



BUBBLER SYSTEMS **HPL, HPS AND ECO SERIES**

Process Vessels for the Storage, Transport
and Removal of Organometallic Compounds.

FOR HIGHEST QUALITY STANDARDS.

Use and Customer Benefits



Applications

Bubblers are process vessels (MOCVD) that have been specially developed for the semiconductor and fine chemical industries. They are used in the storage, transport, and removal of organometallic compounds.

Metalorganic vapor phase epitaxy (MOVPE) and related processes are used in the production of optoelectronic components such as lasers, photocells, and LEDs.

All Dockweiler bubblers are approved by the DOT (Department of Transportation) and comply with the ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road), meeting the requirements for proper transport.

Customer Benefits and Advantages

Our bubblers are manufactured to the highest production and quality standards, from the melt specification to carefully executed orbital weld seams to optimum electropolishability. The standard of quality they offer ensures an optimal enrichment process, optimal utilization of the medium, and optimal evacuation, cleanliness and reusability.

Bubbler Design & Components

- 1 Inlet valve
- 2 Outlet valve
- 3 Crossover function (optional)
- 4 Inspection Port
- 5 Dip tube (inlet)
- 6 Vapor space tube (sampling tube)
- 7 Level sensor (optional)

Options

Dockweiler's HPL and HPS series bubblers can be customized with a wide range of options to create the ideal match for your application.

Valves

We use Ham-Let 90° monolever rotating diaphragm valves as standard for our bubblers. Valves from the following manufacturers are also optionally available: Swagelok, Carten Controls, Parker and other valves on request.

Crossover Function

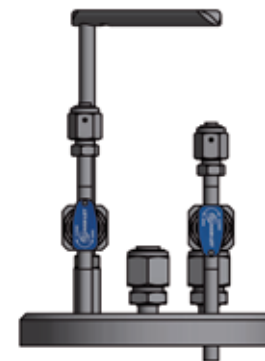
The crossover function is a purging option, with no dead space, for eliminating oxygen from the system (including the inlet and outlet valves) during filling on the chemical manufacturer's premises or while the bubbler is connected to a process. It thus offers a simple, efficient solution for cleaning the gas path.

Level Sensor

The level sensor is a signal generator that, together with a fill level indicator, reliably displays the residual amount of organometallic compound in the bubbler. Dockweiler offers an ultrasonic sensor for the bubbler, featuring specified switching points (90%, 70%, 30%, 10%) for signaling the fill level.

Polarized Connectors

The standard design features male face seal for both connectors. To prevent confusion when connecting, Dockweiler offers male and female connectors in the following configuration:

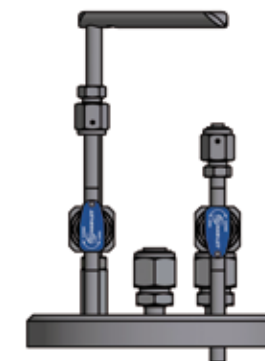


Standard Dip Tube

Inlet: Male

Vapor Space Tube

Sampling tube: Male

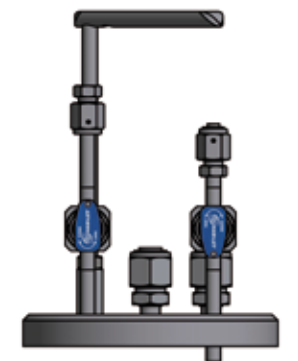


PFD Dip Tube

Inlet: Polarized Female

Vapor Space Tube

Sampling tube: Male



PMD Dip Tube

Inlet: Polarized Male

Vapor Space Tube

Sampling tube Female

The ZeroCon® connections can also be used optionally instead of the face seal connection, at no charge.

IN A CLASS OF ITS OWN.

The advantages at a glance

Completely leak-proof

Helium leak rates of $\leq 4.0 \times 10^{-9}$ mbar l s⁻¹.

No dead space

Orbital welding techniques ensure there is virtually no dead space.

Robust design

All types of Dockweiler bubbler have undergone destructive pressure testing and high-altitude drop tests.

Temperature-stable

from -50°C to +100°C (-58°F to +212°F)

Optimal dip tube size and shape

In collaboration with industry, the course and dimensions of the dip tubes have been optimized for saturation and throughput.

Highest surface quality

Ra $\leq 0.4 \mu\text{m}$ (16 μin) and Ra $\leq 0.25 \mu\text{m}$ (10 μin) for electropolished version.

No outgassing of material

All wetted components available in stainless steel 1.4404/316L or special material.

Easy installation

Clear labeling and manageability make installation easy.

Optimum yield

The optimized bubbler design ensures a maximum yield of 95% of the organometallic compound in the process.

Easy integration with auxiliary equipment

Easy integration with most existing auxiliary systems and temperature control systems.

Refillable

The high quality materials and production processes used ensure that cleaning, conditioning, and refilling can be carried out with ease.

