

Introduction to Overhead Material-Handling Equipment

Overhead Alliance Lecture Material



Topics to be Discussed

I. Introduction to Basic Material Handling Equipment (MHE)

- a. Conveyors
- b. Industrial trucks
- c. Overhead solutions
 - i. Hoists
 - ii. Cranes
 - iii. Monorails

II. Benefits of Overhead MHE

III. The Overhead Alliance

Conveyors

- Move Uniform Loads,
- Continuously,
- Over a Fixed Path



Gravity Roller Conveyor



Powered Roller Telescoping
Conveyor

Industrial Trucks

- Lifting/Moving Loads Intermittently,
- Over a Variable Path



Walking



Riding



Automated

Overhead Equipment

Hoists



Cranes



Monorails

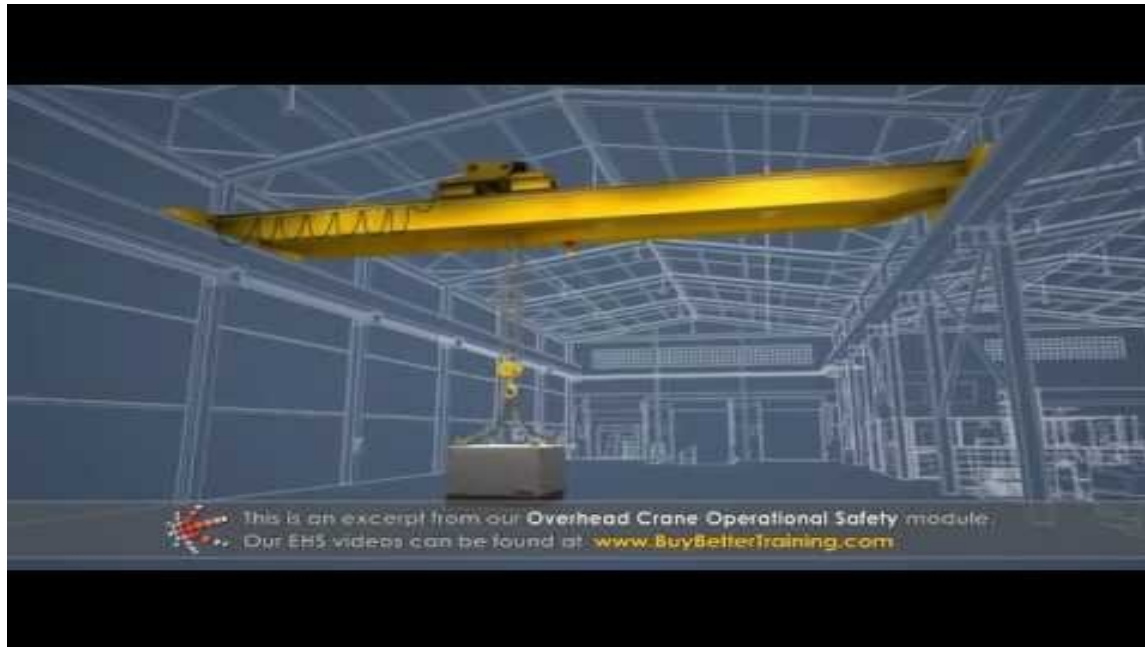


Overhead Hoists

- For Vertical Lifting,
- Of Freely Suspended Loads,
- Using Wire, Rope, or Chain,
- Manual/Electric/Air Power

