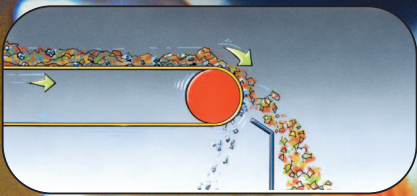
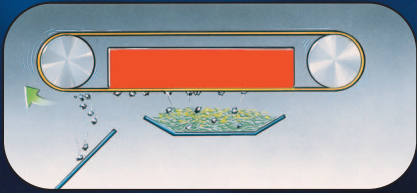
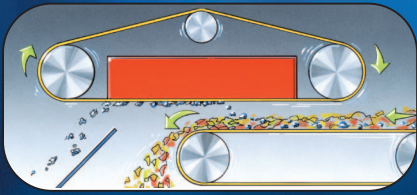
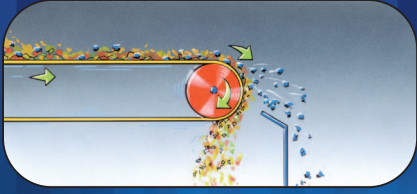


# MAGNETS

## FOR A CLEANER ENVIRONMENT





Do you know the tropical Anemone fish? It lives only in coral reefs where the eco system is in perfect balance. We made a conscious choice in putting this photo on the cover of our "recycling brochure", so that we can remember the beauty of nature every day. As far as Goudsmit is concerned we cannot take enough care of the environment. In this brochure we describe various (cleaning) magnet systems that can be used to recover and re-use metal objects.

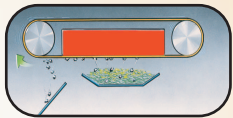
As long ago as 1959 Goudsmit was designing and producing magnet systems for the recycling and bulk handling industries; systems that can be applied in many areas. From potatoes to rubber, fine ceramic powder to grit, no iron particle escapes the power of Goudsmit magnetic separators. Using Goudsmit magnets almost anything is possible, up to a belt width of 2 metres. Using advanced software we calculate exactly which magnet system is the most suitable for you. In the field of recycling, Goudsmit – with a worldwide network of agents - has already successfully provided magnets to many industries. You will come across them in this brochure.

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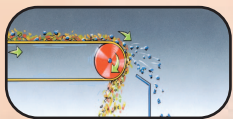


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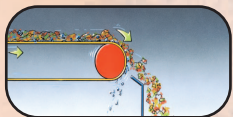
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## BLOCK MAGNETS

Removal of iron objects from raw materials being transported on a conveyor is most effective using a block magnet. Because a block magnet does not continuously carry away ferrous objects these are used in situations where few iron objects are expected. If a lot of iron is expected, then an overbelt magnet is probably better (as described later in this brochure).



*Electro block magnet (5.5 kW, for deferrisation of gravel.*

### ***Electro or permanent magnet?***

It is possible to use either an electro magnet or a permanent block magnet. The advantage of an electro magnet is that they, especially the larger types, have a deeper "field of attraction" and are easy to clean. When the power is turned off the iron objects simply fall off the block. The advantage of a permanent magnet is that the magnetic field is always present. It does not depend on a supply of electricity. In that way a permanent magnet offers significant cost advantages.

### ***How do you choose the right type?***

The size of the magnet is determined, principally, by the depth of the layer on the belt and the belt width. The closer the magnet can get to the iron the better the deferrisation. In addition the width of the magnet must approximately equal the width of the belt on which the product stands (generally the conveyor belt). Additionally, the nature of the product makes demands on the magnet; the removal of iron objects from wood splinters is naturally much easier than removing iron from coal. The average installation height is shown in the table. Naturally, we will gladly advise you.

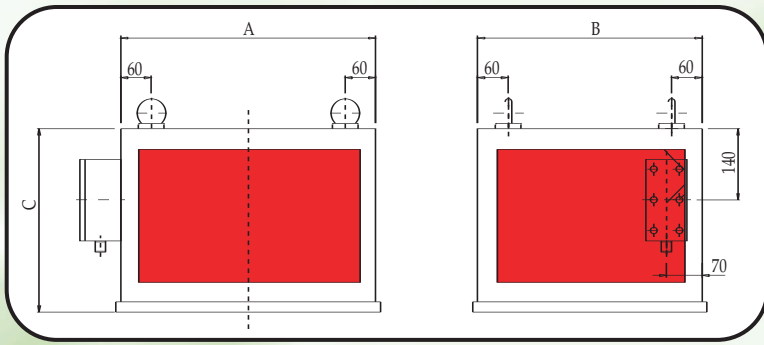
Additionally, the installation of the associated control box is included in the delivery of electro block magnets. This is where the direct current that is required for creating the magnetic field is generated.

You can find a photo of a control box on page 8 of this brochure.





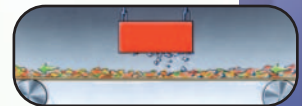
# ELECTRO BLOCK MAGNETS



Air-cooled electro block magnet – type EP.

Type	Sizes			Power (Watt)	Voltage (Volt)	Weight (kg)	Catch field depth (mm)	Eyebolt standard (mm)
	A (mm)	B (mm)	C (mm)					
EP 3	500	440	360	1100	55	350	180	M16
EP 4	600	530	380	1500	55	540	200	M16
EP 5	700	620	380	2000	110	700	240	M20
EP 6	800	700	440	2700	110	950	280	M20
EP 7	900	800	440	3700	110	1200	320	M20
EP 8	1000	940	480	5500	110	1600	360	M20
EP 9	1300	1000	400	7000	220	2000	400	M24

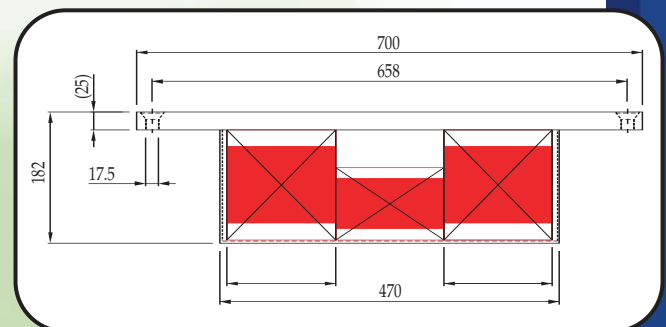
# PERMANENT BLOCK MAGNETS



## Location of permanent block magnets

Permanent block magnets are generally used for material flows over smaller belt widths and where it is expected that small amounts of iron objects will be encountered. If the location of the magnet makes cleaning by hand difficult then we also have a model with cleaning sled. The iron objects are removed from the magnet using a pneumatic cylinder (see photo).

