CHOOSING AND USING THE CORRECT...

LIFT MAGNET
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Introduction To Lift Magnets

Our magnetic material meets Magnetic Materials Producers Association (MMPA) standards for physical quality and magnetic properties.

There are three types of lift magnet to choose from:

- **Permanent**
- **Electromagnet**
- **Permanent /Electromagnet Combination**

Which one to select is based on many factors ranging from power accessibility, cost and how close you can get to the magnet. Consult with your magnet supplier to select the best product for the application instead of just picking a magnet like the other one you may already have. Magnets and magnetics are changing rapidly, getting the best magnet for the application can get you a magnet that is stronger, lighter, contains “smart” technology and/or is less expensive than a lifter that you currently use.

Ceramic magnets are made of Strontium Ferrite (SrFe) in a sintering process. Ceramic magnets are staples in the electronic, automotive, medical, mining, industrial, oil industries and more. Ceramic magnets are medium strength magnet material with a high resistance to demagnetization, long time stability (loses 0.5% of it’s magnetic strength in 100 years), brittle material that has to be cut with diamond tipped blades. Maximum temperature 480°F (249°C).

Rare Earth Neodymium-Iron-Boron (NdFeB) magnets are made in sintered as well as bonded forms. Commonly referred to as Neo, this magnet material provides the highest magnetic strength of any magnet material, very high resistance to demagnetization and is ideal for applications requiring maximum strength in a limited area. Because of its high iron content, Neo is usually coated or plated to prevent oxidization, therefore avoid grinding. Maximum temperature 180°F (82°C).

Permanent Lift Magnets

Permanent lift magnets come in two styles: One is “Always On” and the other is “On/Off”.

**ALWAYS ON**

“Always On” lift magnets utilize some kind of mechanical method to separate the magnet from the steel you are lifting. This mechanical method usually is a roller cam, solid round cam, jack screw or breaker bar. Other than the roller cam, these mechanical release methods could mar or scratch metal surfaces. Typically, this type of magnet has multi-poles meaning strips of steel with alternating polarity (N,S,N,S). These magnets are used on flat steel and have shallower magnetic penetrations that make them better suited for thinner metal.
Permanent Lift Magnets Continued

ON/OFF
“On/Off” permanent magnets have the safety of an Always On permanent magnet and the controlled On/Off of an electromagnet. These magnets often use Rare Earth magnetic material in two separate fields. When both fields are lined up, North to North and South to South, the magnetic field goes down into the steel. When one field is reversed, caused by rotating the On/Off handle, the field stays within the magnet, no longer holding the steel. On/Off magnets generally have two parallel poles which give this magnet a deep penetrating magnetic field for rougher, flat surfaces and work well on round pipe or shaft material. When this type of permanent magnet is “Off” all collected fuzz iron falls away. In most sizes, the On/Off magnet must be on steel to rotate the handle to the “On” position. This is a safety feature that prevents pre-energizing of the magnet prior to being placed on steel, reducing the chance of injury or equipment damage.

Electromagnet Lifts

Electromagnets use electrical power to generate a magnetic field. This power must be in the form of Direct Current (DC) power. The DC power comes from the conversion of AC to DC by a power supply or can be provided from a battery. Electromagnets provide controlled “On” & “Off” from remote locations. They do however require constant electrical current or the magnet will release the load. Battery backup power supplies can provide constant power when a power interruption occurs.

ELECTROMAGNETS
Electromagnets with a “cord” coming from a power source provide concentrated holding power and a deep reaching magnetic field to lift thick, non-flexing ferrous items. Some models have pendant controls or on-board switch for “On, Off and Release” functions.

BATTERY LIFT
Battery lift magnets operate from a self-contained, automotive-type battery, which results in maximum convenience, portability and versatility. This type of magnet is ideal for remote locations. Built-in chargers and a visible power gauge provide ease of operation. However, this type of lift magnet requires a consistent charging schedule to make sure the batteries are charged and ready to use.
Perm/Electro (Permatrol®) combination lifts provide the best of both worlds. Safety of a permanent magnet for the entire lift cycle and only uses a momentary pulse of electricity to redirect the magnetic field inward to release the load.

These Perm/Electro designs use virtually no energy, do not require battery backup and can be controlled remotely. Ideal for lifting applications that require fast cycle times, however surface conditions must be flat and clean.

**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 Surface Finish

<table>
<thead>
<tr>
<th>SURFACE FINISH</th>
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<tbody>
<tr>
<td>Ground Surface</td>
<td>100%</td>
</tr>
<tr>
<td>Rough Machined</td>
<td>100%</td>
</tr>
<tr>
<td>Foundry Finish</td>
<td>85%</td>
</tr>
<tr>
<td>Rough Cast</td>
<td>65%</td>
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</tbody>
</table>

### Percentage Of Stated Lifting Power By Material

<table>
<thead>
<tr>
<th>CARBON CONTENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Carbon 0.05 - 0.29%</td>
<td>100%</td>
</tr>
<tr>
<td>Moderate Carbon 0.30 - 0.59%</td>
<td>85%</td>
</tr>
<tr>
<td>High Carbon 0.60 - 0.99%</td>
<td>75%</td>
</tr>
<tr>
<td>Higher Carbon = Higher Residual*</td>
<td></td>
</tr>
</tbody>
</table>

* High Carbon steel (Tool Steel) will absorb magnetism and may magnetically stick to steel surface, such as the magnet or attract ferrous particles.

