SGM

TECHNOLOGY AND PROXIMITY

LIFTING MAGNETS

From stand-alone lifting magnets to complete magnet systems for the steel industry.

Technology and proximity since 1954!

SGM
TECHNOLOGY AND PROXIMITY

Improving Safety and Productivity in your steel products handling operations.

APPLICATIONS

PLATES
SLAB AND BLOOMS
BILLETS
COILS
BUNDLES
RAIL LAYERS

SOLUTIONS

ELECTRO MAGNETS
ELECRO
PERMANENT
MAGNETS
MAGNET CONTROL
PANELS
SPREADER BEAMS
REMOTE SYSTEMS

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WHO WE ARE

Years of prestigious and consolidated references all over the world have made SGM a world leader in both lifting magnets and separation technologies.

SGM Magnetics started in 1954 in Manerbio (Brescia), north of Italy, a region rich and famous for its competitive steel mills and metal industries. Our name and logo reflect our first two historical core businesses which have been lifting magnets to the steel industry and magnetic separation to the metal recycling industry.

Throughout the years, SGM has developed a position as a pioneer and leader in industrial lifting magnets, and has extended its magnetic separation expertise to other in-house separation technologies such as inductive based sensor separators, X-ray separators, color sorters, gravimetric, separation, and full process definition.

69 Years in business (since 1954)

8 Fully owned subsidiaries

2 Manufacturing and repair facilities

SGM WORLDWIDE

Always available, near you, in your language.

The SGM business model is based on providing technological expertise, staying close to its customers through a network of SGM Magnetics corporations located in Italy, Germany, UK, Belgium, USA, China, Mexico and India, as well as a few long standing agents with extensive experience in the SGM products and technologies.

INDUSTRIES

STEEL MILLS AND STEEL INDUSTRIES

As a result of the experience acquired on the job site over the years, we know what really matters to steel manufacturers: safety and productivity. But also efficient timing in the scrapyard, better productivity in the handling of hot or cold materials, optimization of the stock space, the objectives we set ourselves when we offer our solutions to the steel mills.

Since 1954, major steel mills in the world continue to trust SGM to fullfill their requrements.

At SGM Magnetics we offer customized magnet engineering according to your products. We supply from stand-alone lifting magnets to complete solutions for the steel industry.

PORTS / RAILS / TRUCKS LOADING - UNLOADING

At SGM we manufacture heavy duty magnets for loading and unloading trucks, ships and trains for various industrial applications.

In terms of safety and efficiency, SGM solutions are appreciated by world-renowned customers.

Depending on customers' project requirements, SGM Magnetics offer customized magnet engineering to increase site efficiency, improve safety, increase productivity and load / unload timing.

Lifting magnets and control systems manufactured by SGM Magnetics provide reliable, effective solutions for many ferrous material handling applications.

STEEL SERVICE CENTERS

In a steel service center, operators move large quantities of steel, loads are heavy, and the he hazards of work demand maximum precision. For this reason, lifting magnets must guarantee efficient processes and operators' safety.

The experience of SGM in the sector and the references acquired over the years make us a leader in the supply of lifting magnets manufactured and engineered around the needs and dimensions of the structure, the weight of the application, the dimensions and shape of the materials that the magnets will handle. The size of the work area also affects magnet selection.

Storage facilities for steel products such as coils and packs of long products are always more often managed in a remote way.
Such operations not only call for special magnets but also for magnet control systems that can interface with the remote control system of the customer.

SGM disposes of the experience and expertise to design such interfaces and collaborates with customers in meeting their needs of integration.

ENGINEERING

At SGM we are aware that know-how reflects not only technological process and design, but manufacturing capability as well.
Our Engineering customers have overall control of the projects from in-house design and manufacturing to on-site startup and commissioning.

Our customers don't want to compromise the quality and reliability levels of the equipment supplied. That's why they trust SGM to guarantee the same excellent quality worldwide.

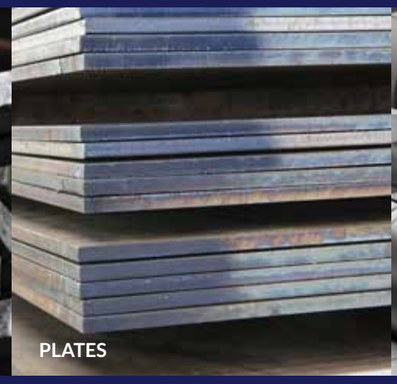
Manufacturing most of the equipment in our own workshops in Italy and China may not have the lowest costs, but we believe this is the best way to guarantee quality.

AREAS OF APPLICATION


SCRAP


SLAB AND BLOOMS


BILLETS, BEAM BLANKS, BARS


PLATES


COILS


WIRE COILS


BUNDLES OF ROLLED REINFORCED CONSTRUCTION BARS (RE-BARS)


BUNDLES OF STRUCTURALS AND HEAVY H-BEAMS


BUNDLES, PACKS AND LAYERS OF PIPES


RAIL LAYERS

SCRAP

SGM produces both round scrap magnets and octagonal mega scrap magnets. As a standard, SGM uses anodized aluminum strip for the electrical conductors of its scrap magnets which results in optimization of heat dissipation, lifting performance and life time of the magnets.

SLAB AND BLOOMS

Suitable for both Electro Lifting Magnet (EM) and Electro Permanent Lifting Magnet (EPR) solutions. The recommendation of choosing the EM or the EPR magnet is based on possible high temperatures of the slabs and/or on safety requirements of the working environment (slab yard, hot mill versus port applications).

BILLETS, BEAM BLANKS, BARS

Suitable for both Electro Lifting Magnet (EM) and Electro Permanent Lifting Magnet (EPR) solutions. For hot applications and intensive duty cycles, typically at the exit of the caster, SGM disposes of the proprietary Convection Electro Lifting Magnet which, thanks to its special design for heat dissipation, drastically extends the duty cycle and life time of the magnet.

PLATES

Suitable for both Electro Lifting Magnet (EM) and Electro Permanent Lifting Magnet (EPR) solutions. EPR solutions are only for single plates or limited quantities of multiple thin plates.

COILS

Electro Permanent Lifting Magnet (EPR) solutions suitable for cold rolled coils and annealing furnace operations with coils in an eye vertical position. Electro Lifting Magnet (EM) solutions also suitable for hot rolled coils.

WIRE COILS

The SGM solution is a substantial progress compared to the “C” hooks. The handling operation of wire coils can be carried out by a single operator from the crane cabin or by remote control. This is not possible when using C-hooks as either an additional operator is needed in order to direct the crane operator on centring the wire coil or the crane operator himself will have to verify the centring operation, all leading to longer handling times in unsafe conditions. The use of an electro magnet results in an important reduction of damages to the wire coils with respect to the use of C-hooks.

