



PI-KEM

WE ENABLE INNOVATION



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# EFFICIENT USE OF BUDGET AND TIME WHEN COMMISSIONING A BATTERY RESEARCH PILOT LINE

**Geoffrey Handley-Harrison**

Business Development Manager-  
Energy Research & Material Processing



# WE ENABLE INNOVATION

All you need for your Coin, Cylinder & Pouch Cell Lines



Cases +  
Consumables



Battery  
Materials



Lithium + Sodium  
Chemicals



Solid State  
Electrolytes



Lab-Scale  
Equipment



Pilot-Line  
Equipment



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# ENERGY PARTNERS

Working together to supply advanced materials & equipment for  
all your R&D needs



[pi-kem.co.uk](http://pi-kem.co.uk)



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# WHO IS PI-KEM?

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 purposely designed to support your science and technology innovation, taking your ideas from lab based concepts to full-scale productions.

With our extensive expertise we are the perfect partners for custom manufacturing solutions and niche products sourcing through our trusted network of UK and international suppliers.

**We enable innovation. We are PI-KEM.**

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# WE SPECIALISE IN THE FOLLOWING AREAS:

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

 <p>Chemical Powder Preparation</p>	 <p>Electrode Coating Preparation</p>	 <p>Dry Electrode or Electrolyte Preparation</p>	 <p>Battery Analyzer / Cycler</p>
 <p>Button Cell Preparation</p>	 <p>Cylinder Cell Preparation</p>	 <p>Pouch Cell Preparation</p>	 <p>Thin-Film Battery Preparation</p>
 <p>Beyond Li-ion Batteries Metal-Air &amp; Solid Battery</p>	 <p>All Solid Li-Ion Battery Research</p>	 <p>Spot &amp; Ultrasonic Welders</p>	 <p>Electrolyte Dispensing</p>
 <p>Big Pouch Cell Equipment</p>	 <p>Pouch Cell Production Line</p>	 <p>Supercapacitor Research</p>	 <p>Flow Cell Research</p>
 <p>Battery Safety Test for IEC62133</p>	 <p>Battery Safety Testing</p>	 <p>Battery Pack Assembling</p>	 <p>Solar &amp; Fuel Cell R&amp;D</p>
 <p>Drying and Storage</p>	 <p>Replacement parts</p>	 <p>Consumables Components</p>	 <p>Glovebox &amp; Dry room</p>
 <p>Li-S Batteries</p>	 <p>Zinc-ion Batteries</p>	 <p>New Li-Alloys preparation</p>	 <p>Battery Recycling</p>

