

VAPBOX 500

High Performance, Precise, Innovative liquid and solid precursors **Delivery and Vaporization System** for **ALD, CVD, MOCVD, PECVD** and all gas phase processes.

The **VAPBOX 500** vaporizes pure **liquid** compounds and **solid ones dissolved in a carrier liquid** (organic solvent).

The **VAPBOX 500** is able to handle and **vaporize most of solid and liquid compounds** including **low vapor pressure, thermally labile and viscous** ones.

The **VAPBOX 500** provides **unmatched performances** based on a very fine atomization of a pulsed liquid mixed with a carrier gas prior to injection inside the vaporizer. The generated vapors can be used for the synthesis by ALD and CVD of thin films, nanoparticles and nanoobjects of numerous functional materials such as for instance : dielectrics (**low-k and high-k**), barrier layers (**Ta, Ti and Nb nitrides**), ferroelectrics, piezoelectrics, metals (**Cu, Pt, Ru, Ir, Rh, Ag, Pd,...**), III-V, II-V, chalcogenides, transparent conductive oxides, photovoltaics, low friction coatings, hard coatings and superconductors.

Because of its unique proprietary way to deliver and atomize the liquid inside the vaporizer the **VAPBOX 500** is able to achieve a **real non-contact flash vaporization** therefore generating **particle free vapors**.



Indeed, the blasting of the carrier gas/liquid mixture inside the vaporizer allows generating an aerosol of around 10 microns diameter droplets. Such very small droplets can be easily flash vaporized. Competitors' vaporizers are generating bigger liquid droplets that cannot be flash vaporized and clogg the vaporizer.

The **VAPBOX 500** operates from vacuum to atmospheric pressure.

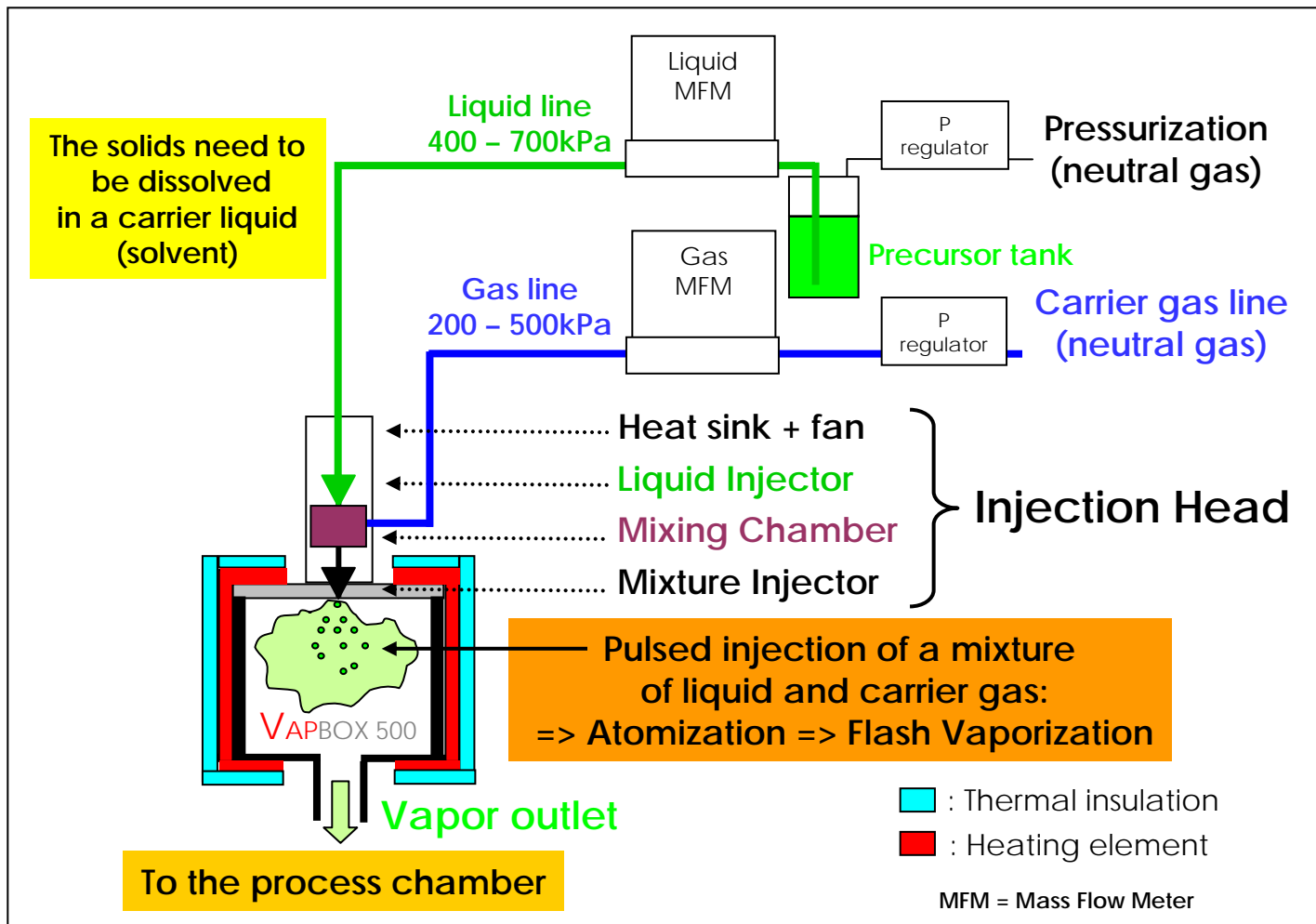
Thanks to delivering of accurate and stable liquid flows, the **VAPBOX 500** delivers accurate and stable vapor flows.