BUNDLES OF ROLLED REINFORCED CONSTRUCTION BARS (RE-BARS)

With respect to the use of chains or slings, the handling of bundles with Electro magnets is much faster and can be carried out by a single operator from the crane cabin or by remote control. A greater volume is available for storing the bundles when using magnets: it is not necessary to use wooden spacers which are required when using chains.

BUNDLES OF STRUCTURALS AND HEAVY H-BEAMS

With SGM Electro magnets, the bridge operator alone loads and unloads the wagons or trucks.
SGM designs and builds specific magnets for this application taking into account the complete range of loads to be handled (section, length, weight, temperature). Movable diapason type polarities are suitable to either handle single profiles (lengthwise) or rows of profiles (crosswise).

BUNDLES, PACKS AND LAYERS OF PIPES

The SGM Electro magnets designed for this application are of compact construction, thus limiting the overall height of the equipment. The use of magnets can reduce or significantly eliminate the damage to the pipes during handling. Unlike the use of chains and slings, the load is handled by a single operator either from the cabin or with a radio control having no contact with the load.

RAIL LAYERS

Electro Permanent magnets for the handling of rails. Irrelevant residual magnetism (welding, inductive quality controls, ...).
Absolute safety is guaranteed because the lifting force of SGM Electro Permanent magnets is autonomous: only an electrical impulse is required to activate or deactivate the magnet.

OUR PRODUCTS

ELECTRO MAGNETS

The SGM Electro magnets are composed of a very high magnetic permeability steel case with sections designed with a highly safety margin for heavy duty applications. The special bottom plate is wear- resistant manganese steel with an extra-heavy cross section. The case has a deep welded construction by submerged arc welding. Windings are preferable manufactured with anodized aluminum strips for its electrical conductors in order to optimize volume and heat dissipation.

The anodized aluminum strip consists in a standard aluminum strip, the surface of which is oxidized in order to have an insulating coating that is chemically bounded to the material. The benefits of using anodized aluminum strips stands in the fact that an electrical insulator is no longer requested between the turns of the aluminum spools resulting in more space for additional turns (stronger magnet) but, above all, provides the magnet with a much higher heat dissipation capacity that is something fundamental for both magnet performance and life time. All elements are designed for maximum lifting performance and mechanical strength. The result is a lifting magnet that offers new standards for performance, endurance, and reliability.

ELECTRO PERMANENT MAGNETS

The SGM Electro Permanent magnet is made of two different permanent magnetic alloys: a static magnet and a reversible one. During the operating phase (lifting phase) the two magnets combine their magnetic forces into the load, while short-circuiting them during the resting phase with no lifting effect on the load. The passage from the resting phase to the active one and vice versa is achieved by applying a short current impulse in a solenoid which changes the polar orientation of the reversible magnet.

During the operating phase, no other electrical current is requested. The limited magnetic field of an electro permanent magnet allows to handle steel products which are compact, thick and with a good contact condition between the upper surface and magnet pole shoes. For this reason this technology can be used for handling products such as eye vertical and horizontal coils, slabs, billets, single plates, round bars while it cannot be proposed for handling scrap, bundles, multi- plates, etc..

MAGNET CONTROL PANELS

All SGM lifting magnet control panels are based on the latest electronic technology and are fully designed by SGM. Control panels can either be standard or customised for a specific application or as per customers' requirements.
Possibility of meeting customers' preferences for brands of electronic components.

PLC and AC/DC drives are all designed for industrial use.
SGM disposes of extensive experience in designing interfaces between magnet control panels and customers' systems that go from manually operated cranes to complex fully remote operated handling systems. All SGM control panels are designed and provided with documentation according to the latest regulations and norms.

SPREADER BEAMS

Based on over 68 years of experience and a position as world leader of lifting magnets, SGM has the experience and references of a wide range of magnet spreader beam solutions. Spreader beams are designed based on the application (steel mill, port, service center,...) and customers' crane situations which, in case of overhead or Gantry cranes can be single hoist , one trolley with two hoists, two hoists on two independent trolleys.

Extendable spreader beams can either be manual or motorized and can include motorized rotation.
Special magnet spreader beams accommodate for quick remote change from one spreader beam to another.
All SGM magnet spreader beams are fully designed by SGM as per the latest regulations and norms.

ADVANTAGES OF ELECTRO MAGNETS

BENEFITS

- **Universality:** EM can generate a very deep magnetic field making them suitable for many different applications, including situations where contact between magnet pole shoes and load or the different elements constituting the load is limited with significant spaces (air-gaps). Typical examples are ferrous scrap or bundle applications where the bundle is made of many structural pieces.

- **Flexibility:** Easy to partialize the force of the magnet by partializing the voltage or current provided to the magnet.

- Suitable for hot applications, up to 650°C (1,200°F).

LIMITS

Need for **Battery back-up**: The lifting force of an EM depends on continuous electrical feeding which, when safety is a sensitive factor, requires a battery back-up system to cover possible electrical power (main) interruptions as well as suitable protection and maintenance of the power cables to prevent possible accidental interruption.

ADVANTAGES OF ELECTRO PERMANENT MAGNETS

BENEFITS

- **Safety:** The lifting force of an EPR is exclusively based on the intrinsic force of its permanent magnets and is independent from any external source of energy. The load does not drop in case of accidental power failure or cable interruption. No battery back-up needed.

- **Duty cycle.** After activation through a short current impulse, the EPRs do not generate heat which means that their lifting force remains constant and independent from duty cycle (except for hot material applications).

LIMITS

- **Shallow magnetic field:** EPRs generate a shallower magnetic field than EMs which means that they are suitable for applications where contact between magnet pole shoes and load presents limited air gaps.

- **Temperature.** Standard EPRs can be used for hot material applications up to 250°C (480 °F)and special EPRs can work for material applications up to 450°C (840°F).

OUR SERVICE

At your service, worldwide, with competence and engagement.

SGM CUSTOMER SUPPORT & SERVICE

SGM has trained staff dedicated to provide training on your equipment anywhere in the world.
Our service technicians are available to respond quickly to our customer's service and support needs and are focused on ensuring reliability, enhanced performance and efficiency while increasing your equipment's operational lifetime.

ON-SITE & REMOTE ASSISTANCE

We handle any service wherever you are. Quick onsite support for maintenance and repairs, fast and reliable spare parts service, operator training, and inspections for components subject to normal wear.

