



PROMAT 2015

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The Effects on MH Equipment Design with an Aging and Obese Workforce

Sponsored by:



EASE
Ergonomic Assist Systems & Equipment
www.mhi.org/EASE

Presented by:

Jim Galante – Southworth Products

James Green – Ingersoll Rand

Dave Lippert – Hamilton Caster & Mfg.



Jim Galante

Southworth Products

SOUTHWORTH
making work faster, safer, and easier

Trade organization made up of 15 manufacturers and a consulting group. There are over 50 different types of products and technologies that provide real solutions to manual material handling problems



UNIFIED INDUSTRIES, INC.

A Columbus McKinnon Company



A MILLWOOD INC. COMPANY





Casters ★ Trucks ★ PRONTO



SOUTHWORTH
making work faster, safer, and easier



Helping solve the ergonomic challenges in the workplace

EASE is the resource for:

- Equipment solutions – 15 companies – 50 technologies
- Case studies
- Work shops & panel discussions
- Equipment photos – huge library
- Ergonomic trends and news articles
- Information – check lists , white papers, technical reports
- Resources – private & governmental organizations
- Presentationsand speakers to present them
- Guidelines – ergonomic best practices
- Ergonomic & productivity enhancements
- Downloads – over 90 available – FREE
- Ergonomic and safety events

GORBEL
A CLASS ABOVE



IR Ingersoll Rand

HAMILTON
Casters * Trucks * PRONTO

UNEX
THE TRACK TO BETTER PICKING

Positech
CORPORATION
The Leader in Positioning Technology

Liberty Technologies
A MILLWOOD INC. COMPANY

ALBION
THE CASTER EXPERTS

SCHMALZ
100 Years
1910 - 2010



UNIFIED INDUSTRIES, INC.
A Columbus McKinnon Company

DEMAG
A TEREX BRAND

resinDEK
the panel of expertise
Mezzanine Floors by CORNERSTONE
SPECIALTY WOOD PRODUCTS, LLC

THE ERGONOMICS CENTER
OF NORTH CAROLINA

dalmec
Industrial Manipulators

SOUTHWORTH
making work faster, safer, and easier

Products available - solutions to material handling problems

Ergonomic research services
Engineered Wood Flooring
Wheels
Casters
Jib Cranes
Full power stackers
Positioners (automatic and manual)
Manipulators
Balancers
Work station cranes
Pneumatic hoists
Electric hoists
Tilters (portable & fixed)
Manual turntables
Bridge cranes
Stainless steel gondolas
Work positioners
Below hook slings

Vacuum lifts (portable & fixed)
Vacuum positioners
Pallet inverter/rotators
Industrial platform trucks & carts
Modular cranes
Pillar & wall mounted cranes
Carton flow rack
Intelligent assist devices
Conveyance systems
Vertical reciprocating conveyors
Manual stackers
Transfer cars
Portal cranes
Personnel lifts
Two wheel hand trucks
Powered & manual hand pallet trucks
Industrial magnets
Scissors lifts

The Effects on MH Equipment Design with an Aging and Obese Workforce

The Aging Workforce

- In 1972, average age of a US worker was 28. Currently it is approximately 46.*
- The number of workers aged 45 and older has doubled since 1950.*
- According to the AARP, the number of people 55 years and older in the labor force – which stood at about 18.2 million in 2000 – is projected to rise to 25.2 million this year and 31.9 million by 2025.

*Source : ASSE <http://www.asse.org/gaitherpdcpaper.htm>

As We Age....

- Maximal Strength
- Muscle Mass
- Bone density
- Visual and Auditory, Acuity
- Fitness
- Aerobic Capacity
- Cognitive Speed/Function

- Obesity
- Arthritis
- High BP
- Diabetes
- Depression/Heart Disease
- Menopausal and Post Menopausal Issues

Definitions of Obesity

Body Mass Index (BMI) of 30 or higher. (Mine's 31.6 – Boo!)

BMI: A measure of an adult's weight in relation to his or her height and age.

