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Case Study NISSIN BRAKE

Nissin Brake Ohio's Modular Design Strategy Uses Configurable Components to Gain Time and Cost Savings

Taking a modular approach to the design of automotive assemblies helps speed up and simplify design engineering and procurement processes.

Nissin Brake Ohio, Inc., in Findlay, Ohio, is a Tier 1 supplier of brake and control system parts and assemblies for automotive and non-automotive applications. Established in 1988 by Japanese manufacturer, Nissin Kogyo Co. Ltd., Nissin Brake serves numerous high-profile automotive OEMs, such as Honda, Harley-Davidson and GM, as well as many non-automotive manufacturers.

With its primary manufacturing plant in Findlay, Nissin Brake also supports production in Rock Spring, GA, and research and development facilities in East Liberty, OH and Milwaukee, WI.

Going Modular to Gain a Competitive Edge

To produce its diverse and extensive product line-up, Nissin Brake has developed expertise in a wide range of manufacturing processes, including aluminum gravity casting, aluminum and cast iron machining, plastic injection molding, zinc plating, anodizing, and assembly and testing technologies and techniques.

The company has also made significant investment and advancements in Lean Manufacturing, 5S**,** TPM (Total Productive Management), and Associate Involvement Programs – programs initiated by management and carried out by the approximately 750 associates employed in the Findlay facility.

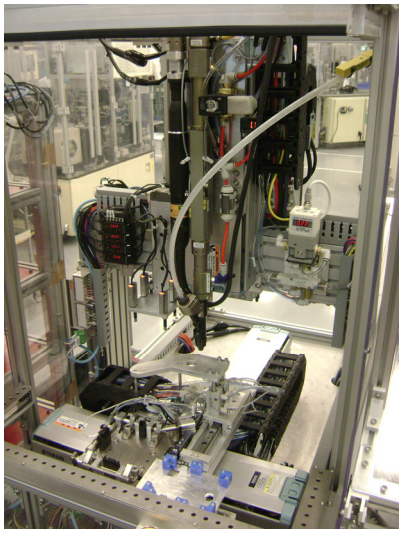
Control Unit Assembly

While all of these factors have enabled Nissin to build a competitive advantage in its marketplace, another strategy has also made a significant contribution to the company's growth and profitability over the past two decades – and that is a design strategy built on the concepts of modularity and flexibility.

In designing customer projects, Nissin's engineering team strives to standardize wherever possible on configurable parts sourced from MISUMI, a premier supplier of high quality precision mechanical components for the manufacture and assembly of industrial automation and motion control equipment and systems.

Modular Design in Action

After a customer order is received and entered, Nissin's design process typically starts with a rough concept of what equipment will be needed to fulfill the customer demand and cost requirements. After baseline manpower and cycle time numbers are generated, the actual equipment design engineering process begins.



Screw Fastening Machine

In the case of the company's ABS (Anti-Lock Brake System) Modulator Department, Nick Fahim, Design Engineer, describes the sequence of steps:

"Our small team of design engineers works together to decide what form the assembly equipment will take, the level of automation, methods of part detection/ quality verification, and overall equipment controls. The next step is the 3D design of the equipment using Dassault Systems' SolidWorks software."

In the course of this process, the engineers incorporate as many Misumi components as possible to speed up design time. After the modeling is completed and approved, the assembly prints and drawings are created along with the Bill of Materials (BOM), from which all parts are ordered for the project.

"We work on a wide range of projects, from small hand assembly station jigs to very large fully automated work cells," explains Fahim. "That's why we try to specify configurable parts as much as possible, because it simplifies our procurement process and significantly reduces the design time for each project."

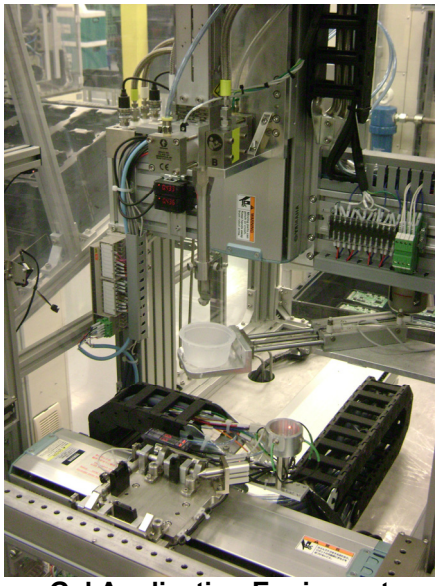
One example of this strategy in action is Nissin's ABS Control Unit Assembly. The project called for building of four (4) sister machines that were modular in design. Nissin engineers were able to source over 50 percent of the parts on the Bill of Material from Misumi's online catalog. "Each machine had roughly 500+ line item parts, so this meant a significant time-savings because of vendor reduction and substantial savings due to quantity discounts," notes Fahim.

"And, in the modular design of the base equipment frame and machine guarding, we used Misumi extruded aluminum, which meant that over 75 percent of the configured components were shared among four (4) machines with different functions," added Fahim. "Thanks to this flexible, modular approach, we only had to design the first machine completely from scratch. The remaining three (3) simply required changing modules for different functions – such as replacing the dispense valve of one machine with a screw fastening spindle on another."

Fast and Easy Online CAD Configuration

MISUMI's online CAD Configurator also plays a key role in Nissin Brake's design engineering process. "The ability to download a native SolidWorks file and incorporate it directly into our equipment model is essential," he notes. "We can configure the component part directly to our specifications and have it fit seamlessly into our models. The ability to get a quote on any number of parts instantly from the vendor's Website makes the purchasing process quick and

easy. In some instances, we have been able to retrieve a quote from our account history and simply reorder all of the parts needed for a particular project that was being duplicated."


Gel Application Equipment

For the same machine building project, the team was able to "kit" all of the necessary wire, nuts and bolts, and commonly-used extruded aluminum hardware for each machine. "In many cases, we will design specifically around Misumi's configurable components because it is one less drawing we will have to make and send out for quote. And the best thing is that we can purchase a configured component and it will arrive on time and be exactly what we requested – no dealing with faulty part tolerance or surface finishes out of specification," said Fahim.

Nissin Brake Ohio has been a long-time Misumi customer due to that company's business ties with Nissin Kogyo, Nissin Brake's parent company in Japan, which has sourced Misumi parts for decades. Today, instead of "thinking outside the box", the U.S. company's engineers think *inside* the Misumi catalog – and the benefits have been substantial in terms of time and money saved, increased design efficiency and product quality.

Summarizing the company's core philosophy, Brandon Peterson, Nissin Brake Ohio's Modulator Department Manager, states: "Nissin believes in empowering our associates to utilize the tools of lean methodology and Kaizen philosophy to eliminate sources of waste, to continue to strive towards world-class quality, and to work more efficiently towards Nissin's continued success."

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