

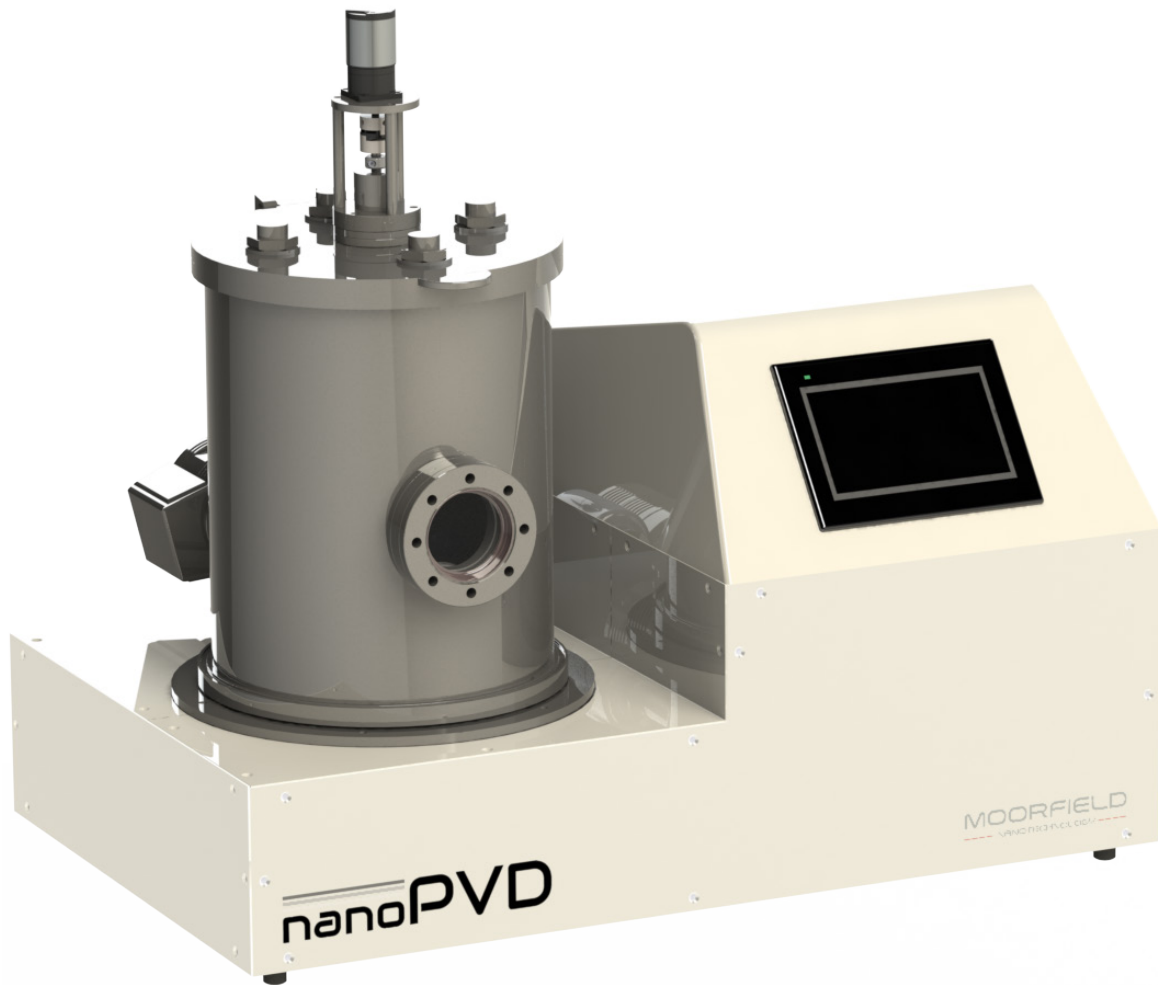
MOORFIELD

NANOTECHNOLOGY

nanopVD

Benchtop, turnkey systems for high-performance vacuum deposition

Model T15A: Thermal evaporation system for metals and organics



Key Features:

- Benchtop configuration
- Up to 4 LTE sources for organics
- Up to 2 evaporation sources for metals
- High aspect-ratio chamber for uniform coating
- Up to 4" diameter stages
- Sample heating option
- Source and substrate shutters
- Fully automatic operation via touchscreen HMI
- Base pressures $< 5 \times 10^{-7}$ mbar
- Define/save multiple process recipes
- Equipped for easy servicing
- Comprehensive safety features
- Cleanroom compatible
- Proven performance