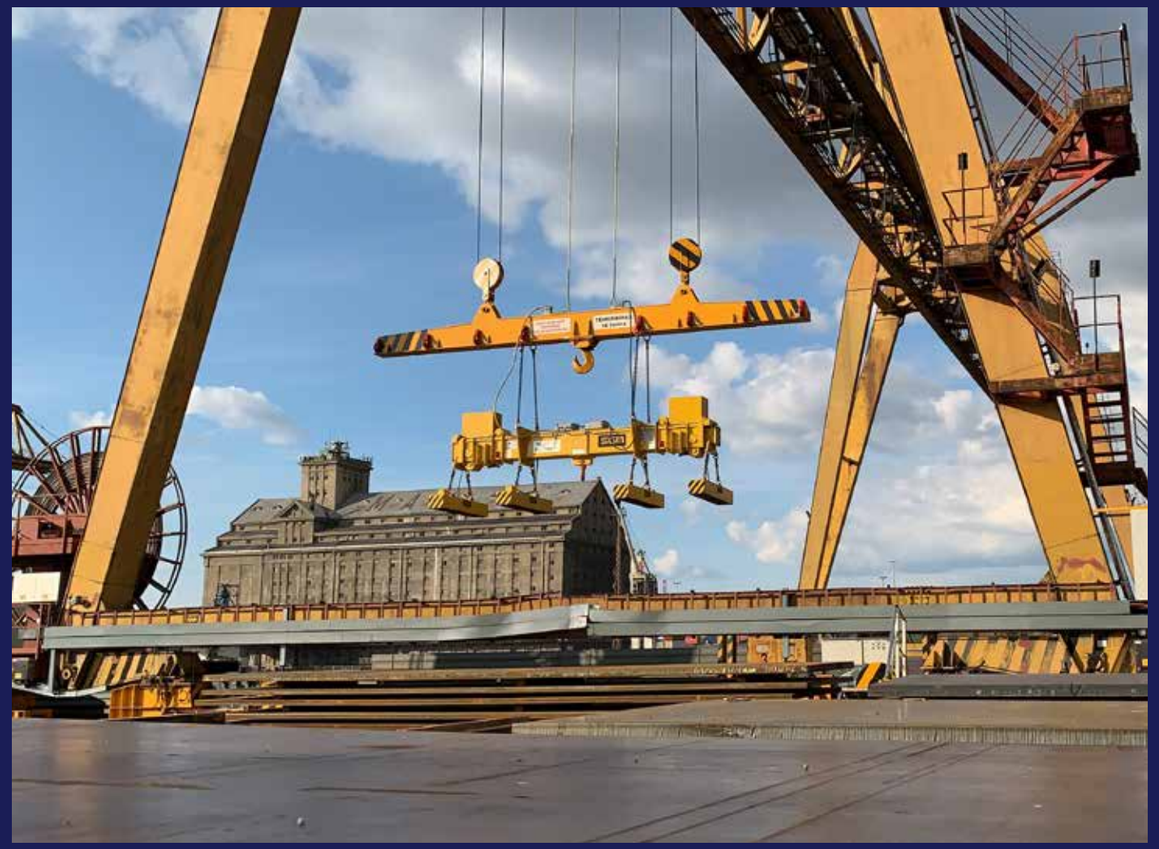
SGM Remote Visual Assistance helps our customers remotely to keep their operations running at optimum performance. This innovative Augmented Reality tool allows the expert to guide the field technicians through all the necessary operations step-by-step.

TEST BENCH

SGM disposes of an in-house test bench and proper magnet force measuring tools to certify the lifting force of its magnets and the accuracy of its safety lifting device. Upon request, magnet force certification tests can be carried out in the presence of the customer and/or of a third party certification entity (DNV, Lloyd's Register,...) designated and paid for by the customer.

PREVENTIVE MAINTENANCE PLANS

SGM recommends regular preventive maintenance of equipment to ensure our customers the peak performance they have come to expect from our products.



FROM SINGLE MAGNETS TO COMPLETE SOLUTIONS

SGM solutions imply an integration of service and products. For each customer we configure our products and services to address that customer's specific challenge.

Whether you're looking for a single stand-alone lifting magnet or a complete turn key solution, SGM's worldwide organization guarantees you proximity and expertise starting from the analysis of your application and your needs to the commissioning and service of the best solution. Years of experience in the various steel industries have made our engineering and project management expertise among the best in the world.

SGM's SOLUTIONS:

1. Needs Assessment & Project Management
2. Concept Development & Engineering
3. Detailed Design & Project Layout
4. Manufacturing
5. Assembling & Commissioning
6. Training & After Sales Service

ELECTRO MAGNETS

Our customer Posco (Korea) operates every day for more than 15 years with such magnetics systems for handling billets up to 600°C with high duty cycle.

SGM complete solutions forklift trucks include spreader beam, electro magnets and diesel dyanamo. Fork lift truck solutions are designed to manage the dynamic forces that accur from the trucks moving on ground that is often uneven.

BILLETS, BEAM BLANK, BARS AND SLABS

These SGM Electro magnets have been developed and manufactured to meet the high mechanical and electrical requirements specific for this type of application.

The winding made of anodized aluminum contributes to a large increase in the duty cycle and its service life especially in the presence of loads up to 600/650 °C.

The SGM electro magnets are designed and sized in all their mechanical and electrical aspects in order to offer the proper response to this very demanding application, often characterised by severe mechanical shocks, high duty cycles and possible high Temperatures. The use of anodized aluminium (aluminium strip chemically transformed on its outer surface into an insulation material able to withstand temperatures beyond the melting point of the aluminium itself) as an electrical conductor and specific resins provides the SGM electro magnets with outstanding heat dissipation capabilities making them extremely performing for high duty cycle and/or high temperature applications.

Modern filling resins with good heat dissipation also contribute to a good natural cooling of the magnet.
Constant monitoring of the internal temperature of the magnet allows the operator to react in time when critical temperatures are reached.

SOME REFERENCES

CAPITAL STEEL & WIRE, INC. · HADEED STEEL INDUSTRIES · GROUP LUCCHINI RS · posco · ArcelorMittal · thyssenkrupp · सेल SAIL

ELECTRO PERMANENT MAGNETS

BILLETS

The lifting force of the Electro permanent magnets is independet from external energy sources = no accidental drops of the load as a result of power failure or cable interruption.

The lifting force of the Electro permanent magnets is constant in time = no accidental drops of the load as a result of a reduction on magnet lifting force.

No need for operator to get in contact with or stay by the billets. Magnet system can be operated from a safe distance using radio control or the control system. No need for slings or clamps.

Technology of the electro permanent magnet controllers facilitates the creation of safety redundancy.

Special recommendations for the use of electro permanent magnets is made for locations where sudden interruptions of main electrical power may happen inadvertently.