Type	Magnet DIM (mm)	Catch field (mm)	Weight
PP 400	426x470x182	280	180
PP 600	626x470x182	280	270
PP 800	826x470x182	280	360
PP 1000	1026x470x182	280	495





# OVERBELT MAGNETS

Overbelt magnets have many applications. Whether it is processing household refuse or the separation of cutlery from catering waste, the principle remains the same. An overbelt magnet combines a powerful magnetic field with a safe working environment. Goudsmit ensures that your system is correctly adjusted to your specific circumstances. Your ideas – as manager of the production process – are very welcome in achieving this.

## Placement

The overbelt magnet is placed above the conveyor belt (as shown in the figure above). Unlike block magnets, overbelt magnets continuously carry away the "captured" iron. The magnets are thus continually cleaned, as a result of which they are excellently suited to the removal of many and heavy iron objects.

## Installation

The choice of magnet depends on the depth of layer on the belt, the width of the product layer and the installation. Installation is possible crosswise above the belt (fig. A) or lengthwise above the belt (fig. B). The latter is preferred. Then the iron objects no longer need to be carried away. A frequently occurring problem is that the end roller of the feed belt – above which the magnet hangs – must be from a non-magnetic material. For this reason, in practice, many magnet belts are installed crosswise above the belt.

## Action

The belt is cleaned using a conveyor belt, which turns around the magnet. The iron objects are attracted, after which the belt carries them away. When the iron objects leave the area of the magnetic field they automatically drop.

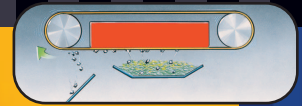
## Extra auxiliary pole

The Goudsmit overbelt magnets are fitted with an extra 'auxiliary pole' as standard. The auxiliary pole ensures that the iron objects can be transported further from the feed belt. This is a bonus, especially in the case of longer iron objects. By gently decreasing the magnetic field, 're-attraction' is prevented and the iron can be successfully carried away in one go. This prevents belt wear and thereby significantly decreases operational costs.





# PERMANENT OVERBELT MAGNETS



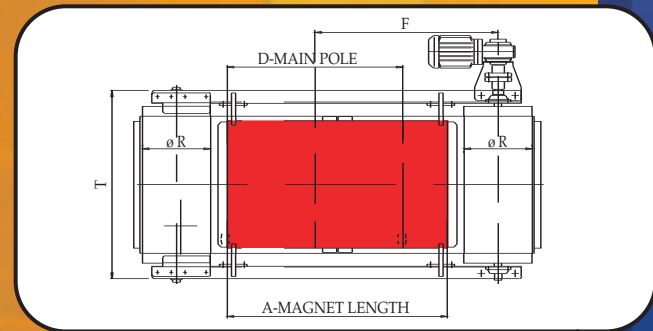
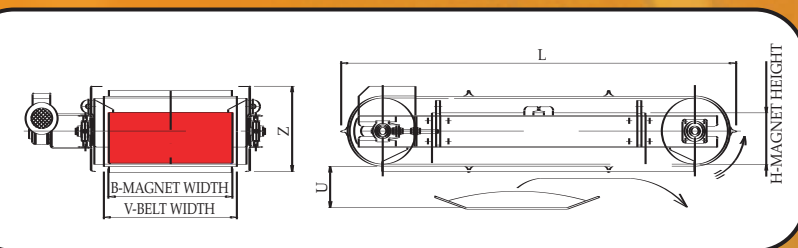
Permanent magnet for processing industrial waste at the end of a grading line. Installation in-line above belt.

## Permanent or electro overbelt magnets?

Goudsmit designs and produces both electro and permanent overbelt magnets. The type most suited to your situation depends, chiefly, on the installation height. If the height above the belt is more than 400 mm we advise using an electro magnet. For installation heights lower than 400 mm a permanent magnet is often a better solution. Because we are constantly working on optimising our magnets we would be happy to offer you advice.

A big advantage of a permanent overbelt magnet is the absence of the (electrical) control equipment that is needed to generate the magnetic field. The magnetic field is, after all, always present. This gives not only a high degree of operational security, the magnet is consequently also maintenance free. Because you do not need electricity this magnet system is ideally suited for application on mobile installations.

Permanent overbelt magnets are used, amongst other things, for the separation of iron objects from: building and demolition waste, paper recycling, electrical cables, car tyres, glass, wood, plastic, processing paint tins and for cleaning slag from incineration ovens. Goudsmit combines years of experience (since 1959!) with a full measure of know-how. There is a good chance that we have already found an effective solution to your problem!



Type nr.	Magnet	D mm	L mm	T mm	U mm	V mm	Z mm	Weight (kg)
SEPB065012	825x426x189	620	1562	730	210	500	300	450
SEPB080012	1010x426x189	825	1747	730	210	500	300	535
SEPB065013	830x602x251	730	1795	890	280	650	415	875
SEPB080013	1040x602x251	830	2005	890	280	650	415	1015
SEPB100013	1250x602x251	1040	2215	890	280	650	415	1270
SEPB080014	1090x778x312	780	2320	1060	320	800	545	1720
SEPB100014	1250x778x312	1090	2470	1060	320	800	545	1970
SEPB120014	1410x778x312	1250	2640	1060	320	800	545	2155
SEPB100015	1250x946x343	1040	2500	1260	400	1000	680	2120
SEPB120015	1450x946x343	1250	2700	1260	400	1000	680	2395
SEPB140015	1660x946x343	1450	2910	1260	400	1000	680	2665

U = recommended installation height above the belt.





# PERMANENT OVERBELT MAGNETS

with rare earth NEOFLUX® magnets

Permanent NEOFLUX® overbelt magnets are exceptional magnets. NEOFLUX® magnets are three times stronger than the conventional ferroxdure magnets. This means that extremely powerful and lightweight magnets can be produced! Eminently suitable for application in mobile installations.