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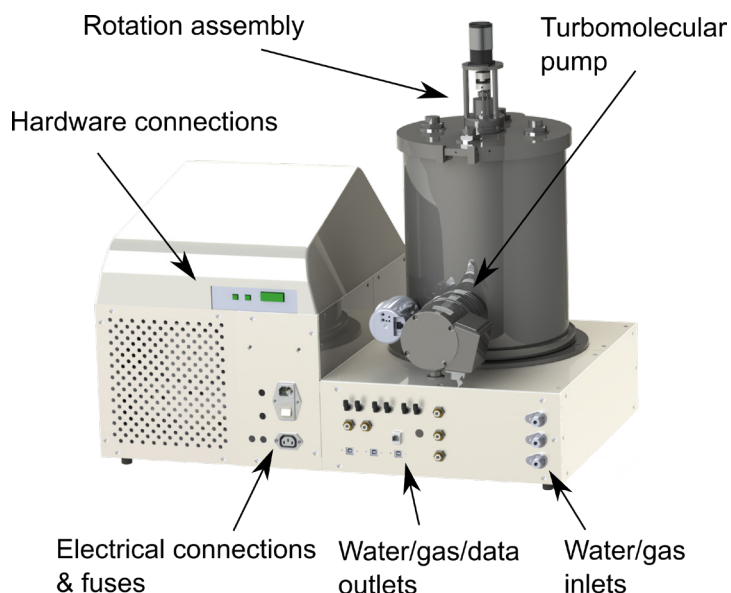
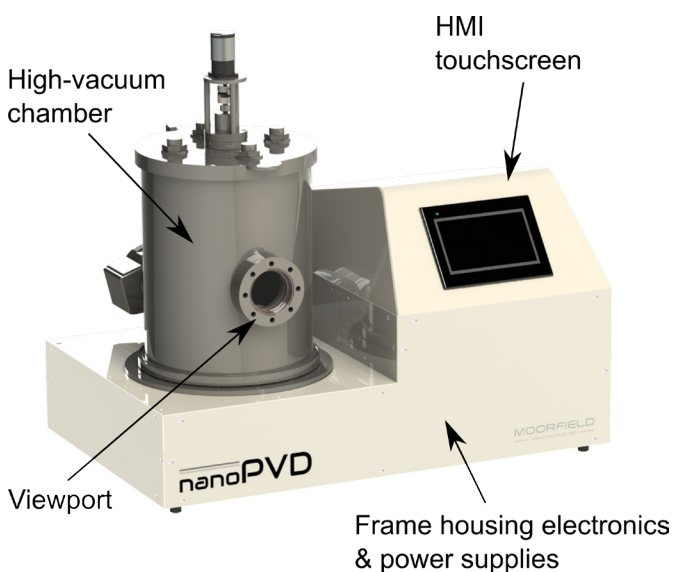
nanopVD Systems — Overview:

Moorfield have recently introduced the nanopVD series of benchtop deposition systems. Compact and suitable for easy location — but not to be confused with microscopy-related products — nanopVD systems are derived from proven R&D thin-film system technology and have been developed through extensive collaboration with leading academic groups. The tools are optimised for ease of use, represent outstanding value for money and are ideal where available space and budgets are key considerations — without compromising on quality of results.

Model nanopVD-T15A:

Model T15A is a thermal evaporation system designed for repeatable coating with organics and/or metals. At the heart of the system is a modular vacuum chamber. The chamber is designed for easy disassembly for routine maintenance. At the rear of the vacuum chamber is a port for the pumping system. The pumping system is based on an Edwards turbomolecular pump that is connected to a rotary or scroll-type backing pump.

Chamber access is via a hinged top lid. Opening the lid reveals the substrate stage, which can hold substrates up to 4" diameter. The stage can also be fitted with a heater, for platen temperatures up to 500 °C, and substrate rotation.



For organics, the system can be equipped with low-temperature evaporation (LTE) sources that offer control for temperatures <600 °C, ideal for working with low melting-point materials. LTE sources can be fitted with alumina or quartz crucibles (2 CC internal volume; suggested 1 CC charge). Replacing crucibles is a straightforward operation.

