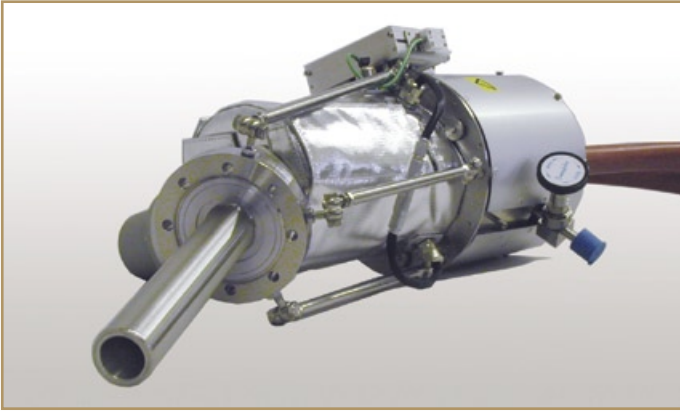


## VALVED MERCURY EVAPORATION SOURCE HGS



**HGS 63-250, mercury source with 250 cm<sup>3</sup> evaporator reservoir and integrated injector**

The Valved Mercury (Hg) Evaporation Source HGS is designed for evaporation of elemental mercury in standard UHV or MBE systems. The source consists of the 250 cm<sup>3</sup> evaporator, heated by a thermostat, the heated valve and the heated injector unit which acts as the interface to the UHV system. Both components valve and injector are heated independently to avoid material condensation.

The source provides precise flux stability of better  $\pm 0.1\%$  by  $\pm 0.03\text{K}$  temperature control of the evaporator reservoir using external heating. Precise longterm flux stability is achieved up to very high flux rates by a liquid level stabilization using an external equalizing tank. The evaporator reservoir is connected to the external tank which allows continuous hydrostatic refill of the evaporator reservoir in order to keep the liquid level within the evaporator constant.

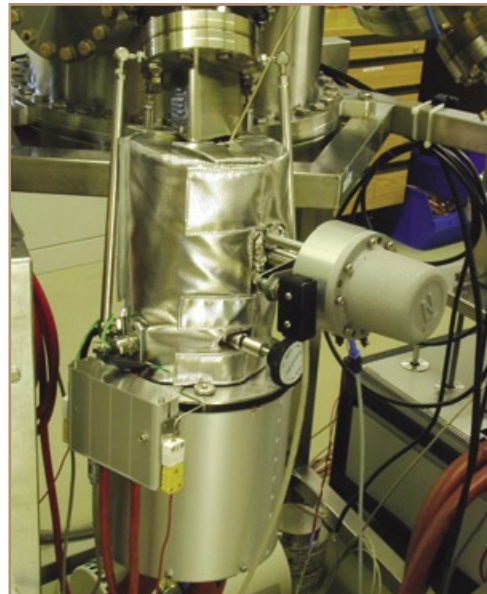
The integrated pneumatic all metal valve allows rapid on/off switching of the Hg beam.

Easy and safe refilling is provided by an additional container which is mounted to the equalizing tank and which can be filled from air side.

The vacuum tight pneumatic valve allows venting the MBE system without breaking the vacuum inside the HGS evaporator.

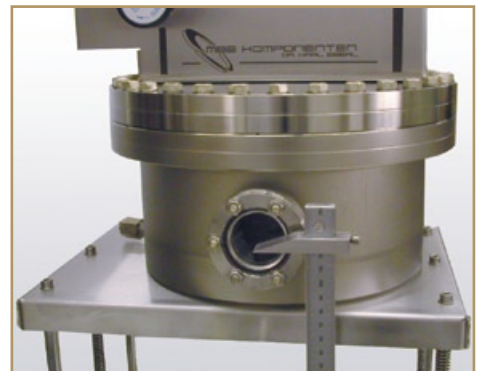
The mercury source HGS has been developed in cooperation and is built under license of University of Würzburg (Germany) and with the advice of Dr. C.R. Becker from the University of Würzburg.

