

PI-KEM

COMPOUND SEMICONDUCTOR RESEARCH



Temperature
Range



Power
Efficient



High Power



Energy



Autonomous



Mobility

5 B 10.81 Boron	6 C 12.01 Carbon	7 N 14.01 Nitrogen
13 Al 26.98 Aluminium	14 Si 28.09 Silicon	15 P 30.97 Phosphorus
31 Ga 69.72 Gallium	32 Ge 72.64 Germanium	33 As 74.92 Arsenic
49 In 114.82 Indium	50 Sn 118.71 Tin	51 Sb 121.76 Antimony



Faster



Lower
Latency



Transmit &
receive light



New business
models



5G



Sensing

Product Overview

A BOND WORTH FORMING

WE ENABLE INNOVATION

For over 30 years we've been enabling you to accelerate your research and development, proudly partnering with the most innovative minds in the science and technology sectors.

We're purpose designed to support your science and technology innovation, and take your ideas from lab-based concepts to full-scale production.

With our capabilities and extensive expertise we're the partner of choice for custom manufacturing solutions and niche product sourcing through our trusted network of UK and international suppliers.

Our PI-KEM Clusters of specialist product groupings:

- Energy Research
- Hydrogen Technology
- Photonics + Optoelectronics
- Thin Films + Nanotech
- Materials Processing + Analysis
- RF Shielding
- Electroforming
- Specialist Metallic Coatings

Accelerate your journey. We are PI-KEM.

MICRO-INFO

- 30+ years supplying advanced materials and equipment
- Custom manufactured components
- Niche product sourcing
- Comprehensive range of standard stock products and consumables
- Call off purchase options
- Support from an expert scientific team
- Low minimum order quantity
- UK, European & global delivery

We offer a wide range of advanced materials and equipment which are available as standard or custom manufacture.

Within this catalogue are our most requested lines, however we welcome any enquiry for other specifications.

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Our Partners

We distribute on behalf of leading manufacturers of advanced materials & equipment



SEMICONDUCTOR WAFERS

SILICON CARBIDE

The use of Silicon Carbide (SiC) in the semiconductor industry has expanded due to its advantageous physical properties, including its hardness, high thermal conductivity and low coefficient of thermal expansion.

We offer a wide range of Silicon Carbide (SiC) wafers, produced to exact customer requirements or as standard wafer specifications. Below are our most requested lines, however we welcome any enquiry for other specifications.

Grades

Production / Prime

Research

Dummy

Crystal Structure / Polytype

4H

6H

3C

Off axis miscuts also available

Size & Thickness

Size	Standard Thickness (µm)
1" (25.4mm)	250
2" (50.8mm)	275
3" (76.2mm)	380
4" (100mm)	525
6" (150mm)	675
8" (200mm)	725
5mm x 5mm	300 - 350
10mm x 10mm	300 - 350

Custom diameters and thicknesses available on request

Surface Finish

Single side polished

Double side polished

Laser marking available on request

Type & Dopant

Type	Dopant
HPSI - High Purity Semi-Insulating	Undoped
Semi-Insulating	Vanadium
Intrinsic	Undoped
n-type	P- Phosphorous, N- Nitrogen
p-type	Al- Aluminium, B - Boron