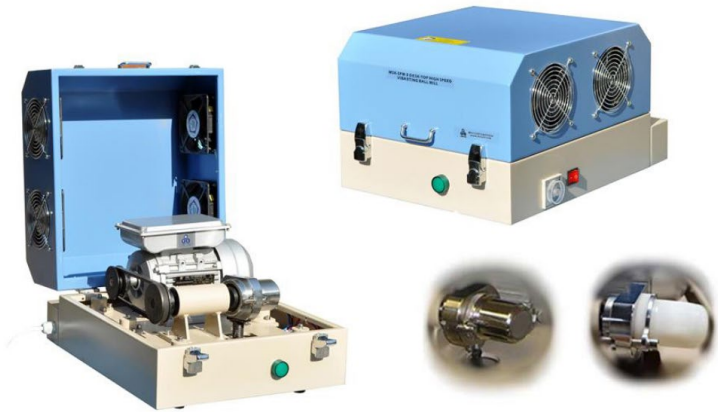
# 6 ESSENTIAL STAGES

1. Mixing
2. Coating
3. Calendaring
4. Slitting
5. Stacking
6. Sealing



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# MIXING



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# COATING



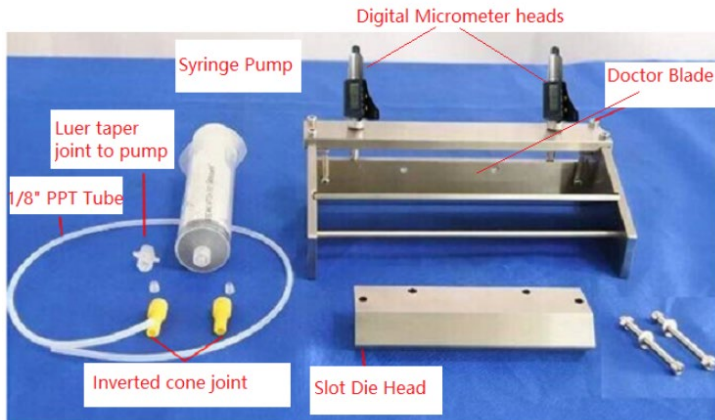
*Doctor Blade*



*Micro Gravure*



*Slot Die*

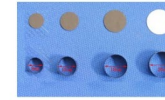


# CALENDARING





# SLITTING



The magnet to absorb a ring cutter

Sheet stage 25 x25 mm



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# STACKING



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# SEALING





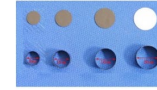
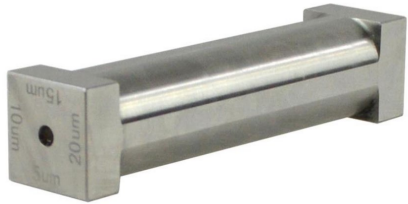
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# PIT FALLS



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# PIT FALLS



Two sets of cutting dies, each set includes 4 types of die : ID: 8, 15, 18, 20 mm

The magnet to absorb a ring cutter

Sheet stage 25 x25 mm





# We provide a bespoke solution for your R&D needs

 <p>Chemical Powder Preparation</p>	 <p>Electrode Coating Preparation</p>	 <p>Dry Electrode or Electrolyte Preparation</p>	 <p>Battery Analyzer / Cycler</p>
 <p>Button Cell Preparation</p>	 <p>Cylinder Cell Preparation</p>	 <p>Pouch Cell Preparation</p>	 <p>Thin-Film Battery Preparation</p>
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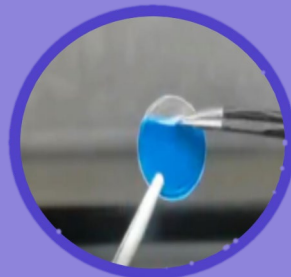
# IMPORTING INCOTERMS

	Any Mode		Sea Transport Only				Any Mode				
	EXW	FCA	FAS	FOB	CFR	CIF	CPT	CIP	DAP	DPU	DDP
	Ex-Works	Free Carrier	Free Alongside Ship	Free On Board	Cost and Freight	Cost, Insurance, Freight	Carriage Paid To	Carriage and Insurance Paid	Delivered At Place	Delivered at Place Unloaded	Delivered Duty Paid
Risk transfers when:	Goods placed at buyer's disposal	Goods placed at buyer's disposal	Goods arrive alongside ship	Goods loaded on ship	Goods loaded on ship	Goods loaded on ship	Goods taken in charge by carrier	Goods taken in charge by carrier	Goods arrive at named destination	Goods unloaded at named destination	Goods arrive at named destination
Loading and inland transport	Buyer	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Export taxes, clearance	Buyer	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Unloading of the vehicle in the export port	Buyer	Buyer	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Loading fees in export port	Buyer	Buyer	Buyer	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Main carriage	Buyer	Buyer	Buyer	Buyer	Seller	Seller	Seller	Seller	Seller	Seller	Seller
Unloading fees in import port	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Negotiable	Seller	Seller	Seller	Seller
Loading to the transport vehicle in import port	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller	Seller	Seller	Seller
Transport to the delivery address	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller	Seller	Seller
Import formalities, duties, fees	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller
Unloading at named destination	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Seller	Buyer
Insurance	Negotiable	Negotiable	Negotiable	Negotiable	Negotiable	Seller Clauses (C)	Negotiable	Seller Clauses (A)	Negotiable	Negotiable	Negotiable

