eBook

POREX Filtration Group®

# Customizing Your Perfect-Fit Porous Solution

Get Started

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# Introduction

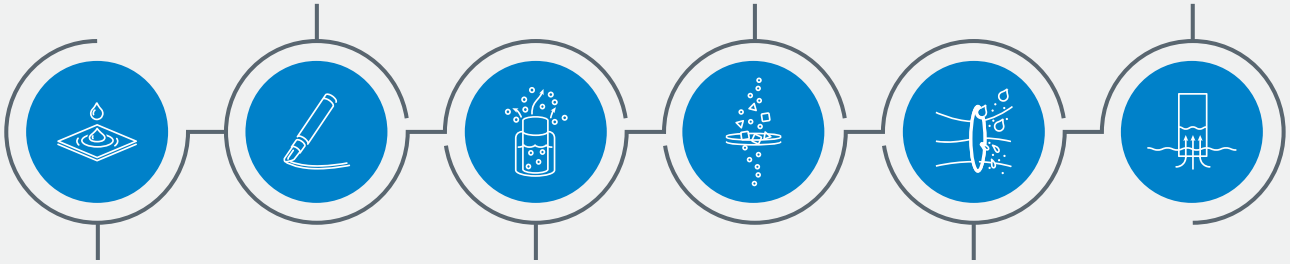
When your project requires functionality that is unique to your application, working with the material science engineers at Porex will ensure you get to the perfect component.

From minor customizations of existing products to completely new designs, our engineers follow a proprietary collaborative innovation process that will bring your unique product to life.

# What are porous polymer solutions?

For over 60 years, Porex has designed and produced 2D and 3D advanced porous components exhibiting a broad range of thermal, chemical, and mechanical properties using our proprietary technologies.

## Porous Polymer Solutions



**Absorb**
Uptake of a fluid or gas in order to hold or encapsulate

**Apply**
Put or spread a fluid, gas, or solid onto a surface or substrate

**Diffuse**
Consistent emission of gas or liquid

**Filter**
Separation of solids and fluid or fluids and gases

**Vent**
Escape or release of fumes, a liquid, a gas, or steam

**Wick**
Fluid transfer by means of capillary action

### Porex University

To dive deeper into the science behind these technologies, visit our webinar series to learn how parts are created, different flexibilities, and industry applications.

Learn More

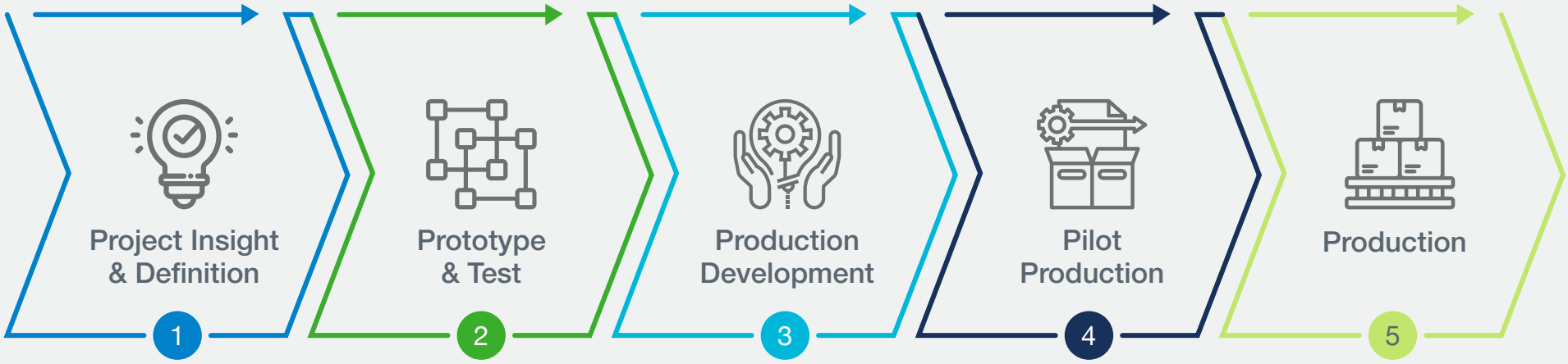
To achieve the specific products and solutions you need, our award-winning collaboration process incorporates a collaborative innovation partnership across both engineering teams that will transform your ideas into reality.

