

Advanced materials & solutions for high temperatures



High Temperature Mission

- To engineer **innovative solutions** for our **customers**

- High temperature
- Corrosion
- Mechanical wear

High Temperature From material to engineering solutions

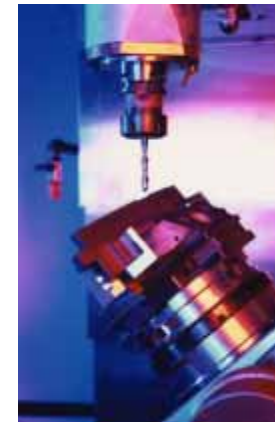


Iso-moulded and extruded graphite
C/C composites
Insulation materials
Sintered SiC



Systems,
Enhancement on carbon
and graphite materials

Solutions

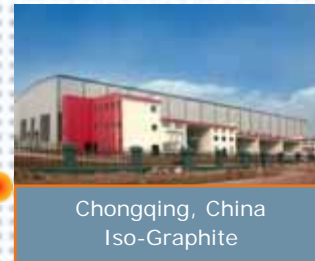


Machining
capabilities



High Temperature - Materials

Main production sites



High Temperature - Materials

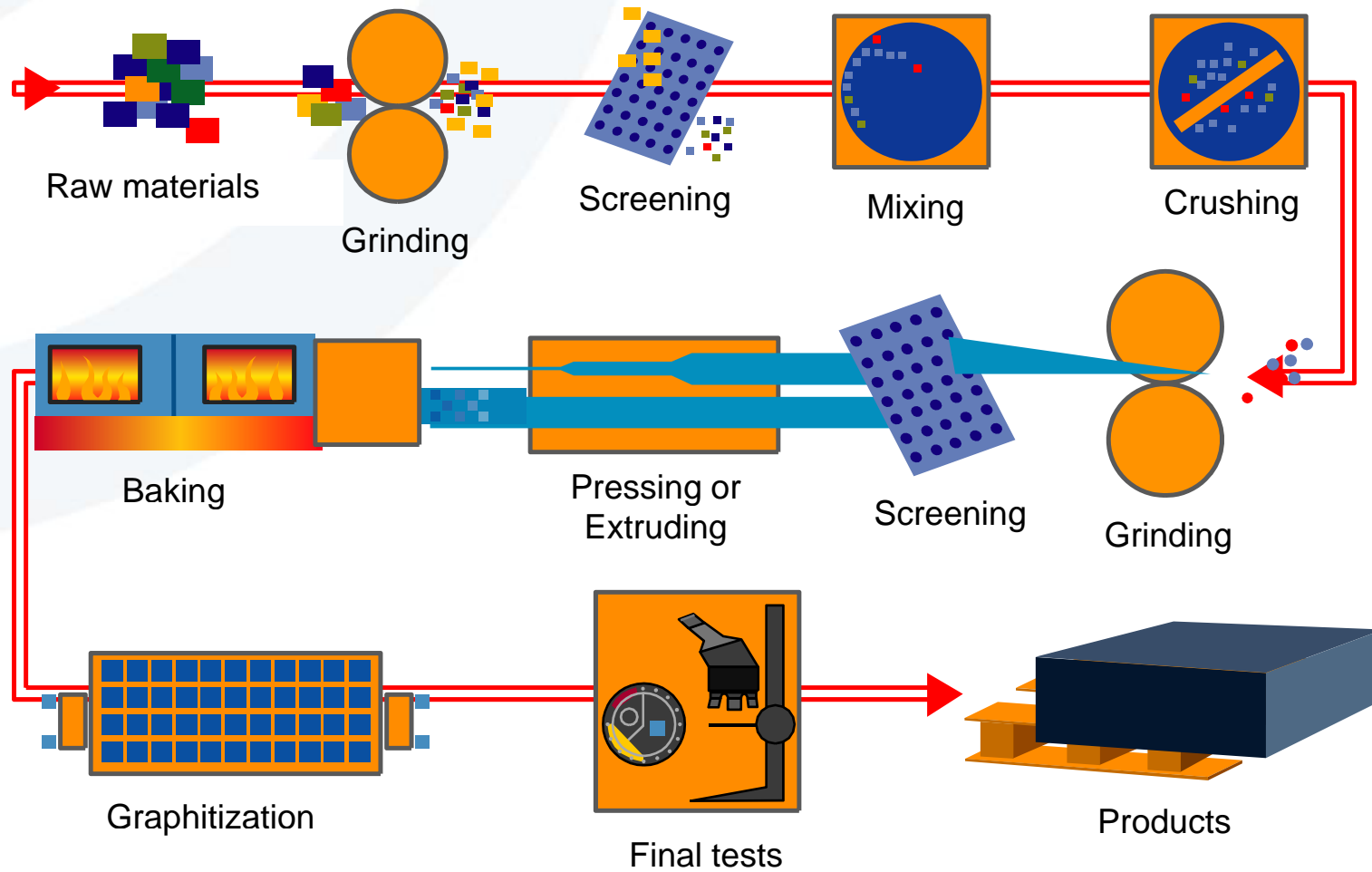
ISO-moulded graphite



- ISO 9001: 2000 in **all plants** since 2002
- **Consistency**: thanks to statistical process control
- **Reliability**: thanks to high production yield (> 99 %)
- Permanent **development** of **new grades** to match your applications
- **High volume** facilities to supply products **worldwide** with the same level of **quality**
- **Large block size capability**
 - Diameter: 1.5 m
