

custom
enclosures:
replacing 'one size fits all'
with 'one-stop shopping'



Custom Enclosures: Replacing ‘one size fits all’ with ‘one-stop shopping’

In the past, OEMs, product designers and engineers had few choices when it came to designing sensitive internal components that required an enclosure. They could design them to fit into a standard, off-the-shelf case or expend considerable time, money and effort to have one or more mill, machining or metal shops modify a standard enclosure or custom build one from the ground up.

With today’s technological advances, however, enclosure fabrication is no longer compromised by standard enclosure dimensions, numerous vendors and limited customization. Today’s forward-thinking enclosure manufacturers are beginning to think outside of off-the-shelf boxes and are bringing many enclosure customization options and services in-house. The result is a convenient one-stop-shop for enclosure design, fabrication and customization that greatly improves a product’s speed to market.

One size really doesn’t fit all

Most enclosure manufacturers already offer a sizeable selection of quality standard cases in various materials, sizes, configurations and styles, such as desktop, handheld and rackmount units. But more often than not, a standard case doesn’t quite fit the bill. With in-house enclosure design and customization, an OEM or designer can now modify an enclosure to fit their product’s exact needs.

By offering the flexibility to change everything from the height, depth or width of a pre-engineered enclosure case, enclosure manufacturers are giving their customers the freedom to design their products and applications without being forced to fit inside a standard enclosure footprint.

Some manufacturers are even offering detailed customization services like hole punching, machining and the application of self-clinching inserts, along with finishing touches like silk screening and graphic overlays. As a result, it’s more affordable and more convenient than ever for an OEM or designer to acquire a case that’s perfectly configured to a specific product or application design—and 100 percent ready to install.

A one-stop shop saves time, money and effort

Modifications allow better support for product and design engineers’ requirements and specifications, down to the very last detail. And they allow customers to get everything they need—all from one single source. When an engineer works with an enclosure manufacturer with customization capabilities, it ultimately lowers costs, simplifies billing and quickens product speed to market.

Customization options are endless

Once the need for a custom enclosure is determined, working with the enclosure manufacturer to commence the customization process is the first step.

In certain instances, starting with a standard enclosure and modifying it to fit a customer's design will work, other times, it's best to design the ideal enclosure solution first. Based on the specifications identified, OEMs can then look for a pre-engineered, standard case, which can be modified to fit the product. Or, if necessary, OEMs can choose to create a completely customized solution from scratch.

To facilitate this first step in the process, some enclosure manufacturers are beginning to offer their customers access to technology-based design and drawing services.

Special sizes

Some manufacturers engineer flexibility into enclosure components in order to accommodate special sizing when a standard size won't fit the end user's requirements. OEMs may be able to request that the height, width and/or depth of the enclosure be modified to meet exact product specifications. If using an extruded case, extrusions can sometimes be cut to specific depths to better accommodate the product design.

Self-clinching inserts

Inserts such as studs, standoffs, blind studs, captive nuts, Spring Latches, rivets and right angle standoffs are available in a variety of

sizes and can often be added to a case in order to mount electronics or hardware.

Punching and holes

OEMs may want a hole punched into their enclosure in order to mount internal components or allow for venting. Some enclosure manufacturers offer a variety of punches and holes in different sizes, configurations and shapes, ranging from square, to round, to trapezoid. The punches are ideal for customizing enclosures made of extruded aluminum, aluminum sheet or steel sheet.

Machining

If an enclosure manufacturer has dedicated CNC milling equipment, it can create virtually any shape a customer requires. A machining process can be used for holes, vents, corner radius, cutouts, counter boring and other customized processes to extruded aluminum enclosures. Unlike punching, the machining process does not require the material to be flat. The machining process can also be used to mill enclosure components—such as handles—out of aluminum bar stock. Most machining is performed before metal finishing to ensure a uniform finish coating.

Finishing

Often, enclosures are finished with an undercoat and topcoat to provide a durable and attractive finish that protects a product and helps it function at its best. The final use for the product often dictates the best type of finish to use—as each finish offers different properties and advantages. Enclosure manufacturers may be able to provide a variety of finishing options, such as:

Paint

Water-based paints can add eye appeal to a product and allow OEMs to utilize a specific color scheme. PMS and RAL colors can be matched, and specific textures can be achieved with this type of finish.

Powder Coating

A powder coating provides a heavy-duty, attractive finish for products with metal parts. Black wrinkle powder comes as standard, but other colors may be available.

Vinyl-Laminated Metals

Vinyl-coated metal is a value-added product in which vinyl film is bonded to the surface of a metal sheet (usually cold rolled, galvanized or aluminum). It typically expedites production turnaround compared to pre-painted products. Alodine, anodize, zinc chromate and vinyl-clad aluminum coatings protect metal enclosures, inhibit oxidation and conductivity, and come in various clear or colored finishes.

Shielding

Shielding protects products by limiting interference into or out of an enclosure. It's particularly important for products that include highly sensitive components inside the enclosure or for enclosures that will be placed near other sensitive equipment or components. The shielding process uses overlapping seams and multiple fasteners to minimize gaps and spaces between enclosure

components while ensuring effective conductivity among components. To meet special requirements, Copper-Beryllium and Metal-Impregnated gasketing, Copper-Nickel paint and/or additional fastening hardware can also be used.

Masking

For plated or painted enclosure components, a masking process creates a raw contact surface, which is essential for improving the effectiveness of the shielding process. Masking can also help achieve a specific appearance for an enclosure.

Graphics and silk-screening

OEMs can customize a product with their company or product name, logo, or other artwork on an enclosure. Some enclosure manufacturers provide graphic overlay and single or multi-color silk screening capabilities to professionally apply graphics or artwork and put the final touches on the case.

Design flexibility and value-added services

With all the customization options that are becoming more readily available from enclosure manufacturers, it's easy to see how any OEM—or even a single inventor working out of his basement—can take advantage of cases designed to better meet the specific requirements of any type of product or application.

But the benefits of in-house customization solutions don't end with lifting the constraints on electrical component and product design. Manufacturers who

provide these services at their shops are also bringing considerable value to their customers of all sizes in terms of customer service, time and costs saved.

Today, we're seeing shrinking order sizes. OEMs and product designers are more pressed than ever for in-house resources. Customers are demanding faster and faster delivery times. When an OEM is able to deal with an enclosure manufacturing expert who already understands the necessity for unique solutions, low volume or one-off orders and fast turnaround times, time and money is saved compared to placing and tracking orders with multiple vendors who may not understand or be able to accommodate needs.

The customization trend has shown that companies that offer customers a wide selection, as well as personalization and modification, are often rewarded with highly satisfied customers. History proves that when a manufacturer offers in-house enclosure customization solutions, OEMs and product designers in every industry win on every level.

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