- Obese is generally defined as at least 30 to 40 pounds overweight.
- Severely obese is considered to be at least 60 pounds overweight.
- Morbidly obese is at least 100 pounds overweight.

The Costs of Obesity

- More than one-third (34.9% or 78.6 million) of U.S. adults are obese.
- Obesity-related conditions include heart disease, stroke, diabetes and certain types of cancer.
- The annual medical cost of obesity was \$147 billion; the individual medical costs are \$1,429 higher than those of normal weight.
- Blacks have the highest age-adjusted rates of obesity (47.8%) followed by Hispanics (42.5%), whites (32.6%) and at Asians (10.8%)

Source: CDC NIOSH

Effects of Obesity

- WC (Workers' Compensation) medical claims cost are 6.8 times higher
- The obese file twice as many WC claims as healthy weight workers.
- 13 times more lost workdays than healthy weight workers.
- Indemnity costs are 11 times higher than healthy weight workers.
- Most prone to injury: back, lower extremities, wrist, and hands.
- The most common causes of these injuries were lifting, lowering, and slipping as a result of manual material handling.

Source: CNA Insurance Co.

James Green

Ingersoll Rand



Freestanding workstation cranes



- Effortless and precise control
- Articulating hanger assemblies
- Enhanced structure stability – no cross bracing



Single & Double girder cranes



- Increased efficiency with handling heavy loads in tight work areas



Monorail Systems and Alumimun Modular cranes



Pillar & Wall Mount Jib cranes

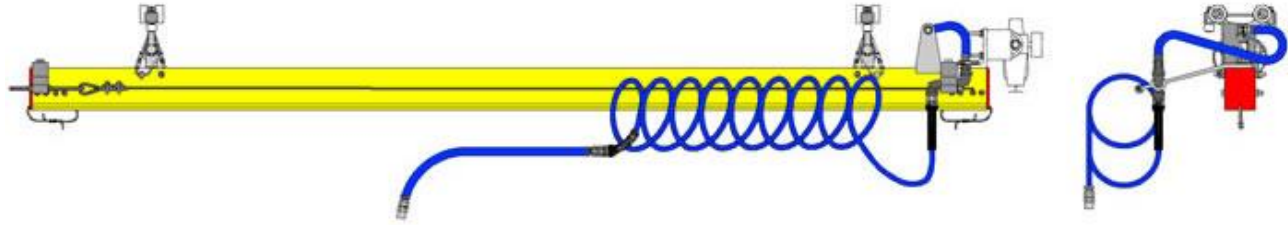


Manipulator and Stacker cranes



■ Optimum ergonomic load handling

Special Purpose Cranes & Systems



Engineered Flooring

- Studies at two Different DC's, 500,000+ S.F
- Bar grate vs. Engineered Wood Decking Platforms



Engineered Flooring

Testing – Order pickers

- How Far Do Employees Walk normally ?
- 16 Volunteers fitted with Pedometers
- Using an average of 30” per pace, employees averaged 21,000 steps = 10 miles per day!



Engineered Flooring

Testing

- Same volunteers fitted with accelerometer
- Measurements recorded on Various Surfaces at Various Walking Speeds



Engineered Flooring

Summary Ergonomics Test Results:

