

## **AIRFRAME™**

**Introducing the Levitate AIRFRAME™ –  
a wearable, ergonomic device that reduces fatigue  
and increases productivity.**

# A GROWING THREAT TO WORKFORCE HEALTH

The human body is an astounding work of engineering. It is not, however, immune from muscle fatigue and overexertion. Our ability to create and build the machines and technologies that drive our society forward is tempered only by our physical limitations. Eventually, the body succumbs to stress from overuse. Over the last 50 years, there has been a significant spike in the instance of musculoskeletal disorders diagnoses among workers. These disorders in 2011 accounted for more than 33 percent of newly disabled workers – up from just over 8 percent in the 1960s.

## Musculoskeletal Disorders on the Rise



Work-related musculoskeletal disorders (WMSD) – including upper extremity WMSD – are commonplace in a variety of industries. The prevalence of these disorders represent a challenge to worker health and productivity – and is partially responsible for consistently rising healthcare costs. Aside from reducing hours, there has been little workers and companies can do to stem fatigue and injury – until now.



# FATIGUE HAS A NEW ENEMY

**Enter the Levitate AIRFRAME™  
– a wearable, lightweight technology  
engineered to improve upper extremity  
musculoskeletal health.**



The AIRFRAME™ transfers the weight of the arms from the shoulders, neck and upper back to the body's core, evenly distributing the load to reduce muscle fatigue. Flexible and scalable to individuals of almost any size, it slips easily on and off and moves seamlessly with the wearer – without intruding into the workspace or limiting motion or dexterity. The AIRFRAME™ mechanical support system progressively activates as the arm is raised, and gradually releases as the arm is lowered, resulting in just the right level of support – at just the right time. It's personalized to fit each wearer, so they can use their arms as normal – while enjoying reduced fatigue and comfort they never thought possible while on the job.

# LOWERING INJURY RISK

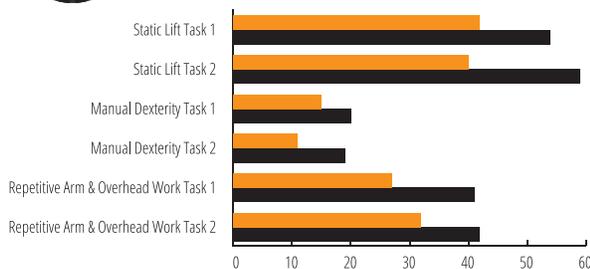
The AIRFRAME™ is new to the market – but it’s already making its presence felt. A recent independent laboratory study, conducted with a university-approved protocol, measured the impact of wearing the AIRFRAME™ during a series of physical activities that mimic the elements of common industrial tasks.

During the study, objective measures of shoulder and neck muscle exertion and force were collected via electromyography (EMG) sensors placed on the muscles. Measures of dexterity were also collected via well-accepted manual dexterity tests, and subjective comfort and effectiveness data was collected via specially designed survey instruments.

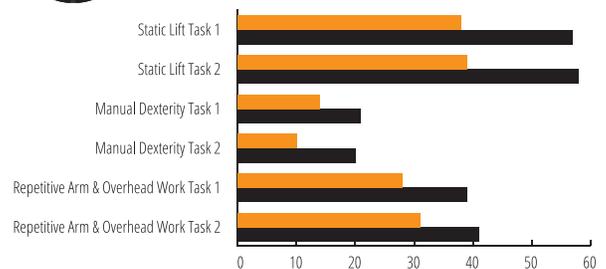
The results indicated a statistically significant reduction in the muscle exertion required to perform the physical tasks, a slight increase in manual dexterity, and an overwhelming preference in regard to the comfort, usability and effectiveness of the AIRFRAME™. Participants rated the AIRFRAME™ as comfortable, and reported that it did not interfere with their workspace or create any undue pressure points on the body. The results further indicate that wearing the AIRFRAME™ during physically demanding work tasks will lessen the muscle fatigue of the shoulder and – by supporting the upper arm and offloading weight to the hips – reduce spinal compression forces on the lower back as well.