US patent pending and patents pending in other countries

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VAPBOX 500 Operating Principle



The **Injection Head** of the vaporizer consists of multiple components which are one **liquid injector**, one **mixing chamber** (maintained under constant carrier gas pressure) and one **mixture injector**. These three components are surrounded by a heat sink on which is attached a fan. It allows to maintain by air cooling the liquid or solution to vaporize at room temperature as long as it is not injected in the vaporizer. Premature undesired precursors decomposition are thus avoided.

The **liquid injector** pulses the cool fluid into the **mixing chamber**. The **mixing chamber** blends this fluid with the carrier gas. Finally, the **mixture injector** injects in a pulsed regime this mixture into the vaporizer. This pulsed flow atomizes the fluid into extremely small droplets and enables a very efficient flash vaporization. The droplets vaporize before touching the internal walls of the vaporization chamber, limiting the clogging risks. It is thus possible to efficiently vaporize thermally unstable compounds without clogging. When it is active, the injection head must be fed with a neutral carrier gas.

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VAPBOX 500 Technical Specifications

- **Heating:**
 - Temperature range: up to 200°C
 - Heating zone: 1
 - Thermocouple: 1, K type
 - Power: 750 W (220 VAC or 110 VAC)
- **System control:**
 - Stand alone 19" 2U rackable ICU (Injector Control Unit)
 - ICU controlled from a PC interfaced to the unit by a software (RS485)
 - "dll" help files provided to allow for easy interfacing of the VAPBOX 500 on the PC
 - ICU controlled from a PLC Via a RS485 port (MODBUS com° protocol), the MODBUS "memory map" is provided to help the customer to interface the VAPBOX 500 on his PLC
 - One SubD 37 F to connect the VAPBOX 500 to a PLC
- **Fittings:**
 - Liquid inlet: 1/8" compression type or 1/8" F VCR
 - Carrier gas inlet: 1/4" Female VCR
 - Vapor outlet: 1/4" Male VCR
- **Injector Control Unit (ICU) facilities:**
 - 19" rackable 2U unit
 - All the necessary cables for the injectors are provided
 - RS 485 MODBUS
 - The ICU must be power supplied by 24 V DC and, depending on the options selected, the ICU must also be power supplied by +15V/-15 V DC
 - Power: 24 V DC: 3 A ; +15 VDC: 500 mA ; -15 V DC: 500 mA
- **VAPBOX 500 Control Software:**
 - Compatible with Windows XP Pro SP2,
 - A demonstration version is provided on request
- **VAPBOX 500 Options:**
 - Low pressure type processes (such as PECVD) compatible vaporizer
 - ICU Devicenet interface

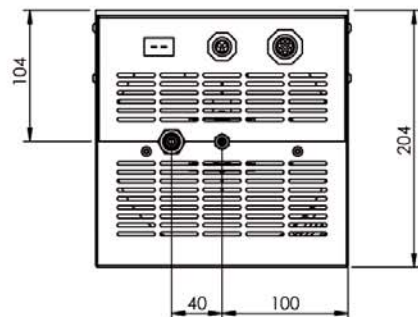
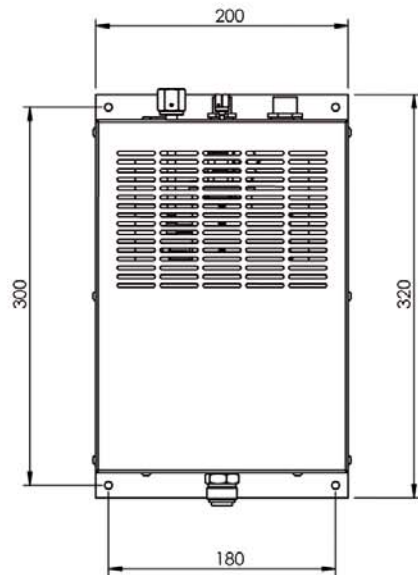
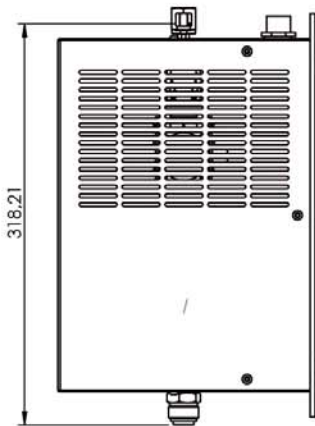
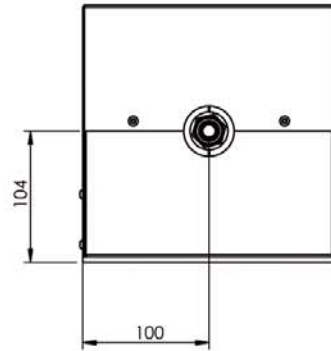
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New DLI Vaporizer

All dimensions are in mm



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