- Walking on Concrete vs. Engineered Wood

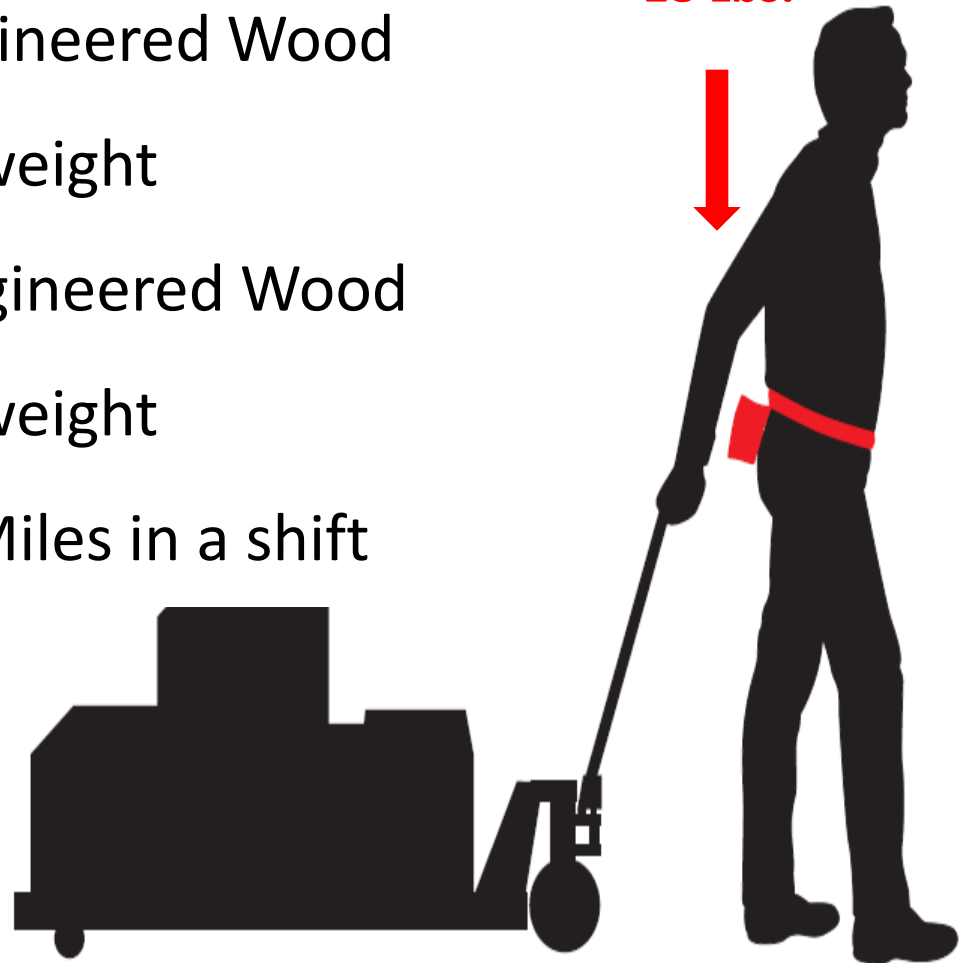
Decking adds 12 lbs. of body weight

- Walking on Bar Grate vs. Engineered Wood

Decking adds 18 lbs. of body weight

- Avg. Order Picker walks 10 Miles in a shift

12 to
18 Lbs.



Jim Galante

Southworth Products

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Understanding the issues



Vacuum Technology

Application

Maneuver and rotate
composite shrouds

Benefits

1 operator vs. 4 to 8 manually
Reduction in ergonomic risks



Vacuum Technology

Application:

Benefits

Large sheet handling

Increased productivity & less turnover



Vacuum Technology

Application:

Keg palletizing

Benefits:

50% productivity increase



Vacuum Technology

Application:

Palletizing & de-palletizing boxes

Benefits:

Reduction in ergonomic risks

Less worker turnover

Maintained productivity



Manipulator Technology

GLASS HANDLING – 30 to 130 lbs.



Manipulator Technology

PANEL HANDLING – 50 to 110 lbs.



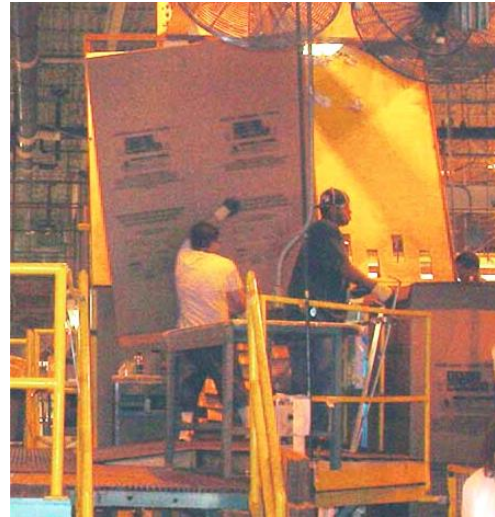
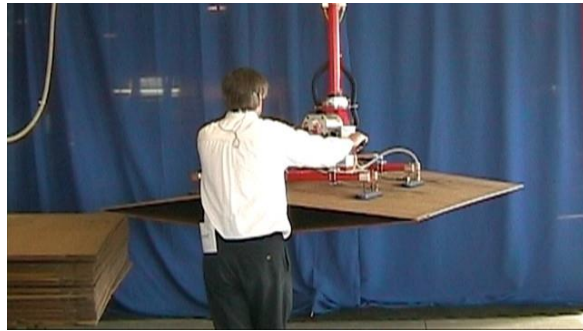
Manipulator Technology

