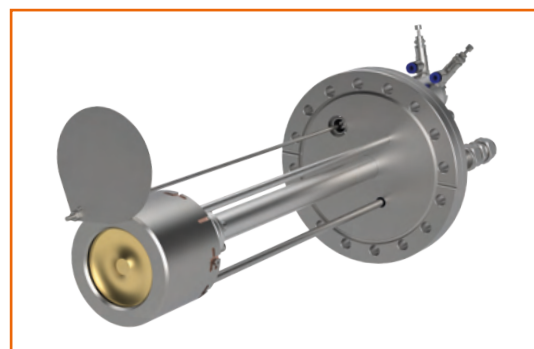
Photo courtesy of Weatherup Group, University of Oxford.

Please refer to our **NL-UHV brochure**, for further details [click here](#).

## 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.

\*Upward facing source geometry required.



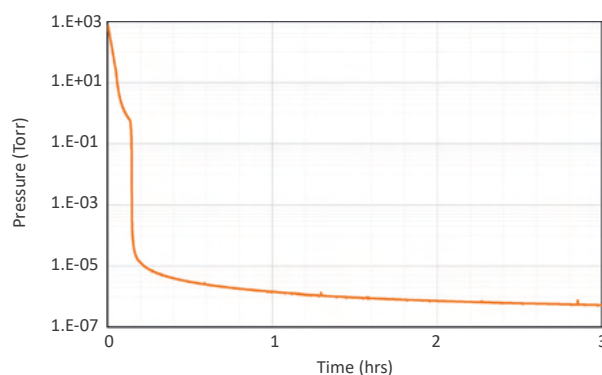
Stellar-2 2 inch sputter source.

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

# The details

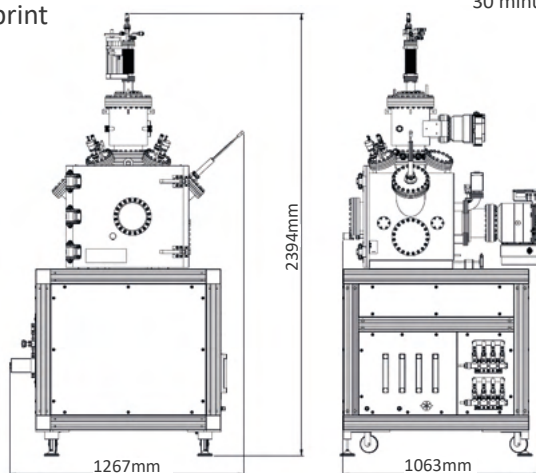
Basic system configuration
5e-7 Torr base pressure
Sputter down geometry as standard
Double O-ring door seal
Sample stage - up to 4 inch wafer size 20rpm rotation
Pumping - 700l/s turbo with 7.2m <sup>3</sup> /hr dry backing pump
Manual valves, shutters, and linear drives
Control software for recipe driven processes, power supply control and data logging
Quartz Crystal Microbalance for process monitoring and end point detection
Up to 6 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†
*Additional differential turbo pump required for Nanoparticle source option, †Third party source #Upward facing source geometry required

Options
Removable deposition shielding
Upward facing source geometry
Sample stage - DC bias for Nanoparticle acceleration RF bias for sample surface cleaning Heating to 800°C
Automation options for valves, shutters, and linear drives
Adjustable baffle in front of turbo to increase dynamic pressure range for sputtering at lower gas flows



Flex chamber pump down curve - from atmosphere to 3E-6 Torr in 30 minutes and 5E-7 Torr in 3 hours.

System footprint



## 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	7.2m <sup>3</sup> /hr dry backing pump supplied as standard
Exhaust	Extracted exhaust. Exhaust port on backing pump size NW16

For further information please contact: [sales@nikalyte.com](mailto:sales@nikalyte.com)

[www.nikalyte.com](http://www.nikalyte.com)



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