

ASE SYSTEMS

The Ergonomics & Productivity Specialists!
5611 Guhn Road Ste: A1 * Houston Texas 77040
713-462-3072 * fax: 713-462-3540 * 800-245-2163

We Turn Your Difficult Handling Tasks Into Powerful Productive Solutions!

Ceiling Mounted Bridge Cranes

The safe, productive, ergonomic solution for overhead materials handling operations

#1

In Safety
In Productivity
In Ease of Positioning and Movement
In Ease of Installation
In Designs, Capacities, and Spans



It's no wonder more and more businesses are choosing Ceiling Mounted Workstation Cranes. As an innovator and leader in the enclosed track work station crane industry, ASE provides a wide variety of overhead solutions. Our work station systems include ceiling mounted bridge cranes and monorails, free standing work station bridge cranes, and work station jib cranes. And we offer high-performance manual and motorized jib cranes. All this, plus quick delivery and the industry's best warranty.

How to Apply Ergonomic Overhead Work Station Cranes What Type of Crane Is Most Appropriate?

- Bridge cranes cover rectangular areas, while jib cranes cover circular areas.
- Bridge cranes can be hung from the ceiling or be floor supported. Jib cranes can be wall or pillar mounted and may require a special foundation.
- An enclosed track work station bridge crane provides consistent ease of operation over the full range of movement.
- Jib cranes move more easily at the very end of the boom and are more difficult to move as the load approaches the pivot point.

Should the crane be manual or motorized?

Ease of movement and light weight are key features of enclosed track work station crane systems. In fact, manual work station cranes do the job faster than motorized cranes. If the operator cannot control the load throughout the operation (for instance, over a vat, pit, or other inaccessible area), then the crane should be motorized.

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What type of suspension: ceiling mounted or free standing?

- With ceiling-mounted systems, supporting steel does not interfere with the handling operation. Ceiling-mounted systems require a building with an adequate overhead structure to hang the crane (see loading formula on page 4).
- Free-standing (floor-supported) systems do not put stress on the building's overhead structure. Installation is usually more straightforward, and these cranes are also easier to relocate in the future. These systems require a reinforced concrete floor of at least 6 inches.

What capacity, bridge length, and height?

The general rule is "less is more"

- Keep capacities to a minimum. Work Station Cranes are designed with an adequate safety factor. If you "over-buy capacity," the operator will need to move extra bridge dead weight, which would not be a good ergonomic solution.
- Keep bridge lengths to a minimum. The less dead weight an operator has to move, the better. Short bridge lengths are better for higher-cycle production areas. Longer bridges are acceptable for lower-production cycle or maintenance areas.
- Keep bridge heights to a minimum. Keeping the height less than 14 feet is desirable because it makes it easier to control and position the load.

Can the operator safely move the load?

- A work cell should be designed so a task can be performed by 90% of the workers.
- A worker should not exceed 33% of his or her capacity; otherwise, the risk of chronic fatigue increases.
- To help determine if your worker can safely move the required loads, refer to the Ergonomic Study by Shealy and Stibitz ©1993, which is available through ASE Systems Inc.

These questions and answers can help you determine which type of overhead work station crane best meets your needs.

Enclosed Track Design Makes for Easy Movement and Long Life

Both the aluminum and steel Work Station Crane Systems utilize enclosed track that is high in strength and low in weight. Major advantages:

- Enclosed track cranes are easier to move than traditional bridge cranes.
- The design virtually eliminates dirt and dust from the rolling surface, thus reducing wear on the wheels of the trolley and end trucks.
- The smooth running surface means lower rolling resistance.
- The low profile of the steel track allows the system to be installed where headroom is a problem.
- The low track weight reduces the applied forces exerted on the supporting structure.

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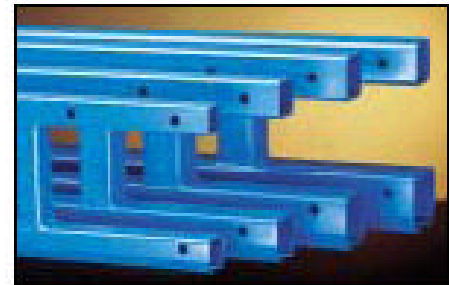
- Long spans allow systems to be installed where hanging points are infrequent (up to 30 feet with the steel truss design).
- Four distinct sizes of track -- 250, 500, 1000, and 2000 series -- enable you to keep bridge weights and costs to a minimum.