MUFFLER HANDLING – 38 to 46 lbs.



Manipulator Technology

LARGE CARDBOARD BOX HANDLING



Intelligent Assist Device (IAD)

precise
and
rapid
movement



Lifting & Positioning



Positioner hold the top layer of goods in the ergonomic "magic Window" (30" to 40" from the floor)

Lifting & Positioning

Positioners respond to the load - leaving the operator to concentrate on the task

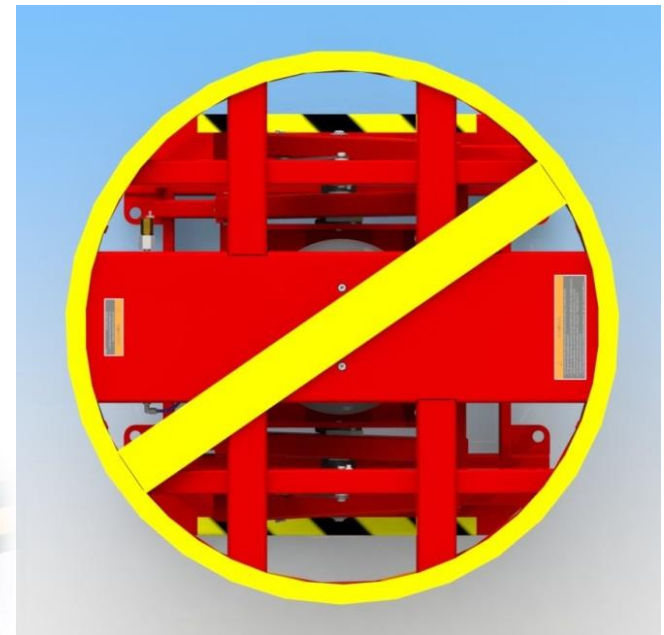
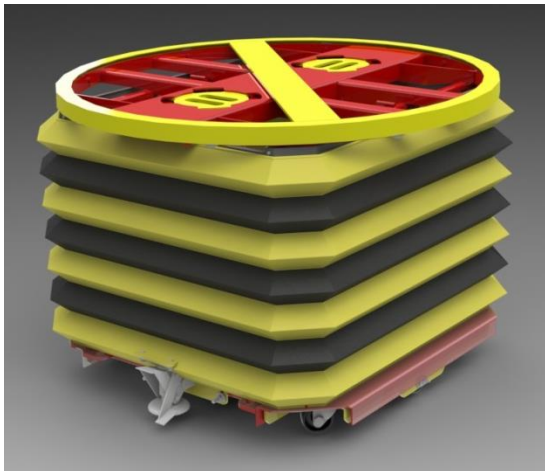
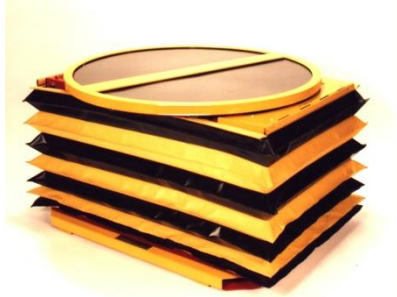


Cognitive skills often diminish as we age.

By reducing the ancillary functions of a task we improve the workplace



Traditionally positioners were "square" with sharp corners and edges.



