

Whether you are a small fabrication shop looking for an easier way to load and unload material from a flat bed truck, or, a large manufacturing facility that needs a complete “system” to handle production flow, there is some fundamental information that needs to be considered when purchasing a crane, hoist or monorail for your facility -

Information Relative to the Equipment itself –

- 1) Use of equipment to be furnished – Is the equipment you wish to purchase for a specific work area, loading or unloading dock, or a plant wide series of systems? Knowing what your requirements are helps to determine which crane is better suited for your application.
- 2) Capacity, type and size of load to be handled – Equipment must be selected to satisfy a given load. It determines whether a manual or motor driven operation is needed, how fast the travel speeds need to be and also what under-the hook components may be required for handling special types of materials.
- 3) Hoist Hook Coverage – Maximum lift and end approach. Knowing the maximum lift of the hook will determine if special considerations are needed on the crane. For example, if there is not enough hook height a low headroom crane may be required. Also consider that a double girder crane will effect end approaches.
- 4) Duty Cycles – Class and duty cycles of a crane is critical. High duty cycles require special hoists, motors, bearings and controls which are very expensive, whereas low duty cycles permit use of less expensive components. As an example, suppose a 5 Ton low duty cycle crane would cost you \$35,000.00. The same crane with the same load capacity and span BUT with heavy duty cycle components can cost as much as \$150,000.00! So it's very important to know your requirements in duty cycles. (See charts below for class and duty cycles)
- 5) Environmental conditions – A vast number of problems can be created by not being aware of special environmental conditions in which the equipment must operate. Excessive heat; dust, moisture, highly corrosive or explosive conditions all require special consideration and pricing.
- 6) Power Requirements – Knowing the type and locations of the power feeds in the facility are important. It would also be necessary to determine if the facility has the required volume of compressed air available should the system need to be air-powered.

Information Relative to the Building or Area where equipment is to be installed

- 1) Building Structure: Column Sizes, Beam or Truss supports and C/C dimensions. Knowing this information helps to determine loads and lengths of runways. It also will help determine if additional steel supporting is required as the current structure may be unable to handle the additional weight of the crane and the applied loads. Since the bottom of the building steel is usually the limiting factor regarding maximum hook height it too is an important factor. Also, if header steel is not sufficient to support the given loading, column type supports should be considered.
- 2) Physical Interferences – Interferences such as pipes, lighting, overhead heaters, ducts, door tracks, machinery and any other items that may interfere or provide a clearance problem should be considered. They must be addressed and resolved before equipment can be installed. Knowing these issues ahead of time will save time and money.

- 3) Location of Machinery – If a crane or monorail is to be coordinated with a specific machine, this machinery should be located with respect to the column center lines. Machine center lines often coincide with the lift and set down locations. When machinery is located close to a wall, end approach can be a problem. If machinery is located in a pit, extra lift may be required on the hoist.

The service classes below were established by the CMAA

Hoist Service Classifications

These classifications are set up for use under normal ambient temperatures and atmospheric conditions

Hoist Class	Service Classification	Areas of Usage
H1	Infrequent or Standby	Powerhouses and utilities. Infrequent handling. Hoists are used primarily to install and service heavy equipment, where loads frequently approach the hoist capacity, with periods of utilization being infrequent and widely scattered. (max on time 8 min/hr, 75 starts/hr max)
H2	Light	Light machine shop and fabricating industries. Service and maintenance work where loads and utilization are randomly distributed with capacity loads infrequently handled. Total running time of the equipment does not exceed 10-15% of the work period. (max on time 8 min/hr, 75 starts/hr max)
H3	Standard	General machine shop, fabrication, assembly, storage and warehousing. Loads and utilization are randomly distributed. Total running time does not exceed 15-25% of the work period. (max on time 15 min/hr, 150 starts/hr max)
H4	Heavy	High volume handling in steel warehousing, machine shops, fabricating plants, mills and foundries. Manual or automatic cycling operations in heat treating and plating operations. Total running time normally approaches 25-50% of the work period with loads at or near rated capacity frequently handled. (max on time 30 min/hr, 300 starts/hr max)
H5	Severe	Bulk handling of material in combination with buckets, magnets, or other heavy attachments. Equipment is often cab operated. Duty cycles approaching continuous operation are frequently necessary. User must specify details of operation, including weight of attachments. (max on time up to continuous, 600 start/hr max)

Crane Service Classifications

These classifications are set up for use under normal ambient temperatures and atmospheric conditions

Crane Class	Service Classification	Areas of Usage
A1	Standby Service	This service covers cranes used in installations such as power houses, public utilities, turbine rooms, nuclear reactor buildings, motor rooms, nuclear fuel handling and transformer stations, where precise handling of valuable machinery at slow speeds with long idle times between lifts is required. Capacity loads may be handled for initial installation of machinery and for infrequent maintenance.
A.2	Infrequent Service	These cranes will be used in installations such as: small maintenance shops, pump rooms, testing laboratories, and similar operations where loads are relatively light, speeds are slow and a low degree of control accuracy is required. The loads may vary from no load to full capacity of a few lifts per day or month.
B	Light Service	This service covers cranes such as those used in repair shops, fabrication shops, light assembly operations, maintenance and service buildings, light warehousing, etc., where service requirements are light, loads are randomly distributed and the speed is slow. Loads may vary from no load to full rated load with an average load of 50% of capacity with 2 to 5 lifts per hour, averaging 15 feet, not over 50% of the lifts at rated capacity. Total running time not over 12.5% of the work period.
C	Moderate Service	This service covers cranes for general use such as those used in machine shops, fabrication shops, assembly, storage, and warehousing, etc., where the service requirements are medium. The crane will handle loads which average 50% of the rated capacity with 5 to 10 lifts per hour, averaging 15 feet, not over 50% of the lifts at rated capacity. Total running time not over 25% of the work period.
D	Heavy Duty Service	This service covers cranes for high volume handling of heavy loads. such as those used in heavy machine shops, mills, foundries, fabricating plants, steel warehouses, lumber mills, etc., and standard duty bucket and magnet operation where heavy duty production is required but with no specific cycle of operation with total running time not over 50% of the work period. It is also for manual or automatic cycling operations of lighter loads with rated load infrequently handled such as heat treating and plating operations, with total running time frequently over 50% of the work period. High speeds are desirable for this type of service with 10 to 20 lifts per hour averaging 15 feet, not over 65% of the lifts at rated capacity.
E/F	E – Severe Duty Service F – Steel Mill A.I.S.E Specifications	Bulk handling of material in combination with buckets, magnets, or other heavy attachments. Equipment is often cab operated. Duty cycles approaching continuous operation are frequently necessary. User must specify details of operation, including weight of attachments. Other information needed is – Number of lifts per hour, how many lifts and at what load capacity, average height of lift, average trolley travel distance and bridge travel distance, ambient temperature at crane elevation, atmospheric conditions, number of hours/day and days/week.