**Design Factor – What is it?**

*Design factor is the amount of lifting value a magnet is labeled versus the 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.* Design factor (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.
**Design Factor – What is it? Continued**

This means a magnet with a 3:1 design factor and labeled to lift 1,000 lbs will have a break-a-way force of 3,000+ lbs. The labeled lifting value 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 lifting 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 stated 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 lift magnet value.**

---

**Lifting Angle relation to Lifting Force**

Maximum lift force achieved by a magnet is when the direction of force is perpendicular (90°) to the metal surface. If a load is tipped at an angle, shear forces, slide forces, friction, peeling forces associated with movement or impact forces from bumping the load as it is conveyed can cause the lift to fail.

- Check magnet/load balance by raising the load off the ground by 2”-3” only.
- Reposition the magnet until the load is level.
- Never lift a load at an angle in excess of 5° from horizontal.

---

**Loss of Magnetism**

Under normal use conditions, a permanent magnet can experience a decrease in its original holding value. The most common factors which can cause a loss of strength include:

- Every day wear and tear on the magnet face such as: fine metal buildup on or between the magnet’s poles, nicks or gouges in the magnet’s poles, rust buildup, etc.

- Exposure to extreme temperatures: Ceramic lifts lower than -76°F (-60°C) and higher than 300°F (148°C). Neodymium-Iron-Boron Rare Earth lifts lower than -10°F (-22°C) and higher than 180°F (82°C). Electromagnet & Battery Lifts higher than 140°F (60°C).

- Severe blow or shock to the magnet. Do not use a blunt instrument to position the magnet on the load.

- Exposure to electrical currents. Never place magnet next to a large motor or generator. Never use the magnet as part of a welding ground circuit.
DETERMINING MAGNET LAYOUT

In a perfect world all steel would come in thick, smooth, non-flexing material that would be either 4’x4’ or 5’x5’ or 6’x6’ square, then one magnet in the center would work just fine. In the real world, we deal with, steel sheets, containers, tubing, I-beams, well drilling pipe and more that can be just about any length, width and thickness. Sometimes the part needs to be rotated 90° or 180°. What all this means is more than one magnet attached to a spreader system may be needed to move your part. See examples below.

The lift magnet may require custom magnetic pole shoes to adequately lift the part if your part is not a sheet or plate and it has peaks, valleys, ridges, etc. Customizing the face of the magnet to conform to the surface condition of the part ensures good contact between the two and most, if not all, magnetic strength will flow into the part to be lifted.
Magnet Maintenance and Care

A lift magnet, like any other tool, needs to be kept in good working order. Maintaining your lift magnet can only assist in a safe lift condition.

• Occasionally check the mechanical operation of the magnet release handle, spring, grip, as well as the lift lug for damage or fatigue.

• Keep the surface (magnetic face) of the lift free of chips, slag, weld beads, dirt, rust, etc. This can be done by wiping the surface of the magnet off frequently with a wire brush, shop rag or gloved hand.

• Apply oil or grease to magnetic face pole surfaces if magnet is to be stored for long periods of time.

• After a period of time the magnet face poles may become somewhat rounded, nicked or gouged, reducing the magnet’s effectiveness. Magnetic pole faces can be machined or ground to bring the magnet back to a consistent flat surface. Calibration tests can determine current magnetic strength of the lifter.

• Do not weld on, hammer, throw or drop the magnet.

• Do not strike, slam, ram or forcefully impact the magnet against other objects.

• Lift magnets are designed to be used in dry applications. Never use magnet under water without consulting the manufacturer.

• Always store the magnet in a non-conductive, dry environment.
Magnet Calibration

An annual calibration test is recommended to ensure that your lift magnet is performing to its optimal level. Calibration of a lift magnet is a test, performed by an approved testing facility that determines the current lift capacity of the magnet, at the time of the test.

Under an “Ideal Condition” environment, a series of break-a-way tests will determine the current “de-rated” holding value of your magnet. This holding value must meet or exceed the value stated on your lift magnet. If the stated holding value is met, the magnet can be returned to use and scheduled for another calibration test in one year. The outcome of the test allows the operator/owner of the lift to know that the magnet meets the lift standards as designed by the manufacturer.

If the stated holding value is not met, the lift magnet can possibly be machined to bring all magnet face poles back to a smooth, level condition. If that does not bring the magnet back to the manufactured lifting value, the magnet should be removed from operation and replaced with another magnet.

A CERTIFICATE OF CALIBRATION, given at the conclusion of the testing, gives the operator/owner documentation of the magnet’s performance.

SHIPPING INSTRUCTIONS FOR MAGNET CALIBRATION:

Note: Customer is responsible for shipping to and from Industrial Magnetics, Inc., and any authorized repairs to the Lift Magnet.

Please contact our customer service department at (888) 582-0822 to obtain your Customer Supplied Material (CSM) number.

At this time, you will be required to supply a P.O.# for the test procedure described under “Magnet Calibration”. Current fees for this procedure can be obtained by contacting the number listed above. Please include your contact information and shipping address with your Lift Magnet and send to:

Industrial Magnetics, Inc.
1385 South M-75
Boyne City, MI 49712
CSM#______, Attn: Quality Assurance, Calibration
ASME B30.20 Lifting Standards

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.

What that means is... the manufacturer has to follow design and marking standards and the operator has to follow safe lifting operations and procedures.

ALWAYS ASK FOR A MAGNET THAT MEETS OR EXCEEDS ASME B30.20 STANDARDS.
Safety Measures

READ THE PRODUCT MANUAL PRIOR TO OPERATION!

ALWAYS use the entire lift pole surface.

ALWAYS keep contact pole areas perfectly flat and parallel on the surface of the load.

ALWAYS keep contact pole areas and surface of the load clean and free of debris.

ALWAYS protect pole surfaces from rust after use by treating with some oil.

ALWAYS store magnet in a dry environment.

