

Crucibles are available for all common MBE systems and effusion cells in a large variety of shapes, sizes and materials. All crucibles are UHV clean and ready for use in your MBE application. On request, the crucibles can be degassed in UHV before delivery.



Options

- Crucible set for face-down cells
- Knudsen insert
- Crucible set with cracker insert
- Liner

Material and size options*



MATERIAL	Coefficient of Linear Thermal Expansion ($\times 10^{-6} / K$)	Max. Temp. ($^{\circ}C$)	SIZE (ccm)								
			0,5	2	10	25	35	40	60	100	150
PYROLYTIC BORON NITRIDE (PBN)	A = 3.1 C = 36	1400		•	•	•	•	•	•		•
PYROLYTIC GRAPHITE (PGR)	A = 0.9 C = 14.2	2000		•	•	•	•				
TANTALUM (TA)	6.3	2500		•	•	•				•	
MOLYBDENUM (MO)	4.8	2000		•	•	•	•	•	•		
TUNGSTEN (W)	4.5	3000		•	•	•	•				
BERYLLIUM (BEO)	7.4	1700		•	•	•	•				
ALUMINIUM OXIDE (Al_2O_3)	8.5	1700		•	•	•	•	•			•
VITREOUS CARBON (VC)	2.6	2000		•	•	•	•				•
YTTRIUM OXIDE (Y_2O_3)	8.1	2000			•						
IRIDIUM (Ir)	8.7	1400			•						
CARBON (C)	1.2	2000			•						
QUARTZ (SiO_2)	0.5	1400	•	•	•	•	•				
HIGH TEMP. STAINLESS STEEL	11.5 - 13.3	1370 - 1425		•	•	•	•	•	•	•	•

a: Parallel to the layers

c: Perpendicular to the layers

* Other sizes and materials on request

Before use of the effusion cell crucibles, the following points must be considered:

In case that the source material is becoming liquid at operation temperature, there are several *critical points* to note when the source material is becoming solid during cooling down:

- If the linear expansion coefficient of the source material is **higher** than the linear expansion coefficient of the crucible material, the crucible can break by heating up the source material. This also applies when the source material wets the crucible walls.
- If the linear expansion coefficient of the source material is **smaller** than the linear expansion coefficient of the crucible material, the crucible can break by cooling down the source material. This also applies when the source material wets the crucible walls.
- In case of **evaporating Al**, it is strongly recommended to fill the crucible with not more than 1/5 or 1/4 of its capacity to avoid an overflowing of source material due to Aluminium creep along the crucible wall to the crucible orifice.

To avoid breaking the crucible, it is strongly recommended:

- ▶ to cool down the effusion cell very slowly (1 - 2 K/min)
- ▶ to keep the effusion cell for stand by on a higher temperature than the melting temperature
- ▶ to always change the crucible after colling down to RT

WARNING



If the source material is becoming liquid, there is always the risk of breaking the crucible. At operating temperature the crucible is expanded and the liquid material fills this larger space. When cooling down the material, it becomes normally solid at a temperature higher than room temperature. In this case, the crucible cannot shrink to its original dimensions and, therefore, can break.

