



World Leaders in Pressure Casting Technology

T. +44 (0) 1553 622000

F. +44 (0) 1553 622020

sales@pclceramics.com

www.pclceramics.com



pocl
ceramics

Contents

- 3. Welcome**
- 4. Core Business**
- 5. High Pressure Casting Machines**
- 9. Custom Built Products**
- 10. Upgrades for Machines**
- 11. Machine Typical Configuration and Output Table**
- 12. Moulds**
- 13. Sanitaryware**
- 15. Tableware**
- 16. Materials**
- 17. Technical Ceramics**
- 18. Product Development**



Welcome

“PCL Ceramics Ltd (formerly Porvair) has been providing high quality machinery and professional servicing to the sanitaryware and tableware industries worldwide for decades. As market leaders, we have over 20 years of international experience developing synthetic mould materials and high pressure casting systems for the production of sanitaryware, tableware and technical ceramics. Many of the world’s major sanitaryware manufacturers have been successfully operating our moulds and high pressure casting systems for years now, benefiting from our exceptional service and the increased performance and efficiency that we offer.

At PCL, we are continuing to expand our product portfolio with new, exciting and innovative materials and systems all the time, whilst also constantly working to improve our existing product range. We are fully committed to industry innovation, and with the support of our highly trained and experienced staff we continue to have a real impact on the sector.

We are dedicated to quality and efficiency at every stage of the production process, and we ensure that all of our equipment is designed and made in

the UK and is built to last with parts you can trust. As a customer of PCL you will also be provided with a wide range of advice, support and services on all aspects of resin mould and high pressure casting system design and operation.

Take a look through this brochure to find out more about all of the products and services that we offer here at PCL. If you need more information about anything you find within, don’t hesitate to get in touch with us to discuss your needs in depth.

On behalf of everyone at PCL, thank you for your interest and we hope to hear from you soon.”



Mark Butler, Managing Director, being presented with the Queen’s Award for Enterprise: International Trade



Automatic casting system designed and built in-house.

Core Business

What we offer

“With a wide range of innovative mould technologies, casting systems and services for the tableware, sanitaryware and technical industries, PCL can help with any need.”

PCL was founded 20 years ago as part of the international KL Technologies group, building on the development and production of microporous materials used for the manufacture of high-pressure resin moulds. This groundbreaking technology has been combined with our first-class technical engineering skills to make PCL a world leader in the supply of high-pressure casting systems.

Over the years PCL has concentrated its resources and staff on expansion into the pressure casting market. Now fully committed to the industry, PCL leads the field with a continually expanding product range, world-renowned service and tireless innovation and development.

We have built our success on the unrivalled ability to combine our deep and detailed understanding of mould technology with our equipment design and process knowledge. We provide innovative solutions to our customers’ needs, providing the means to streamline your manufacturing process and achieve unparalleled ease of use and production efficiency.

PCL Ceramics provides a wide range of services to support our customers’ projects from inception through to implementation and production, including:

- Research and development to find the right product for you
- Specialist mould design, modelling and manufacture
- Designs, building and supply for bespoke casting systems
- Project management, machine installation and site commissioning
- Ongoing technical service assistance for PCL products
- Servicing and spares supply for casting systems

Our bespoke services and our expertise in this industry mean that no matter what stage of the production process you are at, PCL has a service to suit you. The unique mix of experience that PCL possesses in material and machine design and operation means that we will be able to address any issues your business may face and offer a suitable solution.

High Pressure Casting Systems

PCL manufacture a full range of high pressure casting systems to suit any need, designed specifically to meet the demands of the industry and our clients. Our innovative range of casting machines are capable of adding value to any production line, no matter what you produce. Our specialist

“PC” range incorporates an overhead beam casting system which was designed and developed by us, and has gone on to become industry standard equipment. Our high-pressure casting systems are split into two categories, two-part and bowl.



Automatic bowl casting - PCB5/70



Wash basin casting PC5/70

Bowl

PCL produces a number of bowl-casting machines capable of manufacturing a full range of W.C. bowls, as well as three, four and five-part bowls in both open and stuck on box rim form. We supply both modular and beam casting systems to suit any production method, and bespoke solutions can be provided to accommodate your individual business.

