

Titan™ Effusion Cell



- Excellent Deposition Uniformity
- Minimal Defect Counts
- Low Shutter Transients
- High Capacity
- Versatile Design
- Easy Loading
- Ideally Suited for Ga and In Deposition

Product Description

The heart of the Titan™ Design is its novel two piece graphite based crucible. Threaded together, they form a sealed crucible that provides unique benefits to growers. Improvements in uniformity, defect levels, source loading time and shutter flux transients have been realized by users of the Titan™ crucibles. Its versatile design can be changed to accommodate any MBE reactor. This novel design provides the best performance for the evaporation of Ga and In.

The Titan™ crucible is graphite based and has excellent thermal properties, including isotropic thermal conductivity and efficient radiative coupling to the heating filament. These properties enable the realization of strong temperature gradients that are desired in many applications.

Additional heat-shielding is added over the front surface of the effusion cell and crucible to reduce the thermal load on the growth chamber and to minimize the thermal transient when the effusion cell shutter is opened.

The nozzle on the Titan™ crucible is threaded to the bottom reservoir and is easily removable. Removing the nozzle opens the bottom reservoir completely, allowing users to load a single piece charge material. This reduces the handling required to fill a crucible and minimizes the amount of surface area of the charge that is exposed to the atmosphere.

The nozzle portion of the crucible is tailored to the unique geometry of each MBE system. E-science uses proprietary models to determine the shape of the nozzle to optimize layer uniformity and material consumption rates, has a library of nozzle designs for many of the standard MBE reactors, and can custom design nozzles for most reactors.

The performance of the Titan™ cell has been excellent. The deposition uniformity has been better than $\pm 0.1\%$ across a 3" wafer. Defect counts have been reduced by a factor of five as compared with similar PBN shaped crucibles. Extensive SIMS studies have been performed on films grown with the Titan™ effusion cell. In all cases, no C was found in concentrations above the SIMS detection limit of 5×10^{15} atoms / cm^2 .

E-Science has Titan™ crucibles available for any MBE system. Refer to the selection chart on the back to find the correct model number for your system. The crucible can be fitted to either a single filament or dual filament effusion cell. Contact E-science for further information.

Titan™ Effusion Cell Selection

E-Science provides effusion cells for all the major system manufacturers. In addition, E-Science can build effusion cells for other manufacturer's systems and for custom reactors. Please refer to the model number convention for ordering your specific effusion cell. Contact E-Science for more information.

Varian / Intevac / EPI / Veeco MBE Reactors

2" Gen II 40cc = EC-040-275-1140-T	3" Gen II, Gen III or Gen20 125cc = EC-125-450-1140-T	Gen200 200cc = EC-200-600-1250-T	Gen2000 700cc = EC-700-800-1250-T
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Riber MBE Reactors

32P 35cc = EC-035-275-1117-T	Compact 21 125cc = EC-125-450-1250-T	48 / 49 500cc = EC-500-600-1500-T-L	6000 / 7000 700cc = EC-700-800-1300-T-L
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VG Semicon / Oxford MBE Reactors

V80 85cc = EC-085-450-1285-T-L	V90 85cc = EC-085-1150-T-L	V100 200cc = EC-200-600-1150-T-L	V150 700cc = EC-700-800-1890-T-L
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Model Number Convention

Model # = A - B - C - D - E - F

A = EC for Effusion cell

B = Capacity (in c.c.'s)

C = Flange Size

- i. 275 = 2.75" CF Flange
- ii. 450 = 4.5" CF Flange
- iii. 600 = 6.0" CF Flange
- iv. 800 = 8.0" CF Flange

D = length (in inches * 100)

E = Type = T for Titan

F = L for water cooled (if required)

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