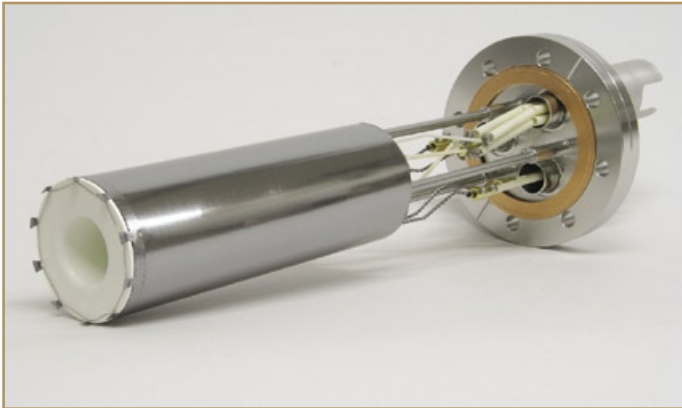




## LARGE CAPACITY GA/IN PRODUCTION EFFUSION CELL



PEZ 63-130-54-DF large capacity Ga/In production effusion cell on DN63 (O.D. 4.5") CF-flange

The Large Capacity Ga/In Production Effusion Cell PEZ was designed to meet the particular requirements of gallium and indium layer deposition in III-V MBE systems with higher throughput, where most efficient source material utilization is needed.

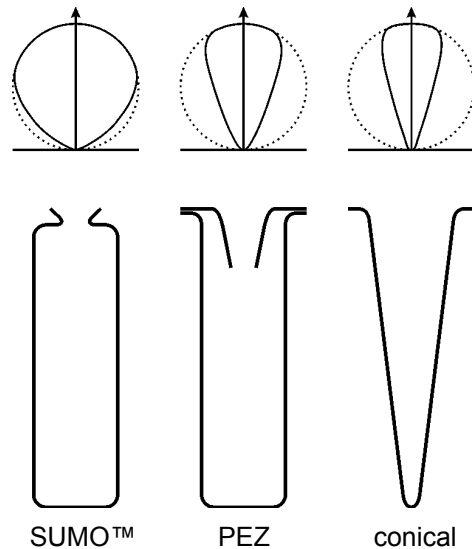
The use of a very large crucible with a customized beam shaping PBN insert allows combining high cell capacity with excellent thickness uniformity and flux stability properties. 500g of gallium or 600g of indium are the maximum loads of the 130 cm<sup>3</sup> crucible, for example, depending on cell positioning on customer's MBE system.

The Large Capacity Ga/In PEZ combines the advantages of conical and cylindrical crucibles:

- The crucible insert provides conical beam shaping, which results in minimized waste of material and excellent uniformity.
- Conical crucibles show the effect of filling level related flux changes, because of the continuous change in evaporation material surface. This effect is highly reduced for PEZ with insert, because the surface is constant during a growth campaign.
- Shutter transients are a common problem for layer growth when using standard crucibles with wide orifice. The influence on the thermal stability of the molten material caused by shutter action is virtually eliminated by the crucible insert's function as a thermal buffer and by the use of dual filament heating.
- Dual filament heating allows keeping the conical insert at higher temperatures to avoid material condensation.

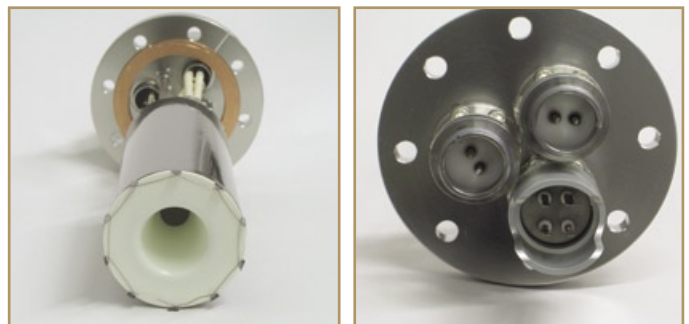
Due to its compact design the Large Capacity Ga/In Production Effusion Cell is compatible to most standard MBE systems. Optimized crucible inserts are provided to fit Varian, EPI, Veeco, VG or Riber MBE systems

- Precise run-to-run flux reproducibility
- Low shutter related flux transients
- High material efficiency, up to 25% better than SUMO™ type
- large crucible capacity up to 130 cm<sup>3</sup> on DN63 CF-flange (i.e. 500 g Ga or 600 g In)
- Excellent uniformity
- Compatible inserts to fit Varian, EPI, Veeco, VG or Riber systems



Comparison of beam shapes with bottlenecked SUMO™ crucible, PEZ crucible with insert, and conical crucible.

The PEZ with long conical insert unites the advantages of a conical crucible beam shape with the large capacity and run-to-run flux reproducibility of a cylindrical crucible.



View into crucible and airside view onto flange design of PEZ 63-130-54-DF: The left picture shows the conical shape of the crucible insert. The picture on the right demonstrates the rugged and reliable design of the cell with flanged feedthroughs, making it ideal for production systems.

## Applications

The Large Capacity Ga/In Production Effusion Cell with PBN crucible insert is the ideal source for evaporation or sublimation of gallium and indium in III-V layer growth applications. The PEZ is offered in compatible versions to all commonly used MBE systems.

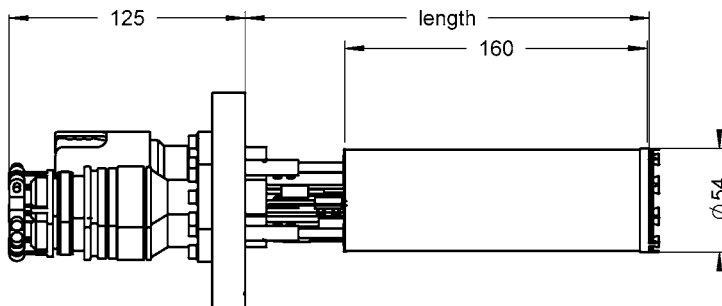
Typical applications for PEZ effusion cells are:

- GaAs/GaInAs/AlGaAs MBE growth
- GaInP MBE growth
- GaN MBE growth
- III-V research and production MBE

## Technical Data

<b>Mounting Flange</b>	DN63CF (O.D. 4.5") or DN100CF (O.D. 6")		
<b>Capacity</b>	Flange	Maximum crucible capacity	Maximum Ga load
	DN63CF (O.D. 4.5")	130 cm <sup>3</sup>	500 g
	DN100CF (O.D. 6")	420 cm <sup>3</sup>	2000 g
<b>Dimensions in vacuum</b>	216mm - 326mm (8.5" -12.85") / depends on MBE system / customized length available		
<b>Filament</b>	Ta-wire dual filament, individual use of each filament		
<b>Thermocouple</b>	2x W5%Re/W26%Re (type C)		
<b>Bakeout temperature</b>	300°C		
<b>Operating temperature</b>	up to 1400°C (outgassing up to 1500 °C)		

Schematic drawing of the Large Capacity Ga/In Production Effusion Cell (drawing shows PEZ 63-130-54-DF)



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