

INTRODUCTION/BACKGROUND

Since 1971, Mill-Max Manufacturing has been a trusted partner of OEMs for application-specific machined pin connector solutions. We are proud to be an industry leader in providing customized connector solutions, with a no-compromise attitude on quality and service.

Outside-the-Box Solutions, Not Off-the-Shelf

When design challenges arise during product development, an off-the-shelf connector may not always suffice. Mill-Max can quickly and efficiently provide precision-machined connector solutions for your specific needs. Our process has been honed over the last 50 years and ensures a timely, detailed response to every inquiry.

From prototyping and low-volume runs to high-volume, repeatable production requirements, we produce consistent products made to exacting specifications for your application—every time.

Solutions Providing Vital Connectivity and Longevity

As the demand for modular sub-system components requiring reliable connectivity increases, so does the need for customization. This is particularly relevant as circuit board real estate becomes limited with component package sizes decreasing. The data revolution and emergence of IoT (Internet of Things) calls for ever more innovative and intricate designs, all of which require thorough planning and increased connectivity.

The key factor for product longevity? Connection reliability. A machined connector is particularly suited for demanding or rugged applications where mechanical stability and a reliable electrical connection is crucial.

SWaP: Size, Weight, and Power

Today's lightweight and compact systems require ever increasing functionality and performance—while limiting overall size, weight and cost. Mill-Max specializes in producing micro/miniature connectors that maintain design integrity and functionality within challenging environments, while keeping the smallest, lightest form possible.

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RAPID CONSULTATION AND PRODUCT DEVELOPMENT

To help with urgent 'time-to-market' product deployment, our US-based team of engineers is ready and able to apply their depth of knowledge and expertise to your custom interconnect project. We pride ourselves on our rapid response time from initial inquiry to delivery of the final product.



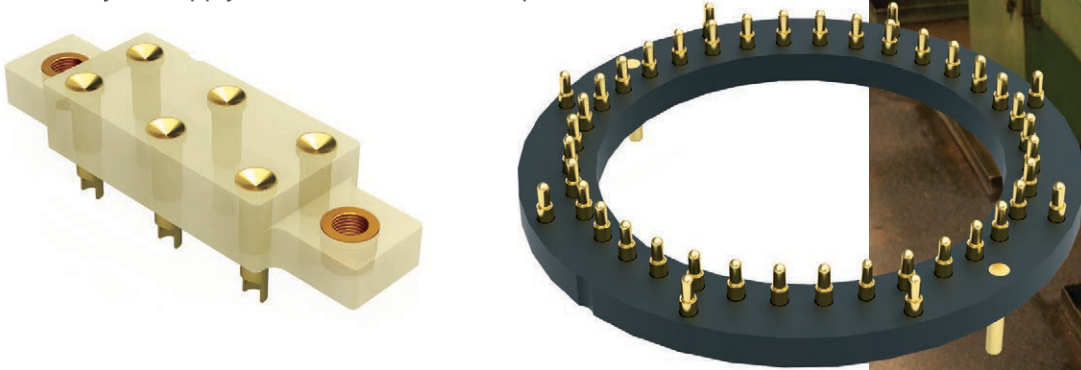
SCALABLE SOLUTIONS

Move From Prototype to Production

Mill-Max custom parts can form the backbone of numerous product iterations, creating a stable, reliable platform to build on. Our broad product line of machined connectors includes various part families, mounting styles, and dimensional configurations designed with modularity in mind—perfect for unexpected PCB changes or sourcing a drop-in replacement.