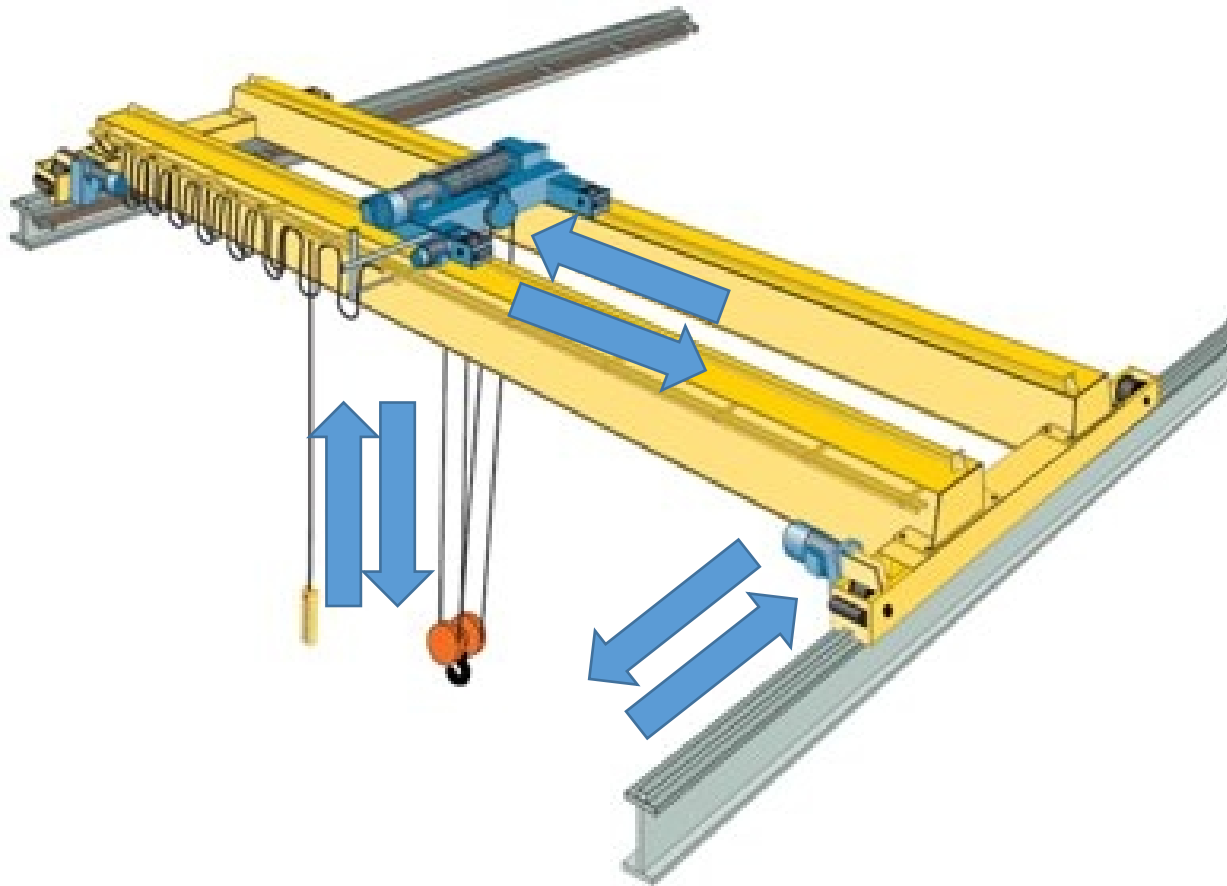


Overhead Cranes



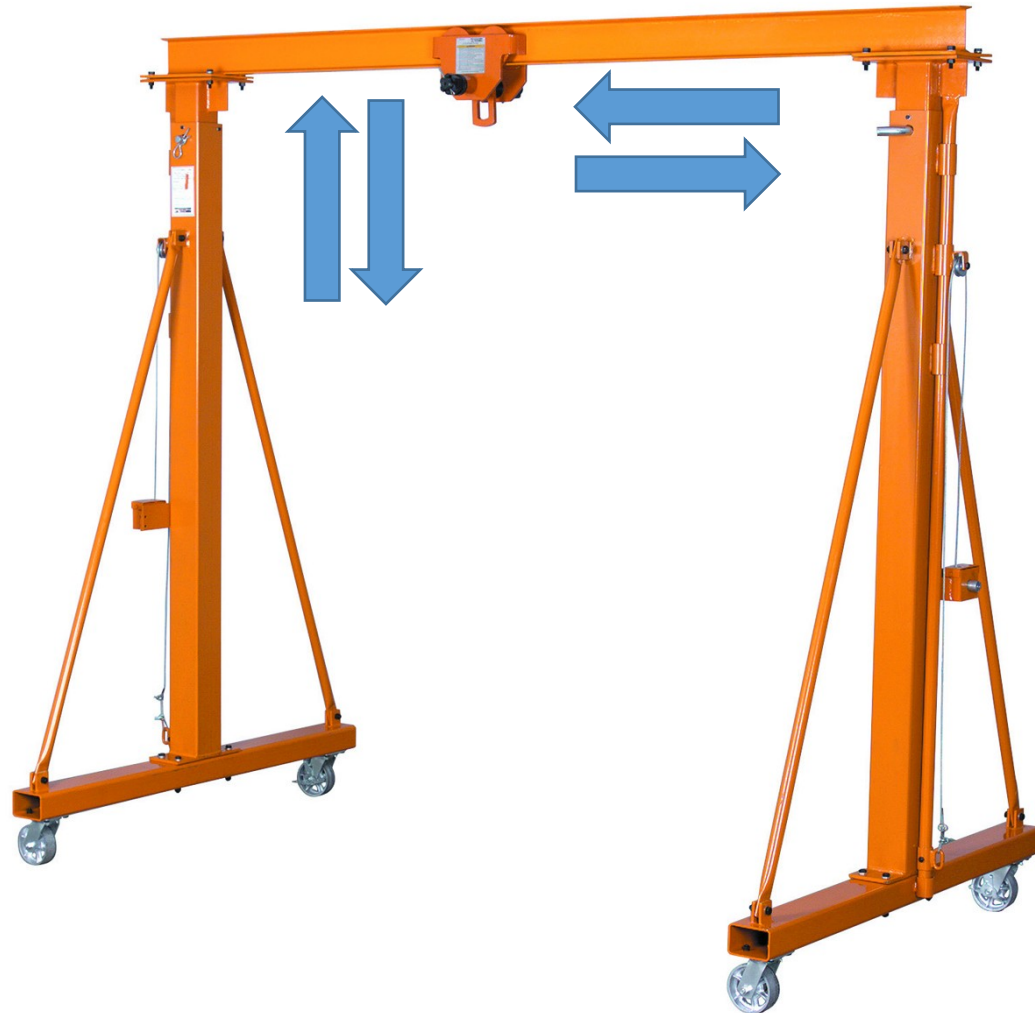
- For Moving Loads,
- Lift Using Hoists,
 - Can be equipped with below the hook lifters including magnets and grabs
- Types: Bridge, Gantry, Jib,
- Full Control of Load

Overhead Cranes - Bridge



- Mounted Bridge (does not touch the floor),
- Spans over Work Area,
- 3 dimensional coverage,
- 2 types: Top Running
Under Running