 - Length: 2.0 m



High Temperature – Materials Graphite manufacturing



High Temperature - Materials

Rigid carbon insulation CALCARB®

- **CALCARB® CBCF** (Carbon Bonded Carbon Fibre) shows **high performance** and very **homogeneous insulation** properties.
- **CALCARB® CBCF** can be **machined accurately** and can be protected with painting or CVD coating in order to get **extended lifetime** for semicon and PV applications.



High Temperature - Materials

CFC- Carbon/Carbon composites AEROLOR®

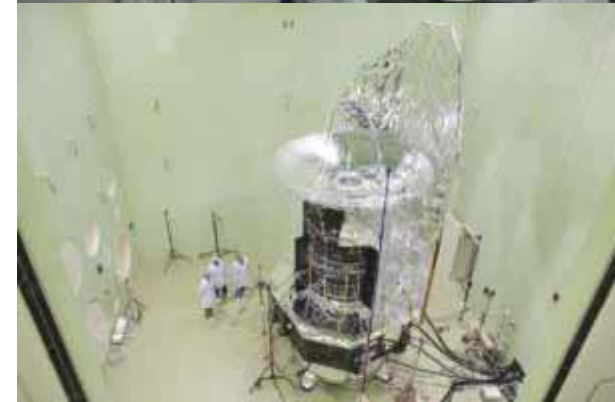
- **3 Dimensional** structure shows high mechanical strength, reduced oxidation and delamination.
- Available in **large sizes** up to 2200 mm.



High Temperature - Materials

Sintered Silicon Carbide BOOSTEC®

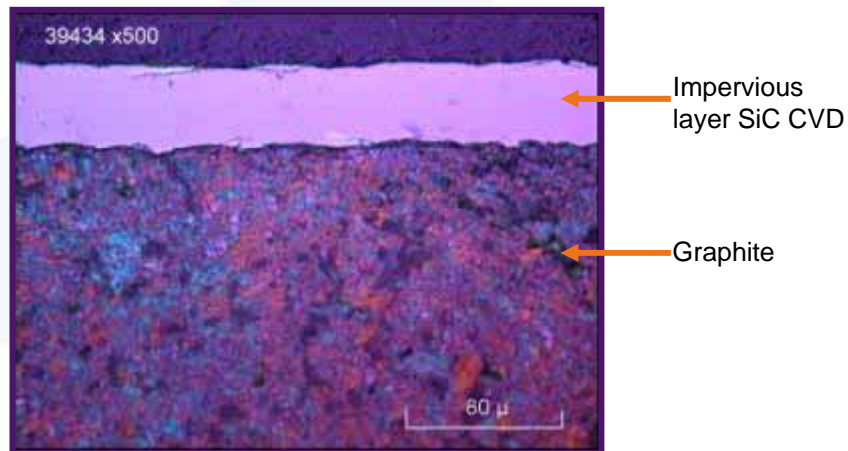
- **Boostec®** shows high thermal conductivity and mechanical strength.
- **Boostec® SiC** is available in **diameter 1500 mm** through isostatic pulling.
- **Boostec® SiC** is available up to 3500 mm in machined parts thanks to patented SiC brazing technology.