ALWAYS check the magnetic poles to make sure they are flat and not damaged from use.

DO NOT attempt to engage the magnetic lift before resting it on the steel to be lifted. If you have an “Always On” lift magnet use, the release handle in the release position while lowering the magnet onto the load to prevent sudden attraction of the lift magnet and the steel material.

DO NOT hoist the load before locking the handle in the “ON” position (if applicable) or making sure the release handle is not interfering with the load.

DO NOT hoist a load weighing more than the lift’s stated capacity.

DO NOT hoist a load if it is flexing and/or unbalanced. Magnet peel-off may occur and the load may fall.

DO NOT hoist a load before ensuring perfect magnetic contact. First make a TEST lift of 2” or 3” (5-7.5 cm).

DO NOT disengage the lift magnet before firmly setting down the load on the floor or support and making sure the load is steadied.

DO NOT weld in close proximity to the lift magnet or use the lift magnet as a part of the ground circuit during a welding operation.

DO NOT place the lift magnet directly onto a grounded floor. Use a non-conductive spacer.

DO NOT lift people or loads with people on them.

DO NOT leave suspended loads unattended.

DO NOT operate a lift magnet that is missing parts, damaged or malfunctioning.

DO NOT remove or obscure product labeling.

DO NOT lift loads higher than necessary or over people.

DO NOT center the lift magnet by pounding on the sides of the lift with a hammer or other blunt instrument.
Magnet Installation and Start-up

Installation and start-up are very simple and safe provided that the load limits and the applicable standards of the lift magnet are observed for handling suspended loads. Read more product specific operational instructions further in this manual.

1. Remove lifter from packaging and set on a non-ferrous floor or support structure. This operation is to be done with a bridge or other crane of appropriate capacity. Check magnet for missing parts, loose bolts or damage. Tighten where necessary or contact the manufacturer.

2. Clean the area where the magnet will touch. With a crane of appropriate size, lift the magnet and position it on the center of the load to be moved. Be careful to make sure that the load to be lifted is within the prescribed range of the lift magnet’s lifting capabilities.

3. Make sure the magnetic lifter’s poles are in full contact with the load.

4. Read product specific operational instructions on how to operate your lift further in this manual to turn the magnet on or introduce the magnet to the load.

5. Move the load observing all applicable standards for safely handling any suspended load. NO ONE SHOULD BE IN THE OPERATING AREA. NEVER STAND UNDER A LOAD BEING LIFTED OR LIFT A LOAD OVER ANY PEOPLE. ALWAYS USE EXTRA CAUTION. ONLY USE ON MATERIAL THAT DOES NOT FLEX OR BEND.

6. Set the load on the floor, machine or other support structure before dis-engaging the lift magnet. Be careful that the load is perfectly settled on the support structure and that the support structure is adequate for the load.

7. Read product specific operational instructions on how to operate your lift further in this manual to turn the lift magnet off.

Note: The above operations must be performed while applying the applicable shop standards and other standards for suspended load handling.
The BasicLift™ is a powerful, no frills permanent ceramic lift magnet perfect for basic flat steel lifting. Featuring a lightweight and durable Stainless Steel design, the BasicLift™ has a full width cam to release the magnet from the steel surface and a tall lift lug for easy use with crane hooks and slings.

A good value for your dollar with strong lifting capacity and basic lifting features.

Features
• Heat resistant up to 300°F (148°C)
• Lightweight Design
• Durable Stainless Steel Casing
• Large Lift Lug
• Full Width Cam Release
• 2:1 Design Factor
• USA M.A.D.E.™
Make sure the cam release device is properly located on the load to be lifted. The cam release is the mechanical device that breaks the magnet free from the load. Improper placement of the cam release on the load to be lifted can make releasing the load difficult.

CAM INSTALLATION INSTRUCTIONS

Follow these steps to Install the handle/cam release:

1. Place Magnet on a non-ferrous work surface.
2. Insert the handle/cam release into the magnet housing (left side) with the cam release handle located on the left and angled toward the lift lug (as shown in the diagram below).
3. Insert the supplied washer onto the end of the handle/cam release opposite the handle side (onto the right side). The washer should be located between the cam and the magnet housing.
4. Insert and slide the handle/cam release into the opening onto the right side of the magnet housing and then lay the magnet on its left side so that washer is pressed against the cam and magnet housing. Use caution when placing/using steel item or tools near the exposed magnet face.
5. Place a Push Nut onto the end of the handle/cam release by using the plastic tube tool (not shown) and a hammer/mallet to tap the Push Nut into position against the magnet housing.
6. Flip magnet over to its right side and repeat Step five.
Creative Lift® - Introduction

Permanent lift magnets are ideal for handling steel plates, die castings, forgings, etc. They eliminate the need for clamping devices, slings or chains. One person can perform operations previously calling for two or more people. The non-marring roller cam will easily release parts without gouging your valuable materials.