Overhead Cranes - Gantry



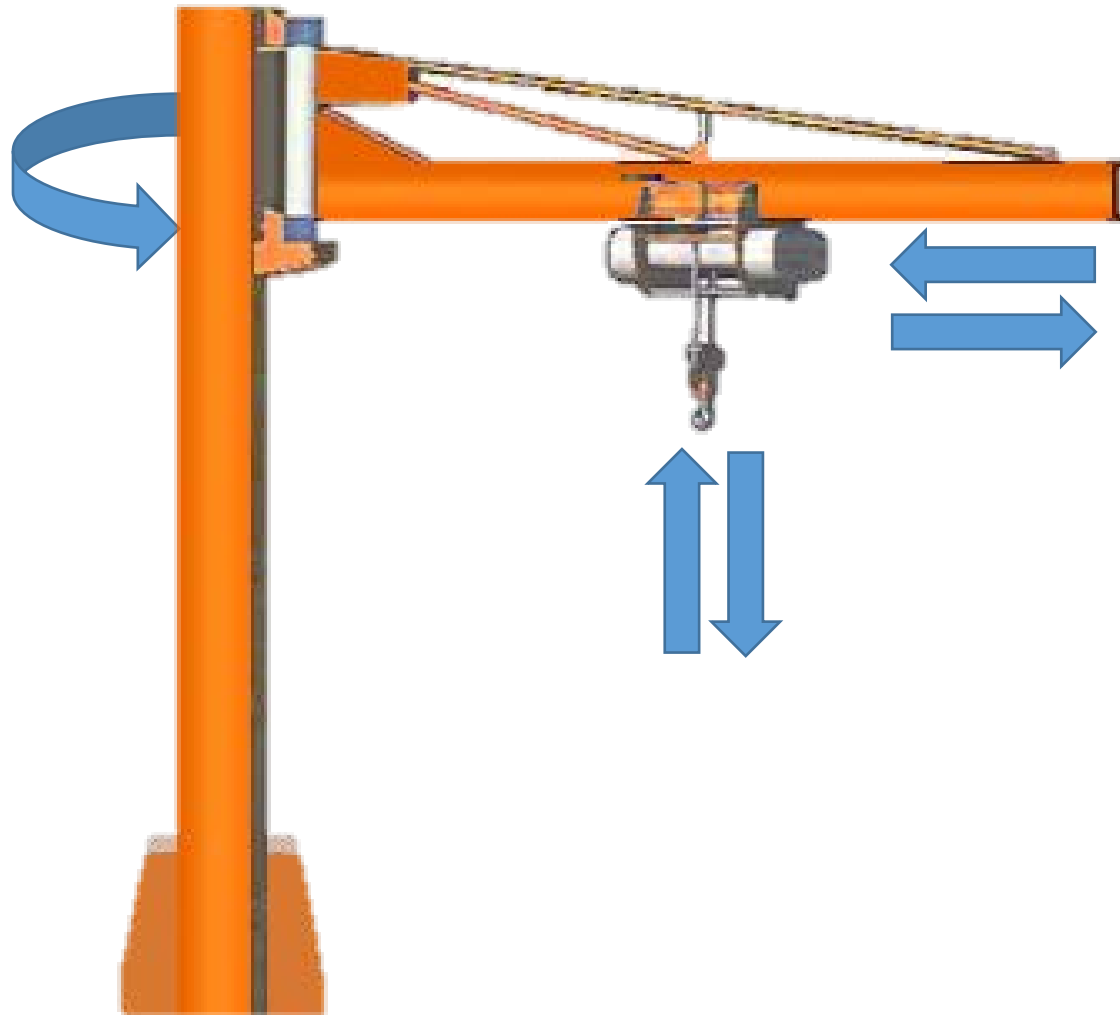
- Spans over Work Area,

- Types:

Floor supported (shown) – Moves on casters for portability of lower capacity lifts, usually under 5T

Rail supported – Moves along fixed rails for higher capacity lifts, usually over 5T.