Notch

- Standard
- Custom

Packaging

- Single
- Pack of 25

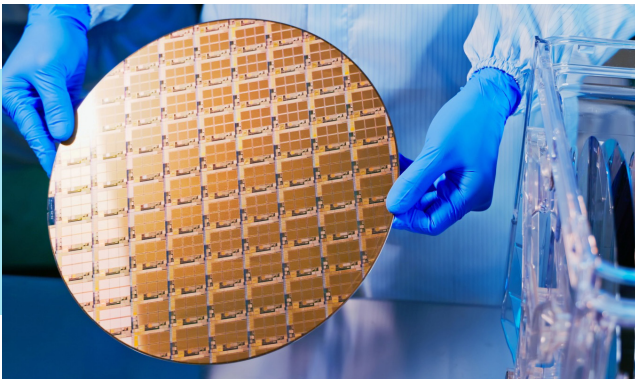
Other Specifications

	Standard Specification or Example
Orientation	e.g. <0001> +/-0.5°
Resistivity	e.g. 0.015-0.025 Ω·cm, > 10^6 - 10^8 Ω·cm
Thermal Conductivity	e.g. a ~ 4.9 W/cm·K @ 298 K, c ~ 3.9 W/cm·K @ 298 K
Surface Roughness	Front surface: Ra < 0.5 nm, Back surface: Ra < 1.0 nm
TTV	e.g. <10 μm
Bow	e.g. ≤ 30-50 μm
Warp	e.g. < 35 μm
Micropipe Density	e.g. low/ 5 cm2/ < 50 cm2
Particles	≥ 0.3 μm (≤ 100 particles/wafer)/ ≥ 5.0 μm (0 particles/wafer)

Silicon Carbide as a Substrate

Type	Specifications
Windows	As per customer drawings
Components	As per customer drawings
Blocks	To customer specification including surface roughness & flatness

For wafer processing services see page 8



SEMICONDUCTOR WAFERS

Below are our most requested lines, however we welcome any enquiry for other specifications.

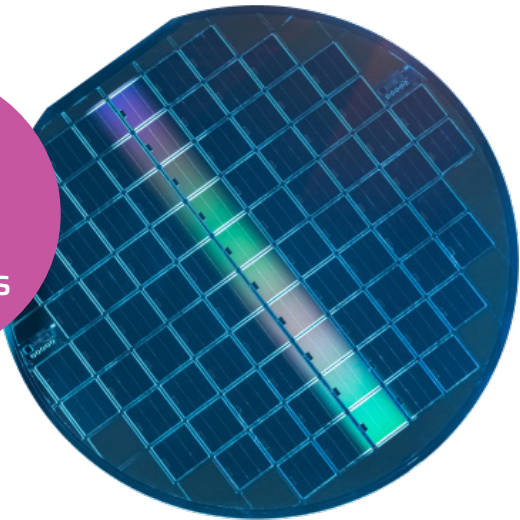
III-V Wafers

Name
Gallium Arsenide (GaAs)
Gallium Nitride (GaN)
Gallium Phosphide (GaP)
Indium Phosphide (InP)
Indium Antimonide (InSb)
Indium Arsenide (InAs)

Other Group Wafers

Name
Silicon Germanium (SiGe)

We can supply
GaAs and
InP Wafers



II-VI Wafers

Name
Zinc Telluride (ZnTe)
Zinc Selenide (ZnSe)
Zinc Sulphide (ZnS)
Cadmium Sulphide (CdS)
Cadmium Telluride (CdTe)
Cadmium Telluride doped with Zinc (Cd-Zn-Te)

SPECIFICATIONS

Through our specialist manufacturing partners, we can provide the below specifications:

Grades

Prime	Test	Mechanical
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Type & Dopant

n-type
p-type
Semi-insulating

Custom specifications also available including **resistivity, surface finish, orientation, thickness and dopants.**

Size & Thickness

(Custom diameters and thicknesses available on request)

Size	Standard Thickness (µm)
1" (25.4mm)	250
2" (50.8mm)	275
3" (76.2mm)	380
4" (100mm)	525
6" (150mm)	675
8" (200mm)	725
5mm x 5mm	300 - 350
10mm x 10mm	300 - 350

OTHER WAFERS

Silicon on Insulator (SOI) Wafers

Specifications	
Size	As per customer specification
Layers	Handle, Device, Buried Oxide (BOX) - All layers as per customer specification

Silicon on Sapphire

Specifications	
Size	E.g. 100mm (4"), 5mm x 5mm, 10mm x 10mm

Pocket Wafers

Pocket wafers enable smaller substrates or wafers to be securely processed on larger wafer handling equipment, helping maximise the use of existing systems while maintaining precise positioning and process compatibility.

Available in a range of materials and custom configurations

Silicon Wafers

PI-KEM offers a wide range of silicon wafers with standard wafers available from stock or manufactured to customer specifications.

Options include:

Grade: Prime, test, reclaim and mechanical

Diameter: 1" up to 12" as standard

Thickness: 30 µm up to 20mm

Type and Dopant: Intrinsic, n-type, p-type

Orientation: <100>, <110>, <111>

Glass Wafers

Below are our most requested lines, however we welcome any enquiry for other specifications.