Features
• Patented Non-Marring Roller Cam Release (U.S. Patent: 6,471,273)
• Less torque required to release part
• "Jack Screw", Secondary Release
• Durable Stainless Steel Casing
• Heat Resistant up to 300°F (148°C)
• 3:1 Design Factor
• USA M.A.D.E.™
• CONFORMS TO ASME B30.20 STANDARDS

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lift - lbs (kg)</th>
<th>Height (in)</th>
<th>Width (in)</th>
<th>Length (in)</th>
<th>Handle (in)</th>
<th>Wd. (in)</th>
<th>L. (in)</th>
<th>Overall Magnet Bail Opening</th>
<th>Wt. (lbs)</th>
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<tbody>
<tr>
<td>CL0400</td>
<td>400 (181)</td>
<td>6-3/4</td>
<td>7-1/4</td>
<td>7-3/4</td>
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<td>6-1/2</td>
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<td>9-3/4</td>
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<td>9-3/4</td>
<td>15-1/4</td>
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Lifting Value in lbs (kg) & *Maximum Sheet Length Due To Sag For Material Thickness For Single Magnet Use

<table>
<thead>
<tr>
<th>Model No.</th>
<th>3/16&quot; (6' Length)</th>
<th>1/4&quot; (6' Length)</th>
<th>3/8&quot; (6' Length)</th>
<th>1/2&quot; (8' Length)</th>
<th>3/4&quot; (8' Length)</th>
<th>1&quot; (10' Length)</th>
<th>3&quot; (10' Length)</th>
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<tbody>
<tr>
<td>CL0400</td>
<td>400 (181)</td>
<td>400 (181)</td>
<td>400 (181)</td>
<td>400 (181)</td>
<td>400 (181)</td>
<td>400 (181)</td>
<td>400 (181)</td>
</tr>
<tr>
<td>CL1000</td>
<td>600 (227)</td>
<td>900 (408)</td>
<td>1000 (453)</td>
<td>1000 (453)</td>
<td>1000 (453)</td>
<td>1000 (453)</td>
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</tr>
<tr>
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<td>1100 (498)</td>
<td>1800 (818)</td>
<td>2700 (1224)</td>
<td>3000 (1360)</td>
<td>3000 (1360)</td>
<td>3000 (1360)</td>
</tr>
</tbody>
</table>

NOTE: Holding Values for the Creative Lift® Magnets are stated at 33% of the actual value. We recommend when lifting sheets over 8', use 2 or more lifts on a spreader bar to prevent sheet flexing, sagging or peel-off. Thin material is susceptible to magnetic bleed through, resulting in two sheets being lifted at once. *These maximum sheet lengths are selected due to the sag characteristics of the specified sheet. The item to be lifted must cover the entire length and width of the magnetic poles to properly engage and release the part.
CHOOSING AND USING THE CORRECT LIFT MAGNET

Creative Lift® - Cam Installation Instructions

Make sure the cam release device is properly located on the load to be lifted. The cam release is the mechanical device that breaks the magnet free from the load. Improper placement of the cam release on the load to be lifted can make releasing the load difficult.

HANDLE ASSEMBLY PARTS & INSTRUCTIONS
1: Place the Bushing (6) on one of the Bolts (5).
2: Push the Bolt with the Bushing through the Roller Bearing (7) and then thread the Bolt into Hole “A” on the Handle (2).
3: Set the Creative Lift® Magnet, Jack Screw end DOWN, on a non-magnetic surface with the Handle Tab end UP in a vertical position.
4: Place the second Bolt through the Handle Tab and then place the Washer (8) over the exposed end of the Bolt on the opposite side of the Handle Tab.
5: Thread the Bolt with the Washer into Hole “B” on the Handle (2).
6: Secure the Spring Retainer (4) on one end of the Spring (3) and pass the other end of the Spring through Hole “C” in the Handle (2) and attach it to Spring Retainer (4) welded on the Creative Lift® magnet body.
7: Testing the Handle. Pull the handle down and release it. The handle should return into an upright position. If the handle doesn’t return to the upright position check for proper installation.

Creative Lift® Single Roller Cam Assembly Diagram

1. GRIP
2. HANDLE
3. SPRING
4. SPRING RETAINER
5. SHOULDER BOLT (2)
6. NYLON BUSHING*
7. BALL BEARING*
8. WASHER*

*“Dual Bearing handle assemblies contain 2 of each of these parts as well as an additional Bronze Bushing that is inserted into the two Bearings and Nylon Bushings.”

Single & Dual Bearing Assembled Handle Examples
PowerLift® - Introduction

These compact yet powerful Rare Earth lift magnets can be used on flat or round surfaces and contain an internal ON/OFF release device that does not contact or damage the surface of the part being lifted. Permanent magnetic lifts eliminate the fear of dropping the load being lifted due to power failures.

Features
- ON/OFF Rare Earth design
- Lifts flat or round loads (see chart below)
- Easy internal manual release does not contact the load
- RFID Enabled
- Heat resistant up to 180°F (82°C)
- Handle locks in both “On” or “Off” position
- 3:1 Design Factor
- CONFORMS TO ASME B30.20 STANDARDS

<table>
<thead>
<tr>
<th>Overall Magnet Handle Bail</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNL0250</td>
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<td>PNL1600</td>
</tr>
<tr>
<td>PNL2500</td>
</tr>
<tr>
<td>PNL5000</td>
</tr>
<tr>
<td>PNL6000</td>
</tr>
</tbody>
</table>

Lifting Value in lbs (kg) & *Maximum Sheet Length Due To Sag For Material Thickness For Single Magnet Use

<table>
<thead>
<tr>
<th>Model No.</th>
<th>1/4&quot; (6&quot; Length)</th>
<th>3/8&quot; (8&quot; Length)</th>
<th>1/2&quot; (8&quot; Length)</th>
<th>3/4&quot; (8&quot; Length)</th>
<th>1&quot; (10&quot; Length)</th>
<th>2&quot; (18&quot; Length)</th>
<th>3&quot; (18&quot; Length)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNL0250</td>
<td>180 (99)</td>
<td>250 (113)</td>
<td>250 (113)</td>
<td>250 (113)</td>
<td>250 (113)</td>
<td>250 (113)</td>
<td>250 (113)</td>
</tr>
<tr>
<td>PNL0800</td>
<td>270 (122)</td>
<td>500 (226)</td>
<td>615 (279)</td>
<td>800 (363)</td>
<td>800 (363)</td>
<td>800 (363)</td>
<td>800 (363)</td>
</tr>
<tr>
<td>PNL1600</td>
<td>CF</td>
<td>800 (362)</td>
<td>1600 (728)</td>
<td>1600 (728)</td>
<td>1600 (728)</td>
<td>1600 (728)</td>
<td>1600 (728)</td>
</tr>
<tr>
<td>PNL2500</td>
<td>NA</td>
<td>NA</td>
<td>CF</td>
<td>CF</td>
<td>1490 (675)</td>
<td>2500 (1134)</td>
<td>2500 (1134)</td>
</tr>
<tr>
<td>PNL5000</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>CF</td>
<td>2625 (1190)</td>
<td>5000 (2268)</td>
</tr>
<tr>
<td>PNL6000</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>6600 (2993)</td>
<td></td>
</tr>
</tbody>
</table>