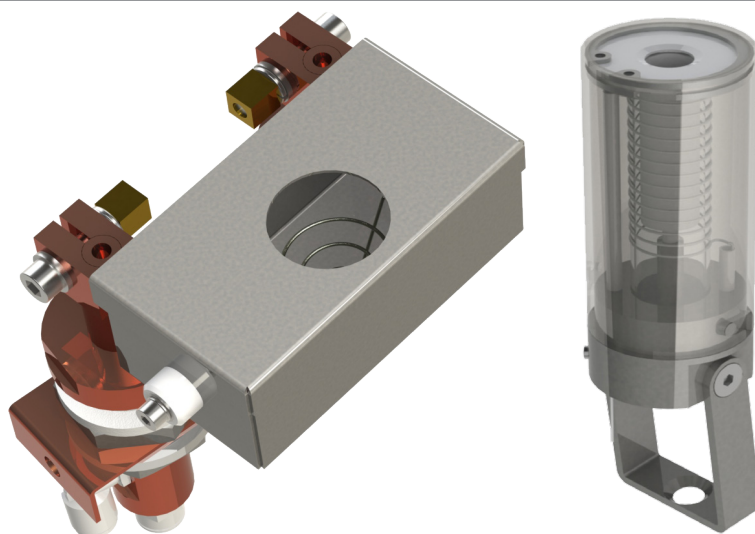
For metals deposition, the unit is fitted with standard thermal evaporation sources. These are boxed sources (efficient operation and restricted stray IR and cross-contamination) that are capable of

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accepting industry-standard basket, wire or boat material supports.

Possible configurations are up to 4 sources, with a maximum of 2 of these being for metals. All source positioning is optimised for uniform deposition onto the 4" substrate stage. Combination systems with both organics and metals sources allows for all key device fabrication steps within one tool.

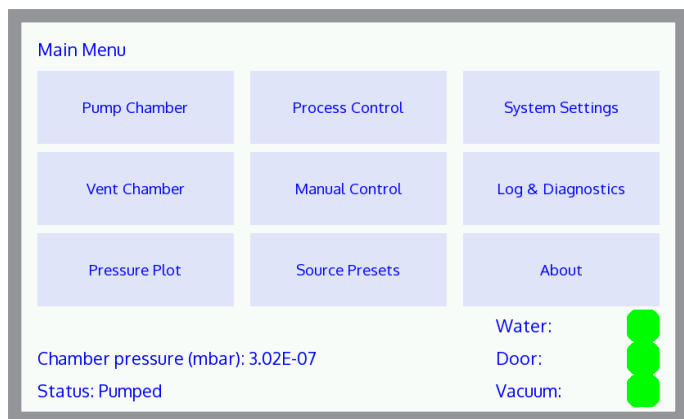
Quartz crystal sensor heads (with PC software) allow for deposition rate monitoring, for rate vs. power calibration purposes.



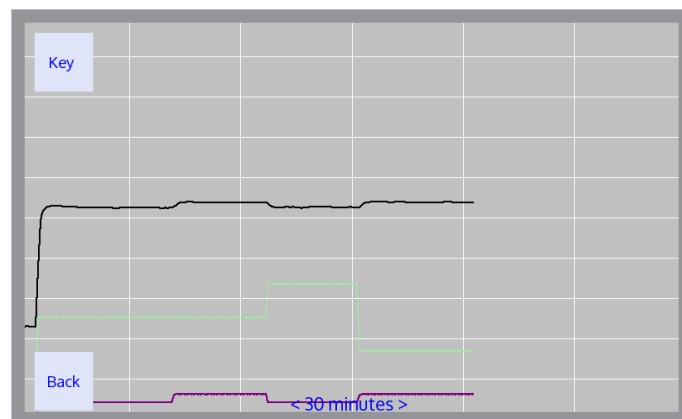
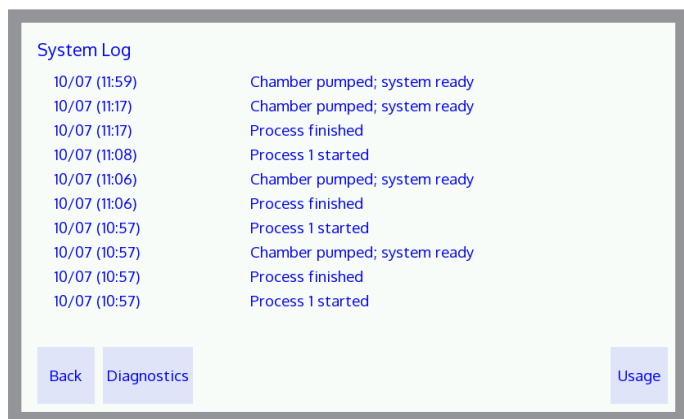
Above: Evaporation source types that can be fitted to the nanopVD-T15A: Standard thermal evaporation source for metals (left) and low-temperature evaporation (LTE) source for organics (right).