The 2 ° taper of the running flange helps to center the trolley in the track for smooth, effortless movement of trolleys and end

TRUSSED STEEL TRACK:

Permits longer spans when frequent support points are not available. The trussed series uses the plain steel track profile but is enhanced for longer spans via a built-up truss design. This design increases the span, which decreases the need for frequent hangers. Model numbers start with: GLCS (for bridge cranes) and GLMS (for monorails) for spans up to 20 feet; GLCSL or GLMSL for spans up to 25 feet, and GLCSLX or GLMSLX for spans up to 30 feet.

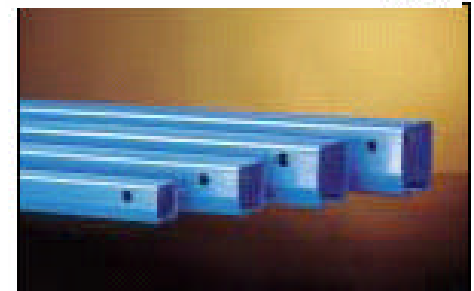


Trussed Steel Track

PLAIN STEEL TRACK:

For use where frequent support points are available or where maximum headroom is required.

The standard hot-rolled steel track profile offers a low-weight to high strength ratio. Model numbers start with GLC (for bridge cranes) and GLM (for monorails).



Plain Steel Track

ALUMINUM TRACK:

For use where lower bridge weight and easier movement are required.

The shape of the aluminum enclosed track provides for low weight, unparalleled spanning capability, and effortless movement. The low weight (up to 44% less than trussed steel track) results in easier movement, which makes for safe, productive, ergonomic work cells. Runway spans up to 20 feet and bridge lengths up to 34 feet meet a wide range of applications. Model numbers start with AL (for bridge cranes) and ALM (for monorails).



Aluminum Track

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Rigid Runways Provide for Superior Positioning of Loads

Work Station Bridge Cranes are installed so that the runways are rigid. They do not move laterally or longitudinally. In addition, the floating end trucks with horizontal wheels prevent binding. The combination of these design features results in unmatched ease of positioning and ease of movement. The bridge travels smoothly down the runways, and movement is unvarying along the way, no matter where a load is positioned on the bridge. This allows superior load positioning. Another advantage of rigid runways is that they can be reinforced (trussed "S" series), so they are useful where long spans are required. This eliminates the need for expensive intermediate support stringers, and it lowers overall installation cost.

Mixed Capacity Bridge Crane Systems: Reduced bridge dead weight equals better ergonomic solutions.

Mixed-capacity systems allow multiple lower capacity bridges to be used on higher capacity runways, provided the equivalent center loads (ECL) are verified at the factory to ensure that runways and hangers are not overloaded. For example, using mixed-capacity end trucks, four 500 lb. bridges (utilizing 500 series rail) can be hung from a 2000 lb. runway, allowing side-by-side use of all four bridges without overloading the system. By mixing bridges of various sizes and capacities, mixed-capacity systems offer reduced bridge dead weight, easier movement, and reduced cost.

What is meant by Rated Capacity?

The rated capacity is the live load that can be lifted by the crane system. The design load for the crane system is based on the rated capacity plus 15% for the weight of the hoist and trolley (capacity x 1.15) and an additional 25% for impact (capacity x 1.25) for a total design of capacity x 1.4 (Note, 25% impact factor is good for hoist speeds up to 50 f.p.m.). For example, a 1000-lb. crane allows you to pick up a 1000 lb. load provided the hoist weighs 150 lb. or less and the hoist speed is less than 50 feet per minute.

Design load for deflection calculations is based on the rated capacity plus 15% for the weight of the hoist and trolley (capacity x 1.15). Under no conditions should the crane be loaded beyond its rated capacity. Work Station

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Cranes meet or exceed the ANSI B30.11 specifications for under-hung bridge cranes.

Calculating Applied Forces to the Supporting Structure

This illustration shows the relative position and the direction of forces that a ceiling-mounted bridge crane applies to its supporting structure. Before installing any crane system, it's critical that you determine whether your building will safely support the loads. Loads applied to the support structure can be determined using the following formulas, where:

R1 = vertical load applied by support hanger (lb.)

R2 = longitudinal load applied by movement of the crane to each runway (lb.)

R3 = lateral force applied by movement of the trolley and load to each runway (lb.) L1 = distance between support centers (ft.)

(NOTE: If there are only 2 supports/runway, $L1 = L1 \times 0.5$)

L4 = bridge span: center line distance between runways (ft.)

P = live load capacity (lb.)

