WAFER CARRIERS FOR MOCVD
HIGH PURITY COATED GRAPHITE
Beyond the development of the silicon semiconductor industry, the compound semiconductor has opened a new range of electronic applications.

A couple years ago, one could find compound semiconductors in limited number of devices like GaAs RF transistors, small LED displays, laser diodes, optical receivers and transmitters. Today, Compound semiconductor growth is driven by mass applications: LED lighting, Flat panel displays, Power electronics, Concentrated PV.

Mersen traditionally supplies high quality coated isotropic graphite parts to OEMs and after-market customers in the electronics industry, including single crystal growing furnaces, epitaxy reactors, MOCVD reactors, dry etchers, ion implanters, and many more.

**A strong expertise and know-how for epitaxy & MOCVD**

For more than 20 years, our Bay City and Midland facilities in Michigan USA supply major Silicon and Compound semiconductor chip manufacturers with high purity coated graphite consumables for epitaxial processing:

**Products :**
- Wafer carrier
- Susceptor
- Planet
- Satellite
- Platter
- Barrel
- Single wafer
To grow highly defined interfaces between individual epitaxial layers, MOCVD process engineers rely on quick and tunable temperature transitions of their process: High speed ramp-up and cool-down cycles of the wafer carrier should be regulated either through inductive or radiative heating with an extreme precision.

High purity iso-molded graphite

Mersen is a leading specialty iso-molded graphite manufacturer, with two major production facilities located in St Marys PA (USA) and Chongqing (China).

Our graphite grades are engineered to fit the application. Mersen optimizes the thermo-physical properties of its graphite grades to withstand the operating constraints of most existing MOCVD tools:

- Bear fast radiative heating cycles without cracking
- Ensure temperature uniformity on a large scale
- Guarantee a long term integrity of the protective coating
- Avoid any contamination processing high purity graphite

Mersen has been able to develop high integrity protections, suitable for MOCVD.

Because the properties of its high purity isotropic graphite are uniform and repeatable, Mersen has been able to develop high integrity protections, suitable for MOCVD.

Our graphite carriers are processed in a clean room environment to avoid surface contamination and get ultra-clean coatings.

- Pyrocarbon coating for GaAs epitaxy
- SiC coating for GaN epitaxy
- TaC coating for SiC epitaxy

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Mersen develops long term partnerships with semiconductor manufacturers by supporting their R&D and production efforts.

Your goal is the optimization of a highly complex system combining:
- The wafer
- The graphite wafer carrier
- The MOCVD machine

Mersen Partnership

OUR SERVICES AND COMMITMENTS:
- Quick turnaround of your R&D designs
- Custom pocket designs
- Multiple pocket designs within one carrier to speed up R&D
- Critical dimensions report provided with each carrier

MOCVD systems and processes:
- Inductive or radiative heating
- Temperature of process
- Ramp up and cool down cycles
- Etching

OUR OBJECTIVE

Our objective is to help you to reach the best temperature uniformity:
- Within the pocket
- Pocket to pocket
- Batch to batch, for a long time

WAFER CARRIER:
- High precision pocket profiles
- Repeatable geometries
- Coating uniformity

WAFER:
- Material: Sapphire, SiC, GaAs, Si
- Diameters: 2” to 8”
- Thickness
- Patterning process
Mersen has developed a dedicated CAD and machining process to manufacture customizable and accurate pocket and susceptor designs.

Our typical machining capability is at +/- 5µm.

A key engineering topic to reach the best temperature uniformity: Customize the pocket designs to fit with different wafer geometries and thermal behaviours.

**Quality control and parameters monitoring**

All the parts are measured with CMMs, with a precision of 2.5µm, before and after the CVD process.

All the key parameters during the coating runs are recorded and stored for 5 years.

The coating thickness is determined accurately.
A GLOBAL PLAYER

Global expert in materials and solutions for extreme environments as well as in the safety and reliability of electrical equipment, Mersen designs innovative solutions to address its clients’ specific needs to enable them to optimize their manufacturing process in sectors such as energy, transportation, electronics, chemical, pharmaceutical and process industries.

A WORLD EXPERT
in materials and solutions for high temperature processes

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