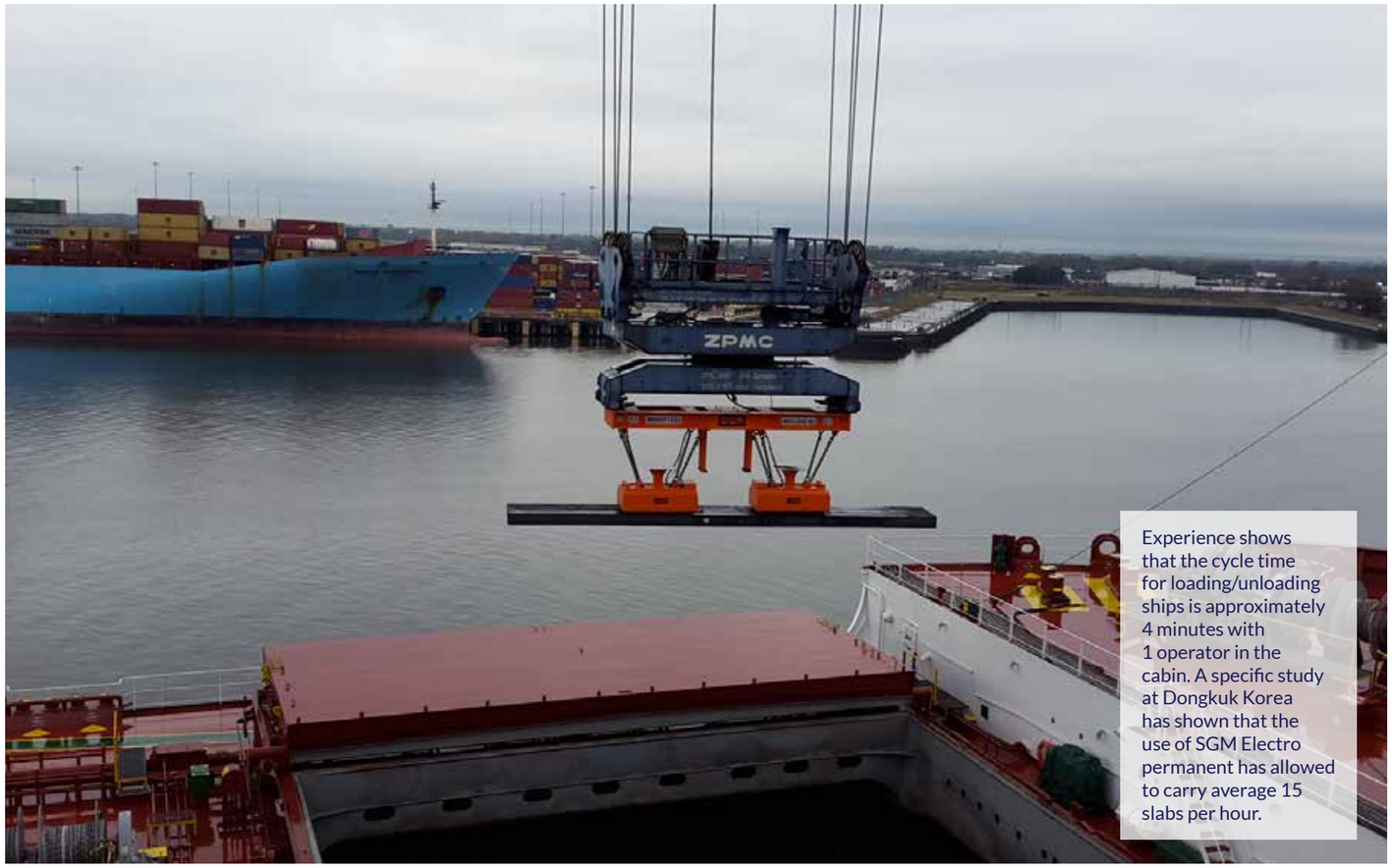
Just a few seconds are necessary to grip and release a layer of billets. Wooden spacers between layers of billets are no longer necessary. The electro permanent magnet technology easier to maintain.

No need for battery back-up.

QATAR STEEL · Çolakoğlu Metalurji · TATA STEEL · HYUNDAI STEEL · emirates steel · SIPG

ELECTRO PERMANENT MAGNETS

SLABS



Experience shows that the cycle time for loading/unloading ships is approximately 4 minutes with 1 operator in the cabin. A specific study at Dongkuk Korea has shown that the use of SGM Electro permanent has allowed to carry average 15 slabs per hour.

The rather shallow magnetic field of an electro permanent magnet allows to handle steel products which are compact, thick and with a good contact condition between upper surface and magnet pole shoes. For this reason this technology can be used for handling products such as eye vertical and horizontal coils, slabs, billets, single plates.

Why use an electro permanent magnet?

INCREASE OF SAFETY

With the use of SGM electro-permanent magnet for slab handling by replacing traditional wire slings our customer can reduce number of workers.

OPTIMIZATION OF LOGISTICS

With use of SGM magnet, no need to have cross-timbers in-between slabs which take up space and weight. This result in optimization of space and weight, therefore much more slabs can be stacked up on the vessel as far as capacity of vessel allows.

INCREASE IN PRODUCTIVITY

Most important advantage would be improved productivity as magnet enables operator to handle loads with higher speed compared to mechanical systems. And it provides safe environment by not having many people working on the ground.

Specially studied for loading and unloading from ships. Absolute safety resulting from the combination of SGM Electro Permanent Technology and Flux Measuring Device (FMD).

The lifting force of SGM Electro permanent is independent: only an electrical impulse is required to activate or deactivate the magnet. There is no power consumption during the handling of the load. No load drop as a result of power failure or cable interruption. The lifting force of SGM Electro Permanent is constant in time, without heat generation.

Prior to each lift, the patented FMD Flow Measuring Device monitors the actual safety factor, which also depends on the contact surface, the air gap and the temperature of the load. The lift will be blocked if the factor of safety is not sufficient. No need for wooden spacers between the slabs. Unlike Electro magnets, Electro Permanent does not generate heat, so the duty cycle is 100%, 24 hours a day.

Developed and manufactured according to European standards (EN13155)

SOME REFERENCES

posco · ArcelorMittal · thyssenkrupp · QATAR STEEL · Çolakoğlu Metalurji · TATA STEEL · HYUNDAI STEEL · easysteel · GRUPO ACERERO · RUSHLIFT · JASO INDUSTRIAL CRANES · Ternium · BC cranes group

MEGA SCRAP

SGM Solution for those who needs to handle more scrap per grip. Octagonal Mega scrap magnets with double magnetic circuit.

By switching from a circular scrap magnet to an SGM Mega Scrap Magnet, an Italian customer has reduced wagon unloading times from 35 to 18 minutes.

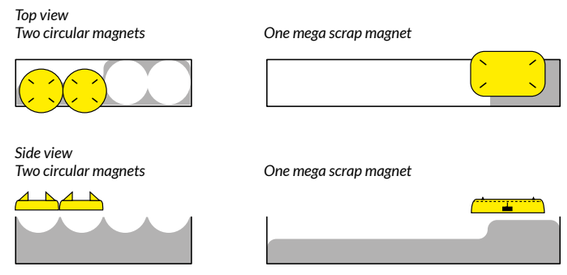
The SGM Mega Scrap Magnet is an alternative to circular scrap magnets specifically suited for belt loading with Consteel® technology. Thanks to the double magnetic circuit (SGM patent), with the Mega Scrap Magnet the scrap is distributed over all the magnetic surface in a more homogeneous way with respect to the traditional circular scrap magnet, eliminating the “mushroom” effect.

