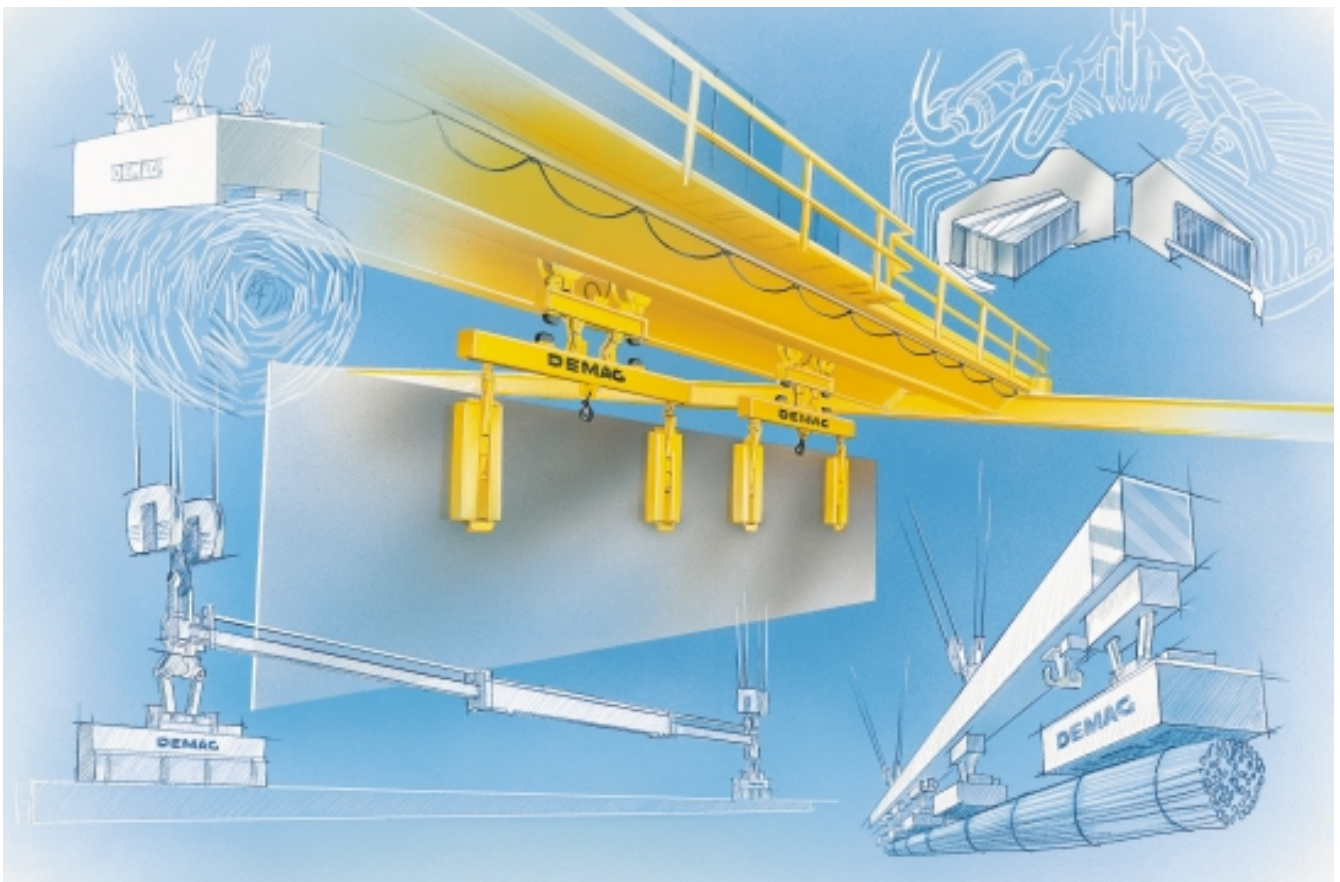


## Load lifting magnets

High performance magnets for materials handling



# Using electromagnetism to carry weight ...

## **Magnetism – inevitable, indispensable**

For thousands of years, natural magnetism remained an inexplicable phenomenon. Just as, until only recently, it was a mystery why the compass – a European invention of the 14th century – always pointed in the right direction. Today, the puzzle of magnetism (named after the Greek landscape of magnesia) has been solved. But that is not all. Virtually all technological development is based on the generation and application of electromagnetic forces.