Our PCB5/70 multi-mould system offers the capability of producing eight bowls in one cycle, whilst our revolutionary and completely modular RotoBowl offering can produce both open and stuck on rim bowls on the same cell. The RotoBowl allows a full range of complex bowls to be made on a single casting system and also improves both slip drainage and flow during production.

Two-part

Our two-part mould casting machine range can be used to produce a wide range of sanitaryware pieces. The PC5/70 and PC120 multi mould overhead beam systems can cast items in both vitreous and fine fireclay materials ranging from small washbasins to large shower trays.

PCL Ceramics also offers a range of two-part casting machines that are suitable for casting a variety of solid and hollow cast two-part moulds. These machines can be custom built, offering maximum flexibility as well as optimum production output for all two-part sanitaryware pieces.

A feature of our two-part range is that the RMS and Slide systems uniquely demould pieces automatically using a mould half as the demoulding tool, minimising handling and loss.

Bowl Production Machines

RotoBowl

PCL Ceramics has developed a modular bowl pressure casting system called “RotoBowl” based on our successful PCB5/70 machine. This patented system uses innovative bowl casting technology that has been in operation for more than 12 years, providing an unparalleled level of flexibility and efficiency. Single bowl mould cells have been mounted in a cradle unit capable of rotating a complete mould 140 degrees during the casting process, improving both slip filling and draining properties.

Individual casting cells can be turned on or off as required to suit product output needs without affecting other casting cells in the system. Each module on the RotoBowl incorporates “Total Individual Mould Station Control” giving complete control of the casting parameters of each mould – allowing for a full range of products to be cast simultaneously. This unique system offers a brand new approach to pressure casting for complex bowls and is significantly more flexible than previous systems.

Features of RotoBowl systems:

- Fully automatic system
- Suitable for three piece, four piece, five piece, open and stuck on box rim bowls
- Single casting cell or twin casting cells per module
- 140 degree rotation for improved slip filling and drainage
- Increased mould utilisation due to shorter demoulding times
- Approximately 6m x 6m footprint for twin system



RotoBowl single cell casting system

See page 19 for RotoBowl layout

PCB5/70

PLC's PCB5/70 bowl-casting machine offers an economic pressure casting system for all forms of W.C. bowl. Our distinctive designs allow up to eight bowl moulds to be mounted at once onto a single PCB5/70 casting machine – the first machine of its kind to allow eight moulds on a single overhead beam. The high capacity of the PCB5/70 allows all the benefits of pressure casting to be applied economically to high volume bowl production whilst still providing sufficient flexibility for low volume products.

The system can produce over 450 pieces per day with a single operator per shift and allows multiple bowl styles to be produced on the same machine. The PCB5/70 utilises our proven resin mould technology and construction techniques and can produce a wide range of styles including open rim, stuck on box rim and back-to-wall styles.



PCB5/70 bowl-casting machine

Two-Part Production Machines

PC5/70

The PC5/70 is our most popular product and has been in use worldwide for 20 years. This powerful single machine is capable of producing a full range of solid and hollow cast sanitaryware using high-pressure overhead battery casting systems.

A fully automatic machine with a cycle of about 20 to 25 minutes, the PC5/70 produces over 1,000 tanks, 1,000 lavatory bowls or 2,600 tank covers per 24-hour day with a single operator. The PC5/70 can also be used to manufacture a wide range of other products, including covers, basins, pedestals, urinals and other two-part moulds.

The standard machine has a nominal five-metre active beam length on which up to 16 single or multi cavity two-part moulds can be hung, with increased beam lengths available for increased output if needed. The PC5/70 machine is supplied as a pre-fabricated unit including a heated slip tank to minimise the work required for site preparation and installation, with only mounting on a plinth necessary.



Multiple machine installation for tanks, covers, basins and pedestals

RMS Pressure Casting

PCL's industry-leading RMS machine provides multiple casting cells and a revolutionary mould handling system capable of changing a mould within 10 minutes. This high-efficiency system has been designed for the production of solid and hollow cast tanks, whilst also being easily adapted for the production of a wide range of other uses.

Within the RMS, an automated system is used to demould after each casting with the empty moulds returned to the casting module to continue production. Each module operates independently, allowing greater flexibility and customisation at each stage of the process.