When using Consteel® technology, it is necessary to reach a level of productivity which must remain constant in order to have savings in energy. By using the Mega Scrap Magnet for loading the belt feeding the Consteel, the loss of scrap is avoided and there is a more homogeneous distribution of the scrap over the whole surface of the belt.
Accumulations of material which are typical when using circular scrap magnet are no longer present. Also, the tipping function (electronic device able to cut the voltage to the magnets for a very brief period) permits the operator to dose the drop of the scrap onto the belt.

The octagonal shape of the Mega Scrap Magnet together with the use of anodized aluminium (aluminium strip chemically transformed on its outer surface into an insulation material able to withstand temperatures beyond the melting point of the aluminium itself) permit the best possible dissipation of heat which is generated inside the magnet itself. The result is optimization of the working cycle of the magnet.

The electrical equipment with integrated converter, is provided with the “over-excitation” function which significantly reduces the magnetization and de-magnetization times.
Designed and manufactured according to European standards EN 13155.

The two sketches below indicate how two circular scrap magnets unload scrap from a wagon with respect to the handling of scrap using one mega scrap magnet.



SOME REFERENCES

DANIELI · KONECRANES · Arvedi · Severstal · DEACERO · ArcelorMittal · PITTINI · ABS ACCIAIERIE BERTOLI SAFAU ABSOLUTE STEEL QUALITY · FERRIERE NORD · GRUPO ACERERO · MUKAND Infinite resolve · SiderurgicaTriestina

ELECTRO MAGNETS

Our customer Centri Servizi Navali (Italy) maximize the productivity handling a precise quantity of plates and taking into account various possible plate thickness and temperatures.

PLATES

Maximize productivity whilst meeting highest safety standards.

The SGM Electro magnets are suitable for single or multiple plates. Constant current equipment (whatever the temperature of the magnets) allows the system to measure the number of lifted plates (sheets) and rest them accurately.

This function is particularly effective for stackers and automatic equipment.

With respect to the use of slings, chains and clamps, the handling of plates with electro magnets can be carried out by a single operator from the crane cabine or from the ground at a safe distance from the load by remote control.

The control apparatus is programmed so as to take a specific number of sheets while taking into account different thicknesses and whatever the temperature of the magnets may be.

Designed and manufactured according to European standards EN 13155.

SOME REFERENCES

DANIELI · KONECRANES · posco · hadeed · Duferco · JINDAL STEEL & POWER · NLMK

Our customer Huludao (China) hanndels its single plate products thanks to 16 SGM electropermanent magnets EPR40/75-8P.
Max weight: 22.400kgs
Width: 1.800-4.500mm
Length: 12.000-22.500mm

PLATES

"Tailored-made" solutions for plates from 900 to 5000 mm width and 24 m length. Absolute safety thanks to the combination of the SGM electro permanent technology and the Flux Measuring Device (FMD).

The lifting force of SGM electro permanent magnets is autonomous: an electrical impulse is sufficient to activate or deactivate the magnet.
There is no energy consumption during the lifting of the load. Therefore, there is no load drop as a result of power failure or cable interruption.

The lifting force of SGM electro permanent is constant in time, without heating. Prior to each lift, the patented FMD flow measurement system monitors the actual safety factor, which also depends on the contact surface, the air gap and the temperature of the load.

Developed and manufactured according to European standards (EN13155).

GERDAU · VILLACERO · ArcelorMittal · MARCEGAGLIA · IVA · Blastech · ACEROS DEL TORO

Ferriere Valsabbia (Italy) reached a record of loading 180 lorries in 16 hours by using electro magnets. Each lorry carried 30 tons of bundles.

BUNDLES

Magnets designed for all types of bundles: re-bars, pipes, sectionals, angles, etc. With respect to the use of chains or belts, the handling of bundles with Electro magnets is much faster and can be carried out by a single operator from the crane cabin or by remote control.

A greater volume is available for storing the bundles when using magnets: it is not necessary to use wooden spacers which are required when using chains or hoists. This results in a more rational use of available space. It is not uncommon to carry 1 to 5 or 6 bundles with one magnetic system.
Considering that the handling is carried out by only one operator it is not necessary to have other personnel present on the ground or lorry during the manoeuvre which would be a risk condition. Extensible spreader beam solutions allow the handling of bundles with 6, 12 and 18 metre lengths with the minimum possible footprint resulting in easier operations by the operator, especially when loading/unloading lorries.

SGM designs and builds the appropriate spreader beam for each application: whether it is a narrow beam of fixed length with auxiliary hooks, or a telescopic beam motorized or not.

Contact is between the magnet pole shoes and the upper surface of the bundle: energizing and de-energizing phases of the magnet take place in 3 seconds. Designed and manufactured according to European standards EN 13155.

SOME REFERENCES

DANIELI · KONECRANES · posco · hadeed · Duferco · JINDAL STEEL & POWER · NLMK · IVA

SGM extensibe spreader beams and EM Magnets supplied in 2008 to Arcelor Mittal in Poland for handling 6 to 24 metre long structurals in 6 ton packs, are still working with no repairs after 14 years full activity.

STRUCTURAL BUNDLES

With respect to the use of slings or chains, the handling of bundles with magnets can be carried out from the crane cabin or from the ground at a safe distance from the load.

With SGM electro magnets, the bridge operator alone loads and unloads the wagons or trucks. Basically 2 Electro magnets thoughtfully sized are enough to carry a load of 10 T beams and a length from 6 to 24 m.

SGM designs and builds specific magnets for this application taking into account the complete range of loads to be handled (section, length, weight, temperature).

In addition to the number and type of magnet, with their specific force and depth of field, SGM designs and builds telescopic and motorized spreader beams that optimize the positioning of the magnets and reduce the load deflection.

Movable polarities type diapason are suitable to either handle single profiles (lengthwise) or rows of profiles (crosswise). The SGM motorized telescopic spreaders can handle loads of 6 - 12 - 18 or even 24 m with a small footprint, which greatly facilitates the handling operations.

GERDAU · VILLACERO · ArcelorMittal · MARCEGAGLIA · MANNI SIPRE STEEL ENGINEERING · RUBIERA SPECIAL STEEL

ELECTRO MAGNETS

The SGM solution is a substantial advance over the “C” hook

WIRE COILS

The SGM solution is a substantial progress compared to the “C” hooks. It is possible to handle wire coils in line up to 5 m length or side by side.