## **We speak with experience**

Mannesmann Dematic has used magnetism in its products since the first Demag electromagnets were introduced in 1905. Only a few years later, we began the serial production of load lifting magnets. Continually developed, repeatedly improved, Demag load lifting magnets are now remarkable for their precision, the defined penetration depth of the electromagnetic fields, superb efficiency and uniformly distributed carrying power.

## **Tried and tested in all industries**

No matter where our load lifting magnets are deployed – in the production of iron and steel, in trade and commerce, in the processing industries and in the recycling sector – our application expertise really is broad based. The experience we have gathered under all kinds of operating conditions is truly extensive. Thanks

to computer assisted calculations of the carrying power and tear-off strength, thanks to punishing practical trials on magnet test rigs, we can meet virtually any operating and load requirements. We can even guarantee that using Demag load lifting magnets will help you:

- improve operational safety
- accelerate working processes
- lower personnel costs and
- boost productivity.

## **All over the world**

Our load lifting magnets are used all over the world. Which means we equip them to all international standards and take any national standards and regulations into account. Demag magnets operate wear-free, do not need maintaining and are impervious to thermal or mechanical stress. Protected against moisture as standard, our magnets can be even be designed for operation under water.

With more than 100 subsidiaries and agencies all over the world, our customer service is fast reacting and comprehensive. However, that service begins long before the actual purchase with a professional advice, project planning and design package. If required, we will install and put your magnets into operation as well and, needless to say, in the event of damage or malfunction, we are on call at any time.

## **For the most varied tasks and specifications**

The unique Demag load lifting magnet range includes circular and rectangular magnets in numerous designs and sizes for all your different applications. Demag magnets come complete with power converters, controls, switches, back-up batteries and other safety features.

Rounding off the magnet range are other facilities such as suspension, spreader and turning systems which we plan, design and construct to match the relevant crane concept. Simulation programs ensure the perfect design, having integrated the properties of the goods transported, the type of handling specified, the operations given and the spatial conditions on site.







## For hot and heavy loads like ingots and billets ...

Even the red-hot heat that ingots and billets give off does not deter Demag load lifting magnets. Fitted with temperature resistant solenoids and automatically cooled via a double base plate, our magnets are just the job when it comes to carrying hot materials weighing up to 600 °C.

Also, to lift and carry ingots and billets with different cross-sections and dimensions as efficiently and safely as possible, we have developed special magnets – for iron and steel industry applications as well.



19308

- 1 Spreader with two rectangular magnets designed to turn heavy ingots weighing up to 35 tonnes.
- 2 Spreader with two rectangular magnets designed to lift heavy ingots weighing up to 40 tonnes.
- 3 Spreader with two rectangular magnets designed to carry a layer of billets measuring up to 12 m in length at temperatures of up to 600 °C .