# 5 Steps to Success

From project definition through prototype development and into full-scale production and ongoing support, Porex delivers customizable porous solutions to solve your most complex product development challenges and accelerate launch timelines.

## The Process

The duration of each step may vary depending on whether you need a new product or the optimization of an existing product.



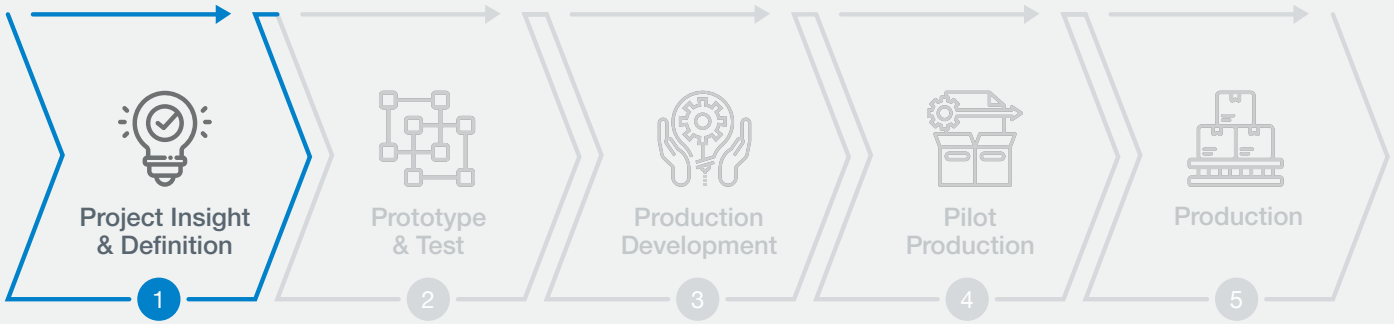

LET'S LOOK AT THE PROCESS IN MORE DETAIL

# Transforming your ideas into solutions

During the Project Insight & Definition step, Porex engineers and members of your team will discuss key project aspects, including design inputs, specific product function, unique end-product requirements, and your desired launch timeline in order to confirm the feasibility of the project.

## Step 1: Project Insight & Definition

TYPICAL TIMELINE: 2 – 4 WEEKS, OR AS NEEDED FOR CUSTOMER TESTING




**Common evaluations include:**

- Key functions of porous component in end device
- Desired geometry
- Anticipated volumes
- Regulatory requirements
- Manufacturing constraints
- Sterilization requirements

This initial discussion provides an overview of potential trade-offs across technologies—for example, prioritizing flexibility in geometry over final product functionality.

During this phase, we often provide standard capability samples to enhance your understanding of how porous materials will integrate into your product. You can also use these samples to conduct basic testing, and we'll refine our approach based on your feedback.

Overall, this iterative process will both help us identify which Porex technologies align with your needs and determine the required volume and timeframe to fulfill your scale-up requirements.

| STEP 1 DELIVERABLES | Confirmation of product feasibility | Technology and material selection to best meet functional product requirements | Jointly agreed-upon design inputs |
|---|---|---|---|

**In each step within this eBook, we will take you through how the actions on both the customer's and Porex's sides played out in the example of the custom development of a plug-in air freshener wick. In this way, you will see how the steps work in a real world example to make them easier to envision.**

# Example

## Plug-in Air Freshener Wick

## Step 1: Project Insight & Definition

| | |
|---|---|
| Define Customer Need | › Method to deliver formulation into room |
| Determine Porex Function | › Wicking and diffusion — goal is to wick fluid from bottle to delivery mechanism so that it will diffuse into the environment with heat with a defined rate of release |
| Applied Design Questions | › Quantity of liquid in bottle<br>› Rate of delivery over time<br>› Basis of the formulation (e.g., water vs. solvent)<br>› Assembly method (auto vs. manual)<br>› Other special functionality (i.e., safety features, high release modes, etc.) |

