

DOPING MATERIALS

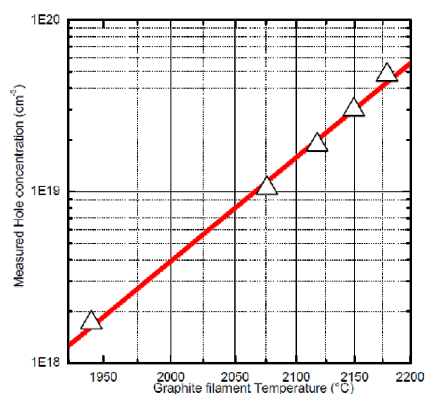
Carbon cell

- Enable to obtain holes concentration from 10^{18} to 10^{20} cm^{-3} in GaAs
- Compatible with existing solid sources MBE systems
- Up to 2100°C operating Temperature range with long lifetime
- Excellent Uniformity
- Rapid flux variation
- Simplicity of operation
- Easy exchange of PG filament

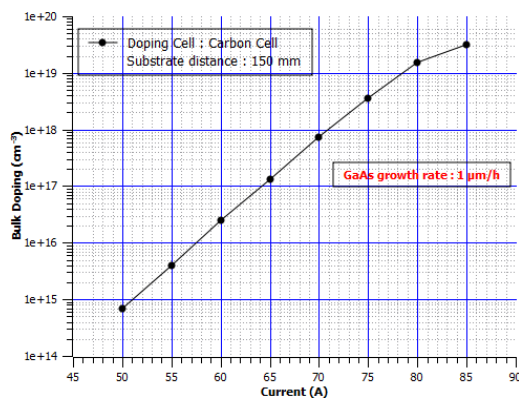


Product introduction

The carbon sublimation doping cell is used for carbon doping. The flux of carbon is generated by sublimating a high purity Pyrolytic Graphite filament. The Pyrolytic Graphite filament is heated up by direct flow of high intensity current. The region surrounding the filament is made out of the same PG material to guarantee the high purity of the carbon flux. In normal operation, the filament is heated up in the range of temperature 1700°C - 2100°C . The low thermal mass of the filament permits to change rapidly the doping levels. The filament emission area gives an excellent lateral uniformity for 2" and 3" substrates. The Filament surrounding is built in high purity Pyrolytic graphite to prevent any cross contamination due to outgassing. The source can be customized in order to fit on a large variety of vacuum systems. Electrical feedthroughs are water cooled in order to stand the current density applied to the source.

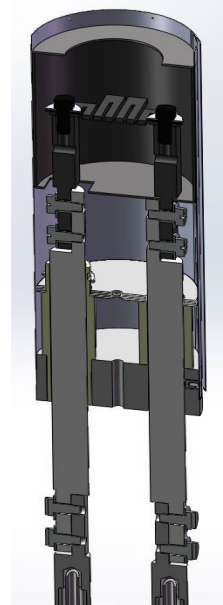
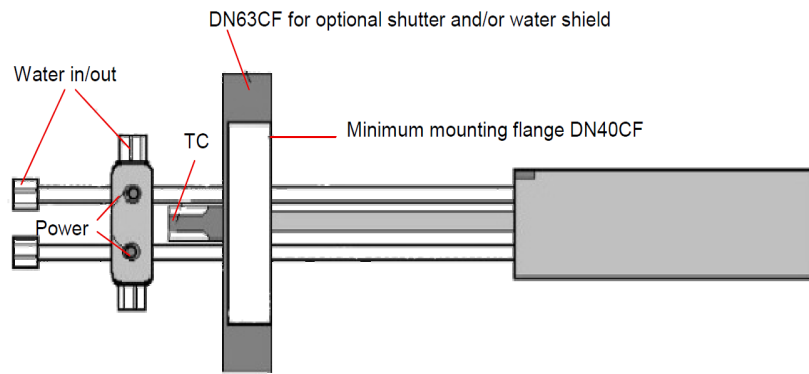


Hole concentration at 300 k in C-doped GaAs as a function of the carbon filament has been recorded. Hole concentration varies from 10^{18} to 10^{20} cm^{-3} .