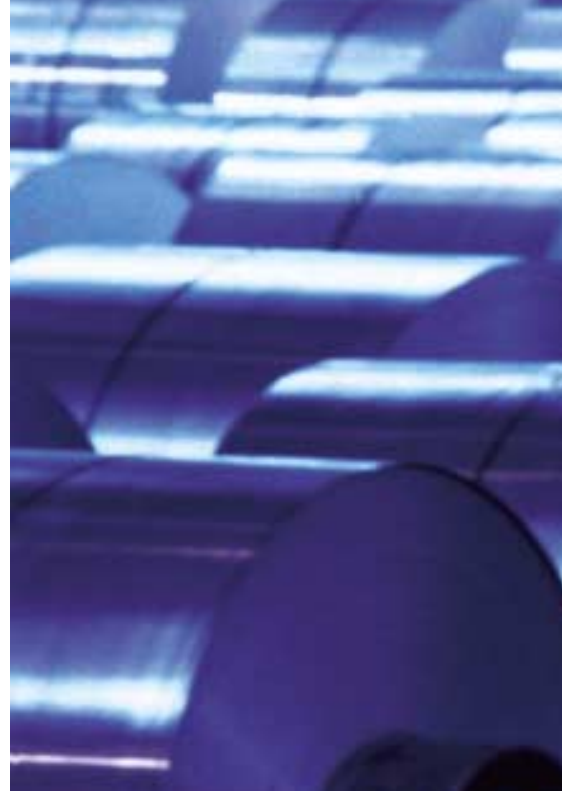


## ... or big and bulky like sheet metal and steelwork ...

Sheet metal and steelwork no longer have to be roped and chained before unloading. Our customised spreader and magnet arrangements ensure loads are held securely with smooth handling in line with production requirements. The magnet type, size, number and grouping all depend on the dimensions, strength, permissible overhang and weight of the load to be carried.

By changing the level of magnetisation, the carrying power can be varied so that the magnets only pick up a given number of sheets from a certain stack.

A crane with two independently travelling crabs is the ideal solution if both short and long sheets have to be handled. Whereas the short sheets only need the one crab, the longer ones are carried using both crabs in tandem mode.



- 1 Spreader with five rectangular magnets for handling large sheet metal at a shipyard.
- 2 Spreader with four rectangular magnets for handling metal slats and sheets: the magnets are motor driven to pivot between +9 and -9° degrees.
- 3 Rectangular magnet with magnetic fields of great penetration depth for handling sheet stacks.
- 4 Spreader and 39 circular magnets for handling individual sheets 3 mm thick and thicker.
- 5 Two spreaders each with two motor driven pivotable magnets to handle metal sheets both horizontally and vertically.
- 6



## ... long and thin like tubes, profile sections, shaped and bar steel ...

Together with individually designed and often telescoping spreaders, our special bipolar and longitudinal flux magnets are ideal for lifting and handling tubes, rails, girders, concrete steel and similar products – one by one, in layers or bundled.

Different levels of magnetisation can be selected so that the load capacity of the magnets varies. In other words, steel bars and tubes can be lifted individually or in a bunch depending on actual requirements. If necessary, we can supplement the spreaders with load hooks and other devices to facilitate the pick-up of longitudinal products etc.



- ❶ Spreader with rectangular magnets for handling long concrete steel bundles that weigh up to 3 t and measure between 12 and 20 m in length.
- ❷ Magnets for handling bundles that weigh up to 4.3 t and measure up to 13 m; fitted with pick-up devices for stacking cradles.
- ❸ Spreader with two patented magnets for handling rails in layers.
- ❹ Spreader with two longitudinal flux magnets.
- ❺ Depending on profile or bundle length, the spreader in twin crab mode can be adjusted between 2550 and 6050 mm.









## ... wound and twisted like wire coil and strip coil ...



Specially designed magnets are used when it comes to handling wire coil and strip coil.

Bipolar magnets are ideal for handling wire coil, with the shape of the poles matched to the coil diameter and the length to the number of coils to be handled.

In the case of strip coil – either cold or up to temperatures of 600 °C – our special coil magnets of segmented configuration make sure that the coils do not telescope when moved vertically.

- ❶ Special magnets to handle coils weighing anything up to 60 tonnes vertically or
- ❷ horizontally.
- ❸
- ❹ Bipolar magnets picking up wire coil.



4

12194

## ... or all mixed-up like scrap iron and broken castings

Rugged cast steel housings with fend-off rings and bottom plates made of manganese steel ensure that heaped and irregular loads can be handled smoothly as well. If necessary, the design can be specified according to the particular scrap classifications of an individual country.

With the help of the right electrical controls, the strength of the magnetic field can be adjusted to the job at hand. For example, charging cranes will pick up the exact weight of material required.

By means of field forcing excitation – or short voltage impulses during the switch-on phase – the quantity of material that the magnet attracts can be significantly increased, thus boosting all-round handling performance.

To move entire bundles of scrap metal, we have developed rectangular magnets with rigid suspension systems. These pick up several heaps simultaneously and eliminate load sway for exact approach manoeuvres at both the pick-up and the drop-off point – even when in automatic mode.

