

# Minco's New Product Introduction Process

*Work with Minco to save money and improve time to market*

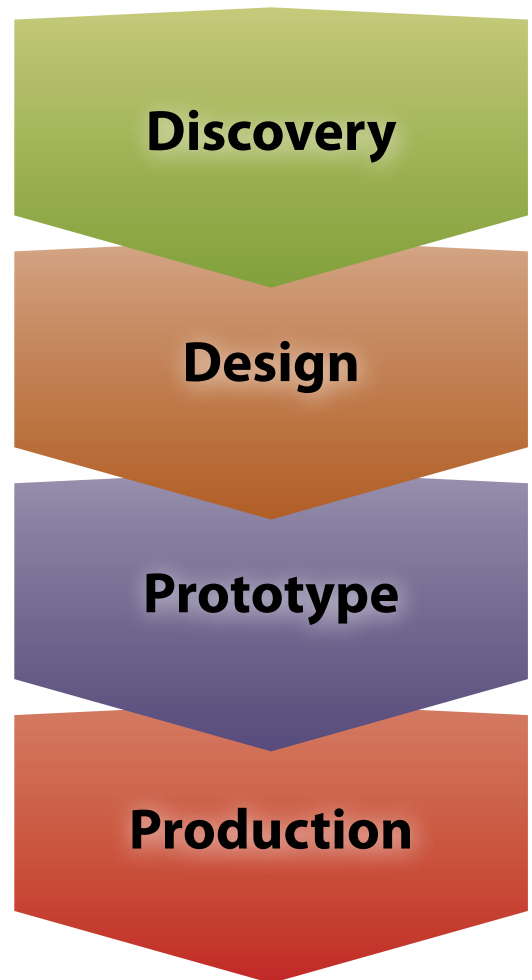
Minco Products, Inc. was founded in 1956 and over the years the company has made a name for itself producing quality sensors, instruments, heaters, and flex circuits. We've had the opportunity to build solutions for countless companies over the years, and we've earned their trust not only because of the quality of the components we manufacture, but also our robust and thoughtful New Product Introduction (NPI) process.

Our team-based NPI approach allows for initial upfront design for manufacturability (DFM) analysis at the bid stage, followed by a comprehensive design and process risk analysis. This detailed NPI approach allows Minco to have fewer product development iterations, ensure robustness of the final product, and minimize delays in time-to-market.

Minco's NPI process consists of a phased approach highlighting 20 key steps.

- **Discovery** involves Minco product managers and engineers sitting down with customers to determine how we can help. We study the documents provided by the customer and assess the project risks that might affect the project's manufacturability and supply chain.
- **Design** sees Minco engineers creating a solution matching the challenges presented during Discovery. We perform a Design for Manufacturability (DFM) analysis and test out processes and materials before the design is finalized.
- **Prototype** results in the creation of a prototype that confirms how the final product will look and function. This allows us to not only confirm the component works as designed but also test out the production facilities and make changes before production begins.
- **Production** involves taking the finished and prototyped design and manufacturing it in Minco's factories. Beginning with a "first run" to validate processes, we are able to ramp up production very quickly after that.

Turn the page to see each step broken out in more detail.



## Download a Design Guide Today

To learn more about Minco's capabilities and product selection, download one of our Design Guides. These catalogs describe the array of resources we offer, including tips on selecting a component, the technical specifications for each part, as well as FAQs and a complete glossary. Finally, each product guide includes an index of

components and accessories that may be purchased from our online store for testing and evaluation purposes. Find the catalogs here:

<https://www.minco.com/resourcecenter/productguides>



# Minco's NPI Process at a Glance

*Minco incorporates these key steps in all standard New Product Introductions*

## DISCOVERY

- 1. Customer Requirements Analysis:** The first step involves collaboration between Minco and our customers to gain an understanding of the application requirements and the problems our customers face. This may include review of a quote package, or even an conference call or site visit.
- 2. Documentation Review:** During the initial stage of the NPI process we will study your specifications, Bill of Materials (BOM) and other critical to quality (CTQ) requirements. The most common problem we encounter at this stage is incomplete information – missing circuit views, operating conditions, tolerance expectations, and design flexibility.
- 3. Risk Assessment:** Are customer requirements attainable? Are materials new to us or that we do not ordinarily stock? Do we need to develop new tooling and create the corresponding procedures around them?