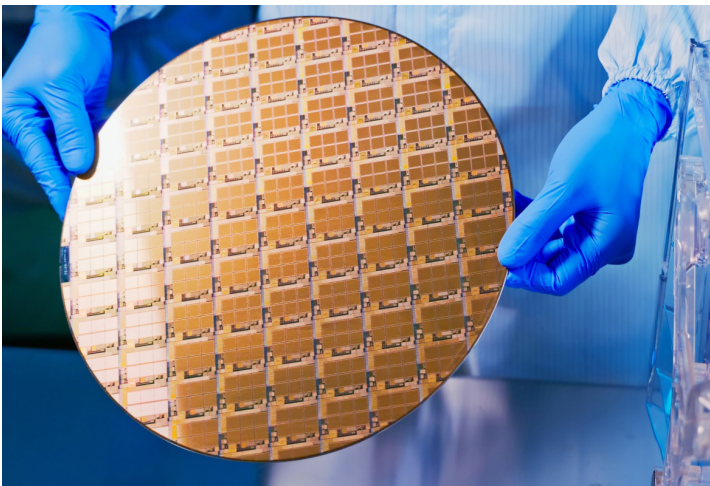
We also offer wafers and tiles to custom specifications, including diameter, thickness and polish.



Material	Wafer Diameter	Thickness	Polish
Borofloat BF33 Glass	2" (50.8mm)	0.5mm ± 0.025mm	Double Sided Polished
Borofloat BF33 Glass	3" (76.2mm)	0.5mm ± 0.025mm	Double Sided Polished
Borofloat BF33 Glass	4" (100mm)	0.5mm ± 0.025mm	Double Sided Polished
Borofloat BF33 Glass	6" (150mm)	0.5mm ± 0.025mm	Double Sided Polished
Borofloat BF33 Glass	8" (200mm)	0.5mm ± 0.025mm	Double Sided Polished
Borofloat BF33 Glass	12" (300mm)	0.5mm ± 0.025mm	Double Sided Polished

WAFER SERVICES

PI-KEM provides an extensive choice of wafers including glass, silicon, germanium, and other semiconductor materials. Alongside this we also offer a range of processing services for our silicon, sapphire, and single crystal wafers.



Below are our most requested lines, however we welcome any enquiry for other specifications.

Cutting / Dicing

Form	Specifications
Tiles	E.g. 10mm x 10mm, 20mm x 20mm (minimum size 1.5mm x 1.5mm)

Lapping

Lapping allows the production of wafers with a flat, smooth surface and tight tolerances of thickness, parallelism, flatness, or finish

Laser Marking

Allowing tight quality control and traceability as each wafer has a unique identification number. Essential for batch monitoring for research, compliance with industry regulations and ongoing quality management.

Polishing

- Single side polished
- Double side polished

Coatings

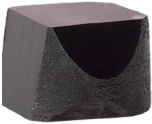
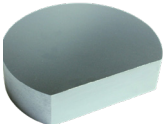
Type	Method	Thickness (nm)	Diameter
SiO ₂ Silicon Dioxide	Wet Oxidation	200-3000	From 1" to 6"
	High Purity Dry Oxidation	20-300	From 1" to 6"
Single face oxidation also available			
Si ₃ N ₄ Silicon Nitride	LPCVD or PECVD	20-500	From 2" to 6"
Metal Coatings including: Cr, Ti, Au, Al, Pt, Mo, W, Ni, Cu, Ir, Ta	PVD Sputtering or Evaporation	20-1000	From 1" to 6" (depending on metals)
Other metal coatings and multi-layer deposition available on request. Please contact us if you require any specifications not listed above.			

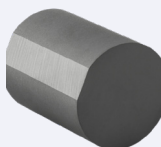
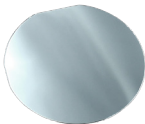
SINGLE CRYSTALS + SUBSTRATES

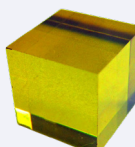
We offer a wide range of single crystals and substrates, which are available as standard or custom manufacture.

Below are our most requested lines, however we welcome any enquiry for other specifications including purity, dopant or custom melts.