Series	HPL							
Type	HPL200	HPL400	HPL600	HPL1000	HPL2000	HPL3000	HPL4000	HPL8000
Diameter [mm]	63.5	63.5	114.3	114.3	168.3	168.3	168.3	168.3
Connection height [mm]	238	297	224	297	259	297	368.5	527.2
Cylinder height [mm]	82.00	141.00	97.00	170.00	132.00	170.00	230.00	400.20
Volume [ml]	192	356	688	1,363	1,982	2,764	4,000	7,505
Filling volume (90 %) [ml]	173	320	619	1,227	1,784	2,488	3,600	6,754
Yield	97.68%	98.75%	99.35%	99.67%	99.78%	99.84%	99.89%	99.94%
Valve options	■	■	■	■	■	■	■	■
Crossover	■	■	■	■	■	■	■	■
DOT	on request	on request	on request	on request	on request	on request	on request	■
ADR	on request	on request	on request	on request	on request	on request	on request	■
ZeroCon® connection	■	■	■	■	■	■	■	■
PMD/PFD	■	■	■	■	■	■	■	■
Level sensor			■	■	■	■	■	■
Additional connection			■	■	■	■	■	■
Surface P (pickled)	■	■	■	■	■	■	■	■
Surface HP (electropolished)	■	■	■	■	■	■	■	■
Surface UHP (electropolished)	■	■	■	■	■	■	■	■
Special materials	■	■	■	■	■	■	■	■
Heat exchanger HE8002					■	■	■	■

HPL		HPS				ECO			
HPL22000	HPL56000	HPS600	HPS1800	HPS3000	HPS6000	ECO1500	ECO3000	ECO4000	ECO8000
168.3	273	114.3	114.3	168.3	168.3	168.3	168.3	168.3	168.3
1.197	1.197	292	451	372	546.3	223.6	297.0	340.1	513.1
1070.00	1070.00	123.10	281.10	225.90	400.20	110.70	184.10	227.20	400.20
21,295	56,294	594	1,795	2,881	5,814	1,586	3,098	3,985	7,548
19,166	50,665	535	1,615	2,593	5,232	1,428	2,788	3,587	6,793
99.98%	99.99%					94.95%	95.46%	99.58%	99.78%
■	■	■	■	■	■				
■	■	■	■	■	■				
■	■	on request	on request	on request	■				■
■	■	on request	on request	on request	■				■
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■				■	■	■	■	■	■

IT'S ALL ABOUT THE CONTENT.

The Dockweiler Bubbler Range



HPL series



HPS series



ECO series



Temperature control unit

PRODUCTS AND FEATURES

HPL series: stands out due to optimal vessel size and shape and the elimination of dead space. One particular advantage is its efficient utilization of the content of the vessel. Electropolishable orbital welding seams ensure the highest level of saturation of the carrier gas. The following versions are available in the HPL series: Pickled Purity (P), High Purity (HP), and Ultra High Purity (UHP).

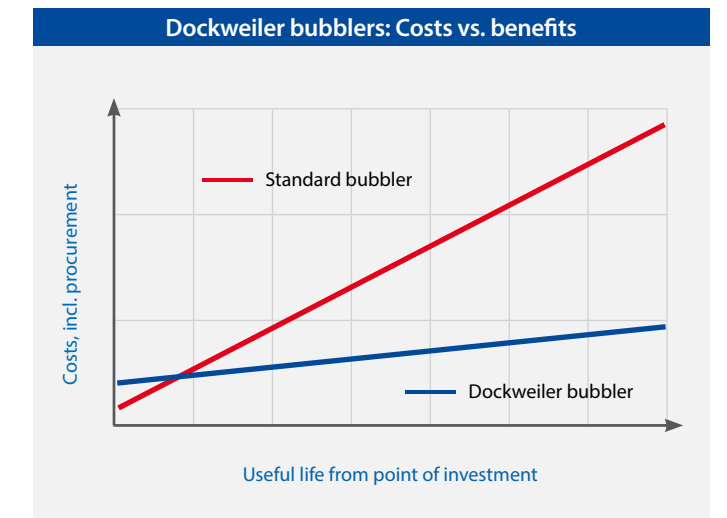
HPS series: The new, patented HPS solids bubbler has a special chamber system. The carrier gas is channeled

through the system in a way that ensures continuous saturation with the filling medium. The following versions are available in the HPS series: Pickled Purity (P) and High Purity (HP).

ECO series: Dockweiler has systematically standardized the components in this series to offer an inexpensive alternative to the HPL bubbler. The following versions are available in the ECO series: Pickled Purity (P) and High Purity (HP).

An Inbuilt Cost Advantage

The special design of Dockweiler bubblers ensures that 99% of the volume in the bubbler can be used. A bead in the floor of the bubbler ensures this high yield.



Standard bubblers with a flat floor without beading have higher residual volumes and therefore lower yields. Unused material reduces efficiency in the production process.

Due to their extreme efficiency, Dockweiler bubblers will usually pay for themselves after only a few months.

AUXILIARY EQUIPMENT

For larger bubblers, Dockweiler offers the flexible **HE8002 temperature control unit**. This is connected and supplied via a pump to the supply, temperature, and control unit. The HE8002 unit is compatible with the following bubbler types: HPL2000, HPL4000, HPL8000, HPL22000, HPS3000, HPS6000, and the entire ECO series.

The **supply, temperature, and control unit** from Dockweiler ensures a constant process temperature and a stable flow of gas in all highly sensitive processes.

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