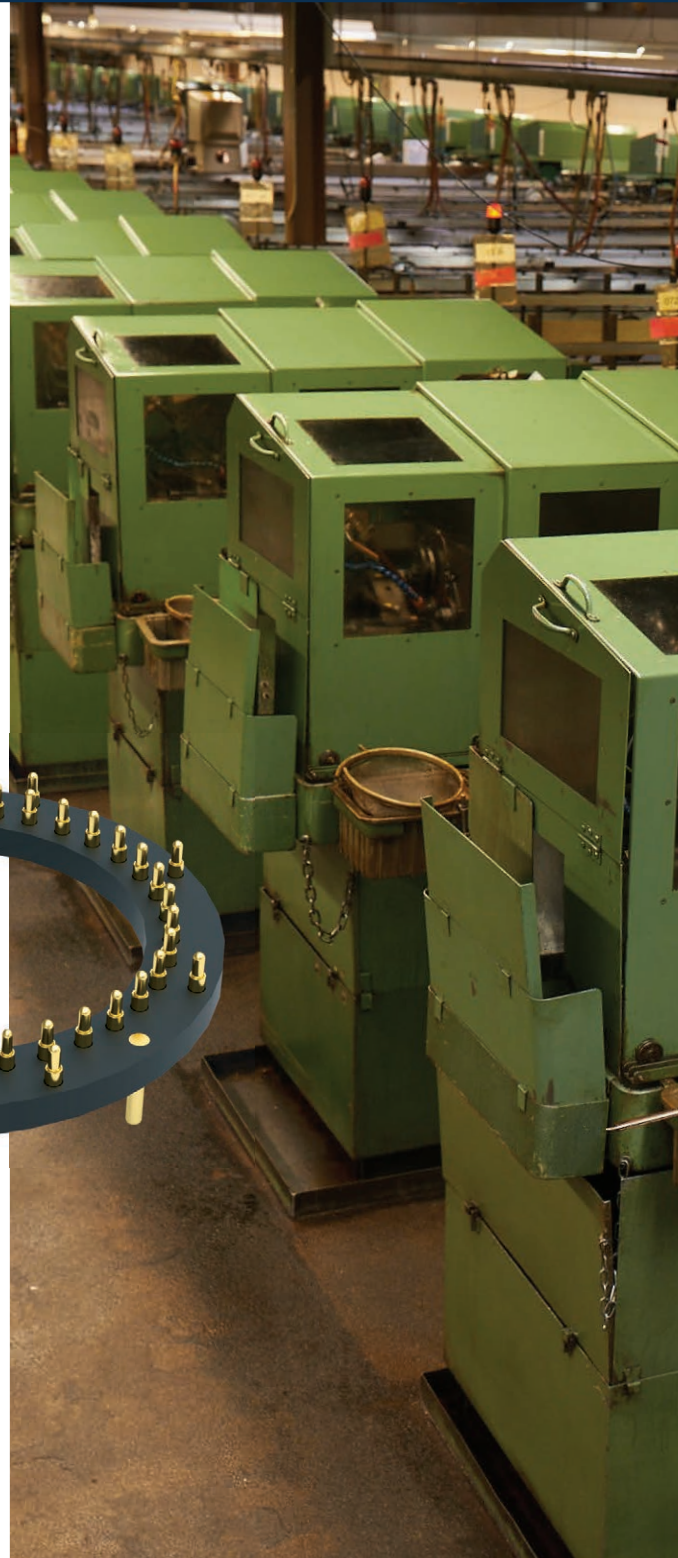
Our full-house production capabilities seamlessly transition from prototype parts to full production without delay. Our in-house tool room and unique production and assembly methods enable us to create parts efficiently. About half of the products we supply are custom, which makes us the go-to supplier for obscure, out-of-the-ordinary designs.

We offer custom parts with excellent lead times to reduce time to market, giving your product a clear roadmap to success. Our complete vertical integration and global distribution network ensures your supply chain will never be compromised.



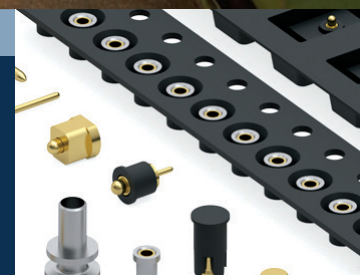
The Benefits of Partnering with Mill-Max

- FAST turnaround from quote to production and delivery.
- Vertically integrated manufacturing without reliance on outside sources means zero barriers to development and production.
- Excellent communication from initial inquiry to delivered product. Our technical team will submit detailed proposals based on our experience and always aim to produce the most cost-effective solution.
- Quality assurance built into the manufacturing process.



FUTUREPROOF DESIGN

We will recommend features to include in your custom design in anticipation that a high-volume production order may follow—for example, features facilitating packaging on tape and reel.

