

medical manufacturing:

creating innovative, precise,
and specialized medical
equipment components



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Advances in medical technology in the past century alone have made possible what was previously considered unfeasible. Where once certain illnesses caused the deaths of millions worldwide, medical innovation has now eliminated many dreaded diseases. Where once we had no way to properly diagnose a simple infection, medical imaging technologies today allow us to venture deep into the human body without ever having to make an incision. As a result of medical and technological innovation, dramatic improvements in life expectancy and mortality rates have occurred. Modern medicine is indeed a marvel.

And thanks to devoted researchers and manufacturers, the rate of advancement in the medical discipline continues to escalate. Diagnostic and treatment devices related to countless ailments are becoming smaller and more powerful. Diseases are targeted and treated with increasingly more microscopic precision. Driving this innovation is an aging population that expects the health care industry to provide early diagnosis and state-of-the-art treatment options, creating an unprecedented demand for rapid and continual advancement of custom medical technologies.

In order to provide the equipment that often makes a life or death difference for critically ill patients, medical equipment industry leaders must predict and respond to the culture of rapid development of more innovative, more precise, and more

specialized equipment. And perhaps just as important, the manufacturers of enclosures and other components for medical supplies, devices, and imaging technologies must jointly progress with the latest emerging design and fabrication techniques, processes, and technologies. In an industry where product characteristics can mean the difference between success or failure—or even life or death—selecting a manufacturer in touch with the industry realities of innovation, precision, and specialization is essential.

Developing innovative medical products for your customers

Although rapid innovation in medical diagnostic and treatment technologies provides countless benefits and drastically improves patients' quality of life, it also increases the risk of technology obsolescence. A detailed look at the place where mind meets metal—the shop—allows one to quickly discern whether or not the manufacturer of enclosures and other components for medical supplies, devices, and imaging technologies has the design, engineering, and fabrication prowess to expertly support medical equipment manufacturers.

First, product design engineers should have a product and application knowledge base from which to draw. Engineering experience allows manufacturers of enclosures and other components to understand the special requirements of both housing sensitive

medical equipment and of precision-made components of advanced medical devices. This knowledge base allows the engineer to quickly translate design requirements into practical, cost-effective product designs. Product design engineers must also be versed in the latest CAD and 3D design software. Such expertise allows the design engineer to create accurate and user-friendly depictions, making the customer-designer interaction an experience to anticipate.

After all approvals in the design process have been made, the fabrication process of enclosures and other components becomes paramount—translating the design into an accurate reality requires the reduction of human error, and can only be performed by state-of-the-art fabrication equipment. Modern manufacturers streamline the fabrication process by synchronizing the computer software with the fabrication equipment, ensuring that human error is removed when inputting product specifications into the fabrication equipment. High-tech equipment is also utilized to perform as many operations as possible in order to eliminate time-consuming and costly extra steps in the fabrication process. Time and money can also be saved by selecting a manufacturer with the capability of performing all the steps of the fabrication process—cutting, machining, punching, bending, shaping, and finishing—under one roof, without the need to outsource to expensive subcontractors. And supporting the fabrication process requires a team of exceptional mechanical experts who understand the intricacies of the equipment and production process.

Such innovative design and fabrication processes help medical equipment suppliers to get their products and services to market more quickly and more cost effectively than their competitors.

Customizing to tight precision requirements

Technological advances have made it possible to more precisely diagnose and treat ailments of the human body. Precise medical diagnostic and treatment tools and devices allow health care providers to isolate specific problems and minimize the procedure's effect on peripheral areas. Fractions of an inch when working with vital body systems can mean the difference between success and tragedy. Not only must component manufacturers be able to stay ahead of the innovation curve, they must also have the ability to create products to serve as tools in diagnosis and treatment procedures requiring the tightest of tolerances. Some diagnosis and treatment devices and components simply cannot afford imprecision; therefore, parts manufacturers must possess the technology to create flawless products, every time.