The handling operation of wire coils can be carried out by a single operator from the crane cabin or by remote control. This is not possible when using C-hooks as either an additional operator is needed in order to direct the crane operator on centring the wire coil or the crane operator himself will have to verify the centring operation all that leading to longer handling times which do not take place in safe conditions.

The use of an electro magnet results in an important reduction of damages to the wire coils with respect to the use of C-hooks. So the complaints about quality disappear. The only point of contact is between the wire coil upper surface and the duly shaped pole shoes of the magnet.

Designed for very heavy duty applications as well as high temperatures, SGM uses high heat dissipation resins as well as anodized aluminum windings: anodizing consists of a chemical transformation of the surface, with remarkable dielectric properties up to the melting temperature of aluminum.

These Electro magnets are therefore particularly powerful. The constant monitoring of the internal temperature of the magnets, with warning threshold and system blocking threshold, informs the operator and protects the equipment when the temperature becomes excessive.
Thus the lifetime of the magnets is particularly high.

Thanks to the over-excitation device which consists of increasing the supply voltage of the magnets for a few seconds, the magnetization and demagnetization times are reduced to a minimum. Developed and manufactured according to European standards EN 13155.

SOME REFERENCES

DANIELI · posco · voestalpine · LUCCHINI RS · DEACERO · BHUSHAN · RAJHI STEEL · CMC Commercial Metals · NUCOR · Steel Dynamics, Inc. · JASO INDUSTRIAL CRANES · Ironwork Ltd

ELECTRO MAGNETS

The handling and storage operations can be performed without dangerous oscillations of the system.

TUBES

The SGM electro magnets designed for this application are of compact construction, thus limiting the overall height of the equipment.

The use of magnets can reduce or significantly eliminate the damage to the pipes during handling. SGM switchboards can be easily connected in an automatic and integrated control system. SGM also offers fixed or motorized telescopic spreader beams with or without rotating magnets.

These magnets can be specifically adapted according to customer needs. The spreader beam can be equipped with the “pantograph” function which allows the magnets to be transversally moved on both sides of the spreader beam. Therefore, it is possible to lift 1 narrow load or 2 even larger bundles with a small overall width and this with a reduced overall width.

Electronic controllers are predisposed to adjust the force of the magnets and monitor the temperature of the same. In addition, the functions of the motor or pantograph of the telescopic arm can be directly controlled. Unlike the use of chains and slings, the load is handled by a single operator without contact with the load, either from the cabin or with a radio control.

The electro magnets require little maintenance and their reliability is guaranteed by redundant power cables, constant monitoring of the internal temperature of the magnets and availability of spare batteries.

The magnet does not magnetically interact with the stalls and therefore the handling and storage operations can be carried out without dangerous oscillations of the system.

The magnet does not interact magnetically with any bundle packs placed near the bundle being moved.

Developed and manufactured according to European standards EN 13155.

SOME REFERENCES

ArcelorMittal · Arvedi Tubi Acciaio · BUDTOR CRANES TECHNOLOGY · Tenaris · DESHAZO · steel&tube · KONECRANES · OMAV SMS group · OMI · SAINT-GOBAIN · YÜCELboru · GERDAU · Steel Dynamics, Inc. · MARCEGAGLIA

HORIZONTAL COILS

Optimisation of storage area on floor surface.

In 2007 Ilshin (Posco service centre) purchased a first magnet for this application. The use of the magnet with respect to mechanical tongs resulted in a 40% increase of storage space thus leading to greater flexibility of the warehouse. This ended up in being a crucial aspect during the subsequent economical slowdown where coils are stored for longer periods. Ilshin consequently purchased other two magnets in 2008 for the other two cranes in the service centre.

This special electro permanent magnet is specifically designed for horizontal coil lifting, in particular for automated wharehouses.

The combination of SGM electro permanent technology and Flux Measurement Device (FMD) provides absolute safety. It guarantees an optimization of the floor storage area up to 90% instead of 40-60% with mechanical devices.

The magnetization/demagnetization only takes a few seconds and drastically reduces the damage to the coils. Unlike electro magnets, electro permanent magnets do not generate heat, so the duty cycle can be 100%, 24 hours a day. The electro permanent magnets can be used in the specific application of cold rolled coils which subsequently are subject to a zinc coating process.

Due to the absence of spare batteries, the electronic controllers of the EPR are less sophisticated than the ones of the electro magnets. This also meets the highest security regulations (EN 13849.1).

Electro permanent magnets do not require any special maintenance and the lifetime of their magnetic alloys is unlimited. Please note that the temperature of the coils is limited. A rotating device can be installed for - 180° + 90° rotation.

The electronic controllers are able to work in local or remote mode with simple transfer of data and interface with other systems (diagnostics). Developed and manufactured according to European standards (EN13155).

When an electro permanent magnet should be used:

The electro permanent magnets can be used in the specific application of cold rolled coils which are subsequently subjected to a zinc coating process.

When an electro magnet should be used:

Electro magnets can be used for lifting both cold rolled and hot rolled coils as well as in all the other production phases of a coil: rolling, pickling, zinc coating, storage of finished product up to the shipment of coils by lorry or train.

Suited for all type of coils : hot rolled, cold rolled with coating, cold rolled with packing.

SOME REFERENCES

Bonfanti INTEGRATED HANDLING SOLUTIONS · KRANBAU KÖTHEN · Street · ZENAR The Last Word in Cranes · posco · NLMK · ILVA · CITROËN

ELECTRO MAGNETS

VERTICAL COILS

Electro permanent magnets are an alternative to mechanical clamps, ideal for annealing furnaces, a single magnet for lifting coils, convectors and bells. Absolute safety thanks to the combination of the SGM electro permanent technology and the Flux Measuring Device (FMD).

The lifting force of SGM electro permanent is autonomous: an electrical impulse is sufficient to activate or deactivate the magnet. There is no energy consumption during the handling of the load. Thus, there is no load as a result of power failure or cable interruption.

The lifting force of SGM electro permanent is constant in time, without heating. Prior to each lift, the patented FMD flow measurement system monitors the actual safety factor, which also depends on the contact surface, the air gap and the temperature of the load. The lift will be blocked if the safety factor is not sufficient.

SGM electro permanent technology facilitates the management of redundant safety and monitoring devices. Magnetization/demagnetization function only takes a few seconds. The approach and contact with the coils is controlled: drastic reduction of coil damage.

Unlike electro magnets, electro permanent magnets do not generate heat, so the duty cycle is 100%, 24 hours a day. Electro permanent magnets do not require any special maintenance and lifetime of their magnetic alloys is unlimited. Attention: the coil temperature is limited. Developed and manufactured according to European standards (EN13155)

SOME REFERENCES

BAOSTEEL · Bonfanti INTEGRATED HANDLING SOLUTIONS · DANIELI · THHEAVY ENGINEERING BERHAD · NLMK · SHOUGANG · posco · Steel Dynamics, Inc. · Ternium · WISCO · ILVA · NUCOR · BAOSTEEL · Hylsa División Alambrón y Varilla

ELECTRO MAGNETS

Absolute safety as the lifting power of the SGM electro permanent magnets is autonomous

RAILS

Electro permanent magnets for the handling of rails. Irrelevant residual magnetism (welding, inductive quality controls, ...).

