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# TBS

## Thermal Boat Sources

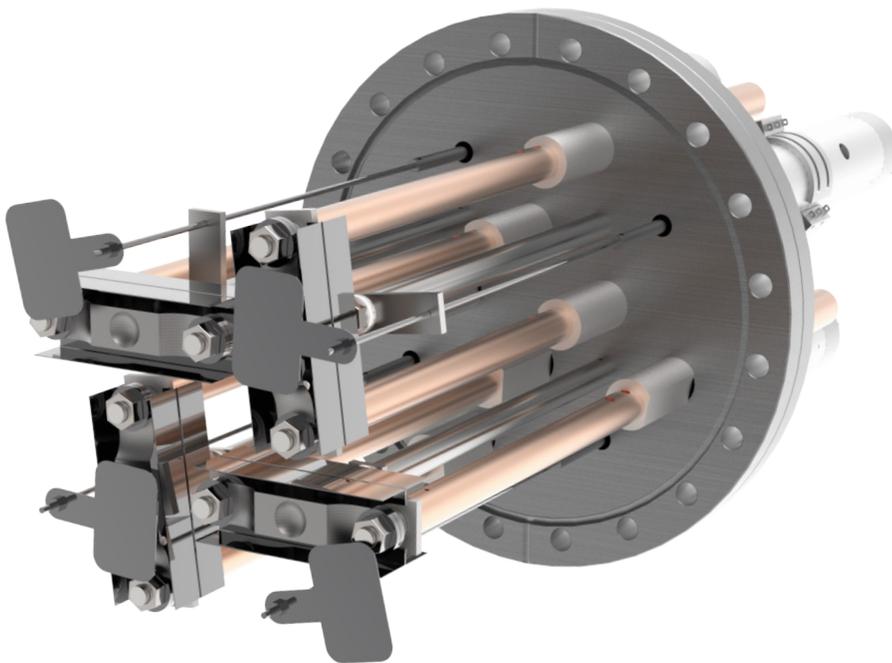
Routine Coatings

Thin Layer Deposition

Optical Coatings

Multilayer Deposition

Contact Metallisation



# Technical Information

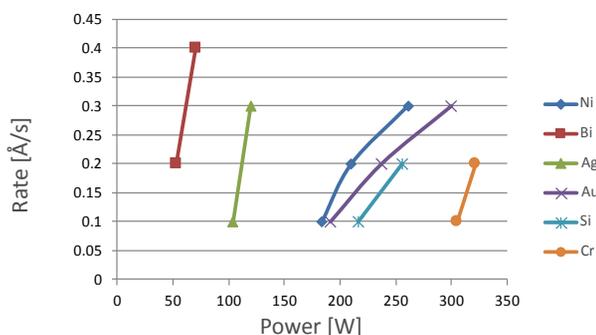
The MANTIS Thermal Boat Source series are used for basic thin film metal evaporation. The deposition process is straightforward and easy to master. The material which needs to be evaporated is put into a conductive boat, which is then heated by passing a high electrical current through it. As the temperature of the boat rises, the material located in the boat starts to evaporate, and the evaporation rate of the material is controlled by the amount of applied power.

The addition of feedback control using QCM rate measurements allows the deposition of more complex multilayer structures.

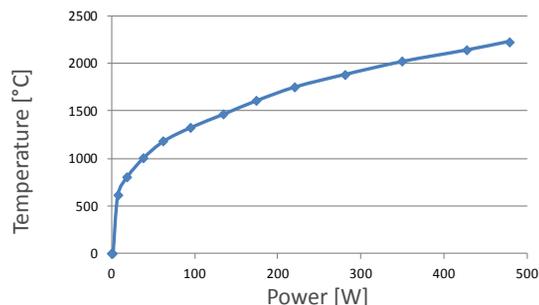
The evaporation process is performed under very high vacuum conditions resulting in very few impurities being incorporated into the deposited films. The MANTIS TBS range features two thermal boat source models: TBS 2-800 (2 boats) and TBS 4-800 (4 boats). In each model the boats are separated with cross contamination shielding and protected by individual shutters mounted on the main source flange.

The source design ensures that every boat is equidistant from the central axis, which provides optimum film uniformity. The sources may accommodate resistive filaments or boats to evaporate various materials.

The operation range is limited to a current of 100A passing through the resistive element, which is roughly equivalent to a maximum boat temperature of 2250°C (depending on the boat model used and amount/type of material loaded).



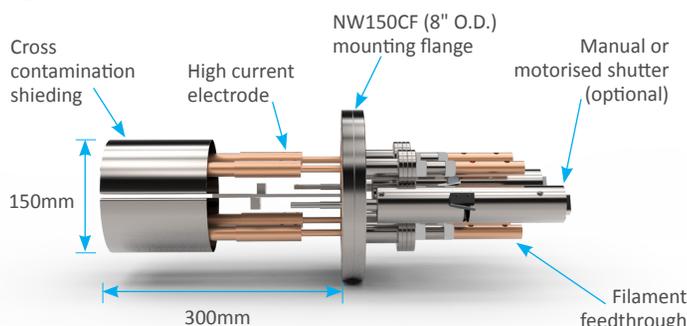
Evaporation rate versus power for different materials at 200mm working distance.



Boat temperature versus applied power (as measured by a pyrometer with an emissivity setting of 0.035).

## Layout Schematics

TBS 4-800



	TBS 2-800	TBS 4-800
Mounting flange	NW100CF (6" O.D.)	NW150CF (8" O.D.)
UHV compatible	Yes, bakeable up to 250°C	
In-vacuum length	300mm - special length and tilted version on request	
In-vacuum diameter	100mm	150mm
Number of boats	2	4
Maximum current	100A	100A
Maximum power	600W	600W
Maximum temperature	Up to 2250°C depending on boat capacity	
Boat capacity	Approximately 0.5cc	Approximately 0.5cc
Boat type	Refractory metal boat sources, alumina coated boat sources, baskets and heaters with crucibles	
Cooling	No cooling required	
Shutter	Integral manual or motorised shutter (optional)	
QCM control	Depending on chamber layout (optional)	

## Power Supply

Cable length	3m - special length on request
Power supply	Single phase, 100 - 240VAC, 50/60Hz
Power switch unit	Able to switch one supply between up to four boats

For further information please contact:  
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