

# Ergonomics

## The backbone of a more productive warehouse

**T**he dictionary defines ergonomics as a science that coordinates the design of devices, systems and physical working conditions with the capacities and requirements of the worker.

That sounds innocent. But just the mention of the word ergonomics is enough to strike fear in the hearts of some executives. Quite frequently, ergonomics conjures up images of mandatory guidelines, expensive and unnecessary solutions, and government inspections to make sure that business is complying with those mandates.

It doesn't have to be that way. For one, there is a cost to not doing ergonomics. "Health care costs are going up 15% a year," says Dr. William S. Marras, the Honda Professor at Ohio State University in Columbus. "Many companies are realizing that one way to tackle this is through prevention. That's what ergonomics is all about."

Ergonomics, however, is more than preventative medicine. While Marras says there are many examples of the

wrong application of ergonomics — and too many products that use ergonomics as a marketing gimmick — good ergonomics is also about improving productivity and efficiency in the plant as well as the warehouse and DC.

"Too many people think that the key to ergonomics is to automate everything," says Marras. "It's not. Ergonomics is about thinking through your processes, understanding the risks, and changing only what you need to change to improve the process."

That's a message any executive should want to hear. As Ed Romaine, marketing director for Remstar International (800-639-5805, [www.remstar.com](http://www.remstar.com)) puts it: "Ergonomics makes dollars and good sense."

It's also a message that is beginning to resonate. "As companies shrink their manufacturing lines into lean work cells," says Charles Alexander Pare, director of sales and marketing for Rousseau Metal (800-463-4271, [www.rousseau-metal.com](http://www.rousseau-metal.com)), "their workers need work environments where their tools are close at hand, the components

Ergonomics is about thinking through your processes, identifying the risks, and changing only what you need to improve in your operations. Good ergonomics is also about improving productivity and efficiency with solutions like intelligent assist devices (IAD), which combine the benefits of traditional devices like hoists with the accuracy of robotics.

Photos courtesy of Gorbel

## Increased Productivity Through Improved Ergonomics

Southworth Products Corp. manufactures a complete line of ergonomic materials handling equipment designed to increase productivity as well as reduce worker fatigue and the risk of injury. Many products thought of as common today, were in fact, Southworth innovations. And, even now with more products and configurations than any other manufacturer, the company continues to introduce new products and improve upon existing ones. The Southworth product line consists of:

### Lift Tables

- Hydraulic or Pneumatic
- Stationary, Portable or Hand Pallet Truck Accessible
- Special Platform size and options including tilt tops and turntables



### Container Tilters

- Designed to accept any type of container
- Tilt angles to 90 degrees
- Stationary, portable, powered portable and hand pallet truck accessible models
- Tilt only or lift and tilt functions

### Level Loaders

- Mechanical, hydraulic or pneumatic
- Self leveling or operator controlled
- Hand pallet truck accessible

### Lifter Transporters

- Manual or powered lift
- Capacities from 200 - 1800 pounds
- High lift capability

As the needs of the factory and warehouse continue to develop and change, Southworth Products Corp. will continue to introduce innovative products to serve them with worker friendly designs, maintenance friendly components and value friendly functionality, dependability and cost.

For more information call  
(877) 656-8593 or visit  
[www.southworthproducts.com](http://www.southworthproducts.com)