**STEP 1 DELIVERABLES**

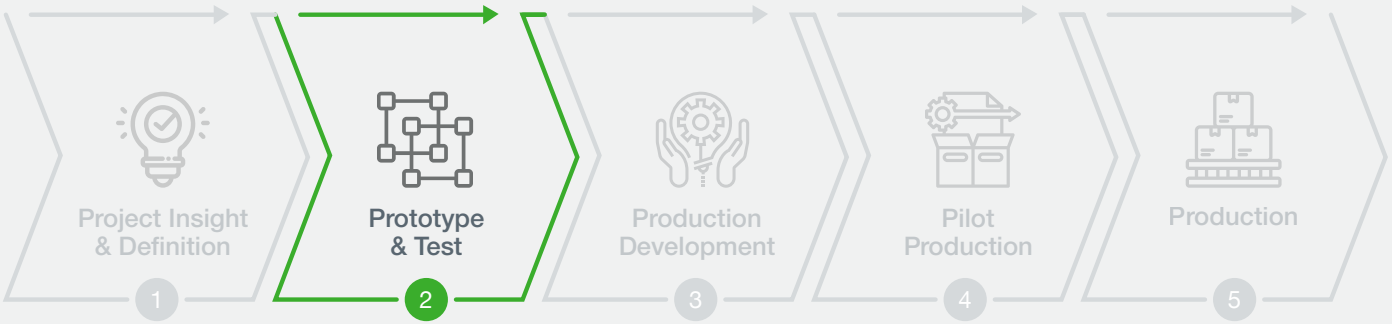
Coming out of Project Insight & Definition, our team will have a solid understanding of your product requirements and will likely have utilized off-the-shelf samples to assess material screens, initial performance, and any resulting customizations or specific functionalities.

# Building and testing the product

In the Prototype & Test step, the Porex engineering team prototypes and provides samples for you to test in your device to assess functionality in order to continually optimize product.

## Step 2: Prototype & Test

TYPICAL TIMELINE: 4 – 6 WEEKS PER ITERATION, OR AS NEEDED FOR CUSTOMER TESTING




**Common evaluations include:**

- Prototype testing timelines
- Types of testing required
- Customization needs to improve performance
- Required criteria to move to production development

This stage includes thorough testing both at our site and in your device to assess performance and specifications across various conditions, enabling our team to make design adjustments in functionality, durability, or reliability.

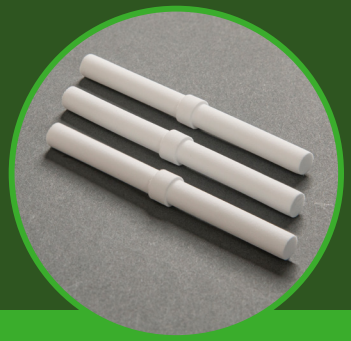
Porex builds our own equipment and tooling, allowing us to conduct testing using the actual materials that will be used in production and ensure requirements are met to your satisfaction.

Refining and testing the design through prototyping reliably prepares your product for future development stages, including manufacturing and quality assurance checks.

| STEP 2 DELIVERABLES | Technical specs defined | Prototype samples delivered | Signed component drawing detailing geometry, tolerances, and functional requirements |
|---|---|---|---|

# Example

## Plug-in Air Freshener Wick



## Step 2: Prototype & Test

| | |
|---|---|
| Porex Activity | › Selection and iteration of material formulation to optimize pore structure for wicking speed and liquid diffusion rate<br>› Iteration of design / geometry for assembly and performance requirements<br>› Internal testing to confirm speed and diffusion rates |
| Customer Activity | › Additional testing alongside Porex to confirm components meet requirements |

**STEP 2 DELIVERABLES**

At the completion of Prototyping and Testing, we've determined the geometry, flexed the material, and know that the combination will meet your requirements. We're now ready to move into production development.