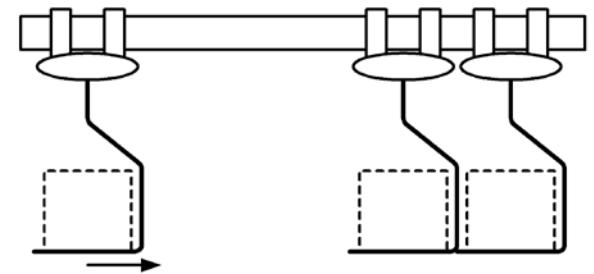
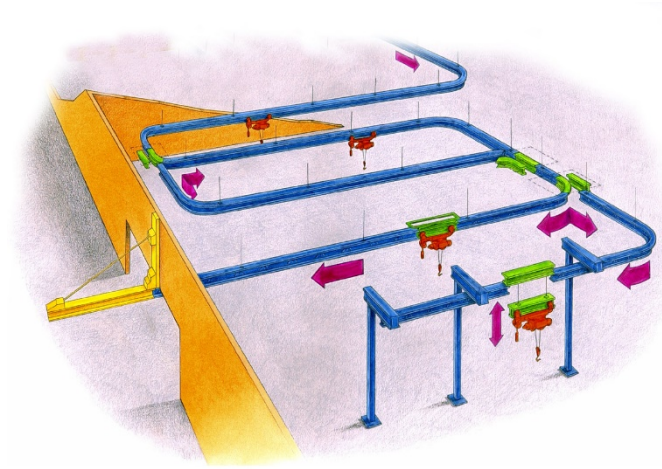
Overhead Cranes - Jib



- Mounted Arm,
- Spans over Work Area,
- Mounting Types:
 - Base-mounted (shown)
 - Wall-mounted cantilever
 - Wall-mounted tie-rod

Overhead Monorails

- For Moving Loads,
- Continuously on Fixed Path,
- Manual or Powered Carriers,
- Single or Network of Tracks



Choice Matrix for Material Transport Equipment

Solutions

Application

Floor-mounted

Overhead

**Fixed-path/
continuous use**

Conveyors

Primary function: conveying

Monorails

Primary function: positioning
and conveying

**Variable path/
intermittent use**

Industrial trucks

Primary function: transporting

Cranes & Hoists

Primary function: transferring

Benefits of Overhead Equipment



Safety



Efficiency & Productivity



Environmental



Technological Value

Improving Safety

- Limits exposure to potential accidents caused by sharing travel path between pedestrians and materials.
- Limits the amount of manual handling, preventing physical injury.



Increasing Productivity & Efficiency



- Travel over or around obstacles
- Allows greater lifting height and vertical storage
- Frees-up floor space
- Reduces product handling and operator error
- Reduce damages to products, walls, and structural supports



Reducing Environmental Concerns



- Reduce air pollution caused by emissions
- Reduce pollution caused by fluid leakages
- No need for battery disposal or battery charge terminals