Deep draw technology allows for such precision. Deep draw technology results in refined, highly calibrated products with tolerances in the thousandths—and the accuracy is repeatable via high-volume, high-speed manufacturing. Because the process allows for multiple wall thickness and diameters in a single part, there is no need to weld or otherwise connect separate product components to achieve the appropriate product shape and dimensions. Thus, vulnerable interfaces in the final

product are eliminated, resulting in a product that performs more reliably any environment—an especially significant advantage in medical applications. The deep draw process also results in a better finish than specified by most product designers. With deep draw, the finish is typically 63 micro-inches or less, lending a smooth, mirror-like luster to the final part. Traditional processes must employ secondary operations to achieve the same quality finish.

Specializing in unique orders

As leading medical equipment suppliers know, not only does every customer have specific needs, but today's complex medical applications require a level of sophistication and expertise unknown to past generations. The enclosures housing the applications are no exception.

Depending on the application, enclosures may need to be in any shape or size. They may require a variety of hole punches. For mounting associated electronics and other components, enclosures often require specific self-cinching inserts such as studs, standoffs, blind studs, captive nuts, spring latches, rivets, and right angle standoffs. To create any shape enclosure and to ensure a uniform finish coating, dedicated CNC milling equipment should be used prior to finishing the material. If a durable and attractive finish is needed, metal enclosures are often treated with both an undercoat and a top coat of powder paint, water-based paint, or vinyl-clad aluminum. Other enclosures require effective shielding, ensured by utilizing overlapping seams and

multiple fasteners, copper-beryllium and metal-impregnated gasketing, copper-nickel paint, and the placement of additional fastening hardware. Still other enclosures require single or multi-colored screen printing. Custom enclosures sometimes require custom accessories, such as handles, feet and mounting solutions.

Because of the nature of today's medical equipment industry, medical equipment suppliers receive requests for products of all sizes. To handle all types and sizes of applications, the ideal manufacturer is small enough to handle single or periodic orders, yet large enough to handle volume orders in the tens of thousands—all with the ability to provide the same level of customer service to any customer, regardless of the order's size. All this can be found at Buckeye Shapeform.

These real-world examples illustrate the many benefits of using Buckeye Shapeform for any medical device enclosure or component need:

CIRS Dynamic Thorax Phantom Body Simulation System

CIRS secured the help of BRG, Inc and Buckeye Shapeform to build the control unit for the CIRS Dynamic Thorax Phantom developed by Computerized Imaging Reference Systems, Inc. The device is designed to simulate the human body during radiation therapy. The control unit takes information recorded from lung cancer patients' respiratory motion and controls the device's movements to help ensure that correct doses of

radiation can be accurately delivered to a patient. Buckeye customized its DII case by creating deeper panels, punching holes, and anodizing the case in one streamlined process, rather than through several sub-contracted processes as had previously been done.

MicroTargeting Power Assist System

FHC, Inc., enlisted Buckeye Shapeform to design an enclosure that would become a component of its microTargeting Power Assist System product line. These products primarily target individual cells within the brain to treat tremors associated with Parkinson's disease. The enclosure houses the power source for the needle probe that surgeons insert into the patient's brain during the treatment process. Buckeye Shapeform utilized its PET (plastic enclosure technology) to develop an enclosure that was small and lightweight, that provided an electromagnetic interference (EMI) shield to its panels to ensure the device's motor provided uninterrupted and reliable power to the needle probe every time.

Oxygen Measurement Systems

OxySense, Inc, the leading global source of non-invasive oxygen measurement systems for packers and processors, contacted Buckeye Shapeform for a custom enclosure for its newest product, Gen III 5000. OxySense wanted the Gen III 5000's enclosure to aesthetically and

functionally match the DSC enclosure that Buckeye Shapeform had previously supplied for a different product. However, the Gen III 5000 required a 7" slant front panel for a touch screen that the DSC case did not have. So the experts at Buckeye Shapeform developed a completely customized, hybrid enclosure from a combination of the DSC and KBS products.

Delivering innovative, precise, and specialized enclosures and other medical product components

In your efforts to provide the most innovative and most precise specialized medical products to your customers, Buckeye Shapeform is in a unique position to assist. It is our business to help you. Our talents meet your needs for innovation, precision, specialization, and customer service in a dynamic medical equipment market.

To learn more about how Buckeye Shapeform products will work for you, visit our Web site at buckeyeshapeform.com, or call (614) 445-8433 or 1-877-728-0776 (toll free).

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