

A dynamic background of water splashes and droplets in various stages of motion, set against a solid blue background. The water is captured in sharp focus, showing reflections and refractions.

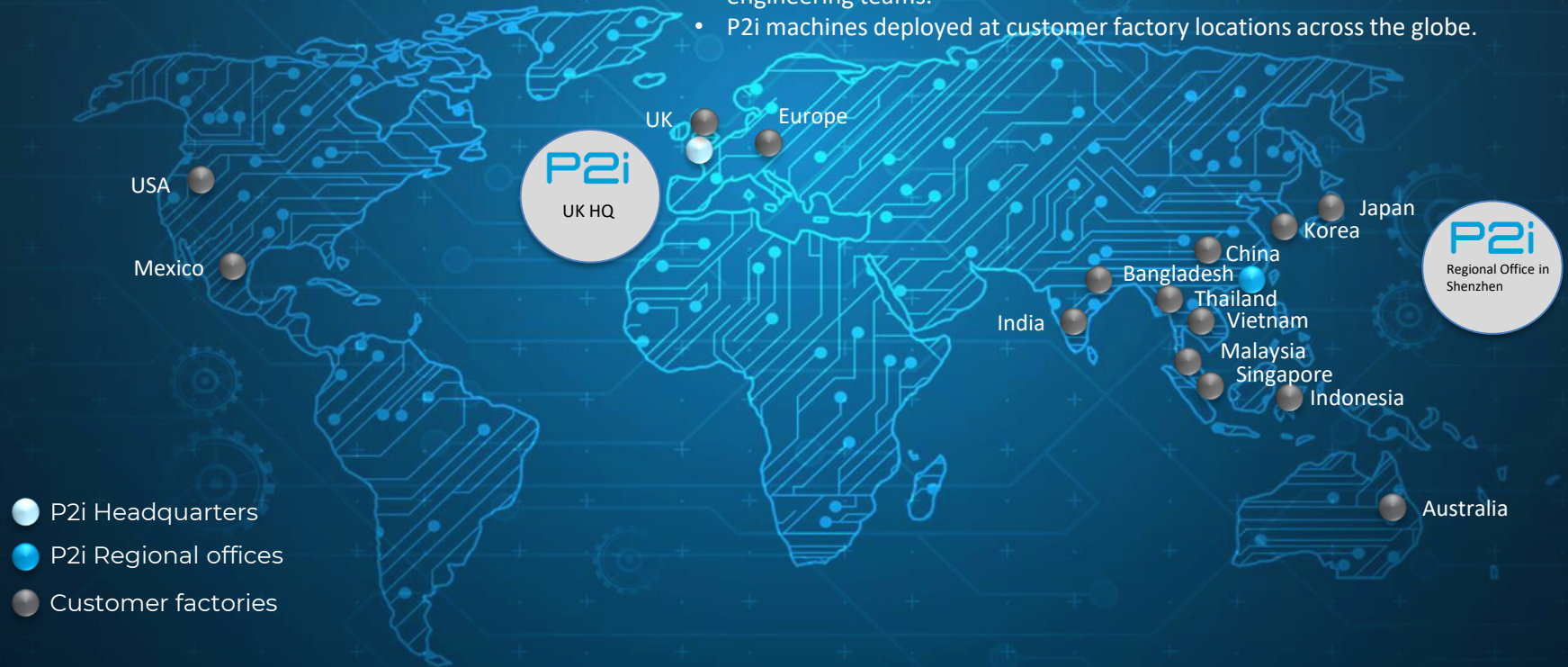
PROTECTED BY
P2i

Business Introduction

April 29th 2024

P2i Global Footprint

- P2i is headquartered in UK with operations in 15 countries.
- c.200 employees are mainly split between the UK (HQ, R&D, Technical) and China (In field operational), with small in-country account management and operational engineering teams.
- P2i machines deployed at customer factory locations across the globe.



Markets

- P2i addresses large and growing markets, providing ultra-thin protective coatings as a cheaper, faster, better and more sustainable alternative to traditional conformal coatings.

Customer Validations*

Consumer Electronics

SAMSUNG Wing B&O SENNHEISER HUAWEI ASUS SONY
motorola Xiaomi NOKIA BOSE meitu Punkt.
sivantor SIEMENS sonova clarity GN ReSound plantronics
TCL AMERICA HEARS Audina Cochlear PHONAK Parrot audifon



* Not all customers named due to confidentiality reasons.

Next Generation of Conformal Coatings

- P2i supplies ultra-thin barrier coatings to protect electronic printed circuit boards (PCBAs) and products from water and corrosion damage, achieving IPx1-8+ (Ingress Protection) ratings.
- P2i has protected over a billion electronic devices from liquid & environmental damage in mass production – increasing their life cycle.
- P2i is delivering the next generation conformal coatings to the electronic manufacturing industry, replacing traditional liquid-based glues and parylene.
- P2i delivers ultra-thin barrier coatings through PECVD (plasma enhanced chemical vapour deposition):
 - **Low Pressure** – enables P2i chemistry to penetrate complex 3D structures at the molecular level, delivering a uniform and repeatable protective coating.
 - **Ionization Technique** – creates covalent bonding to chemically attach P2i monomers to the products/materials to be coated.
 - **Pulsed Plasma** – retains the structural properties of the starting monomers to give the desired water and corrosion protection functionality.