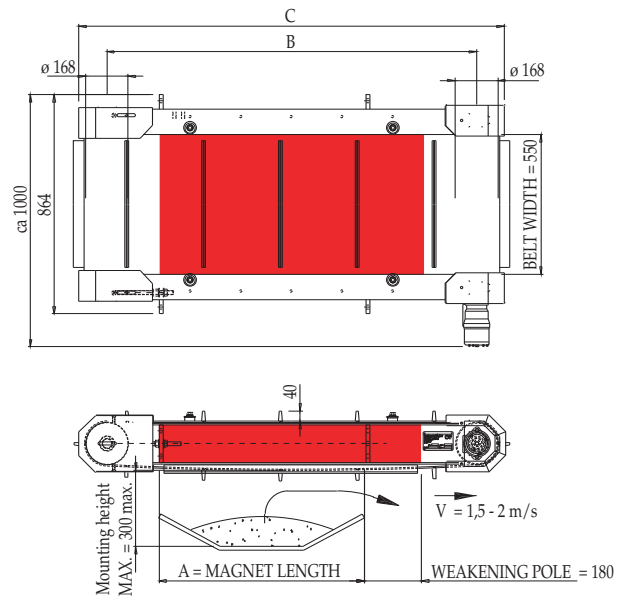
This NEOFLUX® overbelt magnet is a good example of the way in which Goudsmit works together with its customers in optimising systems. The frame is manufactured completely from stainless steel to prevent iron objects coming between the belt and the magnet. We combined our experience in magnetisation with those of our customer in the specific process.

### Special overbelt magnets

We have developed a special overbelt magnet for capturing cutlery for the largest catering company in Europe. The customer wanted a solution for the high belt wear and the dirt residue that was left in the magnet and, of course, the HACCP standards had to be maintained. Together with the customer, Goudsmit Magnetic Systems developed a special stainless steel casing for the moving magnets. The magnetic field radiates out through the stainless steel casing to the cutlery. The cutlery is captured from the trays and automatically carried to the dishwasher. As no moving parts have been incorporated on the outside, a safe working environment is created.



NEOFLUX® permanent overbelt magnet. Extremely light and extremely strong. Specially developed for application above mobile installations.



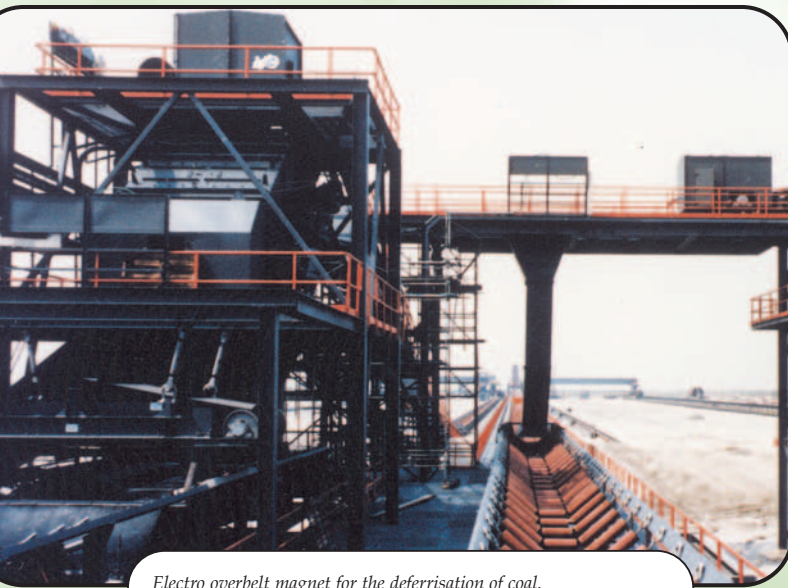
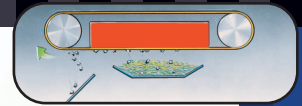
Permanent overbelt magnet for capturing cutlery.

Article number	MAGNET	OTHER		Weight kg
	A mm	B mm	C mm	
SEPBO70018	700	1260	1480	480
SEPBO90018	900	1460	1680	600
SEPB110018	1100	1660	1880	730
SEPB130018	1300	1860	2080	860





# ELECTRO OVERBELT MAGNETS



Electro overbelt magnet for the deferrisation of coal.

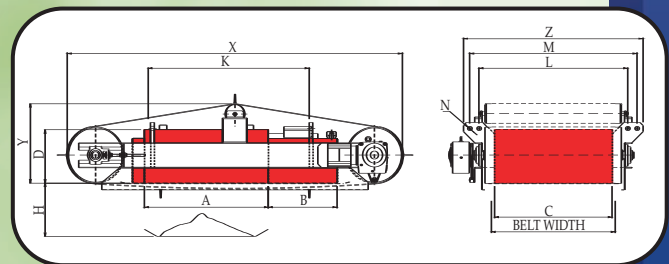
The electro overbelt magnet is used for installation heights greater than 400 mm. Here too Goudsmit uses a main pole and a decreasing pole. Some of the electrical energy supplied to the magnet is converted into heat. This heat decreases the magnetic field. A cold electro magnet is much more powerful than a warm magnet (approx 20%). That is why efficient cooling is a determining factor in the efficient operation of the magnet. Goudsmit has opted for oil-cooled magnets in order to ensure that the heat produced by the magnet is efficiently dispersed. This has already proven its value through the years. Apart from improved operation, the service life of the magnet is significantly increased. The oil preserves the spool.

The switch box is equally as important as the magnet itself. Our own Electro Development Department will be happy to meet your own specialists to find the best fitting solution. As standard, the switch boxes are delivered with an IP54 degree of protection but for dusty situations and where there is the danger of explosion delivery of an Ex-zone switch box is no problem at all.

The standard switch box is manufactured in such a way that it can be operated under both local and remote control (from a control room).



Electro overbelt magnet for processing household waste.