**Prototype Testing**

In a Porex testing room, various devices are plugged in and subjected to controlled airflow and environmental conditions to ensure consistent testing, enabling fair and equal comparisons across multiple devices.

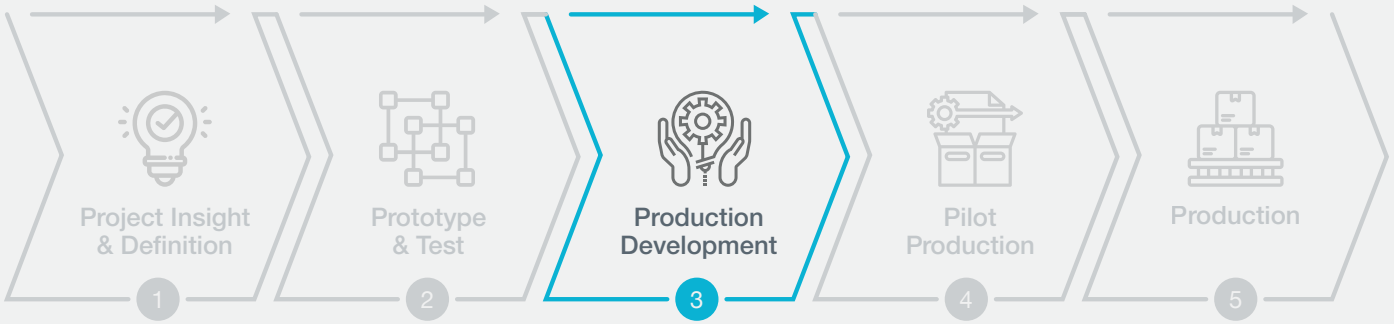
Air Flow Rate | Water Entry Pressure | Diffusion Rate

# Refining part design and specs

Your product truly takes shape in the Production Development step, as the engineering team begins work with the operations team to set up the final production equipment. Refining the production process, including all testing and quality control measures, is the focal point at this stage.

## Step 3: Production Development

TYPICAL TIMELINE: 6 - 12 WEEKS, DEPENDING ON SCALE AND VALIDATION NEEDS




**Common evaluations include:**

- Necessary changes to tolerances and specs for production tooling
- Testing requirements in this phase
- Minimum order quantities
- Quarterly / yearly product launch forecast
- Packaging specifications

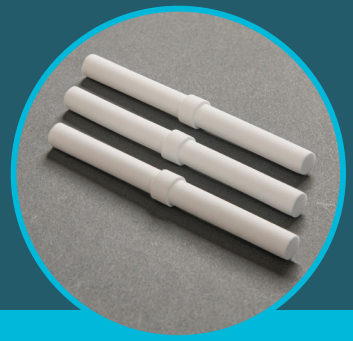
During production development, our team conducts studies on the prototype tooling to finalize fit and function. Regardless of the porous technology used – sintered particles, bonded fiber, porous membranes, or open-cell foam, we build production-scale tooling, fixtures, and test equipment as needed.

Throughout the production validation process, we'll work closely with you to confirm our outgoing test method aligns with your incoming test method to ensure we achieve consistent outcomes and that the parts meet your specifications. We will also perform capability analysis to ensure we are meeting your product specifications.

| STEP 3 DELIVERABLES | Production tool finalized | Part / product validation by both your team and our team | Part / product approved and ready for pilot production |
|---|---|---|---|

# Example

## Plug-in Air Freshener Wick



## Step 3: Production Development

| | |
|---|---|
| Porex Activity | › Run studies on prototype tooling to finalize fit and function specifications and tolerances<br>› Build production scale tooling/capacity<br>› Begin to finalize paperwork for production and conduct validation |
| Customer Activity | › Additional testing alongside Porex to confirm components meet requirements<br>› Review and approve initial parts coming off production tooling<br>› Collaborate with Porex team to define validation protocols<br>› Agree to final component specifications and tolerances |

**STEP 3 DELIVERABLES**

Coming out of phase three, we've refined the part design and are ready to produce your product at production scale, including approved test methods, paperwork, and packaging and labeling.