Demag separator magnets are tried and tested in heavy industry in general and in the mineral reprocessing and building material recycling sectors in particular. Installed above conveyer belts, channels or chutes, designed to match the speed of the materials so conveyed, our magnets attract the iron and steel parts effectively and reliably.

- 1 Separator magnets to pull out the ferromagnetic parts from the rest of the scrap.
- 2 A circular magnet for handling scrap.
- 3 Circular magnets for loading and unloading metal turnings.
- 4





25063



2

13752



3

13760



4

13754

# Making load handling magnets even more effective

## Customised suspension arrangements

Demag load lifting magnets come complete with the suspension arrangements tailored to the type and size of magnet. Depending on specifications, we supply flexible arrangements – rigid or universal or turning or rotating or – mainly as a chain suspension system.

## Customised spreader arrangements

Our spreaders are individually engineered and constructed. The length, width and components are all matched to the type and dimensions of the material to be handled. The technical data of the crane system are also taken into account.

The spreaders can be designed so that they travel in either a longitudinal or latitudinal direction or in both. If required, we fit them with turning and pivoting mechanisms. And that is not all. The spreaders and hoist units are designed in such a way that any load sway in the long or cross-travel direction is effectively minimised.

Moreover, there is always the possibility of integrating other load lifting devices into the spreader system such as load hooks for rope slings or stacking cradles for block stores – e.g. Demag DSR stacking cradles. Spreader with rope disengaging mechanisms facilitate and accelerate the handling of loads that have to be fastened by rope or by chain.



- 1 Spreader, with two magnets; spreader suspended from two crabs can be adjusted to lengths of between 2550 and 6050 mm. The magnets are screened off at the side to prevent reciprocal influence.
- 2 Magnets fitted with latching devices for handling stacking cradles.
- 3 Spreader with four rectangular magnets for moving layers of tubes. It is side-adjustable.
- 4 Spreader with three rectangular magnets and pivoting latching devices for handling stacking cradles.



# Dependable electrics, individual controls

## Reliable energy supply

Demag load lifting magnets and magnet assemblies are powered by non-wearing static converters with adjustable thyristor controls. If a continuous power supply is required independent of the mains, e.g. for safety reasons, low-maintenance batteries and a charger unit can be supplied.

## Wide range of functions

Even in the standard version, the control units that come with the Demag load lifting magnets offer several levels of magnetisation with which the load capacity can be varied. In this way, part loads – such as a predetermined number of sheets or a given quantity of materials – can be picked up speedily and reliably. The special flick switching feature – i.e. a slight weakening of the magnetic field – means that excess or loose hanging load parts can be dropped at the pick-up point. Similarly, thanks to the fast current reverse de-excitation at switch-off, you can be sure that the load will drop immediately and completely.

By compensating for temperature rise in the magnet, we ensure that the magnetic field remains constant during the entire operating period.

The ON time, magnet temperature rise and battery status are all automatically monitored on a cyclical basis and shown on a large display.

Depending on requirements and the task at hand, these functions can be supplemented by a whole series of options. For example, the magnetic field can be boosted within a fraction of second when it is switched on, allowing the load to be picked up very quickly. Also, by means of magnet preselection, the magnets suspended on a spreader can be switched on or off either individually or in groups, again all depending on the size and the weight of the materials to be handled. Even complete de-excitation is possible using alternating current – i.e. any unwanted residual magnetism left in the load, e.g. such as high grade steel, is safely eliminated.



37020

Preinstalled control cabinet ready for connection with power and control sections

Radio remote control unit to operate the crane and magnets from a distance



37082





Operator mobility with infrared controls when operating cranes and load lifting magnets



# From one source – worldwide.

The power to innovate and the power to perform. That is what has made Mannesmann Dematic a world leader in the hoisting, materials handling, conveying and storage sectors. Which means that we offer you a comprehensive range of components and systems so that you can use load lifting magnets to optimum effect. And that is not all. With our help, you will be able to meet your production and materials management requirements with efficient and reliable solutions for the future.