Type	Belt width	Maximum height	Power	Main pole length	Auxiliary pole length	Magnet width	Magnet height	Suspension	Suspension	Hoisting	Diameter	Length	Height	Width	Motor	Weight
	mm	H mm	kW	A mm	B mm	C mm	D mm	K mm	L mm	M mm	N mm	X mm	Y mm	Z mm	kW	kg
SEEB080022	800	300	3.3	800	444	760	400	950	1000	1150	30	2390	640	1250	1.5	1965
SEEB100022	1000	375	5.2	1000	555	950	430	1250	1200	1350	35	2700	640	1450	2.2	2970
SEEB120022	1200	450	7.6	1200	666	1140	460	1540	1420	1590	45	3035	720	1710	2.2	4490
SEEB140022	1400	525	10.3	1400	777	1330	500	1830	1620	1810	55	3365	760	1970	2.2	6790
SEEB160022	1600	600	15.4	1600	888	1520	580	2120	1840	2070	65	3695	890	2270	3.0	10270
SEEB180022	1800	650	20	1800	1100	1600	620	2520	2040	2270	65	4700	1090	2470	4.0	17300
SEEB200022	2000	800	26	2050	1400	2050	790	3020	2400	2630	70	5650	1340	2770	4.0	21000

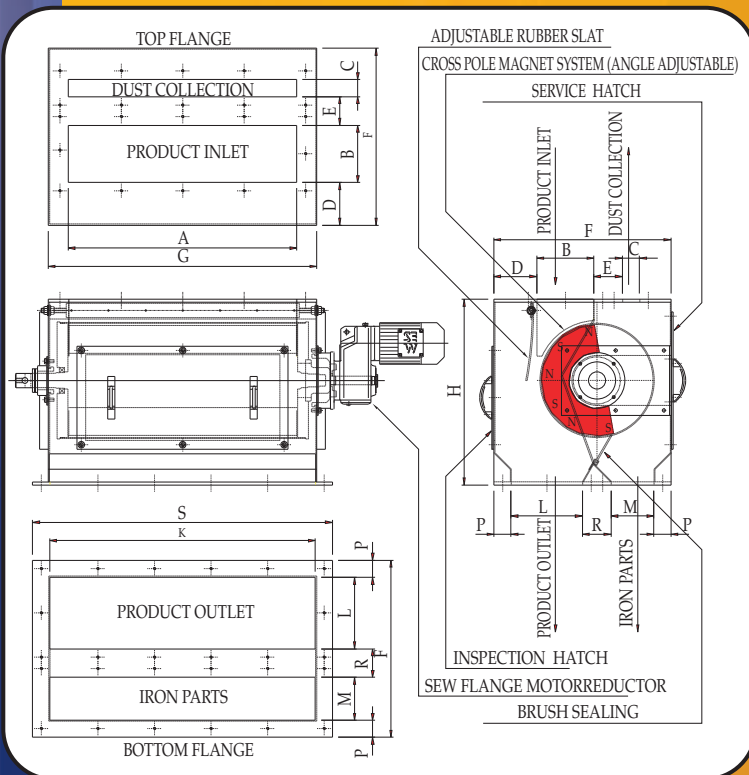






# DRUM MAGNETS

Drum magnets are used for the removal of steel objects in a vertical feed pipe. The big advantage of this system is that the iron objects are continuously carried away and it can process large capacities. All this with a low build-in height. If less dusty products are being processed the drum can also be used without a casing at the end of a feed belt or a vibrating sieve.



Drum magnet with casing.

### Areas of application:

- Cleaning blasting grit.
  - Cleaning cocoa beans, sugar, cattle feeds.
  - Cleaning shredded car tyres.
  - Cleaning fish food and animal meal.
  - Cleaning of granulates in the ceramic industry.
- Please see our Clean-Flow magnets brochure for the separation of particles smaller than 0.5 mm.

Type nr.	Drum Dimensions	Capacity	A G	B C	D E	H F	K S	L M	P R	Drive Power
SRTK040034	ø 300x400	35m <sup>3</sup> /hr	400 540	150	125	500	400 540	175	60	0,37 kW
SRTK060034	ø 300x600	52m <sup>3</sup> /hr	600 740				730 850			
SRTK080034	ø 300x800	70m <sup>3</sup> /hr	800 940				930 1050			
SRTK060044	ø 400x600	90m <sup>3</sup> /hr	600 740	200	150	650	730 850	250	60	0,55 kW
SRTK080044	ø 400x800	120m <sup>3</sup> /hr	800 940				930 1050			
SRTK100044	ø 400x1000	150m <sup>3</sup> /hr	1000 1140				1130 1250			
SRTK100055	ø 500x1000	180m <sup>3</sup> /hr	1000 1140	250	160	775	1130 1300	275	85	0,75 kW
SRTK120055	ø 500x1200	215m <sup>3</sup> /hr	1200 1340				1330 1500			
SRTK140055	ø 500x1400	250m <sup>3</sup> /hr	1400 1540				1530 1700			