High Temperature - Materials

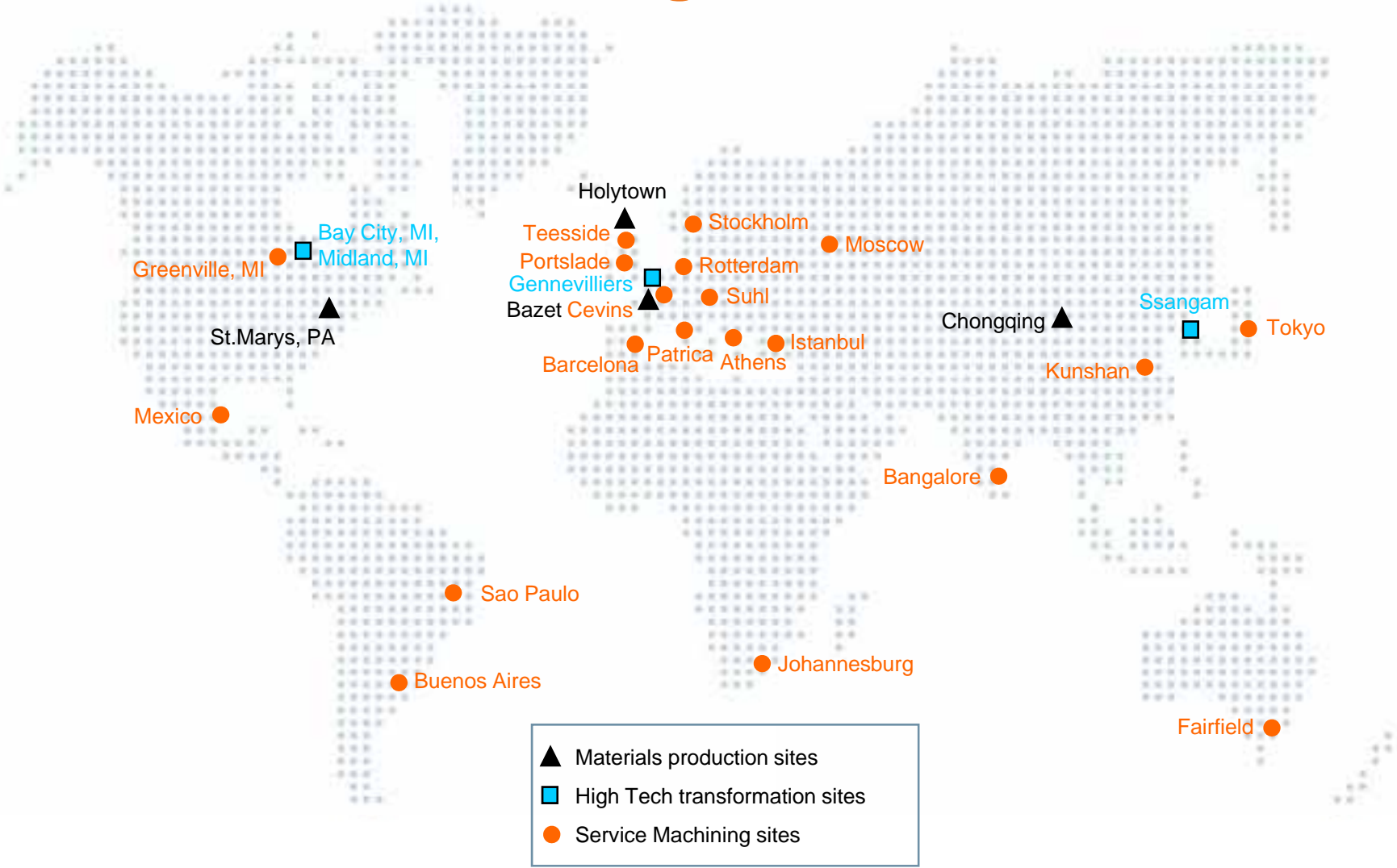
Silicon Carbide coating on graphite

- SiC is deposited by CVD on the surface of specially engineered graphite grades (cracking of MTS).



