MAGNET SAFETY FACTORS

Our magnetic material meets Magnetic Materials Producers Association (MMPA) standards for physical quality and magnetic properties. Some magnetic material is brittle in nature and minor defects such as chips and hairline cracks are unavoidable. When selecting a magnet for your application, consider the following factors that may affect performance of the magnet:

- Physical shape of the part where contacting the magnet will affect the holding power of the magnet
- The surface area & the condition of your steel item (rough, rusty, dirty, oily, painted or coated surfaces) will create a gap and have negative affect on the magnets hold to the surface (also known as Air-gap*)
- Part size, thickness weight and orientation must be considered to help determine the strength of magnet required
- The ambient or part temperature for the application will help determine the type of magnet material needed
- Gauss levels limits for handling a part may prevent the use of magnets or limit the type/strength that can be used
- If protecting the finish of a part is required the type of magnet used may be limited in order to contact the part without damaging the finish

*Air gap - The air, protective coating, paint, galvanizing, oil, rust, dirt, etc. between the magnet and the part.

LIFT MAGNET SAFETY FACTORS

Lift magnets can be effective even when the surfaces of the magnet and/or load have dirt, paint, scale or other debris on them. However, the best efficiency of any magnetic lift is achieved when both the magnet and the load are clean with good, uninterrupted contact between them (minimal air gap).

- Avoid positioning the magnet in places on the load that have limited contact, are dirty or have rough surface texture
- Clear any foreign material from the load before setting the magnet on it
- Often check the mechanical condition of the magnetic contact face to make sure it has not been damaged during use
- After using the lift magnet, protect the pole surfaces with oil to prevent them from rusting

Lifting ferrous items using a magnet requires a good look at the length, width and thickness of the item. Thin metals do not absorb as many of the magnetic flux lines (magnetic energy) as thicker metals. Thin metals also flex, causing the steel to peel- off the magnet. Equally important is the physical size, flatness, surface conditions and type of steel. The charts below illustrate how surface finish and Carbon content affect lifting value.

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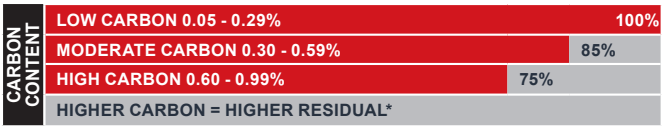
PERCENTAGE OF STATED LIFTING POWER BY MATERIAL



PERCENTAGE OF STATED LIFTING POWER BY SURFACE FINISH

*** HIGH CARBON STEEL (TOOL STEEL) WILL ABSORB MAGNETISM & MAY MAGNETICALLY STICK TO STEEL SURFACES, SUCH AS THE MAGNET, OR ATTRACT FERROUS PARTICLES.**

DESIGN FACTOR

Design Factor is the relation of the magnet's labeled Working Load Limit (WLL) compared to the magnet's maximum lifting value under ideal conditions. Ideal conditions are when a magnet is new and pulled off a newly machined, thick, low carbon steel plate. ***The pounds of pull it takes to break the magnet away from the steel surface is the "maximum" lifting value.***
Working Load Limit (de-rating) values are then determined by taking this maximum lifting value and dividing it by the manufacturer's design factor.

Unless otherwise noted, magnet working load limits are stated up to 50% of the actual value. These magnets may reach substantially higher holding values, but the surface condition of the part may affect the magnet's performance capabilities.

Design factors are minimum 2:1 and most cases 3:1. This means a magnet with a 3:1 design factor and labeled with a working load limit of 1,000 lbs will have a break-a-way force minimum of 3,000 lbs. The labeled WLL is stated for the benefit and safety of the user, due to the fact that ideal conditions rarely exist in the field. The steel that you are lifting may have scale, rust, dirt, or coatings on its surface; or the surface of the magnet itself may be worn. Any of these conditions will cause lower lifting values. Pick a lift magnet that has a WLL value slightly higher than the weight of your part.

ASME B30.20 LIFTING STANDARDS & ASME BTH-1 DESIGN STANDARD

The American Society of Mechanical Engineers (ASME) has established standards for Below-the-Hook Lifting Devices. These standards apply to the marking, construction, installation, inspection, testing, maintenance, and operation of all lifting magnets when used for single or multiple steel piece handling operations in which the operator of the lifting magnet is required to manually position the lifting magnet on the load and manually guide the load during its movement, or in close proximity to people.
Lifting devices designed to these Standards shall comply with ASME B30.20, Below-the-Hook Lifting Devices. Designed and manufactured to ASME BTH-1 Standard.
Industrial Magnetics, Inc. offers several lift magnet options that conform to the ASME B30.20 Standards