1.4 = design factor (see description below) which includes 25% for impact and 15% for assumed hoist and trolley weight

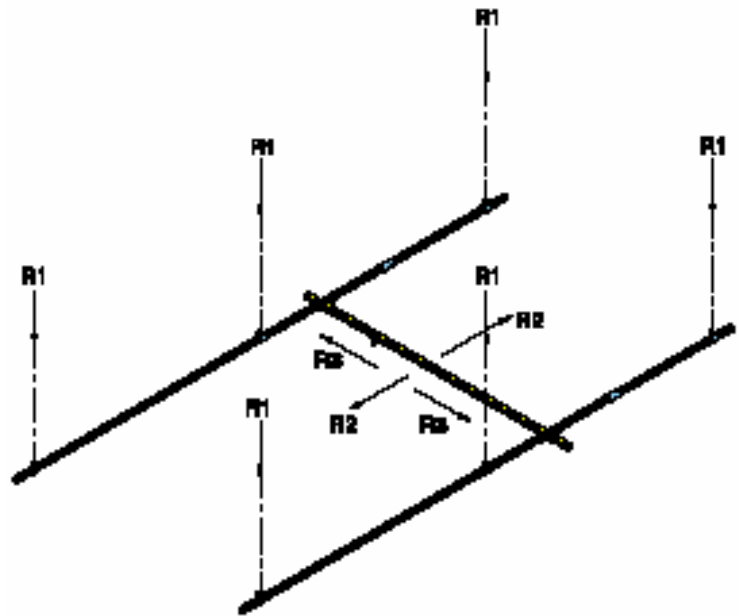
W = weight per foot of runway (lb./ft.) See page 14.

w = weight per foot of bridge (lb./ft.) See page 14.

$$R1 = 1.4 \times P + (W \times L1) + (w \times L4) \div 2$$

$$R2 = ((1.15 \times P) + (w \times L4)) \times .10$$

$$R3 = 1.15 \times P \times .20$$



WARNING: Equipment described in this write up is not designed for, and should not be used for, lifting, supporting, or transporting humans. Failure to comply with any one of the limitations noted can result in serious bodily injury and/or property damage.

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Options When Using Multiple Bridges

What are your options when using multiple bridges? This section addresses the advantages and disadvantages of various multiple bridge system designs.

MIXED CAPACITY SYSTEMS

In mixed capacity systems, each bridge is sized for an individual rated load. Runways, on the other hand, are sized for the combined weight of all loads, so they use a heavier track series than any individual bridge.

Advantages:

- There are no “dead” coverage areas (areas with no bridge coverage) along the length of the system, so each bridge can travel the length of the system. (See mixed capacity system diagram)
- There are limited “dead” coverage areas between bridges, so bridges can be used side-by-side. (Compare mixed capacity system diagram with bridge buffer system diagram)
- Bridges weigh less, making the system more ergonomically friendly.

Disadvantages:

- Mixed capacity systems use larger sized runways, so they may cost more than bridge buffer systems or systems that use intermediate stops.

BRIDGE BUFFER SYSTEMS

In bridge buffer systems, bridges are sized for each individual rated load. Runways are sized for the heaviest individual load, so the runways are the same size as the largest bridge. Bridges are physically separated by wheeled, movable bridge buffers.

Advantages:

- Bridge buffer systems usually cost less than mixed capacity systems because they typically use smaller sized runways.

Disadvantages:

- The bridge buffers take up space (typically half the distance of the support centers), which creates a moving “dead” space between bridges. (See bridge buffer system diagram)
- Note: When using two bridges, the dead space equals half the distance between support centers (L1 from the dimensional charts). When adding a third bridge, the dead space occupied by the additional bridge buffers equals the full distance between support centers.

SYSTEMS WITH INTERMEDIATE STOPS

In systems with intermediate stops, bridges are sized for each individual rated load. Runways are sized for the heaviest individual load, so the runways are the same size as the largest bridge. Bridges are physically separated by internal stops or bumpers. Extra

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hangers usually are required to eliminate overload. (See intermediate stops system diagram)

Advantages:

- Systems with intermediate stops use smaller runways, therefore typically cost less than mixed capacity systems.
- There are fewer potential “dead” spots in the system. (Compare intermediate stops system diagram with bridge buffer system diagram)

Disadvantages:

- Each bridge on the system can travel only a portion of the length of the system. (See intermediate stops system diagram)
- Systems with intermediate stops may be more difficult to install, as additional ceiling support points must be available to accommodate the additional hangers required to prevent an overload situation.

End