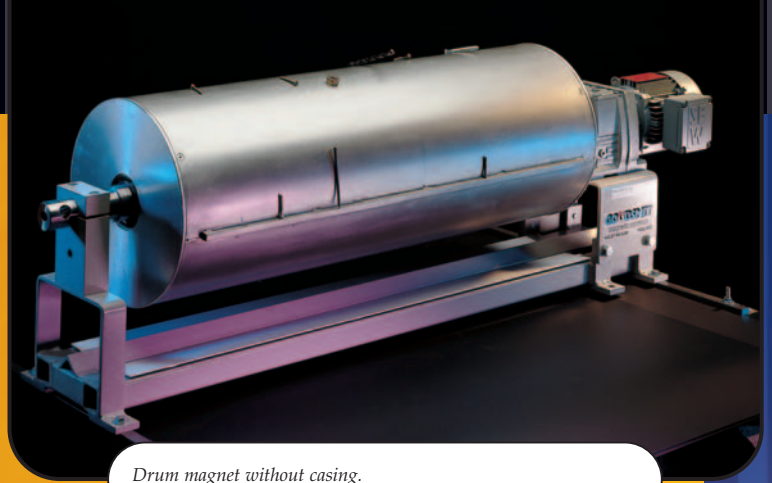


### Action

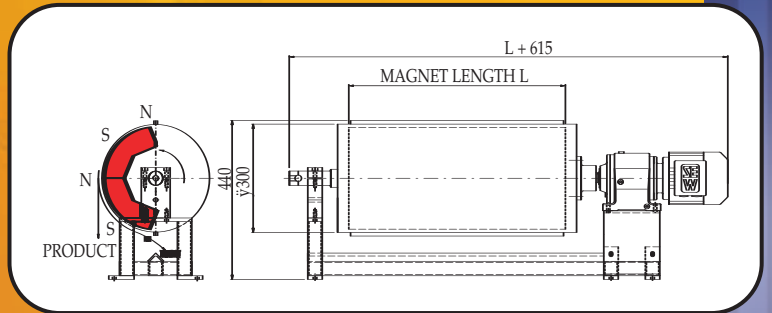
The drum consists of a stationary magnet segment and a stainless steel non-magnetic casing. The casing is driven by an electro motor and revolves in the product. The magnet segment is stationary. The iron objects are attracted through the stainless steel casing and "stick" to the casing. The product, which is non-magnetic, is not attracted and falls straight through to the bottom. The iron objects are transported to the non-magnetic part of the drum. Here there is no longer a magnetic field and the iron objects fall off the drum. To ensure that the iron objects are pushed out of the powerful magnetic field carriers (ribs) have been welded to the casing.

### Magnet construction

The magnet drum is fitted, as standard, with both ferroxdure and the three times more powerful NEOFLUX® magnets. The NEOFLUX® magnets ensure an extra high Gauss value on the drum. The ferroxdure magnets increase the working depth of the magnetic field. An ideal combination! The product flow is led to the drum through an adjustable rubber flap. This gives optimal contact with the separation drum.



Drum magnet without casing.

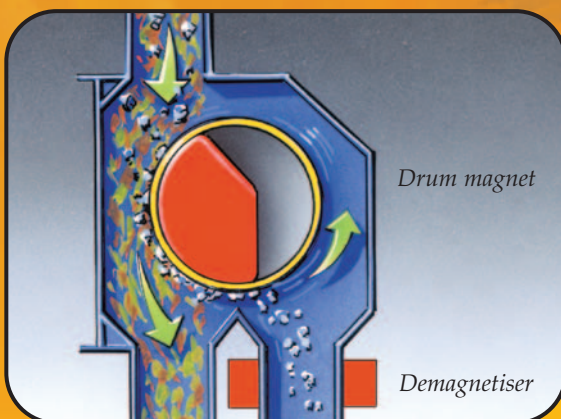


## DEMAGNETISING EQUIPMENT



### Demagnetising equipment

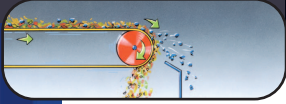
During the deferrisation of your product the captured iron particles can become magnetised. This can cause problems especially in the deferrisation of blasting grit. The blasting grit "lumps" together and causes blockages. If the iron objects are led through a Goudsmit Demagnetising tunnel the product is separated and can be further transported without problem.



Drum with demagnetising tunnel.



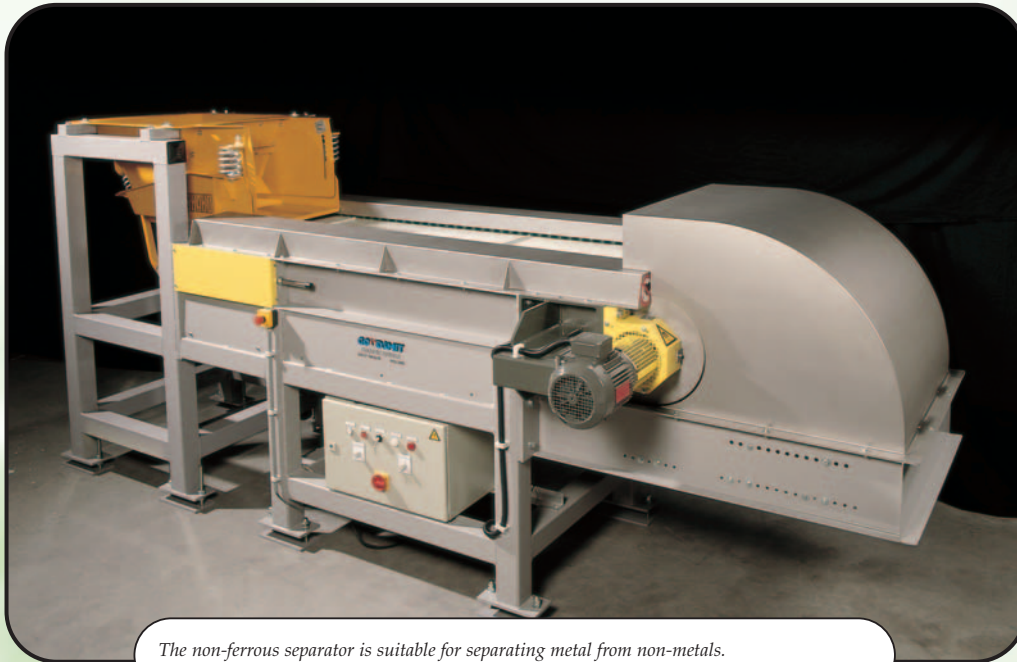




# NON-FERROUS SEPARATORS

*E d d y C u r r e n t t y p e*

By no means does metal contamination of your product consist solely of iron objects. In order to also separate non-magnetic objects Goudsmit developed the Eddy Current Non-ferrous Separator. The separator is eminently suitable if the metal contamination of your product is more than 2%. The metal objects are continuously "thrown" out of the product flow. For contamination of less than 2% you can use metal detectors (as described later in the brochure).



*The non-ferrous separator is suitable for separating metal from non-metals.*

### **The Eddy Current principle:**

Separation is based on the principle that every conductive object that enters an alternating magnetic field will become magnetised.

The original magnetic field is diametrical to the magnetic field created by the eddy current, which causes the metal objects to be repelled.

Put simply, all metal objects that pass the magnetic roller are magnetised for a short period of time, whereby they can be "shot away".

Typical areas of application are:

- The removal of aluminium caps for the glass recycling industry.
- The removal of brass catches and hinges in the wood recycling industry.
- The removal of non-ferrous metal from slag in waste incineration installations.
- Scrap processing.



### **Installation:**

The installation consists of a vibrating sieve, a conveyor belt with a NEOFLUX® separation roller, a separation flapbox and a control box. The vibrating sieve ensures an optimal spreading of the product over the belt in order to improve the "contact" between the magnetic field and the metal. A powerful NEOFLUX® separation roller rotates at high speed at the end of this belt. The metal comes under the influence of the alternating magnetic field and an eddy current is created. This creates its own magnetic field. This field is diametric to the original field. Because opposite magnetic poles repel the metal is, as it were, "shot away".

