

Manufacturing Success



Musculoskeletal disorders on the job cost employers \$50 billion annually. But there are some jobs – even entire industries – in which machines just can't perform as well as a highly trained, real-life person.

Levitate Technologies set out to create a solution for professionals whose work requires constant shoulder mobility. In the process, and with the help of Dynacast, they ushered in the new age of worker safety and productivity: exoskeleton technology.

REPEAT PERFORMANCE

From automotive plants to manufacturing lines, millions of professionals work with their arms elevated, in a static position, or performing a repetitive motion for long periods of time.

To reduce fatigue and injury, companies provide ergonomic solutions like braces and stands; but until recently there has been no truly supportive solution for the shoulder joint. The consequences: skilled professionals who injure themselves or age out of a career too soon.

PROVIDING A HELPING HAND

"It's a problem out there, and it's a very costly problem," says Joseph Zawaideh, VP of Marketing & Business Development at Levitate Technologies. "Anything you can do to relieve fatigue, to reduce injury, to make workers happier is a welcome solution that manufacturers are very interested in exploring.

It was that goal of reducing worker fatigue, physical burnout, and injury, while not intruding on the workspace that drove Levitate founder, President &

CEO, Mark Doyle to develop the innovative designs for what would become the Airframe™. The Levitate team worked with the new production introduction team at Pathway NPI in San Diego, CA, to engineer and manufacture the technology.

A WELCOME RELIEF

In his vision, a sleek, lightweight upper body exoskeleton could transfer part of the weight of the arm off of the wearer's shoulder, neck, and upper back and disperse it safely to the core body—greatly reducing the risk of injury and muscle weakness.

To accomplish this and keep the wearer's workspace clear of obstructions, the exoskeleton would need to utilize the most precise ergonomic technology, and be made as light and convenient to wear as possible.

Importantly, the Airframe™ would have to be manufacturable in quantities that companies around the globe could procure to protect and enable their employees. This critical factor narrowed the field of outsource manufacturers

that Levitate could engage, and Mark went to great lengths to find the right one to choose for a partner.

“They had to be the best of the best,” says Mark, “because we’re going to be making tens of thousands of these devices. Workers around the world are going to be applying pressure on them all day long. Only a company like Dynacast can really provide that level of precision with that level of load management.”

DESIGNING FOR MANUFACTURABILITY

Dynacast’s engineers helped ensure the quality, rigidity, and performance of Levitate’s new exoskeleton technology through a series of comprehensive design for manufacturability (DFM) sessions over several months.

“Before Dynacast, Levitate had not done any of the design for manufacturability work. In fact, all of DFM was driven by Dynacast,” says Mark.

This was crucial, specifically because the shoulders of the Airframe™ include cassettes filled with tiny components that essentially drive the device and

disperse the weight to the core body. “The components have to be very rigid and withstand the load, but they also have to be ultralight at the same time. It’s almost like a surgical instrument level of accuracy, but body worn,” says Joseph.

Dynacast’s engineers solved tricky tolerance, width and size issues and ultimately specified die cast processes, both for the zinc parts—making them exceedingly durable—and for aluminium, making it incredibly lightweight.

REMOVING THE BURDEN

“The final prototype that Dynacast helped us build is in the hands of real users wearing it in real plants,” says Joseph. And the feedback from global companies working with those prototypes? “We want to order more.”

Exoskeleton technology is on the rise as more companies realize its potential as a solution to worker safety, opening Levitate up to new competition. But, thanks to its patented designs and Dynacast’s commitment to its development, it can be manufactured three times lighter than any other exoskeleton currently in production.

“We engineer solutions. We always want to get involved very early-on with a program so we can engineer the best components and be part of the solution.”

DAN TAYLOR, DYNACAST



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