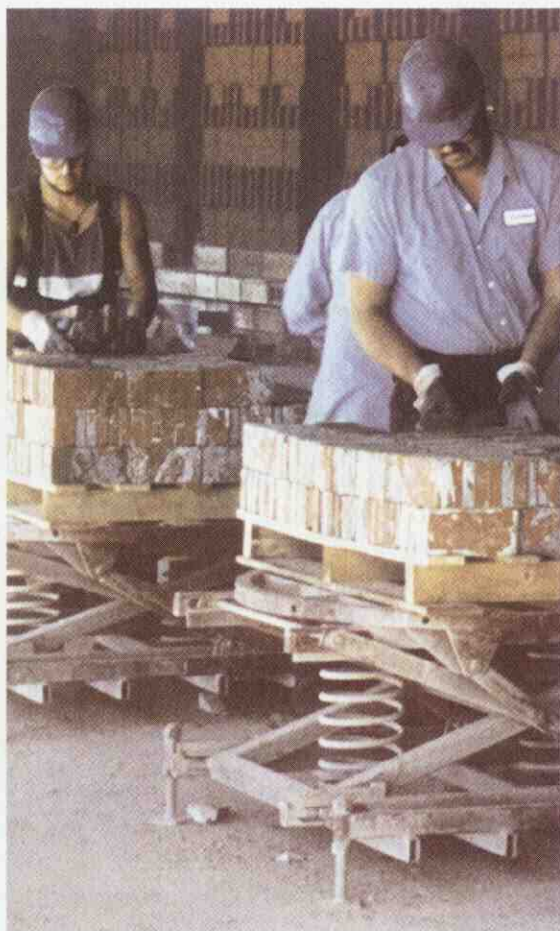


Photo courtesy of Southworth Products

Heavy-duty scissors lifts use springs and shock absorbers to lower or raise the unit to the right height for loading or unloading without bending as pallet loads are built up or broken down.

tions facility can be tricky.

"Ergonomics is a hot marketing topic," says Mike Harnett, director of operations for the workplace consulting firm WorkSMART (866-414-6436, [mharnett@worksmart.com](mailto:mharnett@worksmart.com)). "In a lot of cases, there is no science behind the marketing push."

And yet, ergonomics should be important to any facilities manager. Manual handling, after all, remains the rule at many warehouses. That means

and parts are organized, and the product is in the proper position to be assembled. Those are all elements of an ergonomic workstation."

In this supplement, we'll look at the importance of ergonomics today and how materials handling, packaging and software are providing solutions that deserve to have the word "ergonomics" in the label.

### Ergonomics in action

Best ergonomic practices in warehousing might be summed up this way: Make manual handling jobs easier to perform. Then do it for as many jobs as is feasible to maximize productivity and minimize lost workdays.

That should be simple. But since there are no accepted standards for what constitutes best ergonomic practices, translating that definition into meaningful materials handling solu-

some back and shoulder injuries are inevitable.

"Research has shown that warehouse workers are among the top three high risk occupations, in terms of back strain/sprains claims frequency," according to Wayne Maynard, director, ergonomics and tribology, Liberty Mutual Group (617-357-9500, [www.libertymutual.com](http://www.libertymutual.com)), the largest provider of worker compensation insurance and services.

Nationwide, overexertion injuries rank as the number one workplace safety cost to U.S. business, according to Liberty Mutual, the largest provider of worker compensation services. The price tag: an estimated \$12.5 billion in 2001, the most recent year for statistics.

Injuries occur when warehouse workers manually lift heavy cases; when the job requires that they bend, stretch, or move awkwardly and

overexert their bodies; and especially when they perform highly repetitive tasks throughout a work shift.

It's not just repeated lifting that leads to materials handling related work injuries. So do changing demographics. Today's workers are older, especially in mature industries like automotive. In addition, there are more women in the workplace than ever. Both mean that the amount of maximum load weight that someone is expected to move manually is going down. That is an opportunity for ergonomic solutions.

"We worked with a company in the Carolinas that manufactures glassware for labs," says David Butwid, vice president and general manager, Gorbel (585-924-6262, [www.gorbel.com](http://www.gorbel.com)) and vice chairman of EASE, the ergonomics council of the Material Handling Industry of America (704-676-1190, [www.mhia.org](http://www.mhia.org)). "Until they installed an ergonomic lift device, they could only hire young, strong employees to load the production machines. It's gone from a job that was hard to fill to one where people want to work thanks to ergonomics."

A third important driver is the impact of insurance costs from companies like Liberty Mutual. "I would say that 75% of the people we talk to today are looking for workstations with ergonomic features," says Bob Doucette, sales manager, Bostontec (989-496-9510, [www.bostontec.com](http://www.bostontec.com)). "And a lot of that is being driven by their insurance companies demanding that they do something to improve the workplace environment."

While safety and health care costs are important considerations, they miss another benefit from ergonomics: improved productivity and quality, which lead to better profits.