Non-conductive particles fall straight down. The separation flap ensures that separation is as clean as possible.

The control box regulates the capacity of the vibrating sieve as well as the revolutions of the separation roller and the speed of the belt. This ensures that the separator can be optimally adjusted for every product.



*At the back of the non-ferrous separator is an adjustable plastic separation plate for optimal results.*

### **The magnetic roller**

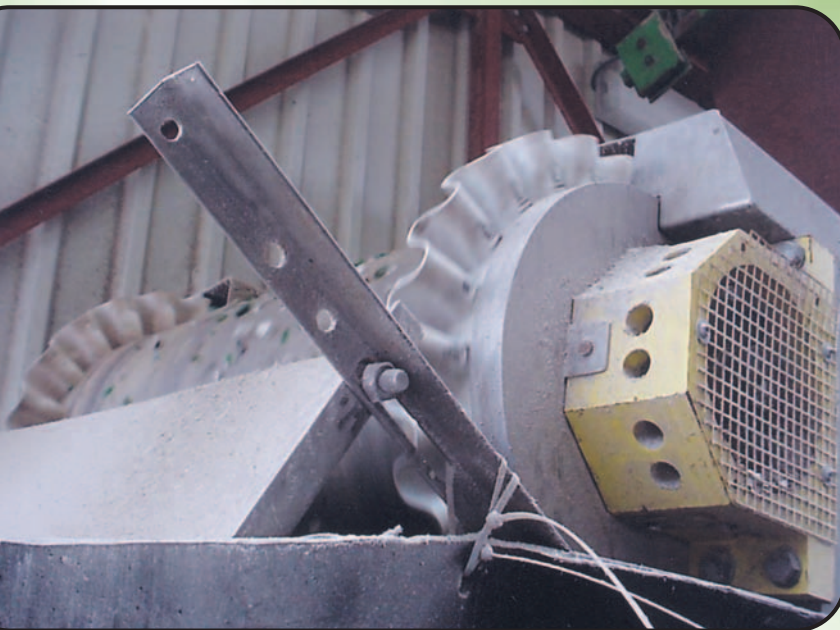
The magnetic roller is built from powerful, rare natural magnets. The internal part is directly driven by an electric motor. The revolutions for the motor can be adjusted. The outer casing revolves at the same speed as the separator feed belt. Each type of metal has its own characteristic properties. In this way, good conductors will be "shot away" further than poor conductors. But also, light materials will go further than heavier objects. Aluminium is an excellent conductor and, moreover, a very light material and it will thus be optimally "shot away". Copper and brass have less of this effect. On the other hand, stainless steel is reasonably heavy and conducts the current poorly. Therefore, it is better to use a "regular" NEOFLUX® magnetic headroller for removing stainless steel particles. This powerful magnetic roller separates the stainless steel using the light magnetic properties of this type of metal.

### **The construction**

The high number of revolutions of the magnetic roller causes heavy loading of the bearings. Environmental factors also play a role in this. We have taken this into account in our design. The magnetic roller is suspended in a robust frame that has been completely aligned in the factory. The roller is, as it were, separate from the rest of the installation. This prevents unnecessary loading of the bearings and, thus, breakdowns. Furthermore, the frame is so constructed that the feed belt can be simply and quickly replaced.

### **Conveyor belt**

The conveyor belt is provided with a heat and wear resistant Ropan layer. This prevents iron particles burning into the belt. Iron particles stick to the magnetic roller. As a result of the eddy current the particles become red hot. The product must, therefore, be first well deferrised. This can be done, for example, using a Goudsmit magnetic headroller or drum magnet. The bottom of the belt is fitted with a guide wire that prevents iron dust entering between the magnetic roller and the belt.



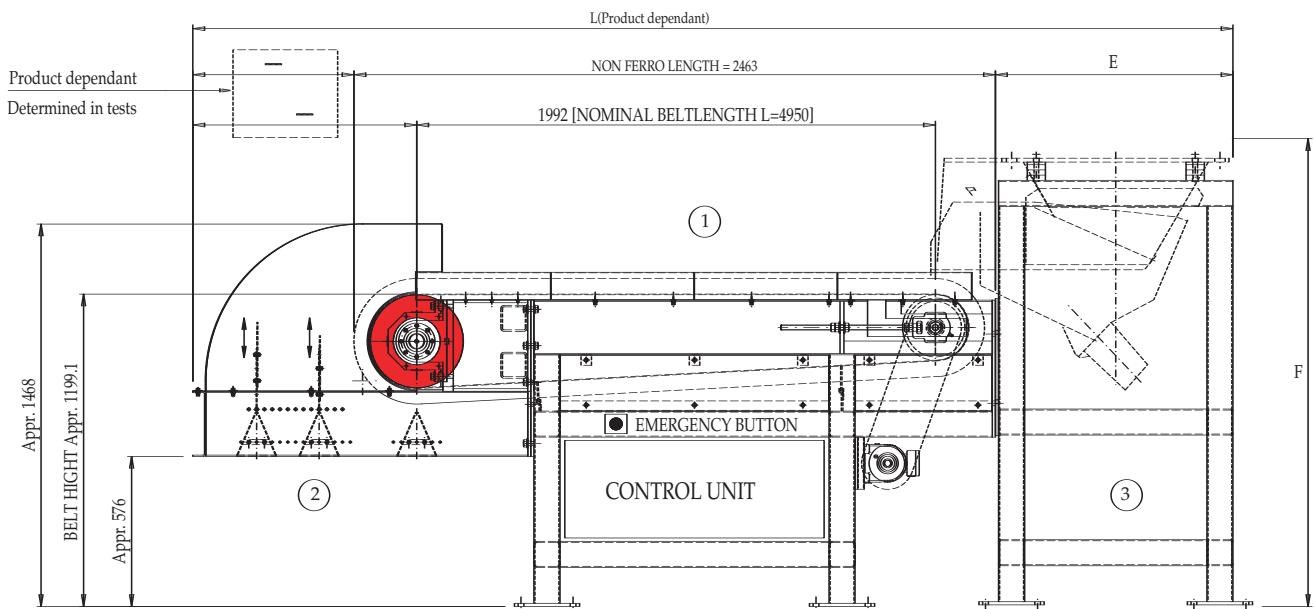


## NEOFLUX® separation roller

The number of poles in the magnetic roller depends on the size of the particles that you want to separate. For instance, the separation of particles larger than 10 mm requires far fewer magnetic poles than the separation of smaller particles.