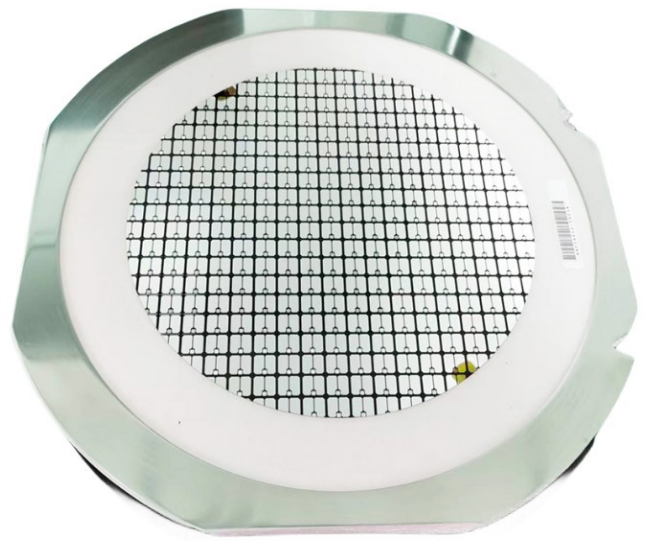
	Substrate
	Cadmium Selenide (CdSe)
	Cadmium Sulfide (CdS)
	Cadmium Telluride (CdTe)
	Gallium Antimonide (GaSb)
	Gallium Arsenide (GaAs) Semi-conducting HB/VB
	Gallium Arsenide (GaAs) (VB) (Semi-insulating VB)

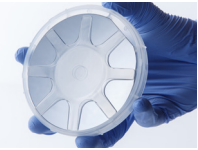
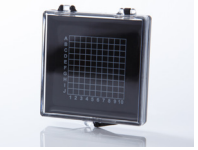
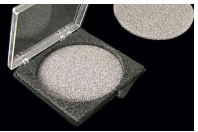
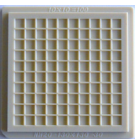
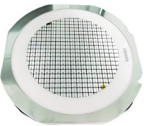
	Substrate
	Gallium Phosphide
	Germanium (Ge)
	Germanium Antimony Doped (Ge:Sb)
	Germanium Gallium Doped (Ge:Ga)
	Indium Arsenide (InAs)
	Indium Phosphide (InP)

	Substrate
	Indium Antimonide (InSb)
	Silicon Carbide (SiC 4 H)
	Silicon Carbide (SiC 6 H)
	Zinc Selenide (ZnSe)
	Zinc Telluride (ZnTe)

SUBSTRATE + WAFER STORAGE

We supply a large selection of substrate and wafer storage. Below are our most requested lines, however we welcome any enquiry for other specifications.



	Product	Sizes
	Individual Wafer Carriers	1", 2", 3", 4" and 6"
	Multi Wafer Storage Boxes	2", 3" and 4"
	Gel-Sticky Boxes	2", 3" and 4"
	Membrane Boxes	1", 2", 3", 4" and 5"
	Plastic Foam Module Boxes	3" and 4" single or multiple wafers
	Die / IC Trays	9 - 1600 pockets
	Metal Flex Wafer Frames	For up to 12" wafers
	Individual Wafer 'Clam Shells' Carriers	For up to 12" wafers
	Wafer Carrier Box	For up to 12" wafers

COATING MATERIALS

TARGETS FOR SPUTTERING + LASER ABLATION

We provide an extensive choice of targets, available as standard or custom manufacture, in an array of purities, materials and sizes. Targets are available as monobloc, multi-tile, circular and rotary, however we welcome any enquiry for other specifications.



Metals

Precious Metals and Alloys including:

Gold (Au)	Palladium (Pd)	Platinum (Pt)	Silver (Ag)
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Also related precious metal alloys

Base Metals including:

Germanium (Ge)	Indium (In)	Niobium (Nb)	Selenium (Se)	Tantalum (Ta)
Tellurium (Te)	Vanadium (V)	Zirconium (Zr)		

Oxides

Compositions including:

Barium Copper Oxides (BaCu)	Barium Strontium Titanate (BaSrTiO ₃)	Barium Titanate (BaTiO ₃)
Bismuth Oxide (Bi ₂ O ₃)	Bismuth Titanate (Bi ₁₂ TiO ₂₀)	

HIGH PURITY EVAPORATIVE COATING PELLETS



We offer a wide range of evaporation materials in pellet, granule and wire form. Below are our most requested lines, however we welcome any enquiry for other specifications such as Alloys, Oxides, Fluorides, Sulphides, Silicides, Carbides, Nitrides.