Lifting Value in lbs (kg) For Material Thickness For Single Magnet Round Lifting Applications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lift - lbs (kg)</th>
<th>Minimum Diameter (in)</th>
<th>Minimum Thickness (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNL0250</td>
<td>125 (57)</td>
<td>2</td>
<td>1/2</td>
</tr>
<tr>
<td>PNL0800</td>
<td>400 (181)</td>
<td>3</td>
<td>1/2</td>
</tr>
<tr>
<td>PNL1600</td>
<td>800 (363)</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>PNL2500</td>
<td>1250 (567)</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>PNL5000</td>
<td>2500 (1134)</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>PNL6000</td>
<td>3300 (1496)</td>
<td>CF</td>
<td>CF</td>
</tr>
</tbody>
</table>

NOTE: Holding Values for the PowerLift® Magnets are stated at 33% of the actual value. We recommend when lifting sheets over 8’, use 2 or more lifts on a spreader bar to prevent sheet flexing, sagging or peel-off. Thin material is susceptible to magnetic bleed through, resulting in two sheets being lifted at once. Round Item Holding Values are based on ideal conditions. Pipe length, wall thickness, diameter and surface condition can all affect the magnet’s performance. Please consult the factory before specifying these magnets for use on round materials. *These maximum sheet lengths are selected due to the sag characteristics of the specified sheet. The item to be lifted must cover the entire length and width of the magnetic poles to properly engage and release the part. CF = Consult Factory NA = Not Applicable (Magnets listed will not turn “ON” on specified material thicknesses).
PowerLift® - Operation Instructions

HANDLE LOCKING SYSTEM
The locking system is performed by first pulling on the handle to release the lock pin, then rotating the handle to the desired position. The locking feature prevents the handle from being bumped partially on and avoids giving the operator a false feeling that the magnet is holding safely.

PowerLift® needs to be on thick steel to engage the magnet to the “ON” position.

To engage, pull handle grip upward and rotate the lever to the magnetized “ON” position, then release the grip. Make sure the lever system is in its lever-stop position.

When turning “OFF” the magnet, be sure to hold the lever as firmly as possible to safely release the load. Once you have a firm grasp on the lever pull up on the handle grip and rotate the lever to the “OFF” position.
VersaLift™ - Introduction

Compact and powerful Rare Earth lift magnet for use on flat or round surfaces. Contains an internal ON/OFF release device that does not contact or damage the surface of the part. More features than other lifts and manufactured in the USA (USA M.A.D.E.™).

Features
- Rare Earth Magnet with a Locking On/Off handle & Test load feature
- Supports custom pole shoes & lifts flat or round loads (see chart below)
- Heat resistant up to 180°F (82°C)
- Stationary Lift Lug(s)
- Vertical Lift Capable using the optional Lift Lug attachment
- RFID tagged
- 3:1 Design Factor
- CONFORMS TO ASME B30.20 STANDARDS

Lifting Value in lbs (kg) & *Maximum Sheet Length Due To Sag For Material Thickness For Single Magnet Use

Model No. 1/4" (6' Length) 3/8" (8' Length) 1/2" (8' Length) 3/4" (8' Length) 1" (10' Length) 2" (10' Length) 3" (10' Length)
VL0275 150 (68) 220 (99) 240 (108) 250 (113) 275 (124) 275 (124) 275 (124)
VL0600 260 (117) 435 (197) 525 (236) 550 (249) 600 (272) 600 (272) 600 (272)
VL1200 NA 755 (342) 960 (435) 1165 (528) 1200 (544) 1200 (544) 1200 (544)
VL2500 NA NA NA 1700 (771) 1800 (816) 2500 (1134) 2500 (1134)

Lifting Value in lbs (kg) For Single Magnet Use for Round Lifting Applications Vertical Lift (Flat Only)

Model No. Maximum Lift at Minimums Minimum Diameter / Thickness Lift - lbs (kg) Minimum Thickness
137 (49) 50 (22) 2.00 in. / 0.12 in. 68 (30) 1.00 in.
300 (136) 130 (58) 2.00 in. / 0.12 in. 150 (68) 1.00 in.
600 (272) 600 (272) 4.00 in. / 0.50 in. 300 (136) 1.00 in.
1250 (567) 1250 (567) 8.00 in. / 1.00 In. 525 (233) 3.00 In.

NOTE: Holding Values for the VersaLift™ Magnets are stated at 33% of the actual value. We recommend when lifting sheets over 8', use 2 or more lifts on a spreader bar to prevent sheet flexing, sagging or peel-off. Thin material is susceptible to magnetic bleed through, resulting in two sheets being lifted at once. Round Holding Values are based on ideal conditions. Consult the factory before specifying these magnets for use on round materials. *Maximum sheet lengths are selected due to sag characteristics of specified sheet. The item to be lifted must cover the entire length and width of the magnetic poles to properly engage and release the part. NA = Not Applicable (Magnets will not turn “ON” with stated thicknesses.)
CHOOSING AND USING THE CORRECT LIFT MAGNET

VersaLift™ - Operation Instructions

HANDLE LOCKING SYSTEM
The locking system is performed by first pulling the spring loaded handle out and then rotating the handle to the desired position. The locking feature prevents the handle from being bumped partially on and avoids giving the operator a false feeling that the magnet is holding safely.