### Installation in-line / off-line

The installation of the Eddy Current Separator is not the same for every production process. Experience has taught us that placement parallel to the shredder gives the highest production figures in most cases. This is despite the extra logistical actions that have to be carried out. The explanation for this is the fact that the Eddy Current Separator gives the best results with an even supply of the product. A shredder's output is far from being constant. It is either "pelting or full stop". By installing the Eddy Current Separator separately in the production line you can provide the separator with a constant supply. At the same time, the separator can still be used while the shredder is being maintained.



Type nr.	POS 1		POS 2		POS 3		m3/hr	m/s	kW	kW	kW	W	A	E	F	B
	Order nr	Order nr	Order nr	Order nr	Order nr	Order nr										
NF 600	SENF060001	Special	M1501	M1504	50-90	0,5-1,9	0,75	1,5	1,4	600	1050	915	1800	710		
NF 850	SENF085001	Special	M1502	M1505	70-180	0,5-1,9	1,1	2,2	2,2	850	1300	1350	1990	1000		
NF 1050	SENF105001	Special	M1503	M1506	90-230	0,5-1,9	1,5	3,0	3,0	1050	1500	1725	2090	1250		

Magnet Motor fully adjustable frequency in full process  
 Imbalance Motor Range adjustable frequency process must be stopped  
 Max Capacity (product dependant)  
 Belt speed  
 Motor Power Belt Drive  
 Motor Power Magnet Roller  
 Motor Power Vibrating Trough  
 Effective Belt Width  
 Width frame  
 Feeder frame length  
 Feeder frame height  
 Feeder inlet



# PERMANENT MAGNETIC HEADROLLERS

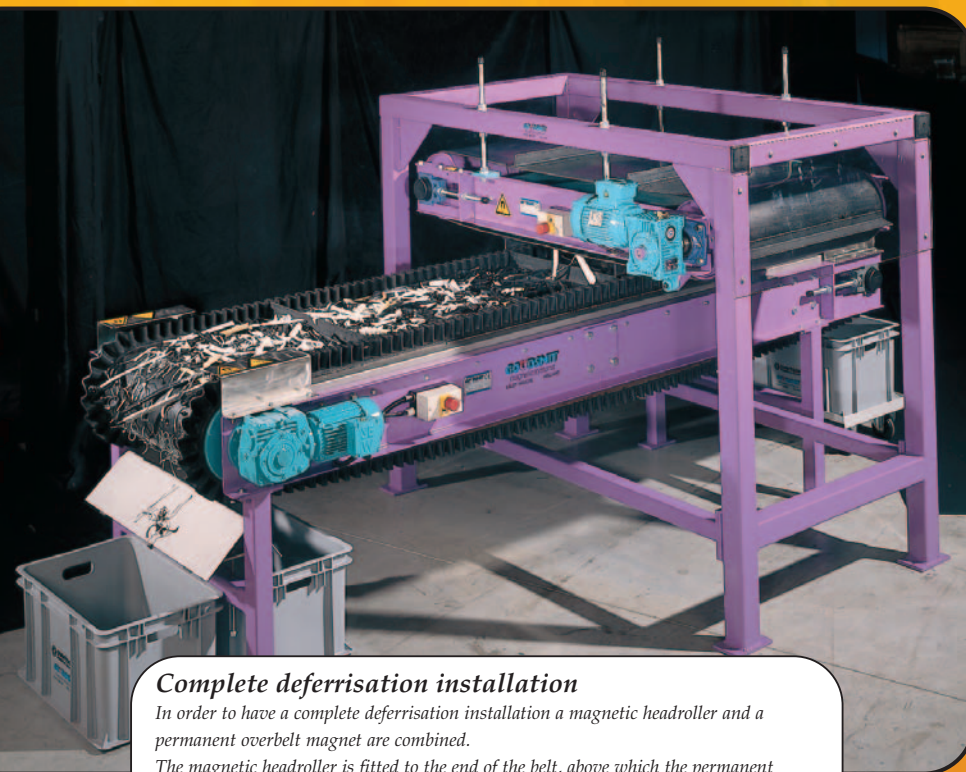


Magnetic headrollers are fitted at the end of the conveyor belt as the return drum. Separation of magnetic and non-magnetic objects occurs here. The magnets retain the iron objects and eject them backwards. Non-magnetic objects fall directly down. A big advantage of this solution is that the magnetic field comes into direct contact with the product.

This is unlike the overbelt magnet, which always hangs above the product. This type of solution is used mainly when seeking very heavy, solid iron objects (such as, for instance the tooth from a shovel). Headrollers are often fitted in combination with an overbelt magnet (see photo). For the removal of longer iron objects, concrete reinforcement for instance, it is better to use an overbelt magnet (see description on page 5).

## Separating stainless steel!

Stainless steel objects are non-magnetic. However, it appears that if stainless steel is deformed, for instance directly following shredding, it does have magnetic properties. Goudsmit has a simple solution for this difficult problem. The powerful NEOFLUX® headroller can separate these objects by using rare earth natural magnets.

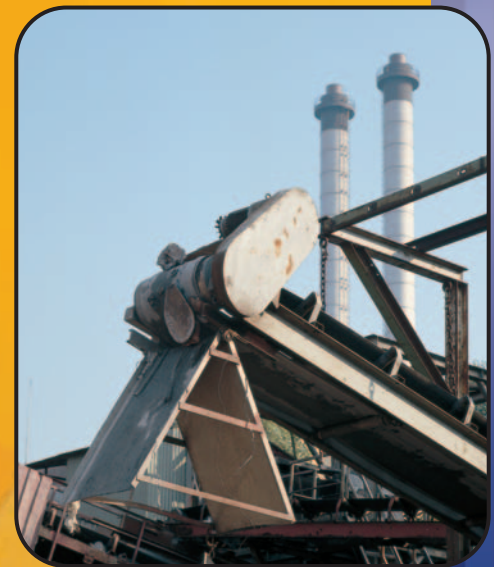


## Complete deferrisation installation

In order to have a complete deferrisation installation a magnetic headroller and a permanent overbelt magnet are combined.