High Technological Value



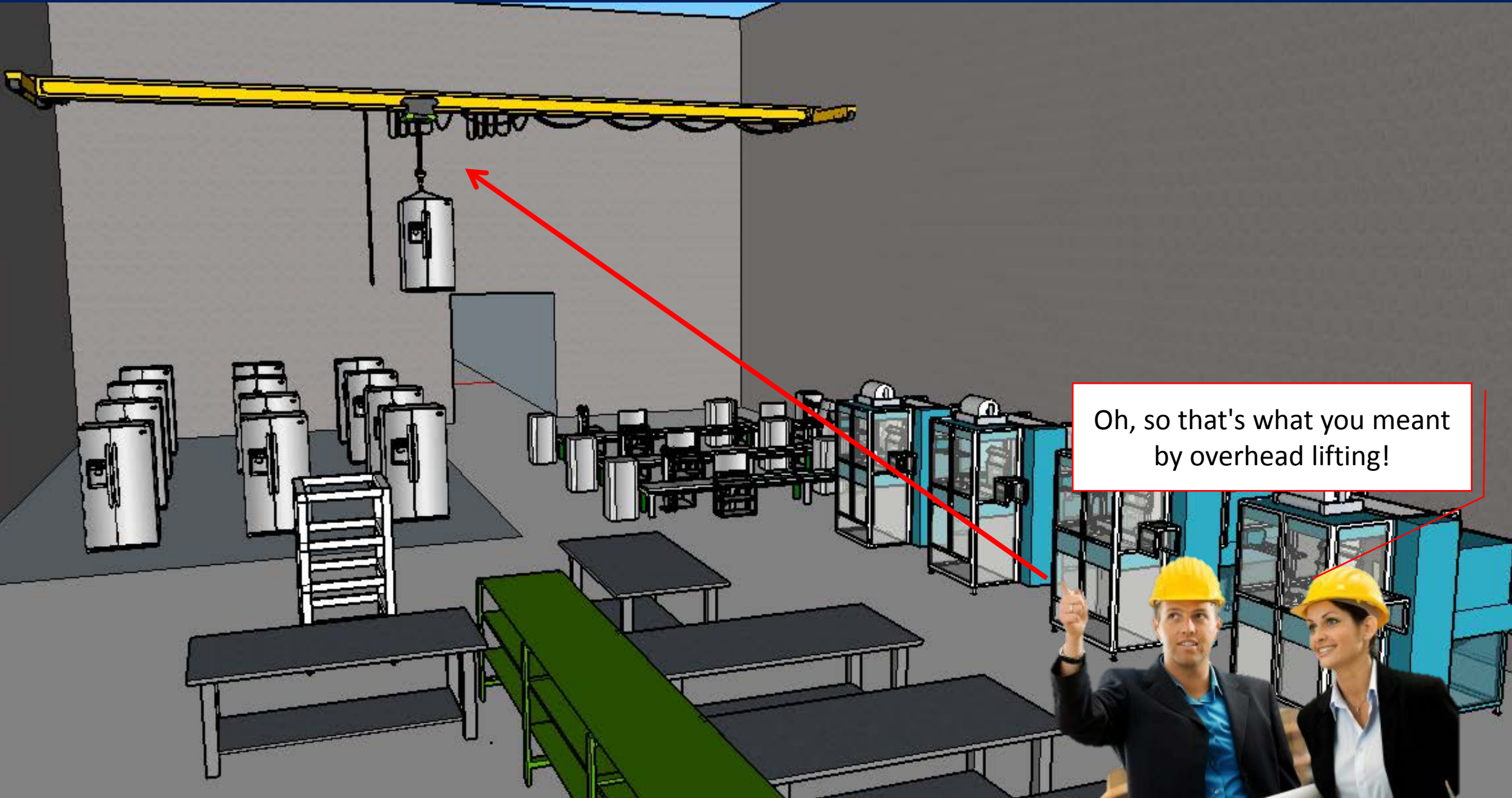
- Advanced motor controls → Improvement of position control
- Material advancements in wire rope & chain → Extended life system and safe operations
- Electric motor technology → Better reliability and increased duty cycle



We're really tight on floor space so industrial truck movers are not a good option. What do we do?

Let's move our products and components using overhead lifting...





