

Dopant Source



- Temperatures up to 1600 C
- High Density Filament
- Low Thermal Mass
- High Uniformity
- Single or Dual Dopant Configuration
- Robust, Reliable Construction

Product Description

Evaporating dopant materials in an MBE environment is often difficult. Many dopant materials have very low vapor pressures and require high temperatures to achieve even the small amount of flux needed for the desired dopant level. Another challenge is the fact that there may be many changes in doping levels throughout one recipe. To achieve this the cell needs to be able to rapidly ramp to various temperatures and stabilize quickly. The E-Science dopant cell has a number of features that have successfully met these performance requirements.

Single Dopant Cells

The standard single dopant cell for research reactors consists of one effusion cell of either 5cc or 12 cc crucibles. The cell is compact with a low thermal mass allowing it to quickly ramp to desired temperatures. This cell fits onto a 2.75" CF Flange and can easily be installed onto most MBE machine. For production reactors, 25cc and 115cc versions are also available

Dual Dopant Cell

The dual dopant cell (pictured above) fits two separate dopant cells onto one 4.5" CF Flange. Typically used in systems growing Sb based films, the dual dopant allows two types of dopant sources to be used. In the case of Sb, Te is often used as an n-type dopant in the place of Si. Because these two materials have very different vapor pressures, they can occupy the same source port without danger of cross contamination. The Si cell is water cooled isolating it from the Te dopant cell. The sizes of the dual dopant crucibles are 4 and 6cc, which is large enough for most applications.

Dopant Cell with Gas Injector

Carbon has been used as an alternative p-type dopant for many years. CBr_4 gas has become the more common form of C used as a source material. Since the delivery of CBr_4 is through a gas injector, it is easy to integrate the gas line directly onto an existing 5cc dopant cell. This again is the most efficient utilization of a source port.

A wide variety of options for doping are available. Contact E-Science for more information.

Dopant Source Selection Chart

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	3" Gen II, Gen III or Gen20	Gen200	Gen2000
5cc = EC-005-275-1140-D 12cc = EC-012-275-1140-D	5cc = EC-005-450-1140-D 12cc = EC-012-450-1140-D	25cc = EC-025-600-1250-D	115cc = EC-115-800-1250-D

Riber MBE Reactors

32P	Compact 21	48 / 49	6000 / 7000
5cc = EC-005-275-1116-D 12cc = EC-012-275-1116-D	5cc = EC-005-450-1250-D 12cc = EC-012-450-1250-D	25cc = EC-025-600-1500-D-L	115cc = EC-700-800-1300-D-L

VG Semicon / Oxford MBE Reactors

V80	V90	V100	V150
5cc = EC-005-450-1285-D-L 12cc = EC-012-450-1285-D-L	5cc = EC-005-450-1150-D-L 12cc = EC-012-450-1150-D-L	25cc = EC-025-600-1150-D-L	700cc = EC-115-800-1890-D-L

Model Number Convention

Model # = A - B - C - D - E - F	
A = EC for Effusion cell	D = length (in inches x 100)
B = Capacity (in c.c.'s)	E = Type = D for Dopant
C = Flange Size	F = L for water cooled (if required)
i. 275 = 2.75" CF Flange ii. 450 = 4.5" CF Flange iii. 600 = 6.0" CF Flange iv. 800 = 8.0" CF Flange	

Veeco, Gen2000, Gen200, Gen II, and Gen III are trademarks of Veeco Instruments, Inc.

Riber, 32P, Compact 21, and Epineat are trademarks of Riber, Inc.

V80, V90, V100, and V150 are trademarks of Oxford Instruments, Inc.

E-Science, Inc.

596 Schommer Dr., Suite 100

Hudson, WI 54016

Tel: 715-381-1899;

Fax: 715-381-1866

Email: info@escience.com;

Web: www.escience.com

European Distributor GEO Semiconductor, Inc.

POB 6262

1211 Geneve 6

Switzerland

Tel: +33 1 45 31 62 84; Fax: +33 1 45 33 39 43

Mobile: +33 680 13 48 95

Email: ralphhananel@gmail.com