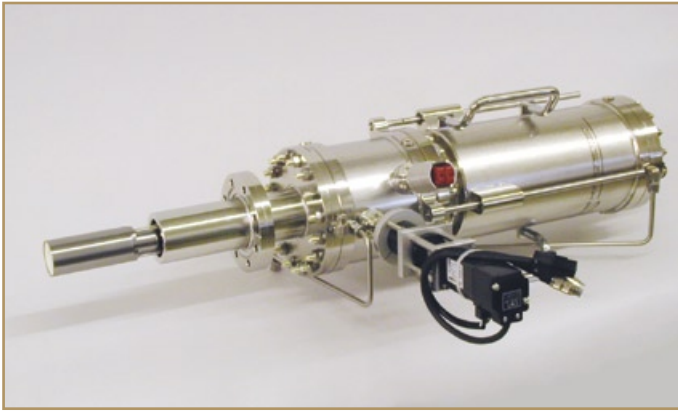




VALVED CORROSIVE MATERIAL CRACKER SOURCE VCCS



VCCS 100-420, valved corrosive cracker source on DN100 (O.D. 6") mounting flange (with water-cooled adapter flange VADP 100-63-K)

The Valved Corrosive Material Cracker Source VCCS is designed for controlled injection of radicals of antimony, tellurium, magnesium or other corrosive materials in standard MBE applications. Parts directly exposed to the evaporant like crucible, valve mechanism, injector tube and cracker are solely made from PBN to minimize corrosion of the cell.

A mixture of larger molecules of, for example, Sb_n is produced by sublimation of the evaporant within the reservoir. The resulting beam flux is controlled by an all PBN mechanical valve unit and finally the gaseous molecules are dissociated within the thermal cracker stage to form a well-defined molecular beam, e.g. of Sb_2 species.

The source consists of the 420 cm³ reservoir, built into a water-cooled vacuum enclosure that also houses the valve unit, and the injector tube with a thermal cracker unit on top.

Operation of the mechanical valve unit shows fast, stable and reproducible flux control. Together with our valve controller MVCU an easy handling and integration into your MBE system is provided.

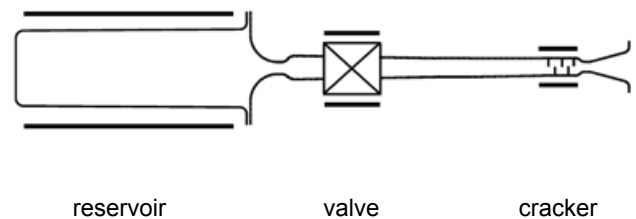
Three independent heater circuits allow precise and flexible adjustment of the temperatures in each part of the cell in order to provide sufficient material vapor, avoid condensation within the valve or injector tube and ensure maximum cracking efficiency, each according to the requirements of the particular evaporant.

The special design enables easy and safe refilling of the crucible from the backside of the cell without the need of removing the complete cell from the system.

- Evaporation and cracking of Sb, Te, Mg, and other corrosive materials
- Large crucible capacity of 420 cm³
- All PBN construction of valve and cracker stage
- Fast, stable and reproducible flux control
- Easy installation and refilling procedure



Additional equipment for the VCCS (motorized valve control unit MVCU with temperature controllers, power supplies and cables)



Schematic drawing of the VCCS all PBN assembly of crucible, valve and cracker, surrounded by three independent heaters

Applications

The main purpose of the VCCS in MBE applications is enhanced flux control and cracking of materials whose vapor is highly corrosive. It was originally designed as a source for an antimony radical (Sb_2) molecular beam as group V material in standard III-V MBE. The all PBN construction of the inner parts, the valve mechanism in particular, in combination with the flexibility provided by three independent heater circuits allows also the use of other materials like Te, Mg or Se with the VCCS.

The large crucible capacity of 420 cm³, fast and precise flux control and easy handling for maintenance and crucible refill make the VCCS an ideal source for smaller production MBE systems as well as for higher throughput research MBE systems.

Motorized Valve Control Unit

The Motorized Valve Control Unit MVCU is designed for operating the valve of a valved source with a servo motor drive. Manual or remote control with 0-10 V analogue input signal is possible. The display indicates the linear position of the valve from 0 - 7.99 mm from fully closed to fully open position. The servo motor drive has a resolution of 0.01 mm/step and a high motor speed of 10 mm/s. The automatic zero calibration guarantees a highly reliable and reproducible operation of the valve unit.

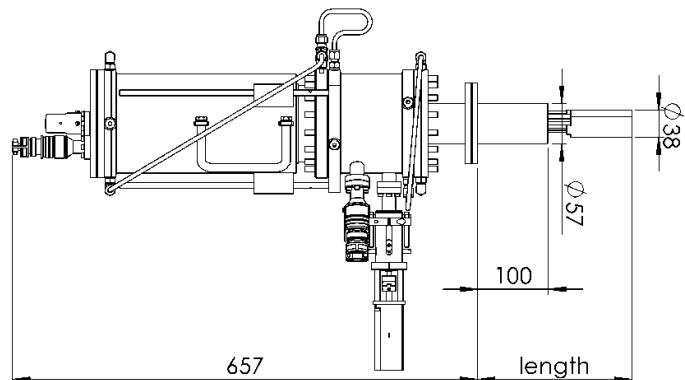
The MVCU housing is compatible with the 19" rack system.

Technical Data

Mounting Flange	DN100CF (O.D. 6") [DN40CF (O.D. 2.75") or DN 63CF (O.D. 4.5") with VADP adapter]
Heating system	3 separate heater circuits (cell/valve/cracker)
Thermocouple	3 Type C W5%Re/W26%Re thermocouples (cell/valve/cracker)
Bakeout temperature	250°C
Operating temperature (values for Sb)	cell crucible: 500-550°C; valve: 600-650°C; cracker: 900-1000°C
Outgassing temperature	cell crucible: 900°C; valve: 1000°C; cracker: 1300°C
Cooling	integrated water cooling shrouds
Crucibles	420 cm ³
Flux control	integrated all PBN valve mechanism / cell temperature
Valve control	servo motor drive with control unit MVCU

Schematic drawing of the
Valved Corrosive Cracker Source
VCCS

(drawing shows VCCS 100-420 with VADP adapter)



Dr. Eberl MBE-Komponenten GmbH
Gutenbergstrasse 8
71263 Weil der Stadt, Germany
Phone : +49 7033 6937-0
Fax : +49 7033 6937-20



info@mbe-components.com
www.mbe-components.com



Please find your local representative on our website