Control System:

The unit is fitted with high-stability, industrial-grade PLC electronics. User operation is via a 7" touchscreen HMI mounted on the front panel. Powerful but easy-to-use software allows for system setup and operation via a menu-driven interface. Users are able to edit, save and load multiple recipes rapidly. Recipes and live data can be logged to a connected PC.



Screenshots from the touchscreen HMI software through which all user operation of the nanopVD-T15A is carried out. Functionality includes recipe definition/saving, process running and monitoring, pump/vent routine control, diagnostics and system configuration.

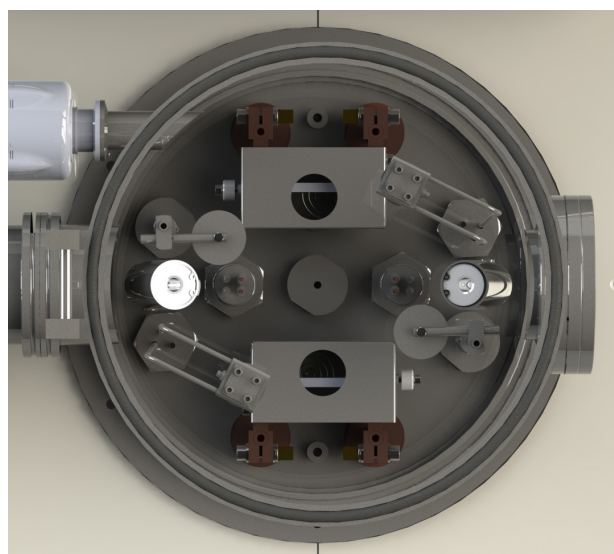
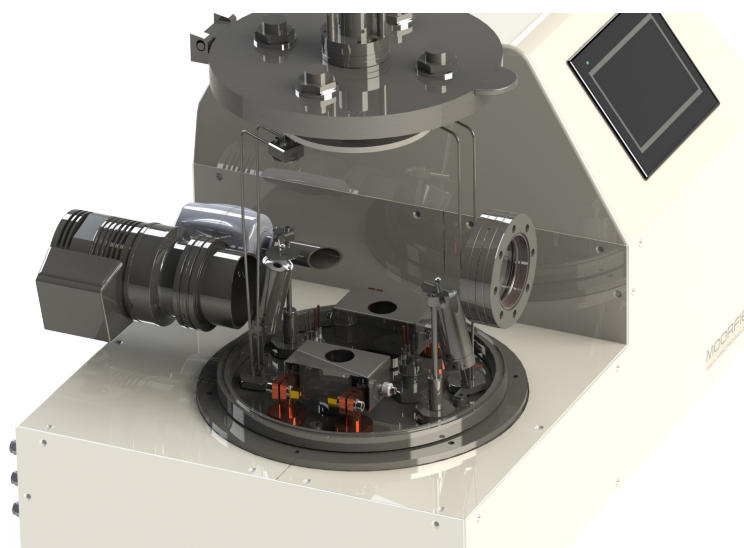


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Configuration and Options:

The standard configuration for the nanoPVD-T15A includes the chamber, pumping system, frame and electronics. To obtain a working system, it is necessary to select at least one metals or organics source, up to a maximum of four (mixed source types allowed). Beyond this, a variety of options allow the tool to be configured per specific budgets and applications:

- Dry backing pump
- Chamber viewport
- Fast chamber vent
- Substrate rotation
- Substrate z-shift
- Single substrate shutter for 2" substrates
- Dual substrate shutter for 4" substrates
- Source shutters
- 500 °C platen heating
- Up to 4 LTE sources for organics
- Up to 2 evaporation sources for metals
- Quartz crystal sensor head



Models of the nanoPVD-T15A configured with two LTE sources for organics and two sources for metals. The system shown is also fitted with quartz crystal sensor heads for calibration of deposition rates and thicknesses.

System Requirements—Standard Configuration:

- Service gas: Dry compressed air nitrogen or argon, 60–80 psi supply
- Power: Single-phase 230 V, 50 Hz, 10 A
- Chilled water: 18–20 °C, 1 L/min, pressure < 4 bar
- Exhaust extraction

Applications:

- Fundamental research
- Education
- Product R&D

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