Equipment Solutions for Manual Material Handling Challenges
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EASE Council
Material Handling Industry
Charlotte, North Carolina
800 Member Companies

Over $170 Billion

17 Industry Groups
19 Member Companies
55 Industries/Technologies
Ergonomic Resources and Tools
Health and Safety News
Case Studies of Equipment Applications
Checklists and Technical Support
Research and White Papers
Speakers and Presentation Materials
Workshops and Outreach to the User Community
Equipment Solutions for Manual Material Handling Challenges
Understanding the Challenges – Warehousing and Distribution
Understanding the Challenges– *Order fulfillment*
Understanding the Challenges – Lifting and Carrying Material
Understanding the Challenges – Assembly tasks
Understanding the Challenges – Manufacturing and Fabrication
Understanding the Challenges – Retail and Merchandising
What is adding to these challenges

✓ Rapidly aging workforce
✓ More obese workforce
✓ Competitive pressures – foreign & domestic
✓ Productivity demands - do more with less people
✓ Financial restraints
✓ Escalating Workers Comp costs
✓ Retaining valuable employees
Ergonomic issues are almost always production bottlenecks

✓ Wasted motion (a core LEAN value)

✓ Wasted time (including fatigue)

✓ Quality shortfalls

✓ Poor morale (effecting worker thru put)
LIFTING
STRETCHING
REACHING
BENDING
STOOPING
and
WALKING
Typical problem ... and an ergonomic problem
As much as 40% of the time required for unloading a pallet, can be spent walking around it!
Manual Turntables

...... inexpensive and pallet jack accessible
This unproductive task that involves repetitive lifting, bending, twisting, stretching and walking with a load
Review the material handling problem holistically

Questions to ask:

- Weight of sacks
- Size of sacks (wider sacks are much harder to carry)
- Can smaller sacks be ordered from the supplier.

Note the stairs. Carrying loads up stairs is a huge ergo issue

Note the condition of the floor some materials can be very slippery – a safety issue
Skid lifters

Manual and powered

Careful, can only be used with nestable, open bottom pallets or skids
Roller conveyor can be used in rack and shelving.

Greatly reducing the stress on storing or retrieving heavy cases and cartons.
Issues: back bending, walking around pallet on a wet floor
The issues were dramatically reduced by the use of a spring load positioner and fixed height table.

The old method req’d the load be lifted twice; the new method meant only lifting the load once; work task reduced 50%.
Consider the work environment like processing perishable foods...

Is expensive stainless steel equipment necessary or could galvanized or just epoxy finished mild steel suffice?
The challenge here is heavy cases of liquids and available workers don’t have the upper body strength to handle them hour after hour.

The vacuum tube lifter makes the individual case almost “weightless”

The worker can do their job safely and maintain even increase productivity.
Vacuum tube lifters are highly efficient for handling cartons, bags and pails. They can be easily adapted and work well in a small work areas.
Load positioners automatically function holding the top layer of goods in the 30” to 40” window
Notice the top layer is about at the same elevation
Opening up the pick slots
Stackers

They are highly maneuverable in tight quarters and can eliminate the manual lifting

These are inexpensive choices especially when compared to fork lifts
Pallet rotators make quick work exchanging pallets.

Damaged product on the bottom of a pallet can be easily removed.
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 Aluminum Modular cranes
Pillar & Wall Mount Jib cranes
Special Purpose Cranes & Systems
Manual loading and unloading of wire baskets, containers, gaylords and totes leads to incidents of upper & lower back injuries.
Challenge: Back bending, back extension, over reaching, fatigue and product loss

Since the legs cannot bend, all the bending is at the lower back.
Portable Powered Tilters
Back Saving Solution!
High hinge tilters are ideal for gaining access to the bottom and back of containers.
The challenge is simply giving the assembler total access to work lift and tilt devices provide ready that access.
These spring loaded positioners can be adapted fitted into carts, hampers, wheeled tubs and gondolas.
There are spring loaded positioners which elevate the goods in the container to speed picking the parts and eliminates the bending and reach issues.
This a low hinge tilter. It can sit flat on the floor and be raised with a built-up base.
Corner Tilters

Excellent for granular material or other semi liquid material that flows
Greatly reducing the stress on storing or retrieving heavy cases and cartons.

Roller conveyor can be used in rack and shelving.
Amplifies operator’s power
Unit has an intuitive, human-like feel

Intuitive
The operator has a sense of control & feel over the load using normal arm, wrist and hand movements.

Intelligent
Resolver feedback from the servomotor allows for future implementation of programmable human limits.
IAD’s for precision handling
Carts, Dollies, Platform Trucks and U-boats
Dave, I’m assuming you can drop a few slides in here to better discuss things on wheels!
Pushing (or pulling) heavy loads is bad ergonomics and is also a dangerous work task (health and safety issues)
They come in all shapes and sizes and to gain the maximum benefit should be applied to the application.
Rule #1 – don’t overload a cart!
Rule #1 ....even if you have help moving it
Rule #1 ......or even if it has a motor!
Wheel and Caster Technology

- Vertical handles 18-20” apart or horizontal handle at 37”
- Load does not block line of sight
- Max. push force:
  - Starting it moving: 45 lbs
  - Keeping it moving: 20 lbs
- Good traction (Coefficient of Friction: 0.6+)
- Max. load 500 lbs.
- Lightweight items only
- Sealed precision bearings or well-maintained roller bearings
- Max. speed Walking pace 3 ft./sec (2 mph)
- Swivel
- Non-swivel

EASE
Ergonomic Assist Systems & Equipment
The wheel choice can have a huge impact on the rolling friction of any cart, dolly or portable rack.
Powered two wheel hand truck
These lightweight aluminum stackers are highly maneuverable...

....they provide easy access to loads to eliminate reaching...

...and increase efficiency and productivity!
Manual & Powered elevating carts

Self leveling carts
Manufacturing and assembly operations are moving to towable carts.
Look to positioning devices when the towable cart is placed in the work cell.
Properly placed supplies and tools eliminates walking around and promotes a highly efficient work space.

These are adjustable height benches.

The majority of industrial work benches sold today are powered.
Available Resources....
Factors Impacting MMH

- The ratio of task demands to worker capacity during manual materials handling influences the occurrence of potential undesirable effects such as fatigue, discomfort, injury, and occupational injury.

Ergo checklists

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Ergonomic Guidelines for Manual Material Handling

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