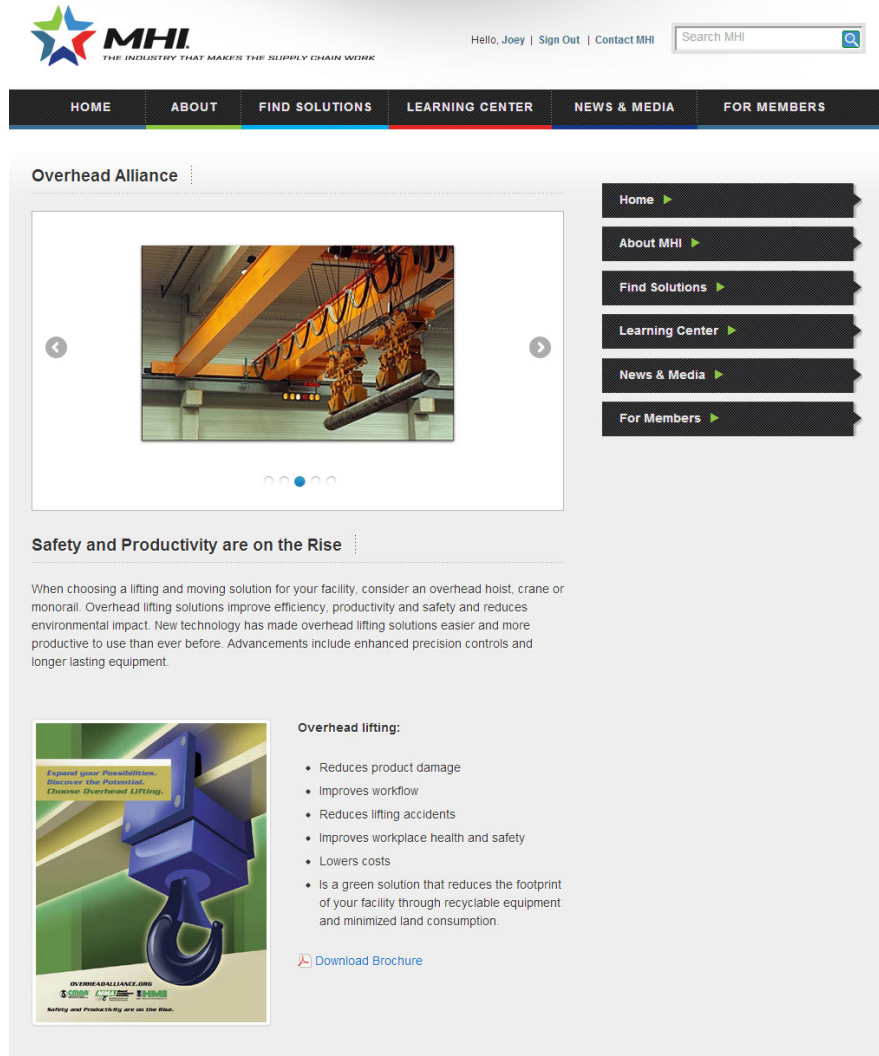
Oh, so that's what you meant by overhead lifting!



Key Takeaway Points

1. There are both floor-based and overhead material transport systems.
2. Conveyors and Industrial Trucks are the traditional floor-based.
3. Overhead material transport systems include hoists, cranes and monorails.
4. Benefits of overhead material transport systems include:
 - Improving Safety
 - Increasing Productivity & Efficiency
 - Reducing Environmental Concerns
 - High Technological Value

For more information:



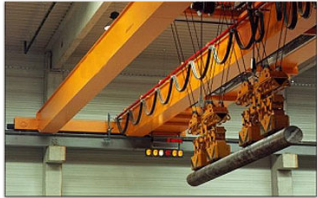
The screenshot shows the MHI website header with the logo and navigation menu. The main content area features a carousel image of an overhead crane system. Below the image is a section titled "Safety and Productivity are on the Rise" with a paragraph of text. To the right of the text is a list of benefits for overhead lifting, followed by a "Download Brochure" link. The right sidebar contains a vertical menu with links to Home, About MHI, Find Solutions, Learning Center, News & Media, and For Members.

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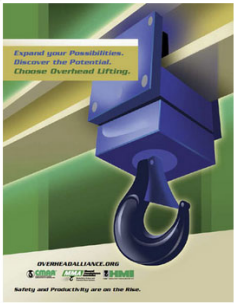
Overhead Alliance



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Safety and Productivity are on the Rise

When choosing a lifting and moving solution for your facility, consider an overhead hoist, crane or monorail. Overhead lifting solutions improve efficiency, productivity and safety and reduces environmental impact. New technology has made overhead lifting solutions easier and more productive to use than ever before. Advancements include enhanced precision controls and longer lasting equipment.



Overhead lifting:

- Reduces product damage
- Improves workflow
- Reduces lifting accidents
- Improves workplace health and safety
- Lowers costs
- Is a green solution that reduces the footprint of your facility through recyclable equipment and minimized land consumption.