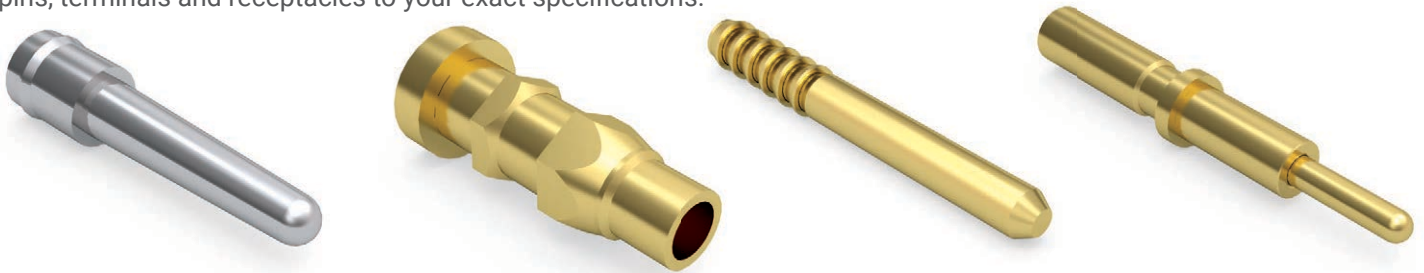


A BROAD PORTFOLIO

We can customize just about every aspect of our product offering, from the machined pin to the insulator components. This gives us the ability to provide our customers with an expansive portfolio of custom parts. We review the design for manufacturing feasibility and provide a suitable solution within a very competitive lead time. Our state-of-the-art plating lines allow us to plate your custom machined component with a selection of industry standard finishes.

Custom Discrete Pins, Receptacles or Spring-loaded Pins

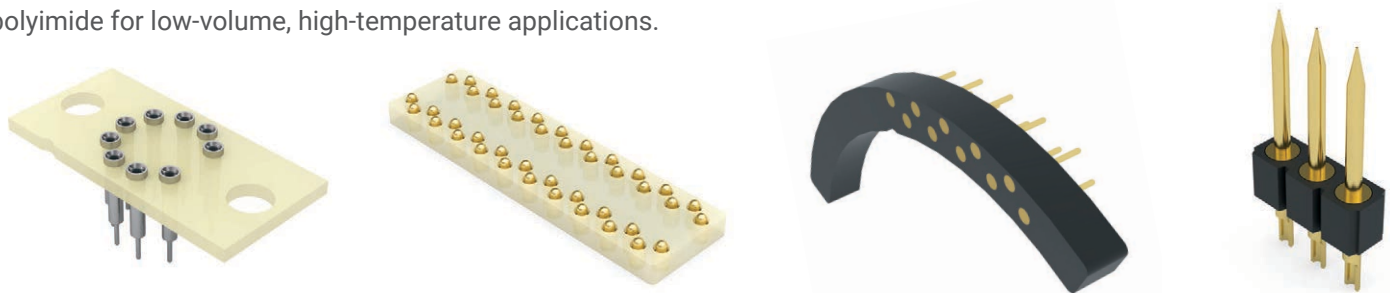
We offer a low minimum-order quantity of 1,000 pieces for any **custom pin, receptacle, or spring-loaded pin** (our discrete machined components), whether you want to modify an existing catalog part or create a complete custom part with all-new features. More than 200 high-speed turning machines on our premises equip us to provide custom pins, terminals and receptacles to your exact specifications.



Low-Volume and Prototype Connectors

In addition to discrete machined components, we can create all new custom connectors. We will help design and create a unique insulator for your application.

In the case of prototype runs, we offer **FR-4** epoxy resin material to create a handful of parts for review at the design concept or alpha stage. We can create low-volume runs of non-standard configurations for one-off requirements, such as test fixturing. Our standard material thicknesses range from .010" to .500" to fit most needs. Using FR-4 sheet material reduces the price for prototyping by negating the requirement of a costly mold tool up-front. We can also provide **G-30** polyimide for low-volume, high-temperature applications.



High-Volume Production Connectors

By seamlessly transitioning to high-volume production order requirements with a custom injection-molded offering, Mill-Max can provide a custom molded insulator—much more suitable and cost-effective for high-volume production needs.

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IT'S ALL HERE IN NORTH AMERICA

On-site machining, plating, assembly and packaging ensure an easy and FAST transition to a custom design with excellent product support & lead times.