"The natural outcome of good

ergonomics ought to be productivity," says Brian McNamara, president of Southworth Products (207-878-0700, [www.southworthproducts.com](http://www.southworthproducts.com)), and

**"Research has shown that warehouse workers are among the top three high risk occupations, in terms of back strain/sprains claims frequency"**

— Wayne Maynard, director, ergonomics and tribology, Liberty Mutual Group

vice chairman of EASE. "If you eliminate wasted motion and make the job more natural for the operator, you do improve safety, but you can also realize labor savings of 20 to 30% that go right to the bottom line," McNamara

adds. That is a message too often overlooked by companies considering ergonomics. "Most companies are still justifying projects based on health and safety."

**Ergonomic mindset**

One effective way to improve the workplace is to implement a best practices process, explains Mario Feletto, area manager, Cal/OSHA Consultation Service, Research and Education Unit (916-574-2528, [www.ca.gov](http://www.ca.gov)). That means, "support for ergonomic improvements has to come from the top and from the bottom," he says. "Everyone has to be on board. Employees need to recognize that the people at the top care."

Feletto is talking about an ergonom-

**5 Day Shipments**

**GORBEL**  
A CLASS ABOVE

FREE STANDING  
WORK STATION CRANES



- ▲ If it's late, we pay the freight\*
- ▲ Aluminum bridges for effortless movement
- ▲ 3X easier to move than I-beam cranes
- ▲ 5-year warranty
- ▲ Increases productivity up to 28%
- ▲ Capacities from 250 lbs. to 4000 lbs.

\*See a Gorbel Dealer for details.

**800-821-0086 • [info@gorbel.com](mailto:info@gorbel.com)**

Fax: 800-828-1808 • Internet: [www.gorbel.com](http://www.gorbel.com)

ic mindset, one where the company culture allows “managers and employees to talk about problems,” he continues. “Input from people out on the shop or warehouse floor, is part of problem identification.”

Maynard of Liberty Mutual urges companies to put together an ergonomic team, and then educate them about the physical risk factors that may be present in their operations. Smart, cost-conscious warehouse managers can learn to recognize such injury risks. They also are encouraged to be proactive, rather than reactive, to achieve ergonomic gains.

“Give me a day of training on ergonomics with a warehouse manager and then we can spend time on how to improve jobs,” Maynard adds. “We can then look at what an orderpicker does over an eight-hour shift and what cost-effective measures will lessen injuries.”

Once an ergonomic mindset is in place, the ergonomic workstation is enabled by some of the following materials handling and information handling solutions. These are the tools most often associated with ergonomic materials handling.



Photo courtesy of Southworth Products

Tilt tables, which tip a bin or drum so an operator can easily remove the contents without bending, take the strain out of repetitive manual tasks in the warehouse or on the manufacturing line.

## Workstations

Workstation design can have an impact on the ergonomic health of employees.

“The ergonomic workstation is really all about posture,” says Doucette of Bostontec.

Posture starts with a determination about whether the operator is sitting, standing or doing both. That calls for the ability to adjust the workstation so that the work is at the right height for the operator’s body type with parts and tools in easy reach. “You start by determining the height of the surface the operator has to deal with,” Doucette says. “Then you consider the reach zones which determine how shelving, racks and other types of storage equipment are placed around the workstation.”

Most importantly, workstations should be adjustable to accommodate more than one worker, especially in facilities with multiple shifts. Those adjustments should be people-friendly. “If the adjustments aren’t easy to make, the operators won’t use them,” says Doucette.

## Pallet and container handling

Many manual jobs can be made much more efficient with assist devices that position pallets and containers, and make them easier to access.

“Ask yourself, ‘how many times does a conveyor stop while a worker builds a pallet or the production line back up while an operator is down on one knee getting a carton from the floor?’” says McNamara of Southworth Products. “Those jobs can be done more safely with simple materials handling devices designed with ergonomics in mind.”

Take manual pallet handling. There, spring-activated lift tables position a pallet at the right height for palletizing or depalletizing. Likewise, tilters tip a container or drum so an operator can easily reach inside to remove the contents. Operations like manual stretch wrapping can become more

## A FRESH ANGLE ON WORKSTATIONS.



- Ergonomically designed for operator comfort.
- Great value in a workstation, standard and custom.
- Quick delivery.