**Ask an Engineer**

Get all your questions answered by having a quick consultation with one of our application engineers.

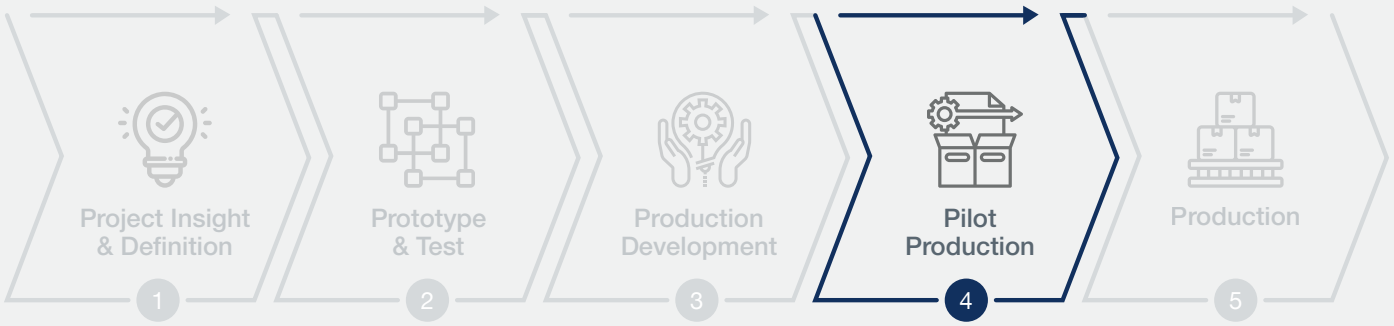
Talk With an Expert

# Pilot testing your product

Once we transition into the Pilot Production step, we utilize production-level equipment and operators, and the product will undergo regulatory approval if needed.

## Step 4: Pilot Production

TYPICAL TIMELINE: 5 TO 10 WEEKS, BASED ON PLATFORM




**Common evaluations include:**

- Number of runs necessary to meet requirements
- Packaging specs refinement
- Special shipment certifications
- Minor modifications needed for final tolerances or certifications
- Need for a quality agreement
- Need for a supply agreement

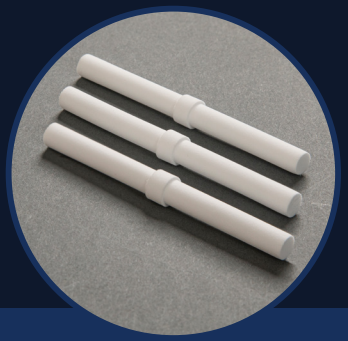
Because the Porex engineering team has had a front-row seat to your product evolution, they will oversee the initial runs of your first commercial orders to ensure satisfaction with process stability.

During this step, we will also collect and share data on process stability and part quality.

| STEP 4 DELIVERABLES | Final modifications completed | Data collection on process stability and part quality | Final tolerances and certifications agreed upon by both Porex and customer |
|---|---|---|---|

# Example

## Plug-in Air Freshener Wick



## Step 4: Pilot Production

| | |
|---|---|
| Porex Activity | › Initial production scale runs with development supervision<br>› Collect data on process stability and part quality<br>› Adjust any parameters needed and finalize part qualification |
| Customer Activity | › Review and provide feedback of initial production parts |

**STEP 4 DELIVERABLES**

Completion of step four sets us up for moving into full production, where we will take what was set up in pilot production and transition it to the Porex operations team for initial product runs oversight.

**Select Samples**

Explore the library of our most common capability samples to discover all that's possible with custom materials from Porex.

