Drive & Control profile

Aluminum Structural Framing Finds New Uses in Medical Applications

The Lithowave lithotripter designed by ESWL Products, Inc. utilizing Rexroth aluminum structural framing in its design, recently received FDA approval for marketing in the United States.

Lithowave lithotripter from ESWL Products, Inc. uses Bosch Rexroth modular structural components. Time-consuming, cumbersome, not readily reused—welded steel is going the way of the stone tablet for a growing list of structural designs, as it is quickly being replaced by aluminum structural framing. Aluminum structural framing is no longer just for common factory structures like machine bases and workstations. Now, it is also finding its way into new, innovative applications in the medical industry.

Previously, medical uses of aluminum structural framing were somewhat unusual, but more and more companies, like ESWL Products, Inc., a medical products company headquartered in Buffalo Grove, IL, are developing new ways to incorporate this modular, flexible, reusable structural component. In fact, by using aluminum framing, almost any

Challenge

Find ways to use aluminum framing to replace welded steel framing in medical applications

Bosch Rexroth Solution

- Aluminum structural framing
- Rexroth FMSsoft AutoCAD®-based software

Results

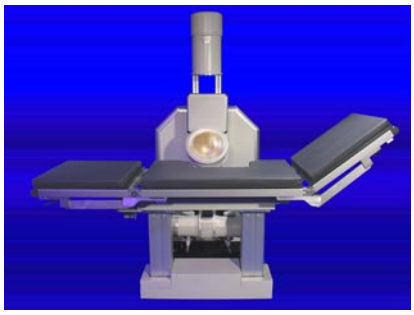
- Assists Lithowave in noninvasive treatment of kidney stones
- Reduced engineering and assembly time of Lithowave
- Ease of use and flexibility of design
- High-strength, scratch and corrosion resistant surface
- Maintenance free
- Eliminates need for special assembly tools or skills

structure can be assembled without special tools or skills and in significantly less time.

ESWL Products, Inc.'s Lithowave lithotripter, for example, is a special piece of equipment specifically designed for noninvasive treatment of kidney stones, and it is the latest design the company has developed using aluminum structural framing from Bosch Rexroth's Linear Motion and Assembly Technologies division.

Breaking Up Is Hard to Do

The extracorporeal shock wave lithotripsy performed on the Lithowave lithotripter is a non-surgical procedure in which shock waves are produced by the machine outside the body and focused on kidney stones inside the body. The shock waves break up kidney stones into smaller pieces, allowing them to pass through the body's urinary system.



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The Lithowave is a third-generation extracorporeal shock wave lithotripter that offers clinicians a proven electrohydraulic spark gap energy source coupled with a fluoroscopic localization system and a multi-functional operating table. Features of the patented Lithowave design include the positioning of both the treatment unit and the target localizing fluoroscopy on two frames mounted on one shaft and revolving around the same axis. This center-based design offers significant advantages over traditional designs.

The console is the focus of control and monitoring of the system. It provides the operator with centralized means for controlling the treatment table, the lithotripsy systems, radiology, and imaging, and it is usually located in a separate control room or behind an X-ray shielding partition. A touch screen interface and a fluoroscopy control panel are part of the control console.

After the stone is localized, the operator adjusts the position of the treatment unit and establishes proper contact between the patient's skin and the membrane of the treatment unit. This part of the procedure is carried out using the controls located on the control panel on the side of the main enclosure. The rest of the treatment is conducted from the control console. The flexible positioning of the table and the radiology apparatus, unparalleled access to the patient, and easily accessible controls all simplify the endourological procedures for treating kidney stones.

Medical Equipment Using Framing Gets OK from FDA

According to Ken Mroz, technical sales representative of Flodyne/Hydradyne Inc., Hanover Park, IL, a distributor of hydraulic, pneumatic and motion control technology, the Lithowave lithotripter designed by ESWL Products, Inc. utilizing aluminum structural framing in its design, recently received FDA approval for marketing in the United States. Also, the previous design included welded steel in the internal frame, but Mroz is working with ESWL Products, Inc. on plans to replace the steel with 90 mm x 90 mm aluminum extrusions.

Notes Mroz: "By using Rexroth aluminum structural framing, ESWL Products, Inc. has been able to build a machine that is very physically stable, aesthetically pleasing, well received by the sales staff and the users, while also decreasing assembly time."

Christopher Nowacki, ESWL Products, Inc. president, agrees that there were many benefits to using this "finished product" in the design of the Lithowave lithotripter. "It was more than a structural component," comments Nowacki, who explained that the Rexroth aluminum extrusions were used for the Lithowave's control cart, as well as in the main structure of the lithotripter itself. "Ease of use, flexibility of design,

aesthetics, ...they were all factors in our decision."

ESWL Products, Inc. selected Rexroth aluminum structural framing because the brand offered the most aluminum profiles—83 different high-strength, anodized aluminum profiles with dozens of different connectors and accessories—satisfying a variety of strength, ease-of-assembly, and aesthetic requirements of the Lithowave for a complete multi-functional structure.

Pioneered by Robert Bosch GmbH in Europe over 20 years ago, aluminum structural framing assists assemblers with a simple T-slot design, allowing them to simply insert a T-bolt into a T-slot and tighten. The high-strength, extruded aluminum profiles also have a natural color and anodized surface that is scratch and corrosion resistant, never needs painting, and is maintenance free.

In addition to the framing's physical characteristics and benefits, Nowacki noted that Rexroth's FMSsoft AutoCAD®-based software "reduced engineering and design time by providing product visualization and generating a bill of materials."

Rexroth's FMSsoft is a suite of programs for layout, planning, and design of structures made with Rexroth aluminum structural framing. FMSsoft simplifies common tasks, improves efficiency, and reduces the time needed to design structures. With AutoCAD 2002 functionality, FMSsoft provides automatic parts list generation, integrated calculation, a 3-D system library, and fast-functioning macros.

"A similar control console design using welded steel would take approximately two days to build compared to aluminum structural framing, which we can assemble in a matter of hours," summarizes Nowacki. "Design flexibility and possibility to customize height and width of components also factored into our decision to use the Rexroth framing. Rexroth framing costs less, is more versatile, and in the case of the Lithowave, does an overall better job than steel."

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