MATERIAL SOURCE SELECTION TABLE

Please pay attention to the special note at the end of this chapter.

MATERIAL	Melting Point [°C]	Temperature [°C] at Vapor Pressure [Torr]				Comments	Crucible Material	SOURCE (Filament Type*)
		10^{-8}	10^{-6}	10^{-4}	10^{-2}			
Ag	961	574	685	832	1027	does not wet W	PBN,Al_2O_3	**WEZ, MEZ**
Al	660	685	812	972	1217	wets all materials rapidly, creep out of crucibles, Al may break the crucible when changing from liquid to solid	PBN	**PEZ, WEZ, MEZ (CL) EBV**
As	820	104	150	204	277	for sublimation requires temp. 200°C - 300°C; decomposition of GaAs temp. ≈ 850°C	PG,PBN, quartz	**NTEZ, DECO, VACS**
Au	1063	807	947	1132	1397	reacts with Ta, wets W and Mo	Al_2O_3,PBN	**WEZ, MEZ, HTEZ**
B	2300	1278	1548	1797		**B**-doping in Si MBE	PG	**HTS, HEIS**
Ba	725	272	354	462	610	wets refractory metals without alloying, reacts with oxides	PBN	**NTEZ**
Be	1278	707	832	997	1227	wets refractory metals powder and oxides toxic	PBN	**WEZ, MEZ**
Bi	271	329	409	517	672		Al_2O_3,PG, PBN	**NTEZ (HL)**
C	3650	1657	1867	2137	2457	sublimation from **PG filament**		**SUKO, EBV**
Ca	842	272	357	459	597		PBN	**NTEZ (HL)**
CaF_2	1360	817	938	1093			PG	**WEZ, MEZ (HL,DF)**
Ce	795	970	1150	1380			Al_2O_3,BeO	**HTEZ**
Cd	321	74	119	177	265	film condensation requires high super saturation, sublimates	Al_2O_3,PBN	**NTEZ (HL)**
CdS	1750	367	448	554			PBN,PG	**NTEZ**
CdSe	1264	359	439	543			PBN,PG	**NTEZ**
CdTe	1098	290	362	455			PG	**NTEZ**
Co	1495	850	990	1200	1517	alloys with W, small sublimation rates possible	Al_2O_3,BeO**	**HTS, HTEZ, EBV**
Cr	1890	837	977	1157	1397	high evaporation rates without melting, sublimates	W, Al_2O_3,BeO	**HTS, HTEZ, EBV**
Cu	1084	722	852	1027	1257	evaporates well from all refractory sources	PBN,Al_2O_3, PG	**WEZ, MEZ (HL) HTEZ**
Dy	1409	625	747	897	1117		PG,PBN	**WEZ, MEZ, HTEZ**
Er	1529	649	777	947	1177		PBN	**WEZ, MEZ, HTEZ**
Eu	822	283	361	466	611		PBN	**NTEZ**

* Filament types: standard, hot lip (**HL**), cold lip (**CL**) and dual filament (**DF**)
** Al_2O_3 below melting point, BeO above melting point!