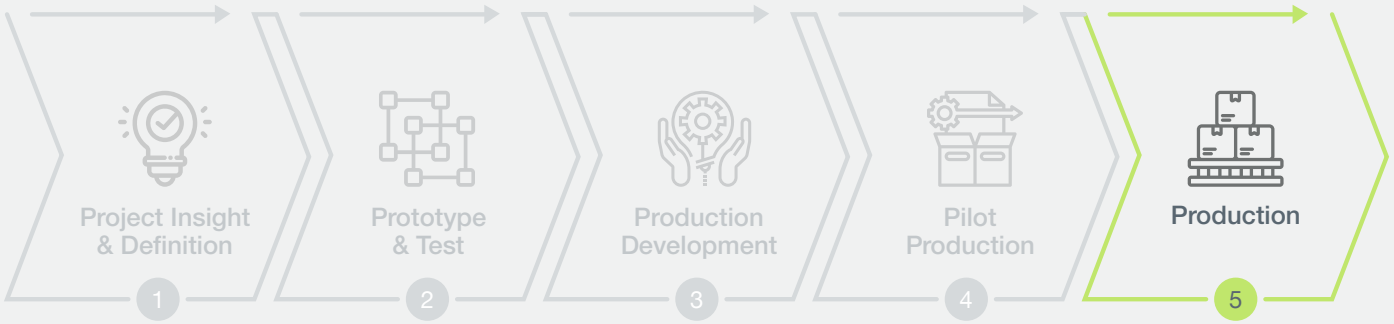
See the Library

# Moving into final production

As we transition into full production, we seamlessly integrate the outcomes of our pilot production phase and hand over control to the local Porex operations team, as they will provide ongoing technical support and collaboration to ensure your success as you commercialize your product.

## Step 5: Production

TYPICAL TIMELINE: 6 – 10 WEEKS LEAD TIME FOR PRODUCTION PARTS AT MINIMUM ORDER QUANTITY (MOQ)




**Common evaluations include:**
- Any updates to your quarterly / yearly forecast

Porex strives to be your company's trusted partner throughout your product's lifecycle. Once your product is commercialized, our commercial team will work closely with you on forecasting and any changes you have as you evolve.

If you have new projects, they will bring our engineering team back in to work with you.

| STEP 5 DELIVERABLES | Final products are manufactured and tested using rigorous statistical sampling methods aligned with agreed-upon specifications. |
|---|---|

# Example

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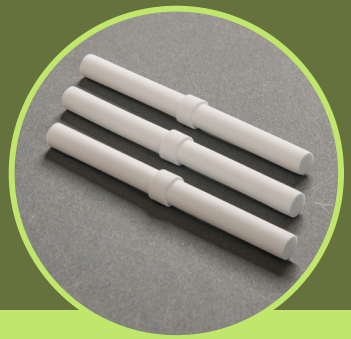


## Step 5: Production

### Porex Activity

- Products manufactured according to agreed-upon specifications on final equipment
- QA team inspects products using statistical sampling methods per quality agreement signed with customer
- Supply chain team aligns with customer forecast to ensure materials are ready for operations to use in production
- Commercial team schedules regular business reviews to ensure partnership continues to grow by evaluating key performance indicators (KPIs)

