



Oxygen Resistant Components

- Extended life sources and heaters for oxygen environments
- SUMO® crucible available with optimal flux distribution and minimized depletion effects
- Sources and substrate heaters for oxygen partial pressures up to 5 milliTorr
- Sources for temperatures up to 1150°C

Description

Oxide material research has increased considerably over the years because of its importance in the IC industry and because of the wide variety of electronic and optical properties made possible using these materials.

Due to the corrosive nature of oxygen, performing thin-film research in an oxygen environment often presents equipment challenges. For example, it is common to thermally evaporate materials in an oxygen environment of 10^{-5} Torr or higher while maintaining the substrate temperature at 800°C. The high oxygen partial pressure and temperature greatly reduces the lifetime of the heating elements in effusion cells and substrate heaters. As a result, the equipment uptime is compromised, leading to shorter campaign lengths and high repair costs.

Using special oxygen-resistant materials as opposed to traditional materials such as Mo and Ta, it is now possible to operate Veeco's innovative and proven sources and substrate heaters in high oxygen partial pressure environments. Oxygen-resistant sources are currently available from Veeco for temperatures up to 1150°C with oxygen partial pressures as high as 5 milliTorr. Substrate heaters are also available for temperatures up to 800°C and oxygen partial pressures of 5 milliTorr.

Substrate Heater Product Specifications

Filament Material	Noble Metal
Heat-Shielding Material	Noble Metal and nickel-based alloy
Maximum Outgassing Temperature	800°C (in O ₂ environment)
Maximum Operating Temperature	800°C (in O ₂ environment)
Maximum O ₂ Partial Pressure	5 milliTorr
Thermocouple Type	Type S (Platinum-10% Rhodium/Platinum)
Maximum Substrate Size	4" or 3x2"
Backside Optical Access	Optional

Larger substrate sizes possible, please contact Veeco for additional information.

Source Product Specifications

Capacity*	5.0cc	5.5cc	12cc	16cc	23cc	30cc	35cc	56cc	60cc	70cc	85cc	87cc	105cc	125cc	150cc	
In-Vacuum Diameter	1.15"	1.4"	1.4"	1.4"	1.4"	1.6"	1.4"	1.6"	2.14"	2.36"	1.6"	2.14"	2.36"	2.14"	2.36"	
Filament Style	SF	SF	SF	SF, DF	DF	SF, DF	SF, DF	DF	DF	DF	SF, DF	DF	DF	DF	DF	
Crucible Shape	Conical				SUMO	Conical	Straight-walled	SUMO	Conical			Straight-walled	SUMO		Straight-walled	
Crucible P/N**	200527	226700	201629	200612	226457	200173	200799	204053	200954	201184	201089	226479	226497	200984	201968	
Minimum Flange Size	2.75"/70mm					4.5"/114mm	2.75"/70mm	4.5"/114mm								
Temperature	LT	MT	LT, MT					LT	LT, MT			LT	LT, MT			
Maximum Outgassing Temperature	LT = 600°C (with outgassing cap) MT = 1150°C (with outgassing cap)															
Maximum Operating Temperature	LT = 600°C MT = 1150°C															
Maximum O ₂ Partial Pressure	5 milliTorr															
Filament Material	LT = Nickel-based alloy MT = Noble metal															
Thermocouple Type	Type S (90% platinum, 10% rhodium/platinum)															
Water-Cooling	Optional 4.5"/114mm flange or larger required								Optional 4.625"/118mm flange or larger required							
Integral Shutter	Optional 4.5"/114mm flange or larger required								Optional 4.625"/118mm flange or larger required							

* SUMO capacity designates maximum useful capacity. Other crucible capacity based on total volume, but not recommended filling capacity.

** PBN crucible. Other materials available upon request (i.e., alumina, BeO and sapphire).



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