## DESIGN

- 4. Documentation:** Manufacturing documents are created alongside the creation of the final design. Minco operating procedures call for revision-controlled specification drawings, manufacturing instructions, and acceptance test requirements; user manuals and installation instructions are developed as needed.
- 5. Supply Chain Analysis:** Minco keeps vast quantities of raw materials on hand, a necessity given the wide variety of sensors, heater, and flex circuits that we manufacture. When sourcing a new component, our extensive supplier contacts allow us to assure the best possible option; we often suggest alternative materials and components that may provide a cost or lead time advantage for our customers.
- 6. Integrated Solution Review:** Minco offers suggestions on ways that we could combine our product groups into a single component. For instance, adding a heater to a flexible interconnect, or adding a RTD or thermistor to an assembly to measure its temperature.
- 7. Design for Manufacturability (DFM) Analysis:** Minco stays focused on the end result by steering the design toward a readily-manufacturable solution. Sometimes it's as simple as ensuring that the maximum-possible panel space is utilized, or that a complicated circuit doesn't pose unusual challenges for our assemblers.
- 8. Regulatory Compliance Assessment:** Minco has been certified compliant with countless standards, including industry certs such as AS9100 as well as environmental guidelines like RoHS. Minco monitors the ongoing project to ensure its compliance with appropriate standards.
- 9. Material/Process Testing:** Before the project parameters are finalized, we test and validate any new material and process to ensure they are suitable for the design.

**10. Design Review:** The final step of the Design Phase is a comprehensive review of all specifications, drawings, processes, and other criteria relating to the design.

## PROTOTYPE

- 11. Develop Tooling and Tool Programs:** Minco's engineers begin developing the laser programs, drill/route programs, die lines, PCB gerbers, and assembly/test fixtures that will not only help Minco create the prototypes but will ultimately be used as part of routine production of the part.
- 12. Prototype Assembly:** The component is built by our team. Most of the processes used to manufacture prototypes utilize standard production procedures and equipment, ensuring the product will be suitable for future launch into production.
- 13. Testing and Simulation:** All prototypes receive a thorough acceptance test inspection including verification of any CTQ requirements. In addition, Minco has a suite of simulation programs available to help solve thermal and electrical challenges.
- 14. Prototype Post-Build Review (PBR):** Having completed the prototype, Minco's team updates assembly instructions and procedures to prepare for the production process.

## PRODUCTION

- 15. Production First-Run:** Any updates or production volume tooling introductions will be processed through a "first-run" manufacturing build, during which the production operators will complete the first build using final manufacturing processes and equipment.
- 16. Inspection:** The finished parts receive a thorough inspection according to Minco's quality procedures, which may include dielectric strength to verify electrical insulation or resistance measurement to verify accuracy.
- 17. First-Run PBR:** Based on feedback from the first production run, Minco identifies any final refinements appropriate for the assembly instructions and procedures.
- 18. Launch:** With all action items completed for the NPI process, the part is now ready for final launch to production. The part is manufactured following statistically-validated production processes and using DOE methodology to reduce variation.
- 19. Ramping Up Production:** Thanks to Minco's ability to be involved in the entire design process, we are able to quickly transition from building prototypes to manufacturing the final component.
- 20. Supply Chain Management:** During the production run, Minco actively manages the supply chain to address demand fluctuations, cost targets, and part obsolescence.



# Contact Us

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In today's competitive markets, manufacturers are always looking for ways to cut costs, slash time to market, and improve product performance. But while component buyers are price sensitive, they also look at measures like total cost of ownership, reliability, performance, and customization. This is particularly true of technical products in fields like medical diagnostics, aerospace, powergen and military and defense where failure is simply not an option. Designers of those products, and others like them, recognize that the cost of a specialized component or an integrated assembly can be more than offset by reduced assembly cost. They know that speed to market can help maximize the profitability of a new or improved product. And they rely on Minco to help eliminate risk in demanding markets.

Minco's process-based approach begins with intense, company-wide focus on customer requirements. For speed and efficiency, the company encourages decision making at the lowest levels possible, particularly those closest to the customer. And, from top to bottom, the company strives to make continuous improvement more than just a slogan.

What sets Minco apart isn't just the products we deliver but how we function as a company and interact with our customers to develop and deliver those products. For quality parts, teamwork you can count on, and responsible manufacturing, make our experienced engineering staff part of your team.

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