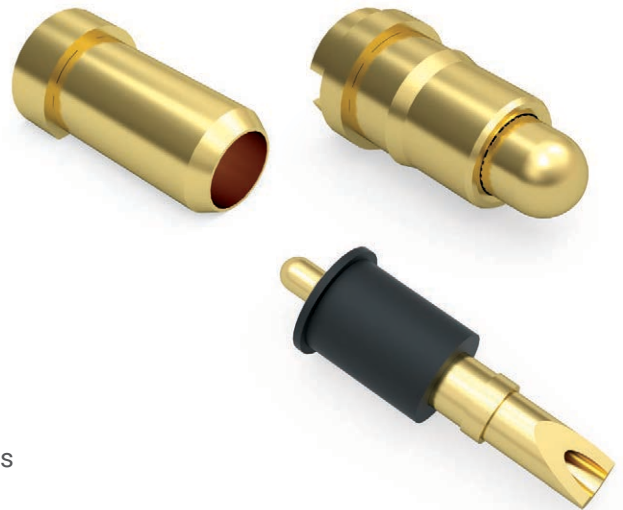


SPECIALIZED APPLICATIONS

When the industry you serve has stringent design requirements, Mill-Max can offer a plethora of alternative materials to suit these environments and go beyond the capabilities of a COTS connector. This includes high-temperature or low-force requirements, excellent outgassing properties, fine-pitch or ultra-low-profile limitations. We understand and accommodate wide-ranging requests for specific industrial requirements.

We offer:

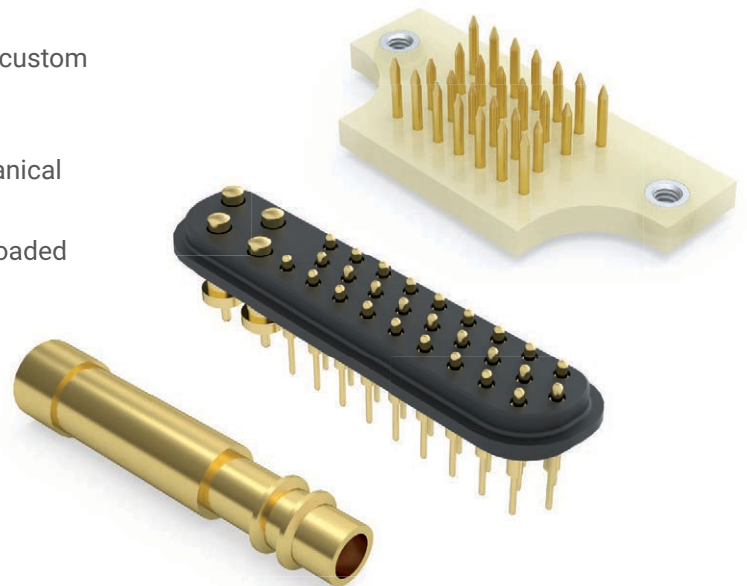
- Beryllium nickel contact clips in place of beryllium copper for high-temperature **receptacle** requirements.
- Stainless steel internal springs for elevated force requirements, improved ruggedness, and high-temperature requirements for **spring-loaded pins**.
- Low-force spring options to decrease overall mating force for **spring-loaded pins**.
- Various insulator material options for high-temperature or specific outgassing requirements.
- Specialized plating materials and non-standard plating thicknesses for any custom **pin** or **receptacle**.
- Non-magnetic material and plating options for non-magnetic application requirements.



Mix-and-Match Capabilities

We can mix-and-match different technologies into the same custom connector, if required. Examples include:

- An SMT connector with thru-hole alignment pins for mechanical alignment and stability.
- Spring-loaded pin connectors with differing height spring-loaded pins for “first-mate last-break” style connectors.
- Threaded inserts incorporated for added mechanical stability and fastening.



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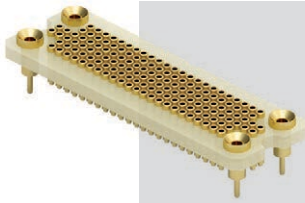
COMPLETE SYSTEM SOLUTIONS

Our experienced in-house engineering team provides complete support at every stage of your development process, including: **conceptualization, engineering, design, assembly, production, and final delivery.**



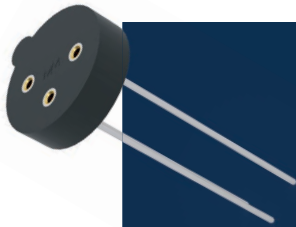
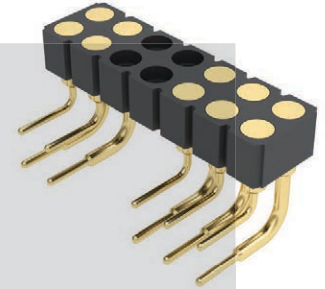