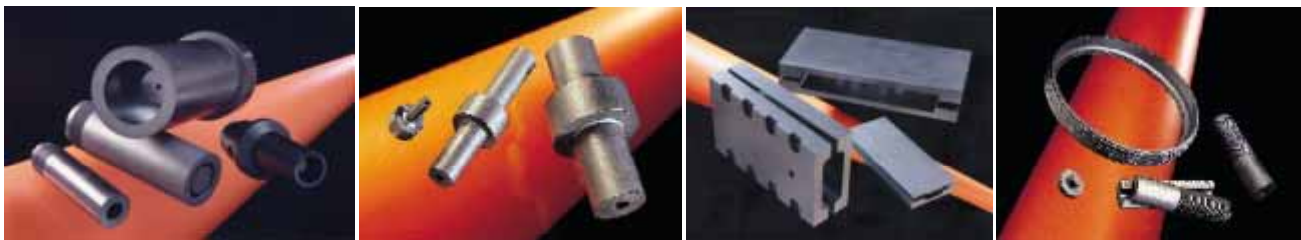
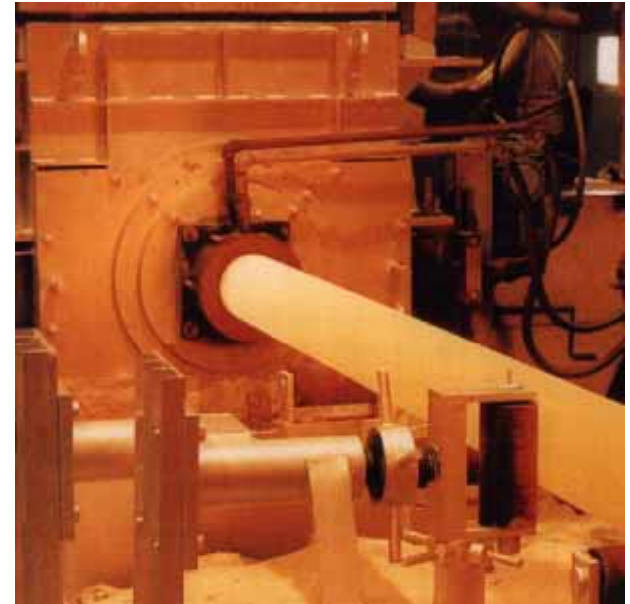
- Improve chemical resistance to H_2 , HCl , HF , O_2 , SiO , NH_3 ,...
- Avoid pollutions of semiconductor wafers or reactants.

High Temperature Materials & Machining facilities



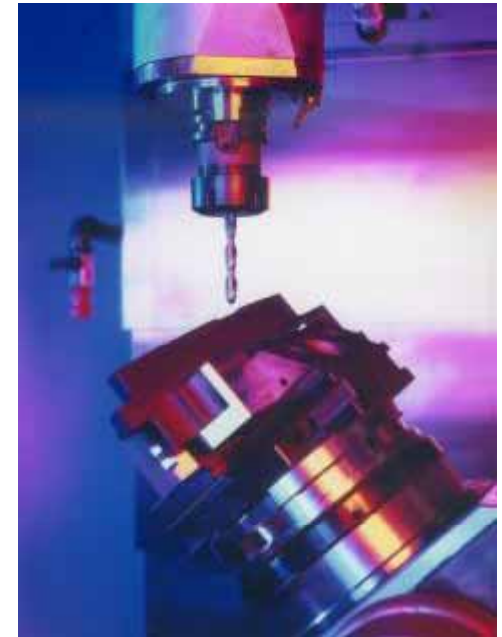
High Temperature Continuous casting of metals

- Dedicated graphite **grades**
- **Cost effective** choice according to your casting operation
- High thermal **conductivity** and enhanced lifetime
- **Machining** “know how” and service



High Temperature ELLOR® - E D M

- A **wide range** of grades from roughing to ultra-fine precision machining
- Extensive distribution **network**
- ELLOR graphite grades **approved** by EDM machine manufacturers
- **Custom machined** electrodes on request



High Temperature CERBERITE® Hot glass handling

- **Proven solutions** for the glass industry
- Only **one source** complete system supplier
- Fully **integrated supplier** from carbon materials to systems
- A **complete product range** combining metallic hardware and carbon-based contact materials
- **Worldwide network** with local service



High Temperature Applications in Semicon



SiO₂



Ultra pure Si



CZ – Monocrystal growing

SiC coating



Wafer processing

SiC coating

Epitaxy

- Barrels
- Pancakes
- Single wafers



SiC = Impervious layer (non pollution / increased lifetime)

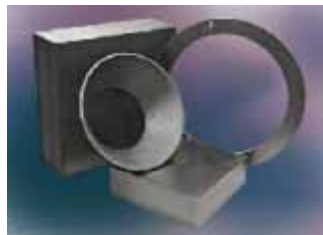
High Temperature Semiconductor Applications