The magnetic headroller is fitted to the end of the belt, above which the permanent magnet is suspended. The overbelt magnet captures all the larger iron objects while the magnetic headroller removes the objects with poor magnetic qualities.

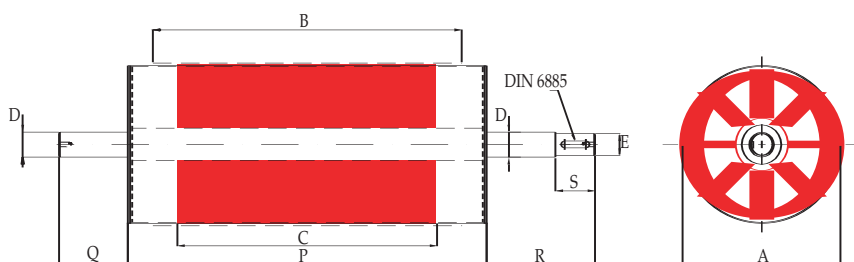
An example is a plastic object containing metal contamination.



## Fitting

Magnetic headrollers are easy to install. Goudsmit makes the magnets for this to measure. The larger the diameter of the roller, the more powerful we can make the magnetic field.

As standard, magnetic headrollers are supplied in diameters of 200 mm, 250 mm, 320 mm, 400 mm, 500 mm, 600 mm and 700 mm. Alongside you can see a diagram of a standard roller. You simply complete the missing sizes and Goudsmit will supply a roller, which is easy to install, to your specification.







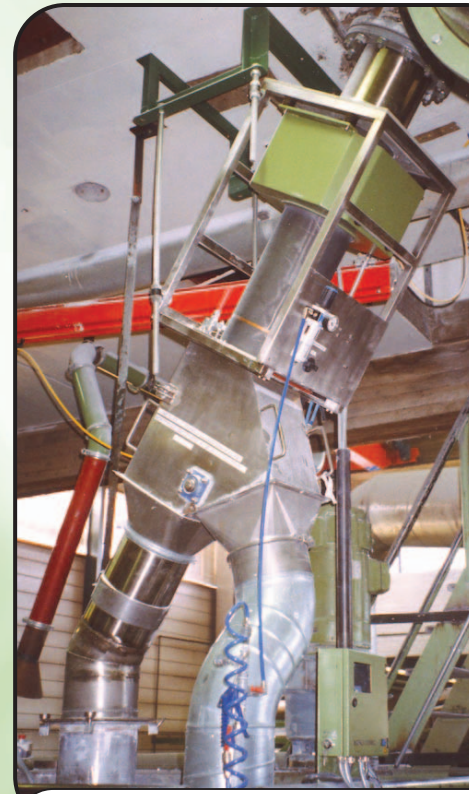
# METAL DETECTORS

If the product is contaminated with non-magnetic metals, these can often be removed using a metal detector. Unlike the Non-ferrous Separator previously described, the detector signals the presence of metal but does not automatically eject it. The signal from the detector can, however, be coupled to an ejection mechanism. This can be a simple flap system or a pneumatic cylinder.

## Installation

The metal detector has to be installed in a metal free zone (MFZ), which cannot contain any metal. The size of this metal free zone is determined by the size of the aperture on the detector.

Because good installation is very important we also supply metal detectors with conveyor belts made to measure.



Quicktron: detection of wood fibres.



For protecting cutting mills  
The belts stops automatically when metal is detected:  
Belt stop and siren.



Metal detectors can also be placed in free-fall systems. Metal separation occurs automatically by means of a flap. The flap switches to the "reject position" for a couple of milliseconds and ejects the metal contamination.







1

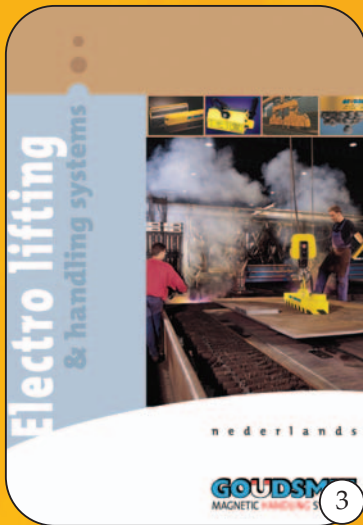


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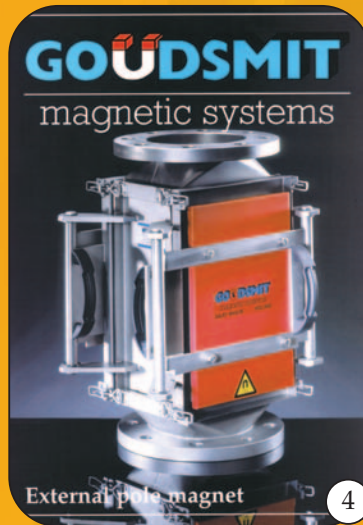
**Teamwork between three divisions**  
 Behind the Goudsmit Group stand the divisions where various disciplines are housed.  
 They are ready to supply fitting answers to all your questions about magnets.



ISO certified:  
 No. 653438



3

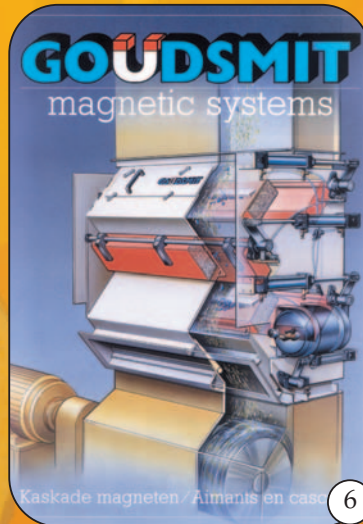


4

- 1 Clean-flow magnets
  - 2 Demagnetising equipment
  - 3 Lifting magnets
  - 4 External pole magnets
  - 5 Pipe magnets
  - 6 Cascade magnets
- Ask for brochures!



5



6

**GOUDSMIT**  
 magnetic systems