Pioneering protection since 2004.



Competitive Advantages

- **Higher Reliability and Quality** – through our molecular based process and covalent bonding, resulting in an ultra-thin plasma conformal coatings delivering the highest uniformity.
- **Faster** – rapid deposition times:
 - *Batch processing:* < 1 hour per loading.
 - *Continuous flow:* ~90 seconds per tray.
- Lower total cost solution - **circa 30-40% savings:**
 - Reduced **factory floor space** and associated **electricity**.
 - Lower **labour and process** costs, with **minimal component masking** required.
 - Increased yield rates and **elimination of scrap** on the assembly line. Printed circuit board **re-work** can take place for all component changes using conventional soldering.
 - **Reduced field failure returns** due to increased product life-cycle and greater reliability.



1 in 5 electronic devices are scrapped each year

75M tones of e-waste forecast to be generated by 2030 – equivalent to 8.8Kg per capita

E-waste contains several toxic additives and hazardous substances

Only 17% of e-waste is recycled per annum – traditional thick conformal coatings prevent recycling

- **Regulatory:**
 - Works complimentary with the [EU 2027 regulation for replaceable batteries](#)* for all electronic appliances. This will also support the impending [Right to Repair regulations](#)^.
- **Circular Economy:**
 - Eliminates BOM components e.g., mechanical seals, gaskets, O-rings.
 - Reduces field failure returns.
 - Enables re-workability of PCBs coated by P2i enables reduced scrap, increased reparability and fully recyclable.
 - Allows recovery of rare earth metals and other critical resources.
- **Sustainability – Scope 3 emissions:**
 - P2i ultra-thin, re-workable protective coatings deliver demonstrable net carbon savings of over 1Kg CO₂-eq per device (e.g. smart phone).
- **Process:**
 - Solvent less, non-VOC (volatile organic compounds), aqueous free gas phase Plasma Enhanced Chemical Vapour Deposition (PECVD) process.
 - No post-process cure or heat required. Filter stack removes all post process vapours.
- **Coating/Monomers:**
 - P2i Barrier coating is [100% halogen-free and PFAS-free \(Per- and polyfluoroalkyl substances\)](#).
 - Fully compliant with all global regulations, inc. RoHS and REACH.
 - P2i deliver the thinnest conformal coating on the market, using less monomer than conformal coating alternatives.

Next Generation Protection

Optimised to meet your desired performance standards & pass your verification tests.

15 - 40 nm		300 – 2500 nm					
IPx1	IPx2	IPx3	IPx4	IPx5	IPx6	IPx7	IPx8



P2i SPLASH
PROOF

- Complete device-level liquid repellent coating.
- Applied to the finished product at the end of assembly line, prior to package and ship.
- Protects against ingress from splashes and spills.



P2i BARRIER

- PCBA level electrical insulating layer.
- Applied post SMT line, prior to final assembly.
- Protects treated PCBA from corroding following shallow and deep immersion.

Specific coating determined by:

(1) **Product verification test protocols** – to deliver the treatment strategy to meet the performance needs of the customer.

(2) **PCBA STEP files** – to determine product loading and any component masking needs.

Budgetary pricing:

(1) Requires estimated annual volumes.

Flexible business model options:

- (1) CaaS/Royalty per PCBA processed.
- (2) Machine lease fee.
- (3) Toll processing at dedicated P2i processing centre.
- (4) Machine and monomer sales + S&S contracts.

Manufacturability

Application technology is as important as the liquid protection coating.

Batch Processing - P2i 400L



P2i has proven mass production scalability in multiple global clients – processing in excess of 750,000 units per day.

Continuous Flow - Tiger

DELIVERING HALOGEN-FREE BARRIER COATING



- Continual flow processing, **eliminating extensive WIP** and process latency wherever possible.
- **Rapid processing**. The same best-in-class Barrier Coating applied in **minutes** Vs. hours.
- **Fully automated** capability for **SMT & Assembly Line integration** with factory “plug-and-play” installation & operation within 48 hours.
- Maximized utilization Vs footprint. **Minimizing cost and CapEx**.
- A **self-contained, fully integrated** and customizable system.



Barrier Coating Machines Selections

Coating Machine	BC 400L Chamber	BC Tiger Chamber
Coating material	M300	M300T
Coating thickness (nm)	≥800	≥800
Loading pcs / run	2000* ¹	200* ¹
Coating Process time (min)	90	3
Chamber clean type	Plasma	Plasma
Chamber clean Time (hr)	6.5* ²	0* ³
Clean Cycle	Every 10 runs	n/a
Jig clean	Plasma or offline	Offline
UPH per chamber	~800	~4000
Production Volume	Low-Med	High

1. Representative loading for comparison purposed only, actual loadings dependant upon product geometry
2. For empty BC 400L chamber without jigs;
3. Tiger machine process includes chamber cleaning.



BC 400L machine



Tiger machine

P2i would be pleased to meet you to discuss your specific application needs and technical requirements.

Contact us below on:

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Thank you

The logo for P2i, featuring the letters 'P2i' in a bold, white, sans-serif font. The '2' is stylized with a rounded, blocky appearance.

Protective Coatings

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