- **Innovative solutions** for the semiconductor industry from CZ to wafer processing
 - Dedicated graphite grades
 - Highly purified graphite & ETV-ICP impurity analysis
 - SiC coating CARBOSIL®
 - Carbon and graphite enhancement
 - Rigid carbon insulation CALCARB® & ISOLOR®
 - Carbon/Carbon composites
- Unique **machining** competences
- Clean room packaging
- **Partnership** with O.E.M.s



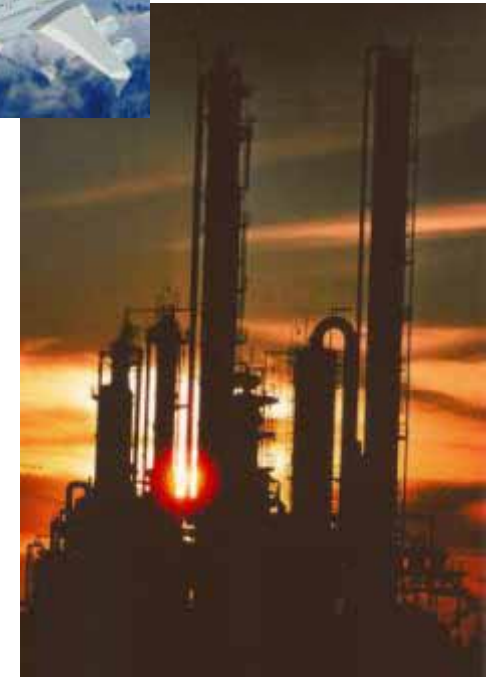
High Temperature Solar silicon and photovoltaics

- **Dedicated solutions** for solar silicon and photovoltaics
 - Highly purified graphite
 - ETV-ICP impurity analysis
 - SiC coating CARBOSIL®
 - Carbon and graphite enhancement
 - Rigid carbon insulation CALCARB® & ISOLOR®
- Large size in isostatic graphite and insulation (Ø 1500 mm) and carbon / carbon composites (Ø 2200 mm)
- Unique **machining** competences
- **Partnership** with O.E.M.s



High Temperature Carbon friction materials

- **Dry friction** conditions
- Cryogenic and high **temperatures**
- **Corrosive** applications (basis, solvent, acid)
- Reducing lubrication in mechanical equipment
- Low and stable **friction coefficient**
- **High speed** friction applications
- Air bearings
- Thermal shock conditions
- When **weight** saving is required



High Temperature Dynamic sealing applications

- **Solutions** for
 - linear and rotation movement
 - high speed in dry friction
 - application when other materials cannot resist severe technical conditions
- **Increased lifetime**
- The Carbon material solution even in **dry friction conditions**



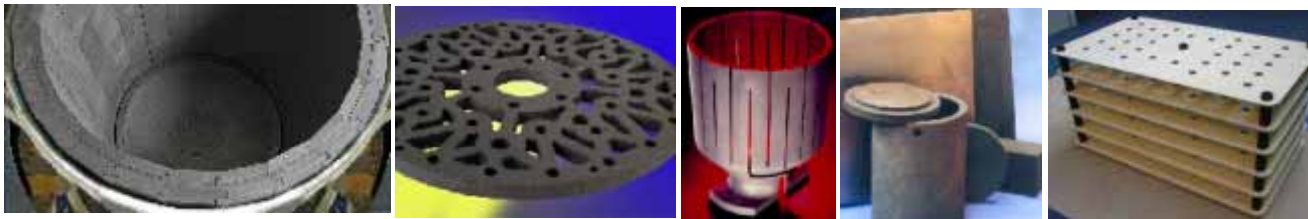
High Temperature PAPYEX flexible graphite

- **Compressibility** and elastic recovery
- Chemical inertia and **resistance** to temperature
- **Approved** by specialized institutes (TÜV, BAM...) for the chemical industry
- Used for **dynamic** and **static sealing** applications, and for **thermal** insulation
- An **asbestos substitute** material



High Temperature Furnace equipment

- **Graphite** (resistors)
- **AEROLOR**® C/C composites
 - 3D and 2D grades
- **Thermal insulation**
 - Flexible graphite **PAPYEX**®
 - **ISOLOR**® and **CALCARB**® insulation
- From **materials** to **thermal engineering**





MERSEN
Expertise, our source of energy