Our product range is based on hoists, industrial drives, overhead travelling cranes, automated electric monorails and mobile cranes.

The range also includes process and production cranes, harbour cranes, railway cranes and automatic guided vehicle systems that we design and build to your specifications.

And we also plan and manufacture conveying, assembly, warehouse and distribution systems and entire turnkey facilities such as high bay warehouses, cargo terminals and parcel sorting systems and sophisticated data management and automation systems for the manufacturing and logistics sectors.

As an international player, we can provide professional advice anywhere in the world thanks to our experienced engineers, our unrivalled customer service, our extensive network of support centres and our reliable spare parts supply system via central warehouses and many local stores.



# Powerful small units – also independent of the mains

Compact circular magnets, battery magnets and permanent magnets round off our load lifting magnet range.

## All-round success

Circular magnets offer load capacities that are ten to twenty times greater than their own weight which ranges between 15 and 75 kg. As single magnets, they are fitted with a rectifier and ideal for operation with electric hoists. They are particularly suitable for handling smaller sheets, workpieces and tool parts.

Used as spreader magnets for handling large sheet metal, circular magnets provide smooth and reliable handling to feed machinery in line with production requirements. They can also be controlled in groups to pick up specific parts that have been flame-cut, for example.

## All-in one units

Our battery magnets are a complete compact unit comprising magnet, power pack, recharger and control unit. Not having to rely on mains power, they can move magnetisable articles efficiently and safely. And, designed to handle loads weighing between 900 and 4,000 kg, depending on the model, they are often used as single units. An automatic safety device prevents the magnet from being switched on if there is not enough voltage in the battery, thus guaranteeing maximum safety.

## Always ready for action – anywhere

Permanent magnets are remarkable for the fact that they can create a magnetic field anywhere and at any time by literally drawing on their own strength. They are ideal for use with workplace hoists and facilitate the handling of smaller single metal sheets or other flat and circular materials.



- 1 Battery magnet with a load capacity of up to 2,000 kg.
- 2 Battery magnet with a load capacity of up to 4,000 kg and safety factor of 2.
- 3 Battery magnet with a load capacity of up to 700 kg and safety factor of 2 for handling flat loads.
- 4 Circular magnet with a built-in rectifier, a load capacity of up to 2,000 kg and safety factor of 2.
- 5 Independent of the mains power supply, permanent magnets can be used anywhere.

# At a glance



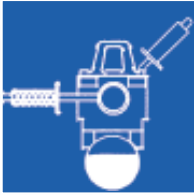
**DBM battery magnets**  
Mains independent single magnets for handling individual sheets and smaller metal and tool parts



**R small capacity magnets**  
Single magnets for handling smaller sheets, workpieces and tool parts. Particularly suitable for fitting to electric hoists and as spreader magnets for handling thin sheet metal



**EG rectangular magnets**  
Chiefly used as single magnets for handling plate metal, ingots and billets under arduous steel mill conditions – also at higher load temperatures



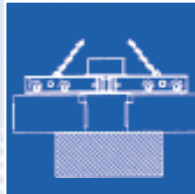
**DPM permanent magnets**  
Mains independent single magnets for handling individual sheets and flat and round materials



**RG/RGH circular magnets**  
Single magnets for handling scrap, pig iron and broken castings as well as metal blocks, ingots and billets



**EBP rectangular magnets**  
Single magnets with movable pole fingers for handling billets and ingots with different cross-sections or diameters



**RSC coil magnets**  
Single magnets for handling coils in a vertical position – also at higher load temperatures



**ESB bipolar magnets**  
Single or spreader suspended magnets for handling pipes, round material, single profile sections and wire coils



**EST rectangular magnets**  
Mainly used as spreader suspended magnets for handling individual or several sheets of metal, shaped steel, billets and tubes.



**ESL longitudinal flux magnets**  
Mainly used as spreader suspended magnets for handling single profile sections



**ESE/ESD rectangular magnets**  
Used as single magnets for handling plate metal, ingots and billets – also at load higher temperatures



9582



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