Test Feature: To operate the Test Feature, pull spring loaded handle out and rotate it to the “TEST” position. Lift load approximately 2-3” to verify the magnet has the capacity to lift your load. Once verified, place load back down and turn the handle to the “ON” position. Never complete entire lift operation in “TEST” position.

To Engage: Make sure the VersaLift™ magnetic poles are in full contact with the load. VersaLift™ needs to be on thick steel to engage the magnet to the “ON” position. Pull handle grip upward and rotate the lever to the magnetized “ON” position, then release the grip. Make sure the lever system is in its lever-stop position. When turning “OFF” the magnet, be sure to hold the lever as firmly as possible to safely release the load. Once you have a firm grasp on the lever pull up on the handle grip and rotate the lever to the “OFF” position.

VERTICAL LIFT LUG ASSEMBLY INSTRUCTIONS:
Insert Provided Cap Screws into the Vertical Lift Lug Adaptor (as shown in diagram) and then insert into the End Plate of VersaLift™ Magnet into the provided location.

Note: The Vertical Lift Lug Adaptor is designed and intended to be installed with the lug portion close to flush with the magnet face. Improper installation may reduce the effectiveness and safety of the Magnet and Adaptor.
**RELM - Introduction**

Round Electro Lift Magnets (RELM) provide concentrated holding power and a deep reaching magnetic field to lift thick, ferrous items. These electromagnetic lifts are an extremely valuable material handling tool. The RELM’s durable construction make them suitable for working in most environments handling thick, non-flexing ferrous items such as steel plates, billets, die castings, forgings and more. Designed for plug-in use (no separate power supply required), the control switch for the “On, Off and Release” functions of the magnet are mounted on the top of the unit. When compared to our competitors electro lifts, IMI’s RELM series of lift magnets offers lower wattage requirements, higher lifting capacities and a lower unit weight.

NOTE: RELM’s are not intended to be used as scrap handling magnets. Picking up several pieces of steel at once is not recommended and may result in serious injury or property damage. Not recommended for painted or finish coated surfaces. Magnet is supplied with a 36” long, 16/3 SOOW Heavy Duty cord. Cord cap is supplied by others. A Twist Lock style cap is recommended.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lift - lbs (kg)</th>
<th>Voltage (VAC)</th>
<th>Watts</th>
<th>Magnet Diameter (in)</th>
<th>Overall Height (in)</th>
<th>Bail Height (in)</th>
<th>Bail Width (in)</th>
<th>Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELM06</td>
<td>1,200 (544.31)</td>
<td>115</td>
<td>33</td>
<td>6-3/8</td>
<td>11-1/2</td>
<td>2-1/2</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>RELM08</td>
<td>2,500 (1,133.98)</td>
<td>115</td>
<td>51</td>
<td>8-3/8</td>
<td>12-7/8</td>
<td>2-7/8</td>
<td>2-1/4</td>
<td>75</td>
</tr>
<tr>
<td>RELM12</td>
<td>6,000 (2,721.55)</td>
<td>115</td>
<td>149</td>
<td>12-1/4</td>
<td>15-1/4</td>
<td>3-3/8</td>
<td>2-1/2</td>
<td>210</td>
</tr>
<tr>
<td>RELM16</td>
<td>8,000 (3,628.74)</td>
<td>115</td>
<td>260</td>
<td>16-3/4</td>
<td>15-1/2</td>
<td>3-1/2</td>
<td>2-1/2</td>
<td>300</td>
</tr>
<tr>
<td>RELM20</td>
<td>13,000 (5,896.70)</td>
<td>115</td>
<td>260</td>
<td>20</td>
<td>14-1/8</td>
<td>4</td>
<td>3-1/8</td>
<td>615</td>
</tr>
</tbody>
</table>

*RELM Holding Values are stated at 50% of the actual value for a 2 to 1 design factor.

**RELM - Operation Instructions**

1. Wipe any debris the bottom of the lifting magnet and the area of the work piece where the magnet will be located.
2. The magnet should be centered on the work piece.
3. After positioning the magnet, turn switch to “On/Hold”
4. Lift the piece slightly (2"-3") and jar the load to insure positive holding power is available. Lower load and reposition magnet if necessary to balance load properly.
5. Move the piece smoothly to the desired location. Avoid severe jarring and swinging of the load.
6. Position load on a solid surface then move the load switch past “Off” to “Drop/Release” and hold for 2-3 seconds.
7. CAUTION: DO NOT ENERGIZE MAGNET UNTIL IT HAS BEEN PLACED IN CONTACT WITH THE NEXT PIECE TO BE LIFTED.
CHOOSING AND USING THE CORRECT LIFT MAGNET

RELM - Control Schematic

MAGNET VOLTAGES:
ALL RELM UNITS - 120VAC INPUT
110VDC OUTPUT
300W MAX.