- High throughput of up to 60g Hg/h
- large capacity 250 cm<sup>3</sup> evaporator
- 3000 cm<sup>3</sup> (40kg Hg) equalizing tank
- Larger capacity on request
- Easy and safe refilling procedure
- Compatible with most MBE systems



**HGS 63-250 source for mercury evaporation with 250 cm<sup>3</sup> evaporator mounted to UHV Chamber**

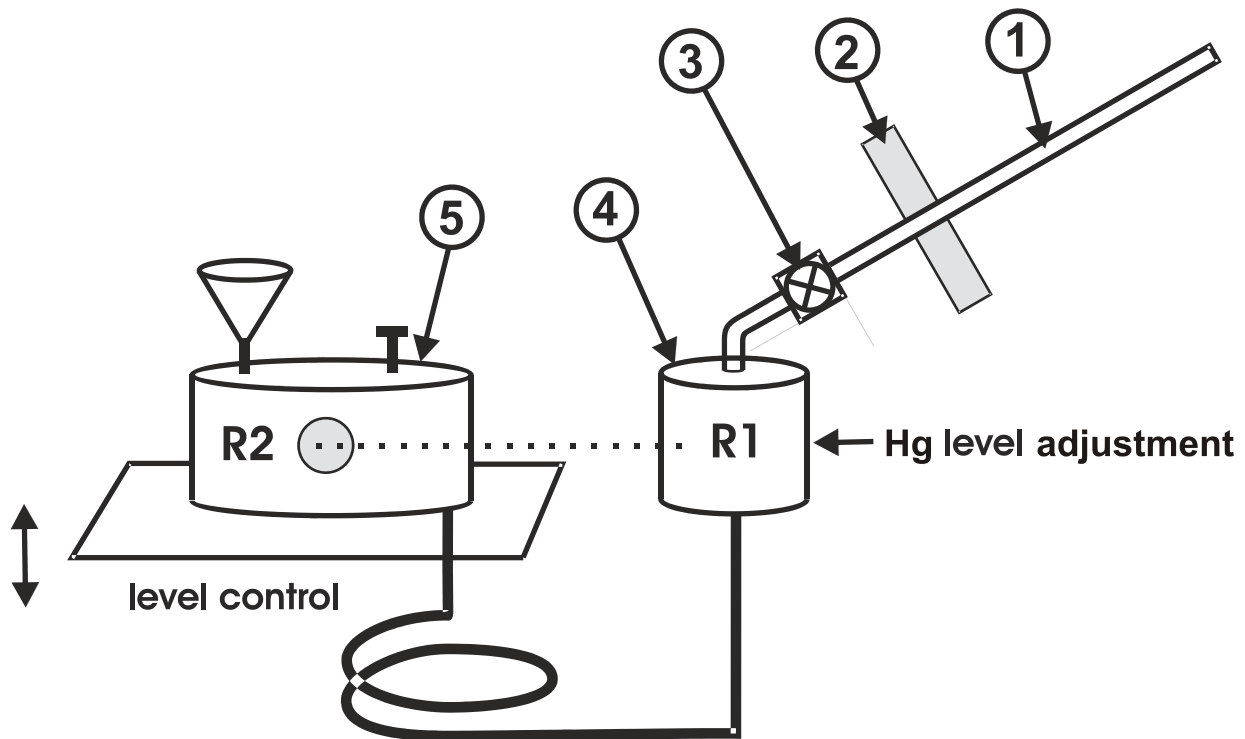
**Equalizing tank with level control viewport**



## Applications

Typical applications for the HGS are:

- II-VI Hg MBE, e.g. growth of Hg based compounds and heterostructures
- production of MCT devices, e.g.  $\text{Hg}_{1-x}\text{Cd}_x\text{Te}$  infrared photodiodes



Schematic of the main parts of the HGS source

- (1) Injector tube
- (2) Cell flange
- (3) All-metal valve
- (4) Evaporator reservoir
- (5) Equalizing tank

### References:

- [1] C.R. Becker, V. Latussek, G. Landwehr, L.W. Molenkamp, Physical Review B 68 035202 (2003)
- [2] Y.S. Gui, C.R. Becker et.al., Physical Review B 70 115328 (2004)
- [3] V. Latussek, C.R. Becker, G. Landwehr, Physical Review B 71 125305 (2005)

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



**MBE KOMPONENTEN**  
DR. KARL EBERL

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