RMS machine in operation

The standard RMS unit contains the following:

- 4 off twin mould casting modules
- 4 off local service modules
- 1 main service centre
- 1 main workstation
- 1 automatic demould/mould handling unit

Two-Part Production Machines

Slide Unit

Developed by PCL in 2013, the Slide Unit is one of our most recent products, as well as one of the most simplistic casting systems we have designed. The system has been manufactured to allow production of a range of products simultaneously, allowing also for both manual and automatic demoulding as required.

The Slide Unit is suitable for vitreous and large fine fireclay productions such as lavatories and sinks, as well as a wide range of other moulds both big and small. Just some of the features of the Slide Unit are:

- **Automated demoulding for the easy casting of large items**
- **Improved drainage by customisable angle and orientation settings**
- **PCL's mould clamping technology to ensure a small system foot print**
- **Individual cells can cast a range of pieces independently to allow greater flexibility and customisation**
- **Rapid mould change technology to provide less production downtime**



Single slide unit

PC120

The PC120 is designed to meet the needs of manufacturers of sanitaryware pieces, including shower trays and kitchen sinks, by using an overhead beam pressure casting system with a closing force of up to 120 tonnes.

The casting cycle for the PC120 is controlled using a simple system that gives complete control over the cycle for drain and solid cast products. The PC120 casting system is supplied complete with a slip supply module, including a heated slip tank, a water tank for mould treatment, slip and water pumps and hydraulic power pack.

Each PC120 machine can be easily upgraded to add a mould rotation system, enabling distortion free horizontal demoulding of larger single cavity moulds such as shower trays or large sinks with attached shelves. This module also reduces the risk of damage to items by allowing greater ease of demoulding.



PC120 machine installation

Custom Built Products

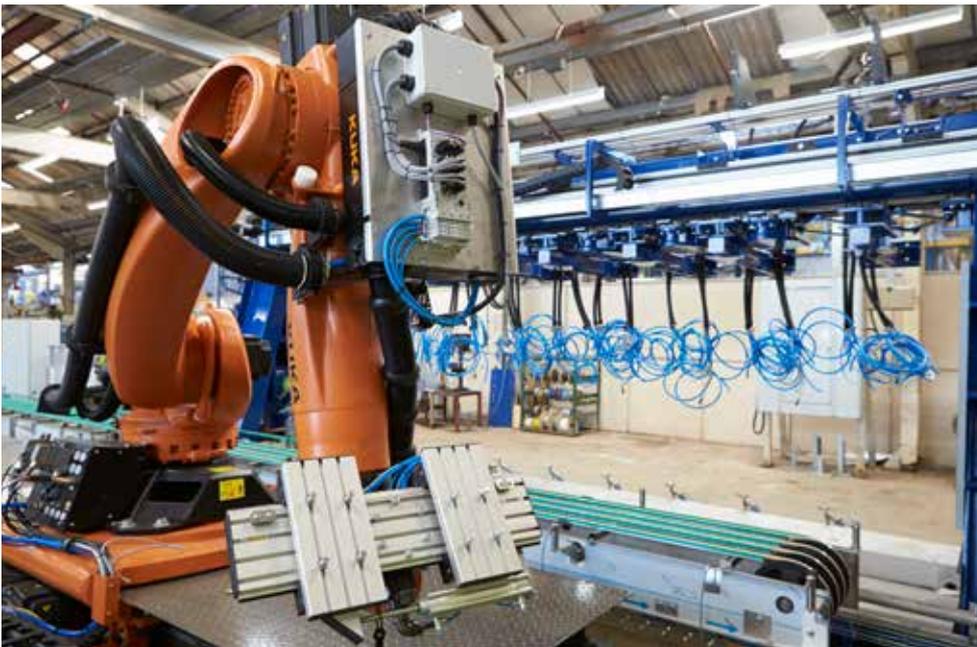
Machines Made To Order

PCL produces a flagship range of standard machines designed to suit all kinds of needs in the industry, but we also now design and build custom machines to suit our customers' exact, specific requirements. We use our decades of experience in the industry and feedback from our customers to provide machines that fit your precise circumstances, providing the ultimate bespoke solution.

Each of our machines is designed for maximum flexibility and customisation, with all of our standard equipment being fully modifiable to increase capacity and cast size. For customers that have different needs than standard or want to streamline their processes to suit their business, our custom built machinery is one of the best products on the market.

Every machine that we produce at PCL is built to order, tailored to fit your specific needs to provide a bespoke resolution to the requirements of your production line.