**Production  
BASICS**

Solid To The Core.

1.800.318.2770

www.pbasics.com

productive with a simple powered turntable that can take the strain out of that job.

### Ergonomic packaging

The auto industry has already embraced ergonomics. "The auto companies have an aging work force and there's a heavy price tag attached to strains and sprains," says Bret Carlson, director of engineering services for ORBIS Corp. (262-560-5000, [www.orbiscorporation.com](http://www.orbiscorporation.com)). "Most have ergonomists on staff to look at workstation layouts and devise weight limits for their containers."

Ergonomics also dovetails nicely with lean manufacturing initiatives being implemented by the major automakers here and abroad. "Lean is about eliminating waste," Carlson says. "Don't make me walk further than I have to walk, reach further than I have to reach, or lift more than I have to lift. Those are also good ergonomic principles."

That has led to a complete redesign of the containers and dunnage used to deliver parts to operators at the line. Where a day's worth of parts might have once been stored lineside in large containers, now, an hour's worth of parts are presented to the operator in containers that are easy to lift and easy to access.

By replacing disposable corrugated packaging and wooden pallets with reusable plastic containers, automakers are also eliminating injuries associated with loose boards and nails, metal and plastic strapping, and box knives used to open containers.

### Vacuum lifting and manipulators

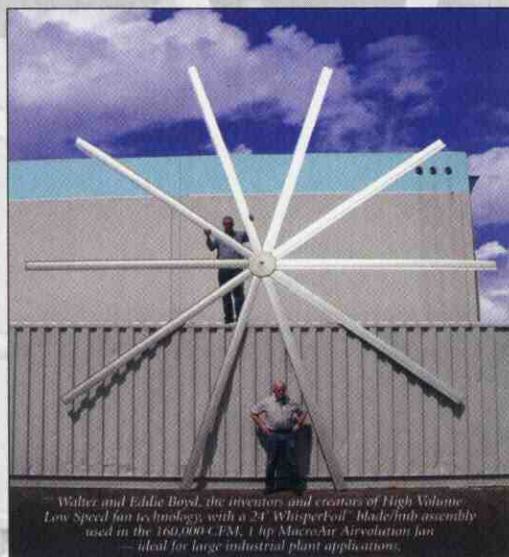
Smarter packaging and assist devices are an important first step. But in manual warehouses and factories, someone still has to lift and move those packages by hand. That's

where vacuum lifters and manipulators come into play.

Vacuum lifters use a vacuum of air to grip and lift boxes, pails, drums or sheets of material. "A vacuum system

is less expensive than a robot and cheaper to maintain," says Alan Zimmermann, vice president, Unitech Industries, Inc. (800-571-1182, [www.unimove.com](http://www.unimove.com)). "And while a

## Stop Energy Costs From Going Through The Roof!



*Walter and Eddie Boyd, the inventors and creators of High Volume Low Speed fan technology, with a 24' "WhisperVoll" blade/fan assembly used in the 180,000 C.F.M. 1 hp MacroAir Airvolution fan — ideal for large industrial plant applications.*

### High Volume Low Speed fans from MacroAir:

- Save up to 20% or more on heating bills.
- Effectively de-stratify heat layers for greater comfort.
- Efficiently cool large spaces.
- Mix & ventilate large volumes of air.
- Operate for just pennies per day.
- Provide quick payback, high ROI, and significant NPV.
- Leverage complex physics using a simple system — for healthier, drier, and more productive environments.

**Join the Airvolution™ in HVAC!** We invented High Volume Low Speed fans. We've been building them for years. People love them. We stand behind them. And they'll make you a hero!

Contact our team today. We'll treat you right.

(866) MoveAir (1-866-668-3247)

Email: [info@macro-air.com](mailto:info@macro-air.com)

[www.macro-air.com](http://www.macro-air.com)



**We Move Air™**



MacroAir™, Airvolution™, We Move Air™, The Original Big Fans™ (EMBLEM), and the MACROAIR TECHNOLOGIES™ (LOGO) are trademarks of MacroAir Technologies LLC. All rights reserved. ©MacroAir Technologies LLC 2004.

The backbone of a more productive warehouse

vacuum system won't eliminate all operators, it does allow one person to do the job of several."