MAGNET CONTROL SWITCH
RELEASE-OFF-ON
RELEASE POSITION IS MOMENTARY. IT REVERSES MAGNET POLARITY TO CLEANLY RELEASE LOAD

POWER CORD
16/3 SJJO X 5 FT, LC.
PLUG BY OTHERS
TWIST LOCK OR EQUAL RECOMMENDED

120VAC INPUT

F1 5A AGC

BR1

330Ω 25W
RELEASE RESISTOR

R1

SW1

R2

ELECTROMAGNET

INDUSTRIAL MAGNETICS, INC. • MAG-MATE® GROUP
Battery Lift - Introduction

Battery Lift Magnets (BLM) operate on a self-contained automotive type battery, which results in maximum convenience, portability, versatility, and dependability. No need for external power cords. Ideal for remote locations, use with forklift type transports, or lift cranes that do not have means of power. BLM’s come complete with built-in chargers and a visible power gauge that shows when the magnet needs charging. This simple lift magnet does not have fancy lights, whistles or bells that can malfunction and cause a dangerous lifting situation. BLM’s make loading and unloading of thick, non-flexing ferrous parts simple and fast.

NOTE: BLM’s are not intended to be used as scrap handling magnets. Picking up several pieces of steel at once is not recommended and may result in serious injury or property damage. You must have 100% coverage on a FLAT SURFACE to operate the magnet. Not recommended for painted or finish coated surfaces. User supplied 120 Volt timer recommended for best charging operation and longest battery life. Batteries are not included. Use Automotive or Heavy Duty commercial batteries. Deep cycle batteries should not be used.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Lift - lbs (kg)</th>
<th>Qty. of Batteries Required</th>
<th>Watts</th>
<th>Width (in)</th>
<th>Length (in)</th>
<th>Height (in)</th>
<th>Bail Height (in)</th>
<th>Bail Width (in)</th>
<th>Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM2500</td>
<td>2,500 (1,133.98)</td>
<td>1 @ 6 Volts</td>
<td>52</td>
<td>7-1/2</td>
<td>13-1/8</td>
<td>19-3/4</td>
<td>3-7/8</td>
<td>5-5/8</td>
<td>135</td>
</tr>
<tr>
<td>BLM5000</td>
<td>5,000 (2,267.96)</td>
<td>1 @ 12 Volts</td>
<td>104</td>
<td>7-1/2</td>
<td>20-1/8</td>
<td>19-3/4</td>
<td>3-7/8</td>
<td>5-5/8</td>
<td>250</td>
</tr>
<tr>
<td>BLM7000</td>
<td>7,000 (3,175.15)</td>
<td>3 @ 6 Volts</td>
<td>156</td>
<td>9-1/2</td>
<td>25</td>
<td>20-1/2</td>
<td>4-5/8</td>
<td>6-1/8</td>
<td>360</td>
</tr>
<tr>
<td>BLM10000</td>
<td>10,000 (4,535.92)</td>
<td>4 @ 6 Volts</td>
<td>208</td>
<td>7-1/2</td>
<td>41-1/8</td>
<td>19-3/4</td>
<td>3-7/8</td>
<td>5-5/8</td>
<td>470</td>
</tr>
</tbody>
</table>

*6 Volt Batteries - BCI Group 1 or similar size, 400CCA at 0°F Minimum. 12 Volt Batteries - BCI Group 29NF or similar size, 400CCA at 0°F Minimum.

Battery Lift - Operation Instructions

1. Before use, the Battery Lift should be checked to insure it is sufficiently charged. See Battery Installation and Charging section of guide.
2. Wipe any debris from the bottom of the lifting magnet and the area of the work piece where the magnet will be located.
3. The magnet should be centered on the work piece.
4. After positioning the magnet, turn switch to “On/Hold”. Check meter to insure the needle is into green zone on the magnet side. **Charging cord must be disconnected.**
5. Lift the piece slightly (2”-3”) and jar the load to insure positive holding power is available. Lower load and reposition magnet if necessary to balance load properly.
6. Move the piece smoothly to the desired location. Avoid severe jarring and swinging of the load.
7. Position load on a solid surface then move the load switch past “Off” to “Drop/Release” and hold for 2-3 seconds.
8. **CAUTION: DO NOT ENERGIZE MAGNET UNTIL IT HAS BEEN PLACED IN CONTACT WITH THE NEXT PIECE TO BE LIFTED.**
CHOOSING AND USING THE CORRECT LIFT MAGNET

Battery Lift - Indicating Meter

The panel meter indicates the degree of charge of the battery. For a fully charged battery the meter pointer will be about 1/4 into the safe green area on magnet side and represents 6, 12, 18 or 24 volts. The green/red boundary represents 2 to 3 volts less. Further dropping of voltage (into RED zone) reduces the magnet lifting capacity to an unsafe condition.

Therefore, indications in the RED zone call for immediate recharging. THE MAGNET SHOULD NOT BE OPERATED IF THE METER POINTER MOVES INTO THE RED ZONE. If the battery is low, recharge it.

Battery Lift - Maintenance Instructions

Battery should be kept charged as described. Poles of the magnet should be kept free from rust and periodically inspected for nicks and burrs which reduce lifting capacity. Burrs may be removed by filing, however, deep nicks may require grinding of the magnet's pole faces.

Care should be taken to avoid dropping, banging or slamming the magnet into other objects. The coil of the magnet is encapsulated in a strong, rigid epoxy and care should be taken to prevent sharp objects from penetrating it.

Battery Lift - Battery Selection

IMI recommends at minimum, the use of a standard automotive vehicle battery for the Battery Lift Magnets vs. the use of a deep-cycle battery. Our experience has shown that the deep-cycle batteries do not tolerate many short charge/discharge cycles like an automotive battery can. Automotive batteries can be charged and recharged in short cycles whereas deep cycle units work best with long discharge times and subsequently long recharge times. The best service will be obtained from Heavy Duty, Commercial Vehicle Batteries.