Machines can be designed to include as many, or as few, moulds as needed, with automatic or manual demoulding processes built in and can also be made in a range of sizes and pressures. Whilst designing your machine we will also arrange for all parts used to come from suppliers that you know and trust, giving you complete control over the entire construction process.



A custom-made machine undergoing final inspection



A custom made eight bowl machine with conveyor

Upgrades For Machines

In an ever-changing industry, we understand that your business requirements can shift over time. Increases in business size, new production methods and even different business areas can all demand a change in the equipment you use.

When you need to make changes to your production line, PCL offers a wide range of upgrades and modifications that can be fitted to your existing machines. Just some of our upgrades include:

- Individual Mould Station Control – This system allows customers to fully optimise the casting cycle of individual moulds. A range of generic moulds styles can now be cast on a single machine simultaneously, including both solid and hollow cast items
- Mechanical Demoulding Systems – Allows automatic opening and closing of moulds for use with the automatic demoulding systems
- Automatic Mould Movement and Opening System – Assists with manual operation and allows fully automatic manufacture and demoulding
- Installation, Commissioning and Training Services – Access to PCL's specialist range of on-site assistance and tailored training

Machine Typical Configuration and Output Table

Machine Type and Demould	Cycle Time In Minutes	Mould Type	No. of Moulds	Cavities Per Mould	Cast Pieces Per Year
PC5 / 70 Manual / Automatic	25	Large Lavatory Basin and Squats	10	1	191,520
PC5 / 70 Manual / Automatic	25	Small Lavatory Basins, Squats or Pedestals	10	2	383,040
PC5 / 70 Manual / Automatic	25	Tank Covers	16	3	919,295
PC5 / 70 Manual / Automatic	20	Tanks (Solid)	8	2 or 3	383,040 to 574,560
PC 120 Manual / Automatic	45	Large Sinks	8	1	85,120
PC 120 Manual / Automatic	45	Shower Trays	13	1	138,120
RMS Automatic	14	Tanks and Covers (Solid and Hollow)	8	1	273,600
Slide Modular	18	Single Cavity Viteous Items	1	1	26,600
Slide Modular	28	Single Cavity Fine Fire Clay Items	1	1	15,960
PCB5/70 Automatic	24	Open Rim Bowls	8	1	159,600
Rotobowl Automatic	18	All Styles of Bowl Including Stuck on Rim	2	1	53,200

Moulds

PCL Ceramics provides a complete range of modelling, blocking and casing services in addition to the manufacturing of moulds at our UK facility. With years of experience designing and producing single and multi cavity moulds to produce solid and drain cast sanitaryware products, PCL is now a globally recognised industry leader.

As well as an expansive array of sanitaryware moulds, at PCL we also use our experience and expertise to manufacture a wide range of tableware moulds in both pressure cast and ram press.

Mould design

PCL has the knowledge and adaptability to design any type of sanitaryware or tableware mould that you might need for your production line, no matter what machinery you currently use. All of our moulds are designed with extended lives and require minimal treatment between casts and storage, as well as having a customised internal air supply, releasing air where needed to improve quality and reliability.

Our in-house CAD CAM systems allow us to rapidly scan, develop and modify designs or to take your existing CAD designs and convert them into resin moulds, enabling our moulds to fit with your existing systems.



Five-part mould



Tableware mould

Sanitaryware Moulds

With unrivalled experience and constant innovation, PCL is one of the leading manufacturers of single and multi-cavity pressure casting moulds. Our moulds are designed to produce a variety of solid and drain cast sanitaryware products including solid tanks, covers, basins, pedestals, pans, urinals and a full range of three, four and five-part open and stuck on rim bowls.

Tableware Moulds

The experience that PCL gained over the past two decades is now put to use creating a wide range of tableware moulds, provided as both pressure cast and ram press moulds to the world's largest producers. Moulds are produced to fit clients' existing frames to prevent any costly adaptations to current machinery and to allow for greater flexibility and customisation of your processes.

Sanitaryware Moulds

At PCL we have been manufacturing single and multi-cavity pressure casting moulds for major businesses for decades, designing tailored products to meet the needs of the whole sanitaryware industry. All PCL resin moulds are chemically inert, resistant to water and retain their shape through their extended lifetimes, allowing manufacturers to benefit from higher productivity, lower costs, reduced waste and a simplified casting process.