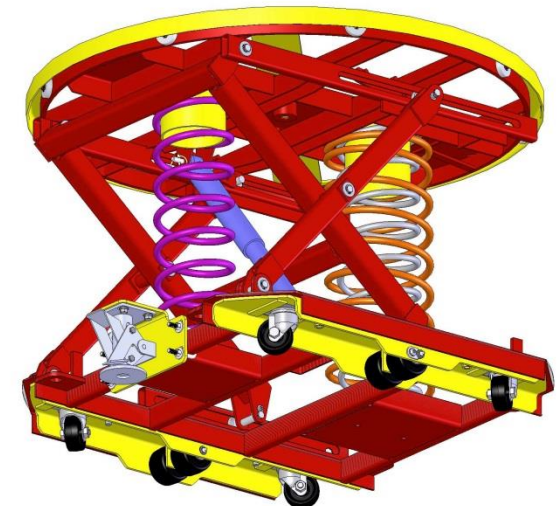
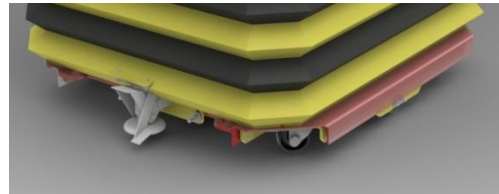
New designs today are looking at round platforms and "soft edges"



Traditionally transport and portability sets with located on the corners of bases



Today, we are trying to move them up under the frames, tuck them in and eliminate the trip hazards.



Lifting & Positioning

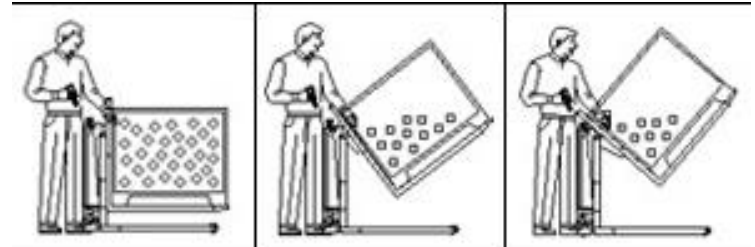


Notice the "Dog Bone" shaped turntable to allow better horizontal access to the large assembly. The lift provide vertical access.

Lifting & Positioning



By minimizing this width we bring the worker closer in to the work which reduces the reach.



Lifting & Positioning



Battery powered light-duty scissors lift

Powered two wheeled truck

Saves the lower back , eliminates the wasted motion and increases productivity.

Dave Lippert

Hamilton Caster and Mfg. Co.