SNAPSHOT CASE STUDIES



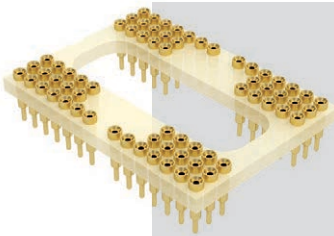
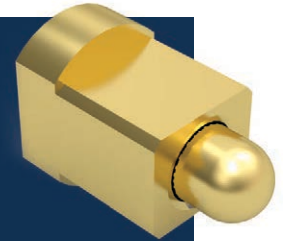
Custom 150 position FR-4 socket utilizing two receptacle sizes for both connection & mechanical stability

Custom selectively loaded, right-angle target connector



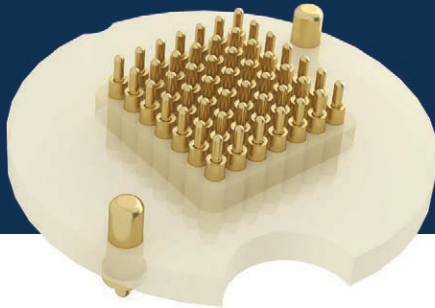
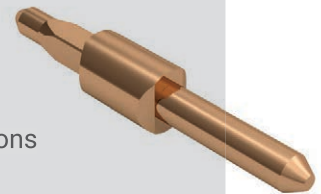
Custom TO-3 transistor socket with elongated solder tails

An extremely short, horizontal surface mount, spring-loaded pin



Custom 68 position FR-4 socket in a custom array with large window opening

A Tellurium Copper 'Power Pin' with press-fit features for high-current applications



Custom 49 position FR-4 spring-loaded header with custom alignment pins

EXPERIENCE DRIVES INNOVATION

Our in-house method of production ranges from creation of our own tooling and assembly apparatus to packaging the parts for pick and placement onto a PCB. Years of experience allow us to quickly suggest efficient methods of design and manufacturing for customer review.



A startup medical device manufacturer contacted Mill-Max for assistance creating a high-reliability, spring-loaded connector for their device. The need for an aesthetically pleasing design to fit the curves of this patient worn device precluded the use of off-the-shelf connectors. Mill-Max took advantage of our ability to machine insulators from FR-4 to fulfill low-volume, production-quality requirements for testing and qualification. When a final design was decided upon and qualification was achieved, Mill-Max transitioned to our in-house injection molding capabilities to meet the high-volume requirements of this disposable device.

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CASE STUDIES

An OEM in the gas detection and safety equipment industry approached Mill-Max for help to solve a problematic issue with assembly of one of their PCB designs. Limited real estate and existing components on the board was making placement of 3 machined pins difficult without additional labor and apparatus being required. Mill-Max was able to apply our expertise in carrier products to design a system whereby a one-piece assembly could be dropped onto the PCB and hold all 3 pins steadily in place during soldering. The carrier piece is then removed after assembly leaving the pins neatly in place on the board after soldering. To maximize efficiency, the carrier pieces are returned to Mill-Max where newly manufactured pins can be reloaded onto the carrier for recurring shipments. Therefore, the same carrier part can be re-used multiple times, cutting down on recurring lead time and reload cost. The carrier construction itself is achieved by taking a standard receptacle and press-fitting it into a custom FR-4 insulator. The 3-piece socket component is then loaded with standard nail head pins for shipment to the customer.

AESTHETICS MATTER

When form is as important as function, we'll work with you to create your desired appearance. We offer several materials "off-the-shelf" and can also work with you to source material specific to your needs.



About Mill-Max

Mill-Max Manufacturing Corporation, an engineering and manufacturing company, is the largest manufacturer of precision-machined interconnect components—more than 100 million each week—in North America.

What We Offer

Mill-Max's interconnect components include precision-machined contact pins and receptacles, spring-loaded connectors, PCB pins and solder terminals, IC sockets, and board-to-board interconnects, all available in SMT and through-hole.

What Sets Us Apart

Mill-Max exercises total control from raw materials to finished product. Our 150,000-square-foot plant houses all facilities including engineering, customer service, sales and marketing, tooling, primary and secondary machining, stamping, electroplating, injection molding, and automatic assembly operations.

Our customer-driven philosophy means we welcome custom designs, regardless of volume, beyond the more than 20,000 standard products we offer in our catalog and website.

Our Focus

From order entry to product shipping, Mill-Max is focused on the total satisfaction of our customers. Our products are sold directly through our sales representative organizations and through a network of authorized distributors located throughout the U.S. and in various locations worldwide. Contact us at 516-922-6000 or via our online contact form at www.mill-max.com/contact.

Our commitment to excellence makes Mill-Max your source for maximum interconnect solutions.



WORLDWIDE DISTRIBUTION



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