They guarantee an absolute safety because the lifting force of SGM electro permanent magnets is autonomous: only an electrical impulse is required to activate or deactivate the magnet.
There is no power consumption during the handling of the load. So, there is no load drop as a result of power failure or cable interruption.

The lifting force of SGM electro permanent magnets is constant in time.
The equipment can be controlled either from the deck cabin or remotely by remote control. A wrong operation is not possible.

The SGM electro permanent technology facilitates the management of redundant safety and monitoring devices. The electro permanent magnets are recommended by many companies for high-risk applications or when power interruptions are common.

The magnetization/demagnetization function only takes a few seconds. Unlike electro magnets, electro permanent magnets do not generate heat, so the duty cycle is 100%, 24 hours a day for cold rails. Suitable for full automatic equipment.

The electronic controllers of the EPR are less sophisticated than the ones of the electro magnets. This even for the highest safety classe (EN 13849.1). The electro permanent magnets do not require any special maintenance and lifetime of their magnetic alloys is unlimited.

Attention: the temperature of the rail is limited. Developed and manufactured according to European standards (EN13155).

SOME REFERENCES

corus · ArcelorMittal · BRITISH STEEL · thyssenkrupp · VÍTKOVICE STEEL · DANIELI · iteco steel · MORIS · Steel Dynamics, Inc.

SPREADER BEAMS

SPREADER BEAMS

Based on over 60 years of operation and a position as world leader of lifting magnets, SGM has the experience and references of a wide range of magnet spreader beam solutions. Spreader beams are designed based on the application (steel mill, port, service center,...) and customers' crane situations which, in case of overhead or Gantry cranes can be single hoist , one trolley with two hoists, two hoists on two independent trolleys.

Extendable spreader beams can either be manual or motorized and can include motorized rotation.
Special magnet spreader beams accommodate for quick remote change from one spreader beam to another.

All SGM magnet spreader beams are fully designed by SGM as per the latest regulations and norms.

INTERCHANGEABLE SPREADER BEAM

For some specific applications we have supplied a magnetic system composed of a MASTER spreader beam and multiple secondary (SLAVE) spreader beams, each one provided with different types and/or different number of magnets.

When the load to be handled is hot and the duty cycle intensive, it is advisable to foresee two sets of magnets which can be rotated after each or every two shifts in order to avoid stops in operation.

The master spreader beam is made up from a main welded structure that is fixed to the crane suspension.

The master spreader beam is fitted with a mechanical locking system (composed of pins for the suspension of the slave spreader beams) and an automatic electrical connection system (composed of plug & socket for the connection of the slave spreader beams).

REMOTE HANDLING SYSTEM

Storage facilities for steel products such as coils and packs of long products are always more often managed in a remote way so as to optimize handling productivity, storage space, operating costs and safety.

Such operations not only call for special magnets but also for magnet control systems that can interface with the remote control system of the customer. SGM disposes of the experience and expertise to design such interfaces and collaborates with customers in meeting their needs of integration.

SGM disposes of many years of consolidated references in the supply of the electro-permanent magnets for remote slit coils lines.

THE PANTOGRAPH

The pantograph spreader beam results in the following advantages with respect to a standard spreader beam:

- It's possible to lift 2 bundles at a time (only in manual operation mode): in fact, when the pantograph is opened, the whole width of the 2 bundles is completely covered by the magnets.
- It's possible to adapt the position of the magnets to the single bundle,whatever the width. It results in a high stability, and so in a safety lifting manouvre.
- The pantograph spreader beam has a reduced width (when the pantograph is closed) and so it's easy to manoeuvre it within the warehouse, without having to limit the width of the bundle to be handled (when the pantograph is opened).

The pantograph movement can be carried out in two different ways:

- With electrical actuators (electric linear driven)
- With hydraulic actuators

SGM has got a great experience in both the types of pantograph.

CONTROL PANELS

Absolute safety as the lifting power of the SGM Electro Permanent magnets is autonomous

MAGNET CONTROL PANELS

As a technology world leader, SGM disposes of numerous proprietary solutions and is the pioneer and leader in offering the technology of both electro lifting magnets and electro permanent lifting magnets.

All SGM lifting magnet control panels are based on the latest electronic technology and are fully designed by SGM.

QUALITY AND PERFORMANCE

The quality and performance of the SGM control panels for electro magnets depends on:

- the proven quality and performance of the functions: Power, Command, Data Elaboration and Safety Backup (just for electro);
- the service organization that a company can offer for supporting its products;
- the speciality of the Power function on control panels for electro magnets.

The performance and reliability of the Safety Backup function of the SGM control panels is a proven fact supported by countless references that is worth to make present to customers.
Control panels can either be standard or customised for a specific application or as per customers' requirements.
Possibility of meeting customers' preferences for brands of electronic components.
PLC and AC/DC drives are all designed for industrial use.
SGM disposes of extensive experience in designing interfaces between magnet control panels and customers' systems that go from manually operated cranes to complex fully remote operated handling systems.

