COMPREHEND OF BASIC INFORMATION FOR HOISTS

PURPOSE
This HMI web page has been developed by member companies of the Hoist Manufacturers Institute ("HMI"), a trade association of Hoist Manufacturers, to familiarize potential hoist purchasers and users with the many different types of material handling hoists, hoist terminology, and hoist standards, as applicable in the United States, and in various countries and regions of the world. Standards may be mandatory by way of national or regional regulation, or voluntary as recommended by an engineering or manufacturers organization.

HMI believes that this overview may be helpful given the ever shrinking world wherein hoist products increasingly pass across international borders with resulting questions by the hoist purchaser and installer as to a hoist's governing design and safety specifications from various regions and countries of the world.

The HMI involves itself in activities according to its Vision and Mission statement.

MISSION
To deliver exceptional value to our members, channel partners, consumers, end-users, and industry associates. HMI achieves this through:

• Educational Materials  
• Marketing Information  
• Standards Development  
• Member Professional Development
VISION

HMI is recognized as the leading authority and the principal resource in the hoist industry.

HMI is recognized as the leading advocate for the safe application and operation of hoisting equipment and related products.

HMI conducts business professionally with a spirit of enthusiasm, cooperation, honesty and integrity.

HMI’s members are recognized as:

- The leaders in the marketplace
- Delivering superior value in their products and services
- Providing products and services that are safe and productive
- Providing high value solutions through knowledgeable and expert channel partners
- Providing an environment in which our customers can confidently purchase and derive superior value from our products

DISCLAIMER

This Standards Overview for Overhead Hoists (“Overview”) is advisory only and has been promulgated by the Hoist Manufacturers Institute (“HMI”) with the sole intent of offering information for interested parties. HMI makes no warranties whatsoever in connection with this Comparison. HMI specifically disclaims all implied warranties of merchantability or of fitness for a particular purpose. Further HMI, its officers, agents and employees shall not be liable in tort, contract or otherwise – whether based on warranty, negligence, strict liability or any other theory of liability for any action or failure to act in connection with this Overview and this information, it being the user’s intent and understanding to absolve and protect HMI, its successors and assigns, officers, agents and employees, from any and all liability in tort, contract or other liability.
Hoist Basics

Some basic information about hoists is presented here. More in-depth information is available in the various manuals published by HMI [http://www.mhiastore.org/category.cfm?Category=40]

AN OVERHEAD HOIST IS A MACHINE USED FOR VERTICAL LIFTING OF MATERIAL (NOT PEOPLE) THAT IS FREELY SUSPENDED (UNGUIDED).

A MANUALLY LEVER OPERATED HOIST IS A DEVICE USED TO LIFT, LOWER, OR PULL A LOAD (NOT PEOPLE), AND TO APPLY OR RELEASE TENSION TO ITEMS.

Hoists can provide lifting and lowering motions in an overhead material handling system. When a hoist is mounted to a trolley on a fixed monorail, two directions of load motion are available: forward or reverse, up or down. When the hoist is mounted on a crane, three directions of load motion are available: right or left, forward or reverse, up or down. These systems can achieve straight-line moves, reduce material damage, reduce noise, minimize energy cost, reduce floor-based traffic, improve worker ergonomics, and accomplish other operational objectives.

Usually, a hoist is not a piece of stationary hardware. It is generally available for use whenever required and rarely requires a full time operator. Hoists can be integrated into a variety of automated handling systems.

In an overhead material handling system, hoists provide vertical movement of below-the-hook load supporting and positioning devices.

In any material handling system, the hoist is used to accurately position a load.

The majority of hoists used in the United States are classified as Standard or “packaged hoists”, typically defined as largely self-contained units, prepared to be installed on existing structures. They are selected and installed into an application, often as part of a system. These systems vary greatly from simple, manually controlled systems to complex integrated and automated systems involving sophisticated components and controls. Hoists can be powered manually, with air, hydraulics, or electricity. Trolley selection is dictated by system requirements.

