

## MINI E-GUN EVAPORATOR MOD.MEG1

ULTRA HIGH VACUUM DESIGN  
EVAPORATION OF ALMOST EVERY MATERIAL POSSIBLE  
COST EFFECTIVE PRICING  
RUGGED IN CONSTRUCTION

The material either in rod form or into a crucible, is heated by the electrons coming from the filament. The capacity for electrons to be directed to deliver up their energy in a confined area, leads to extremely high power density and local heating, allowing temperature in excess of 2800°C to be reached.

All the components, chosen for UHV, are mounted on a CF40 flange.

The power supply may be switched to supply the power for evaporation :

- low power (50W) should be used for high vapor pressure materials,
- or up to 500W for crucible or thicker rods (2 or 3 mm) depending on the application and the deposition rate required.

### APPLICATION

Two ways of evaporation are applied :

- e-beam mode* : material in rod form is fed in the evaporation zone and polarized at high voltage to collect the electrons coming from the filament; the temperature rises rapidly to evaporation temperature and a pure film is deposited. Those materials with high thermal conductivity and low melting points need crucible evaporation.
- crucible mode* : material is filled in a crucible made in refractory material which is heated by the electron flux causing the contents to evaporate. Crucible mode is advised for insulator or other poor electrical conductors and low vapor pressure materials such as silver, gold and aluminum which melt before reaching useful vapor pressures.



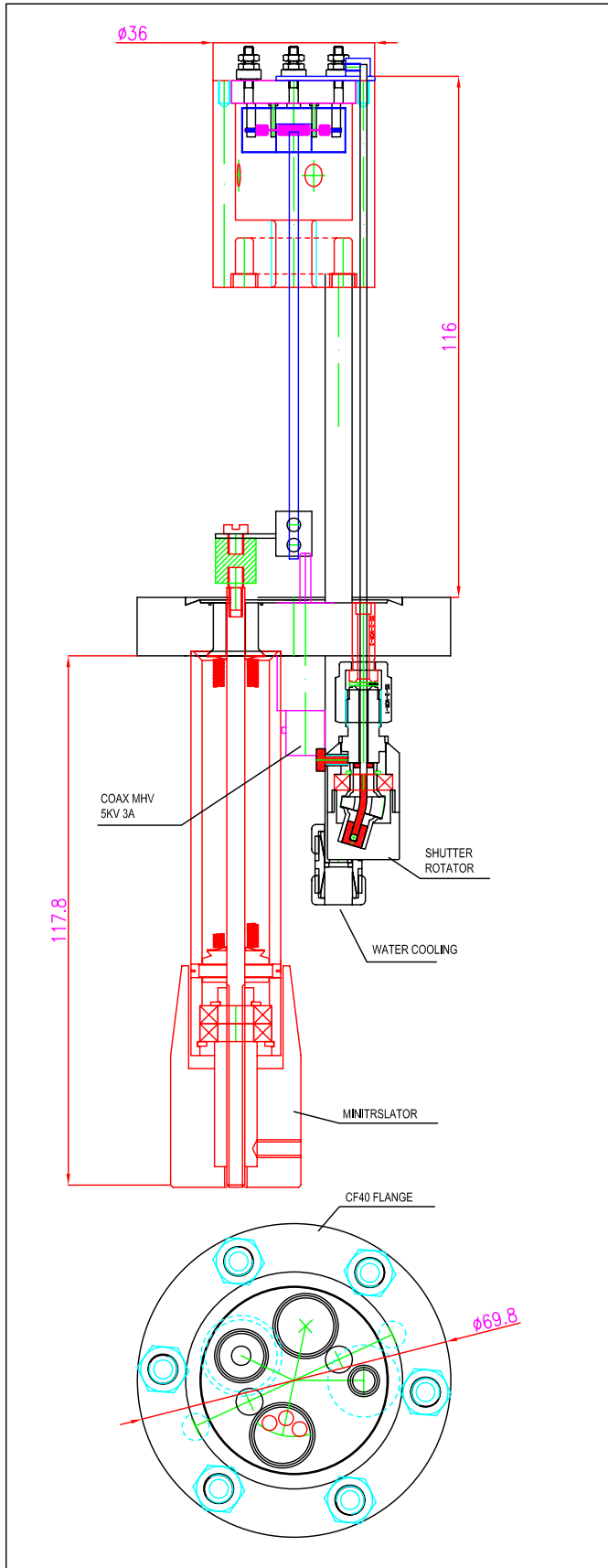
MEG-1 with shutter

So evaporation is possible for materials such as W, Ta, Mo, C, Pt, Cr, Ti, Fe from rod and Ag, Au, Al, Ni from crucibles. Rods from 1mm up to 4mm in diameter may be accommodated for requested applications. Crucibles from 50 to 200mm\*3 can also be installed using the included rod holder.

Deposition rates may be controlled from sub-monolayer/minute for refractory materials up to ~2nm/sec for higher vapor pressure materials at 100mm working distance, matching the 500W power supply.

Doping in MBE, electron microscopy, growth, surface science, atomic surface preparation are only some examples of applications of this technology.

Thickness monitors are often used to measure the evaporation rate through the deposited material; in this way it is possible in feedback to program a defined thickness deposited in few mono-layers of material. Closed loop control as an option can be obtained mounting an integrated flux monitor to measure the ion current of the partially ionized evaporating beam. In feedback a PID controller regulates the power supply of the e-gun.



Sizes

## SPECIAL DESIGN

On request we can design different types of mini gun and mounted in special configurations, also for organic materials.

## SPECIFICATIONS

### MECHANICAL

Flange	2.75"(CF40)
In vacuum length	110mm(other sizes on/r)
In vacuum diam.	33mm
Bakeout temp.	350°C
Rod feed	40mm
Rod diameters	1+4 (or crucible)
Crucible volumes	50+200cm*3
Crucible materials	Mo,Ti,PG,BN

### BEAM

Deposition rate	from <math><0,01 \text{ \AA}/\text{s}</math> to 2nm/s
Beam divergence	$\pm 15^\circ$

### POWER SUPPLY

Size	19" rack mount,7U high, 380Vtri/50Hz
E-beam power	Max 500W

### OPTIONS

- Flux monitor
- Flux controller
- Crucibles
- Thermocouple
- Motorised rod feed



MEG on CF64-CF40 pumping channel