LIFT MAGNET BASICS & SAFETY INFORMATION

Lift Magnet Safety Factors

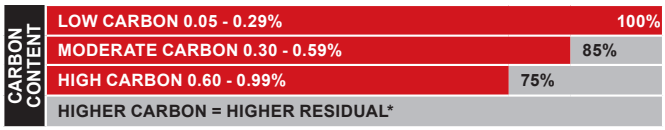
Lift magnets can be effective even when the surfaces of the magnet and/or load have dirt, paint, scale or other debris on them. However, the best efficiency of any magnetic lift is achieved when these surfaces are clean and the poles of the lift (the surfaces in contact with the load) have good, uninterrupted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

It is therefore recommended to:
Avoid setting down the lift in places on the load that are dirty or have rough surface texture. Clear any foreign material from the load before setting the lift on it. Occasionally check the mechanical condition of the magnetic poles to make sure they are flat and have not been damaged during use. After using the lift, protect the pole surfaces with oil. This will keep the steel surface from rusting.

Material Surface & Safe Lifting Conditions

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 effect lifting value.

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.***

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.

Working load limit (de-rating) values are then determined by taking this maximum lifting value and dividing it by the manufacturers' design factor. 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.

DO NOT ADD additional weight to your lifting requirements. If you have a 1,000 lb part and you buy a higher labeled 2,000 lb lift magnet, it will result in a magnet that is much heavier, harder to handle and cost more than needed since the 2,000 lb magnet should have a Design Factor of 2:1 or 3:1. **Under no circumstances should you lift ferrous objects that weigh more than the stated working load limit value**.

ASME B30.20 Lifting Standards & ASME BTH-1 Design Standard

The American Society of Mechanical Engineers has established standards for Below-the-Hook Lifting Devices. This standard applies 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 this Standard 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