All of our moulds contain an air distribution system designed and developed by PCL to ensure air is evenly distributed over the surface of the mould during the casting, demoulding and cleaning process. Every mould is produced in a reusable steel frame to reduce distortion at high pressures as well as streamline mould fitting and alignment.

Bowls moulds

PCL manufactures a full range of moulds for three, four and five part open and stuck on rim bowls, which can be used in conjunction with our PCB5/70 and RotoBowl range of casting machines. We can manufacture bowl moulds from plaster moulds, models, free issue block or case moulds and 3D product scans.

Our bowl mould designs are compatible with our entire bowl casting system range and each mould can be cast on both our modular and beam casting systems. When used in conjunction with our slide mould system, the RotoBowl machinery can cast a full range of stuck on rim bowls.



Fully automated five-part bowl casting

Two-Part Moulds

PCL offer multiple systems that are suitable for pressure casting a full range of sanitaryware items as two-part pieces. Both the PC5/70 and PC120 offer the ability to cast a range of sanitaryware products in two parts, and to complement these we supply moulds that use our proven, industry-leading technology.

The two-part moulds produced by PCL can be used to manufacture a wide array of products. In addition to bespoke designs which we can fabricate for you, our standard range of moulds include:

- Squat Pans
- Shower Trays
- Urinals
- Solid Tanks
- Hollow Tanks
- Covers
- Pedestals
- Basins and Drop Ins



Two-part mould casting - automatic tank and cover machine



Two-part mould casting - manual demoulding

Tableware

Pressure Cast

Tableware manufacturers have traditionally used plaster moulds and a variety of forming processes to manufacture their full ranges of tableware. With the advent of resin materials, however, more and more manufacturers are turning to new technologies to meet rising demand, and PCL is the only company able to offer a full range of new resin casting processes.

Our products have been designed to suit both pressure casting and ram pressing, and are guaranteed to offer you:

- Increased quality
- Increased productivity
- Reduced inventory
- Reduced costs

PCL has been supplying pressure cast moulds for the tableware industry for 20 years, and our quality products and continued product development have earned us a spot at the forefront of the industry. Our pressure cast moulds provide the following advantages to your productions:

- **Guaranteed mould life** – PCL guarantees that all of its pressure casting moulds have a lifespan of between 6,000 and 8,000 cycles, with actual lives in excess of 20,000 cycles achievable
- **Fine pore structure** – Using our specially designed materials, our moulds have a tightly controlled pore structure providing excellent surface quality
- **Machine interfacing** – PCL moulds can be designed to work with any pressure casting tableware machinery that you operate, saving you costs and time in refitting
- **Customised mould materials** to match existing operation

Final washing of ram press mould



Ram Press

The synthetic resin ram press moulds made by PCL are a direct replacement for plaster moulds previously used across the industry. Our ram press moulds provide the following features and benefits to your production process:

- **Wear and cracking resistance** – Ceramic articles produced in PCL resin moulds provide a higher surface quality, reducing the need for sponging and finishing
- **Bespoke mould construction** – Moulds can be produced to fit your existing machinery, reducing costs and maintenance needs
- **Air system designs** – PCL's innovative internal air system provides release air where needed, making demoulding easier and providing a better finish
- **Long service life** – Our resin moulds have expected lifespans of between 8,000 and 15,000 fills. The longevity of our moulds reduces costs and downtime in your processes whilst also reducing your mould inventory

Mould Materials

PCL Ceramics has been producing mould materials for the production of resin high-pressure casting moulds to industry-leading businesses for years, providing materials for sanitaryware, tableware and technical ceramic casting.

Our material has a proven track record within this sector, and with its excellent performance and long casting life offers an economical solution to in-house mould manufacture when compared with cheaper low quality

choices. The high quality resin that goes into our mould design also means that any wares produced have a finer, superior surface quality, and a lower chance of mould binding at the production stage.

Mould technology transfer is also available. Please contact PCL directly for more information.



Sanitaryware Materials

By developing and blending all mould materials here in-house at PCL, we are able to offer a product to suit any need you have. Ideal for sanitaryware moulds, our resin mould material can provide a range of strengths, finishes and pore sizes, ensuring that your finished product is exactly as required.