MATERIAL SOURCE SELECTION TABLE

MATERIAL	Melting Point [°C]	Temperature [°C] at Vapor Pressure [Torr]				Comments	Crucible Material	SOURCE (Filament Type*)
		10^{-8}	10^{-6}	10^{-4}	10^{-2}			
Fe	1535	858	998	1180		alloys with all refractory metals, large charge, small sublimation rates possible	Al_2O_3,BeO**	**HTEZ, EBV**
Ga	30	619	742	907	1132	alloys with refractory metals, oxides are attacked >1000°C, Ga may break the crucible, if it changes from liquid to solid	PBN	**PEZ, WEZ, MEZ (HL,DF)**
Ge	937	812	957	1167	1397	wets refractory metals but low solubility in W. (Si-orifice plate)	PBN,PG	**HTS, WEZ, EBV**
Gd	1312	760	900	1175	1511		PBN,Al_2O_3	**WEZ, HTEZ**
H						gas-cracker for H_2 used for low temp. cleaning		**HCS, GRZ**
In	157	488	597	742	947		PBN	**PEZ, WEZ, MEZ (HL,DF)**
InAs	943	780	870	970		for As_2 beam	PBN	**WEZ, DECO**
InP	1058		630	730		for P_2-beam	PBN	**WEZ, DECO**
K	64	21	65	123	208		PBN	**NTEZ**
La	920	1022	1192	1422	1727		W,Y_2O_3	**HTS, HTEZ, EBV**
Li	179	227	307	407	537	attacks oxides	PBN	**NTEZ**
Mg	649	185	246	327	439	sublimates	PG,PBN	**NTEZ**
Mn	1244	505	611	747	937	wets refractory metals	PG,PBN	**WEZ, MEZ (HL)**
Mo	2617	1592	1822	2117	2527	wets refractory metals		**EBV**
Na	98	97	123	193	289		PBN	**NTEZ**
Nb	2468	1762	1987	2277	2657			**EBV**
Nd	1024	731	871	1062	1306		PBN,Al_2O_3	**WEZ**
Ni	1453	927	1072	1262	1527	alloys with refractory metals, hence charge must be limited	Al_2O_3,BeO**	**HTS, HTEZ**
P	41	54	88	129	185	**P**-doping in Si MBE; decomposition of GaP ≈750°C	PBN	**DECO**
Pb	328	342	429	547	715	does not wet refractory metals	PG,Al_2O_3	**NTEZ (HL)**
PbO	890					evaporation under O_2-partial pressure	MgO,PBN Pt,Al_2O_3	**OREZ**
PbTe	917	339	413	508			PBN	**NTEZ**
Pd	1550	842	992	1192	1462	alloys with refractory metals, evaporates rapidly	Al_2O_3,BeO	**HTS, HTEZ**

* Filament types: standard, hot lip (**HL**), cold lip (**CL**) and dual filament (**DF**)
** Al_2O_3 below melting point, BeO above melting point!

MATERIAL SOURCE SELECTION TABLE

MATERIAL	Melting Point [°C]	Temperature [°C] at Vapor Pressure [Torr]				Comments	Crucible Material	SOURCE (Filament Type*)
		10^{-8}	10^{-6}	10^{-4}	10^{-2}			
Pt	1772	1292	1492	1747	2097	alloys with refractory metals, must be evaporated rapidly	PG,BeO	**HTS, HTEZ, EBV**
Re	3180	1947	2217	2587	3067			**EBV**
Rh	1966	1277	1472	1707	2037		PG	**HTS, EBV, HTEZ**
Sb	630	279	345	425	533	sublimation of Sb, decomposition of GaSb ≈900°C	PBN	**DECO, NTEZ**
Sc	1541	772	917	1107	1377		Al_2O_3, BeO,PG	**HTS, HTEZ**
Se	217	63	107	164	243	wets all support materials	PG,PBN Al_2O_3,quartz	**NTEZ (HL)**
Si	1410	992	1147	1337	1632	small rates by sublimation from **Si filament**, doping with WEZ	PG, PBN	**SUSI, WEZ, MEZ, EBV**
Sn	232	682	807	997	1247	wets and attacks Mo	PG,Al_2O_3, PBN	**WEZ, MEZ (HL,DF)**
Sr	770	241	309	394	537	wets all refractory metals without alloying	PG,PBN	**NTEZ (HL)**
Ta	2996	1957	2237	2587	3057	wets all refractory metals	PG	**EBV**
Te	452	157	207	277	374	wets all refractory metals without alloying	PG,Al_2O_3 PBN	**NTEZ (HL)**
Ti	1660	1062	1227	1442	1737	wets all refractory metals	PG,Y_2O_3	**HTS, HTEZ, EBV**
Tl	304	283	359	463	609			**NTEZ**
V	1890	1162	1332	1547		wets Mo without alloying, alloys slightly with W, small sublimation rates possible	W	**HTS, HTEZ, EBV**
W	3410	2117	2407	2757	3227			**EBV**
Y	1526	957	1117	1332	1632		Al_2O_3,BeO	**HTS, HTEZ**
Yb	824	247	317	417			PG,PBN	**NTEZ**
Zn	419	127	177	250	344	wets all refractory metals without alloying, high sublimation rates	Al_2O_3,PBN PG	**NTEZ (HL)**
ZnTe	1238	361	439	540			PBN	**NTEZ**
Zr	1852	1477	1702	1987			PG,Y_2O_3	**HTS, EBV**

* Filament types: standard, hot lip (**HL**), cold lip (**CL**) and dual filament (**DF**)

Special note

The material/source selection table comprises only general recommendations based on scientific knowledge and our experience. Without additional enquiry we can not take guarantee that the suggestions above will suit for your specific needs due to the great amount of applications and system conditions. It is strongly recommended to specify your requirements when ordering, so we can give you further and more detailed information.