### Customer Activity

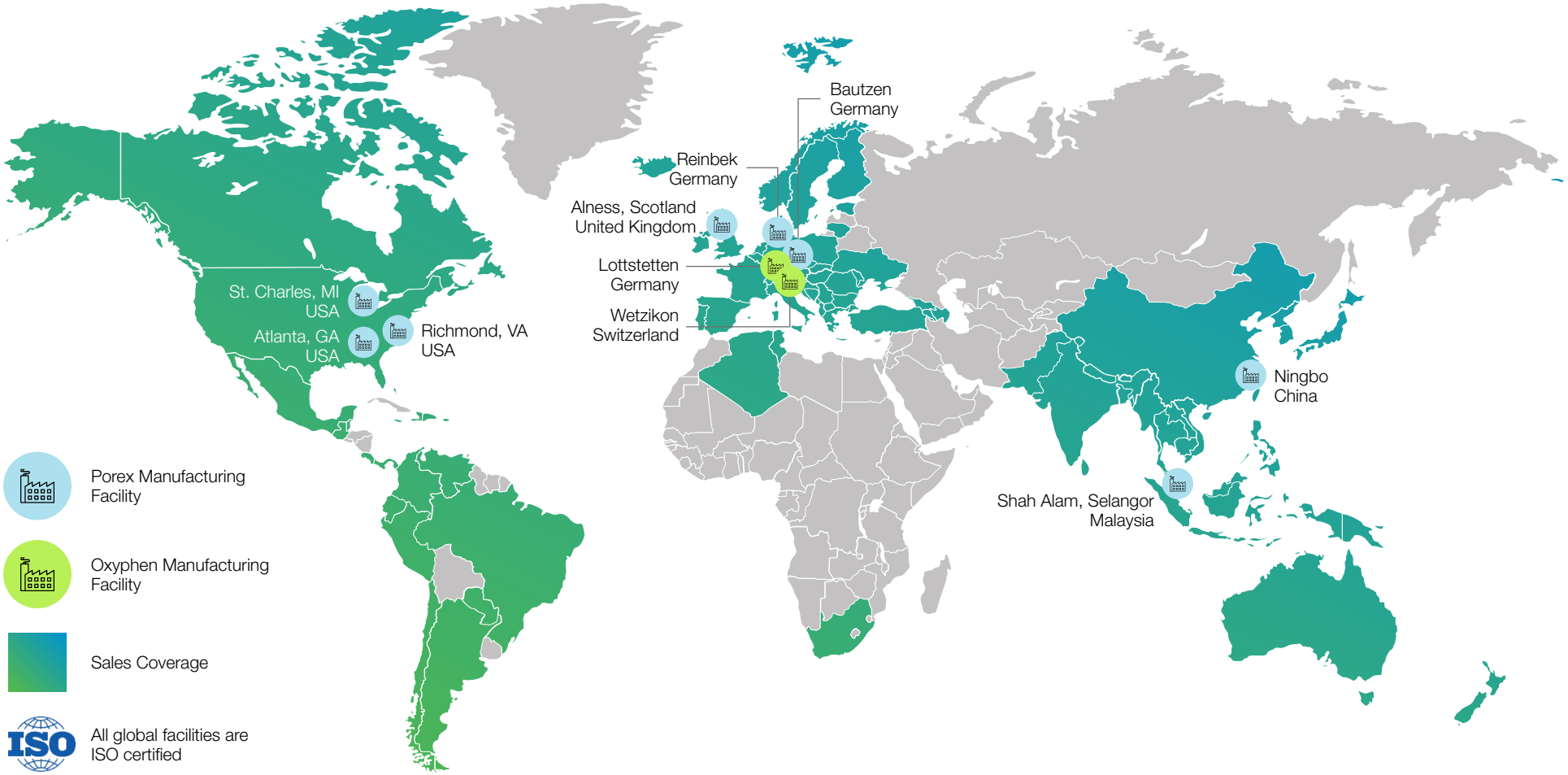
- Provide accurate forecasting either annually or quarterly to allow supply chain to purchase materials and for operations to schedule production.
- As new projects and design challenges materialize, reach out to commercial team to begin brainstorming for next innovation.

**STEP 5 DELIVERABLES**

Once product enters full production, the collaborative innovation process is complete, and the commercial team focuses on ensuring your forecast and orders are delivered on-time and within quality specifications.

# Quality manufacturing and local support

Porex is able to serve its customers through a robust ISO-certified manufacturing network that is designed to align closely with your supply chain network. Engineering teams are located at each manufacturing site, along with Quality and Customer Service.



# Contact Us

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See the Library

## Request Samples

Not sure what technology is right for you? Talk with our experts to find the right sample(s) for your application.

Request Sample

**Contact us for more information**

Website: www.porex.com
Email: info.porex@filtrationgroup.com