This publication does not specifically address “Built-up Hoists”, which may be covered by other standards, more crane related.

Types of Overhead Hoists
These hoists are defined by:


- Lifting Medium – Four types of lifting medium for overhead hoists: Welded Link Chain, Roller Load Chain, and Wire Rope, synthetic web or rope material.

Overhead Hoist Mounting Types

Hoist mounting selection depends upon the requirements of the application and must be considered in conjunction with other lifting considerations.

Trolley Types:
Plain
Hand Chain Geared
Motor Driven
Overhead Hoist Lifting Media

Welded Link Chain (Roller Load Chain not shown)
Overhead Hoist Power Application

<table>
<thead>
<tr>
<th>Manual, by Hand Chain</th>
<th>Electric</th>
<th>Pneumatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric is the most common power source</td>
<td>Power supply and control cords, cord reels, hoses, electrification systems, and flexible festooning systems provide means for supplying power to hoists. Such systems must be properly sized and meet all prevailing codes or regulations.</td>
<td></td>
</tr>
<tr>
<td>Pneumatic power is often required in applications of high speed, higher duty cycle involving rapid, repetitive tasks or hazardous areas where electric power is inadvisable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control Options
A wide range of pendant and remote controls are available to provide suitable and convenient positioning for the operator.

Operational Considerations
Hoist operators should be trained in the proper use of all hoisting equipment. Many accidents occur because operators simply do not know that they are doing something dangerous. Refer to the manufacturer’s parts, maintenance and operating documents.

ASME B30.16 deals with equipment and the workplace safety issues, which apply to all overhead hoists that lift freely suspended unguided loads.
Lifting Considerations

To select the proper hoist, consider:

A. The weight of the load to be lifted including below-the-hook lifting, load supporting, and positioning devices.

B. Physical size of the load.
   1. Holding and orienting devices.
   2. Design for center of gravity (control & stability).

C. Lift – the vertical distance the load can be moved.

D. Clearance Considerations.
   1. Headroom
   2. Obstacles to be cleared during the load transfer.
   3. Design for vertical lift required including holding device height.

E. Lifting Speed Considerations.
   1. Distance the load is to be raised and lowered
   2. Frequency of usage
   3. Required positioning accuracy
   4. Nature of the load being lifted

F. Hoist duty Cycle Considerations based on:
   1. Number of lifts per hour
   2. Total number of lifts per shift
   3. Maximum number of starts and stops per hour
   4. Number of shifts per day
   5. Average distance load is raised and lowered
   6. Average weight to be lifted
   7. Maximum weight to be lifted
   8. Frequency of lifts with maximum weight.
Types of Manually Lever Operated Hoists

These manually lever operated hoists are defined by four types of lifting media:

- Roller Load Chain
- Welded Link Chain
- Wire Rope
- Web Strap
**Balancers**

These overhead devices provide and perform functions different from overhead hoist in that they can lift, lower and float a load. The balancer configurations and suspensions are similar to a hoist.

The balancer functions differently from a hoist. The functional difference is indicated in the name: balancer. A balancer balances the load in a near weightless condition during the lifting operation. This feature allows the operator to maneuver the load easily.

Balancers are often used for awkward and/or rapid load movements. Balancers can also be used to suspend equipment, which is used in repetitive operation.

A variety of control options are available.

A very broad range of load handling devices (end effectors) can expand this product’s versatility.

Balancers are typically supported on small jibs, light monorail systems, or enclosed track monorail systems.

**Equipment Characteristics**

Vertical lift only

Max. Lifting Capacity: 500 pounds, approx.

Weigh: 100 pounds, approx.

Balancers may or may not have been historically designed with hoist standards applied. Work is presently under way by the ASME B30 committee to prepare a safety standard for balancers. When available this standard will be released at B30.28