SPECIAL OPTIONS FROM SGM

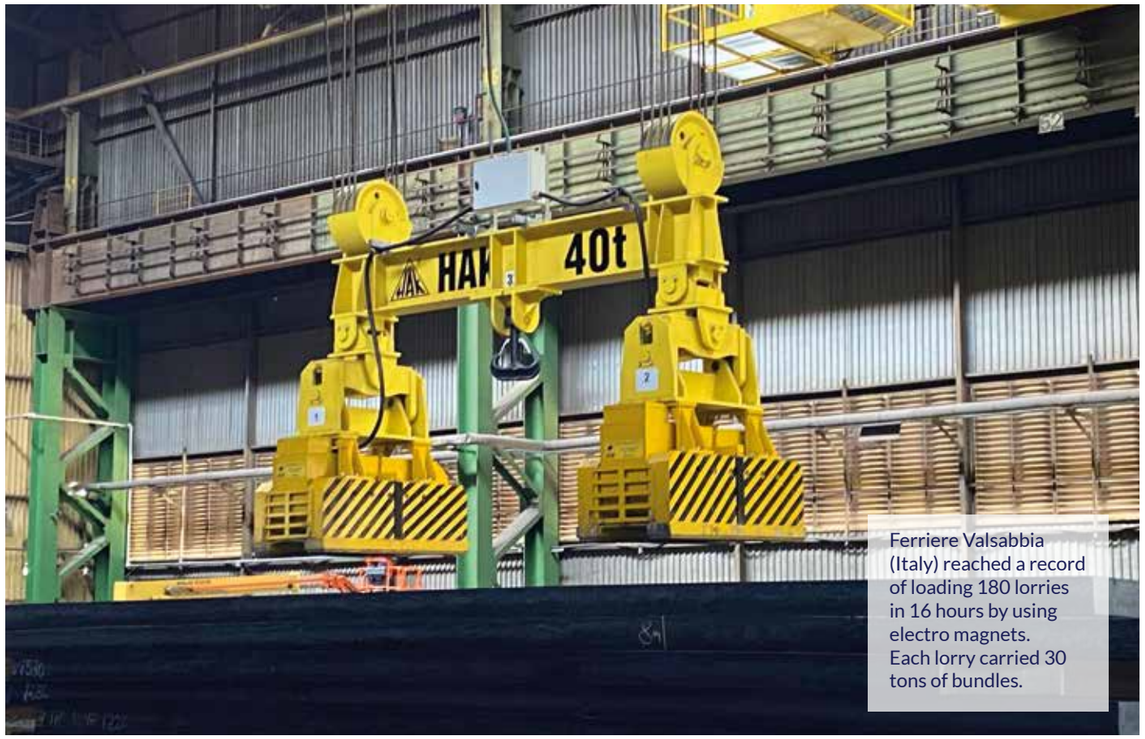
Possibility of reducing residual magnetism in the load.
For situations where the steel and/or application is sensitive to residual magnetism left in the load by the use of lifting electro magnets (typical example: special alloy structurals,...).
During the de-energizing of the magnet(s), the SGM control panel generates an alternate current pulse of decreasing amplitude for a few seconds with the consequent significant reduction of residual magnetism present in the load.

The de-energizing curves can be parameterized by the customer from a touchscreen display panel in order to optimize the result on each of the different loads.

Possibility of operating electro magnet at pre-set level(s) of current instead of rated voltage.
For situations requiring the magnet force to be accurate and constant.

The SGM control panel provides the magnet with a preset level of current leaving the voltage to adjust itself according to the electrical resistance of the magnet winding.

ELECTRO MAGNET SPECIALS



Ferriere Valsabbia (Italy) reached a record of loading 180 lorries in 16 hours by using electro magnets. Each lorry carried 30 tons of bundles.

SPACER ELECTRO MAGNET (CELM) FOR HIGH TEMPERATURE MATERIALS

Spacer electro magnet (CELM) for high temperature materials.

The high temperature of the material being handled is typically the main cause for lifting magnet down times and premature aging.

The SGM CELM lifting magnet is specifically designed for high temperature material applications such as slabs, blooms, billets coming directly off casters.

The proprietary design of the CELM results in no contact between the magnet ferrous core subject to direct heat transmission from the hot load and the magnet winding.

The benefit of the SGM CELM magnet design is a radical extension of the duty cycle (and life time) of the magnet.

The proprietary SGM CELM constitutes a revolutionary technological innovation related to lifting magnets.

MAGNET WINDINGS MADE OF ANODIZED ALUMINUM STRIP

Anodized aluminum strip consists in a standard aluminum strip the surface of which is chemically oxidized so as to achieve an insulating coating bounded to the metal.

By using anodized aluminum strip there is no longer need for the typical electrical insulator tape between the turns of the aluminum spools. This results in creating more space for additional aluminum turns (stronger magnet) and, above all, in providing the magnet with a much higher heat dissipation capacity which is beneficial for magnet performance and life time.

LIFTING MAGNETS WITH NO MAGNETIC SIDE ATTRACTION DISPERSION

Special SGM proprietary magnet design resulting in a drastic reduction of magnet casing side attraction.

These SGM magnets are specifically suited for steel service centers where magnets can enter racks with no disturbing side attraction to steel columns or to other bundles/packs next to the one being handled. These magnets are also specifically recommended for remote operations in large storage facilities.

SAFETY DEVICE (CDMD) FOR MAGNETS LIFTING DYNAMIC LOADS

Some Loads such as multiple plates, eye horizontal coils or bundles of structurals do not always behave as compact loads but may flex or open up a bit (structurals in a bundle) when lifted up by a magnet. This results into possible significant dynamic forces in addition to the weight of the load itself.

The SGM proprietary CDMD safety device mounted directly on the magnet reads possible flexing and opening up situations and makes sure they are not excessive for the safe handling of the load by magnets.

ELECTRO PERMANENT MAGNET SPECIALS

FLUX MEASURING DEVICE (FMD)

The SGM FMD is a safety device mounted on the electro permanent magnet and connected to its control panel giving indication to the magnet operator on whether or not the contact condition between magnet and load for every lift is good enough to guarantee a safe lift.

Indeed, the presence of air between the pole shoes of a magnet and a load to be lifted negatively influences the lifting capacity of the magnet. The greater the airgap (poor contact between magnet and load), the more the magnet force disperses in the air and the less the remaining force available for lifting the load.

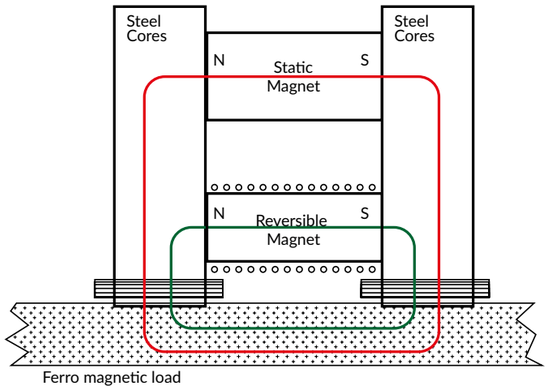
In case of a negative reading by the FMD, the lift is disabled leaving the operator the possibility of repositioning the magnet on the load to find an appropriate contact.

FMD guarantees a high lifting safety factor under the most critical load conditions specified by the customer, working as a SAFETY CONTROLLER.

Furthermore, it prevents any risk lift in case of load conditions accidentally more critical than the ones specified by the customer such as worse air-gap configuration, lower magnetic permeability of load, higher load temperature, which will result in a lower magnetic flow detected by the FMD device.

In this case FMD, working as a RISK DETECTOR, will inform the crane operator on the lifting safety conditions under which the magnet is working, leaving him the possibility to take all the necessary precautions to render the delicate lift a no-risk lift.

SGM disposes of many years of consolidated references in the supply of the electro-permanent magnets for remote slit coils lines.



CONVECTION ELECTRO PERMANENT MAGNET (EPCLM) FOR HIGH TEMPERATURE MATERIALS

The SGM proprietary design of the electro-permanent magnet model EPCLM makes them suitable to operate on hot loads such as slabs and billets up to 450°C (840°F) with an extended duty cycle.

We have several offices and distributors all over the world. Please refer to the sales office nearest to your location or contact directly our headquarters offices in Italy. Find here your nearest SGM!

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