While vacuum lift devices are found in both manufacturing and warehousing environments, manipulators are primarily used in manufacturing. A manipulator extends an operator's reach, allowing the operator, for instance, to reach into a car to install a seat on an auto assembly line. And, it does so with very little effort on the part of the operator.

### Intelligent assist devices

While vacuum lifters, manipulators and hoists have been in the market for years, a new class of lifting device has recently emerged: intelligent assist devices (IAD), also known as intelligent lift devices.

An IAD is a computer-controlled device that enables workers to lift, move, and position loads much faster, safer and more accurately than in the past. Because the devices can be programmed for precise placement, product damage is reduced.

"IADs combine the benefits of traditional human assist devices, like hoists, with the accuracy of robotics," says Steve Klostermeyer, global product manager — Cobotics, a division of Stanley Assembly Technologies (440-461-5500, [www.stanleyassembly.com](http://www.stanleyassembly.com)). "By using sophisticated sensors and servo-actuated controls, the technology is faster and more responsive."

What's more, through the use of computers, sensors and software, the units are more intuitive, says Butwid of Gorbel. "An intelligent lift device adjusts to a changing force, a changing load, or changing direction without human interaction," Butwid says.

IADs are more expensive than traditional lifting devices. For that reason, they have primarily been used in appli-

cations requiring high throughput, a high degree of precision, or high value add, like the automotive industry.

### IT & Ergonomics

Once an ergonomic workstation is in place, warehouse management systems (WMS), especially those with robust labor management, can play an important role in managing the ergonomic workstation, according to John Roesler, consulting group leader, RedPrairie (877-733-7724, [www.redprairie.com](http://www.redprairie.com)).

Slotting modules, for instance, can be programmed to determine the location of product based on carton size and characteristics like weight, putting

**"Many companies are realizing that one way to tackle rising health care costs is through prevention. That's what ergonomics is all about ...."**

— Dr. William S. Marras,  
Ohio State University

heavier items in the ergonomic "knees to chest zone," while storing lighter items near the floor or on top, where workers have to bend or reach.

Labor management systems can also be used to develop ergonomic work standards that allow people enough time to do a task and eliminate unnecessary twisting. And since labor management systems also monitor a worker's output, those systems can be programmed to send alerts to management when a worker has reached his or her threshold. That can be important for an employee returning from an injury, or who is restricted in some way.

These are just some of the solutions that go into creating the ergonomics workstation. But with them, companies can create a safer environment for the workers, reducing health care costs and increasing productivity, turning ergonomics into dollars and sense.

### New Ergonomic Study From Gorbel

An independent research team compared Gorbel's G-Force to four other lifting devices, plus manual lifting. They simulated typical lifting situations: high cycle and precision placement applications and studied each device's performance in terms of productivity, energy exerted and potential for product damage.

Visit [www.gorbel.com/gforce/study](http://www.gorbel.com/gforce/study) for your copy.

**GORBEL**  
A CLASS ABOVE

### We are the original inventors and manufacturers of High Volume Low Speed fans.

With diameters up to 24 feet, and moving up to 230,000 CFM in up to 20,000 square feet of space, our MacroAir™ fans with WhisperFoil™ anodized aluminum blades provide the most cost-effective and efficient air movement systems for cooling, ventilation, and heat destratification compared to other HVAC solutions. Visit us to learn more — we'll treat you right.

**MacroAir Technologies LLC**  
2 Corporate Drive  
Shelton, CT 06484  
Tel: 203-925-7726  
866-MOVEAIR  
(866-668-3247)

### Use Hand Crank Height Adjustable Table to Improve Ergonomics

This adjustable work table provides smooth movement and precise positioning with a minimum of effort using an integrated crank handle. The Hand Crank Height-Adjustable Table is ideal for dual shifts or operators sharing a workstation. Table is height adjustable from 30 to 42 inches and available in four widths.



**Production Basics**  
Watertown, MA 02472  
Tel: 617-926-8100  
Toll Free: 800-318-2770

Reed Business Information, a division of Reed Elsevier, Inc. All Rights Reserved. Copyright of Modern Materials Handling is the property of Reed Business Information and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.