P-type doping concentration for bulk doping in GaAs as a function of electrical current of the carbon cell

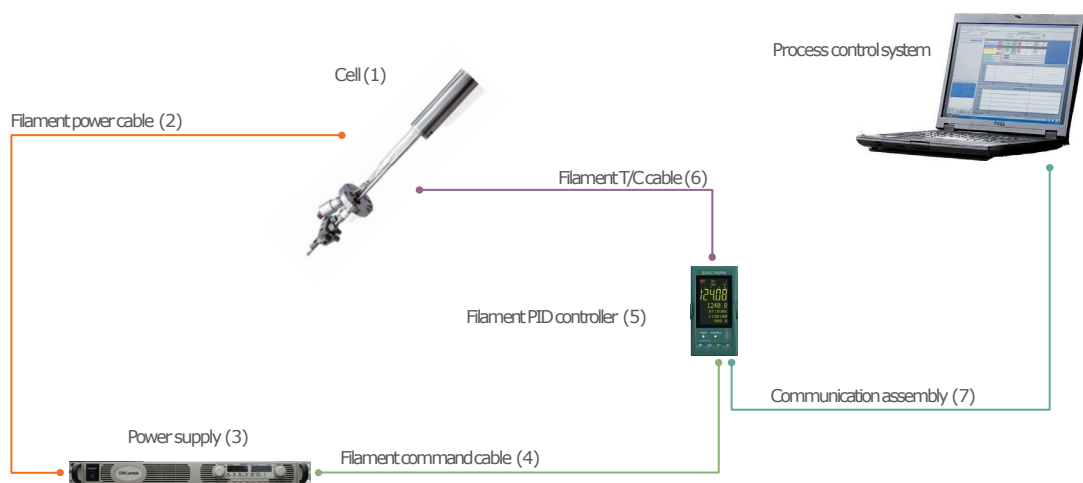
Layout



Specifications

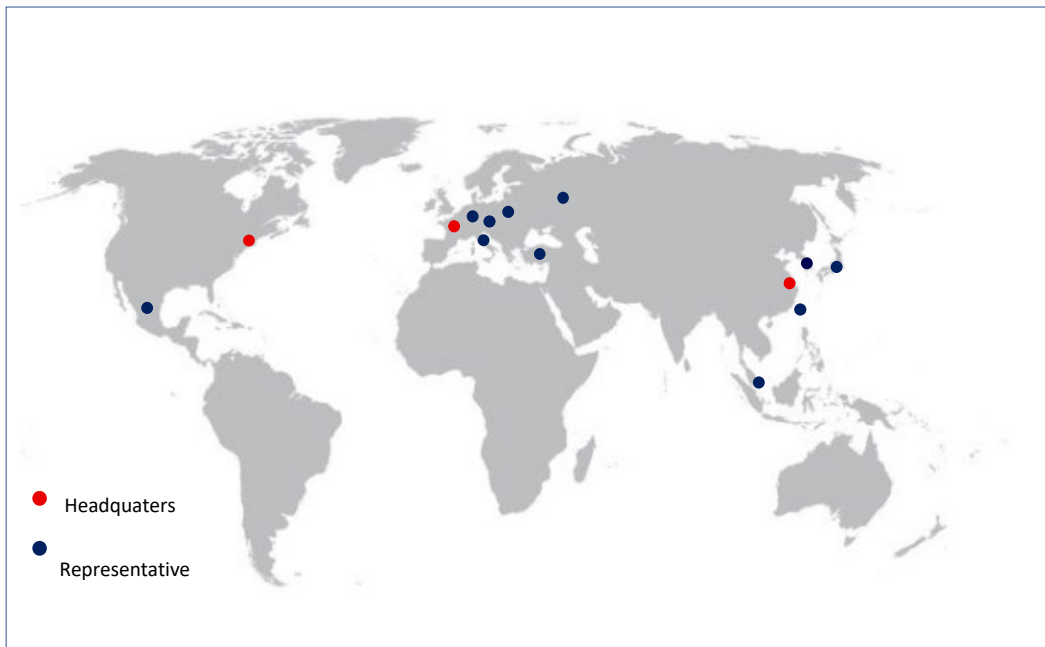
Cell characteristics	Carbon cell
Filament	Single high purity carbon (PG)
Capacity	800h @ 0,5Å/min // 10^{19} cm ⁻³
Mounting flange	CF 40
Water-cooled feedthroughs	Yes
Water flow	2-7 bar / 0,3 L/min
Thermocouple	C-type
Typical operating temperature	1900°C (~72 A) - 2100°C (~80 A)
Maximum outgassing temperature	2300 °C (~100A)
Power consumption	1500 W

Component interfacing



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