When using 6-volt batteries, use BCI Group Size 1, 625CCA or equal. Approximate dimensions: 8.81” long x 6.75” wide x 8.62” high. An equivalent battery is the Exide COM-1H-P 6-volt heavy duty commercial vehicle battery.

When using 12V batteries, use BCI Group Size 29NF, 400CCA or equal. Approximate dimensions: 13.00” long x 5.50” wide x 8.88” high.
Always check the electrolyte level of all cells and add distilled water to the battery according to the manufacturer’s mixing and charging instructions to ensure proper performance and ensure battery life.

The built-in charger is turned on by connecting the Power Pack to the 115 VAC line using the line cord packed with the magnet. The control switch must be in the “OFF” position when the charger is connected to the AC line. Leaving the control switch in the “ON” position will greatly increase the time required to recharge the batteries and will damage the charger. An accurate meter indication is only achieved in the “ON” position when the charging cord has been disconnected.

The charger is designed to charge at the maximum safe rate. The meter pointer will be in the charge region while the battery is being charged and will return to the “ZERO” center position when charging is completed. However, only a hydrometer will show the true state of a charge.

Batteries should be charged in a well ventilated area and never with the power pack lid down. Battery gases are explosive. Recharging the battery every night will increase battery life and magnet safety. DO NOT OVERCHARGE! The use of an AC timer is recommended. Simple 120 VAC timers used for lamps or other small appliances can be used. These timers are readily available from any hardware store or building center. IMI also has custom designs for built-in timers.

A rule of thumb for charge timers is; charge time equals magnet on/use time. For example, if the magnet is on/used for 3-4 hours during a day or shift the charge time for the battery pack should be 3-4 hours.

OTHER TIPS:

A. Do not simply plug the charger in and leave the battery charging. This is a sure way to overcharge the battery.

B. With proper care, the battery will have a useful life of two years or more.

C. The battery, if discharged continuously, will energize the magnet for 6 – 8 hours. Most applications, however, only require about 4 hours of magnet on time (battery discharge time) because the magnet is cycled on and off in normal use.
CHOOSING AND USING THE CORRECT LIFT MAGNET

BATTERY LIFT PARTS LIST

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control Panel</td>
</tr>
<tr>
<td>2</td>
<td>Ammeter</td>
</tr>
<tr>
<td>3</td>
<td>Receptacle</td>
</tr>
<tr>
<td>4</td>
<td>Control Switch</td>
</tr>
<tr>
<td>5</td>
<td>Instruction Plate</td>
</tr>
<tr>
<td>6</td>
<td>On-Off Plate</td>
</tr>
<tr>
<td>7</td>
<td>Battery Cable (Positive)</td>
</tr>
<tr>
<td>8</td>
<td>Battery Cable (Negative)</td>
</tr>
<tr>
<td>9</td>
<td>Switch Lever</td>
</tr>
<tr>
<td>10</td>
<td>Charging Cord</td>
</tr>
<tr>
<td>11</td>
<td>Charger Chassis</td>
</tr>
<tr>
<td>12</td>
<td>Rectifier - Silicon (Not Shown)</td>
</tr>
<tr>
<td>13</td>
<td>Transformer</td>
</tr>
<tr>
<td>14</td>
<td>Circuit Breaker</td>
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<tr>
<td>15</td>
<td>Magnet Body &amp; Case</td>
</tr>
<tr>
<td>16</td>
<td>Cover</td>
</tr>
<tr>
<td>17</td>
<td>Clevis / Clevis Assembly</td>
</tr>
<tr>
<td>18</td>
<td>Clevis Pin</td>
</tr>
<tr>
<td>19</td>
<td>Battery - Jumper Cable</td>
</tr>
<tr>
<td>20</td>
<td>Battery (Furnished by User)</td>
</tr>
<tr>
<td>21</td>
<td>Hold Down Bracket</td>
</tr>
<tr>
<td>22</td>
<td>Battery Pad</td>
</tr>
<tr>
<td>23</td>
<td>Caution Plate</td>
</tr>
<tr>
<td>24</td>
<td>Coil</td>
</tr>
<tr>
<td>25</td>
<td>Clevis Spacer</td>
</tr>
</tbody>
</table>
Battery Lift - Control Schematic

MAGNET CONTROL SWITCH
RELEASE-OFF-ON

RELEASE POSITION IS MOMENTARY. IT REVERSES MAGNET POLARITY TO CLEANLY RELEASE LOAD

MAGNET VOLTAGES:
BLM2500 6 VDC - ONE 6V BATTERY
BLM5000 12 VDC - ONE 12V BATTERY OR TWO 6V BATTERIES CONNECTED IN SERIES
BLM7000 18 VDC - THREE 6V BATTERIES CONNECTED IN SERIES
BLM10000 24 VDC - FOUR 6V OR TWO 12V BATTERIES CONNECTED IN SERIES
**Lift Magnet Warranty**

All New Products are warranted to be free from defects in material and workmanship for the periods specified below for the original purchaser only. Any Modifications To The Magnet, Handle or Lift Lug Voids The Warranty. This warranty is not transferable. IMI will replace or repair any Products returned to it, free-of-charge, by the original purchaser which, upon examination by IMI, is found to have failed, under normal use and service by the original purchaser, due to a defect in material or workmanship. Additionally, at IMI’s sole discretion, IMI may return to the original purchaser the purchase price paid for any Product in lieu of repairing or replacing such Product.

All Products will be covered by the exclusive limited warranty for 365 days from the date of shipment unless otherwise specifically stated in writing.

IMI must be given an opportunity to investigate and inspect any defects.

The expense of freight to and from the repair site will be the responsibility of the purchaser. The expense of travel and lodging for IMI service personnel will be the responsibility of the purchaser, if repair site is other than the IMI factory.