# LITHIUM + SODIUM CHEMICALS



Lithium & Sodium Discs



# SOLID STATE ELECTROLYTES



# CASES + CONSUMABLES

Cylinder Cells



Coin Cells



Pouch Cells



Split Test Cells



# SOLID OXIDE FUEL CELL TECHNOLOGY

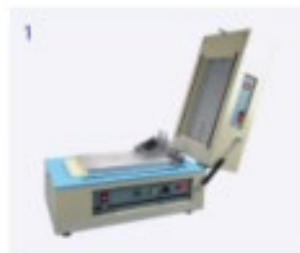


# LAB SCALE EQUIPMENT

## Product

1. Electrode Coating Preparation
2. Coin/ Button Cell Preparation
3. Chemical Preparation/ Analysis
4. Battery Testing System
5. Sample Handling & Storage
6. Pouch Cell Preparation
7. Cylinder/ Prismatic Cell Preparation

We provide an extensive range of Lab Scale Equipment. Here are some of our most requested line, however we welcome any other enquiries.





# PILOT-LINE EQUIPMENT



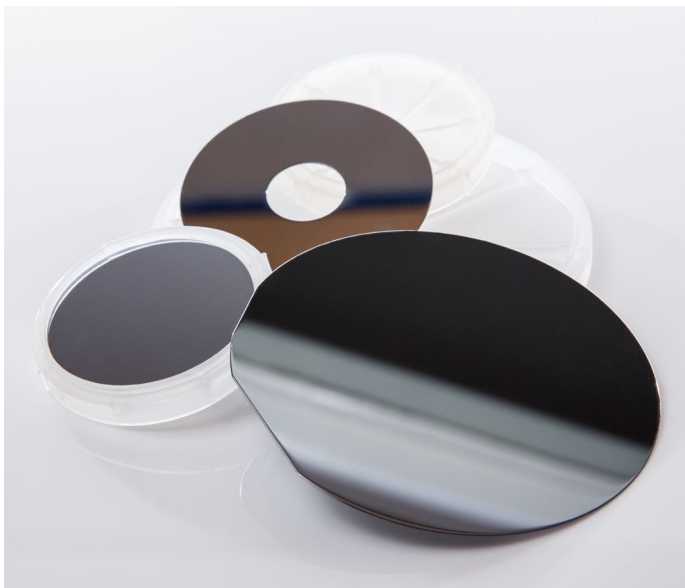
# SAFETY TESTING EQUIPMENT

## Process

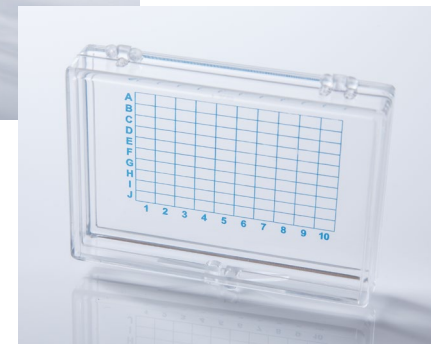
1. Altitude Simulation
2. Thermal Test
3. Vibration
4. Shock
5. External Short Circuit
6. Impact/ Crush
7. Overcharge
8. Thermal Abuse
9. Nail Penetration



# WAFERS



# SUBSTRATE + WAFER STORAGE





# ENERGY RESEARCH TEAM



**Alex Timney**

Head of Business Development



**Geoffrey Handley-Harrison**

Business Development Manager –  
Energy Research & Material  
Processing



**Brigid Ray**

Business Development Executive –  
Energy Research & Material  
Processing



**Lee Fitzpatrick**

Sales Executive –  
Energy Research & Material  
Processing



**Tyler Williams**

Sales Support Assistant –  
Energy Research & Material  
Processing



**Sam Entwistle**

Sales Support Assistant –  
Energy Research & Material  
Processing



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## DISCOVER MORE

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PI-KEM Ltd, Unit 18-20 Tame Valley Business Centre, Magnus,  
Tamworth, B77 5BY, UK

Learn more at [pi-kem.co.uk](http://pi-kem.co.uk)

**+44 (0) 1827 259250**

**[info@pi-kem.co.uk](mailto:info@pi-kem.co.uk)**

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