Wheel and Caster Technology



Pneumatic



Soft faced,
molded and
composition



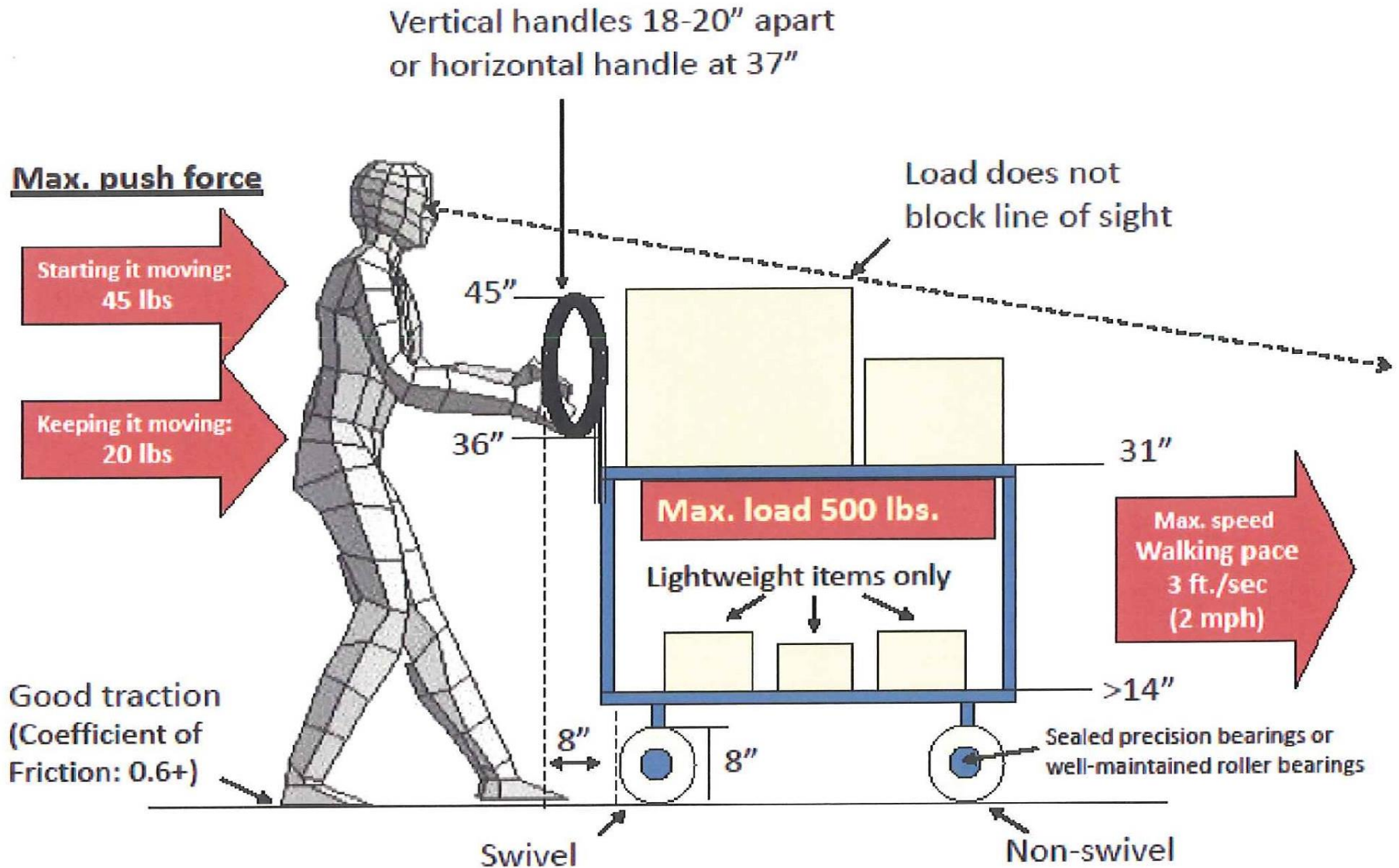
Metal



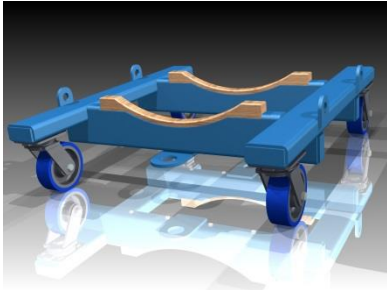
Caster styles



Wheel and Caster Technology



Wheel and Caster Technology



Light duty
specialty carts
and industrial
trucks



The right casters can:

- Reduce push-pull forces
- Minimize rolling noise
- Protect floors
- Increase service life.



Wheel and Caster Technology



Platform elevated

Examples
of good
applications



Correct push bar height



Larger wheels



Platform too low

Examples
of poor
applications



No push bar



Wheels too small

Wheel and Caster Technology



Narrowest wheels possible to minimize the rolling friction

Notice the assembler is “rolling” also – minimizing body movements

Carton Flow / Liquor Application

Benefits

- SKU density reduces walking
- Reduces reaching and bending.
- Ergonomic presentation angle



Carton Flow / Liquor Application

Benefits

- increased density reduces walking
- Assisted pick reduces overexertion
- Improved organization for a safer workplace