[Download Brochure](#)

OVERHEADALLIANCE.ORG
Safety and Productivity are on the Rise.

www.overheadalliance.org

Appendices

A. Case Studies

- Hoists
- Cranes
- Monorails

B. The Overhead Alliance

- Crane Manufacturers Association of America (CMAA)
- Hoist Manufacturers Institute (HMI)
- Monorail Manufacturers Association, Inc. (MMA)



Selected Case Studies - Hoists

- Unique rail system allows quick hoist exchange
- University-Industry partnership studies auto worker ergonomic situation
- Heavy duty electric chain hoist operates over hot sulfuric acid
- Power station long lift wire rope hoist
- Vertical roller mill maintenance hoists lift up to 200 tons
- Hoist maintenance program reduces downtime



- Crane and hoist efficiently load metal press
- Hoist for critical nuclear weapon applications
- Simultaneously-controlled hoists handle long loads
- Electric hoist for railcar AC maintenance
- Electric chain hoist for low headroom application

Selected case studies - Cranes

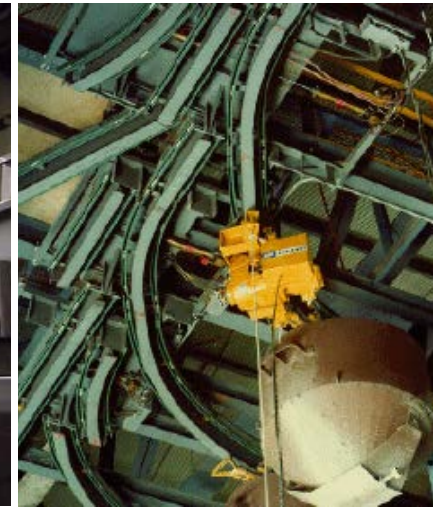
- Cranes provide solution for major manufacturer of steam turbines
- ASRS crane facilitates enzyme blending and storage for biofuel manufacturers
- Gantry simplifies loading of large concrete panels
- Custom hoists for railroad car maintenance
- Coke-handling crane increases productivity and reduces downtime
- Improved remote controls solve service center problems
- Cranes service hydro-electric plant



- Wall-mounted jibs provide supplemental lifting for crane manufacturer
- Bridge crane with precise hook positioning lifts jet engines

Selected case studies - Monorails

- Sand distribution application
- Monorail reduces maintenance and increases safety in medical supply lab
- Hot metal carrying system for auto-pouring operation
- Tire manufacturer improves productivity
- Stainless steel rail in food plant
- Aerospace company solves die handling problem



CMAA

The Crane Manufacturers Association of America (CMAA) is an independent trade association incorporated in 1955. Member Companies, representing the industry leaders in the overhead crane industry, serve the US market from operations based in the United States, Canada, and Mexico. CMAA is recognized as the leading authority and the principal resource in the overhead traveling crane industry.



HMI

The Hoist Manufacturers Institute (HMI) members are the Industry's leading suppliers of hoisting equipment including hand chain hoists, ratchet lever hoists, trolleys, air chain hoist, air wire rope hoists, electric chain hoists, and electric wire manufacturing and distribution sector. HMI operates through committees with programs and policies reviewed and adopted by the membership with representation from each member company. Its many activities include an active engineering committee. HMI is represented on a number of standards developing committees and actively supports the development and certification of safety standards by the ANSI consensus method.



MMA

The Monorail Manufacturers Association, Inc. (MMA) is an independent incorporated trade association affiliated with the Material Handling Industry. MMA Members produce the preponderance of patented and enclosed track underhung cranes and monorail systems. MMA operates through committees with programs and policies reviewed and adopted by the membership with representation from each member company. Its many activities include an active engineering committee. MMA is represented on a number of standards developing committees and actively supports the development and certification of safety standards by the ANSI consensus method.



Other Overhead Lifting Info Sources

[Cranes Today Magazine](#)

[Hoist Magazine](#)

[Industrial Lift and Hoist](#)

[OCH Magazine](#)

[Material Handling & Logistics Magazine](#)

[Modern Materials Handling Magazine](#)