The high quality finishes that our mould technology produces are much desired in the sanitaryware industry, and through our patented techniques we have become a market-leading producer. We work with each of our individual customers to provide materials unique to them, giving continuing on-site assistance with mould production and machine set-up.

Tableware Materials

PCL Ceramics offers two different mould materials, produced for both ram press and pressure casting, developed and blended in-house to provide quality, efficient manufacturing. Because our expert team produces PCL materials in-house, we are able to manufacture bespoke resins with different properties including a range of pore sizes and mould strengths to suit your specific applications and requirements.

All of our materials are widely tested and used across the tableware industry, known for using superior performance and long lifespan to provide an economical and reliable solution to in-house mould manufacture.

Technical Ceramics

Using decades of experience and expertise accumulated in the ceramics and moulding industries, PCL is able to offer services for the production of technical ceramics. Requiring a high level of production quality and specialist knowledge, PCL is ideally placed to meet your technical ceramic manufacturing needs.

Typical applications of PCL's technical ceramic expertise include the manufacturing of tiles, crucibles and ceramic body armour. We offer a personalised service to provide moulds, materials and machinery to produce any item to your exacting standards, and full confidentiality is offered where needed.

High-pressure ceramic casting, as utilised by PCL Ceramics, provides a number of benefits when producing complex items for the technical ceramic industry. Some of the advantages of our techniques and materials include:

- Higher green density and more uniform manufacture, giving more homogenous physical properties to each fired piece
- Tighter dimensional tolerances to reduce the need for expensive and complex finishing processes
- Negligible contamination of the finished product compared to other methods, saving on waste and costs



Range of technical ceramic products

Product Development

Continually striving to expand our product range, to explore new innovations and improve the productivity, efficiency and quality of our products is what drives the PCL business. We invest heavily into research and development projects to help bring our customers technology on the cutting edge of the industry, keeping you a step ahead of your competitors and putting us at the forefront of innovation.



PCBS/70 product development



3D product scanning

Mould Design and Development

Our expertise in ceramic production, materials technology and machine design enables us to address any issues that ceramic manufacturers are likely to face.

With the recent introduction and upgrading of our 3D scanning, modelling and CNC systems we are able to develop and progress new and more complex mould designs than ever before. PCL is now able to undertake rapid prototyping and model development, dramatically shortening the lead-time in mould design and production. Design improvements and modifications can now easily be introduced into existing designs for customers, with further scope for changes to be made in the future.

Equipment Design and Development

PCL continues to develop and produce a range of class-leading sanitaryware and tableware casting systems suitable for the production of a huge range of wares.

Our in-house design department operates with state of the art design systems to develop and produce superior casting systems to suit your current and future needs. Recent innovations include the RotoBowl modular casting system and the Slide casting unit, both developed following extensive market research and analysis into the needs of our clients.



The PCL RotoBowl, for the manufacture of open rim, stuck on rim and complex bowls.

See page 6 for more information

Machine Typical Configuration and Output Table

Machine Type and Demould	Cycle Time In Minutes	Mould Type	No. of Moulds	Cavities Per Mould	Cast Pieces Per Year
PC5 / 70 Manual / Automatic	25	Large Lavatory Basin and Squats	10	1	191,520
PC5 / 70 Manual / Automatic	25	Small Lavatory Basins, Squats or Pedestals	10	2	383,040
PC5 / 70 Manual / Automatic	25	Tank Covers	16	3	919,295
PC5 / 70 Manual / Automatic	20	Tanks (Solid)	8	2 or 3	383,040 to 574,560
PC 120 Manual / Automatic	45	Large Sinks	8	1	85,120
PC 120 Manual / Automatic	45	Shower Trays	13	1	138,120
RMS Automatic	14	Tanks and Covers (Solid and Hollow)	8	1	273,600
Slide Modular	18	Single Cavity Vitreous Items	1	1	26,600
Slide Modular	28	Single Cavity Fine Fire Clay Items	1	1	15,960
PCB5/70 Automatic	24	Open Rim Bowls	8	1	159,600
Rotobowl Automatic	18	All Styles of Bowl Including Stuck on Rim	2	1	53,200



Tel: +44 (0) 1553 622000
Fax: +44 (0) 1553 622020

sales@pclceramics.com
www.pclceramics.com

Estuary Road,
King's Lynn,
Norfolk,
PE30 2HS,
United Kingdom