**Upper Shoulder Muscle**



**Upper Neck Muscle**



**32% REDUCTION IN MUSCLE EXERTION**

 Muscle activity level w AIRFRAME™  
 Muscle activity level w/out AIRFRAME™

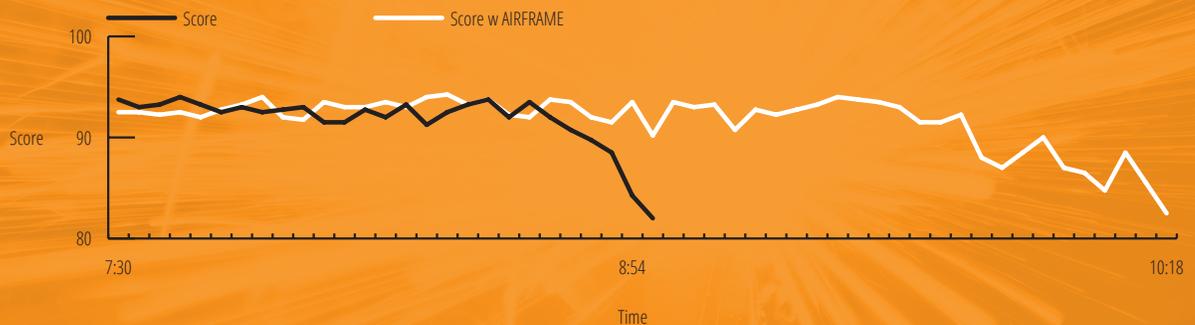
# UPGRADING PERFORMANCE

Many industries rely on human accuracy to drive quality and productivity. Accuracy can significantly decline as repetitions increase and muscle fatigue sets in. To determine if the AIRFRAME™ could enhance quality and productivity in both dynamic and static tasks by delaying muscle fatigue from occurring throughout the work shift, an on-site test of highly-skilled painters and welders at a manufacturing facility was conducted over a five-day period. Both productivity and quality spiked.

During shifts where painters (dynamic tasks) wore the AIRFRAME™, the amount they were able to paint increased 53% before their muscles became fatigued. Quality improved as well, as the AIRFRAME™ helped subjects maintain a steady hand while performing tasks.

**53%**  
**INCREASE IN  
NUMBER OF  
PARTS PAINTED**

Welder (static tasks) testing yielded similar results. Productivity – measured in number of successful welds – increased by an astounding 86 percent. Quality jumped as well, as welders were able to complete successful welds over a much longer period of time while wearing the AIRFRAME™.



**86%** MORE WELDS  
WITH AIRFRAME™

# 50 BILLION DOLLARS

**THAT'S THE ANNUAL DIRECT COST TO EMPLOYERS DUE TO MUSCULOSKELETAL DISORDERS. A LARGE PART OF THIS COST IS ATTRIBUTED TO THE FACT THAT MUSCULOSKELETAL DISORDERS ACCOUNT FOR \$1 OF EVERY \$3 SPENT FOR WORKERS' COMPENSATION.**

# AN INVESTMENT IN HEALTH PAYS THE BEST DIVIDENDS

\$50 billion dollars. That's the annual cost of lost productivity due to musculoskeletal disorders. *Fifty* billion. With approximately 650,000 incidences of upper extremity disorders annually – 45% of workers in certain professions experience shoulder pain – health issues in the workforce are at a critical junction. Pain and injuries result in missed days, low productivity, escalating healthcare costs – and loss of profit. In an effort to address these issues, ergonomics researchers and practitioners have closely examined Personal Lift Assist Devices as a solution.

The Levitate AIRFRAME™ is the best result of these efforts. By infusing innovative mechanical engineering into a practical application, the AIRFRAME™ mitigates the epidemic of musculoskeletal disorders by improving worker health, reducing healthcare costs – and boosting productivity.

**650,000**  
**INCIDENCES**  
**ANNUALLY**



## **ABOUT LEVITATE**

**Levitate Technologies, Inc., is dedicated to improving the lives of active professionals and skilled trade workers through innovative technologies.**

**Levitate is the sole inventor of all of its products and technologies, and holds a comprehensive portfolio of patents. Levitate has an ongoing program of innovation in the field of performance enhancement and health improvement for professionals, and works closely with world class industrial organizations to support them with expertise in manufacturing as well as health and safety engineering.**

**[levitatetech.com](http://levitatetech.com)**