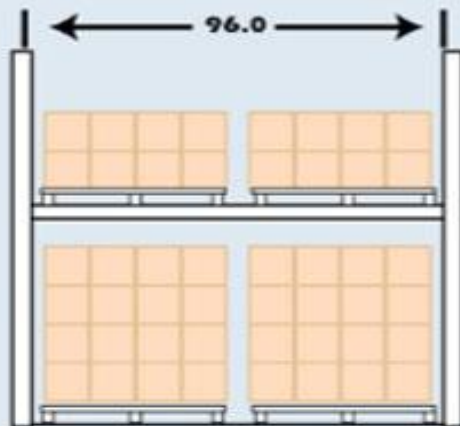
Carton Flow / Retrofit Application

ROI

Convert From Pallet Rack to Carton Flow

TYPICAL BAY

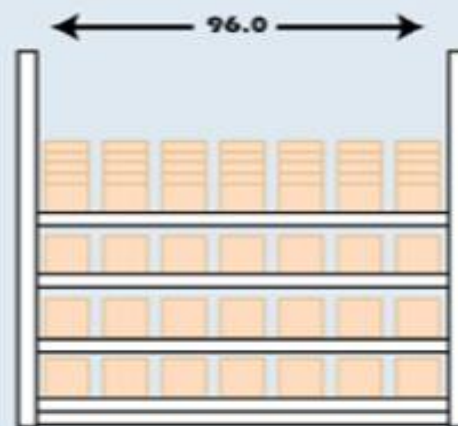
Pallet Rack Pick



4 SKU's per Bay
96 Bays
384 SKU's



Carton Flow

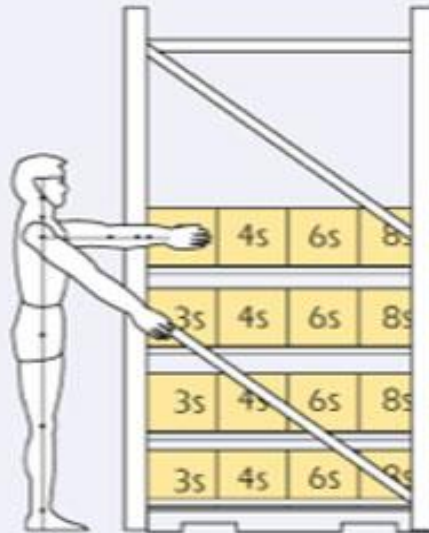


28 SKU's per Bay
14 Bays
384 SKU's

Carton Flow - Retrofit Application

Pick Rates

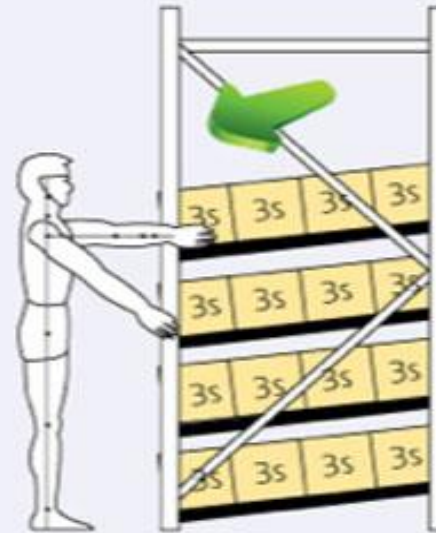
Pallet Rack
Static Storage



Average Pick

5.2 Sec

Carton Flow
Dynamic Storage



3.0 Sec

Ergonomic Guidelines for Manual Material Handling

Free copy

The Ergonomic Guidelines

68 pages, full process
color, cover-to-cover

Hard copy or electronic

Available on the website



www.MHI.org/EASE



CNA

E.A.S.E.

NIOSH



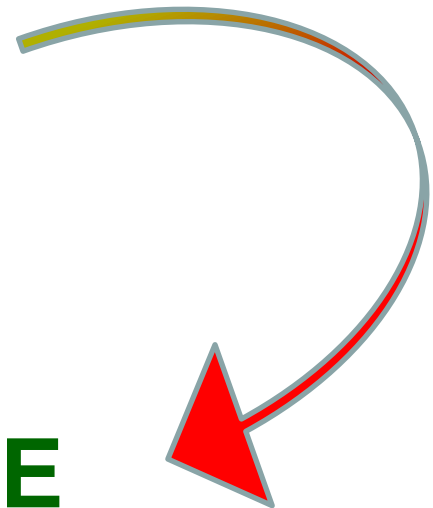
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Questions

For more information about this and other ergo issues



www.MHI.org/EASE



**FIND WHAT'S
NEXT.**



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