Precious Metals - Related Precious Metal Alloys are also available upon request

Metal	Typical Available Purities
Gold (Au)	99.99+%
Silver (Ag)	99.9+%, 99.99+%

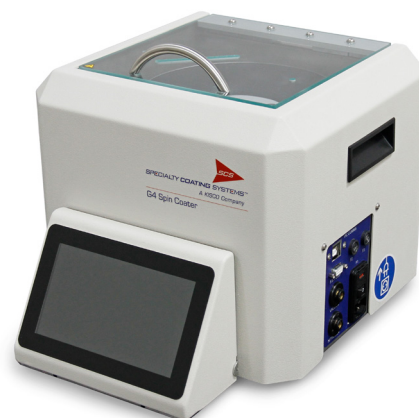
Metal	Typical Available Purities
Platinum (Pt)	99.99+%
Palladium (Pd)	99.99+%

COATING EQUIPMENT

SPIN COATERS

We supply a range of spin coaters for electronic and photonic research.

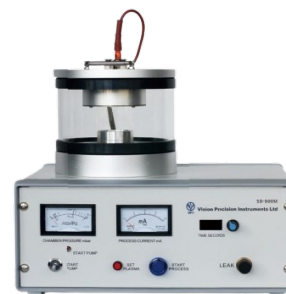
Below are our most requested lines, however we welcome any enquiry for other specifications and your custom chuck needs.



Spin Coater Options	Specifications
Bowl Size	6", 8", 9", 10", 12" & 15" Bowl Diameters
Control	Programmable and touch screen options
Dispensers	Manual, & Automatic options
Chucks	Standard Sizes & Custom Designs
Additional Options	- Vacuum Pump Oil-less (free) - UV Cover - Infrared Heated Cover

MAGNETRON SPUTTER COATERS

Our magnetron sputtering range supports the deposition of conductive and non-conductive materials, including metals, oxides, ceramics, semiconductors, dielectrics, optical materials, ferroelectrics, alloys and polymers.



Feature	Available range
Magnetron size	From 1" (approximately 25 mm) to 2" (approximately 50 mm), with custom options up to 200 mm
Chamber Size	From 150 × 120 mm to 300 × 300 mm
Power Options	DC, RF or combined DC/RF configurations
Number of Heads	Single, dual or three-head systems
Installation	Primarily benchtop
Vacuum	External vacuum pump required; standard and high-vacuum options available
Integration	Glovebox-compatible and custom configurations available
Process options	Gas-flow control, substrate heating, water cooling and programmable operation, depending on model

CSS + THERMAL EVAPORATION COATERS

Close Spaced Sublimation (CSS) and thermal evaporation systems provide flexible options for coating metallic and organic materials, processing wafers, annealing thin films and supporting semiconductor research.



Feature	Available range
Chamber Size	From 150 × 250 mm to 280 × 260 mm
Sample Stage	From 50 mm to 300 mm
Source Configuration	Single source or up to four sources
Temperature Control	Automatic and programmable
Heating	Single-zone or multi-zone
Installation	Benchtop and floor-standing
Heating components	Tungsten coil heaters and crucibles
Integration	Glovebox-compatible systems available

OTHER SERVICES

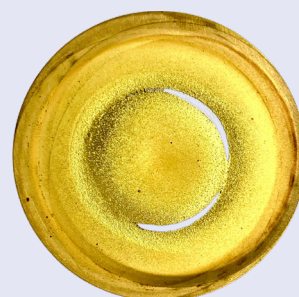
Bonding

We offer a target bonding service using Indium, Elastomer and Epoxy bonding agents. Our targets can be bonded to standard backing plates or backing plates produced to custom technical drawings provided by the customer.

Precious Metal Reclaim

We provide a complete Precious Metal Reclaim Service offering both economic and environmental benefits such as;

- Fast and efficient refining process for high metal return
- Prompt settlement time for improved cash flow
- Reclaim credit which can be used towards your next purchase



NOTES

[illegible]



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Version 1 09.2026